

ABSTRACTS

Abstracts

16th European Congress of Trauma and Emergency Surgery

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Amsterdam, The Netherlands

Congress President

Prof. Dr. Roelf S. Breederveld MD, PhD
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Abstracts for the 16th European Congress of Trauma and Emergency Surgery
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Dear Colleagues, dear friends,

It is a great honor to welcome you to the 16th European Congress of Trauma and Emergency Surgery in Amsterdam, capital city of the Netherlands.

The leading theme of this congress is:

"Save Lives—share Knowledge"

Colleagues of all over the national ESTES member societies in Europe and also from the other continents will share their knowledge in over 80 sessions during 3 days.

In instructional lecture courses, keynote sessions, case presentations and poster sessions the state of the art in emergency and trauma surgery will be presented.

With special interest for these topics:

- Military and Disaster medicine: disaster preparedness
- Skeletal trauma: Fragility Fractures, Pediatric fractures, Sports injuries, Spine and Pelvic injury
- Emergency Surgery, Burn Care
- Abdominal, Thoracic and Visceral trauma. Pancreatitis and Pancreatic trauma
- Evidence based trauma care, Epidemiology, Trauma registration systems
- Innovations, New techniques, Minimal invasive surgery
- Bleeding control, Necrotizing infections.

Many other subjects will be addressed.

Furthermore there are several pre courses organized such as: Definitive Surgical Trauma Care (DSTC), Modular Ultra Sound Estes Course (MUSEC), and the Emergency Management of Severe Burns course.

During the sessions there will be time for discussion to share knowledge. During the social events there are several possibilities for renewing contacts and exchanging experiences between colleagues from all over the world.

I am very grateful that so many experienced and young less experienced colleagues in the Netherlands supported the organization of this powerful event, some with creative ideas, and some by investing a lot of time and effort to effect these ideas.

The 16th European congress for trauma and Emergency Surgery is organized by the European Society for Trauma and Emergency Surgery (ESTES) in close cooperation with the Dutch Trauma Society of which a lot of the members were active in the organization.

Amsterdam as a well-known city offers a lot of history, culture and amusement and this shopping paradise will especially in the evenings put a spell on you!

The famous canals, the international atmosphere and the high-quality museums, theatres and historic buildings are offering many opportunities to relax and enjoy during your stay.

More over the hundreds of restaurants in the city guarantee a lovable and pleasant week for you.

I am honored and proud to meet you in Amsterdam!

Prof. Dr. Roelf Breederveld

Congress president

Oral Presentations

THORACIC INJURY

O001

SURGICAL TREATMENT OF FLAIL CHEST WITH TITANIUM CLIPS. MULTICENTER STUDY

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Introduction: Until recently the conservative treatment of unstable chest was regarded as the gold standard. Various studies show the benefits of surgery over conservative. The availability of clips for oteosíntesis, made of titanium have tipped the scales toward this form of treatment.

Materials and methods: A multicenter, prospective study was conducted at four institutions. A system with titanium clips (STRATOS System) for rib fixation of flail chest is used. As a control group of patients treated conservatively used during the same time period in an institution. Patients were divided into two groups: those treated surgical (Group I) and those treated conservatively (Group II). Both groups were compared with respect to age, sex, associated injuries, ISS and AIS. Both groups were similar to each other.

Results: For both groups of hospital stay was similar. Regarding ITU stay, mechanical ventilation days, morbidity (pneumonia) and mortality: in all cases the surgically treated group produced better results than the conservatively treated. Group I Group II p Num pat 144 41

Hosp stay 21 (1–90)	21 (4–73)
ITU stay 10 (0–90)	21 (2–73) P < 0.005
MKV days 5 (1–30)	29 (10–45) P < 0.005
Morbidity 36 (25 %)	25 (61 %) P < 0.005
Pneumonia 21 (14 %)	11 (27 %) P < 0.005
Mortality 4 (3 %)	16 (39 %) P < 0.005

Conclusion: Based on our results, we consider that: the costal osteosynthesis in patients with flail chest, improves survival and decreases: complications, time in ITU and the need for mechanical ventilation. The system with titanium clips is a good alternative for the treatment of these patients.

Disclosure: No significant relationships.

O002

STABILIZING FLAIL CHEST INJURIES THROUGH MINIMIZED APPROACHES TO THE POSTERO-LATERAL CHEST WALL - A FEASIBILITY STUDY USING POST MORTEM HUMAN BEINGS

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Introduction: Stabilizing techniques of flail chest injuries are described through wide approaches to the chest wall. Three main regions need to be considered when stabilizing the rib cage: median-anterior with dissection of pectoral muscle; lateral – axillary with dissection of mm. serratus, externus abdominis; posterior – inter spino-scapular with division of mm. rhomboidei, trapezius and latissimus dorsi [i] Severe morbidity due to these invasive approaches needs to be considered. This study discusses possibilities for minimized approaches to the posterior and lateral Region.

Materials and methods: Preliminarily 5 fresh frozen cadavers in lateral decubitus position were observed on both sides. Each arm was kept mobile during the procedure. Approaches were performed following a standard protocol with muscle sparing incisions starting with 5 cm length and extensions to 10 and 15 cm. The reachable surface comparing the extensions was measured and the visible ribs were counted. In a next step MatrixRibPlates were fixed to those ribs to proof the feasibility of stabilizing ribs through limited approaches.

Results: Preliminary, one minimized approach offers sufficient access to 6–8 ribs when using 5 cm incisions and up to 10 ribs in 10 cm extension. There is no relevant increase of reachable ribs in 15 cm approach whereas free access to each rib gains up remarkably. Keeping the arm and thus the scapula mobile is very important for providing the largest reachable surface of the rib cage through each Approach.

Conclusion: Minimized approaches allow sufficient stabilization of severe dislocated rib fractures without extensive dissection or division of the important muscles.

References: Bottlang M, Long WB, Phelan D, Fielder D, Madey SM. Surgical stabilization of flail chest injuries with MatrixRIB implants: a prospective observational study. Injury. 2013 (Epub).

Disclosure: The first author has Consultant Agreement with Synthes CMF, the other authors are not involved in any COI

O003

A PROSPECTIVE REVIEW OF OPERATIVE FIXATION OF RIB FRACTURES IN A UK MAJOR TRAUMA CENTRE

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Introduction: Thoracic jury is the second biggest cause of trauma-related mortality, up to 25 %. Rib fracture is the most common injury in chest trauma [1–3]. Following a retrospective audit of rib fracture management and the NICE guidelines of 2010 [4] rib fracture fixation was introduced into our institution in March 2015.

Materials and methods: After a retrospective audit of thoracic trauma patients identified patients with rib fractures who could potentially have been treated with operative treatment it was decided to introduce rib fracture fixation as a treatment option. An audit in 2013 in our institution showed poor outcome in thoracic injury patients requiring mechanical ventilation. therefore in March 2014 clinical guidelines were introduced for rib fracture fixation. A database of all patients with thoracic trauma led by our physiotherapists was instituted.

Results: 20 patients (10:10, M:F) with rib fractures were managed with open reduction and internal fixation. 77 % of patients had a flail chest, with an average ICU stay of 14.3 days and a total average length of stay of 17.6 days. There was a 0 % mortality with 1 patient with a superficial wound problem but 0 % deep infection and 0 % reoperation rate.

Conclusion: Rib fixation in patients with serious bony thoracic injury is effective and has very low morbidity and mortality.

References: 1. Vana PG, Neubauer DC, Luchette FA. Contemporary management of flail chest. Am Surg. 2014;80(6):527–35. 2. Khandelwal G, Mathur RK, Shukla S, Maheshwari A. A prospective single center study to assess the impact of surgical stabilization in patients with rib fracture. Int J Surg. 2011;9(6):478–81. 3. Lafferty PM, Anavian J, Will RE, Cole PA. Operative treatment of chest wall injuries: indications, technique, and outcomes. J Bone Joint Surg. 2011;93(1):97–110. 4. National Institute of Health and Clinical Excellence (NICE). Insertion of metal rib reinforcements to stabilise a flail chest wall (NICE interventional procedure guidance 361). 2010.

Disclosure: No significant relationships.

O004

CLAMSHELL THORACOTOMY AND OPEN HEART MASSAGE: A PROCEDURE THAN CAN BE PERFORMED EASILY BY UNSKILLED PHYSICIANS?

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Introduction: Patients with traumatic cardiac arrest especially after penetrating trauma seem to benefit considerably from an immediate emergency thoracotomy. If the arrest occurs on the place of accident and the transport exceeds 10 min the outcome stays low. The idea of taking the surgery to the patient is already implemented in some emergency medical services. Purpose of this study was to evaluate the time an unskilled physician needs for his first and second emergency thoracotomy.

Materials and methods: Two clamshell thoracotomies at a time were performed at 28 cadavers by internal specialists, anaesthetists, students and surgeons. Times and complications were recorded by an experienced thoracic surgeon.

Results: The mean total time for the clamshell procedure till both hands were applied on the heart was 2:47 min. The surgeon group did not perform best, we found no significant differences between the groups ($p = .273$). Complication rate dropped from 36 % in the first attempt to 7 % in the second attempt. Pericardiocentesis was the most critical part of the procedure.

Conclusion: The clamshell thoracotomy is an effective and easy to teach approach to decompress a pericardial tamponade and provide open cardiac massage. A nationwide training of emergency physicians in learning this technique has to be considered seriously.

References:

- Tisherman SA. Salvage techniques in traumatic cardiac arrest: thoracotomy, extracorporeal life support, and therapeutic hypothermia. Curr Opin Crit Care. 2013;19(6):594–8.
- Davies GE, Lockey DJ. Thirteen survivors of prehospital thoracotomy for penetrating trauma: a prehospital physician-performed resuscitation procedure that can yield good results. J Trauma. 2011;70(5):E75–8.

- Coats TJ, Keogh S, Clark H, et al. Prehospital resuscitative thoracotomy for cardiac arrest after penetrating trauma: rationale and case series. J Trauma. 2011;50(4):670–3.
- Athanasiou T, Krasopoulos G, Nambiar P, et al. Emergency thoracotomy in the pre-hospital setting: a procedure requiring clarification. Eur J Cardiothorac Surg. 2004;26(2):377–86.

Disclosure: No significant relationships.

O005

STABILIZING THE “FOURTH VERTEBRAL COLUMN” THROUGH ANTERIOR STERNAL PLATING IN VERTEBRAL SPINE INJURIES CONCOMITANT TO STERNAL INSTABILITY

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Introduction: Sternal fractures are rare with 3–8 % out of the total number of trauma cases mostly caused by direct impact to the anterior chest wall but indirect forces may lead to sternal fractures, too. In this context, flexion and compression forces to the trunk can cause severe instability of the vertebral column and the anterior chest wall. In combination, the worst case would be a complete disruption of the trunk. Some authors consider the Sternum-Rib-complex to be the fourth vertebral column [1]. This study discusses possibilities to treat instable trunk injuries with sternal fractures concomitant to thoracic vertebral spine fractures. Could a sternal plating alternatively be used instead of anterior instrumentation of vertebral bodies?

Materials and methods: 8 Patients were included to the cohort study, suffering from at least one fracture of vertebral body in combination with an unstable sternum fracture. Sternum was stabilized by locked plate osteosynthesis between May 2012 and October 2014 [2]. Each vertebral spine injury was stabilized through a dorsal instrumentation. Patients were followed up with a look to consolidation of fractures and the question of sagittal dislocation of the trunk.

Results: Anterior sternal plating was uneventful in all cases. All Sternal fractures showed sufficient consolidation. Any patient showed anatomic alignment of the vertebral column without secondary dislocation and acquired sagittal deformity.

Conclusion: Dorsal Stabilization of the vertebral column alongside anterior sternal plating seems to be an option for sufficient treatment of unstable injuries to the vertebral column combined with those at the anterior chest wall.

References: 1. Berg EE. The sternal-rib complex. A possible fourth column in thoracic spine fractures. Spine (Phila Pa 1976). 1993;18:1916–9. 2. Schulz-Drost S, Mauerer A, Grupp S, Hennig FF, Blanke M. Surgical fixation of sternal fractures: locked plate fixation by low-profile titanium plates—surgical safety through depth limited drilling. Int Orthop. 2013.

Disclosure: No significant relationships.

O006

INJURY OF THE CHEST WALL IN POLYTRAUMA: INCIDENCE, ASSOCIATED INJURIES, COURSE AND OUTCOME: AN ANALYSIS OF 21,741 PATIENTS REGISTERED IN THE TRAUMA REGISTRY OF THE DGU

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Introduction: In polytrauma patients thoracic injury is described in about 50 % of all cases. Besides soft tissue contusions especially the osseous thorax is seriously compromised. The aim of this study was to investigate the prevalence of osseous chest wall injuries in conjunction with associated injuries, treatment options and outcome.

Materials and methods: Included were patients with an ISS ≥ 16, primary admission to a trauma center with participation in the Trauma Registry of the DGU. Groups with the features rib fractures and Flail chest were formed. 21,741 patients were assigned.

Results: 48.2 % had rib fractures. The literature provides little comparable results. In the present study 3492 patients (16.1 %) had an unstable chest wall. In 1108 cases a bilateral flail chest was detected. Interestingly only 1957 cases had one or two ribs fractured, while 5025 cases had multiple rib fractures without instability. With increasing severity of injury to the osseous chest wall an increase in overall injury severity was observed. A thoracic drainage was inserted in rib fractures of AIS 1 in 17.0 % to AIS 5 in 56.2 %. The thoracotomy in the early phase showed similar results. Operative stabilization of the chest wall were done in up to 24 % of cases. An increase in the osteosynthesis was found.

Conclusion: This study highlights the particular relevance to diagnose unstable chest wall injuries in severely injured patients. It is the first overall survey of the Trauma Registry of DGU. Moreover it can improve optimal identification of sometimes life-threatening injuries, to respond therapeutically. This study can advance the prognosis of severe injuries.

References: Ziegler DW. The morbidity and mortality of rib fractures. *J Trauma*. 1994;37(6):975–9. El-Menyar A. Age and traumatic chest injury: a 3-year observational study. *Eur J Trauma Emerg Surg*. 2013;39. Galan G. Blunt chest injuries in 1696 patients. *Eur J Cardiothorac Surg*. 1992;6(6) Dehghan N. Flail chest injuries: A review of outcomes and treatment practices from the National Trauma Data Bank. *J Trauma Acute Care Surg*. 2014 TraumaRegister DGU®, Jahresbericht 2014 für den Zeitraum bis Ende 2013, Sektion NIS der Deutschen Gesellschaft für Unfallchirurgie (DGU)/Akademie der Unfallchirurgie. 2014. <http://www.traumaregister.de>

Disclosure: No significant relationships.

O007

STERNAL NON-UNION WITH CHEST DEFECT TREATED WITH A LOCKING TIBIAL PLATE AND DUAL MESH MEMBRANE. A CASE REPORT

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Introduction: Sternal non-union is rare but disabling complication, occurring after surgical intervention or less often after trauma. Most non-unions are longitudinal and occur after sternotomy. Transverse non-union is rare, appearing after sternal fracture or rarely after

transverse sternotomy. Surgical methods are developed mostly for managing longitudinal non-union.

Materials and methods: A 60-year-old man sustained aortic dissection type B and was operated through transverse thoracotomy with partial removal of the rib. After reoperation 10 years later, he developed dehiscence and non-union of transverse sternotomy, which was originally closed with wiring. Two unsuccessful revisions with wiring and conventional plating were performed. Three years later he presented with unstable chest and lung herniation. After extensive adhesiolysis, plate osteosynthesis with intraoperatively reshaped titanium locking compression plate for distal medial tibia was done. The bone defect was filled with iliac crest autologous graft. Chest defects were covered by two 2 mm thick Gore-Tex dual mesh membranes, attached by sutures on two adjacent ribs.

Results: Postoperatively the patient recovered well, with good bony healing of the sternum. Chest was stable with no pain at breathing, coughing or moving, no lung herniation was present.

Conclusion: Limited data is published on transverse non-union treatment, which shows superiority of the locking plates over the wiring. Reconstruction of chest wall defects with Gore-Tex dual mesh membrane is one of described options.

We successfully treated a case of unstable chest due to post-operative sternal non-union and chest defect with a combination of sternal osteosynthesis with locking plate, autologous bone grafting and defect coverage with Gore-Tex dual mesh membrane.

References: 1. Akiba T, et al. Chest wall reconstruction using Gore-Tex(R) dual mesh. *Ann Thorac Cardiovasc Surg*. 2012;18(2):166–9. 2. Bertin KC, et al. Repair of transverse sternal nonunions using metal plates and autogenous bone graft. *Ann Thorac Surg*. 2002;73(5):1661–2. 3. Nagayasu T, et al. Long-term results of chest wall reconstruction with DualMesh. *Interact Cardiovasc Thorac Surg*. 2010;11(5):581–4. 4. Queitsch C, et al. Treatment of posttraumatic sternal non-union with a locked sternum-osteosynthesis plate (TiFix). *Injury*. 2011;42(1):44–6. 5. Wu LC, et al. Sternal nonunion: a review of current treatments and a new method of rigid fixation. *Ann Plast Surg*. 2005;54(1):55–8.

Disclosure: No significant relationships.

ABDOMINAL AND VISCERAL TRAUMA AND DISEASE

O008

A 10-YEAR REVIEW ON RENAL TRAUMA TREATMENT: COMPARISON OF NONOPERATIVE VERSUS OPERATIVE MANAGEMENT RESULTS

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Introduction: Non-operative management (NOM) is the standard of care in hemodynamically stable patients with low to moderate renal injuries. Controversy exists regarding the management of hemodynamically stable patients with high grade injuries (Grade IV–V). We reviewed our experience with renal injuries to compare NOM versus OM, in terms of mortality and morbidity.

Materials and methods: We analysed the data on demographics, clinical presentation, management and complications, of 161 patients (10-year period).

Results: There were 129 (80 %) males with a mean age of 39.1 years. Blunt injuries and road trauma accounted for 94.4 and 65 %, respectively. There were 54 (44.6 %), 55 (45.4 %), 24 (19.8 %), 25 (20.7 %) and 5 (4.1 %) patients of grade I, II, III, IV and V respectively. The renal trauma was isolated in 41 (25 %) patients and associated to other abdominal injuries in 120 (75 %). NOM was successful in 100 %, in 98, 92, 92 and 75 % of grade I, II, III, IV and V patients, respectively. An angioembolization was performed in 11 cases and 1 urinoma was drained percutaneously. Eight (89 %) penetrating traumas were treated conservatively. NOM failed in 3 patients. Overall 13 patients underwent OM (11 nephroureterectomies and 2 renorraphies). We observed 16 deaths, 6 due to renal failure and 10 due to other injuries.

Conclusion: We found that: Conservative treatment is feasible and safe even for high grade renal trauma. Survival is related to age and ISS and not to renal injury grade. Morbidity rate is lower after NOM. Interventional radiology is very useful to minimize OM.

References: Kuan JK, Wright JL, Nathens AB, Rivara FP, Wessels H. American Association for the Surgery of trauma organ Injury scale for kidney injuries predicts nephrectomy, dialysis and death in patients with blunt injury and nephrectomy for penetrating injuries. J Trauma. 2006;60:351–6.

Disclosure: No significant relationships.

O009

PENETRATING SPLENIC INJURIES: CAN WE SAVE THE SPLEEN?

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Introduction: Selective nonoperative management (NOM) for the treatment of penetrating liver trauma is safe. Currently the feasibility of selective NOM for penetrating splenic injury (PSI) is unclear. Furthermore little is known about the success rate of spleen preserving surgical procedures. The aim of this study was to investigate the treatment and outcome of selective NOM for penetrating splenic injuries.

Materials and methods: We identified all patients treated for PSI at a level one trauma center. Patients were grouped based on the treatment they received. Group one consisted of splenectomized patients, the second group included patients treated by a spleen preserving surgical intervention and group three included those patients who were treated by NOM.

Results: A total of 103 patients with a median age of 26 and a median ISS of 22 (range 4–50) were included. Eighty patients required operative intervention, of whom 32 underwent a total splenectomy. Except for significantly higher grades of splenic injury and ISS in the splenectomy group, there were no differences in baseline characteristics. Mortality was only seen in the splenectomy group. The median hospitalization time was 8 (range 1–70) days and no significant differences between groups were encountered. Furthermore a total of 23 patients (stabwounds ($n = 13$) and gunshot wounds ($n = 10$)), were treated by NOM. One patient underwent delayed surgical intervention for the treatment of ongoing splenic bleeding.

Conclusion: Spleen preserving surgical therapy for PSI injury is a safe treatment modality and not associated with increased mortality.

Moreover, a select group of patients can be treated without any surgical intervention at all.

Disclosure: No significant relationships.

O010

DOES INDUCED HYPOTHERMIA IMPROVE HEPATIC DAMAGE FOLLOWING MAJOR TRAUMA?

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Introduction: Previous studies revealed evidence that induced hypothermia attenuates ischemic organ injuries after severe trauma. In the current study, we examined the influence of therapeutic hypothermia on hepatic function in a porcine polytrauma model.

Materials and methods: The experimental procedures were approved by local authorities and the study was performed in compliance with the Helsinki convention for the use and care of animals. In 60 pigs, a standardized polytrauma including lung contusion, liver laceration, lower leg fracture and two different degrees of controlled hemorrhage was induced. Following trauma, hypothermia of 33 °C was induced for 12 h and intensive care treatment was evaluated for 48 h. As outcome parameters, we assessed liver function and serum transaminase levels as well as a histopathological analysis of tissue samples.

Results: Serum transaminase levels were increased at the end of the observation period following hypothermia without reaching statistical significance compared to normothermic groups. Liver function was preserved ($p = <0.05$) after the rewarming period in hypothermic animals but showed no difference at the end of the observation period. In H&E staining, cell death was less frequently found in hypothermic animals while Caspase-3 stainings showed a tendency towards more apoptosis in hypothermic groups.

Conclusion: In the present investigation, the induction of mild hypothermia of 33 °C for 12 h showed an early liver protective effect but did not affect outcome after 48 h. Further studies focusing on multi-organ failure including a longer observation period and maybe an extended liver traumatisation are required to illuminate the impact of hypothermia on hepatic function in multiple trauma patients.

Disclosure: No significant relationships.

O011

INCIDENCE AND MANAGEMENT OF INITIAL AND DELAYED CT SCAN BLUSH IN BLUNT SPLENIC TRAUMA: A PROSPECTIVE STUDY

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Introduction: The objective of this study is to analyze the incidence and management of early and late CB liable to cause failures of non-operative management (NOM).

Materials and methods: This is a prospective multicenter study. We included all adults patients with splenic contusion and diagnosed by computerized tomography (CT) or surgery. A control CT scan was always performed to evaluate the presence of early (on initial CT) and late (on control CT) CB. The management of the CB and the clinical course of patients with CB were analyzed.

Results: Of the 91 enrolled patients, seventeen patients (19 %) underwent surgical treatment, seventy-four patients (81 %) underwent NOM and 15 of them underwent angioembolization (AE). Success rate of NOM was 93 % with a splenic salvage rate of 80 %. Of the 26 patients presenting an early CB, ten had a splenectomy, six underwent AE and ten were only monitored. Four of the monitored patients with early CB (40 % of untreated early CB) showed secondary splenic rupture. On control CT, 16 late CB (22 % of patients who had a control CT) were found with eight already present on the initial CT. Ten late CB (63 %) were embolized, three had a splenectomy and three were monitored.

Conclusion: Early CB is a major and easily identifiable prognostic factor for the risk of splenectomy and NOM failure. In the absence of more precise data on the hypervascular injuries that may regress spontaneously after splenic trauma, prophylactic treatment for early or late CB by AE should be offered whenever available.

Disclosure: No significant relationships.

O012

THE DIAGNOSTIC AND THERAPEUTIC UTILISATION OF LAPAROSCOPY FOR OCCULT DIAPHRAGM INJURY FOLLOWING PENETRATING THORACOABDOMINAL TRAUMA

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Introduction: The diagnosis of the occult traumatic diaphragmatic injury continues to trouble trauma surgeons. No imaging modality can accurately identify small defects in the diaphragm following

penetrating trauma. However, the consequences of missed diaphragmatic injuries can potentially be devastating. In recent years, new clinical management algorithms utilizing laparoscopy have emerged to diagnose and treat the occult diaphragmatic injury.

Materials and methods: The Pietermaritzburg Metropolitan Trauma Service (PMTS) has maintained an Electronic Surgical Registry (ESR) and a Hybrid Electronic Medical Record (HEMR) system since January 1st 2012. All cases of laparoscopy performed for penetrating thoraco-abdominal trauma between the 1st January 2012 and the 31st May 2014 were extracted from the registries and analysed.

Results: 96 patients underwent semi-elective diagnostic laparoscopy following penetrating left-sided thoraco-abdominal injuries (94 stabs, 2 gunshot wounds). 22 patients were found to have diaphragm injuries (23 %) at laparoscopy, 18 (82 %) of which were repaired laparoscopically. 9 patients (9 %) had 12 associated visceral injuries. Complications of laparoscopy were limited to wound site sepsis in 3 patients. This study's detection and laparoscopic repair rate compare favourably to published results in the literature.

Conclusion: Diaphragmatic injury presents in a spectrum from the obvious to the occult. This series of laparoscopic diaphragm repair is the largest in the published literature, proving that laparoscopy is a valuable tool to both diagnose and repair diaphragmatic injuries.

Disclosure: No significant relationships.

O013

NONOPERATIVE MANAGEMENT, AND NOT SPLEEN PRESERVING SURGERY FOR BLUNT SPLENIC INJURY RESULTS IN LOWER IN-HOSPITAL INFECTION RATES

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Introduction: The spleen plays an important role in the immune reaction to pathogens. Asplenic patients are at increased risk of developing severe infectious diseases. Nonoperative management (NOM) is the preferred treatment for blunt splenic injury (BSI). However sometimes operative intervention is inevitable. The aim of this study was to evaluate the effect of the method of splenic injury management on in-hospital infectious complications.

Materials and methods: From our prospectively composed database we identified all adult patients admitted between 2000 and 2012, for the treatment of BSI. Patients were grouped based on treatment, and we compared infectious complications between groups. Group 1 consisted of patients treated by NOM, those who underwent a spleen saving operation were included in group 2, group 3 consisted of splenectomized patients. Furthermore, we matched patients with respect to ISS and systolic blood pressure.

Results: A total of 148 patients (mean age 37) and a mean ISS of 24 were included. Nonoperative therapy was successful in 73 individuals. Eight patients were treated by a spleen saving procedure, while 67 patients were splenectomized. The most frequently encountered infections were pneumonia ($n = 22$) and wound infections ($n = 7$). Patients treated by NOM had significantly less infections than patients treated by operative intervention, even if the patients were matched. The highest infection rates were seen in patients treated by a spleen saving procedure.

Conclusion: Spleen preserving therapy for the treatment of BSI is not associated with less infectious complications than total splenectomy.

However, NOM results in lower infection rates and should therefore be advocated in selected patients.

Disclosure: No significant relationships.

O014

MANAGEMENT OF GRADE IV RENAL TRAUMA. A REVISION OF THE AAST RENAL INJURY GRADING SCALE IS MANDATORY

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Introduction: The AAST injury grading scale for renal trauma is currently the most important variable predicting the need for kidney repair or removal, for morbidity and for mortality after blunt or penetrating injuries of the kidney. The 2011 revision included the renal pelvis, the uretero-pelvic junction and the segmental vascular injuries as grade 4, limiting grade 5 to severe hilar injuries. However, this revision does not permit the identification of the group of patients who will require surgery because of hemodynamic instability due to grade IV renal injuries. This study aims to propose an add-on for the grade IV of AAST renal injury scale, in order to improve the management of these patients.

Materials and methods: We searched the following electronic databases: Medline and Scopus database. Searches were not restricted by date, language or publication status. Searches were last conducted in September 2014. Paediatric studies were excluded.

Results: 71 articles were found, 57 were pertinent, including 6 with directly related to the topic. 3 risk factors were identified to be associated with surgery for hemodynamic instability: perirenal hematoma >3.5 cm, intravascular contrast extravasation, medial renal laceration. Presence of two or more of these criteria has been validated by two other studies to predict the need for intervention. Patients with >25 % devascularized fragments also present a poor prognosis and should be treated more aggressively.

Conclusion: These elements should be incorporated into a future reassessment of the classification, in order to better determine the time for surgery in grade 4 renal traumas, generally leading to a nephrectomy.

References: Duggi DD 3rd, Morey AF, Gupta A, et al. American Association for the Surgery of Trauma grade 4 renal injury sub-stratification into grades 4a (low risk) and 4b (high risk). J Urol. 2010;183(2):592–7. Long JA, Fiard G, Descotes J-L, et al. High-grade renal injury: non-operative management of urinary extravasation and prediction of long-term outcomes. BJU Int. 2013;111(4 Pt B):E249–55. Malaeb B, Figler B, Wessells H, et al. Should blunt segmental vascular renal injuries be considered an American Association for the Surgery of Trauma Grade 4 renal injury? J Trauma Acute Care Surg. 2014;76(2):484–7.

Disclosure: No significant relationships.

O015

WATER SOLUBLE CONTRAST AGENT IN ADHESIVE SMALL BOWEL OBSTRUCTION: A SYSTEMATIC REVIEW AND META-ANALYSIS OF DIAGNOSTIC AND THERAPEUTIC VALUE

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Introduction: Adhesive small bowel obstructions (ASBO) are the most common post-operative cause of hospitalization; several studies have investigated the role of water soluble contrast agent (WSCA) in predicting the need of surgery. The presence of contrast in the colon at the abdominal X-ray after 4–24 h from administration seems to indicate the resolution of the obstruction, but nowadays there is still no consensus.

Materials and methods: A systematic review was done searching in Pubmed and Embase databases RCT and prospective studies to assess the diagnostic and therapeutic role of oral WSCA: diagnostic data were recorded as sensitivity, specificity, negative and positive likelihood ratio; therapeutic effect was recorded as weighted OR of need for surgery, morbidity, mortality and weighted mean difference of length of stay. Statistics were done with RevMan 5.3.

Results: For the diagnostic role of WSCA 13 studies, including 838 patients, were selected: the presence of contrast in the colon at the abdominal X-rays after 4–36 h had a sensitivity of 97 % and a specificity of 95 % in predicting resolution without surgery; positive LR was 18.8 and negative LR was 0.03. For the therapeutic role of WSCA 12 studies, including 653 patients, were selected: the administration of oral WSCA was effective in the reduction of need for surgery (OR 0.55, $p < 0.001$) and of hospital stay (WMD –2.2 days, $p < 0.001$). No significant differences in term of morbidity or mortality were recorded.

Conclusion: The administration of WSCA is a safe and effective therapy, with a significant reduction in need for surgery and in length of hospital stay.

Disclosure: No significant relationships.

O016

THE FEAR OF A “DIFFICULT CHOLECYSTECTOMY”: ANALYSIS OF FACTORS INVOLVED IN CONVERSION TO OPEN APPROACH DURING CHOLECYSTECTOMY FOR ACUTE CALCOLOUS CHOLECYSTITIS

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Introduction: Acute Calcolous Colecystitis (ACC) should be approached by surgery during the index hospitalization as reported by many trials. However the fear of a “difficult laparoscopic cholecystectomy” produce a still high rate of Delayed Laparoscopic Cholecystectomy (DLC). Aim of the study was to analyze the reasons for the conversion to open approach between ELC and DLC.

Materials and methods: A retrospective analysis of patients discharged home after cholecystectomy for ACC was undertaken from January 2008 to April 2013. Conversion rate, reasons for that, and complications were compared

Results: The total population study was 341, 222 ELC group and 119 in DLC. In ELC conversion was required in 15.3 % due to failure to identify the structures in Calot's triangle in 87 % cases (20 for acute inflammation and 9 to adhesions), Mirizzi's syndrome (3 %), perforation of the gallbladder (3 %) and bleeding (7 %); in DLC group conversion was required in 13.7 % ($p = ns$) due to failure to identify the Calot's structures in 93 % cases (13 for adhesions and 2 for acute inflammation) and bleeding in one case (7 %). No difference in post-operative morbidity and length of stay were noticed between ELC and DLC.

Conclusion: To postpone laparoscopic cholecystectomy doesn't reduce the rate of conversion. The main reason for conversion in both groups was the difficulty in recognition the triangle Calot's structures due to acute inflammation and chronic inflammation/scare tissue in ELC and DLC respectively with a different role played by inflammation/adhesions: initial conservative treatment is effective on the acute inflammation process but can not restore the normal anatomy having no effect on the formation of adhesions.

Disclosure: No significant relationships.

EPIDEMIOLOGY/EVIDENCE BASED TRAUMACARE

O017

RISK FACTORS FOR NONUNION AFTER INTRAMEDULLARY NAILING OF FEMORAL SHAFT FRACTURES

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Introduction: Fracture stabilisation with intramedullary nailing (IMN) is the current treatment of choice for femoral shaft fractures in adults. Although previous studies published good results with this technique, some controversies still remain. A retrospective study was performed to identify factors that influence the outcome after IMN of femoral shaft fractures.

Materials and methods: Between July 1998 and July 2013, 236 consecutive patients with 254 femoral shaft fractures were enrolled in the study. Analysis was performed to determine predictors of nonunion. The following independent variables were selected for analysis: age, sex, obesity, polytrauma, fracture type, Gustilo type, primary external fixation and reaming.

Results: There were no documented cases of deep infection. Factors affecting the occurrence of nonunion in the univariate analysis were AO/OTA fracture type, Gustilo type and primary external fixation (EF). Multiple logistic regression analysis could only reveal AO/OTA fracture type as a risk factor for nonunion. Reaming of the fracture did not change the outcome. Separate analysis of the polytrauma group could not reveal primary EF as a risk factor in this patient population.

Conclusion: Fracture stabilisation with IMN is a good treatment option for femoral shaft fractures in adults. The present analysis revealed that there was no difference in the outcome whether the fracture was reamed or not. Multiple logistic regression analysis could only correlate AO/OTA fracture type with the occurrence of

nonunion. In polytrauma patients EF did not seem be a risk factor in our study population.

Disclosure: No significant relationships.

O018

RISK ADJUSTED FALL RELATED MORTALITY REMAINS UNCHANGED (2001–2011) –A NATIONWIDE SWEDISH STUDY

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Introduction: The most common trauma reason for hospital admission is accidents by falling. Despite preventive measures fall related accidents seems to remain unchanged in the western world and contributes significantly to both morbidity and mortality. The aim of our study is to investigate if survival has improved for this condition (risk adjusted mortality), and particularly examine effects of sex and age. We used and wanted to evaluate an ICISS model for this purpose.

Materials and methods: Data was obtained from the Swedish National in Patient (NPR) and Cause of Death Registers (CDR) including patients with a serious injury, using codes for external causes (W01–W19). ICISS for the main diagnosis and the subsequent nine secondary diagnosis were calculated and together with sex, age and length of stay we constructed a mortality model of death within 30 days from the injury, based on logistic regression.

Results: During 2001–2011 741,420 falling accidents occurred, that required in hospital care. This was 34.5 % of all trauma related hospital admissions. In the model factors important for increased mortality were age (7 %/year), male sex (increased 45 %) but length of stay decreased ($p < 0.001$). The risk adjusted over all mortality using the ICISS model (ROC 0.86) remained unaltered.

Conclusion: In contrast to our findings in traffic related accidents risk adjusted mortality for fall injuries remained unaltered. Similar to traffic related mortality both age and sex (male) contributed significantly to mortality. The ICISS model performed well under these conditions.

References: Bergeron E, Simons R, Linton C, et al. Canadian Benchmarks in Trauma. J Trauma Injury Infect Crit Care. 2007;62(2):491–7. Stephenson S, Henley G, Harrison JE, Langley JD. Diagnosis based injury severity scaling: investigation of a method using Australian and New Zealand hospitalisations. Injury Prev. 2004;10(6):379–83.

Disclosure: No significant relationships.

O019

ASSESSMENT OF SURAL NERVE-ORIGINATED NEUROPATHIC PAIN AFTER ANKLE SURGERY: COMPARISON WITH A HEALTHY POPULATION AND A NORMAL ANKLE SURGERY POPULATION

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Introduction: Neurological complications following ankle surgery are reported; the sural nerve is susceptible to local and iatrogenic trauma because of its suprafascial course. The objective of this study was to examine the prevalence of neuropathic pain in ORIF operated patients and to evaluate the morphological changes of sural nerves using ultrasound and correlate them with clinical findings.

Materials and methods: In this retrospective survey; 530 patients undergoing ankle surgery over a period of 7 years, were invited to an online questionnaire. Pain symptoms were assessed using the McGill Pain Questionnaire, the DN4 and the CISS. Risk factor analysis was performed through a logistic regression model. Completed questionnaires were used to select cases and controls to perform ultrasound measurements. Nerves were identified using 18 MHz high-frequency ultrasound imaging. Cross-sectional-area, diameter, echogenicity and vascularization were measured in 15 symptomatic patients, 15 asymptomatic patients and 15 healthy volunteers.

Results: Preliminary; A total of 159 patients completed the questionnaire. The mean follow-up period was 4.2 years (± 2.0) and overall pain symptoms were reported by 109/159 (68.6 %) of the study population. In 82/159 symptoms were persistent and in 27/159 transient. Prevalence of neuropathic pain symptoms was 61/159. In multivariate analysis, independent significant predictors of neuropathic pain were: older age (OR 0.19), hypertension (OR 4.98) and back pain (OR 2.31). The sural nerves were clearly identified in all 45 participants.

Conclusion: This study showed that neuropathic pain symptoms are prevalent. We strongly believe that the ultrasound findings will prove the usefulness in the evaluation of SuN complications after ankle stabilization surgery.

Disclosure: No significant relationships.

O020

RATIONALE AND PROTOCOL FOR SUSPECTED PATHOLOGICAL AND METASTATIC FRACTURE SURGERY IN ELDERLY NECK OF FEMUR FRACTURES

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Introduction: Hip fractures have become major public health issue with aging population. The beneficial effects of early surgical with combined medical treatment are well documented. There is a cohort of these elderly patients who present with fractures that raise the suspicion of pathological fracture (primary/metastatic). Treatment of such patients is delayed to investigate the cause. We present our research and ensuing protocol in the management of such patients.

Materials and methods: A clinical review of 850 hips fracture patients over 3 years. One hundred and twenty two patients had suspicion of pathological fracture and treatment was delayed. MRI was the investigation of choice.

Review of the results and treatment following the establishment of the cause of fracture was undertaken and a treatment protocol was established based on BOA and NICE guide lines.

We determined coefficient of multiple correlations through regression analysis and ratio of residual variability calculated between the causes of fracture and treatment. The significance was taken P values < 0.05 using Pearson test.

Results: A protocol was defined based upon the findings that no primary malignancy was detected. The association between history of previous malignancy and MRI scan showing evidence of metastatic lesion was statistically significant odds ratio 20.2 95 % confidence interval 4.03; 101.91. No significant relation was found between MRI evidence of pathology and change in the surgical treatment odds ratio 0.60, 95 % confidence interval 0.11; 3.34 P 0.56.

Conclusion: A research based treatment protocol that prevents the delay in treatment of this cohort of patients.

Disclosure: No significant relationships.

O021

CLEARING THE CERVICAL SPINE AFTER BLUNT ASSAULT: A PAIN IN THE NECK?

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Introduction: Although blunt physical assault of head and neck is common in trauma patients the likelihood of cervical spine injury (CSI) is low [1]. Clearing the cervical spine of CSI in assaulted patients is challenging, especially since contrasting reports in literature exist lacking clear recommendations [2]. Purpose of this study is to evaluate the applicability of the NEXUS clearance-criteria in the unreliable and assaulted patient.

Materials and methods: All patients suspected for CSI after blunt assault presented within a two-and-a-half year period at the emergency department of a Dutch level-II trauma-center were extracted from the computerized database of the radiology department. The NEXUS-criteria were analyzed in all patients retrospectively. The number of cervical spine fractures (CSF) and neurologic symptoms including deficit and spinal cord lesions were assessed.

Results: Of all patients suspected for CSI 63 patients were identified (68.3 % male, median age 33.0) after blunt assault of head and neck. Fifty-four patients (85.7 %) did meet the NEXUS-criteria, with a median injury severity scale (ISS) of 9.0 ± 8.3 . Within this group 14 patients (25.9 %) were intoxicated, 17 (27.0 %) had distracting injuries, 14 (25.7 %) did have an altered Glasgow Coma Scale. Neurologic symptoms were diagnosed in 4 patients, additional radiology showed 1 CSF (C7). NEXUS-negative patients (median ISS 4.2 ± 2.2) were without CSF or neurologic symptoms.

Conclusion: Patients suffering blunt assault of head and neck not meeting the NEXUS-criteria were without CSI. The unmodified NEXUS-criteria are applicable for clearing the cervical spine of CSI in the unreliable and assaulted patient. Implementation could have implications for rates of radiologic examinations.

References: 1. Rhee P, Kuncir EJ. et al. 2006. ²Hadjizacharia P, Rhee P. et al. 2014.

Disclosure: No significant relationships.

O022

SEATBELT AND MORTALITY IN A RAPIDLY DEVELOPING MIDDLE EASTERN COUNTRY: A 4-YEAR ANALYSIS

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Introduction: Motor vehicle crashes (MVC) are the leading cause of morbidity and mortality in Qatar among young age population. We aimed to evaluate the impact of seatbelt use on the injury pattern and outcome of vehicle occupants involved in MVC.

Materials and methods: It is a retrospective analysis of all trauma patients who sustained MVC-related injuries and need admission (2011–2014).

Results: Of the total 2730 MVC, 1830 (67 %) cases sustained MVC-related injuries; majority was young males (88 %) and two-third was expatriates. Fifty five percent of the victims were drivers; only 26.3 % used seat belt and airbag was found in 2.5 % cases. Higher proportion of unbelted passengers were nationals, younger in age, and had higher incidence head, chest and upper extremities injuries than belted passengers ($P = 0.001$). Belted passengers sustained more bowel ($P = 0.001$) and lower extremities injuries ($P = 0.01$). Unbelted passengers sustained higher injury severity (ISS, GCS and chest AIS), prolonged hospitalization and had higher rate of pneumonia and mortality compared to belted patients ($P = 0.001$). Compliance of seatbelt ($P = 0.001$) and air bag ($P = 0.008$) was significantly lower in the ejected group. Also, ejected patients had prolonged hospital stay and developed significantly higher proportion of pneumonia and sepsis ($P = 0.001$). Overall mortality was 8.3 % and three fold higher in the ejected group as compared to non-ejected group (18 vs. 6.3 %; $P = 0.001$).

Conclusion: The use of seatbelt improves occupant's safety and potentially prevents ejection during MVCs. The study findings highlight the lower rate of seatbelt compliance among young population which resulted in worse morbidity and mortality. Community education, strict rules and more attention for legislative implementation are needed.

References: Ball CG, Kirkpatrick AW, Brenneman FD. Noncompliance with seat-belt use in patients involved in motor vehicle collisions. Can J Surg. 2005;48:367–72. Munk MD, Carboneau DM, Hardan M, Ali FM. Seatbelt use in Qatar in association with severe injuries and death in the prehospital setting. Prehosp Disaster Med. 2008;23:547–52.

Disclosure: No significant relationships.

O023

RELIABILITY, VALIDITY AND RESPONSIVENESS OF THE WESTERN ONTARIO MCMASTER OSTEOARTHRITIS INDEX (WOMAC) IN THE ELDERLY POPULATION WITH A FEMORAL NECK FRACTURE

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Introduction: This study aimed to determine the reliability, construct validity, and responsiveness of the WOMAC, compared with the SF-12 and EQ-5D, in the elderly with a femoral neck fracture.

Materials and methods: The reliability was tested by assessing Cronbach's alpha, construct validity by Pearson correlation coefficient. Change scores were calculated from the 10 week and 12 months follow-up. Standardized response means and floor and ceiling effects were determined. Analyses were performed for two age groups (50–80 versus ≥ 80 years).

Results: Mean total score was 89 points prefracture in younger patients, increasing from 70 (10 weeks) to 81 (24 months). In the oldest old, these scores were 86, 75, and 78. Pain scores were 92, 76, and 87 in the younger, 92, 84, and 93 in the older group. Function scores were 89, 68, and 79 in the younger 84, 71, and 73 in the older group. Cronbach's alpha for pain, stiffness, function and total scale were between 0.83–0.98 (young) and 0.79–0.97 (old). Construct validity was good with 82 (young) and 79 % (old) of predefined hypotheses confirmed. Responsiveness was moderate. No floor effects were found. The Function and Total score showed no ceiling effect. Moderate to large ceiling effects were found for Pain and Stiffness scales at 10 weeks and 12 months in younger (18–36 %) and older patients (38–53 %).

Conclusion: The WOMAC showed good reliability, construct validity and responsiveness in both age groups with a femoral neck fracture. It is a suitable instrument for use in future clinical studies in these populations.

Disclosure: No significant relationships.

MILITARY AND DISASTER

O024

GUNSHOT VASCULAR INJURY CAUSED BY A HIGH-VELOCITY MISSILE DOES NOT MANDATE SURGICAL EXCISION OF THE ARTERIAL WALL

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Introduction: Radical debridement of a gunshot vascular injury remains a controversial issue. The aim of this study was to determine whether high-velocity missiles cause extensive damage of the arterial wall beyond the wound tract and mandate broader surgical excision.

Materials and methods: Four anesthetized sheep (34–42 kg) were shot with a 7.62 mm high-velocity bullet from an AK-47 assault rifle from a distance of 15 m. Two sheep of the control group were not injured. The aiming point was the medial aspect of the middle part of the thigh in the line of the vascular bundle. Animals were euthanized immediately after injury. The configuration of any associated femoral fracture was studied using X-Ray. Histological sections of the arterial wall were taken every 1 cm from the wound tract and stained with hematoxylin and eosin (magnification $\times 40$, $\times 100$).

Results: In two from four injured sheep, there was a massive arterial bleeding after a shot. The diameter of the targeted artery was 3–3.5 mm. In all cases, the arterial defect 5–7 cm in length with hematoma formation around the wound channel extending to the subcutaneous fat. X-Ray revealed severe femoral fractures with multiple small and large bone fragments. Histological analysis demonstrated no damage to the arterial wall remote from the wound tract. Arterial structure in injured and control animals was identical.

Conclusion: Arterial gunshot injuries caused by a military rifle did not cause damage to the arterial wall beyond the wound tract. Arterial injury caused by a high-velocity missile does not mandate additional surgical debridement of the arterial wall.

Disclosure: This experimental study was funded by a research grant MK-3439-2014-7 of the President of the Russian Federation.

O025

FORWARD SURGICAL TEAM EXPERIENCE (FSTE) IS ASSOCIATED WITH INCREASED CONFIDENCE WITH COMBAT SURGEON TRAUMA SKILLS

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Introduction: Little is known regarding the confidence of military surgeons (MS) prior to combat zone deployment. MS are frequently deployed without peers experienced in combat surgery. We hypothesized that FSTE increases surgeon confidence with critical skill sets.

Materials and methods: We conducted a national survey of military affiliated personnel. We used a novel survey instrument that was piloted and validated by experienced military surgeons to collect demographics, education, practice patterns, and confidence parameters for trauma and surgical critical care skills. Skills were defined as crucial operative techniques for hemorrhage control and resuscitation. Surveyors were blinded to participants, and surveys were returned electronically via REDCap database. Data were analyzed with SPSS using appropriate models. Significance was considered $p < 0.05$.

Results: Of 174 distributed surveys, 86 were completed. Nine individuals failed to characterize their FSTE, thus leaving a sample size of 77. At the time of first deployment, 78.4 % were alone or with less experienced surgeons and 53.2 % had less than 2 years of post-residency practice. The respondents' confidence in Damage Control Techniques and 7 other trauma skills increased relative to FSTE. After adjusting for years of practice, number of trauma resuscitations performed per month and pre-deployment training, there remained a significant positive association between FSTE and confidence in damage control, thoracic surgery, extremity/junctional hemorrhage control, trauma systems administration, adult critical care and airway management.

Conclusion: Training programs and years of general surgery practice do not replace FSTE among MS. Pre-deployment training that mimics FST skill sets should be developed to improve MS confidence and outcomes.

Disclosure: No significant relationships.

O026

CONSECUTIVE MINIMAL INVASIVE OSTEOSYNTHESIS OF GUNSHOT FRACTURES OF LONG BONES OF EXTREMITIES

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Introduction: The objective of the study was to assess the clinical and the X-ray outcomes of two-step consecutive minimally invasive osteosynthesis (MIO) in patients with gunshot fractures of long extremity bones.

Materials and methods: We analyzed the results of surgical treatment in 59 patients with gunshot fractures of long limb bones. Primary reposition and stabilization of bone fragments by an external fixator was followed by MIO by plates and nails, which was performed after healing of soft tissue wounds and after stabilization of the patient's general condition. All procedures were performed on a fracture table with the patient being placed in the supine position. The follow-up examination of the patients was made in one year. It included X-ray examination and functional tests to determine the movement amplitude in the joints adjacent to the damaged segment.

Results: The fracture consolidation was achieved in all patients except 3 who had gunshot fractures of both hipbones. Good functional results were registered in all the cases according to the SF-36 scale.

Conclusion: The consecutive two-step minimally invasive technique using LCP plates and intramedullary nails in treatment of gunshot fractures of long extremity bones allows to achieve good anatomical and functional results. Minimally invasive osteosynthesis performed after healing of soft tissue wounds and after stabilization of a patients' general condition enables early rehabilitation and reduces the total treatment time.

References: Burg A, et al. Treating civilian gunshot wounds to the extremities in a level 1 trauma center: our experience and recommendations. Isr Med Assoc J. 2009;11:546–51.

Disclosure: No significant relationships.

O027

CLINICAL EVALUATION OF INFRASCANNER MODEL 2000 FOR DETECTION OF TRAUMATIC INTRACRANIAL HEMATOMAS

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Introduction: The purpose of this clinical study was to evaluate the sensitivity of a portable, non-invasive device that uses near-infrared (NIR) to screen for traumatic intracranial hematomas. First responders in the field can easily screen the patient for intracranial hematomas and take action properly. This saves time, money and brain in case of a bleeding. This device can be applied in multiple

casualties situations, sporting events, emergency rooms, remote locations and of course the military.

Materials and methods: In the emergency department of a level 2 trauma center in the Netherlands, a lot of patients with traumatic brain injury (TBI) are seen. All these patients received, after informed consent, both a CT-scan and a scan with the NIR device. Blinding of the operator and the radiologist was performed. The results were processed and conducted into sensitivity, specificity, positive and negative predicting values. **Results:** Patient enrollment is still ongoing and therefore there are no definitive results yet. However, Robertson et al. reported in 2010 in comparable situations a sensitivity of 88 % and a specificity of 90.7 % for traumatic intracranial hematomas of clinical importance. Our preliminary results tend to be comparable and even may be improved by better training and standardization.

Conclusion: Our preliminary results show an important role for the NIR device as a screening tool. It is not a substitute for a CT-scan, but can be very helpful in determining which patients should be immediately transported to a trauma center with neurosurgical capabilities (or in the military setting a role 3). This saves time and brain.

References: Robertson CS, Zager EL, Narayan RK et al., Clinical evaluation of a portable near-infrared device for detection of traumatic intracranial hematomas. *J Neurotrauma*. 2010;27:1597–604. Kahraman S, Kavall H, Atabev C, et al. The accuracy of near-infrared spectroscopy in detection of subdural and epidural hematomas. *J Trauma*. 2006;61:1480–3.

Disclosure: The infrascanner used in this study was provided by QRSCHC.

O028

PAEDIATRIC CARE IN THE DUTCH ROLE 2 IN URUZGAN, AFGHANISTAN

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Introduction: From August 2006–August 2010 the Armed Forces of the Netherlands deployed a Role 2 Medical Treatment Facility (MTF) to Uruzgan province, Afghanistan. Although doctrinally not considered a primary task, it delivered care to civilians, including many children. Particularly pediatric care demanded specific expertise and equipment. In our pre-deployment preparations, this aspect had been undervalued. We analysed our data and compared them with international reports.

Materials and methods: Retrospective, descriptive study. Using the hospital's electronic database, all pediatric cases, defined as patients <17 years of age, who were admitted between August 2006 and August 2010 to the Dutch Role 2 MTF at Multinational Base Tarin Kowt (MBTK), Uruzgan, Afghanistan were analysed.

Results: Of the 2736 admissions, 415 (15.2 %) were pediatric. The majority (80.9 %, 336/415) of these admissions were for surgical, often trauma-related, pathology and required 610 surgical procedures, being 26 % of all procedures. Mean length of stay was 3.1 days. The male to female ratio was 70:30. Girls were significantly younger of age than boys. In-hospital mortality was 5.3 %.

Conclusion: Pediatric patients made up a considerable part of the workload at the Dutch Role 2 MTF in Uruzgan, Afghanistan. This is comparable with other reports from the recent conflicts in Iraq and Afghanistan. Our findings stress the need for a comprehensive, prospective, and coalition-wide patient registry with uniformly applied criteria. Civilian disaster and military operational planners should incorporate reported patient statistics in manning documents, future courses, training manuals, logistic planning, and doctrines; pediatric care is a reality that cannot be ignored.

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Disclosure: No significant relationships.

O029

RECOVERY AND REHABILITATION OF SYRIAN WAR-WOUNDED TREATED IN AN ISRAELI DISTRICT HOSPITAL

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Introduction: Ziv Medical Center in Israel (the closest hospital to the Israel-Syria border) has treated nearly 400 civil war-wounded. The majority of the wounded are children and men under the age of 30 years. Their background and the course of their lives over the last 4 years of war have a significant impact on their recovery and rehabilitation from injuries that may result in stomas, amputation and blindness.

Materials and methods: The social work and trauma teams work closely from the outset as soon as the patient arrives in the Trauma Room to treat both the physical injuries of the patients (obtaining consent for treatment) and address their social and psychological needs.

Results: Over the last 18 months the social work and trauma teams have learned much about how to communicate and interact with war-wounded: Earning the trust of the patients is an enormous challenge. They are afraid that official organisations and aid agencies may share their information with Syrian authorities, they are skeptical of the help offered in Israel (an enemy state) and suspicious of some Arab staff of different ethnicities. In addition, they must cope with major surgery blindness and amputation in a foreign environment, separated from friends and family. Their rehabilitation is limited to learning to mobilise with prostheses weeks after injury. Communication, follow up and long term care is not possible after patients return to Syria where their homes, jobs and essential services are damaged or lost.

Conclusion: Recovery and rehabilitation is hugely dependent on building trust between hospital staff and war-wounded.

Disclosure: No significant relationships.

O030

EFFICACY AND SAFETY EVALUATION OF A WOVEN CHITOSAN-BASED HEMOSTASIS GAUZE

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Introduction: The integrity of chitosan-based dressing influences the handling and hemostasis efficiency. The split of dressing not only deteriorates hemostasis performance but also increases the debridement difficulty. A chitosan-based dressing, identified as HEMO-Bandage, is weaved by patented techniques to enhanced structural strength. Its efficacy and safety are assessed.

Materials and methods: Five healthy Yorkshire cross-bred pigs (weight: 30–45 kg) were recruited. Following the protocol by Kheirabadi et al. [1], a segment of femoral artery was injured with a 6 mm diameter punch. After 45-s free bleed, HEMO-Bandage (z-folded, 10 cm × 300 cm, CoreLeader Biotech, Taiwan) was packed, and resuscitation fluid was administrated after 30 s. The compression was performed for 2 min followed by a 3-min release. If bleeding recurred, another fresh dressing was applied with 2 min compression. The hemostasis was observed for 3 h or until death.

Results: The animal survival rate was 100 % by the end of 3 h observation. Re-bleeding was not observed in any animal after leg stretching. Overall, the initial hemostasis can be secured by 2 or less dressings. Assisted with saline irrigation, it was easy to remove the dressing from the treated area without tearing apart. The tissue histology showed minor to moderate inflammation and neutrophilic infiltration.

Conclusion: The initial hemostasis time, post-treatment bleeding, tissue histology after HEMO-Bandage application is comparable to kaolin-based and chitosan-based hemostasis dressings assessed in previously studies with similar animal traumatic models [1, 2]. With enhanced structural strength, HEMO-Bandage is suggested to be handier without performances compromised in treating severe bleeding.

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Disclosure: No significant relationships.

NEW TECHNOLOGY

O031

IMMEDIATE TOTAL-BODY CT SCANNING VERSUS CONVENTIONAL IMAGING AND SELECTIVE CT SCANNING IN TRAUMA PATIENTS (REACT-2 TRIAL)

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Introduction: The primary objective of this study is to compare the effectiveness of immediate total-body CT scanning as part of the primary trauma evaluation with that of the standard work-up with conventional imaging and selective CT scanning in trauma patients. Secondary objectives are to evaluate clinically relevant time intervals, costs, and radiation exposure associated with immediate total-body CT scanning.

Materials and methods: REACT-2 was designed as a randomized, controlled multicenter trial in which immediate total-body CT scanning in the primary work-up of trauma patients is compared to the standard work-up with conventional imaging supplemented by selective CT scanning. Patient enrolment began on April 22, 2011, and ended January 1, 2014, at four hospitals in The Netherlands and 1 hospital in Switzerland. Eligible patients were trauma patients with compromised vital parameters, clinically suspicious injuries or severe injury mechanisms.

Results: Inhospital mortality for 541 patients randomized for immediate total-body CT scanning was 15.9 % compared to 15.7 % in 542 patients randomized for the control group ($p = 0.923$). Time to diagnosis of vital injuries was reduced from 58 min (IQR 42–78) to 50 (IQR 38–68) by total-body CT scanning ($p = 0.001$). Radiation exposure at the trauma resuscitation room increased by total-body CT scanning ($p < 0.001$).

Conclusion: An evaluation strategy incorporating immediate total-body CT scanning in the primary work-up of severe trauma patients did not show a survival benefit compared to the standard work-up with conventional imaging and selective CT scanning. Time to vital diagnosis was reduced and radiation exposure increased by total-body CT scanning.

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Disclosure: No significant relationships.

O032

A PROSPECTIVE STUDY COMPARING THE EXTENDED LATERAL AND THE SINUS Tarsi APPROACH IN DISPLACED INTRA-ARTICULAR CALCANEAL FRACTURES; SETTING A NEW STANDARD

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Introduction: The current gold standard surgical approach in displaced intra-articular calcaneal fractures is the extended lateral approach (ELA). This exposure aids in restoring anatomy, however the wound-complication rates are high. Recently, the sinus tarsi approach (STA) has regained interest. There is insufficient evidence whether the STA allows for similar anatomical reduction.

Materials and methods: All patients, from 2012 to 2014, with surgical treatment for a displaced intra-articular calcaneal fracture, or with a displaced posterior joint facet, were prospectively included. Patient-, fracture-, and surgical characteristics included: pre-Böhler angle, type of approach (ELA or STA), duration of procedure, post-Böhler angle, step-off at the posterior facet on the post-operative CT-scan, and occurrence of post-operative wound complications according to CDC criteria.

Results: The ELA was used in 65 and the STA in 53 patients. Mean duration of the surgery was 136 min with ELA and 117 with STA. In the ELA-group the Böhler-angle increased from -6 to 25 and in the STA-group from -1 to 27°. Mean residual step-off at the posterior facet was 1.1 mm with ELA (89 % ≤ 2 mm) and 0.4 mm with STA (100 % ≤ 2 mm). In the ELA group 13 major and 9 minor complications occurred, whereas in the STA-group 1 major and 3 minor complications. The differences in total ($p = 0.0007$) and major ($p = 0.003$) complications were statistically significant.

Conclusion: The STA allows for similar restoration of height and better joint congruency. However, the wound complication rates were significantly lower. We recommend the STA as the new standard approach for calcaneal fractures.

Disclosure: No significant relationships.

O033

THE IMPACT OF TRAUMASURGERY ON THE ACTIVATION STATUS OF BLOOD AND BONE MARROW NEUTROPHILS SUBSETS IN PIGS

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Introduction: Activation and migration of polymorphonuclear neutrophils (PMNs) are pivotal mechanisms in the development of complications such as ARDS and MODS. The bone marrow contributes to this process by immediate mobilization of young neutrophils in response to surgical stress. Therefore, in order to prevent inflammatory complications, this process should be countered at an early stage. The aim of this study was to investigate the early neutrophil response to traumasurgery in both the bone marrow and peripheral blood of pigs.

Materials and methods: Large pigs were subjected to a standardized protocol of traumasurgery. Blood and bone marrow samples were taken at baseline and at 3 h. The membrane receptor expression of CD11b(Mac-1), CD62L(L-selectin), CD32(FcγRII), CD16(FcγRIII) on neutrophils was measured by flow cytometry. Our endpoint was

the difference in activation status of neutrophils between baseline and after 3 h of surgery in blood and bone marrow.

Results: All animals survived the procedures. The leukocyte count dropped significantly from 8.5×10^6 cells/mL to 2.05×10^6 cells/mL, $p < 0.05$. Flowcytometric analysis revealed substantial differences between baseline and after 3 h in activation status as well as forward- and sideward scatter signals of bone marrow leukocyte subsets. Moreover, peripheral blood neutrophils had an more activated profile as reflected by increased receptor expression of activation and migration markers.

Conclusion: Traumasurgery results in a transient systemic activation of neutrophils in peripheral blood. Furthermore, we characterised changes in bone marrow neutrophil populations in response to traumasurgery. These insights can result in new targets to intervene in the (excessive) mobilization and activation of neutrophils in response to traumasurgery.

Disclosure: No significant relationships.

O034

PREHOSPITAL USE OF THE iTCLAMP

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Introduction: Bleeding remains a leading cause of death in trauma patients, both in civilian and military settings. We describe our experience using a new device. The iTClamp 50 (Innovative Trauma Care) is a temporary wound closure device designed to control bleeding within seconds of injury. The clinical experience with the iTClamp is limited, as the product is new.

Materials and methods: We have implemented the iTClamp 50 in prehospital use, during our work on the Nijmegen Helicopter Emergency Medical Service (HEMS), Lifeliner 3, one of the 4 Dutch HEMS. Indications were massive bleeding that could not be controlled with an “ordinary” compressive bandage or haemostatic bandage. The study was started August 1, 2013.

Results: Five patients were treated with the iT Clamp. Four patients had a severe head injury due to various trauma's, one patient had a neck injury due to a disk cutter. Three bleedings were venous of origine, two bleedings were combined arterial-venous. After application of the iTClamp: bleeding was stopped in 60 % of the patients, controlled in 20 % and in one patient the bleeding could not be controled with the iT Clamp alone. It took on average 15 s to apply the iTclamp, average usage satisfaction score was 7.

Conclusion: We conclude that the iTClamp 50 is a safe, fast and useful tool in stopping or controlling external blood loss in our series of prehospital patients. Further studies of the iTClamp 50 are needed in order to determine which patients might benefit from this device.

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Disclosure: All used IT Clamps were distributed free of charge by the manufacturer.

O035

RAPID APPROXIMATION OF PLATELET AND FIBRINOGEN CONTRIBUTIONS TO CLOT STRENGTH BY AMPLITUDE DOMAIN THROMBELASTOGRAPHY

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Introduction: Thrombelastography (TEG) is a viscoelastic hemostatic assay used in hemostatic resuscitation of trauma patients. Important limitations of TEG are the time required to obtain the test result (>40 min), and difficulty in discriminating between platelet versus fibrinogen dysfunction. We sought novel TEG-based parameters that predict clot strength more rapidly and distinguish platelet from fibrinogen dysfunction.

Materials and methods: We performed citrated native TEG on blood and plasma samples with known, varied levels of platelets or fibrinogen. The TEG amplitude (A) was transformed into a time-independent function $dA = f(A)$. This yielded three novel parameters: dA_{max} , A_{crit} (A at dA_{max}) and the Critical Product ($P_{crit} = dA_{max} \times A_{crit}$), which were correlated independently to platelet count and fibrinogen activity. We then applied these parameters to prediction of clot strength in blood samples from 54 consecutive trauma patients.

Results: Curve fitting by nonlinear regression demonstrated a sigmoidal relationship of dA_{max} to fibrinogen activity in a range from 60 to 2060 mg/dL ($R^2 = 0.9996$). A similar sigmoidal relationship existed for A_{crit} and platelet count from 13,000 to 206,000/ μ L ($R^2 = 0.9338$). When these metrics were applied to trauma patients, where both platelet and fibrinogen function varied in an unknown manner, the product of these two parameters (P_{crit}) correlated to final clot strength, which depends upon both platelets and fibrinogen ($R^2 = 0.7566$), and yielded a result roughly 30 minutes faster than final clot strength.

Conclusion: The novel time-independent TEG parameters dA_{max} , A_{crit} and P_{crit} independently predict fibrinogen activity, functional platelet count, and final clot strength in trauma patients. These parameters yield results within approximately 7 min.

Disclosure: No significant relationships.

O036

THRESHOLD SETTING FOR THE ADVANCED AUTOMATIC COLLISION NOTIFICATION ALGORITHM THAT ACTIVATES THE HEMS SYSTEM

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Introduction: The Advanced Automatic Collision Notification (AACN) system created from the macro data of 5 million collision cases is developing to further reduce mortality from motor traffic accidents (MTAs) in Japan. We are trying to use AACN for dispatching the helicopter emergency medical service (HEMS). Therefore the algorithm is the most important to predict the deadly or severe trauma. However the macro data may include the data that was far from the reality. Therefore we need to set the threshold in accordance with in-depth investigations. This study aimed to set the algorithm's threshold for predicting severe trauma for Japanese HEMS system.

Materials and methods: We analyzed 201 MTA cases collected medical data and in-depth collision data by Chiba Hokusoh Hospital and Nihon University during 5 years since October 2009. We calculated the predicted rate of the mortality or severe trauma from these data to establish the algorithm and to find the appropriate threshold.

Results: We found a 5.5 % rate was the appropriate threshold to keep the under-triage rate at 10 % or less. With this threshold, the sum of the positive and negative predictive values of the algorithm was 60.3 %, and the over-triage rate was 35.5 %.

Conclusion: We consider 5.5 % is an acceptable triage rate. This threshold setting was agreed by the AACN association. We will schedule to implement HEMS dispatch via AACN using this threshold in the near future.

Disclosure: No significant relationships.

O037

SOCIAL MEDIA PERFORMANCE PREDICTS IMPACT OF ORTHOPAEDIC TRAUMA JOURNALS

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Introduction: Academic surgery has traditionally relied on journal publication to disseminate research; this has been viewed as a one-directional process with limited opportunity for discussion and consensus. The advent of social media offers additional opportunity for debate, education and building consensus amongst orthopaedic trauma surgeons.

Materials and methods: Some journals have begun to embrace such social media. The *Journal Citation Report* identified all peer-reviewed orthopaedic trauma journals with an impact factor. The social media presence on Twitter, Facebook and Rich Site Summary (RSS) of each journal was assessed.

Results: Sixty-five journals met our inclusion criteria; of these, 43/65 (66.2 %) had some form of social media presence. For those on Twitter, profile age, total and daily tweets, and validated metrics of social media influence (including Klout® and Bird Song®) were calculated. Profile age, total and daily posts, and total 'likes' were produced for journals with Facebook accounts.

Conclusion: Multivariate analysis correlated social media metrics with journal impact factor and annual citations. We establish how social media success through Twitter, Facebook and RSS can predict journal impact factor and article citability. **Keywords** social media, orthopaedic surgery, impact factor, twitter, facebook, RSS

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Disclosure: No significant relationships.

MISCELLANEOUS**O038****IMPACT OF INJURY SEVERITY ON DYNAMIC INFLAMMATION NETWORKS FOLLOWING BLUNT TRAUMA**

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Introduction: Clinical outcomes following trauma depend on the extent of injury and the host's response to injury, along with medical care. We hypothesized that dynamic networks of systemic inflammation manifest differently as a function of injury severity in human blunt trauma.

Materials and methods: From a cohort of 472 blunt trauma survivors studied following IRB approval, three Injury Severity Score (ISS) sub-cohorts were derived after matching for age and gender: Mild ISS (49 patients [33 males, 16 females; age 42 ± 1.9 ; ISS 9.5 ± 0.4]); Moderate ISS: (49 patients [33 males, 16 females; age 42 ± 1.9 ; ISS 19.9 ± 0.4]) and Severe ISS: (49 patients [33 males, 16 females; age 42 ± 2.5 ; ISS 33 ± 1.1]). Multiple inflammatory mediators were assessed in serial blood samples. Dynamic Bayesian Network (DyBN) inference was utilized to infer causal relationships based on probabilistic measures.

Results: ICU length of stay [LOS], total LOS, days on mechanical ventilation, Marshall MOD Score, prevalence of pre-hospital hypotension and nosocomial infection, as well admission lactate and base deficit were elevated as a function of ISS. Multiple circulating cytokines were significantly elevated in Severe ISS vs. Moderate or Mild ISS over both the first 24 h and out to 7 days post-injury. Moderate and Mild ISS. DyBN suggested that IL-6 production in Severe ISS was affected by MCP-1/CCL2, MIG/CXCL9, and IP-10/CXCL10; by MCP-1/CCL2 and MIG/CXCL9 in Moderate ISS; and by MIG/CXCL9 alone in Mild ISS over 7 days post-injury.

Conclusion: ISS correlates linearly with morbidity, prevalence of infection, and early systemic inflammatory connectivity of chemokines to IL-6.

Disclosure: No significant relationships.

O039**INFLUENCE OF FRAGMENT SIZE AND POSTOPERATIVE JOINT CONGRUENCY ON LONG-TERM OUTCOME OF POSTERIOR MALLEOLAR FRACTURES**

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Introduction: Fixation of Posterior Malleolar Fracture Fragments (PMFF's) is usually performed when fragment size exceeds 25–33 %. However, the long-term influence of fragment size and fixation on development of post-traumatic osteoarthritis remains unclear.

Materials and methods: Retrospective cohort study. A total of 131 patients treated for ankle fractures with PMFF's were included. Mean follow-up was 6.9 (range 2.5–15.9) years. Patients were divided into groups depending on size of the fragment, presence of step-off after operative treatment, and follow-up (short (< 5 years, n = 54) and long (>5 years, n = 77). We have compared functional outcome measures (AOFAS, AAOS), pain (VAS), dorsiflexion restriction compared to the contralateral ankle and the incidence of osteoarthritis.

Results: More osteoarthritis occurred in ankle fractures with medium and large PMFF's compared to small fragments ($P = .002$). Larger fragment size did not lead to a significantly decreased function (median AOFAS 95 vs 88 $P = .17$). Osteoarthritis occurred more frequently when there was a postoperative step-off ≥ 1 mm in the tibiotalar joint surface ($P = .02$). In this group, fixing the PMFF did not influence development of osteoarthritis. However, in 40 % of these cases a postoperative step-off remained. Considering this, no step-off after fixation lead to less osteoarthritis than if there was a persisting step-off. (29 vs 60 %, $P = .14$).

Conclusion: The main risk factor for developing osteoarthritis in these fractures is related to non-anatomical restoration of tibiotalar joint surface. This does not only apply to PMFF's larger than 25 % of the articular surface, but also to fragments of 5–25 %. Emphasis in treatment of these fractures should therefore be in anatomical reduction and fixation.

Disclosure: No significant relationships.

O040**CORRELATION BETWEEN DIFFERENT VALIDATED QUESTIONNAIRES FOLLOWING A DISTAL RADIUS FRACTURE IN A COHORT OF YOUNG NON-OSTEOPOROTIC PATIENTS**

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Introduction: Distal radius fractures (DRF) in young non-osteoporotic patients are common injuries and result mostly from high energy trauma and often have intra-articular involvement [1–3]. Clinical result is captured in radiological assessment, functional outcome (i.e. grip strength, range of motion), but also in subjective outcome measures, such as validated questionnaires [3, 4]. Patient satisfaction is important. Although generally assumed, the question arises if a correlation exists between different validated

questionnaires in a non-osteoporotic group of patients who suffered from a distal radius fracture.

Materials and methods: From a database all patients were selected from a non-osteoporotic age group (men 18–50 years and women 18–40 years old) who had sustained a distal radius fracture in the period January 2005 until January 2011 at the Medical Center Leeuwarden, the Netherlands. All eligible patients answered 4 validated questionnaires (PRWE, DASH, MHQ and the SF-36).

Results: Seventy-three patients with intra- and extra-articular fractures were included with a mean age of 39 years (32 women). After a mean follow up of 69 months (range 37–108) the following results from the questionnaires were extracted; the DASH-score was 9.2 points (mean, range 0–51), the PRWE score was 14.4 (mean, range 0–77), the MHQ-score was 84.1 (mean, range 30–100) and the SF36 general health experience was 72.6 (mean, range 10–100). All outcome scores of the questionnaires were significantly correlated ($p < 0.05$, range $r = .286 - r = .850$).

Conclusion: The outcome scores of different validated questionnaires are strongly associated following a distal radius fracture in non-osteoporotic patients. We suggest a more prominent role for questionnaires in the follow up of these patients.

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Disclosure: No significant relationships.

O041

DOUBLE DYNAMISATION (IN THE AXIS OF THE NECK OF THE FEMUR AND IN THE LONG AXIS OF THE FEMUR) IS IMPORTANT IN THE SURGICAL TREATMENT OF PERTROCHANTERIC FRACTURES

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Introduction: The aim of this study is to present results of using one new selfdynamisable method and device which provides spontaneous axial dynamisation and at the same time dynamisation in the axis of femoral neck.

Materials and methods: We analyzed series of 30 patients with unilateral pertrochanteric fractures treated by the use of selfdynamisable internal fixator (SIF) developed by Mitkovic. That selfdynamisable device known as “Intelligent implant” has feature to become spontaneously dynamic in long axis of the femur if union is slower or absent 4–6 weeks after the operation. Subtrochanteric fractures where not included in this series.

Results: The average operative time was 32 min (19–71) average fluoroscopy time was 11 s (6–33) while average blood loss was 60 ml (30–180 ml). None of the patients developed complications during the intraoperative period. Healing time was 3 months (2.5–6). Healing was achieved in 100 % of patients. Superficial infection developed after 1 fixations (1 %) while deep infection has not been registered. Cut out

phenomenon has not been registered in this series. Spontaneous axial dynamisation was observed in 2 patients (6.7 %) 2 and 5 ml.

Conclusion: SIF is one effective method and device for the treatment of pertrochanteric femoral fractures but at the same time it can be regarded as one suitable tool to define the need for axial dynamisation. In our series we found that axial dynamisation during the surgical treatment of femoral fractures happened in 6.7 % in our series of patients.

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Disclosure: The author has licence agreement with Traffix Ltd.

O042

FOUR-YEAR IMPACT ON THE USE OF IVR-CT SYSTEM IN THE EMERGENCY ROOM FOR THE PATIENTS WITH SEVERE BLUNT TRAUMA WHO REQUIRED EMERGENCY BLEEDING CONTROL

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Introduction: We have advocated that CT performed before emergency bleeding control was associated with improved survival in severe trauma patients. In recent years, some major urban trauma centers have elected to install CT scanners inside emergency room. In August 2010 we installed a sliding CT scanner with interventional radiology features (IVR-CT) in our emergency room that allows emergency bleeding control without relocating the patients. The objective of this study was to assess whether IVR-CT has a beneficial impact on survival of patients with severe blunt trauma.

Materials and methods: This historical control study was conducted from February 2004 to September 2014 in a level I trauma center. Inclusion criteria were patients with blunt trauma who admitted directly from the incident scene and required emergency bleeding control. We compared the time from patient arrival to CT initiation, to start emergency bleeding control procedures, and the mortality ratio in the patients of new workflow (IVR-CT group) with that of conventional workflow(C group).

Results: There were 134 patients in group C and 63 patients in group IVR-CT. CT initiation was faster in IVR-CT group. There was not significant difference of 28-days mortality ratio if compared all patients in both group. However, we found the lower mortality of IVR-CT group (43 %) compared with group C (55 %) in the severe patients who showed higher trauma and injury severity score (TRISS: probability of survival <50).

Conclusion: IVR-CT in the emergency room might contribute the beneficial effects on survival in severe trauma patients at high risk of death.

Disclosure: No significant relationships.

O043

ANGIOGRAPHY AND EMBOLISATION IN EMERGENCY: A CURRENT PERSPECTIVE

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Introduction: Any level-one trauma center should have an interventional radiologist as part of the trauma team. Embolization is a well-established interventional radiology technique that is used to treat trauma victims with massive bleeding and as a treatment prior to surgery to decrease blood loss.

Materials and methods: We present a retrospective evaluation of the patients admitted to Level I trauma center who required selective arterial embolization in emergency department for traumatic and non-traumatic haemorrhage. Patients with incomplete data was excluded from our lot. We selected 78 patients divided into 2 groups: traumatic and nontraumatic. 37 patients were included in trauma group: 19 with spleen injury, 15 liver injury and 3 with pelvic trauma. The others were nontraumatic emergencies.

Results: The embolization was efficacy and safe in both groups. However, immediate hemostasis occurred in 96.15 % (75 patients) because in three failed procedure and we reported rebleeding within 24 h. One patient who underwent right hemicolectomy for rebleeding had ischemic changes found on pathologic analysis of the resected specimen after the first embolization, and a second patient who underwent embolization of branches of the superior and inferior mesenteric arteries developed bowel infarction requiring left hemicolectomy.

Conclusion: Emergency arterial embolization is a safe and effective means of control hemorrhage for stable patients. Also it's well-tolerated procedure.

Disclosure: No significant relationships.

O044

GRADING OPERATIVE FINDINGS AT LAPAROSCOPIC CHOLECYSTECTOMY: A NEW SCORING SYSTEM

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Introduction: Variation in outcomes from surgery is a major challenge and defining surgical findings may help set benchmarks, which currently do not exist in laparoscopic cholecystectomy. This study outlines a new surgical scoring system incorporating key operative findings.

Materials and methods: English language studies pertaining to severity scoring and predictors of difficult laparoscopic cholecystectomy were searched for in PubMed, Embase and Cochrane databases using the search terms 'Laparoscopic cholecystectomy or Lap chole' AND/OR 'Scoring Index or Grading system or Prediction of difficulty or Conversion to open' in various combinations. Cross-referencing from papers retrieved in the original search identified additional articles.

Results: Sixteen published papers report a gallbladder (GB) scoring system, but all relate to pre-operative clinical and imaging findings, rather than operative findings. The new scoring system (outlined below), using operative findings incorporates the appearance of the GB, presence of GB distension, ease of access, potential biliary complications and time taken to identify cystic duct and artery. A score of <2 would imply mild difficulty, 2–4 moderate, 5–7 severe and 8–10 extreme.

Operative Grading System for Cholecystitis Severity.

Gallbladder appearance Adhesions <50 % of GB 1

Adhesions burying GB 3

Max 3

Distension/Contraction Distended GB (or contracted shrivelled GB) 1.

Unable to grasp with atraumatic laparoscopic forceps 1

Stone ≥ 1 cm impacted in Hartman's Pouch 1

Access

BMI > 30 1

Adhesions from previous surgery limiting access 1

Severe Sepsis/Complications

Bile or Pus outside GB

1

Time to identify cystic artery and duct

>90 min 1

Total Max 10

Degree of difficulty

A Mild < 2

B Moderate 2–4

C Severe 5–7

D Extreme 8–10

Conclusion: This paper reports one of the first operative classifications of findings at laparoscopic cholecystectomy. It has the potential to allow benchmarks for international collaboration of operative and patient outcomes in patients undergoing laparoscopic cholecystectomy.

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Disclosure: No significant relationships.

O045

EARLY SEVERE LYMPHOPENIA PREDICTS MORTALITY IN CRITICALLY ILL EMERGENCY SURGICAL PATIENTS

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Introduction: Lymphopenia several days after admission has been postulated as a poor prognostic sign in patients with sepsis and following trauma [1, 2]. We hypothesized that severe lymphopenia among critically ill emergency general surgical (EGS) patients within the first 48 h of admission was associated with increased mortality.

Materials and methods: We retrospectively reviewed a prospectively compiled database of adult EGS patients requiring ICU admission at our institution between 2002 and 2013. Lymphocyte counts at admission and on day 2 were recorded. The lower limit of normal for lymphocyte count at our laboratory was 1.0×10^9 cells/L. Moderate lymphopenia was defined as a lymphocyte count of $0.5–0.9 \times 10^9$ cells/L; as previously described [1], severe lymphopenia was defined as a count of less than half the lower limit of normal ($< 0.5 \times 10^9$ cells/L).

Results: 173 patients with acute intra-abdominal pathology were included. The overall mortality rate was 41 % (71/173). At admission,

39 % of patients (69/173) demonstrated severe lymphopenia, 38 % (66/173) had moderate lymphopenia and 22 % (38/173) were not lymphopenic. Patients with severe lymphopenia at admission had a mortality of 51 % compared to 35 % among those without severe lymphopenia ($p = 0.04$). Mortality was not significantly different between patients with lymphopenia ($< 1.0 \times 10^9$ cells/L) and those without (45 vs 34 %, $p = 0.27$). On the second day of ICU admission, 30 % (50/165) had severe lymphopenia. Again, mortality among this group was significantly higher compared with patients without severe lymphopenia (58 vs 35 %, $p = 0.006$).

Conclusion: Severe lymphopenia during the first 24 h of critical illness is associated with adverse outcome in EGS patients

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Disclosure: No significant relationships.

O046

NO DIFFERENCE IN ADVERSE EVENTS BETWEEN SURGICALLY TREATED REDUCED AND UNREDUCED DISTAL RADIUS FRACTURES

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Introduction: When surgery is planned before reduction, we typically reduce the radius prior to surgery to relieve soft tissue tension and pressure on the median nerve, and to reduce discomfort; however, these issues are either uncommon or debatable. We wonder if the discomfort and inconvenience of a closed reduction is worthwhile if the fracture will be treated surgically anyway. We hypothesize that there are no differences in (1) adverse events and (2) subsequent surgeries between patients treated with manipulative reduction compared to those that were splinted without reduction before distal radius fracture surgery.

Materials and methods: We retrospectively included 1511 patients who underwent plating of their distal radius fracture between January 1st 2007 and December 31st 2012 of whom 102 (7 %) were not reduced prior to surgery. We recorded any infections, hematomas, disproportionate finger stiffness, (transient) neuropathology after surgery and resultant delayed carpal tunnel release, malunion, loss of alignment, plate removal and tendon ruptures within 1 year after surgery. Outcome measures were grouped to determine the overall adverse event rate and subsequent surgery rate.

Results: We found no difference in specific adverse events between unreduced and reduced fractures. After adjusting for possible confounding variables by multilevel logistic regression, we found no difference in overall adverse event rates (adjusted odds ratio

unreduced fractures 1.1, 95 % confidence interval 0.56–2.3, $P = 0.74$) and subsequent surgeries (adjusted odds ratio unreduced fractures 0.71, 95 % confidence interval 0.25–2.0, $P = 0.38$).

Conclusion: For the subset of patients who choose operative treatment and have no wounds, skin tenting, or neuropathy prior to manipulative reduction, reduction may not be helpful.

Disclosure: No significant relationships.

HAND AND WRIST

O047

INTRAMEDULLARY FIXATION OF INTRA-ARTICULAR FRACTURES OF THE DISTAL RADIUS WITH THE TARGON DR: A RANDOMIZED TRIAL VERSUS PALMAR LOCKING PLATES

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Introduction: Proposed benefits of intramedullary techniques include limited soft tissue dissection while affording sufficient stability to allow early wrist motion. We hypothesized that there is no significant difference with respect to functional outcome, pain and disability between patients treated with either 2.4-mm volar locking plate fixation or intramedullary nail fixation of intra-articular fractures of the distal radius.

Materials and methods: We conducted a single-centre, prospective randomized matched-pair trial. Patients with intraarticular distal radius fractures (AO type C2) were randomized to receive volar locking plate fixation ($n = 13$) or intramedullary nailing ($n = 13$). The outcome was measured on the basis of the Gartland and Werley and Castaing score; the pain level; the range of wrist motion; the rate of complications; and radiographic measurements including volar tilt and ulnar variance. Clinical and radiographic assessment was performed at 8 weeks and 2 years after the operation.

Results: There were no significant differences between groups in terms of range of motion, grip strength or the level of pain at eight weeks. At the final follow up, patients in the nail group had regained significantly more extension than in the plate group (98 % of the unaffected side vs. 92 %). Reduction was maintained in both groups; however volar tilt and ulnar variance were significantly better in the plate group. There was no significant difference in the complication rate between groups.

Conclusion: The present study suggests that intramedullary nail fixation is a reasonable alternative to volar plate fixation for the treatment of intra-articular distal radius fractures and both techniques can yield reliably good results.

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Disclosure: No significant relationships.

O048**EVALUATING COMPUTER-ASSISTED 3-D PLANNING FOR CORRECTIVE OSTEOTOMY OF THE MALUNITED RADIUS**

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Introduction: During a corrective osteotomy of the malunited radius, complex deformations are not always addressed during conventional preoperative planning. Computer-assisted techniques with three-dimensional (3-D) images and models address 3-D deformity and may optimize functional and radiological results. We analysed the radiological results of computer-assisted 3-D planned corrective osteotomy in a series of patients with a malunited radius, using 3-D reconstructions of the postoperative radii.

Materials and methods: We included eight patients aged 13 to 64 with a symptomatic radius malunion who underwent a computer-assisted 3-D planned corrective osteotomy of the radius. We evaluated postoperative residual malpositioning on 3-D reconstructions as expressed in six positioning parameters. Additionally, we assessed wrist function as well as patient reported outcome measures (Patient Rated Wrist Evaluation Score [PRWE] and the Disability Arm Shoulder Hand Score [DASH]).

Results: Three patients had an extra-articular distal radius malunion and five patients a diaphyseal malunion. Postoperative 3-D evaluation revealed improved positioning parameters for most patients in rotation, palmar tilt, radial inclination, radial length and sagittal shift (volar – dorsal), although not significant. Rotational alignment was significantly improved ($p = 0.05$). Coronal shift (ulnar - radial) was worsened by the correction osteotomy. All but one patient experienced improved range of motion and the postoperative median DASH and PRWE scores indicate mild perceived disability.

Conclusion: Computer assisted 3-D planning ameliorates alignment of radial malunions and improves clinical and functional results in patients with a symptomatic malunion of the radius. We recommend guided intraoperative bone positioning in future osteotomy surgery, to further improve clinical and functional results.

Disclosure: No significant relationships.

O049**PREVENTION OF CRPS-1 IN PATIENTS WITH DISTAL RADIUS FRACTURE - A PILOT STUDY**

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Introduction: Complex regional pain syndrome type 1 (CRPS-1) is a post-traumatic pain syndrome characterized by excessive pain

with autonomic disturbances and disabilities. For prevention, vitamin C has been shown to significantly reduce the incidence of CRPS-1 in distal radius fractures from 10 % to 2.4 %.¹ Other studies have indicated that disuse and kinesiophobia might be crucial in the development of CRPS-1.² The question is whether the management of disuse and kinesiophobia could be used to prevent CRPS-1.

Materials and methods: In this study, a self-rehabilitation program including written instructions of progressive loading exercises was applied to prevent disuse in the post-immobilization period for a distal radius fracture. The aim of the study was to evaluate whether this self-rehabilitation program could prevent the development of CRPS-1. All consecutive patients who underwent treatment of distal radius fracture with casting, were included in a prospective cohort study. Immediately after cast removal, the self-rehabilitation program was started. Budapest diagnostic criteria for CRPS-1 were assessed by telephone interview at three to four months follow-up. When these subjective Budapest criteria were positive, the patient was invited to the CRPS-outpatient clinic to assess also objective symptoms of the Budapest criteria.

Results: From 2012 until 2014, 81 patients were included in this study. Only 56 patients were available for follow-up. Nine patients (16 %) scored positive with telephone interviewing. None of these nine patients were diagnosed with CRPS-1 when the clinical symptoms of the Budapest criteria were assessed.

Conclusion: Management of disuse and kinesiophobia with a self-rehabilitation program is effective to prevent the development of CRPS-1.

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Disclosure: No significant relationships.

O050**TITLE: THE VALUE OF CT IN DETECTING DISTAL RADIOULNAR JOINT INSTABILITY AFTER DISTAL RADIUS FRACTURE**

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Introduction: The diagnosis of distal radioulnar joint (DRUJ) instability is challenging, both clinically and radiologically. The stress test and clunk test are generally accepted clinical tests [1, 2]. Four methods for determining DRUJ instability on CT are the radio ulnar line, subluxation ratio, epicenter method and radio ulnar ratio method [3, 4]. We determined the diagnostic ability of CT to discriminate between patients with and without clinical DRUJ instability.

Materials and methods: CT scans were made of both injured and uninjured wrist of 46 patients with a conservatively treated distal radius fracture. In 16 of them, clinical DRUJ instability was diagnosed. Two observers independently quantified the position of the ulna relative to radius of both wrists in supination according to the

four methods for diagnosing DRUJ instability on CT. Receiver-operating characteristic (ROC) curves were constructed for the absolute difference in ulnar position between injured and uninjured sides for all four methods.

Results: Diagnostic ability of all four methods for identifying clinical DRUJ instability according to the stress test was poor for both observers (area under the ROC curve (AUC) ranging between 0.37–0.53). For predicting clinical DRUJ instability according to the clunk test, the diagnostic ability of the radio ulnar line method, radio ulnar ratio and subluxation ratio method were comparable (AUC 0.75) and lower for the epicenter method (AUC 0.66), for one observer. The AUCs for the other observer were lower.

Conclusion: This study suggests that the diagnostic ability of CT for identifying DRUJ instability is limited and may vary between observers.

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Disclosure: No significant relationships.

O051

CLINICAL DIAGNOSIS OF A TRUE SKIERS THUMB

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Introduction: The general thought is that an acute skiers thumb is a clinical diagnosis. However, swelling, pain, natural left-right differences and inexperience of a young physician can be problematic. Our theory however, is that any physician, given the correct instructions, should be able to diagnose this injury by physical examination alone.

Materials and methods: All physicians (interns or residents with working experience of 6 months–3 years) working at the ER received a pocket card with instructions for physical examination. Patients >18 years, with an injury <1 week old, suspected of a true (unstable) skier's thumb had an MRI reported by two independent radiologists to confirm the diagnosis.

Results: Twenty patients were included. Four patients had no fixed endpoint (21 %), all had a complete ligamentous rupture of the UCL on MRI, of which one patient had a Stener lesion. Ten patients (50 %) met with the criteria >35° laxity in extension of MCP/>20° laxity in 30° flexion of the MCP. Of these, eight patients (80 %) had a complete rupture (5 Steners (63 %)). One patient had a partial rupture and one patient had no UCL-injury. Six patients (32 %) had inconclusive results during physical examination. Of these, two had a complete rupture (33 %, 1 Stener). Two patients had a partial rupture and two patients had no UCL injury.

Conclusion: Preliminary results show that physical examination of a skier's thumb performed by any intern or resident, when correctly instructed, should be sufficient to diagnose a true skiers thumb.

Disclosure: No significant relationships.

O052

CATASTROPHIC THINKING IS ASSOCIATED WITH FINGER STIFFNESS AFTER DISTAL RADIUS FRACTURE SURGERY

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Introduction: Variations in pathophysiology such as trauma mechanism or fracture type do not seem to adequately account for the variability in stiffness after fracture. We aimed to identify demographic, injury-related or psychological factors associated with finger stiffness at suture removal and 6 weeks after distal radius fracture surgery. We hypothesize that there are no factors associated with distance to palmar crease (DTPC) at suture removal.

Materials and methods: We prospectively enrolled 116 adult patients who underwent plating of their distal radius fracture of whom 96 were also available 6 weeks after surgery. At suture removal we recorded demographics, fracture type, carpal tunnel release at the time of surgery, Pain Catastrophizing Scale, Whiteley Index, Patient Health Questionnaire-9, and Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire, 11-point ordinal measure of pain intensity, DTPC and active flexion of the thumb through small finger. At 6 weeks after surgery we measured motion, DASH, and pain intensity. Pre-reduction and post-surgery radiographic fracture characteristics were assessed: ulnarward inclination, ulnar variance, volar tilt, and intact ulna.

Results: Female sex, being married, carpal tunnel release, AO type C fractures, and greater catastrophic thinking were associated with increased DTPC at suture removal. At 6 weeks, fewer years of education and greater catastrophic thinking were associated with increased DTPC.

Conclusion: Catastrophic thinking was a consistent and major determinant of finger stiffness at suture removal and six weeks after surgery. Future research should assess if treatments that ameliorate catastrophic thinking can facilitate recovery of finger motion after operative treatment of a distal radius fracture.

Disclosure: No significant relationships.

O053

THE VALUE OF ROUTINE RADIOGRAPHS AND THE USE OF CT-SCANS IN PATIENTS WITH WRIST FRACTURES IN THREE LARGE TEACHING HOSPITALS IN THE NETHERLANDS

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Introduction: In The Netherlands, follow-up protocols for wrist fractures recommend radiography at 1,2,6 and 12 weeks post-trauma. CT scans are made on indication. The aim of this study was to

evaluate the reasons for making radiographs of wrist fractures after 3 weeks post-trauma and the overall use of CT scans.

Materials and methods: A retrospective cohort study was performed including all adults with a wrist fracture treated in one academic and two non-academic teaching hospitals in the Netherlands in 2012. The indication and subsequent policy changes of all radiographs and CT scans were recorded from the hospital records.

Results: 950 patients were analysed. An explicit clinical reason for radiography was mentioned in the hospital records for only 52 of the 655 (8 %) radiographs taken beyond 3 weeks follow-up. All 152 CT scans were made in accordance with the Dutch Guideline. The proportion of patients with a CT scan varied between the hospitals from 6 % to 23 %. This difference was statistically significant ($p = 0.001$), corrected for fracture type and age.

Conclusion: Less than 10 % of the radiographs taken during follow-up of wrist fractures are made for an explicit clinical reason, suggesting that almost all radiographs are routinely made. The protocols may be adjusted into taking radiographs only when clinically indicated. This may lead to cost reduction without compromising quality of care. Since the difference in CT between the hospitals was not explained by fracture type and age, this is most likely due to the preference or experience of the surgeon.

Disclosure: No significant relationships.

THE ACUTE CARE SURGEON

O054

INFLUENCE OF INTRA-ABDOMINAL PRESSURE ON EARLY INTESTINAL ISCHEMIA IN RAT

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Introduction: The aim of this study was to determine the effect of intra-abdominal pressure (IAP) on the development of early intestinal ischemia in rats.

Materials and methods: Twenty-five anesthetized and ventilated rats were randomly assigned to five groups and exposed to an IAP of 0, 5, 10, 15, or 20 mmHg for three hours. IAP was induced by intraperitoneal catheter infusion of polyethylene glycol 4 %. Blood pressure, end tidal CO₂ (EtCO₂), aastrups, and serum samples were collected at baseline, 90, and 180 minutes. Serum albumin-cobalt binding (ACB) capacity was determined as measure for systemic ischemia, and intestines were processed for histopathology. Spearman rank correlation was used to test the association between IAP and the individual variables.

Results: IAP was negatively associated with mean arterial pressure at 90 (Spearman correlation coefficient; $Rs = -0.446$, $p = 0.025$) and 180 minutes ($Rs = -0.466$, $p = 0.019$), oxygen saturation and partial oxygen pressure (pO₂) at 90 minutes ($Rs = -0.673$, $p < 0.001$; $Rs = -0.561$, $p = 0.004$) and 180 minutes ($Rs = -0.882$, $p < 0.001$;

$Rs = -0.752$, $p < 0.001$), pH-value at 90 ($Rs = -0.819$, $p < 0.001$) and 180 minutes ($Rs = -0.934$, $p < 0.001$). IAP was positively associated with central venous pressure ($Rs = 0.581$, $p = 0.002$) at 180 minutes, and EtCO₂ at 180 minutes ($Rs = 0.639$, $p = 0.001$). No relation was found between IAP and lactate level or ACB capacity at 90 and 180 minutes. Histopathology of the intestines revealed no signs of evident ischemic damage in any of the groups.

Conclusion: Although increasing IAP was associated with increasing respiratory difficulties, no signs for intestinal ischemia could be demonstrated in the first three hours of increased IAP.

Disclosure: No significant relationships.

O055

HYPOTHERMIA AS PREDICTOR FOR MORTALITY IN TRAUMA PATIENTS

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Introduction: Previous studies reported hypothermia as an independent predictor for mortality. However different cut-off points were used and external validation has never been applied. The aim of this study was to quantify the net effect of hypothermia on admission to the ICU on the 28-days mortality and to test predictors from the developed model in another level-1 trauma center to validate the model.

Materials and methods: A retrospective study was performed in trauma patients admitted to a level-1 trauma centre and who were transferred to the Intensive Care Unit (ICU). Different cut-off points for hypothermia were compared to find the best definition for hypothermia. Logistic regression analysis was performed to quantify the net effect of hypothermia on 28-days mortality and to develop a model with predictors. The developed model was externally validated in data from another level-1 trauma center.

Results: In total 722 trauma patients were included, of which 300 patients were hypothermic. The mortality in the hypothermia group was significantly higher (OR 3.73, 95 % CI 2.02–7.13, $p < 0.001$). A cut-off point of 36° Celsius was observed as the best threshold for hypothermia (sensitivity 74 %, specificity 56 %). Other predictors found for 28-mortality were APACHEII score, minimum thrombocytes and urea and included in the final model (AUC of 0.89 (95 % CI 0.85–0.92)). External validation of the model was associated with a predicted probability of 0.64 (95 % CI 0.51–0.77).

Conclusion: Hypothermia, defined as <36° Celsius, is associated with an increased 28-days mortality. The AUC of the developed model (0.64) reflects moderate discriminative ability in a new patient population.

Disclosure: No significant relationships.

O056**THE CENTRALIZATION OF EMERGENCY GENERAL SURGERY LEADS TO IMPROVED SHORT AND LONG-TERM SURVIVAL; EXPERIENCE FROM 841 EMERGENCY LAPAROTOMIES FROM A UK UNIVERSITY HOSPITAL**

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Introduction: The debate about the creation of dedicated emergency general surgery (EGS) units, similar to the American departments of Acute Care Surgery, has started in the UK. A dedicated unit for EGS was created in our hospital between 2008 and 2009, staffed by specialist emergency and trauma surgeons.

Materials and methods: A retrospective dataset was created by examining 2 time periods prior to and after the creation of the dedicated EGS service. Demographics, ASA grade and time of operation were pre-operative variables examined. Primary outcomes measured were 30 day mortality, Intensive care stay, and histological malignant diagnosis. Secondary outcomes were 3 year survival rates. Statistical analysis were conducted using the Chi squared test.

Results: 417 cases were conducted between 2007 and 2008 (pre EGS), and 424 between 2010 and 2011(post EGS). Mean age was 65.7 pre EGS, and 64.5 post EGS. 35 % of the pre EGS cohort had a malignant diagnosis histologically confirmed, as compared to 28 % of the post EGS cohort ($p = 0.04$). 35 % patients had a laparotomy overnight pre EGS and 23 % post EGS ($p = 0.001$). 30 day mortality was 21.8 % pre EGS and 13.4 % in the post EGS cohort ($p = 0.001$). The 3 year survival was 68 % in the post EGS cohort, compared to 60 % in the pre EGS group.

Conclusion: The 30-day mortality of emergency laparotomy fell and the long term survival improved. Fewer patients with malignant diagnoses were operated on emergently and the proportion of night time laparotomies fell. This was due to much greater senior surgical input into pre and peri-operative decision making.

Disclosure: No significant relationships.

O057**PROPOSAL FOR THE EVALUATION OF QUALITY OF THE CARE IN EMERGENCY GENERAL SURGERY**

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Introduction: One of the most established strategies to improve quality of care in surgery is to monitor performance and outcomes. Emergency General Surgery (EGS) represents a significant burden of disease. However, lack of well-defined specific procedure/quality indicators in EGS may account for difficulties in demonstrating a positive impact on EGS quality of care.

Materials and methods: A clinical outcome registry for monitoring the quality of care in emergency general surgery patients is proposed. Demographic variables, risk stratification, severity scoring

information, and 30-day postoperative overall morbidity, serious morbidity, and mortality were obtained from medical records.

Results: Over a one month, 231 patients underwent to 261 EGS procedures. The crude mortality rate was 3.46 % and serious morbidity 17.17 %. The hospital length of stay and ICU LOS was $6.54 \text{ days} \pm 5.7 \text{ days}$ and 5.18 ± 4.42 respectively. Other postoperative complications: overall SSI 9.06 %, non-planned relaparotomy 6.49 %, severe sepsis 6.06 %, renal failure 4.76 %, bile leak from cystic duct injury 0.86 %, and anastomotic dehiscence 1.73 %. Time to surgery was: appendectomy 5 hours ± 1.56 for perforated appendicitis, 8 h ± 5.79 for localized appendicitis, 37 h ± 29.61 for acute cholecystitis, 7.48 h ± 2.39 for cholangitis, and 2.42 h ± 0.98 for perforated diverticulitis.

Conclusion: The serious morbidity and mortality in our series is similar to the one described in recent studies, and likewise confirms the increased morbidity and mortality in EMS compared to elective surgery. We have created at our institution, a system to monitor the quality of care in EGS that help to define the improvement programs.

Disclosure: No significant relationships.

O058**US ESTES SURVEY. RESULTS OF A EUROPEAN SURVEY ON THE USE OF POINT-OF-CARE ULTRASOUND IN EMERGENCY AND TRAUMA SURGERY**

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Introduction: “Point of care” ultrasound is useful diagnostic tool. In order to know its level of implementation among its members, ESTES has distributed a survey.

Materials and methods: In April 2014 a survey was administered to 654 ESTES members. 111 responses were received; 81 were completed and analyzed.

Results: Most respondents are males, (30–65 years), 44 % under 45 years. 45 % general surgeons, 22 % trauma surgeons, 12 % orthopedic, 5 % anesthesiologists or intensivists. Category: 15 % Heads of Service, 20 % Unit Heads, 56 % staff surgeons, 9 % residents. 78 % of responses from EU, 9 from Asia, 5 from USA. Facility: 40 % Trauma Centers (TC) level 1; 26 % level 2; 6 % level 3; 10 % University Hospitals unqualified TC; 13 % community hospitals; 5 % private. 52 % of respondents performed ultrasound, 91 % of which finding it useful and 89 % believing it should be in the curriculum (96 % among general surgeons). 61 % of surgeons perform emergency ultrasound, (55 % of other respondents, 36 % general surgeons in trauma). Ultrasound is not related to age or workplace. 100 % of respondents from America perform ultrasound. Less CT scans are required (46 vs. 73 %, $P = 0.035$). Among physicians who do not perform ultrasound, 74 % have emergency ultrasound <1 hour, and only 2.6 % > 12 hours. 59 % of them have portable ultrasound in the service and 59 % reported knowledge of ultrasound. 82 % finds “point of care” ultrasound is useful. 64 % have learned after a short course.

Conclusion: Interest in ultrasound “point of care” among surgeons emergency is clear. The majority of respondents finds US useful and think it should be included in surgical curriculum.

Disclosure: No significant relationships.

O059

THE FIXATION OF FRACTURES IN PRESENCE OF AN OPEN ABDOMEN AFTER 'DAMAGE CONTROL' LAPAROTOMY IS NOT ASSOCIATED WITH AN INCREASED POSTOPERATIVE INFECTION RATE

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Introduction: The optimal timing and safety of fracture fixation in patients with an open abdomen after 'damage control' laparotomy remains a topic of debate.

Materials and methods: We reviewed a prospective database of all trauma patients with open abdomen after 'damage control' laparotomy during a 10-year study time-window at an academic regional level 1 trauma center. Inclusion criteria consisted of all adult patients with an open abdomen and associated fractures requiring surgical fixation. Patients were stratified into two distinct study cohorts depending on the timing of fracture fixation in relation to the timing of abdominal wall closure. The primary outcome parameter was the rate of orthopaedic surgical site infections.

Results: A total of 169 consecutive patients with open abdomen after 'damage control' laparotomy were identified during the 10-year study time-window. Of these, 68 fractures in 45 patients underwent surgical fixation after the laparotomy. There was no significant difference in surgical site infection rates of fractures fixated before (group 1) or subsequent to the abdominal wall closure (group 2; $P > 0.05$). However, fracture fixation was initiated significantly sooner in group 1, compared to group 2 ($P = 0.01$).

Conclusion: Fracture fixation in multiply injured patients can be safely performed in presence of an open abdomen, without a risk for increased orthopaedic surgical site infections. The anecdotal notion of delaying fracture fixation until abdominal wall closure does not appear justified and should be abandoned, particularly in the vulnerable subset of critically injured patients who benefit from early fracture fixation to allow unrestricted mobilization.

Disclosure: No significant relationships.

O060

PROPOSAL TO ESTABLISH A EUROPEAN QUALIFICATION OF COMPETENCE IN TRAUMA AND NON-TRAUMA EMERGENCY SURGERY

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Introduction: In most European countries, a progressive focus on planned activities at the expense of the urgent, has undermined the ability of surgeons in general to intervene in emergency situations outside their area of specialization. To bring emergency surgical care

into line with the modern world, it is essential to redesign our training curricula.

Materials and methods: The training model needs to put emphasis on the ability to identify, prioritise and resolve potentially lethal acute situations in different anatomical areas. While recognizing the difficulty that this represents, it is obvious that only specific periods of training will enable it. To this extent, initial training modules should be based on the existing programs for partial traineeships that residents of the various surgical specialties already carry out in related areas.

Results: This study program should enable the acquisition of a wide range of skills, not only in terms of surgical technique, but also in the clinical sense, of decision-making and scientific knowledge with regard to the initial approach to the patient with severe trauma or other acute life-threatening disease.

Conclusion: The emphasis should be placed not on to ensure, with temporary surgical procedures in a damage control perspective, stabilization and subsequent transfer of the patient to a more specialized level of care. In the United States, the surgical panorama already includes this type of training. For practical reasons and without prejudice to the necessary adaptations to the European realities, we believe that this model should be adopted as a working basis.

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Disclosure: No significant relationships.

NEW TECHNOLOGY

O061

FLUOROSCOPIC BASED NAVIGATION IN ORTHOPAEDIC TRAUMA – A REVIEW OF A LARGE CENTER'S EXPERIENCE

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Introduction: Computer-Aided Orthopaedic Surgery (CAOS) is a powerful tool for skeletal procedures. Fluoroscopic based navigation (FBN) had managed to facilitate certain orthopaedic trauma procedures such as femoral neck pinning, iliosacral screw insertion and femoral nailing. While the advantages of each procedure in term of accuracy and radiation exposure was previously published, the aim of this study was to review the usage and the indication for these procedure in a large, academic, level I trauma center.

Materials and methods: The BrainLab v 3.0 Software was utilized in our institution since late 2010. The advantages of this platform including a hand-held C-arm calibration target (X-spot™), intraoperative planning of implant trajectory for femoral neck fractures and percutaneous pelvic screw insertion, and noninvasive tracking of the contralateral limb for comparison during femoral nailing. Altogether 126 procedures were performed using FBN with this platform

Results: Procedures included, 58 hip pinnings, 28 femoral shaft fixation, 19 iliosacral screw fixation, 4 acetabular column screws, 9

implant navigation for distal femoral plates, and 12 other procedures. In 4 cases navigation was aborted due to technical reasons. All but in 2 cases implant position was accurate and did not require implant reposition after navigation. No tracker pin associated complications (fractures or infection) were noted. Average additional set-up time was 10–10 min. All femoral nailing patients healed with satisfactory length and rotation values, measured by postoperative CT scans.

Conclusion: FBN is an accurate and effective tool increasing surgical accuracy and precision for skeletal trauma procedures, although it is associated with increased operative time.

Disclosure: No significant relationships.

O062

REDUCTION OF THE FIBULA WITH SYNDESMOSTIC INSTABILITY (AO/OTA CLASSIFICATION 44-C TYPE) USING INTRAOPERATIVE 3D IMAGE

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Introduction: Malalignment of the fibula after fixation of ankle fractures with syndesmotic instability was occurred up to 50 % of the cases in some studies. Many authors recommend a postoperative control with a CT-scan after such procedures. We tried to do that evaluation intraoperatively. In this study, we present our experience with the intraoperative use of the 3D image (ARCADIS Orbic 3D, SIEMENS) in the treatment of syndesmotic injuries.

Materials and methods: We treated 10 syndesmotic lesions by fixation using an intraoperative control with 3D image. Firstly, tibio-fibular joint was reduced and fixed under conventional fluoroscopy. The position of the joint was controlled with a 3D image acquisition. Using intraoperative 3D image and postoperative CT scan, we evaluate about three-dimensional position of fibula.

Results: Eight patients showed a good reduction result intraoperatively. The other two patients needed a change in reduction of the tibio-fibular joint after intraoperative 3D imaging. One was 1.5 mm shortening of fibular, the other one was 2 mm ventral displace. Post-operatively, one was 1 mm ventral displace and the other 3 cases had 5 ~ 8 degree rotational malalignment.

Conclusion: Although our study population is very small, there seems to be obvious advantages in intraoperative 3D imaging control of syndesmosis fixation. However, there is abnormal rotation of 5–8 degrees in 3 cases (30 %) which is considered to be due to malreduction of posterior malleolar fragment or displace among the insertion of position screws. which is an issue in the future. Further studies are needed to confirm our preliminary findings.

Disclosure: No significant relationships.

O063

ELECTROMAGNETIC NAVIGATION: A NEW TECHNIQUE FOR MINIMAL INVASIVE ILLIOSACRAL SCREW PLACEMENT?

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Introduction: The aim of this study was to prove the feasibility of this technique in the posterior pelvic ring and to compare the results with established image guided procedures.

Materials and methods: A pelvic specimen was used for testing. Either extraforaminal or transforaminal sacral fractures were performed prior to the experiment. Four test series were performed: OCT-Gr.: Optical navigation using preoperative CT-scans; O3D-Gr.: Optical navigation using intraoperative 3-D-fluoroscopy; Fluoro-Gr.: Conventional 2-D-fluoroscopy; EMT-Gr.: Electromagnetic navigation combined with a preoperative Dyna-CT-Scan. Screw placement accuracy was analyzed by standardized postoperative CT scan. The time of procedure and the time of intraoperative radiation exposure for the surgeon was documented.

Results: 160 iliosacral screws were set using a pelvic specimen. Optimal screw placement was significant more frequent in the EMT-Gr. (36/40) compared to the Fluoro-Gr. (30/40; $p < 0.05$) and the OCT-Gr. (31/40; $p < 0.05$). These results were comparable to the O3D-Gr. (37/40; n.s.). Equally the time of operative procedure was comparable between the EMT-Gr. and the O3D-Gr. (EMT 7.62 min vs. O3D 7.98 min; n.s.). Those results were significant shorter compared to the Fluoro-Gr. (10.69 min; $p < 0.001$) and the OCT-Gr. (13.3 min; $p < 0.001$). During the procedure there was no need for intraoperative imaging in the electromagnetic group because of real time navigation. Within the other groups the O3D-Gr. needed significant less additional intraoperative fluoroscopy (1.25 s) as compared to the OCT-Gr. (15.4 s; $p < 0.001$) which in turn needed significant less fluoroscopy as the Fluoro-Gr. (42.6 s; $p < 0.001$).

Conclusion: Electromagnetic guided iliosacral screw placement is a safe procedure.

Disclosure: No significant relationships.

O064

ROBUST-REGENERATION OF OSTEOFORTIC BONE USING STEM CELL TRANSPLANTATION

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Introduction: The heterogeneous human adipose stromal vascular fraction (SVF) possesses osteogenic potential without pre-differentiation [1–3]. This recommends it for one-step grafting procedures/fracture-augmentation especially in osteoporotic patients [4–5]. Safety and feasibility of the approach are assessed in a first-in-men trial.

Materials and methods: Patients with indication for surgical treatment of low-energy proximal humeral fractures were included if liposuction was feasible. The cell-suspension isolated in an automated device (Celution 800/CRS, Cytori, USA) was implanted via a

hydroxyapatite carrier before osteosynthesis with a PHILOS-plate (Synthes, CH). Follow-up was performed 6, 12 and 24 wks. postoperative including osteodensitometrie. A cell-sample was analysed using clonogenicity-/differentiation-assays and fluorescent activated cell sorting (FACS). In case of later implant removal a biopsy was taken for histology.

Results: Eight patients (mean age 69 yrs) were treated without procedural difficulties. Patients reported only minimal pain scores at the liposuction site. Four serious adverse events (hospitalisation of study-patients) were documented, none related to the novel technique. The cell-analysis revealed an average clonogenicity of 10 % with osteogenic potential in 30 % of clones. FACS showed high rates of mesenchymal progenitors proportional to the total cell-count with a constant population of endothelial progenitors. Histology of 5 biopsies after min. 6 months revealed the presence of bone within the graft.

Conclusion: This one-step approach using adipose as cell source for bone grafting is safe and feasible. The heterogeneous SVF could support vascularisation additional to bone formation, circumventing the dysfunctionality of autologous bone graft in elderly patients. This proof of principle underlines the prospects of the approach as alternative to standard grafting procedures.

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Disclosure: No significant relationships.

O065

INTRAFOCAL LED OPERATING LIGHTING. EVALUATION AND PERSPECTIVES IN TRAUMA SURGERY

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Introduction: The lightning of the operating theatre has to be stable, mobile, continuous and focalized. The most common solution is the use of a ceiling-mounted surgical lightning (scialytic). However, their performance is often put in default because of the shadows. The goal of this study was to evaluate the efficacy and the gain of using an intrafocal operative lightning (IOL) in trauma surgery.

Materials and methods: The IOL was tested during a 2 months period in an austere environment. The main operating lightning was a mobile floor surgical lightning. The IOL is a 3 LED lightning, sterilized and made to be used directly on the surgical field. The data collected were clinical data and IOL evaluation: efficiency, comfort of use and simplicity.

Results: 95 patients were managed with 95 % of penetrating trauma. Most frequent Injuries were orthopedic (69 %), soft tissues (34 %) and nerves trauma (21 %). The median of ISS was 11 (1-75, \pm 5,36). 105 surgeries were performed. The IOL was used for nerve and vascular repairs, myo-fascial flap and for explorative laparotomy. The median value for the efficacy was 4,18/5. Efficacy was particularly important that the operative field was small and focused. The median

value of the ‘comfort of use’ was 4,09/5 and ‘simplicity’ 5/5.

Conclusion: The results of this evaluation trend to prove that using an IOL during trauma surgery provides a best surgical lightning than a classical surgical lightning (scialytic) used alone. In its current form, the interest is however limited to small surgical field as vascular or nerves surgery. Further developments are needed.

Disclosure: 1/The intrafocal operating lightning ISIOS® used for the evaluation were ant free of charge by the laboratory IIN Medical, Besançon, France. 2/No other significants relationships are reported.

O066

ACUTE MANAGEMENT OF THE FIBULA IN PILON AND VERY DISTAL LOWER LEG FRACTURES WITH OPEN AND CLOSED SOFT TISSUE TRAUMA

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Introduction: due to the thin soft tissue coverage and the relatively bad blood supply of the ankle and distal lower leg, protection of the soft tissue must be given primary attention. On the other side length and axial restoration and in pilonfractures also articular surface reconstruction must be given attention. The percutaneus locked nail osteosynthesis with the XS/XXS nail osteosynthesis of the extraarticular and extrasyndesmotic fibula fractures allows to avoide major lateral incisions and so soft tissue protection and improved alignment and stability

Materials and methods: The XS/XXS Nails are straight locked nails with 4,5/3,5 mm diameter with angle stable locking with 2,4/2,0 mm threaded wires and compression possibility for transverse fractures through the nail itself. By intamedullary reduction by nail insertion in the fibula of the nail after distal locking by traction or compression with the aiming device the length and so varus and valgus reposition and by the nail alone the ante- or retroflexion can be excludet. By rotating the lower leg until proximal and distal tibia are in line also the rotation is guaranteed and secured by proximal locking oft he nail. In the period Jan 2000- Dec 2010 248 patients with pilon and very distal lower leg fractures had fibula stabilisation oft the fibula by XS/XXS nail. 91 % oft the patients had a high energy trauma, the mean age was 52(35-80) years. 11 % of the fractures were open usually over the tibia. 90 % had a two time stabilization with fibula XS/XXS nail oft the fibula and Tibia ExFix stabilization and in a second procedure joint surface reconstruction and MIPO with a multidirectional angle stable plate. Only low energy trauma patients had a 1 step procedure. 52 % of the patients could be evaluated according to the Ovadia score.

Results: In no case amputation and in only one uncompliant patient arthrodesis oft the ankle was needed. In no case pseudarthrosis of the fibula or tissue necrosis over the fibula occurred. In 10 patients fibula bony union was later than 3 months but in no case fibula osteosynthesis or implant failure occurred. Soft tissue problems of the ventral or medial lower leg occurred in 5 % of the cases and required suralflaps and in 2 cases a free flap transfer. The Ovadia score 1 year after operation was good and very good in 69 % of the patients.

Conclusion: The minimal invasive osteosynthesis of the fibula improves reduction, stabilit but also reduces the risc of soft tissue probles in the management of pilon and distal 1/5 lower leg fractures

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Disclosure: I am author of the XS nail but no financial interest in the patients of this study.

O067

FUNCTIONAL OUTCOME FOLLOWING BRIDGE PLATING IN LISFRANC INJURIES

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Introduction: The standard in operative treatment for Lisfranc fracture-dislocations nowadays consists of transarticular fixation. Recently bridge plating was introduced. By joint-spanning plates the open reduction of the fracture is stabilized to minimize articular damage. The current study describes the outcome of patients treated with bridge plating after tarsometatarsal fracture dislocations compared to transarticular screw fixation.

Materials and methods: A retrospective cohort study was performed. Patients with an isolated tarsometatarsal injury, treated operatively between 2000 and 2013, were included. Primary functional outcome was measured by the AOFAS midfoot score and the Foot Function Index. Secondary outcome was patient satisfaction.

Results: Thirty-four patients were included. Bridge plating was used in 21 patients. In 13 patients Kirschner wires or transarticular screws or a combination were used. The median follow up was 49 months (IQR 18–89). The implants were removed in 17/21 in the transarticular group vs. 10/13 in the bridge plating group. Wound complications were equally present in both groups. The median AOFAS score was 77 vs. 66 in the bridge plating and the transarticular group respectively and Foot Function Index was 18 in both groups. Patient satisfaction was 90 % vs. 80 %.

Conclusion: The results of this study showed that bridge plating in Lisfranc injuries, although needing more dissection, leads to acceptable results without a rise in wound complications. Longer follow up is necessary to see whether the reduction of additional trauma to the articular surface leads to less post-traumatic arthritis and a better functional outcome.

Disclosure: No significant relationships.

NECROTIZING SOFT TISSUE INFECTIONS

O068

RISK STRATIFICATION OF NECROTIZING FASCIITIS BASED ON THE INITIAL PROCALCITONIN LEVELS: A SINGLE CENTER OBSERVATIONAL STUDY

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Introduction: Necrotizing fasciitis (NF) is a potentially fatal subcutaneous tissue and fascia infection. We studied the role of procalcitonin in assessment of the severity and development of sepsis in patients with NF.

Materials and methods: A retrospective analysis for all patients who admitted with provisional diagnosis of NF was conducted from January 2000 to December 2013. Patients were categorized into 4 groups based on the initial procalcitonin levels (Gp1: < 0.5 low risk, Gp2: ≥ 0.5–< 2 moderate risk, Gp3: ≥ 2–< 10 high risk and Gp4: ≥ 10 ng/L high likelihood of severe sepsis).

Results: During the study period, NF was diagnosed in 331 cases with a mean age of 51 ± 15. Procalcitonin values were positive in 62 cases (Gp4:39 %, Gp1:22 %, Gp3:21 %, and Gp2:18 %). The most common affected regions were thigh and chest in Gp2 (46 % and 9 %, respectively), lower limbs Gp3 (46 %), perineum and abdomen in Gp4 (25 % and 21 %, respectively). In the 4 groups, 21patients developed septic shock (Gp1:0 %, Gp2:14 %, Gp3:24 %, and Gp4:62 %, respectively). The cut off procalcitonin value for septic shock was 5.6 ng/L. Using Receiver operating characteristic curve, this cut off with the Area under the Curve (AUC) of 0.77 (AUC = 0.77) was found to have sensitivity (81and specificity (67 %). SOFA score was significantly higher in Gp3 and Gp4 in comparison to Gp 1 and Gp2 (13 (7–16) and 13 (8–19) vs 9 (7–18) and 9 (2–21), p = 0.006. There were 17 deaths in the 4 groups (Gp1:6 %, Gp2:23 %, Gp3:12 %, and Gp4:59 %, respectively).

Conclusion: Initial procalcitonin levels in NF carry an important prognostic value and it can predict the development of septic shock in its early stage.

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Disclosure: No significant relationships.

O069

RELATIVELY SIMPLE WOUND MANAGEMENT IN PATIENTS WITH FOURNIER'S GANGRENE

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Introduction: Fournier's gangrene (FG) is a rare but potential lethal genital infection. Surgical treatment is invasive and usually results in an extensive perineal and genital soft tissue defect. For reconstruction, musculocutaneous or fasciocutaneous flaps are most often being used. However, these flaps are associated with donor site morbidity and the cosmetic result is unpredictable. We describe a relatively simple surgical alternative, in which the scrotum is treated with negative pressure wound therapy (NPWT) and split thickness skin grafts (STSGs).

Materials and methods: In this prospective case series, all consecutive male patients that were diagnosed with FG between January 2011 and January 2013 were included. All patients were treated with antibiotics and aggressive surgical debridement. Thereafter, NPWT was performed until the wound bed consisted of healthy granulation tissue. Subsequently, STSGs were applied. The primary outcome measure was failure of the treatment, defined as the necessity of a flap to close the defect.

Results: Four male patients, with a median age of 53 years were included. In none of the patients additional surgery using a flap was required. Uncomplicated wound healing was seen in three patients. One patient developed secondary erysipelas and impetiginisation, which was successfully treated with antibiotics.

Conclusion: NPWT and placement of STSGs is a relatively simple procedure, which resulted in a good cosmetic outcome without major morbidity. Therefore, NPWT and STSGs might pose as a feasible treatment option in patients who underwent surgical debridement for FG.

Disclosure: No significant relationships.

O070

THE LRINEC (LABORATORY RISK INDICATOR FOR NECROTIZING FASCIITIS) SCORE AS AN INDICATOR OF THE HIGH RISK PATIENTS

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Introduction: The Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC) score is mainly used to distinguish necrotizing fasciitis (NF) from severe soft tissue infections, however it is rarely used as a prognostic indictor. We aimed to evaluate the role of LRINEC score as a predictor in patients with NF.

Materials and methods: We conducted a retrospective analysis for patients who admitted to surgical intensive care with provisional diagnosis of NF (2000–2013). Patients were categorized according to LRINEC score (group 1: score < 6 versus group 2: score ≥ 6).

Results: During the study period, 304 cases were identified to have NF (133 in group 1 and 161 patients in group2). Patients in group 2 were 5 years older ($p = 0.009$). Patients in group 2 were likely to have diabetes mellitus (61 % vs 41 %, $p = .001$). There were no significant differences in the gender, locations of NF or the causative organisms except for the higher rate of *Pseudomonas aeruginosa* ($p = 0.004$) and *Proteus mirabilis* ($p = 0.03$) infection in group 2. The initial procalcitonin levels were greater in group2 (median 0.8 (0.09–82) vs 8 (0.07–127). Patients in group 2 were characized with greater Sequential organ failure assessment (SOFA) score (11.5 ± 3 vs 8 ± 2 , $p = 0.001$) and the development of septic shock (37 % vs 15 %, $p = 0.001$). The intensive care and hospital length of stay were prolonged in group 2 (median 7 days (1–75) vs 5 (2–34) and 22 (2–129) vs 11 (2–115), respectively, $p = 0.001$). The hospital deaths were 2 fold greater in group2 (29 % vs 15 %, $p = 0.001$).

Conclusion: In patients with provisional diagnosis of NF, LRINEC scores should be calculated to identify the very high risk group of patients.

References: Corbin V, Vidal M, Beytout J, Laurichesse H, et al. Prognostic value of the LRINEC score (Laboratory Risk Indicator for Necrotizing Fasciitis) in soft tissue infections: a prospective study at Clermont-Ferrand University hospital. Ann Dermatol Venereol. 2010 Jan;137(1):5–11

Disclosure: No significant relationships.

O071

THE IMPACT OF DIABETES MELLITUS ON THE OCCURRENCE AND SEVERITY OF NECROTIZING FASCIITIS

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Introduction: Diabetes (DM) increases both susceptibility to infection and its virulence, we aimed to assess the pattern and outcome of necrotizing fasciitis (NF) in DM patients.

Materials and methods: A retrospective analysis for all patients who were diagnosed with NF was conducted (2000–2013). Patients were categorized into 2 groups (Group1:non-diabetics versus Group 2: diabetics).

Results: During the study period, 331 NF cases were identified with a mean age of 51 ± 15 years;of whom 74 % were males and 52 % were diabetics. Patients in group2 were 10 years older ($p = 0.001$) and more likely to have coronary artery disease ($p = 0.003$), hypertension ($p = 0.001$) and renal impairment ($p = 0.01$). In the enter study population,13 cases had recurrent NF and all were diabetics and 2 of them had 3 NF admissions. There were no significant differences in the causative organisms or the locations of NF except for the greater rate of scrotal and lower limbs involvement in Group2,whereas the head was more involved in group1 ($p = 0.04$).LRINEC (Laboratory Risk Indicator For Necrotizing Fasciitis) Score was greater in Group2 (7 ± 3 vs 5 ± 2.6), $p = 0.001$. The initial procalcitonin levels, number of debridement, hospital and intensive care stay were comparable in the 2 groups. The incidence of septic shock was greater in group 2 (32 % vs 22 %, $p = 0.09$). In-hospital mortality was higher in the diabetic group (27 % vs 16.7 %, $p = 0.02$). Multivariate analysis showed that serum sodium was independent predictor of mortality in the diabetic group with odd ratio 1.2, $p = 0.002$.

Conclusion: NF in diabetics carries greater mortality and therefore needs more attention.LRINEC score plays diagnostic and prognostic role in those patients and to be used early.

References: Gürlek A, Firat C, Oztürk AE, Alaybeyoğlu N, Fariz A, Aslan S. Management of necrotizing fasciitis in diabetic patients. J Diabetes Complications. 2007 Jul-Aug;21(4):265–71.

Disclosure: No significant relationships.

O072**ENDOVASCULAR TREATMENT OF ACUTE POST-TRAUMATIC ARTERIAL THROMBOSIS: AN EXPERIMENTAL STUDY**

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Introduction: Open surgery is a preferred method of treatment of acute post-traumatic arterial thrombosis. The aim of this study was to evaluate the feasibility of endovascular approach to the femoral artery (FA) thrombosis in sheep

Materials and methods: Ten sheep (35–42 kg) were enrolled into this study. A 2-cm portion of the explored FA underwent multiple clamping to obtain thrombosis. The animals were divided into two groups: endovascular surgery (stent group, SG, n = 5) and conservative treatment (control group, CG, n = 5). No operation was performed in CG. In SG, recanalization and thromboaspiration were performed; a bare-metal stent (3.5–4.0 × 28–38 mm) was implanted through the contralateral arterial access. Enoxaparin (in both groups), clopidogrel and aspirin (in SG only) were administered in therapeutic doses. Total observation time before euthanasia was 7 days. Doppler ultrasound and angiography were used to evaluate FA's patency.

Results: A thrombosis formed in all cases. Mean peak systolic velocity (PSV, cm/sec) significantly decreased from 44.7 ± 5.0 to 6.1 ± 4.7 in SG and from 44.1 ± 6.3 to 6.8 ± 5.8 in CG immediately after thrombosis ($p > 0.05$ between groups). We had 100 % technical success rate for recanalization and stenting. After stenting, PSV returned to baseline (39.3 ± 9.6 , $p = 0.07$). In CG, PSV remained low until the end of the study (12.9 ± 4.7 , $p < 0.0001$ between groups). No complication, amputation or death was seen during the study period. Angiography demonstrated that all stented FAs were patent and all control FAs were thrombosed

Conclusion: This study demonstrated the feasibility, efficacy and safety of endovascular approach to acute arterial thrombosis in sheep. Clinical studies are warranted to confirm our results.

Disclosure: This experimental study was funded by a research grant MK-3439-2014-7 of the President of the Russian Federation.

O073**THE ENDOVASCULAR REPAIR OF VASCULAR INJURIES – A SELECTIVE APPROACH TO POLY-TRAUMA**

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Introduction: Blunt and penetrating poly-trauma involving the vascular tree may result in life and limb threatening injury. Management priorities are both the control of hemorrhage and the prevention of occlusion leading to ischemia.

Materials and methods: Five patients with distinct peripheral vascular injuries were selected for endovascular intervention using bare or covered stents after clinical assessment in line with ATLS priorities and CT angiogram. Two patients with penetrating lower limb injuries had femoral AV fistula; two patients with extensive penetrating torso trauma had false aneurysms of the external iliac artery and internal carotid artery, respectively, and one patient with crush injury had dissection and occlusion of the superficial femoral artery. All endovascular procedures were performed in the operating room or angio suite by the multidisciplinary vascular team. Patients received complementary short term antiplatelet and long term anticoagulation therapy.

Results: All procedures were undertaken without complication. Completion angiogram showed successful stent deployment, control of hemorrhage and restoration of blood flow without leak. Postoperative follow-up at 3–6 weeks and sequential vascular imaging confirmed patency and an absence of leak or infection.

Conclusion: Endovascular treatment of peripheral vascular injury is gaining in acceptance as a safe and effective mode of intervention both as a bridging and definitive procedure. In poly-trauma patients, this is a fast and reliable intervention that obviates the need for further physical trauma associated with open surgery and extensive dissection across fascial planes (that may spread infection). It also enables access to remote injuries.

Disclosure: No significant relationships.

O074**QUALITY OF LIFE AFTER A NECROTIZING SOFT TISSUE INFECTION**

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Introduction: Necrotizing soft-tissue infections (NSTIs) are rare but severe infections. The main focus of therapy for NSTIs consists of early and aggressive surgical debridement of affected tissue. Little is known about the quality of life of patients who have survived a NSTI. The aim of this study is to determine the quality of life after a NSTI.

Materials and methods: Patients who had been treated for a NSTI in a large academic medical center between 2002 and 2013 were approached. Quality of life was assessed using the Short Form-36 questionnaire. Norm-based scores are compared with the norm of the Dutch population. Data was analyzed using IBM SPSS version 21.0.

Results: Forty-six patients were identified to have been treated for a NSTI. Nine patients (20 %) had died. Of 36 surviving patients, 33 patients (92 %) returned filled in questionnaires. The median age was 56.7 years (IQR 47.7–62.2). The median time between discharge and follow up was 4.1 years (IQR 2.4–5.9 years). The median physical component score was 43.2 (IQR 35.0–55.0). The mean mental component score was 54.5 (51.8–61.2). None of the eight individual physical and mental domains differed significantly from the Dutch population.

Conclusion: Necrotizing soft-tissue infections are associated with high mortality and morbidity. Long-term physical functioning in patients who survived a NSTI tends to be lower compared to the general population, although no significance was found. Mental health does not appear to be affected after treatment for a NSTI. More, larger studies are required to achieve statistically significant results.

Disclosure: No significant relationships.

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TRAUMA SYSTEMS/TRAUMA REGISTRATION

O075

EPIDEMIOLOGY OF INJURIES, OUTCOMES AT A RURAL HOSPITAL IN CAMEROON

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Introduction: Injuries disproportionately impacts low and middle income countries (LMICs). Few of which have robust trauma datasets describing patient injuries and outcomes. Objective: Implement a trauma registry to assess patterns of injury and outcomes using the Kampala trauma score II (KTSII) at Mbingo Baptist Hospital (MBH) a 270 bed rural hospital in Northwest Cameroon.

Materials and methods: MBH trauma patients (12/6/12-6/5/14) were prospectively enrolled in a KTSII based. Variables – mechanism of injury, transport mode and time, injury type, KTSII variables, preoperative procedures and the outcomes in ER and at 2 weeks.

Results: 719 trauma patients were evaluated (Males comprised 74.8 % Females 25.4 %, mean age range 28. 72 % of the injuries were road traffic accidents with motorcycles responsible in 73 % of injuries and only 11.1 % helmet usages. Lower extremities injury was the most common site 47.2 %. 502 (69.8 %) received care at another facility before arrival, 48.8 % arrived 24 hrs post injury. KTS II trauma scores distribution was 53 % mild, 42 % moderate and only 5 % severe. Outcome from ER showed 73.6 % admitted and at 88.1 % had been discharged at 2 weeks; overall fatality rate was 2.1 % with only 14 % of these deaths seen in the severe KTSII scored patients. 50 % of deaths were in KTSII mild score patients.

Conclusion: A limited dataset trauma registry captured important epidemiologic data on trauma injuries at MBH, Cameroon. Mortality review in patients with moderate and low KTSII scores (failure to rescue patients) inform improvement strategies to trauma care both at MBH and referring facilities.

Keywords: Injuries, Kampala trauma score II.

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Disclosure: No significant relationships.

O076

THE ALCOHOL INTOXICATED TRAUMA PATIENT: IMPACT ON TRIAGE, IMAGING, RADIATION EXPOSURE, AND MORTALITY

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Introduction: The purpose of this study was to investigate the effects of alcohol intoxication in a continuous series of trauma patients and to evaluate its impact on triage decisions, CT imaging, and associated radiation exposure.

Materials and methods: We conducted a continuous patient cohort study. Inclusion criteria: Admission to the emergency room of an urban Level 1 trauma center with trauma team activation during a 12-months period (Jan.–Dec. 2012). Patients with incomplete data, age ≤ 12 years, and individuals with neurological diseases (e.g. seizures, n = 3) were excluded. Demographics, mechanisms, severity, and patterns of injury (AIS/ISS/NISS/GCS), blood alcohol concentration (BAC, in permille, ‰), imaging studies (head/whole body CT), radiation exposures (mAS, dose length products (DLP)), length of stay (LOS), surgical procedures, and mortality were evaluated with IBM-SPSS statistics (21, Chicago, IL).

Results: A positive BAC (mean 1.80 ± 0.767) was reported in 19.2 % (n = 41/214) of the cohort. In general, the presence of alcohol was associated with overtriage (p = 0.001), despite minor injury severity (ISS < 9) and a comparable rate of head injuries (p = 0.275). However, alcohol intoxication was associated with higher utilization of head CT (58.5 vs 38.7 %, p = 0.023) and radiation exposure (231.75 vs. 151.25mAS, p = 0.045; DLP: 583.03 vs. 391.04, p = 0.006). Head injury (AIS ≥ 3) and positive BAC (OR 2.34, 95 % CI: 1.096–5.001) were identified as strongest independent predictors for head CT.

Conclusion: Alcohol is a common finding in trauma patients, but is not associated with higher ISS values or adverse outcomes (LOS/mortality). However, a stunning rate of resource utilization was found in intoxicated patients, especially regarding head CT imaging and associated radiation exposure.

References: Kornblith et al. The “found down” patient: A diagnostic dilemma. J Trauma Acute Care Surg 2013 Lea et al. An overview of injuries to adolescents and young adults related to substance use: data from Canadian emergency departments. CJEM 2009 Zeckey, Hildebrand et al. Alcohol and multiple trauma: is there an influence on the outcome? Alcohol 2011 Taylor et al. Alcohol-related head injury: Impact on acute CT workload in a major trauma centre. Br J Neurosurg 2009 Inaba et al. The Increasing Burden of Radiation Exposure in the Management of Trauma Patients. J Trauma 2011.

Disclosure: No significant relationships.

O077

A MULTIPLE IMPUTATION MODEL AS A SOLUTION FOR MISSING DATA IN THE DUTCH TRAUMA REGISTRY?

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Introduction: Like most registries, the prevalence of missing (physiologic) data in the Dutch trauma registry (TR) is substantial.

When data is not complete analysing data is difficult. Smaller samples lead to lack of statistical power and reliability and results also may be biased. This study examines if a multiple imputation (MI) model may be a solution for this. Therefore, first we investigated whether missing data were associated with auxiliary variables (=Missing At Random (MAR)) which is one of the assumptions of MI. Secondly, we investigated if a clinically abnormal physiologic status can be predicted.

Materials and methods: Prehospital and hospital data between 2011 and 2014 of three (of the total of eleven) regional trauma care networks in the Netherlands was used (42,027 observations). Percentage of missing data on Glasgow Coma Scale consisting of an eye (E), motor (M) and verbal (V) component, systolic blood pressure (SBP) and respiratory rate (RR) recorded at the emergency department was reported. Logistic regression was performed to determine independent predictors of missing data and clinically abnormal values on E, M, V, SBP and RR.

Results: Independent predictors for missing data and clinically abnormal physiologic status were found.

Conclusion: Missing data in TR seem to be MAR and information on the prediction of clinically abnormal physiologic status might provide sufficient information for imputation.

Disclosure: No significant relationships.

O078

INFRASTRUCTURE AND CLINICAL PRACTICE FOR THE DETECTION AND MANAGEMENT OF TRAUMA ASSOCIATED HAEMORRHAGE AND COAGULOPATHY

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Introduction: Early detection and management of post-traumatic haemorrhage and coagulopathy have been associated with improved outcomes but local infrastructures, logistics and clinical strategies may differ.

Materials and methods: To assess local differences in infrastructure, logistics and clinical management of trauma-associated haemorrhage and coagulopathy, we have conducted a web-based survey among the delegates to the 15th European Congress of Trauma and Emergency Surgery (ECTES) & the 2nd World Trauma (WT) Congress held in Frankfurt, Germany, May 25–27th, 2014.

Results: 446/1540 delegates completed the questionnaire yielding a response rate of 29 %. The majority specified to work as consultants/ senior physicians (47.3 %) in general (36.1 %) or trauma/orthopaedic surgery (44.5 %) of level I (70 %) or level II (19 %) trauma centres. Clinical assessment (>80 %) and standard coagulation assays (74.6 %) are the most frequently used strategies for early detection and monitoring of bleeding trauma patients with coagulopathy. Only 30 % of the respondents declared to use extended coagulation assays to better characterize the bleeding and coagulopathy prompted by more individualized treatment concepts. Most trauma centres (69 %) have implemented local protocols based on international and national

guidelines using conventional blood products, e.g. pRBCs (93.3 %), FFPs (93.3 %) and platelet concentrates (83 %), and antifibrinolytics (100 %). 89 % considered the continuous intake of anticoagulants including “new oral anticoagulants (NOACs)” and platelet inhibitors (PI) as an increasing threat to bleeding trauma patients.

Conclusion: This study confirms differences in infrastructure, logistics and clinical practice for the detection and management of trauma-haemorrhage and trauma-associated coagulopathy among international centres.

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Disclosure: No significant relationships.

O079

TRAUMATIC RE-FRACTURE WITH INTRAMEDULLARY FEMORAL NAIL IN SITU : A MECHANICAL ANALYSIS

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Introduction: Intramedullary nail fixation is the gold standard treatment of femoral shaft fracture. Patients sustaining a new fracture through an intramedullary nail stabilized femur are less frequently reported in literature. Additionally, little data is known about interacting forces producing such fractures in high-velocity trauma. Therefore the aim of the present work was to analyse and understand forces responsible for femoral refracture and bending of an intramedullary nail used for treatment of a prior femoral diaphysal fracture in a 24 years old patient.

Materials and methods: Following this concept, we applied mathematical model to calculate acting forces occurring in a high velocity femur trauma and reproduced them, *in vitro*, on a muscle-bone-nail model.

Results: The plastic deformation of the nail was 14 mm representing 5 % of its entire length. *In vitro*, femoral fracture occurred when a 7,9kN force was applied to the bone while this force was 10kN when an intramedullary nail was present. To perform a 5 % nail distortion, more than 35kN had to be applied.

Conclusion: Following present results, intramedullary nail fixation slightly improved femoral resistance to bone fracture. However, the massive quantity of energy released in high velocity trauma make this difference insignificant. Additionally, because of energy spread into surrounding soft tissues, associated lesions have to be carefully considered.

Disclosure: No significant relationships.

O080**UNCONSCIOUS BIAS IN TRAUMA CARE PROVIDERS**

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Introduction: Obesity is an increasing epidemic in the United States, also affecting trauma patients. To date, implicit or subconscious biases have been shown to exist in favor of white, upper class persons among trauma surgeons. It has not yet been explored, however, if trauma care providers have implicit biases against obese persons. Our objective was to evaluate if these unconscious biases exist among multidisciplinary trauma care providers at a Level I Trauma Center.

Materials and methods: We undertook a prospective web-based survey of physicians, nurses and other employees of an affiliated, stand-alone trauma center of the third largest public hospital in the US. Basic demographics were collected. Participants then completed the Obesity Implicit Association Test (IAT). Parametric and non-parametric statistical analyses were conducted. Participants were offered a \$20 Gift Card for their time.

Results: A total of 88 trauma care providers participated. Twenty two percent were surgeons (trauma, orthopedic and neurosurgery), 8 % were trauma anesthesiologists, 33 % were Registered Nurses, 19 % EMTs and 17 % other professions. Of all participants, 47 % explicitly stated that they prefer thin persons to obese persons. This rate increased when testing for implicit biases in favor of thin people to 65 %. On subgroup analysis, ANOVA testing did not find significant differences in either implicit or explicit bias against obese persons by participant occupation or by race.

Conclusion: Multidisciplinary trauma care providers at a level I Trauma Center have both explicit and implicit biases against obese persons. Further work is needed to explore if these results have any clinical ramifications.

Disclosure: No significant relationships.

O081**POST MORTEM IMAGING OF THE THORACIC AND LUMBAR SPINE VERSUS AUTOPSY IN DECEASED TRAUMA PATIENTS - A SYSTEMATIC REVIEW**

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Introduction: Post-mortem imaging or virtual autopsy is a rapidly advancing field of post-mortem investigations in trauma victims. In this review we investigate whether post-mortem imaging can complement or replace traditional autopsy for the detection of thoracic and lumbar spine injuries in trauma victims.

Materials and methods: A systematic review was performed in compliance with the PRISMA guidelines. MEDLINE, Embase and the

Cochrane databases were systematically searched for studies published between January 2008 and January 2013, in which post-mortem imaging had been compared to traditional autopsy for detecting thoracic and lumbar spine injuries trauma victims. Studies were included when two or more trauma victims had been investigated.

Results: Six studies investigated thoracic spinal cord injuries. Five studies investigated these injuries with post mortem CT (PMCT). PMCT detected all thoracic spine fractures and dislocations except for one T1-fracture. Two studies investigated thoracic spine injuries with post mortem MRI (PMMRI) and discovered a sensitivity of 75 %. Lumbar spine injuries were investigated by PMCT or PMMRI in five studies. Post mortem imaging in these studies revealed detection rates equal or superior to autopsy.

Conclusion: This review demonstrates that PMCT and PMMRI detect most thoracic and lumbar spine injuries in trauma victims. PMCT also detects additional injuries that are missed at traditional autopsy. Mainly PMCT is an adequate alternative for traditional autopsy for analyses of thoracic and lumbar spine injuries in trauma victims.

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Disclosure: No significant relationships.

EPIDEMIOLOGY/EVIDENCE BASED TRAUMACARE**O082****EFFECT OF TRANEXAMIC ACID IN THE REAL WORLD – A PROPENSITY SCORE MATCHING ANALYSIS OF DATA FROM JAPAN OBSERVATIONAL STUDY FOR COAGULATION AND THROMBOLYSIS IN EARLY TRAUMA (J-OCTET)**

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Care Medicine, Juntendo University, Urayasu Hospital, Urayasu, Chiba, Japan, ¹⁷Tohoku University, Sendai, Japan

Introduction: CRASH-2 trial showed a significant reduction in mortality from the use of tranexamic acid (TXA) in bleeding trauma patients [1]. However, critics pointed out that the treatment effect was modest and there was no evidence of any reduction in the receipt of blood transfusion [2]. We aimed to estimate the effectiveness and safety of TXA in patients with severe trauma in usual clinical practice.

Materials and methods: Our data source was the Japanese Observational study for Coagulation and Thrombolysis in Early Trauma (J-OCTET), which included consecutive trauma subjects with an Injury Severity Score (ISS) of more than 16 in the year of 2012 from 15 academic institutes in Japan. We estimated a propensity score to predict TXA administration within 3-hours from hospital arrival, using baseline characteristics. We conducted a propensity score matched analysis to compare 28-day all-cause mortality and the need for blood transfusion in subjects with or without TXA.

Results: Of a total of 796 J-OCTET subjects, 281 subjects were treated with TXA. Propensity score matching selected 165 matched pairs who received TXA and 165 subjects who did not. ISS (median of 25 versus 25) was well balanced between groups. TXA was associated with lower 28-day all-cause mortality (9.7 % versus 18.8 %, P = 0.020). However, there was no significant association with the receipt of blood transfusion (29.7 % versus 33.9 %, P = 0.408).

Conclusion: In this propensity matched observational study we found that TXA use was associated with reduced mortality in severely injured trauma patients but there was no association with the receipt of blood transfusion.

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Disclosure: No significant relationships.

O083

THROMBOPROPHYLAXIS FOR BELOW-KNEE CAST IMMOBILISATION: A SURVEY STUDY

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Introduction: Because of insufficient evidence for its effect, guidelines recommend not to use thromboprophylaxis routinely for patients with below-knee cast immobilisation (1–3). Our aim was to assess the current practice of thromboprophylaxis in all Dutch hospitals and to determine considerations for prescribing prophylaxis.

Materials and methods: An electronic questionnaire regarding the thromboprophylaxis policy in patients with below-knee cast immobilisation was sent to one of the trauma surgeons in all orthopaedic (90) and all trauma surgery departments (89) in the Netherlands.

Results: Response rate was 88 % for orthopaedic and 81 % for trauma surgery departments. Prophylaxis is provided in the large majority of departments (57 trauma (79 %) and 50 orthopaedic surgery departments (63 %)) for patients with below-knee cast immobilisation (conservative treatment, no weight bearing). At 11 trauma (15 %) and 26 orthopaedic surgery departments (33 %) prophylaxis is provided in case of additional risk factors for venous thrombosis and at 4 trauma (6 %) and 3 of orthopaedic surgery departments (4 %) prophylaxis is never provided. Furthermore, prophylaxis policies depend on the combination of cast immobilisation with surgery and the allowance of weight bearing in the cast. Most reported considerations for prescribing prophylaxis were: the perceived risk reduction of prophylaxis outweighs the bleeding risk; the experience that prophylaxis is effective; to act in accordance with hospital guidelines.

Conclusion: Despite insufficient evidence for its effect, thromboprophylaxis is administered to the large majority of patients with below-knee cast immobilisation. Furthermore, large variations in prophylaxis policies exists, demonstrating the need for an evidence-based uniform prophylaxis strategy in order to improve quality of care of these patients.

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Disclosure: No significant relationships.

O084

HOW CAN WE IMPROVE ANALGESIA CONTROL IN PATIENTS ADMITTED FOR TRAUMA SURGERY?

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Introduction: By the nature of their injuries, trauma patients awaiting surgery often receive varying degrees of analgesia control. The impact of this can delay operative intervention whilst altering the patients overall satisfaction of their hospital stay. The purpose of the study was to evaluate the impact of anaesthetic lead analgesia teaching to junior doctors, and evaluate the impact this has on patient analgesia control.

Materials and methods: A patient satisfaction survey was answered for one month by all trauma and orthopaedic patients admitted as emergencies who were awaiting next day surgery, the same questionnaire was administered post-operatively. After a detailed course was given by the anaesthetic team to junior doctors on the topic of analgesia control - the same questionnaires were put to patients for a further month. The questionnaire asked about pain for 24 hours before and 24 hours after theatre and the impact on sleep.

Results: We found that pain control was sub-optimal, particularly on admission to the ward the night before surgery. On the morning of theatre pain control is also sub-optimal and often affects sleep. Patients admitted after hours, often experience poorer pain control. Post operative pain is worse immediately after theatre. After anaesthetic analgesia teaching, we found trauma patients were much happier with their analgesia control, both pre, and post operatively.

Conclusion: Anaesthetic teaching on analgesia is an effective way of ensuring junior doctors manage patient analgesia better. Patients admitted after hours often experience worse pain control.

References : NICE guidance - pain control for pre op patients

Disclosure: No significant relationships.

O085

TRAUMA IS NOT JUST 9-5. THE EPIDEMIOLOGY OF CHILDHOOD INJURY IN THE EAST MIDLANDS MAJOR TRAUMA CENTRE

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Introduction: Trauma is a leading cause of death and disability in children¹. Since inception of the UK Major Trauma Centres (MTCs) in 2012, most injured children are transferred directly to a dedicated regional Paediatric MTC². The timing of injury has impact on configuration of specialist children's trauma services. We aim to identify when injuries are occurring to discuss how services must develop to optimise care.

Materials and methods: We reviewed a prospectively collected database of children 0–16 years with ISS ≥ 9 treated in a regional MTC April 2012–March 2014. Data included demographics, time, date and mechanism of injury, ISS and outcome. School term dates were obtained from the education authority.

Results: 148 children were identified (72 % male), median ISS 15 (range 9–57), representing 1.42 paediatric trauma presentations per week. 30 were infants (age < 1), 32 pre-school (1–3), 32 primary school (4–10) and 54 secondary school age (11–15). Injuries were most frequent in infants (5/10000 population vs 1.5/10000 for 1–16 yrs). In school age children, more injuries presented at weekends (0.15 injuries/day) and school holidays (0.17 injuries/day) than term time days (0.09 injuries per day, p = 0.0274). 74 % of children presented outside core hospital working hours (0800–1700), but with few patients (9 %) attending after midnight. All five deaths occurred in children presenting outside core hours.

Conclusion: The majority of injured children present at evenings and weekends, when availability of specialist staff may be reduced. It is imperative that trauma services are configured to recognise the timing of trauma presentations to deliver the best possible care for injured children.

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[new-major-trauma-centres-to-save-up-to-600-lives-every-year](https://www.gov.uk/government/news/new-major-trauma-centres-to-save-up-to-600-lives-every-year)

Disclosure: No significant relationships.

O086

INJURY PROFILE AND OUTCOMES OF ELDERLY NURSING HOME RESIDENTS ADMITTED TO AN AUSTRALIAN MAJOR TRAUMA CENTRE

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Introduction: The objectives of the study were to examine injury profile and in-hospital outcomes in a population of elderly nursing home residents admitted after a fall, and determine predictors of increased length of stay and severe head injury.

Materials and methods: Retrospective trauma registry study of all patients age 65 years or over who resided in a nursing home facility and who were admitted to hospital after a ground level fall at the nursing home between January 2013 and December 2013. Outcomes of interest were the proportion of patients with particular body region injuries, specifically severe head injury, and in-patient length of stay.

Results: Two hundred and fifteen cases were analysed. The most common injuries sustained were head injury (38 %), of which nineteen cases classified as severe head injury, and lower limb injury (24 %). The median length of stay for admitted patients was 7 days (Interquartile Range 3–10 days). The only predictor of increased length of stay including transfer to rehabilitation after adjusting for age, injury severity and co-morbidities were the presence of lower limb injuries (OR 5.2 95 %CI 1.5, 18.0 p = 0.01).

Conclusion: Head injuries are the most commonly injured body region after a fall in a nursing home. Lower limb injuries were associated with longer length of stay in hospital.

References: Dinh M, Sotade O, Bein M. Injury profile and outcomes of elderly nursing home residents admitted to an Australian Major Trauma Centre. Original Article.

Disclosure: No significant relationships.

O087

CHANGING LANDSCAPES FOR PLASTIC SURGERY: THE EFFECT OF THE MAJOR TRAUMA NETWORK ON EMERGENCY OPERATIVE WORKLOAD

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Introduction: The advent of major trauma centres (MTCs) in the UK in 2010 has led to a concentration of complex, polytrauma cases in these centres. The role plastic surgeons play in trauma has increased and evolved over time,¹ and currently plastic surgeons input into a

wide variety of trauma.² Our study aimed to analyse the effect of MTC status on plastic surgery activity at our centre.

Materials and methods: All trauma patients admitted to a London MTC in 2013 who underwent an operation were identified using Trauma Audit & Research Network data. Operative procedure(s) and operating specialty were recorded. This was compared to local historical data from pre-MTC go-live (2008–2010).

Results: Of the 2606 trauma calls in 2013, 416 patients required surgical intervention. 29.3 % of these patients ($n = 122$) were operated on by plastics (either as sole operating team or part of multi-specialty team). 76.2 % ($n = 93$) involved lower limb trauma and 30.3 % ($n = 37$) upper limb trauma. Emergency general extremity referrals increased from an average of 65/year to 484/year in the period 2011 to 2013, whilst plastics operative workload increased from an average of 53 cases/year to 407/year in the same period. This represents a more than sevenfold increase in the plastic surgery operative workload at our centre.

Conclusion: There has been a dramatic increase in emergency plastic surgery activity following designation of major trauma centre status at our centre. Understanding the epidemiology of plastic surgery healthcare is vital to improve service design, postgraduate training in the specialty, and workforce provision.¹

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Disclosure: No significant relationships.

O088

REGIONAL EXPERIENCE OF THE MANAGEMENT OF SEVERE OPEN LOWER LIMB INJURIES IN THE UK

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Introduction: The joint British Association of Plastic, Reconstructive and Aesthetic Surgeons/British Orthopaedic Association standards define best practice management in open diaphyseal fractures of the lower limb. Our study reviewed the regional approach and experience in South West England and Wales. A further objective was to evaluate service provision with regard to the standards' key recommendations. **Materials and methods:** A prospective audit was undertaken of open diaphyseal fracture patients. Compliance with published standards within all orthoplastic services in South West England and Wales was assessed, and facilities were evaluated.

Results: 86 patients were managed between October 2012 and March 2013. This was a 56 % increase from 2008. 56 % presented directly to the orthoplastic services with all patients undergoing debridement within 24 hours. Two-third of procedures were in daylight hours excluding those requiring immediate surgical intervention. Adherence to correct antibiotic therapy was 88 % at admission, 50 % at primary surgery and 62 % at definitive surgery. 60 % of primary procedures were performed with combined senior orthoplastic teams, with 81 % achieving definitive soft tissue coverage and fixation within seven days. Compliance improved in units with larger patient caseloads.

Conclusion: Increased open lower limb fracture workload was demonstrated across South West England and Wales, probably owing to centralisation of trauma services. An improvement in early transfer of this patient group to orthoplastic facilities has allowed patients to be assessed and debrided within the recommended timeframe. Standards were most likely to be met in those centres seeing higher numbers of injuries and when there was a daylight hours procedure by combined orthoplastic teams.

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Disclosure: No significant relationships.

O089

INTRAMEDULLARY NAIL VERSUS DYNAMIC HIP SCREW; COSTS AND COMPLICATIONS

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Introduction: Multiple meta-analysis and cochrane reviews comparing the Intramedullary Nail and Dynamic Hip Screw in case of pectrochanteric fractures did no show any significant difference in complications and patients' outcome. Lacking an evident advantage for a particular operative treatment, combined with a growing number of hip fractures in the future, costs could play a decisive role in choosing between the intramedullary nail and dynamic hip screw. The main objective of this study is to compare the total hospital costs between patients treated with an IMN versus DHS.

Materials and methods: This study was conducted in a level 1 trauma center. All patients with a pectrochanteric fracture treated with an IMN or DHS from 2003 through 2010 were analyzed. All activities and corresponding costs registered during admission were obtained from the financial department of our hospital. Patient characteristics, prospectively recorded complications and additional treatment data were retrieved from the EMR database.

Results: In total 181 patients were treated with a DHS and 211 patients with an IMN. The operation and total hospital costs, exclusive and inclusive re-admission, were significantly higher for the IMN group. There was a tendency for a higher complication rate in the IMN group ($p = 0.057$). However, when adjusting for AO fracture and ASA classification, there was no significant difference in total hospital costs between the DHS and IMN group.

Conclusion: There was no difference in total costs between the DHS and IMN in case of pectrochanteric fractures. Patient characteristics, including fracture type, seem to be an important factor.

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fractures. *The Journal of bone and joint surgery.*

Disclosure: No significant relationships.

ABDOMINAL EMERGENCY

O090

ISOLATED BLUNT DUODENAL TRAUMA: SIMPLE REPAIR, LOW MORTALITY

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Introduction: The optimal management of blunt traumatic duodenal injury remains a controversial issue.

Materials and methods: The National Trauma Databank (NTDB) was queried for all blunt trauma patients with abdominal AIS ≥ 1 and duodenal injury. The following data were collected: demographics, duodenal organ injury score (OIS), and type of operative intervention. Patients with isolated duodenal injury were identified by excluding chest and head AIS > 3 and non-duodenal intra-abdominal OIS ≥ 3 . Outcomes included mortality and hospital length of stay (HLOS).

Results: During the study period, 3,456,098 blunt trauma patients were entered into the NTDB, 388,137 of which had abdominal trauma. Overall, 3,798 (1.0 %) patients with abdominal trauma had duodenal injury. Isolated duodenal injuries were identified in 2228 patients (59 %). Of these, the majority were low-grade injury (duodenal OIS 2: n = 2063, 93 %) with only 165 patients with severe injury, OIS ≥ 3 . Mortality was 5.2 %. Overall 354 (15.9 %) patients underwent duodenal operation, of which 281 (79 %) had primary repair only (PR), 69 (19 %) had gastroenterostomy (GE), and five (1.4 %) underwent a Whipple procedure. Overall, patients with PR had similar mortality to those with GE (6.5 % vs 5.9 %, p = 1.000) however their HLOS was shorter (median 11d, IQR 10, vs 18d, IQR 20 p < 0.001). In OIS 4 and 5 injuries, PR was associated with similar mortality (p = 1.000) and shorter HLOS (p = 0.004) when compared to GE.

Conclusion: Duodenal injury after blunt abdominal trauma is rare, with isolated duodenal injury occurring in 0.57 % of patients with abdominal trauma. In severe injuries, PR is associated with a shorter HLOS without effecting mortality when compared to GE.

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Disclosure: No significant relationships.

O091

ULTRASOUND: EFFICIENCY OF THE MASTERY LEARNING APPROACH IN GAINING COMPETENCE PERFORMING FAST

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Introduction: Ultrasound has become the gold standard as an early screening method in Emergency Department. Thus, competencies in ultrasound are an early requirement not only for surgical residents but also for medical students, since medical school graduates are increasingly expected to demonstrate proficiency in ultrasound diagnostics. The mastery learning approach has proven sufficient to improve procedural skills in a variety of medical specialties. The aim of this study was to evaluate the efficiency of the mastery learning approach regarding students' competencies in performing FAST directly after training.

Materials and methods: Third year medical students have to participate in a mandatory 3 week surgical training including a 90 minute FAST training. On a voluntary basis with written consent, participating students were randomized into two groups. The study group had a 90 minute peer guided FAST training using the mastery learning approach. The control group completed the traditional 90 minute peer guided module. Prior to the study, students filled in a questionnaire regarding epidemiological data as well as their previous US experience. Students competencies in FAST were determined using a 23 item checklist rating in a 5 min OSCE station directly after training and 3 month after training, respectively.

Results: A total of 160 students participated in the study (n = 84 study group, n = 76 control group). In the checklist rating, the Mastery learning group achieved 89.1 % of the checklist items (41 + 5.8 of max. 46 points), the control group achieved 73.9 % (34 + 7.6), respectively.

Conclusion: The mastery learning approach proves as a successful teaching method for a 90 minute FAST-training.

Disclosure: No significant relationships.

O092

PREVALENCE OF PERITONITIS, SEPSIS AND SHOCK IN OCTA- AND NONAGENARIANS WITH PERFORATED PEPTIC ULCER: RELATION TO SEVERE COMPLICATIONS AND DEATH

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Introduction: Perforated peptic ulcer (PPU) mortality increases with older age. Knowledge of age-specific characteristics in presentation of PPU in relation to outcomes is thus important.

Materials and methods: A consecutive cohort of patients diagnosed and operated for PPU (years 2001–2010). Age-groups (per decennial) were investigated for association with peritonitis, sepsis and shock and the relation to mortality or serious complications.

Results: Of 172 patients, 20 % were older than 80 years, and 46 % over 70 years of age. Men predominated in the <60 years group, while for septa-, octa- and nonagenarians the women rate was 67, 66 and 80 %, respectively. Two-thirds of patients presented with frank peritonitis on admission, but its presence declined with age, from >93 % in patients <40 years, to 50 % in those >90 years (Pearson's R –0.2; p = 0.009). Sepsis was present in 49 %, and had highest

prevalence in those aged >70 to 80 years of age (57 %). Overall, 22 % presented in shock (<90 mmHg) on admission, with highest rate in the oldest decades (32, 28 and 20 % for those >70, >80 and >90 years, respectively; Pearson's R 0.17; p = 0.025). Mortality was highest in patients >80 years of age (>40 % mortality), and this age group had frequent hypoalbuminemia (in 61 %; OR 2.6, 1.2–5.4; p = 0.010). Patients >80 years and with hypoalbuminemia had 50 % mortality (10 of 20).

Conclusion: Elderly patients often lack sign of peritonitis, but more often have septic shock and hypoalbuminemia on presentation. Associated mortality is high. Presence of sepsis and severe complications did not differ significantly between age-groups.

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Disclosure: No significant relationships.

O093

PERCUTANEOUS CHOLECYSTOSTOMY AS DEFINITIVE TREATMENT FOR A SELECTED GROUP OF HIGH-RISK PATIENTS

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Introduction: Percutaneous cholecystostomy (PC) can serve as a bridging option to surgery or as definitive treatment. The purpose of this study was to identify predictors of the need for permanent PC.

Materials and methods: PC's performed for acute calculous cholecystitis in 257 patients (139 males, 54.1 %, mean age 67.3). Demographic and clinical characteristics at index admission were collected. Patients who underwent interval cholecystectomy were defined as the surgery group (SG) (n = 163, 63.4 %) and the remaining patients as the non-surgery group (NSG) (n = 94, 36.6 %). Predictors of permanent PC were defined using logistic regression analysis.

Results: Patients in the SG were significantly younger and had a shorter length of hospital stay (p < 0.01). The rate of coronary artery disease (CAD) (63.2 % vs. 20.2 %), chronic renal failure (CRF) (14.9 % vs. 6.1 %), and the mean number of co-morbidities (2.2 vs. 1.4) were significantly higher in the NSG. Sepsis at admission was more common in the NSG (19.1 % vs. 4.9 %, p < 0.001). 56 patients (34.4 %) in the SG and 24 patients (25.5 %) in the NSG developed tube-related complications. Thirty-day mortality was similar between the groups. Multivariate regression analysis showed that age ≥75, increased alkaline phosphatase at admission, history of CAD, and sepsis at admission were predictors of PC as definite treatment for acute cholecystitis.

Conclusion: High operative risk due to older age and CAD preclude cholecystectomy in more than 1/3 of patients following PC especially presenting with sepsis and elevated alkaline phosphatase. This study

suggests that PC could be a safe treatment option in a select group of high-risk patients.

Disclosure: No significant relationships.

O094

NEW THERAPEUTICAL APPROACH IN MANAGEMENT OF ACUTE MESENTERIC ISCHEMIA : A RADIO-SURGICAL COOPERATION

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Introduction: Acute mesenteric ischemia (AMI) remains a serious disease with high mortality rate (app 40 %). Goal of the treatment is to revascularize ischemic territories, and remove all necrotic digestive segments. For patients in unstable condition, lengthy revascularization procedures are not possible and damage control surgery (DCS) limited to resection is then recommended. Objective of this study was to evaluate results of current management of severe AMI by a DCS strategy, and discuss a new therapeutic approach.

Materials and methods: A retrospective review of all DCS for AMI performed at the University Hospital of Grenoble between 2005 to 2012 was realized. The 28-day mortality was compared with Simplified Acute Physiology Score (SAPSII) predicted mortality to evaluate our strategy.

Results: Fifty-nine DCS for AMI were performed with 75 % of patients initially in shock. IMA was related to superior mesenteric arterial occlusion (embolism or thrombosis) in 37 cases, mesenteric venous thrombosis in 3 cases, and non-occlusive mesenteric ischemia in 19 cases. Revascularization was realized in only 1 case. There was no significant difference between SAPS predicted mortality and real 28-days mortality (respectively 59 % and 51 %, p = 0.1). This result was probably related to the difficulty to incorporate revascularization in resuscitation timing. Based on this finding, we developed a new therapeutic approach for arterial occlusive AMI. It is to carry out a DCS initially, follow by a revascularization angiography, with a mandatory surgical revision after 48–72 hours.

Conclusion: Multidisciplinary approach to these complex patients is essential. A radio-surgical collaboration treat AMI with shorter operative time and less invasiveness.

Disclosure: No significant relationships.

O095

PERFORATED PEPTIC ULCER WITH POSITIVE COMPUTED TOMOGRAPHY FINDING IN OMENTAL BURSA IMPOSES MANAGEMENT COMPLEXITY

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Introduction: Perforated peptic ulcer (PPU) is one of the most common abdominal emergencies. Radiologic findings no doubt are the definite evidences of diagnosis. Due to the accessibility of computed tomography (CT) scan, more and more patients had been diagnosed with PPU under the help of CT scan. CT scan not only provides characteristic signs of diagnosis but also reveals anatomic information. In this study, we tried to correlate the CT findings with anatomic findings, difference of clinical management, and outcome.

Materials and methods: During a period of 34 months, there were 175 patients of PPU with CT scan arrangement and fulfilling our inclusion criteria in our institute. All these patients underwent surgical treatment, either laparotomy or laparoscopic procedure. Statistical significance is defined as $p < 0.05$.

Results: There were 144 patients with negative CT finding (NCT) in omental bursa while 31 patients with positive CT finding (PCT). Neither statistically significant difference nor trend was noted in demographic data, severity, surgical procedure, or clinical outcome between the 2 groups. The most significant finding is the percentage of difficult ulcer sites (juxta-lesser curvature PPU and posterior PPU) were defined as difficult ulcer sites in our study, 4.3 % of NCT group vs. 82.4 % of PCT group, $p < 0.001$. In addition, a trend of higher laparotomy conversion rate (40 % of PCT vs. 5.3 % of NCT, $p = 0.09$) was noted in patients of NCT group with initial laparoscopy intent although without statistical significance.

Conclusion: Positive CT finding of omental bursa in patients with PPU implicates the unfavorable PPU sites and possible failure of laparoscopic treatment.

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Disclosure: No significant relationships.

O096

FACTORS PREDICTING POSITIVE FAST RESULT TO DETECT HEMOPERITONEUM IN TRAUMA PATIENTS

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Introduction: Abdominal trauma patient is one of most common condition being seen in Emergency Department (ED). Focus Assessment Sonography in Trauma (FAST) is the procedure commonly use in ED to detect hemoperitoneum. The sensitivity of FAST depended on various factors; equipment, operator, time, amount of fluid, etc. The study aim to identify predicting factors for positive FAST result to detect hemoperitoneum in abdominal trauma patients in the ED.

Materials and methods: Prospective cohort study in adult trauma patients in Emergency Department (ED). Multiple logistic regression was used to identify significant parameters to FAST positive result.

Results: There were 93 patients enrolled in the study; 16 patients has FAST-positive result and the sensitivity, specificity, accuracy were 78.9, 98.9, and 94.6. In multivariate analysis, the significant factors

correlating with a FAST-positive result were pre-hospital arrival time more than 1 hour (Odd ratio = 6.7 % CI 1.3–36.1, $p = 0.025$), clinical of abdominal or pelvic tenderness (odd ratio = 20.9 % CI 3.1–143.8, $p = 0.002$).

Conclusion: Abdominal trauma patients with pre-hospital arrival time more than 1 hour and clinical of abdominal and pelvic tenderness have a high incidence of a positive FAST result.

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Disclosure: No significant relationships.

SPORTS RELATED INJURIES

O097

HIGH PERCENTAGE OF COMPLICATIONS FOLLOWING LOCKING PLATE FIXATION FOR PROXIMAL HUMERUS FRACTURES: AN ANALYSIS OF RISK FACTORS

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Introduction: The primary aim of this study was to evaluate the number of complications following locking plate fixation of proximal humeral fractures. The secondary aim was to identify risk factors for these complications.

Materials and methods: Multicentre retrospective case series of ninety-eight consecutive patients with proximal humeral fractures, treated with a proximal humeral locking plate between 2008 and 2012. Setting: two level 1 trauma centres in the Netherlands. Demographic data and data on postoperative complications and reoperations were collected. Fractures were classified according to the AO and Hertel classification and postoperative x-rays were reviewed to assess the quality of reduction and plate fixation. Logistic regression analysis was performed to analyse the relation between different risk factors and complications.

Results: Ninety out of ninety-eight patients were included in the analysis ($n = 2$ deceased, $n = 6$ lost to follow up). The median age was 59 and 68 % was female. During a median follow-up of 11 months, 76 complications were encountered in 43 patients (48 %). The most frequent complications were: screw perforation in the glenohumeral joint (26.7 %), persistent shoulder complaints 6 months postoperatively (16.7 %), non-union (8.9 %), implant failure (5.6 %), sub acromial impingement (5.6 %) and frozen shoulder (5.6 %). Fifty re-operations were performed in 27 patients (30 %). Twenty-four implants were removed. Non-anatomic reduction of the greater tuberosity and incorrect plate height were identified as risk factors for complications.

Conclusion: The use of locking plates for proximal humeral fractures is associated with an unexpected, high number of complications,

especially screw perforation in the glenohumeral joint. These complications result in a large number of revision surgeries.

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Disclosure: No significant relationships.

O098

PRE-OPERATIVE FITTING OF OSTEOSYNTHETIC PLATE FOR CLAVICLE FRACTURE USING RAPID PROTOTYPING

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Introduction: When a midshaft clavicle fracture is treated surgically, open reduction and internal fixation (ORIF) is common practice. No preoperative planning is available, which means that the selection of the plate and screw and possible bending of the plate takes place perioperatively. This takes time and is suboptimal in the sterile environment. Preoperative planning would benefit the surgeon with the presence of the correct osteosynthetic material during surgery and a preset drill depth to avoid complications as pneumothorax or bleeding. Furthermore the incision time is shortened and incision and anatomical clavicle shape can be fabricated, which benefits the patient esthetically and lesser risks.

Materials and methods: A real size, patient specific plastic model of their clavicle fracture is constructed from a CT-scan and subsequently printed in 3D with a low budget 3Dprinter. On basis of this plastic model the reposition of the fracture as well as the selection of the osteosynthetic material can be planned. The plate is bent to fit the model and sterilized before implantation.

Results: During the one case in the pilot study the plate fitted beautifully. In addition, repositioning of the fracture was performed according to the curvature of the plate.

Conclusion: Preoperative planning is possible to create a plastic model of the clavicle, with a low budget 3D printer, without intervention of a third party, through this method. The next step is an ongoing clinical follow up study with a larger subject population, to research reduction in surgery time and improved workflow for the surgical team.

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Disclosure: No significant relationships.

O099

RECONSTRUCTION PLATES FOR THE FIXATION OF MIDSHAFT CLAVICULAR FRACTURES

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Introduction: For the fixation of displaced midshaft clavicular fractures, many different plates with specific pros and cons are available. The ideal choice of plate for this cause is subject of ongoing discussion. Reconstruction plates are cheap and easily bendable, but their strength and stability has been questioned. Complication rates of all plate types vary greatly in literature, but the overall reoperation rate due to implant failure seems to be around 2–3 % in most plates. The aim of this study was to evaluate the safety of reconstruction plates for the fixation of clavicular fractures.

Materials and methods: Multicenter, retrospective cohort study of all consecutive patients with a displaced, midshaft clavicular fracture (Robinson type 2a/2b) treated with a 3.5-mm reconstruction plate between 2006 and 2013. The primary outcome measure was reoperation rate due to implant failure. Secondary outcome measures were nonunion, symptomatic malunion and elective plate removal.

Results: One hundred eleven patients were analysed. During a median follow-up of 8 months, 14 patients (12.6 %) had implant failure, of which 7 (6.3 %) required a reoperation. Three nonunions (2.7 %) and no symptomatic malunions occurred. Plate removal was indicated in 37.8 % of patients because of implant irritation.

Conclusion: The incidence of reoperation due to implant failure following clavicular plate fixation with a reconstruction plate, is 6.3 %. Although comparing is difficult since rates in literature vary greatly, this seems to be higher than in other plate types. Therefore a stronger plate should be considered, especially in patients with known risk factors for complications (e.g. smoking, osteoporosis, comminuted fractures).

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Disclosure: No significant relationships.

O100

MID-TERM OUTCOME OF INJURIES IN LISFRANC'S JOINT

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Introduction: Traumatic injuries of the tarsometatarsal joint are rare, often missed and they have a high risk of long term functional

limitations. Our aim was to assess mid-term functional outcome and if there are indications of insufficient treatment.

Materials and methods: Fifty patients who were treated between January 2007–July 2013 with a fracture involving the Lisfranc's joint were included with a mean F-U of 40 (range, 12–84) months. Radiologic re-evaluation was performed and treatment and complications were collected. With questionnaires, functional outcome (AAOS) and pain (VAS) were assessed.

Results: 26 Patients had a dislocation >2 mm, of which 22 were treated by ORIF. 26 patients were treated non-operatively. 3 out of 18 cases who had removal of the osteosynthesis material had loss of reduction and needed arthrodesis. Also, 2 non-operatively treated patients had secondary dislocation and needed arthrodesis.

A mean AAOS score of 82 (range, 60–98) was seen among patients with fracture dislocation versus 92 (range, 74–100) among patients without dislocation. VAS-pain was respectively 3 and 2. Maximal functional recovery was achieved after respectively 19 (range, 6–24) and 12 (range, 3–36) months.

Conclusion: Injuries in Lisfranc's joint often cause disability and often don't fully recover. Remarkably, also patients who had a non-dislocated, non-operatively treated injury often experienced mid-term disability. In some patients who had removal of the osteosynthesis material or were treated non-operatively, a secondary arthrodesis was performed.

Disclosure: No significant relationships.

O101

FIXATOR-ASSISTED NAILING IN FRACTURES OF PROXIMAL HUMERUS

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Introduction: Fractures and malunions of the proximal humerus lead to functional impairment, especially limitation of abduction. Our aim was to develop a mini-invasive technique of correction of typical varus deformity providing easy closed nailing.

Materials and methods: 51 patients with 2-part fractures (36/51) and malunions of the proximal humerus (15/51) were operated. The technique featured small wire temporary external frame with two k-wires in the humeral head for spatial control. In case of acute fracture it allowed to reach alignment and proper length. In case of malunions percutaneous osteotomy of the surgical neck was performed prior to fixator application, and alignment was reached acutely by the fixator. Then closed intramedullary nailing was performed through a stab wound.

Results: The technique allowed to restore anatomy of the proximal humerus and avoid varus malalignment. Mini-invasive approach provided fast functional recovery. 37 patients were available for follow-up in 1 year. 35/37 fractures and osteotomies healed. Two cases of nonunion were treated with exchange nailing. Patients demonstrated significantly increased shoulder function and quality of life.

Conclusion: The presented technique provides easy and reproducible way of mini-invasive restoration of anatomy of the proximal humerus in fractures and in malunions. It results with low complication rate and good functional outcomes

Disclosure: No significant relationships.

O102

MIDCLAVICULAR FRACTURES TREATED WITH MINIMAL INVASIVE PLATE OSTEOSYNTHESIS (MIPO)

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Introduction: From September 2009 on, we treated 115 patients with clavicular fractures. 76 cases were midclavicular fractures. Operations were performed in a minimal invasive approach using a locking plate osteosynthesis. Indication for plate osteosynthesis were clavicular fractures B1 and higher (AO-Classification). This study evaluates the clinical and radiographic outcome of midclavicular fractures treated by minimal invasive plate osteosynthesis.

Materials and methods: Operation was performed with the patient lying on a radiolucent operating table in a supine position. Incisions were made over the lateral and medial fragment of the clavicular. For osteosynthesis we used an anatomical shaped (s-shaped) locking plate with 8 holes. Reposition of fracture was achieved with the plate attached to the lateral fragment. All patients were reexamined after one year with radiographs and functional tests like DASH- and Constant-Score.

Results: 47 patients showed consolidation at one year follow up, except two. Three cases acquired revision because of cutting out the lateral screws in the early postoperative time. In two cases we had to convert to open reduction because adequate reposition could not be achieved with closed reposition. First results show good functional results in DASH and Constant Score.

Conclusion: Minimal invasive plate osteosynthesis (MIPO) of mid-clavicular fractures shows to be an effective treatment with a good functional as well as cosmetic outcome. An approximate reposition of fracture can already be achieved with the patient lying in supine position. This facilitates the final reposition via the minimal invasive approach. Cosmetic results were better than after conventional approach, no patient had celoid.

Disclosure: No significant relationships.

MILITARY MEDICINE

O103

LIFE-SAVING SURGICAL UNIT: EXPERIENCE OF A RECENT CONCEPT IN THE FRENCH ARMY

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Introduction: Recent experiences showed that combatants during special force actions are particularly exposed to “potentially

treatable” fatal injuries. The most common cause is noncompressible haemorrhage. Facing that risk, the French army health services decided to create a “life-saving surgical unit” in 2009, designed to provide flexible and mobile surgical support to special operations forces.

Materials and methods: The team has 4 personnel : general surgeon, intensivist, OR nurse and nurse anesthetist. The equipment is 1,000 kgs and 4 m³ including : inflatable tent, generator, lightning set, ICU equipment, blood refrigerator, ultrasound device, operating table, 6 instruments sets, diathermy, suction generators, and OR materials. It can be airdropped and quickly deployed close to the combat zone within 30 minutes under a tent, or in a surface ship. It can also be pre-deployed and used directly in a tactical aircraft. Damage control surgery can be performed for 3–4 casualties, just before the evacuation into a role 2–3 facility or directly into France.

Results: After an initial time of operational qualification, drilling of the teams and validation of the equipments, first trainings in real conditions were realised in 2009. Since then, LSSU was employed several times in war conditions and participated in several multinational exercises. Similar teams exist in foreign armies. This tactical unit is ideally suited for high-risk operations during a short period, which makes it very different from a classical forward surgical team.

Conclusion: French LSSU is a recent military concept. Its extreme mobility and rapid engagement capability make it an appropriate tool for the support of special operations.

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Disclosure: No significant relationships.

O104

SURGICAL COMPLICATIONS AND SKILLS IN MSF TRAUMA SURGERY SETTINGS

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Introduction: Trauma care is an important component of surgical care provided in humanitarian assistance. Modern-day emphasizes on minimally invasive surgery and specialization. In trauma centers of humanitarian organizations, specialists encounter a wide range of complex trauma cases with possible surgical complications.

Materials and methods: A retrospective analysis using routine programme data of all consecutive procedures from two MSF trauma centers in Afghanistan and Haiti, between March 2012 and June 2014. Surgical site infections and admissions to the intensive care unit (ICU) were assessed.

Results: A total of 15894 procedures were performed to 8682 patients in the two projects: 3950 (45,5 %) in Afghanistan and 4732 (54,5 %) in Haiti. 20 expatriate specialists were sent to the two missions: 2/11 and 1/9 on their first mission in Afghanistan and Haiti respectively working with 10 and 13 local surgeons respectively. For Kunduz and Kunduz, the three main causes of trauma were:

accidental trauma (36 %, 32 %), road traffic accident (34 %, 42 %) and gunshot injuries (20 %, 13 %) respectively. Surgical site infection (SSI) rates were 2,4 % in Afghanistan and 2,8 % in Haiti. In the first half of 2014, in Afghanistan and Haiti, 2 % and 4 % respectively were admitted to the ICU for surgical complications.

Conclusion: This report may represent an underestimation of the overall surgical complications, as only SSI rates and ICU admissions were assessed. These positive results may be the consequence of the high proportion of previously-experienced surgeons in these projects. The study demonstrates that performing quality surgery in resource limited settings is achievable by supplying the means and skilled human resources.

Disclosure: No significant relationships.

O105

BATTLEFIELD CARE IN MOTION; WHAT INFLUENCES THE DEVELOPMENT OF BATTLEFIELD ADVANCED TRAUMA LIFE SUPPORT? PAST, PRESENT AND FUTURE

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Introduction: Battlefield Advanced Trauma Life Support (BATLS) is about optimizing survival rates of injured soldiers. This article will review major changes in BATLS NLD over the past 2 decades, the factors that have led to these changes, current developments within BATLS NLD and glance at the future.

Materials and methods: A literature study using Pubmed and Google. Search terms: Battlefield advanced trauma life support, battlefield advanced resuscitation and Battlefield advanced resuscitation techniques and skills. Interviews with key medical officers

Results: Major changes in BATLS NLD over the past 2 decades

- Treat intubation with more caution and convert to cricothyroidotomy early.
- Complicated medical procedures are delegated.
- Reintroduction of the tourniquet.
- Introduction of haemostatic bandage.
- Introduction of permissive hypotension in the first hour.
- ABCDE changed into <c> ABCDE.

Factors of influence

- Clinical doctrine
- Best Practice
- Experiences of physicians deployed
- Transportation times
- Severity or type of injury
- Military material
- Circumstances of deployment
- Financial cutbacks

Current developments

- Financial cutbacks
- Deployment to the African continent
- Growing number of civilian casualties

Conclusion: For the past 20 years the BATLS protocol was influenced by both medical advances and military developments. Currently we are deployed to the African continent which requires more knowledge on infectious diseases endemic there. We are also faced with a growing number of civilian casualties which requires more

knowledge on the treatment of women, children and elderly. General duty medical officers cannot be expected to have this extensive knowledge. Emergency physicians might be the right doctors to fill this void so we can continue delivering good medicine in bad places.

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Disclosure: No significant relationships.

O106

VASCULAR DAMAGE CONTROL FOR WAR PENETRATING TRAUMA OF THE LIMBS. LESSONS LEARNED AFTER A 2 YEARS EXPERIENCE IN A FRENCH FORWARD SURGICAL TEAM

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Introduction: Penetrating injuries to the extremities are the most common injuries sustained during combat. Rapid vascular control and perfusion of injured extremities at forward surgical team (NATO role 2) is essential to limit loss of life and maximize limb preservation. The use of temporary vascular shunts (TVS) is the cornerstone for the management of wartime vascular injury and represents a safe and effective damage control technique.

Materials and methods: We reviewed our 2 years experience with the management of extremity vascular trauma and the use of TVS for proximal extremity vascular injuries.

Results: From 2012 to 2014 the FST was deployed in Afghanistan, Jordan, Mali and Chad. 14 patients presented a vascular trauma of the limb with acute ischemia. 7 TVS were placed. 100 % were patent at the time of definitive revascularization. 4 underwent successful autologous vein reconstruction and 3 a direct end-to-end arterial anastomosis. All shunt patients survived their injuries with 100 % limb preservation (early follow up).

Conclusion: All patients with suspected vascular injuries must undergo exploration in the operating room. The surgical approach is large. After vessel control, thrombectomy and instillation of heparinized saline, vascular injuries in the proximal extremity are temporarily shunted in a standardized fashion. A concomitant venous TVS is recommended if possible. Vascular injuries in the distal extremity are commonly ligated. No systemic anticoagulation is routinely mandatory. Discharge aponeurotomy are systematic in upper and lower limb. The delay before definitive revascularization can be extended to 72 h. Aeromedical evacuation are not recommended because of the risk of dislodgment of the TVS.

Disclosure: No significant relationships.

O107

THE ASSESSMENT OF THE ROLE, PREPARATION AND MANAGEMENT OF EMERGENCY NURSES DURING DISASTERS

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Introduction: When we look at definitions of disaster in literature; is a natural, technological or human-caused event, cause physical, economic and social losses for people, halt or stall normal life and human activities, thereby negatively affecting societies, while such negatively affected societies cannot overcome such events by using their own opportunities and resources as well as the results of any such event (2).

Materials and methods: This study which was conducted with a prospectively descriptive viewpoint, was performed between 12 February 2013–12 July 2013 with a questionnaire responded to by nurses who work at emergency units of University Hospitals and Training and Research Hospitals in Turkey. Questionnaires were filled out either via internet or face to face interviews with nurses. For statistical analyses, the NCSS 2007 & PASS 2008 Statistical Software program was used. The results were assessed at a % 95 confidence interval and a $p < 0.05$ significance level.

Results: A meaningful difference has been determined between the preparation points yielded by nurses by their educational levels ($p < 0.05$). Meaningful differences have been determined between the role points yielded by health care staff by their marital status ($p < 0.05$).

Conclusion: As a conclusion of our study we may say that healthcare personnel do not have the expected training and practical knowledge within the scope of both their professional training/education and their continuous professional developments with respect to their emergency case management and preparation. Moreover, we may stress that there is no coordination between public healthcare and hospital centered sectors in our country, which is a center of great earthquakes.

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Disclosure: No significant relationships.

O108

END-USER REQUIREMENT GATHERING FOR RESEARCH PROJECTS IN EMERGENCY AND DISASTER MEDICINE

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Introduction: European Commission funds research projects in Emergency and Disaster Medicine in Security Sector. Industrial/technical/commercial nature of the proposals needs platform implementation and end-user requirement gathering (EURG). Methodology for EURG is the aim of presentation.

Materials and methods: EURG was done for PULSE and IMPRESS Projects. EU identification started from a **high level analysis** of roles and functions in the project (stakeholders) and **framework definition**. An appropriate questionnaire was designed. Workshops were organized to interview end-users. Questionnaires were administered in plenary sessions, but also to external EU in single Member States or other similar EU aggregations. In one project participants to a MRMI course were interviewed. Methodology used for data analysis consisted in **summarizing the information gathered per module, by taking into consideration participants' answers, total of respondents and type** (EU or project partner). Prioritization and relaxation whose main goals are to analyze EU answers in order to avoid overlaps and generate a **list of ranked requirements/expectations** were carried out.

Results: For PULSE project 34 EU inputs were gathered; for IMPRESS 12. After prioritization and relaxation 136 requirements were identified that were successively grouped into **general requirements, aggregated key needs** (incidents database and information sharing, command and control capabilities, data/information presentation, resource management, planning capabilities, reporting, decision support capabilities) and **aggregated key features** (data collection, recording and sharing, resource management & decision support tool, simple and intuitive user interface, risks assessment, lessons learned/incident prediction, CBRN support).

Conclusion: Emergency and Disaster Medicine projects require adequate EURG. Methodology is mandatory to achieve good results that will usefully help stakeholders.

Disclosure: No significant relationships.

O109

DISASTER MANAGEMENT, MASS CASUALTY ORGANIZATION- FROM THEORY TO PRACTICE TEN PHASES OF EMERGENCY ORGANIZATION

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Introduction: One of Israel's greatest challenges is the development and improvement of the national medical preparedness for emergencies- in both war and peaceful times. The national preparedness system is built on a multi- step model which deals with defining the scenario and adapting the proper medical response to the specific threats. The response is based on the quality improvement process which includes- debriefing, lessons learned and introducing improvements based on experience.

Materials and methods: We will present the national medical response model according to the ten preparedness phases. Each phase contains the theoretical background and ways to put the theory into practice as is done at Rambam as a level 1 trauma center in Israel Based on lessons learned from the second Lebanon (2006) war and other mass casualty situations

Results:

- Threat assessment- risk analysis models are created for the specific threats at the national level.

- Building national protocols for each disaster.
- Hospital level- Building a division in charge of emergency operations.
- Creating a management team -physician, nurse and logistics personnel specific for each emergency site and building protocols for site activation.
- Founding an educational system based on the training software, table top drills
- Using medical simulations as a tool for team preparedness
- Planning and conducting full scale hospital drill
- Debriefing real events and examining the outcome of the hospital operation
- Logistical system- building a computerized system for managing the hospital during emergencies
- Building an underground hospital based on past experience- The second Lebanon war and operation Protective Edge demonstrated the rocket threat on the civilian population and on medical teams

Conclusion: Dealing with emergencies and organizing rescue missions for disaster areas led to development of a national preparedness infrastructure. We will present the practical operational principals and the lessons learned

Disclosure: No significant relationships.

MISCELLANEOUS

O110

INJURY OF VERTEBRAL ARTERIES IN POLYTRAUMA PATIENTS - UNDERESTIMATED?

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Introduction: In up to 0,7 % of patients sustaining a blunt trauma an injury of vertebral arteries is described in the literature. 88 % of these lesions are associated with spine fractures. Neurological symptoms or complications are seen in up to 25 % of the patients. Expecting a higher incidence of arterial lesions and neurological complications, we evaluated our patients collective.

Materials and methods: At our level I trauma center we retrospectively analyzed from 01/2011 to 12/2013 all patients with vertebral artery injuries. Data were collected throughout the German trauma registry. We included all patients with an injury severity score (ISS) >16.

Results: In 10 of 577 patients (1,7 %) an injury of vertebral arteries was detected during polytrauma-CT-scan. 4 patients had lesions of the left, 3 of the right and 3 of both arteries. In 7 cases there were dissections, in 3 cases occlusions caused by the trauma. 9 of 10 patients suffered a fracture of the cervical spine. All patients received a therapeutic anticoagulation with heparin intravenously. An embolism occurred in 6 of 10 patients, in two patients initially, in 3 patients between day 2 to 4 and in 1 patient after 4 months. The neurological symptoms and complications were paraesthesia (2), impaired consciousness (2) and death (2).

Conclusion: At our trauma center we had more patients with vertebral artery injuries than described in the literature (1,7 % vs. 0,7 %). The quantity of complications caused by embolism in our patients collective was also considerably higher (60 % vs. about 25 %); under anticoagulation. We are now evaluating alternative therapy options.

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Disclosure: No significant relationships.

O111

SEPTIC COMPLICATIONS IN COMMUNITY-ACQUIRED AND NOSOCOMIAL SECONDARY PERITONITIS

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Introduction: Surgical site infection (SSI) remains one of the most common complications in patients with secondary peritonitis, increasing the risk of morbidity and mortality.

Materials and methods: Unicentric prospective observational study with 359 consecutive patients with secondary peritonitis (minimum two quadrants), done from 01/2010-12/2013. 262 of Community-Acquired Peritonitis (CP; 73 %) and 97 of Nosocomial Peritonitis (NP; 27 %). The aim was to analyse differences in postoperative complications between subtypes of peritonitis.

Results: 48 % patients were classified as ASA III/IV, being significantly severer systemic disease in NP (65 % vs. 42%; P = 0.0001). It was recorded the value of the Systemic Inflammatory Response Syndrome (SIRS) in 64 % of cases (29 % had ≥3 of SIRS). Mannheim and Charlson comorbidity index obtained statistically significant differences between CP and NP (21.39 ± 8 vs. 26.3 ± 9; P < 0.001 and 1.96 ± 2.6 vs. 2.92 ± 2.2; P = 0.002). More differences between them were: age > 50 years old (57 % vs. 77%; P = 0.005), multiple organ failure (27 % vs. 45%; P = 0.0013) and fecaloid exudate (12 % vs. 36%; P < 0.0001). 54 % of patients had septic complications, twofold in NP; SSIs was 34 %. There were significant differences between prevalence of patients with SSIs between CP and NP (23 % vs. 62%; P < 0.0001). Within patients in which SSI appeared, the subtypes were classified by: superficial (62 %), deep (36 %) and organ-space (66 %). In NP, the superficial SSIs was threefold (42 % vs. 13%; P < 0.0001) and deep SSIs (25 % vs. 7%; P < 0.0001). The organ-space SSIs showed startling differences between CP and NP (16 % vs. 39%; P < 0.0001). The readmission, reoperation and exitus rate were 5, 14 and 15 %, respectively. There were significant differences in the reoperation and exitus rate PC and NP (10 % vs. 25%; P = 0.001 and 12 % vs. 26%; P = 0.0086), respectively.

Conclusion: The NP is associated with increased number of septic complications, specifically in superficial and deep SSIs leading reoperations and mortality.

Disclosure: No significant relationships.

O112

EFFECT OF TREATMENT PROTOCOL FOR INFECTION AFTER OSTEOSYNTHESES

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Introduction: Infection after osteosynthesis is an important complication with significant morbidity and even mortality. These infections are often caused by biofilm producing bacteria. Antibiotic combination therapy with rifampicin seems promising in infection near prosthesis, yet has scarcely been studied in infection after osteosynthesis. The aim of this study is to analyze the effect of a standardized treatment protocol for infection after osteosynthesis, in terms of primary and secondary cure.

Materials and methods: A retrospective two year cohort in a single, level 1 trauma center. Treatment protocol consists of retention of osteosynthetic material, if still functional and providing adequate stabilization, thorough surgical debridement and antibiotic combination therapy with rifampicin. Cure is defined as consolidation of the fracture and resolved symptoms of infection. Culture and susceptibility testing is performed to identify bacteria and rifampicin resistance. Univariate analysis is conducted on patient related factors in association with primary cure and rifampicin resistance. Primary cure is defined as consolidation of the fracture on X-ray, as assessed by the treating physician, resolved clinical signs and symptoms of infection after completion of the protocol.

Results: Forty-nine patients are included for analysis. Primary cure rate is 63.3 % and overall cure rate 87.8 %. Factors negatively associated with primary cure: Gustilo-classification (P = 0.023), higher number of debridements (P = 0.015), inability of primary closure (P = 0.017) and application of vacuum therapy (P = 0.030). Strict protocol adherence was positively related to primary cure (P = 0.034). Resistance to rifampicin is seen in 8 patients, 7 *S. epidermidis* and 1 *S. aureus*. Rifampicin resistance is associated with secondary closure after debridement (P = 0.044).

Conclusion: Our treatment protocol results in high overall cure rates, comparable with cure rates achieved in staged exchange in prosthetic joint infection treatment. Rifampicin resistance is more likely to be found in wounds which cannot be primarily closed.

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Disclosure: No significant relationships.

O113**INDUCED MEMBRANE, A SYSTEMATIC REVIEW ON THE RATE OF UNION**

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Introduction: Segmental bone loss remains a challenge to the trauma surgeon. The induced membrane technique, introduced by Masquelet, utilises the membrane formed around a cement spacer to facilitate consolidation with cancellous bone graft. We have systematically reviewed the literature to determine the previously unknown union rate.

Materials and methods: We conducted a literature search in Pubmed and Embase. We included studies reporting on the clinical use of the induced membrane technique in defects of traumatic nature. Case reports and studies reporting on tumor resections or maxillofacial surgery were excluded. We assessed study quality using a combination of the Newcastle Ottawa Scale and a list of items considered important by the authors.

Results: A total of 13 retrospective case series were included reporting on a total of 248 patients with an average defect size of 5,9 cm in 190 lower limb defects and 60 upper limb defects. Studies showed an average of 12/27 for study quality. The overall reported union rate was 92 percent, reached after 7 months with an infection rate of 16 percent.

Conclusion: Based on the literature the induced membrane technique seems a viable option with an overall union rate of 92 percent. Caution is warranted as current results are based on retrospective studies which lack homogeneity and may be subject to publication bias. Prospective research using standardized reporting should be conducted in order to obtain better evidence regarding union, complications and functional results.

Disclosure: No significant relationships.

O114**FIBRINOLYSIS SHUTDOWN IN TRAUMA ICU PATIENTS**

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Introduction: Despite implementation of routine prophylaxis for venous thromboembolisms (VTE's) the incidence following trauma remains 7 %, and is much higher if asymptomatic VTE's are included. The fibrinolytic system, through tissue plasminogen activator (tPA)-generated plasmin, promotes clot degradation, thus preventing

clotting beyond the site of injury. Fibrinolysis-shutdown has been recently implicated in sepsis-induced organ failure. However, fibrinolysis shutdown has not been investigated in the injured patient. We hypothesized that trauma-ICU patients have fibrinolysis-shutdown, as measured by TEG, when compared to healthy-individuals.

Materials and methods: Once resuscitation was achieved, trauma-ICU patients were studied by thrombelastography (TEG) on re-calibrated citrated whole-blood, and compared to 10 healthy-volunteers. To induce fibrinolysis, tPA was added incrementally before initiating the assay (0, 75, 150 or 300 ng/ml). Median (IQR) of TEG variables were compared by the Kruskal-Wallis test ($p < 0.05$ for statistical significance).

Results: 15 trauma-ICU patients (age 41, 60 % male, ISS 24, 11 % penetrating) demonstrated hypercoagulability vs. healthy volunteers (R-time, angle, and MA: 6.5 min, 71 deg, 79 mm, vs. 8.1 min, 61 deg, 65 mm, respectively) ($p < 0.05$) on samples with no tPA addition. When fibrinolysis was induced with tPA, these trauma-ICU patients had a marked blunted response in LY30 (% clot lysis 30 min after reaching MA) vs. healthy-volunteers: 75 ng/ml (4.4 % vs. 8.1 %) ($p = 0.08$), 150 ng/ml (10.9 % vs. 31.8 %) ($p = 0.03$), 300 ng/ml (11.5 % vs. 69.8 %) ($p = 0.02$), representing fibrinolysis-shutdown.

Conclusion: As shown previously, trauma-ICU patients are hypercoagulable as demonstrated by TEG. But these patients also have profound fibrinolysis-shutdown. Thus, the inability to degrade clot, in combination with hypercoagulability, could explain the continued dilemma in preventing VTE's in the injured patient.

Disclosure: No significant relationships.

O115**THE EFFECT OF RED BLOOD CELL STORAGE ON TRANSFUSION ASSOCIATED FIBRINOLYSIS**

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Introduction: Systemic hyperfibrinolysis is associated with an increase in mortality in severely injured trauma patients, although the mechanism is unclear. Addition of lysed red blood cells to healthy volunteer blood is associated with hyperfibrinolysis. As stored red blood cells age, membrane stability decreases and cell lysis increases. We hypothesize that resuscitation with stored RBCs will increase tPA-induced fibrinolysis due to increased storage time secondary to increased cell lysis.

Materials and methods: One unit of O negative packed red blood cells was donated and stored. Citrated blood samples were collected weekly from 6 healthy volunteers. A 75 ng/ml tPA-challenge TEG assay was performed on each sample with progressive replacement with RBCs (5–50 %). Fibrinolysis was measured via the LY30 parameter, and data were statistically analyzed using a linear mixed model.

Results: There is a U-shaped relationship between age of red blood cells and LY30 ($p = 0.0003$) that is independent of RBC dose. 5 % replacement median LY30 were 13 % (day 1), 2 % (day 21), and 17 % (day 42). 25 % replacement median LY30 were 29 % (day 1), 6 % (day 21), and 37 % (day 42). 50 % replacement median LY30 were 44 % (day 1), 30 % (day 21), 49 % (day 42). Increasing RBC replacement dose was independently associated with increasing LY30 ($p < 0.0001$).

Conclusion: The relationships between fibrinolysis and RBC age is U-shaped, with maximal fibrinolysis at days 1 and 42 and nadir at day 21. This may be due to early mechanical RBC lysis during collection and late lysis due to the storage lesion. Moreover, increasing transfusion volume (% RBCs) is associated with increased fibrinolysis.

Disclosure: No significant relationships.

O116

PLATELET ARE INTEGRAL IN THE REGULATION OF POST-INJURY SYSTEMIC FIBRINOLYSIS

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Introduction: Tissue plasminogen activator(tPA) is implicated as the primary mediator of hyperfibrinolysis in trauma. However the tPA levels measured in hyperfibrinolytic patients do not provoke fibrinolysis in healthy volunteers whole blood. This suggests dysfunction of regulation of the fibrinolytic system is integral in the development of pathologic fibrinolysis. We hypothesize that platelets are important regulators of fibrinolysis and their activity predicts susceptibility to tPA-mediated fibrinolysis better than fibrinogen function.

Materials and methods: Blood samples were collected within 30 minutes of injury. Platelet function (ADPMA) fibrinogen function (FFMA) clot strengthening (Angle) clot strength (TEGMA) and fibrinolysis(LY30) were measured via thrombelastography (TEG). Measurement of sensitivity to tPA was assessed by adding exogenous tPA [75 ng/ml] to patients blood and TEG analysis (tpaLY30). Regression model was preformed to predict tpaLY30 based off other TEG variables.

Results: 44 patients were included. Median age was 41, ISS 19, and mortality rate 16 %. The average and range of variables of interest were: ADPMA 37.7 (4–64.5) FFMA 23 (4.4–31.1) Angle 63.3 (38.2–75.8) TEGMA 62 (20.5–70) Ly30 5.5 (0–85) tPALY30 21.6 (0–91). Simple bivariate correlation identified significant correlation between tPaLY30 with ADPMA, FFMA and TEGMA but not Angle. The regression model to predict tPALY30 had an R^2 0.529 ($p < 0.001$). TEGMA had the largest beta coefficient of -0.560 ($p = 0.001$) followed by ADPMA -0.386 ($p = 0.016$). However, FFMA ($p = 0.967$) and Angle ($p = 0.15$) were not significant.

Conclusion: These data suggest that platelet function is important for regulation of tPA-mediated fibrinolysis. This hypothesis is supported by both conventional TEG parameters (TEGMA > Angle) and modified TEG analysis (ADPMA > FFMA). Whole blood assays are important to evaluate fibrinolysis in trauma and have clinical implications for transfusion strategies.

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Disclosure: No significant relationships.

BURNS

O117

ADVANCED ENZYMIC DEBRIDEMENT IN FULL-THICKNESS THERMAL BURNS

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Introduction: Since Dezember 2013 the conceptual use of enzymatic debridement (NexoBrid™) in burns was pursued at the Burn Center Murnau. NexoBrid™ is indicated for the removal of eschar in adults with deep partial- but also full-thickness thermal burns. We will provide an overview of this treatment and why combination of enzymatic debridement and NPWT will improve the management of deep burn injuries.

Materials and methods: The prospective analysis included 20 patients with burn injuries (TBSA up to 50 %) treated with combined use of NexoBrid™ and NPWT. NexoBrid™ was used for the removal of eschar in adults with deep partial- but especially full-thickness thermal burns. Negative pressure wound therapy was used during all steps of burn treatment from the initial debridement up to the final defect coverage with skin grafts. Intensive care parameters and surgical parameters of tissue repair were recorded during the complete intensive care phase of all burned patients.

Results: In the majority of cases the combination of NexoBrid™ and NPWT removed completely the eschar even in full-thickness thermal burns without harming viable tissue after only a single 4-hour topical application. This early, non-surgical, successful eschar removal allows the physician to get an outstanding, well-debrided, clean wound bed even in full-thickness burn injuries from the point of patient's admittance without significant required surgery and therefore without considerable blood loss.

Conclusion: In conclusion combined use of enzymatic debridement and negative pressure wound therapy has shown to be an excellent option especially in the treatment of full-thickness burned patients.

Disclosure: No significant relationships.

O118

USABILITY AND EFFECTIVENESS OF SUPRATHEL® IN PARTIAL THICKNESS BURNS IN CHILDREN

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Introduction: This study evaluates the usability and effectiveness of Suprathel® in the treatment of partial thickness burns in children.

Materials and methods: In a prospective, observational study adherence of Suprathel® to the wound bed, reepithelialisation time, grafting, wound colonisation and infection, pain, dressing changes, length of hospital stay (LOS) and scar formation were evaluated.

Results: 23 children (median age 2.4 years, range 5 months–14 years) with a median TBSA of 4 % (range 1–18) were included. Suprathel® was only adherent in wounds debrided with Versajet®. The median reepithelialization time was 13 days (range 7–29). Three patients needed split skin graft. During treatment with Suprathel® wound colonization was found in twelve (57 %) of the patients. One patient developed a wound infection. Median Visual Analogue Scale (VAS) scores for the background and procedural pain in patients >7 years were 3.2 (range 2–5) and 3.5 (range 2–5, p = 1), respectively. In the younger patients, the median background COMFORT-B score was 13.8 (range 10–23), while the median procedural score was 14.8 (range 13–23, p = 0.03). The median number of outer layer dressing changes was 3 (range 1–14). Median LOS of the admitted patients was 10 days (range 3–20). Favourable scar quality was found in our study after 6 months post burn according to the Patient and Observer Scar Assessment Scale (POSAS).

Conclusion: Suprathel® provides potential advantages regarding pain and scar formation, but extensive wound debridement seems needed to achieve adequate adherence.

Disclosure: No significant relationships.

O119

BURN TREATMENT PRINCIPLES IN BURN TRAUMA CENTRES IN GERMAN-SPEAKING EUROPE

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Introduction: The initial therapy of major burn trauma in burn trauma centres is a challenging task where special demands have to be met by the treating surgeon. Our previous research, surveying all major burn trauma centres in Germany, Austria and Switzerland, revealed a significant lack of consistent operating procedures and varying structural conditions leading to inhomogeneous quality of treatment.

Materials and methods: Based on our preliminary study we developed a detailed questionnaire surveying standards in diagnostics, airway management, volume substitution, temperature management, treatment of inhalation trauma and burn wound management as well as qualification of the personnel. This questionnaire was sent to 21 burn trauma centres in the German-speaking Europe.

Results: Analysis of the returned questionnaires showed that a small fraction of the personnel involved in burn treatment is trained by specific courses. While volume resuscitation is calculated using the same formula in most centres, choice of resuscitation fluid and usage of colloidal fluids differ widely. Indication for bronchoscopy, intubation and primary tracheotomy are inconsistent just like indication for escharotomy and measures for temperature preservation. Further controversial treatment rules were found in burn wound management using synthetic epidermis or enzymatic debridement.

Conclusion: This study revealed heterogeneous treatment principles originated in a persisting lack of standardised guidelines. Available training courses for burn treatment like ABLS or EMSB and even widespread courses like ATLS are little used in burn centres. Instead, an individual approach to meet burn-specific requirements. To ensure a homogenous treatment quality, detailed guidelines have to be developed and inaugurated in European burn centres.

References: Münzberg M, et al. In view of standardization: Comparison and analysis of initial management of burned patients in Germany, Austria and Switzerland. Burns (2014), accepted 22 August 2014, in press.

Disclosure: No significant relationships.

O120

THERMOMECHANICAL COMBINATION INJURIES - A RARE BUT LIFE-THREATENING SITUATION

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Introduction: Severe burns and serious injuries can be isolated already connected with a very high mortality. Due to the low incidence of severe burns, the thermal-combination injuries are again significantly less. Therefore, in most cases lack the routine for proper diagnosis and treatment of this injury patterns. In this study, thermomechanical combination injuries were retrospectively collected, analyzed and evaluated by a multidisciplinary team in a national trauma center/burn center.

Materials and methods: In the period of 2000–2012, 45 patients were treated with combination thermo mechanical injuries in our national trauma/burn center. These were 35 male patients. Were evaluated in addition to routine data, the causes of accidents, injury pattern, the TBSA and mortality. All patients were included with a TBSA about 10 % from second-degree burns and at least one additional injury.

Results: The proportion of thermomechanical combination injuries over 10 % of all burn VKOF during the period was 4 %. The average age was 38 years [14–86]. The TBSA was 43 % (3: 78 %, 2b: 71 %, 2: 56.5 %). 18 patients were secondary to misplaced. The recording temperature was 34.8 °C [29.6 °C–37.1 °C], it was 2215 ml volume [500–8000 ml] administered preclinical. Leading in the accident causes were traffic accidents (n = 10) and explosions (n = 3). Traumatic brain injury, thoracic and abdominal Injuries, limb and amputation injuries gave the priority. Mortality was 25 % (n = 11).

Conclusion: Thermomechanical combination injuries are rare and require diagnosis of possibly burn “hidden” accompanying injury, and have higher mortality of particular importance.

Disclosure: No significant relationships.

MISCELLANEOUS

O121

AN IMPACT OF COMPREHENSIVE TRAUMA CARE APPROACH FOR SEVERE TORSO INJURY

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Introduction: To succeed in the surgical management for severe torso injury, three elements consisting of tactics, strategy and team should be considered. Since 2006, we have applied the comprehensive trauma care approach to achieve this concept that included aortic cross clamping and damage control surgery to control hemorrhage, damage control resuscitation to avoid coagulopathy, and trauma team establishment. Then, we verified our approach for severe torso trauma patients.

Materials and methods: This is a retrospective study of 418 patients requiring urgent surgical intervention during recent 8 years in our institution. After excluding cardiac arrest at the ED arrival and AIS = 6, 258 eligible cases were divided into two groups, the 1 st half (Early, E group: n = 111) and the 2nd half (Late, L group: n = 147) of study period. The TRISS probability of survival and the actual survival rate (ASR) were compared with each group.

Results: There was no difference in age, gender, blunt/penetrating, RTS and ISS between two groups. Although there was also no significant difference in the ASR compared to the mean PS in the E group (0.747 vs. 0.723), the ASR in the L group was significantly higher than the mean PS (0.782 vs. 0.689, p = 0.001).

Conclusion: The present findings suggest that actual survival rate might improve with the developing our policy of the resuscitation and surgery for severe torso trauma patients. We have tried to press for improvement in quality of trauma care during about ten years, as a result, the satisfied trauma team performance are realized with making full use of tactics and strategy.

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Disclosure: No significant relationships.

O122

THE ALGORITHM OF PROXIMAL FEMORAL NAIL USE FOR SURGICAL TREATMENT OF TROCHANTERIC FRACTURES

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Introduction: 59 per cent of all femur fractures are trochanteric fractures, and most of them happen to elderly and old people suffering from various concomitant chronic somatic diseases.

Materials and methods: We analysed the results of treatment of 94 patients suffering from trochanteric fractures, who underwent treatment by proximal femoral nail. The IM nailing was performed according to the developed algorithm based on the following criteria: AO fracture type, existence of severe concomitant injuries, presence of systemic osteoporosis. Depending on these factors we made static or dynamic IM nail locking, or used no distal cortical screws at all. Thus, in cases of A1 fractures with undamaged trochanteric outer wall distal cortical screws are needless. A2 fractures are unstable, fragmented, and both cortical screws should be inserted. A3 fractures

have only rotational instability, and require only one cortical screw insertion into the lower part of oval hole.

Results: Results of treatment have been monitored for up to two years. Using the algorithm we increased by 27.4 per cent the good results of treatment and social adaptation of our patients and by 9.3 per cent decreased the amount of dissatisfactory results compared to the control group.

Conclusion: The developed approach to treatment of the patients suffering from different types of trochanteric fractures promoted improving the results of treatment and further rehabilitation, and facilitated social adaptation of the patients.

Disclosure: No significant relationships.

O123

LONG TIME RESULTS OF THE XS NAIL OSTEOSYNTHESIS OF FRACTURES UNDER TENSION LIKE PATELLA AND OLECRANON

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Introduction: Fractures under tension always show tendon insertion on the bone surface and so tension belt wires never can be placed directly on the bone surface on the shortest way and therefore loosening after alternating load occurs. The eccentric position of the tension belt also leads to distraction of the articular surface. A tension belt however is a static system in which the compression forces are bigger than the maximal occurring tension load so that a dynamic tension belt is not possible and would lead inevitably to a fatigue break of the implant. Examinations from Brill & Hopf 1987 already showed that after only 1 s there is no compression on a patella at all.

Materials and methods: To avoid these disadvantages of tension belt osteosynthesis we use for patella and olecranon fractures after open reduction a straight locked nail with 4.5 mm diameter the XS nail. Locking is performed on the whole width of the fracture with angle stable threaded wires. Due to the oval proximal holes of the nail with a compression screw the fracture can be additionally be compressed independent from the soft tissues. In a prospective monocenter examination from 2002–2005 132 patients with patella and 108 patients with olecranon XS nail osteosynthesis were analysed. 67 Patella- and 49 olecranon fractures were isolated fractures and were evaluated at 3 to 6 years. 61 % of the patella and 65 % of the olecranon fracture patients could be reexamined clinically and radiological according to the Scores of Soltzmann for the patella and Mayo Elbow score for the olecranon.

Results: The Soltzmann score for patella fractures was 90 points and so very good. Only 2 patients showed poor results with 50 and 66 points. The Mayo elbow score was 92 and so also very good. Only 2 patients with very complex fractures had unfavorable results.

Conclusion: The XS nail allows a stable Osteosynthesis of patella and olecranon fractures. The functional and radiological results are very good. The intraosseous position increases stability and maximal soft tissue protection.

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Disclosure: I am inventor of the implant but no financial interest in this study.

O124
**MODIFIED PLATE DESIGN FOR LOCKING
OSTEOSYNTHESIS OF THE DISTAL HUMERUS IN
OSTEOPOROTIC BONES**

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Introduction: Distal humeral fractures represent 3 % of all fractures with a relevant peak in elder women. The treatment of this injury in the osteoporotic bone is still a challenging mission for surgeon and material. Respecting the demographic evolution the number of these injuries will rise and demands adapted material for stabilization.

Materials and methods: Biomechanical comparison of an new distal humeral locking plate (Litos, Ahrensburg, Germany) with a standard AO-Plate and a locking plate, focussing on the Bone-Implant-Interface under static and dynamic load. The implants were attached to synthetic bones (1.64 g/cm) and proximally shortened. The plates were fixed to the bone, removed and the bone cut to simulate fracture type 22C2.3 with a 5 mm fracture zone. A total of 24 testbones were fixed to the testing machine and static load tests in extension and flexion carried out. Dynamic testing was performed using 5.000 cycles. Results were obtained by optical measurement and internal programs.

Results: In our test no implant failure occurred. Implant failure was defined as screw pull out or fracture movements more than 2 mm. In the static load test in extension the new designed plate was statistical significant superior to the AO-plate, but not to the TiFix-plate. In flexion the TiFix-plate was significant superior to both. No relevant deformity was measured in the dynamic testing.

Conclusion: The superiority of locking plates to conventional plates is confirmed. Probably differences in the fixation technique or due to the fixation-fracture-sequence co-influence our results. Additional testing and clinical evaluation of the soft-tissue effect are necessary to evaluate the benefits.

Disclosure: No significant relationships.

pilot study investigates if training with a 3D immersive spatial cognition trainer (SCT) transfers on spatial standardized tasks (MRT, VVT).

Materials and methods: Sixteen 4th year medical students (mean age 24, 9 women, 7 men) were randomly assigned to receive either training (case) or no training (control). The case group practiced 3D manipulations with the SCT through 4 levels of increasing difficulty. Both groups completed the Mental Rotation Test (MRT) before and after the training and the Visualization of Viewpoints Test (VVT) after training.

Results: With similar mental rotation ability (MRT-A) prior to examination ($t(15) = 1.621, p = .222$), performance in mental rotation of the control group improved substantially (MRT-B) whereas there was no significant change in the training group ($F(1, 13) = 6.76, p = .002$). There was no difference in VVT test between groups ($t(15) = 0.017, p = .898$).

Conclusion: Findings could be explained by the short training duration, as well as a possible cognitive overload when manipulating 3D models for the training group. Future research will address the influence of spatial training on surgical tasks.

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Disclosure: No significant relationships.

O126
PREHOSPITAL USE OF MOBILE NEAR-INFRARED SPECTROSCOPY TO DIAGNOSE INTRACRANIAL HEMATOMA

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Introduction: Patients with traumatic brain injury (TBI) with traumatic intracranial hematomas must be promptly identified and surgically evacuated. A non-invasive hand held screening device using near-infrared spectroscopy (NIRS) technology allows a preliminary estimate of an intracranial hematoma. We are the first in Europe testing prehospitally a small mobile NIRS scanner (Infrascanner 2000) in order to diagnose intracranial hemorrhages in patients with TBI.

Materials and methods: We prehospitally tested the use of Infrascanner Model 2000, during our work on the Nijmegen Helicopter Emergency Medical Service (Lifeliner 3, one of the 4 Dutch HEMS). All patients with suspected TBI were included and were scanned using the Infrascanner in the prehospital situation. We recorded the easy-to-use, the time needed for measuring and the data were validated with the results of the CT scan in-hospital. The study was started October 1, 2014.

Results: Since the start of the study, we have scanned several patients prehospitally, in which the Infrascanner2000 has proven to be a useful tool, easy in use and taking only a small amount of time for scanning patients. At the ECTES congress in may 2015 we will present our data of a 3 months test period with prehospital use.

O125
Spatial Ability Training in a 3D Immersive Environment. A Pilot Study

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Introduction: Surgical tasks require understanding 3D information based on 2D representations. Evidence in the literature suggests that training, or playing 3D games can improve spatial abilities. This

Conclusion: This study investigates the prehospital use of the device in patients with TBI. It shows that handling is easy to learn and measurements of cerebral hemorrhage can be repeatedly done, even under emergency conditions. Further studies to assess the validity of this device prehospital are necessary.

References: 1. The use of handheld near-infrared device (Infrascanner) for detecting intracranial haemorrhages in children with minor head injury. Bressan S, Daverio M, Martinoli F, Dona' D, Mario F, Steiner IP, Dalt LD. *Childs Nerv Syst.* 2014 Mar;30(3):477–84. 2. Clinical evaluation of a portable near-infrared device for detection of traumatic intracranial hematomas. Robertson CS, Zager EL, Narayan RK, Handly N, Sharma A, Hanley DF, Garza H, Maloney-Wilensky E, Plaum JM, Koenig CH, Johnson A, Morgan T. *J Neurotrauma.* 2010 Sep;27(9):1597–604.

Disclosure: The infrascanner Model 2000 can be field tested for three months free of charge.

O127

BIOMECHANICAL EVALUATION OF AUGMENTED VERSUS NON-AUGMENTED SACROILIAC SCREWS IN A NEWLY DEVELOPED HEMI-PELVIS MODEL

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Introduction: Operative treatment of sacral insufficiency fractures in osteopenic bone can be fraught with difficulties, one of the most important being implant fixation^{1,2}. Cement augmentation of implanted sacroiliac (SI) screws may lead to superior construct stability and prevent certain failure modes, especially screw loosening^{3,4}. The aim of this study was to biomechanically investigate the effect of augmented versus non-augmented SI screws on cycles to screw failure in a cadaveric hemi-pelvis model.

Materials and methods: A novel hemi-pelvis model was developed to test five fresh-frozen cadaveric pelvi. Each pelvis was bilaterally osteotomized through the sacral ala and fixated with SI screws. Cement was introduced through the screw randomly to either side of each pelvis, leaving the contralateral side non-augmented. Each specimen was tested twice, connecting the respective side of the Ilium to the machine base, and applying superimposed cyclic axial compression forces and torsional moments to the sacrum. Screw fixation was analyzed fluoroscopically to asses for the following events recorded as screw failure: loosening, cut-out or pull-out. Optical motion tracking was used to evaluate construct stability.

Results: Screw loosening was observed three times with non-augmented and twice with augmented screws. Cement augmentation resulted in a significantly higher number of cycles to screw failure than non-augmentation (augmented: 14000 ± 1409 ; non-augmented: 2680 ± 2185 , $p < 0.05$). There was no significant difference between augmented and non-augmented state in overall construct stability.

Conclusion: Cement augmentation significantly improved time to screw failure in the sacrum. The developed hemi-pelvis model was found to be valid for reproduction of clinically observed failure modes, specifically that of screw loosening.

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O128

QUALITY OF LIFE IN PATIENT WITH MULTIPLE TRAUMA: DIFFERENCE 10 VERSUS 20 YEARS AFTER ACCIDENT

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Introduction: Due to improvements in trauma and intensive care treatment more patients survive severe trauma. However, in those patients physical and mental disorders are common. We performed a long term analysis at two different time points to assess the quality of life and dynamics in patients sustained multiple trauma.

Materials and methods: A standardized SF (short form 12) questionnaire was administered to 637 multiply injured patients aged between 3 to 60 years old at time of trauma. Inclusion criteria: multiple trauma and treatment at level 1 center. The SF 12 includes the analysis of physical health score (PHS) and mental heath score (MHS) and associated sub scores ($n = 8$). Moreover, all data were compared with the representative German population.

Results: 299 patients completed the questionnaire and were included to this study. Demographic parameters: male ($n = 223$) 74.5 %; ISS median = 19, mean 20 ± 9.3 points; age 25 ± 11.7 years at time of injury; mean follow up (time point I) 18 years and (time point II) 28 years. PHS was significantly higher in German representative population (48.2 ± 9 points) than scores measured at follow up in trauma patients (2001: 44.9 ± 10 point and 2011: 38.9 ± 13 point, $p = 0.0001$). At time point of follow up (I) MHS was not different to levels measures in healthy German population.

Conclusion: Reduced physical quality of life was observed in all age groups after multiple trauma. Quality of life appears to decrease further with aging of the patient. Physical rehabilitation is of immense important in patient after multiple trauma to maintain physical status.

Disclosure: No significant relationships.

O129

PRE-HOSPITAL HYPOTENSION IS ASSOCIATED WITH ALTERED INFLAMMATION DYNAMICS AND WORSE OUTCOMES FOLLOWING BLUNT TRAUMA IN HUMANS

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Introduction: To define the impact of pre-hospital hypotension on the dynamic, systemic acute inflammatory response to blunt trauma. **Materials and methods:** From a cohort of 472 blunt trauma survivors studied following IRB approval, two stringently matched sub-cohorts were derived. 22 patients who sustained pre-hospital hypotension following blunt trauma (15 males and 7 females; age: 45 ± 3.8 ; Injury Severity Score [ISS]: 20.7 ± 1.8) were matched with 28 normotensive trauma patients (20 males and 8 females; age: 46.1 ± 2.5 ; ISS: 20.8 ± 1.3). Serial blood samples (3 samples within the first 24 h and then from days 1 to 7 post-injury) were assessed for 24 mediators using Luminex™, and NO₂—/NO₃— was measured using the nitrate reductase/Griess assay. Two-Way ANOVA was used to compare groups. Dynamic Bayesian Network (DyBN) inference was utilized to infer causal relationships based on probabilistic measures.

Results: Statistically significant differences were observed in ICU LOS, total LOS, days on mechanical ventilator, and Marshall MODScore between hypotensive and normotensive patients. Shock markers (shock Index, pH, lactate, and base deficit) were significantly altered in hypotensive patients. Plasma levels of chemokines (MCP-1/CCL2, IP-10/CXCL10, MIP-1α/CCL3, IL-8/CCL8) and cytokines (IL-6, IL-10, IL-17, GM-CSF, IL-1β, IL-7), as well as sIL-2R α were significantly elevated over the first 7 days post-injury in the hypotensive vs. normotensive patients. DyBN suggested that the chemokines MCP-1/CCL2 and MIG/CXCL9 in the hypotensive and normotensive patients, respectively, affect plasma IL-6 levels differentially in the initial 24 h post-injury.

Conclusion: Studies in stringently-matched cohorts suggest that an episode of pre-hospital hypotension post-trauma leads to early, dynamic reprogramming of systemic inflammation, and worse outcomes.

Disclosure: No significant relationships.

THE ACUTE CARE SURGEON

O130

COMPARISON OF LAPAROSCOPIC AND OPEN APPENDECTOMY: 5-YEAR SINGLE CENTER EXPERIENCE

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Introduction: Acute appendicitis is the most common cause of acute abdomen and a major part of the emergency surgical interventions. The aim of our study is to examine to laparoscopic or open appendectomy cases demographic data, length of stay and morbidity.

Materials and methods: Between January 2008 June 2013 with the diagnosis of acute appendicitis in 1490 patients who underwent surgery were analyzed retrospectively. The data were analyzed with SPSS 16.0 software package.

Results: 546 laparoscopic cases (37 %), 944 cases open surgery (63 %) underwent appendectomy procedure. Mean age was 31.4 years of laparoscopic surgery group, open surgery group was 33.7 years. 296 patients in the laparoscopic group (54 %) were male and 621 patients in open group (65 %) were male. the average length of hospital stay was 1.5 days at laparoscopy group, 2.1 days at open surgery group. At laparoscopy group, the mean length of hospital stay were significantly shorter than the open surgery group ($p=0.003$). 25 patients (4 %) at Laparoscopy group, 43 patients (4 %) at the open surgery group that extends the length of stay or requiring re-hospitalization morbidity (superficial surgical site infection and/or deep surgical site infection) were observed. There was no statistically significant difference between the two groups

Conclusion: Laparoscopic surgery is preferred in terms of patient comfort and earlier return to work. Between the open surgery, and laparoscopic surgery, in terms of length of stay and wound infection, was shown to be statistically significant difference in favor of laparoscopic surgery. With increased experience in laparoscopic surgery will increase for treatment of acute appendicitis.

Disclosure: No significant relationships.

O131

IMPLEMENTATION OF A NOVEL SURGICAL ADMISSION PROFORMA IN A SUB-SPECIALISED EMERGENCY GENERAL SURGICAL UNIT TO IMPROVE PROVISION OF CARE

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Introduction: The Emergency General Surgery Unit (EGSU) at Aintree University Hospital, Liverpool, is a busy subspecialised unit. The high volume of patients admitted to the unit is reflected in recent evidence showing significant increases of emergency surgery nationwide [1]. The NHS commissioning board produced ‘Commissioning for Quality and Innovation (CQUIN): guidance’, to improve quality, safety and outcomes [2]. These include; dementia assessments and venous-thromboembolism (VTE) assessment. This project audits the completion of CQUIN targets, and implementation of a novel surgical admission proforma.

Materials and methods: Patients admitted to the EGSU were audited over two 3-week periods pre and post-introduction of the proforma. Items audited included: VTE assessment and prescription, regular medication prescribed and dementia assessment. Qualitative feedback was obtained from online surveys in order to further develop and improve the proforma.

Results: A total of 232 consecutive patients were included in this study, 102 pre-introduction of the surgical admission proforma, 130 post-introduction of which 88 (68 %) the surgical admission proforma was used. VTE assessment completion significantly increased post-introduction of the proforma (pre 62.1 % vs post 81.8 %, *** $p > 0.001$). This was reflected in VTE prescription (pre 64.1 % vs 81.8 %, *** $p > 0.001$). Where the proforma was used, 98 % of VTE assessments were completed. Dementia assessment significantly increased post-introduction (9.1 % vs 56 % respectively).

** $p < 0.01$. Introduction of the proforma did not increase prescription of regular medication.

Conclusion: Implementation of a novel surgical admission proforma has significantly improved the completion of CQUIN targets integral to patient safety and care. This surgical admission proforma can easily be transferred for use in any other EGSU.

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Disclosure: No significant relationships.

O132

ANTIBIOTIC VS. SURGERY IN UNCOMPLICATED ACUTE APPENDICITIS (ASAA): FINAL RESULTS?

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Introduction: The acute appendicitis (AA) is a very common disease with a life time risk 7–8 % and the highest incidence in the second decades. The mortality rate of appendectomy is 0.07–0.7 % and 0.5–2.4 % in patients respectively without and with perforation and 30 years post appendectomy bowel adhesions reach about 13 %. In 2013 we already presented on ESTES meeting the preliminary results of the ASAA study (Antibiotic vs. Surgery in no-complicated Acute Appendicitis) which is a no-inferiority prospective randomized trial comparing surgery to antibiotic in uncomplicated AA.

Materials and methods: the Andersson score joined to US is used to select patients. Ertapenem has been choosed for the antibiotic arm, closed envelop method and computer randomization has been utilized. Primary Outcome: evaluation in both arms of the rate of patients free of symptoms into 2 weeks (from operation in the surgery group or from the third Ertapenem administration in the antibiotics group) with no pain, no fever, WBC ≤ 10000 , CRP ≤ 1 .

Results: after 3 years we observed 260 patients with suspected appendicitis. We observed about 50 % of no randomization. The patient where then analyzed according to the study design and to the intention to treat. Antibiotic was successful in about 80 %. Relapse of appendicitis was treated by uneventful surgery in 90 % of cases. Readmission after primary surgery occurred in about 10 %.

Conclusion: despite antibiotic for uncomplicated AA is safe, the high rate of no randomization and its reasons could suggest different study designs to approach the right answers for patients affected of AA.

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Disclosure: No significant relationships.

O133

MULTIDISCIPLINARY APPROACH IN EDUCATING ACUTE CARE TRAUMA SURGEONS

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Introduction: Modern medicine requires complex training of the physicians, in order to face the rapid changes of pathology and therapeutic means. The objective of this paper is to present a multi-disciplinary approach in training orthopedic surgeons, using e-learning as an educational tool.

Materials and methods: This paper presents the experience expanding the results of the Leonardo da Vinci project (transfer of innovation), named “A Web-based E-Training Platform for Extended Human Motion Investigation in Orthopedics”, addressed to skeletal trauma surgeons, with interdisciplinary approaches. The main result of the project is a Virtual Training & Communication Center ORTHO-eMAN for innovative education - on-line education and training material accessed using a standard web browser, which provides an integrated on-line learning environment.

Results: The teaching materials were created by a multi-disciplinary team, and the unique feature of this e-learning platform is that it contains not only courses, but also interactive training material with real clinical case studies. The trainees analyze the given clinical or imagistic information, regarding the patient, and establish, within an interactive process, the diagnosis and treatment. As in real situations, each step of the algorithm must be followed, otherwise the outcome of the patient is negative.

Conclusion: Complex changes in medicine concerning diagnosis and treatment generated major educational challenges, since medical training has to reflect the multi-disciplinary approach of modern medicine. The project presented in this paper uses a pluridisciplinary approach and significantly improves the image-based diagnostic and therapeutic skills of the orthopedic trainees, which were not at all targeted by the classical “courses and dissections”.

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Disclosure: No significant relationships.

O134

THE EFFICIENCY OF EMERGENCY SURGICAL CARE IN A LONDON DISTRICT GENERAL HOSPITAL

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Introduction: We audited our institution's emergency surgery provision against the auditable standard outlined in the Royal College of Surgeons of England's *Standards for unscheduled surgical care*. This

report mandates that emergency surgery patients receive surgery within a timescale concordant with their degree of illness.

Materials and methods: Retrospective analysis of 100 emergency general surgical operations over a two-month period. Patients were stratified according to degree of illness per Royal College guidance, from grade 1 (ongoing haemorrhage) to 5 (no systemic sepsis). The primary outcome was interval from decision for surgery to start of surgery. Timings were compared with those outlined in the report's 'timescale of intervention'.

Results: A mean of 17 hours elapsed between admission and decision for surgery. Registrars made the majority of these decisions (64 %), consultants 21 %, and senior house officers 15 %. Stratifying patients, 8 % were grade 3 (severe sepsis with organ dysfunction) and only 5/8 of these patients received surgery within the designated six-hour period. 39 % of patients were grade 4 (sepsis without organ dysfunction) and, of these, 9/39 breached the limit of 18 hours. 53 % patients were grade 5 (no designated time limit for surgery).

Conclusion: At our district general hospital, 26 % of the most acute, grade 3–4 patients failed to receive timely surgery. Surgical assessment and treatment are essential aspects of emergency care. Evidence shows that systems of emergency surgery that have centralised treatment into larger units offer significantly improved care and treatment outcomes. Centralising London's emergency surgical care may result in fewer operative delays and improved patient outcomes.

Disclosure: No significant relationships.

O135

IMPLEMENTATION OF AN ACUTE CARE SURGERY SERVICE FACILITATES ADHERENCE TO MODERN CLINICAL PRACTICE GUIDELINES FOR GALLSTONE PANCREATITIS

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Introduction: Current practice guidelines for the management of gallstone pancreatitis (GSP) recommend early cholecystectomy (EC) upon patient stabilization and bile duct clearance, preferably, on the index admission. Historically, it has been difficult to achieve this due to a lack of emergency surgical resources. We sought to investigate whether the implementation of an acute care surgery (ACS) model allowed us to better achieve the current practice guidelines for GSP.

Materials and methods: Retrospective review on all patients admitted with diagnosis of GSP to two tertiary care university based teaching hospitals from January, 2002–October, 2013. Patients were divided into pre-ACS (2002–2009) and post-ACS (2010–2013) eras. Only one hospital implemented an ACS service. Data were collected regarding demographics, admissions, timing of cholecystectomy and emergency room visits. Multivariate logistic regression was used to determine predictors of index cholecystectomy.

Results: Prior to implementation of an ACS service, the rate of index cholecystectomy was 3 % at both hospitals. The rate of index cholecystectomy significantly increased at both sites in the post-ACS era; 2.4 % to 67 % ($p < 0.001$) at the ACS site and 3.8 % to 26 % ($p < 0.001$) at the non-ACS site. The presence of an acute care surgery team was highly predictive of index cholecystectomy (OR 10.4, 2.0–55.1) as was post-ACS era (OR 9.1, 3.0–27.5). An overall readmission rate of 24.9 % was found in patients who did not undergo a cholecystectomy during the index admission.

Conclusion: The implementation of an ACS service resulted in a higher rate of index cholecystectomy and allowed for increased adherence to clinical practice guidelines for GSP.

Disclosure: No significant relationships.

O136

WHY PATIENTS DIE IN THE OPERATING ROOM. RATIONALE FOR ADVANCED VASCULAR TRAINING OF THE NEXT GENERATION OF TRAUMA SURGEONS

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Introduction: Trauma remains the leading cause of death for individuals under the age of 50. We hypothesize that intraoperative deaths are influenced by a variety of pre-hospital, emergency department and intraoperative factors. To identify areas for improvement in trauma surgeon care, we analyzed all-cause mortality for trauma patients who were brought to the operating room but did not survive surgery.

Materials and methods: Trauma database from July 2009 to June 2014 was screened for trauma patients who died in the operating room. Patient demographics and injuries were acquired and pathology charts/attending surgeon dictations were reviewed for cause of death.

Results: Fifty four patients met the inclusion criteria. The median age was 33, median ISS was 35.5. Mechanism was evenly distributed between penetrating and blunt trauma (51 vs 49 %). Emergency department thoracotomy was preformed on 50 % of patients and 67 % of patients had their aorta cross-clamped. Injury pattern distribution was 38 % major vascular, 20 % lung, 20 % pelvis, 17 % brain, 13 % cardiac and 7 % major liver. Operative reports indicated that the cause of death was uncontrolled bleeding in 42 % of patients, lethal arrhythmia in 35 %, refractory shock in 20 % and non-survivable head trauma in 4 % of patients.

Conclusion: Trauma patients die in operating room predominantly from major vascular injuries and inability to gain hemostatic control. In combination with lethal arrhythmias, this represents nearly 3 of 4 deaths in the operating room. While not all of these injuries may have been survivable, these data validate that training future trauma surgeons in vascular and circulatory support may help reduce mortality.

References:

Disclosure: No significant relationships.

TRAUMA SYSTEMS

O137

PATTERNS OF SURGICAL PRESENTATIONS AT AN AFRICAN REGIONAL REFERRAL HOSPITAL: SURVEILLANCE AS A STEP TOWARDS IMPROVING ACCESS TO CARE

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Introduction: Surgical disease is increasingly recognized as a significant source of disease burden in Africa. Efforts have been made to describe surgical disease and capacity at the district hospital level. Little is known about patterns seen at regional hospitals supporting the district hospital network.

Materials and methods: This retrospective study was conducted at Uganda's Soroti Regional Referral Hospital, serving eight district hospitals. Data were collected from July 2010 to June 2011 using operative and inpatient records. Univariate and bivariate analyses were performed to explore patterns of procedures performed and inpatient diagnoses.

Results: There were 8,511 procedures recorded in the operative log over 12 months, averaging 709 per month. Caesarian sections (41.0 %), dilation and evacuations (28.0 %), and laparotomies (19.0 %) were the most frequent. Referrals to Soroti averaged 260 per month, while transfers out averaged 5 patients per month. Inpatient records documented 2966 surgically-related diagnoses over the 11 months available. In patients over 4 years old, 23 % of mortality was due to surgical disease, 33 % of which was trauma-related. Women comprised 80 % of violent injury. Common hospital record elements, such as demographic data, relevant clinical information, and operative notes were absent.

Conclusion: The World Health Assembly recently recognized strengthening of first referral hospitals as a crucial element to achieving universal health coverage. Inconsistencies in record keeping despite the large volume of surgical disease seen at this regional referral hospital suggest that sustainable surveillance systems and capacity building at the referral hospital level are potential building blocks to improving access to surgical care.

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Disclosure: No significant relationships.

O138

PATTERNS OF INJURY AT A TRAUMA CENTER IN INDIA: OPPORTUNITIES FOR INJURY PREVENTION

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Introduction: In India, the WHO estimates that 10 % of deaths and 13 % of disability-adjusted life years lost are due to injury. The purpose of this study is to describe patterns of injury among patients treated at a tertiary trauma center in Mumbai in order to identify opportunities for targeted injury prevention strategies.

Materials and methods: This is an analysis of data from an institutional trauma registry. All patients presenting to the hospital with life- or limb-threatening injuries over a 16 month period were included. Univariate and bivariate analyses were performed for demographic characteristics, injury mechanisms and clinical outcomes.

Results: A total of 1115 patients met inclusion criteria, with mean age 31 years and 88 % male. In-hospital mortality in this severely injured cohort was 32 %. The most common mechanisms of injury were blunt assault (33 %), road traffic injuries (32 %) and falls (24 %). In a sub-group analysis of road traffic injuries, 52 % of those injured were pedestrians struck by vehicles, 30 % were injured while riding motorcycles or bicycles, and 18 % were motor vehicle collisions. Mortality was highest among pedestrians struck by automobiles (38 %) and blunt assault victims (37 %), and lowest among victims of penetrating injuries (4 %).

Conclusion: While injury prevention is a major public health concern worldwide, it is important to understand local patterns of injury to guide targeted prevention strategies. This study highlights the utility of trauma registries in collecting crucial injury surveillance data. In this context, a focus on pedestrian safety and an investigation into potential risk factors for interpersonal violence are warranted.

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Disclosure: No significant relationships.

O139

SINUS Tarsi APPROACH WITH MINIMAL HARDWARE FIXATION IN JOINT DEPRESSION TYPE CALCANEAL FRACTURE

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Introduction: operative treatment of intraarticular calcaneal fractures is still a challenging procedure due to associated soft tissue damage and bone comminution. The sinus tarsi approach allows disimpaction, elevation, reduction and fixation of the calcaneal fragments. The use of minimal hardware limits the need for extensive soft tissue dissection. Our hypothesis was that joint depression calcaneal fractures can be effectively managed through the sinus tarsi approach and minimal hardware with good functional outcomes while minimizing wound problems.

Materials and methods: 27 closed calcaneal fractures in 22 patients (5 bilateral) were treated with open reduction and minimal fixation through the sinus tarsi approach using k-wires and screws with or without iliac bone graft. Sander classification was used to classify our patients. average timing for the operation was 8 days according to the soft tissue condition. all operations were done with assistance of image intensifier.

Results: All fractures eventually united (clinically and radiologically) with averaged time 3 months. Mean Maryland foot scores were: 92 in Sanders type II; and 87 in type III fractures at final follow-up (average 16 months). There were 2 cases of superficial infection that were effectively managed, 4 cases with pin tract infection and 3 cases with subtalar arthritis.

Conclusion: Joint depression calcaneal fractures can be effectively managed through the sinus tarsi approach and minimal hardware with good functional outcomes while minimizing wound problems.

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Disclosure: No significant relationships.

O140

IS TSF EXTERNAL FIXATOR A DEFINITIVE TREATMENT SUITABLE FOR A COMPLEX FRACTURE OF THE TIBIA? FUNCTIONAL RESULTS

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Introduction: The goal is to evaluate the hybrid external fixator Taylor Spatial Frame (TSF) as primary and definitive treatment for complex fractures of the tibia.

Materials and methods: Retrospective study was performed on 15 patients with fractured tibia (12 proximal and 3 distal) treated by the Trauma Unit of the Hospital 12 de Octubre between 2007-2013, of which 9 were open (60 %). The results were assessed by rating scale “Association for the Study and Application of the Method of Ilizarov.” Patient demographics, initial treatment type and time was recorded until placement of TSF, time to consolidate, consolidation in bad position, the number of necessary corrections and complications.

Results: 80 % were initially treated with external fixation Hoffman II, while 20 % were initially treated with TSF. The mean time to

definitive surgery was 10 days. In all cases it was necessary to make at least one setting. Bone healing was achieved in 80 % (12/15), the other needed a reamed nail (3/15). The average time for consolidation was 23.6 weeks. The functional result was excellent 60 % (9/15), good in 28 % (4/15), fair in 6 % (1/15) and poor in 6 %. The most common complications were: pin infection 73 %, injury of external popliteal sciatic nerve 20 %, 13 % delayed union and nonunion 6 %.

Conclusion: The TSF is a suitable alternative for definitive treatment in complex juxta-articular tibial fractures with soft tissue problems. The complication rate is low and predictable and is a treatment with lots of benefits: mobilization and early loading, possibility of multiplanar changes after surgery, low risk of infection.

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Disclosure: No significant relationships.

O141

AN AUDIT OF AN ALCOHOL SCREENING AND BRIEF INTERVENTION FOR TRAUMA PATIENTS IN A MULTICULTURAL SETTING: CLOSING THE LOOP ON GAPS AND BARRIERS

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Introduction: The Alcohol Screening and Brief Intervention [ASBI] program for trauma patients is a standard component of Level I Trauma Centers and previous analysis of our ASBI identified challenges and opportunities for such an intervention in the Middle East. This study will describe the process evaluation of a new ASBI program in a Trauma Center serving a culturally diverse population.

Materials and methods: A process evaluation of the initial implementation of the ASBI program was conducted using data from the trauma registry. The characteristics of non-compliance with each segment of the ASBI were identified and compared with those of compliant patients for the first 6 months of the program.

Results: 132 patients [17.1 %] were not subjected to a blood alcohol concentration [BAC] test; predictors of this non-compliance included: female gender, occupational injury mechanism and lower level of trauma activation [Level 2]. Of the 81 BAC (+) patients, only 17 met criteria [AUDIT Zone 3 or 4] for intervention by the substance abuse service. None of these patients consented to formal referral and evaluation for alcohol dependence or abuse. Barriers identified from interviews include: fear of criminal persecution or loss of employment, social stigma and denial.

Conclusion: The gaps and barriers for implementing elements of an ASBI program for trauma patients in a multi-cultural setting in the

Middle East are unique. The gaps in laboratory screening can be overcome with staff education and institutionalization of protocols. Barriers to intervention, which are more deeply imbedded in societal culture and norms, need more nuanced approaches.

References : Alcohol Screening and Brief Intervention (SBI) for Trauma Patients: COT Quick Guide. AMERICAN COLLEGE OF SURGEONS Committee on Trauma.

Disclosure: No significant relationships.

O142

THE INFLUENCE OF PREHOSPITAL TIME ON TRAUMA PATIENTS OUTCOME: A SYSTEMATIC REVIEW

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Introduction: Time is considered an essential determinant in the initial care of trauma patients. Salient tenet of trauma care is the ‘golden hour’, the immediate time after injury when resuscitation and stabilization are perceived to be most beneficial. Several prehospital strategies consist regarding time and transport of trauma patients. Literature shows little empirical knowledge on the exact influence of prehospital times on trauma patient outcome. The objective of this study was to systematically review the influence of prehospital time on trauma patients outcome.

Materials and methods: A systematic review was performed in MEDLINE, Embase and the Cochrane Library from inception to May 19th 2014. Studies reporting on prehospital time intervals for Emergency Medical Services (EMS), outcome parameters and potential confounders for trauma patients were included. The STROBE-statement was used to evaluate risk of bias.

Results: From the 20 articles considered eligible, 281.980 patients were analyzed. Results demonstrate a positive influence on mortality for the generic trauma patient when response-time or transfer-time is shorter. Contrasting increased on-scene-time and total prehospital time are associated with increased odds of survival for this population. Nevertheless rapid transport does seem to be beneficial for patients suffering penetrating trauma or neurotrauma.

Conclusion: Swiftness of transport is beneficial for patients suffering neurotrauma and the hemodynamically unstable penetratingly injured patient. For hemodynamically stable trauma patients in general, prolonged on-scene-time and elongated total prehospital time improves outcome. For the general trauma patient, focus should be on the type of care delivered prehospital and not on rapid transport.

Disclosure: No significant relationships.

O143

DIRECT TRANSPORT VERSUS INTER HOSPITAL TRANSFER OF SEVERELY INJURED TRAUMA PATIENTS

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Introduction: The trauma region North-Brabant in the Netherlands employs a trauma system where patients are initially transported to the nearest hospital for treatment. If further treatment is required, patients are transferred to a trauma centre. Only patients suspected of traumatic brain injury (TBI) are transported directly to a trauma centre with neurosurgical care. The purpose of this study was to examine the benefits of direct transport to a trauma centre versus primary treatment in a non-trauma centre followed by inter hospital transfer to a trauma centre for severely injured patients without TBI. **Materials and methods:** We used the regional trauma registry and included all patients with an Injury Severity Score (ISS) >15, and patients who died in the emergency or operating room. Patients with an Abbreviated Injury Scale >3 for head injury were excluded. A multiple logistic regression analysis was performed with potential pre-hospital confounders to produce adjusted odds ratios for mortality.

Results: A total of 441 patients were included of whom 62 patients (14 %) died in the emergency room. The median age was 48 years (interquartile range [IQR] 30–68) and the median ISS was 22 (IQR 18–29). The crude odds ratio of death was 2.2 (95 % CI 1.2–4.0). After correcting for confounders (age, pre-hospital blood pressure, ISS, Glasgow Come Scale and type of injury) the odds ratio was 2.7 (95 % CI 1.2–6.2)

Conclusion: The risk of death is significantly higher for patients who are first treated in a non-trauma centre and transferred, than patients who receive primary treatment in a trauma centre.

Disclosure: No significant relationships.

EPIDEMIOLOGY/EVIDENCE BASED TRAUMACARE

O144

PAIN EXPOSURE PHYSICAL THERAPY VERSUS CONVENTIONAL THERAPY IN PATIENTS WITH COMPLEX REGIONAL PAIN SYNDROME TYPE 1: A RANDOMISED CONTROLLED TRIAL

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Introduction: More than half of the patients with complex regional pain syndrome type 1 (CRPS-1) do not respond well to the current conventional evidence-based treatments and may progress to chronic disease with associated disabilities and restrictions in daily life. Non-randomised studies have shown that a more comprehensive CRPS-1 treatment; Pain Exposure Physical Therapy (PEPT), is safe and possibly effective. The aim of this study is to determine whether PEPT is more effective than current conventional treatment regarding CRPS related impairments, activities and quality of life.

Materials and methods: In a single-blinded randomised controlled trial, adult patients with CRPS-1 according to the ‘Budapest’ criteria were recruited and randomised to receive either Pain Exposure Physical Therapy or conventional treatment. Primary outcome was the CRPS-1 Impairment level Sum Score. Baseline measurements were performed before treatment and follow-up measurements were done at three, six and nine months after inclusion.

Results: Between January, 2009 and June, 2011, 58 patients were randomly assigned to either PEPT ($n = 29$) or CONV ($n = 29$) treatment. The Impairment level Sum Score improved significantly more in the PEPT group compared to the CONV group as primary endpoint. The estimated group difference for ISS-RV for patients that did not switch after randomisation was 3.22 (95 % CI -0.29; 6.72, $p = 0.076$). The estimated group difference for patients that switched after randomisation was 3.79 (95 % CI 0.83; 6.75, $P = 0.013$).

Conclusion: Pain Exposure Physical Therapy is a safe, non-pharmacological and effective treatment of CRPS-1 and is superior to the current evidence-based conventional treatment

Disclosure: No significant relationships.

O145

IMPAIRMENT OF PLATELET AGGREGATION IN ISOLATED TRAUMATIC BRAIN INJURY

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Introduction: Traumatic brain injury (TBI) is a leading cause of trauma morbidity and mortality worldwide; it is associated with coagulopathy and the associated sequelae. Recent data suggests that TBI-related coagulopathy may involve platelet dysfunction. We hypothesized that this functional platelet impairment occurs secondary to brain injury and is distinct from non-TBI traumatic coagulopathy.

Materials and methods: Blood samples were prospectively collected from 207 critically-injured trauma patients on arrival to a Level I urban trauma center, and sequentially to 120 hours. Platelet function was assessed using impedance aggregometry. Conventional coagulation testing, factor levels and functional viscoelastic assays were also measured. Demographics, injury characteristics, treatment and comprehensive outcome data were prospectively collected; associations between patient characteristics, platelet function, and outcomes were analyzed.

Results: 43 patients had isolated-TBI, and 164 patients had non-TBI trauma. There were no significant differences between these groups with respect to prehospital fluids, admission pH and base deficit, early blood product administration, or mean admission platelet count (all $p = \text{NS}$). As measured by platelet impedance aggregometry, 55 % of isolated-TBI patients had platelet hypofunction at admission and 95 % at some point during their hospital course. Platelet hypofunction was more prominent with isolated-TBI compared to the non-TBI trauma cohort.

Conclusion: Patients with isolated-TBI have significant impairment of platelet function after injury compared to those with non-TBI trauma. This difference is observed early and is most prominent in the first 24-hours after injury. Traumatic brain injury may inhibit platelet function through pathways that are distinct from those in other types of injury.

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Cohen MJ, Manley GT. Coagulopathy after traumatic brain injury. *Neurosurgery* 2012;70:1334–45. 4. Greuters S, van den Berg A, et al.; ALARM-BLEEDING Investigators. Acute and delayed mild coagulopathy are related to outcome in patients with isolated traumatic brain injury. *Crit Care* 2011;15:R2.

Disclosure: No significant relationships.

O146

PROVIDING SUPPORT FOR YOUNG PEOPLE DURING THE ACUTE HOSPITAL PHASE OF CARE FOLLOWING MAJOR INJURY: A QUALITATIVE STUDY OF FAMILY MEMBERS

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Introduction: Family members' experience of providing support for young people during the acute hospital phase of care following major injury: a qualitative study

Materials and methods: This study is part of the explanatory follow-up phase of a mixed methods study. Epidemiological methods in Phase 1 provided context and sampling priorities for this qualitative phase^{1,2}, comprising of two participant groups: a purposive sample of young people (aged 16–24 years) admitted with major traumatic injury to a Level 1 Trauma Centre; and their family. This paper reports on experiences and perspectives of 10 family participants. Single semi-structured in-depth interviews were conducted and transcribed verbatim. Data were managed using NVivo software, and analysed using thematic analysis.

Results: Findings reveal that family support hinges on how family members perceive the injury event. Driven by an intrinsic need to protect the injured young person, family members seek to control potential emotional impacts of injury, creating a buffer between the young person and all other people including healthcare professionals. This process is seen by family members as safeguarding the psychological well-being of the young person, facilitating their transition back to independence.

Conclusion: This study identifies iterative changes in family dynamics across the injury trajectory, extending our understanding of the broader burden of injury. Key elements of family resilience offer a useful framework for the development of anticipatory guidance for clinicians that are responsive to the emotional needs of patients and families, supporting the need for a family-centred care approach to managing major traumatic injury in young people.

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Disclosure: No significant relationships.

O147

VITAMIN D DEFICIENCY IN PEDIATRIC FRACTURE PATIENTS: PREVALENCE AND RISK FACTORS

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Introduction: The primary aim was to determine the prevalence of vitamin D deficiency in a pediatric fracture population and secondly to identify risk factors for this deficiency.

Materials and methods: This cross-sectional study included all pediatric patients (age <18 years), who were conservatively or operatively treated for a fracture of the upper or lower extremity between 1 September 2012 and 1 October 2013. A serum calcidiol level < 50 nmol/L was defined as vitamin D deficiency. In case of a deficiency, one month supplementation with 2000 IU vitamin D daily followed by three months 400 IU daily was applied. A multivariable logistic regression analysis was performed to identify independent risk factors for vitamin D deficiency.

Results: A total of 187/587 (32 %) eligible children were included in the study; 108 boys (58 %) and 79 girls, with a mean age of 11.1 years (SD 3.9) and with 189 fractures (43 % were distal forearm fractures). Sixty-four patients (34 %) were vitamin D deficient, including 9 severely deficient (calcidiol < 25 nmol/L). Higher age, non-Caucasian skin type and spring season were independent risk factors for a vitamin D deficiency. Non-Caucasian skin type was also an independent risk factor for a severe deficiency. After four months treatment with cholecalciferol, 74 % of the initially vitamin D deficient children were no longer vitamin D deficient.

Conclusion: Clinicians treating children with a fracture may consider routine supplementation with a safe dose of 800 IU cholecalciferol per day during 4 months, in all children with a non-Caucasian skin type and in children with a Caucasian skin type during winter and spring.

Disclosure: No significant relationships.

O148

VENOUS THROMBOEMBOLISM IN MULTITRAUMA PATIENTS

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Introduction: Multitrauma patients face the highest risk in developing venous thromboembolism (VTE). Thromboprophylaxis is indicated in these patients, but should be given with caution because of the associated risk with hemorrhages. Worldwide, there is still no consensus about prophylactic therapy in these patients. In this study we compare the occurrence of VTE and therapy-induced hemorrhagic complications between two hospitals with different thromboprophylactic policies.

Materials and methods: International trauma registry based study involving University Medical Center Utrecht (UMCU), Utrecht, the Netherlands, and Harborview Medical Center (HMC), Seattle, United States. HMC maintains a more restrictive thromboprophylactic policy for multitrauma patients compared to UMCU.

Inclusion criteria: Multitrauma patients (ISS ≥16), ≥18 years, registered in the institutional trauma registry. In UMCU admitted in 2013, in HMC admitted in April–December 2013.

Results: Included patients: UMCU = 279, HMC = 974. In UMCU, 75.6 % received chemical prophylaxis, of whom 71.6 % < 48 h after arrival, no patients received a vena cava filter. In HMC, 71.7 % received chemical prophylaxis ($p = 0.488$), of whom 46.7 % < 48 h, ($p < 0.001$), 12.0 % received a vena cava filter.

In UMCU, VTE occurred in 3.8 % compared to 1.4 % in HMC ($p = 0.824$). Odds Ratio (OR) adjusted for age, ISS, and hospital length of stay was 2.397 ($p = 0.102$). Therapy-induced bleeding was 1.4 % in UMCU compared to 1.0 % in HMC, adjusted OR = 0.586 ($p = 0.383$).

Conclusion: There was no significant difference in the number of patients who received chemical thromboprophylaxis; more patients in UMCU received thromboprophylaxis <48 h after arrival.

The results of this study showed no significant difference in the occurrence of VTE or hemorrhagic complications between hospitals with different thromboprophylactic policies.

Disclosure: No significant relationships.

O149

FUNCTIONAL OUTCOME 6 MONTHS AFTER TREATMENT FOR HIP FRACTURES: COMPARISON BETWEEN A COMPREHENSIVE CARE PATHWAY AND CARE AS USUAL

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Introduction: In elderly people a fractured hip is a common injury. These fractures have a strong negative effect on activities of daily living and quality of life. Comprehensive care pathways are developed to make the care for these patients better and more efficient. To investigate the effect on functional outcome after 6 months the results of patients treated in a care pathway were compared with patients who received care as usual.

Materials and methods: A prospective cohort study was conducted in which the care pathway of one hospital (study cohort) was compared with usual care in another hospital (control cohort). Patients aged 60 years and older with a hip fracture were included. Patients were interviewed six months postoperatively and the Harris Hip Score was assessed. The Katz Index and the Lawton Index were used to assess the ability to perform activities of daily living (ADL) and instrumental ADL.

Results: In total, 360 patients were included (study cohort N = 191; control cohort N = 169). Mean age was 79 vs 80 years ($p = 0.60$). Median ASA classification in both cohorts was 2 ($p = 0.72$). At 6 months, the median Harris Hip Score was 77 vs 76 ($p = 0.45$). The KATZ Index was comparable in both groups (median score of 6, $p = 0.60$). The Lawton Index was also the same in both groups (median score of 6, $p = 0.58$).

Conclusion: A comprehensive care pathway for hip fractures does not lead to a better functional outcome nor the ability to perform ADL tasks 6 months after treatment.

Disclosure: The study has had a grant from Biomet® and Trauma Centre Northern Netherlands, a department of the University Medical

Center. These organizations do not have any influence on the design nor publications of the study. The grant is used to.

O150

SEVERE TRAUMATIC BRAIN INJURY IN BERN, SWITZERLAND AND THE USA: DIFFERENT PREHOSPITAL MANAGEMENT, COMPARABLE OUTCOMES

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Introduction: The ideal prehospital management of patients with severe traumatic brain injury (TBI) including the impact of endotracheal intubation (ETI) and physicians on scene is unclear. Prehospital management differs substantially in Switzerland and the USA: in Switzerland there is usually a physician on scene who performs ETI, whereas in the USA prehospital management (including ETI) is performed by paramedics.

Materials and methods: Retrospective comparative cohort study of patients with isolated blunt severe TBI(head AIS 4–5) and no major extracranial injuries, utilizing the Bern University Hospital data from the Swiss PEBITA (TBI-specific) database and the U.S. National Trauma Data Bank (NTDB) 2009–2010. A 1:4 cohort matching of Bern and U.S. patients was performed. Matching criteria were sex, age (+/−10 years), exact field GCS, exact head AIS, and injury type (subdural hematoma, epidural hematoma, intraparenchymal hemorrhage, intraventricular hemorrhage, brain edema/swelling, brain stem injury). The matched cohorts were compared with univariable analysis (Fisher's exact and Mann-Whitney U test).

Results: Matching of the Bern (n = 128) and U.S. cohort (n = 86'375) resulted in 380 matched cases (76 Bern and 304 U.S.). Bern patients had significantly longer field times (mean 26 vs 11 min, p = 0.000) and transport times (103 vs 56 min, p = 0.000), more prehospital ETI (34 vs 19 %, p = 0.008), and more air transportation (42 vs 21 %, p = 0.000). There were no significant differences in procedures (craniotomy/craniectomy, ICP-monitoring, tracheotomy), outcome variables (ICU and total LOS, ventilator days), and in-hospital mortality (16 vs 17 %, p = 0.865).

Conclusion: The different prehospital management of patients with severe TBI in Bern, Switzerland and the USA is reflected in longer field and transport times and more prehospital ETI in Bern patients. However, there were no significant differences in outcomes.

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Disclosure: No significant relationships.

NEW TECHNOLOGY

O151

SAFETY OF OSSEointegrated PROSTHESIS FOR TRANS-FEMORAL AMPUTEES

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Introduction: Purpose: Osseointegration is a known concept to avoid problems related to the socket-body interface for trans-femoral amputees. With this technique the prosthesis is transcutaneously attached to the distal femoral shaft by osseointegration using a retrograde intramedullary implant. In this study we report on complications to determine potential risk factors in the first two years after implantation.

Materials and methods: Methods: After IRB approval, two university hospitals in Australia and The Netherlands conducted a prospective clinical cohort study to analyze all consecutive subjects with trans-femoral amputation (3 bilateral) who underwent implantation of osseointegrated femoral prosthesis with two years follow-up. All complications were prospectively registered and classified. Potential risk factors for complications were determined including gender, age, duration after amputation, cause of amputation, comorbidity including BMI, smoking behavior and length of stoma.

Results: Results. Complications occurred in 26 from 47 subjects (55 %) during the first two years after osseointegrated femoral prosthesis. 26 patients had 101 events. 88 events were graded as a minor event not requiring surgery. Eleven patients had major complications requiring surgical intervention (23 %): two patients underwent exchange of intramedullary implant and nine other patients underwent surgical corrections for recurrent peri-implant soft tissue irritation with pain. No septic loosening of implant was identified. Risk factors that might have contributed to these complications included smoking, and female gender.

Conclusion: Conclusions. Complications related to the osseointegrated leg-prosthesis do occur but the suffering and disabilities are relatively mild. Infectious events are superficial and can be managed with intensive local irrigation and antibiotics.

Disclosure: No significant relationships.

O152

WRIST FRACTURES TREATED WITH A NEW PERCUTANEOUS INTRAMEDULLARY ROD OSTEOSYNTHESIS: ILLUMINOSS® USING A POLYMERIZED MONOMER – A CASE SERIES

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Introduction: IlluminOss® is a new technology using photodynamic monomer for intramedullary rod osteosynthesis. Application of IlluminOss® is performed percutaneously and enables patients to use their wrists from day one after surgery. Using this minimal invasive technique the elderly patient can return to their home faster using less health care. The aim of this study is to evaluate the potential advantages and hazards of IlluminOss® in distal radius fractures.

Materials and methods: From July 2012 till October 2014, 27 distal radius fractures in 22 patients were operated using IlluminOss®. Ten patients had an isolated distal radius fracture. Five patients had bilateral distal radius fractures. Seven patients had distal radius and distal ulna fractures. Postoperative treatment consisted of a pressure bandage and unrestricted use of their wrist as tolerated. Follow up was performed in the outpatient clinic up to 2,5 years.

Results: All but one patient were able to leave the hospital without a cast. All patients demonstrated complete range of motion within three months. There were no infections, secondary procedures, or delayed unions.

Conclusion: IlluminOss® is a new technique offering stable intramedullary osteosynthesis which is applied percutaneously. Advantage is early mobilization without the need for a cast, enabling lower demands on postoperative care. Patients showed low pain postoperatively and quick recovery. Early data shows promising results. IlluminOss® can provide a stable osteosynthesis in the osteoporotic fracture of the distal radius.

Disclosure: No significant relationships.

O153

RECONSTRUCTION OF FEMORAL HEAD IMPACTION INJURIES USING OSTEOCHONDRAL SHELL AUTOGRRAFTS HARVESTED FROM THE HEAD-NECK JUNCTION

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Introduction: Traumatic dislocation of the hip might be complicated by impaction injuries to the femoral head. This study reports the outcome after a minimum follow up (FU) of two years in a consecutive series treated with transfer of osteochondral shell autografts in hips (TOSAH) from the head-neck junction into the defect using surgical hip dislocation.

Materials and methods: Between 06/2007 and 03/2014 twelve patients (median age: 38 yrs, range: 17–53; median Injury Severity Score: 13, range: 9–14) sustained a traumatic posterior hip dislocation in combination with acetabular and/or Pipkin fractures and were inter alia treated using TOSAH. Conversion to total hip replacement (THR) during FU was noted as failure. Patients with preserved hips and a minimum FU of two years were included for clinical evaluation using the Merle-d'Aubigné Score and radiographic assessment for occurrence of osteoarthritis (OA), avascular necrosis (AVN) and/or heterotopic ossifications (HO).

Results: In four patients conversion to THR was performed at eleven, twelve, 28 and 44 months postoperatively. Out of eight patients with

preserved hips, five (median age: 44 yrs, range 20–53) passed a follow up of two years (median FU: 26 mths, 24–62) and presented with a median Merle-d'Aubigné Score of 16 points (range: 14–18), no signs for OA or AVN but HO (Brooker grade 1 in two, Brooker grade 2 in one).

Conclusion: The presented technique used as a salvage procedure for severely injured hip joints showed the potential to delay conversion to THR up to almost four years and to preserve the hip joint at midterm with satisfying clinical and radiological outcome.

Disclosure: No significant relationships.

O154

ACUTE ATROPHIC CHANGES OF THE VOLUME OF INTEREST COMPOSING OF HIPPOCAMPUS, AMYGDALOID BODY, AND ENTORHINAL AREA FOLLOWING MODERATE TRAUMATIC INTRACRANIAL INJURY IS ASSOCIATED WITH REDUCTION OF DAILY ACTIVITY IN THE MIDDLE-AGED AND THE ELDERLY

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Introduction: The voxel-based specific regional analysis system for Alzheimer's disease (VSRAD) advance can evaluate the volume of interest (VOI) composing of hippocampus, amygdaloid body, and entorhinal area from MRI images, and compare the brain image database between patients and healthy individuals. We aimed to investigate the acute atrophic changes of VOI using the VSRAD advance program following moderate traumatic intracranial injury among patients aged ≥ 50 years.

Materials and methods: This study included patients aged ≥ 50 years with moderate traumatic intracranial injury since 2013. Patients with GCS score < 8 were excluded. MRI evaluation was carried out within 3 days ($\text{MRI}_{3\text{day}}$), on 10 days ($\text{MRI}_{10\text{day}}$), 3 weeks ($\text{MRI}_{3\text{week}}$), and 1 month ($\text{MRI}_{1\text{month}}$) after injury. Neurological outcome was evaluated at 3 months after injury using mRS score.

Results: Fourteen patients were enrolled. All of them lived independently before injury and the median age was 64 years. The most common type of injury was brain contusion. Seven of 14 patients already showed moderate cerebral atrophy of VOI by $\text{MRI}_{3\text{day}}$. Although 5 of them who discharged with $\text{mRS} \leq 3$ did not show atrophic change after injury, 2 of them showed acute atrophic change of VOI by $\text{MRI}_{3\text{week}}$, and discharged with mRS 4. Five of 14 patients already showed mild cerebral atrophy by $\text{MRI}_{3\text{day}}$. Two of them showed advanced atrophic change, and discharged with mRS 4 and 5. Two of 14 patients did not show any atrophy and discharged with mRS 0–1.

Conclusion: Appearance of acute atrophic change of VOI can predict reduction of daily activity among head trauma victims aged ≥ 50 years.

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O155

INFLUENCE OF MASQUELET'S INDUCED MEMBRANE FILLED WITH AUTOLOGOUS BONE AND STEM CELLS ON BONE HEALING IN A CRITICAL SIZE DEFECT MODEL OF THE RAT'S FEMUR

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Introduction: The Masquelet technique for the treatment of large bone defects consists of a 2-stage procedure. In a first step, a cement spacer is inserted into the defect and a membrane forms that encapsulates the spacer. This membrane is filled with autologous bone (gold standard). This animal study was conducted to compare the gold standard with b-TCP, b-TCP seeded with mesenchymal stem cells (MSC) and endothelial progenitor cells (EPC), respectively b-TCP seeded with bone marrow mononuclear cells (BMC).

Materials and methods: 144 male SD rats received a femoral 10 mm critical size defect which was filled with Palacos for membrane induction. After 3 weeks the induced membrane was filled with b-TCP, vital autologous bone, b-TCP with MSC + EPC, b-TCP + BMC. Control animals received the same defect filling but the induced membrane was removed. Bone healing was characterized 8 weeks later by means of µCT (bone mineral density, BMD), histology and 3 point bending test.

Results: The induced membrane lead to a significant increase of BMD and biomechanical stability in all groups in comparison to control groups (no induced membrane). If combined with the induced membrane, autologous bone was in trend superior to the b-TCP groups whereas no differences were observed between autologous bone and cell therapy.

Conclusion: We demonstrated that the induced membrane supports bone healing significantly. Further we conclude that a vital filling of the defect (autologous bone, progenitor cells) is superior to b-TCP alone. Further parameters will be evaluated to elucidate the role of the induced membrane for bone defect healing.

References: Giannoudis et al., Injury 42, 2011

Disclosure: No significant relationships.

O156

CELL COUNT OF MESENCHYMAL STROMAL CELLS (CD45-, CD271+) DEPENDING ON THEIR LOCALIZATION IN ADULT BONE. INCREASED NUMBER FOR CANCELLOUS AREAS OF THE HUMAN FEMORAL NECK

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Introduction: Bone defects and non-unions still pose a challenge for todays trauma surgeon. Golden standard is the autologous bone grafting. On the cellular level mesenchymal stromal cells (MSC) have been identified as a factor promoting bone healing. Previous studies were limited to qualitative detection of MSC or focussed on a quantitative comparison of bone harvesting procedures. The aim of this study was to investigate differences between cortical and cancellous areas in bone.

Materials and methods: We collected 14 femoral neck specimen of patients (5f/9 m; Q1/median/Q3 56/67/77 years) undergoing hip replacement. Samples (1,5 cm³) from two standardized regions, cortical (ROI1) and cancellous (ROI2), were extracted, mononuclear cells were isolated and counted. MSCs were identified using flow cytometry (CD45-, CD271⁺) and CFU-F assay. Absolute amount and percentage of ROI1 was determined. Wilcoxon-Mann-Whitney-U test was used for statistical evaluation. A p value below 0.05 indicates statistical significance.

Results: We found a trend towards an increased number of mononuclear cells in cortical- (ROI1 3,8/10,9/24,5x10⁶) compared to cancellous (ROI2 3,6/7,4/21,0x10⁶) regions (p = 0,114). Flow cytometry revealed a statistical significant increase in the percentage of potential MSCs (ROI1 100 %, ROI2 169,7 %, p = 0,002). Nevertheless the CFU-F Assay did not show any significant differences in the number of colonies (ROI1 10/16/56, ROI2 8/27/49, p = 0,519).

Conclusion: To optimize the osteogenous potential of bone grafts the amount of contained osteogenic progenitor cells is important, as well as choice of harvest site and graft procedure. Our study shows that the number of contained mesenchymal progenitors differs from cortical to cancellous zones, which offers the possibility to further optimize the progenitor cell yield of bone grafting.

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Disclosure: No significant relationships.

O157

THE ELECTRONIC TRAUMA HEALTH RECORD (ETHR); THE PROMISE OF ELECTRONIC INJURY SURVEILLANCE FOR GLOBAL INJURY CONTROL

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Introduction: A tablet-based app has been designed, the electronic Trauma Health Record (eTHR), for use by front line clinicians to

inform trauma care, trauma quality care improvement, and to acquire injury surveillance data for injury control research and health policy development.

Materials and methods: The study was conducted in 3 phases: 1. Design and implementation of a paper based Trauma Admission Record at a large South African trauma Centre to assess the feasibility to trauma data collection by clinicians during the process of clinical care, 2. Design of an electronic app capable of supporting clinical care and injury surveillance, and 3. Qualitative usability testing with 25 trauma clinicians from a spectrum of high and low resource and urban and remote settings including the Vancouver General Hospital, the Parkland Memorial Hospital in Dallas, the Whitehorse General Hospital, the British Columbia Mobile Medical Unit, and the Groote Schuur Hospital in Cape Town, South Africa.

Results: Clinician-driven registry data collection proved to be feasible. The use of the eTHR as a clinical tool allowed for the creation of a real-time, self-populating trauma database. Usability assessments with traumatologists in various settings revealed the need for unique eTHR adaptations according to the environment of its intended use. Overall, in all settings, eTHR was found to be user friendly and to have ready appeal for frontline clinicians.

Conclusion: The eTHR has the potential to be used as an electronic medical record that can guide clinical care while providing data for injury surveillance, without significantly hindering hospital workflow in various health care settings.

Disclosure: No significant relationships.

O158

CUSTOM MADE IMPLANTS: EVERY FRACTURE AND EVERY SURGEON HAS HIS OWN PLATES

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Introduction: In difficult articular fractures, there are many ways to skin a cat. The approach, the implant and its positioning differs from surgeon to surgeon. At our institution we use preoperative planning software (EBS - Ekliptik l.t.d.) to plan operations for difficult articular fractures. With new technologies such as 3D printing a new feature was added – possibility to print individual custom made implants. Procedure was tested on plastic bone models.

Materials and methods: We used plastic bone fracture model of a high anterior wall posterior hemi transverse fracture of acetabulum (Synbone). CT of the fractured model was done. DICOM images were used to proceed with preoperative planning. Three surgeons from the same institution that deal with acetabula fractures and work together for many years did the preoperative plan. Each one did his plan without seeing each other's plan. Planned implants were exported and sent to 3-D printing. Than each surgeon did his planned procedure. Reduction and fixation was evaluated and each individual plan was analyzed.

Results: There were differences in between planned approach, construction of plates and positioning of the screws among each individual surgeon. Each surgeon made perfect reduction and stable fixation according to his own plan and steps of the procedure. After completing the study it was difficult to say which plan or implant was the best for the fracture.

Conclusion: Individual approach to treat difficult articular fractures seems promising. This approach is individual for the specific fracture and for each surgeon. Despite obvious differences of the designed implants, the result was comparable.

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Disclosure: No significant relationships.

O159

GROWTH PLATE AUTOLOGOUS CHONDROCYTE IMPLANTATION TO RESTORE JOINT CARTILAGE LESIONS

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Introduction: The aim of experimental research on fourteen New Zealand white rabbits was to investigate the process of autogenous cartilage cell transplantation in the treatment of growth articular hyaline cartilage damage.

Materials and methods: The 14 New Zealand white rabbits at the age of 5 weeks were selected. The plate growth cells were harvested from medial part of right tibias and than they were cultured. 22 days after the first procedure, the second operation was done during which a lesion in medial femoral condyle was made. The lesion was filled by autologous growth plate cultured cells. 60 days after the second surgery, the experimental animals underwent euthanasia. The tissues were taken for histological examination

Results: 1 Aquired samples of the whole distal femur were prepared and evaluated after hematoxylin/eosin and Safranin O/fast green and staining according to the ICRS II histological scale. Collagen fibers orientation and amount were examined in polarized light microscopy. 1 All criteria were evaluated by 2 independent reaserchers according to the ICRS II VAS histologic scale. In the study two rabbits had died before they underwent euthanasia. We found good results of cartilaginous healing in most cases covering both marginal part and bottom of lesions revealing hyaline like tissue in histological examination.

Conclusion: Growth plate is useful and good quality donor place for chondrocytes culturing procedure forming hyaline like healing tissue after ACI reconstruction. GP chondrocytes are simillar in efects of regeneration to native cartilage chondrocytes.

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Disclosure: No significant relationships.

MISCELLANEOUS

O160

SEASONAL TRENDS IN PAEDIATRIC AND GERIATRIC TRAUMA: JUSTIFICATION FOR A DEDICATED PAEDIATRIC SERVICE

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Introduction: It is well documented in the literature that adult hip fracture should be managed operatively within 48-hrs of admission. Anecdotal evidence suggests that trends in paediatric admissions directly impact hip fracture management within our trauma service.

Materials and methods: All adult hip fracture and paediatric trauma cases presenting in 2013–2014 were sourced from internal clinical databases. Hospital In-Patient Enquiry (HIPE) provided Date of Admission (DoA) and Date of Operation (DoO) in order to calculate Time to Theatre (TtT).

Results: Trauma admissions average 194 cases per month with paediatric admissions comprising 29 % of this total. In January, when paediatric cases were only 14 % of admissions, 82 % of hip fractures were managed operatively within 48-hrs. However, when paediatric admissions reached 37 % in August, only 56 % of hip fracture cases met this 48-hr target. Statistical analysis revealed a statistically significant negative correlation of 0.89 ($p < 0.002$) between “hip fracture TtT < 48-hrs” and “% of paediatric cases”. We obtained daily weather data from Met Éireann (<http://www.met.ie>). With time-series for temperature, rainfall and solar radiation, we explore predictable seasonal trends in paediatric trauma admissions.

Conclusion: Operative fixation of hip fracture within 48-hrs is a key priority in any trauma service; increasing paediatric trauma cases limit the ability to meet this criteria. We analyze trends in admissions and propose a dedicated seasonal service for paediatric trauma surgery. A retrospective study of trauma admissions validates this novel approach to regional trauma care. **Keywords** seasonal trends, paediatric trauma, geriatric trauma, statistical analysis, dedicated service

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Disclosure: No significant relationships.

O161

ACCIDENTS INVOLVING A MOTORIZED MOBILITY SCOOTER; A GROWING PROBLEM

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Introduction: The objective of our study was to analyze injury patterns, injury severity and mortality among victims of motorized

mobility scooter (MMS) crashes in relation to the trauma mechanism and patient's age.

Materials and methods: Data in the trauma registry of the Trauma Center West (TCW) of all MMS crash victims, aged 18 years and older, who were admitted to hospitals in the TCW region during the period 2003–2013, were retrospectively analyzed.

Results: During the study period 242 MMS crash victims were admitted, of whom 51 % were elderly (aged 75 years or older). Severe trauma (ISS ≥ 16) was diagnosed in 15 % of all cases and more common in victims of a high-energy trauma ($p < 0.0001$) and in elderly patients ($p = 0.04$). Severe injuries after low-energy trauma mostly affected the extremities, and particularly the legs in elderly patients. Severe injuries after high-energy trauma mostly involved the head and thorax, especially in patients younger than 75 years. Ten patients (4 %) died in hospital, of whom five patients older than 75 years after a low-energy trauma.

Conclusion: Crashes involving the seemingly safe MMS often result in serious injuries and sometimes death, even after low-energy trauma. Concomitant chronic diseases and poly-pharmacy may affect both the safe usage of MMS's in daily traffic and clinical outcome after an accident. Awareness of the potential seriousness of MMS crashes and a multidisciplinary evaluation may help to improve clinical outcome of these patients. MMS drivers need to improve their driving skills in order to reduce the number of MMS crashes.

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Disclosure: No significant relationships.

O162

PERFORMANCE OF THE TAYLOR SPATIAL FRAME FEMORAL FRACTURES IN PATIENTS WITH MULTIPLE TRAUMATIC INJURIES

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Introduction: The Taylor Spatial external fixator (TSF), (Smith and Nephew, Memphis, Tennessee), is a modified Ilizarov fixator with six telescopic struts that are free to rotate at their connection points to the proximal and distal rings. We discuss our experience and the versatility of this device in management of femoral fractures in patients with multiple traumatic injuries.

Materials and methods: Over 4 years TSF was used in over 25 femoral cases. Patients age ranged from 17 to 77 years. Injury Severity Score ≥ 16 for all patients. Classic TSF planning strategy was adopted and reduction of fractures was achieved by realigning one fracture end to the other through “fractur method” and “total residual software mode of the TSF programm.

Results: Complete union was obtained in 22 fractures without additional surgery at an average of 26 weeks. Two nonunions and 1

delayed union occurred. Results based on Association for the Study and Application of the Method of Ilizarov criteria: 54 % excellent, 32 % good, and 12 % poor for bone outcomes and 36 % excellent, 44 % good, and 20 % fair for functional outcomes. Seventy-five percent of patients returned to preinjury work activities.

Conclusion: Primary and definitive fixation with the TSF is effective. Advantages include continuity of device until union, reduced risk of infection, early mobilization, restoration of primary defect caused by bone loss, easy and accurate application, convertibility and versatility compared with a monolateral fixator, and improved union rate and range of motion for lower extremity long-bone fractures in patients with multiple traumatic injuries.

Disclosure: No significant relationships.

O163

LONG TERM FOLLOW-UP OF TRAUMA PATIENTS TREATED BY A HELICOPTER EMERGENCY MEDICAL SYSTEM

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Introduction: In May 2010 the first Danish Physician-staffed Helicopter Emergency Medical Service (HEMS) was implemented. A study on trauma patients showed significantly reduced time to specialized care and lower 30-day mortality following the implementation of HEMS. The aim of this study is to compare long-term mortality in trauma patients before and after implementation of HEMS.

Materials and methods: Patients from the first 12 months after implementation of HEMS were compared with patients from a 5-month period prior to the implementation of HEMS. All trauma patients in HEMS catchment area from the 1st of December 2009 to the 30th of April 2011 were included. Follow-up period was until 1st of May 2014. Primary outcome was long-term mortality 3 to 4.5 years after trauma.

Results: We included 1790 patients in the study with a median follow up of 3–4.5 years. All-cause mortality was 8.8 % in the period prior to HEMS and 6.4 % in period with HEMS. Beyond the first month after trauma, we found a mortality rate ratio (RR) for patients after HEMS relative to prior to HEMS of RR = 0.89 (CI 0.53–1.49; P = 0.65), and RR = 1.06 (CI 0.64–1.82; P = 0.79) adjusted for age, sex and trauma severity (ISS).

Conclusion: No significant change in long-term mortality was found following the implementation of HEMS.

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Disclosure: No significant relationships.

O164

A GLOBAL PERSPECTIVE OF A NEW MODEL TO EVALUATE AND COMPARE TRAUMA CENTER PERFORMANCES IN CURRENT TRAUMA POPULATIONS

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Introduction: The comparative performance of trauma centers is difficult to measure and evaluate. The currently used TRISS method¹ has recognized limitations and an unacceptably high misclassification.^{2,3} In this study we have modelled several parameters to predict the mortality for trauma patients in three different national trauma population samples.

Materials and methods: International institutional trauma registry based study involving University Medical Center Utrecht (UMCU), the Netherlands, John Hunter Hospital (JHH), Australia, Harborview Medical Center (HMC), the United States. Inclusion: patients ≥18 years, blunt trauma, admitted in 2012–2013, registered in the institutional trauma registry. Seven different models were derived with a combination of the predictors: age, ISS, GCS, SBP, respiratory rate (RR), base deficit, single highest AIS score. Models were evaluated for their predictive power (Nagelkerke's R²), calibration (Hosmer-Lemeshow p-value [HL]) and discriminative power (AUC).

Results: Patients included: UMCU = 1841, JHH = 2432, HMC = 7950. SBP and RR showed to have no predictive power for mortality in all three populations. The base deficit showed to be a valid substitute for GCS to indicate the physiologic derangement. The ISS did not have an additive predictive value in a model including the highest AIS score. The model with the best quality includes the predictors: age, BD, single highest AIS score. UMCU: R² = 0.419, HL = 0.304, AUC = 0.911. JHH: R² = 0.425, HL = 0.909, AUC = 0.936. HMC: R² = 0.382, HL = 0.162, AUC = 0.912.

Conclusion: The results in this study identify high quality parameters in current trauma care and valid predictors to predict the outcome in trauma patients. The best model applicable in current trauma populations included three predictors: age, base deficit, and single highest AIS scores.

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Disclosure: No significant relationships.

O165

VIRTUAL FRACTURE CLINIC: A TIME FOR CHANGE?

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Introduction: Virtual fracture clinics (VFC) were introduced in our institution in order to reduce pressure on fracture clinics and improve patient safety through early consultant review, timely specialist referral and safe, early discharge for patients with stable fractures. Patients who are referred to VFC have their images and notes reviewed by a consultant orthopaedic surgeon within 24 hours. The consultant decides to either discharge the patient with advice or place them in a specialist clinic.

Materials and methods: Data was collected over a six-month period following implementation of VFC and compared to pre-VFC data. Direct discharges from A&E, as well as all referrals to the VFC were reviewed.

Results: Prior to VFC, 3281 new patients were seen in fracture clinic over a 6 month period. After VFC implementation, 2852 new patients were referred to the VFC, 2161 patients referred by A&E. All patients were reviewed on a virtual clinic within 24 hours. In total 361 new patients were discharged without needing to be seen in clinic. (143 from A & E, 218 from VFC). A patient satisfaction survey was performed, with 94 % of patients stating they are “very happy” with the new service.

Conclusion: VFC significantly reduces pressure on fracture clinics through direct discharge of patients from A & E and virtual clinics. Patient safety is improved, as subtle injuries are picked up early due to the consultant review nature of the VFC. VFC increases patient contact time: levels of patient satisfaction are high, and extra time in clinic enhances the learning experience for trainee surgeons.

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Disclosure: No significant relationships.

O166

KINETICS OF LOCAL INFLAMMATION IN FRACTURE HEMATOMA AND SYSTEMIC COURSE AFTER A COMBINED TRAUMA MODEL WITH HEMORRHAGIC SHOCK IN PIGS – WHAT CAN WE EXPECT?

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Introduction: Previous studies in small animal models showed a significant interaction of the local and systemic response after severe trauma with long bone fractures. Therefore, we examined the association between local inflammation in fracture hematoma and the systemic inflammatory response in a long-term (48 h), porcine trauma model.

Materials and methods: The combined trauma model consisted of lung contusion, liver laceration and tibial fracture as well as hemorrhagic shock (trauma group: n = 15; sham group: n = 5). After 90 minutes volume loss was substituted by a standardized crystalloid

infusion protocol. After trauma, animals were mechanically ventilated and under ICU-monitoring for 48 h. Blood samples as well as samples from fracture hematoma were taken before trauma, after trauma/reperfusion and after 14 h, 24 h and 48 h. Local and systemic levels of IL-6, IL-8, IL-10 and diverse alarmins (HSP70 and HMGB1) were determined by ELISA.

Results: Compared to the SHAM group, a significant increase of systemic cytokines and alarmins was observed. Local levels in fracture hematoma showed an earlier and more intense increase (14 h, 24 h and 48 h) compared to the systemic inflammatory response. Also, local pro-inflammatory cytokine (IL-6) and alarmin (HMGB1) levels decreased while systemic response increased. In contrast, local anti-inflammatory IL-8 increased over time.

Conclusion: For the first time, posttraumatic course of fracture-associated local inflammation is described in a clinically relevant polytrauma model. Different kinetics were observed for local pro- and anti-inflammatory levels. It has to be clarified how local inflammation at the fracture site contributes to systemic inflammation and in how far this contributes to delayed process of early bone healing.

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Disclosure: No significant relationships.

O167

ENHANCING SURGICAL TRAINING BY USING DIFFERENT MODELS OF EDUCATION

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Introduction: New doctors appointed to surgical residency-training schemes often find it difficult to transition to their new role. The ability of the resident to adapt to this role is dependent on their own self-directed learning as many surgical programmes do not have a very well structured ‘novice’ period for new residents. This is in stark contrast to the specialties of Anaesthetics and Pre-hospital Care where there is a highly-structured ‘novice’ or ‘sign-off’ period for all new doctors.

Materials and methods: The structure of the Anaesthetics novice period and the Pre-hospital Care sign-off period were reviewed. Residents are constantly supervised during these training periods and also need to complete a structured reading list that includes seminal research papers, policy documents and departmental standard operating procedures. There is also a procedures list that needs to be completed and signed off by a senior doctor.

Results: All aspects of the ‘sign-off’ period are then examined in a formal, supervised clinical session with a senior Consultant. All clinical encounters are assessed in detail and the trainee is examined on all aspects relating to their specialty as outlined in the ‘sign-off’ book. Once the assessment is successfully completed, the trainee doctor is then allowed to undertake appropriate independent clinical activities.

Conclusion: Designing a bespoke sign-off training package for new surgical residents will give them a structured format for study and

allow them to adapt to their new more senior role. In addition, this would help improve their own confidence and competence when managing patients.

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Disclosure: No significant relationships.

O168

HIP PAIN IN THE ACTIVE ADULT FEMALE: A MISSED DIAGNOSIS

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Introduction: Stress fractures of the proximal femur are relatively uncommon; most reports involve athletes or military recruits ("march fracture"). Two such cases presented to our trauma service in the last 12-months (see Table 1).

Materials and methods: Case A (aged 19) was referred with a 4-month history of progressive pain in the left hip and groin. She was unable to weight bear without pain and confirmed no history of trauma. Computed tomography revealed findings consistent with healing stress fracture (Figure 1). Case B (aged 25) presented with a 1-week history of mild stiffness in the right hip, without initial radiographic abnormality. Her symptoms progressed to joint pain aggravated by standing from a sitting position. After 5-weeks she was referred to our service for further investigation. Subsequent radiographs revealed an undisplaced basicervical fracture of the right hip (Figure 2).

Results: Both patients underwent internal fixation in theatre with a dynamic hip screw (DHS) ± anti-rotation. Both active young women had a prolonged history of running on a hard surface or gym treadmill.

Conclusion: In both cases the diagnosis of stress fracture was initially missed. We report on each patient's course from presentation through referral to operative fixation. **Keywords** hip pain, female, stress fracture, missed diagnosis, dynamic hip screw

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Disclosure: No significant relationships.

BLEEDING

O169

RESUSCITATIVE ENDOVASCULAR BALLOON OCCLUSION OF THE AORTA VERSUS AORTIC CROSS CRAMP IN TRAUMA RESUSCITATION

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Introduction: This study hypothesis was that resuscitative endovascular balloon occlusion of the aorta (REBOA) was superior to aortic cross clamp (ACC) in terms of bleeding control in patients with severe abdominal trauma. We tested the hypothesis on the data of the Japan Trauma Data Bank (JTDB) from the year of 2004 to 2013.

Materials and methods: Of 159167 registered subjects in JTDB, we extracted subjects who underwent REBOA or aortic cross clamp in addition to emergency abdominal surgery. Subjects which were treated with both REBOA and ACC or subjects whose systolic blood pressure of 0 mmHg on arrival at the emergency department were excluded. Logistic regression analysis showed relative of in-hospital death in subjects with REBOA in comparison of ACC after adjustment for the Trauma Injury Severity Score.

Results: Of 409 eligible subjects for the selection criteria, 305 and 104 subjects underwent REBOA and aortic cross clamp, respectively. The Injury Severity Score is higher in subjects with ACC than with REBOA (REBOA: 34 [IQR 20–45], ACC: 38 [IQR 25–50], $P = 0.018$), and the Revised Trauma Score was lower in subjects with ACC than subjects with REBOA (5.97 [IQR 4.28, -6.90], 4.07 [IQR 2.63–5.81], $P < 0.001$). The logistic regression analysis adjusted for the Trauma Injury Severity Score showed significant improvement in in-hospital death in subjects with REBOA (OR 0.27 95 % CI: 0.12–0.61 $P = 0.002$).

Conclusion: REBOA was associated with better survival than ACC in subjects with abdominal emergency surgery. Further prospective study is expected to compare efficacy and safety of REBOA to ACC after the study result.

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Disclosure: No significant relationships.

O170

THE USE OF EXTRACORPOREAL CIRCULATION SYSTEMS IN SEVERE ACCIDENTAL HYPOTHERMIA AFTER DROWNING: A CENTER EXPERIENCE

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Introduction: Objectives: Cardiopulmonary failure due to drowning with accidental hypothermia is still associated with high mortality rate.

Materials and methods: In this case series, we describe our experience in 9 patients with cardiopulmonary failure after drowning with accidental hypothermia <35 °C, who were provided on an emergency basis with an extracorporeal circulation system (ECCS). Conservative re-warming methods were not considered for this study. Operative reports and clinical data sets were collected.

Results: Median age was 24 years (3–75). Climatic conditions mostly showed cold to frosty weather. Indications for extracorporeal membrane oxygenation and extracorporeal life support were cardiopulmonary resuscitation (CPR) and in one case pulmonary failure. The mean CPR duration was 94 min (10–150 min). Prior to ECCS implantation, the median pH value was 6.9. After a median ECCS support of 56 [3–260] hours, 2 patients could be successfully weaned from the systems. Cause of death was severe neurologic damage in 7 patients.

Conclusion: The use of ECCS support is a therapy option for a small range of patients. The timeline of preclinical rescue is extensively long for patients after drowning accidents.

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Disclosure: No significant relationships.

O171

MASSIVE TRANSFUSION PROTOCOLS IN TRAUMA: THREE YEAR'S EXPERIENCE

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Introduction: Massive transfusion protocols (MTP) with early administration of plasma and platelets in a 1:1 ratio to red blood cells (RCBs) has demonstrated improvement in survival in trauma patients.

Our aim was to review MPT outcomes after 3 years of its implementation in a level 1 Hospital.

Materials and methods: Retrospective descriptive analysis of prospectively collected data from our trauma registry. A modified ABC score were used as activation criteria. Our protocol includes tranexamic acid and a ratioof plasma and platelets to RCBs 1:1,25 and 1:1,6, respectively.

Results: Since February 2012 we have had recorded 34 MPT activations. Median ISS was 34 (IQ 21–41) and main mechanism was blunt trauma (87 %). 18 did not need more than 10 RCBs, 5 of them died in the first hour after admission, none of them received plasma due an early call-off policy. In all patients requiring a massive transfusion (MT) was MPT activated. Sixteen patients received a MT, and median number of RCBs units given was 21 (IQ 11–27), 8 (IQ 6–12) plasma units and 2 (IQ 1–3) platelets pools. No postoperative coagulopathy was reported, 6 patients required extraMPT platelet transfusion, and the median hematocrit value at six hours after arrival was 32 % (IQ 24–37 %). Mortality rate in the 16 patients who require a massive transfusion was 25 %.

Conclusion: In our experience a modified ABC score is a helpful instrument identifying trauma patients who required MT. We found good outcomes in terms of mortality and trauma induced coagulopathy, although our rates suggested an excessive RCBs use as in other reports.

Disclosure: No significant relationships.

O172

USE OF REBOA (RESUSCITATIVE ENDOVASCULAR BALLOON OCCLUSION OF THE AORTA) IN CATASTROPHIC PELVIC HAEMORRHAGE

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Introduction: Non-compressible torso haemorrhage is the leading cause of preventable trauma deaths. Trauma systems have optimised access to definitive means of haemorrhage control, namely surgery and interventional radiology. However, patients in haemorrhagic shock associated with pelvic injuries have a high chance of death in the pre-hospital phase and immediately on arrival in the Emergency Department before any meaningful intervention can be delivered, including pelvic packing.

Materials and methods: Temporary occlusion of the aorta with an endovascular balloon is a standard technique to control haemorrhage in shocked patients with ruptured aortic aneurysms. It has also been described in gastro-intestinal bleeding and post-partum haemorrhage and has high rates of technical success. REBOA involves the retrograde insertion of a balloon catheter, at the femoral artery, so that the balloon lies at the aortic bifurcation (aorta zone 3) and effectively acts as an internal aortic cross-clamp. Subsequently, the peri-arrest patient can be concurrently resuscitated and taken to theatre or interventional radiology for definitive haemorrhage control.

Results: The procedure is being utilised at a number of centres around the world with recorded survivors who would have otherwise died.

Conclusion: This evolving procedure may help reduce the mortality in patients with severe pelvic haemorrhage. The procedure can be completed via an open cut-down or as a 'blind' technique with

ultrasound guidance and no live fluoroscopy. At our institute, the procedure is used, when appropriate, in both the Emergency Department and the Pre-hospital setting.

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Disclosure: No significant relationships.

O173

TOURNIQUET USE FOR CIVILIAN EXTREMITY TRAUMA

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Introduction: Unlike in the military setting, where the use of tourniquets has been well established, in the civilian sector their use has been far less uniform. The purpose of this study was to examine the outcomes associated with the use of tourniquets for civilian extremity trauma.

Materials and methods: Adult (≥ 18 yo) patients admitted to our institution with an extremity injury requiring tourniquet application from 01/2007 to 06/2014 were retrospectively reviewed. The primary outcome was limb loss. Secondary outcomes included death, hospital length of stay and complications.

Results: There were 87 patients who met inclusion criteria. Average age 35.3 years, 90.8 % male and 66.7 % penetrating with an average ISS of 8.3. Tourniquets were placed prehospital in 50.6 %, ER in 39.1 % and OR in 10.3 % of patients. The windlass type Combat Application Tourniquet (CAT) was the most commonly utilized type (67.8 %), followed by a pneumatic system (24.1 %) and self-made tourniquet (8.0 %). The mean duration of use was 103.2 ± 99.6 min with no differences between groups ($p = 0.547$). Overall, 80.5 % had a vascular injury (70.1 % arterial) and a total of 99 limb operations were performed, including 15 amputations. 14 (93.3 %) amputations occurred at the scene or were directly attributed to the extent of tissue damage with an average MESS score of 7.6 ± 1.4 . Seven patients sustained 13 other complications, however none were directly attributed to tourniquet use.

Conclusion: Tourniquet use in the civilian sector carries a low rate of complications and high potential for benefit. Therefore, aggressive use of this potentially life saving intervention is justified.

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Disclosure: No significant relationships.

O174

PACKED RED BLOOD CELLS FOR TRAUMATIC CARDIOPULMONARY ARREST CAN IMPROVE THE RATE OF RETURN OF SPONTANEOUS CIRCULATION

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Introduction: BACK GROUND The early and aggressive use of blood products for severe trauma with hemorrhagic shock can improve patient outcome. However, the efficacy of use of blood products for blunt traumatic cardiopulmonary arrest (BT-CPA) is uncertain. The aim of this study is to investigate the efficacy of use of packed red blood cells (PRBC) for BT-CPA on arrival.

Materials and methods: We conducted retrospective observational single center study. We reviewed the records of witnessed BT-CPA patients on arrival. We compared clinical variables, including PRBC transfusion, between the return of spontaneous circulation (ROSC) group and the non ROSC group.

Results: 51 witnessed BT-CPA patients on arrival were enrolled in this study. There were 10 patients in ROSC group and 41 patients in non ROSC group. Age and sex, bystander cardiopulmonary resuscitation (CPR), ISS, ER thoracotomy (ERT), time from injury to ER were not significantly different between the two groups. There was no initial shockable rhythm. The ratio of PEA was significantly higher in ROSC group than non ROSC group ($P < 0.01$). PRBC were transfused for 9 patients in the ROSC group (90 %) and for 14 patients in the non ROSC group (34 %) ($P < 0.01$). According to the multi-variable logistic regression analysis, including ISS, ERT, Time from injury to ER, Initial wave form, and PRBC transfusion as variables, PRBC transfusion was the independent contributed factor for ROSC in this study.

Conclusion: The use of PRBC for BT-CPA on arrival may improve the rate of ROSC.

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Disclosure: No significant relationships.

O175

VALIDATION OF CITRATED RAPID THROMBELASTOGRAPHY FOR POINT-OF-CARE USE IN TRAUMA

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Introduction: Rapid thrombelastography (rTEG) is a widely used method to diagnose trauma induced coagulopathy. Typically, samples for rTEG are collected without preservative; however, this leads to a high rate of test failure due to clotting in the collection tube. To counteract this, a citrate preservative is used for delayed testing (>30 min) but has not been validated for immediate, point-of-care testing. Therefore, we sought to validate the use of citrated blood samples for point-of-care testing with rTEG, within 5 minutes of sample collection.

Materials and methods: Citrated and unpreserved blood samples were collected from 17 healthy volunteers. Four repetitions of the rTEG assay were run on both the citrated and unpreserved samples at 5 minutes after collection. Citrated samples were reactivated with calcium chloride at the time of assay initiation. The activated clotting time (ACT), angle, maximum amplitude (MA) and lysis at 30 minutes (LY30) parameters for the citrated versus the unpreserved samples were compared for agreement using the Wilcoxon signed rank test.

Results: There was no statistically significant difference between the ACT and angle values for citrated versus unpreserved samples. MA citrated correlated to MA unpreserved with an R^2 value of 0.94 and a slope of 1.06. LY30 citrated correlated to LY30 unpreserved with an R^2 value of 0.76 and a slope of 1.26.

Conclusion: Citrated rTEG produces equivalent results to rTEG run on unpreserved samples as early as 5 minutes after sample collection. This methodology thus allows point-of-care testing with rTEG in trauma without the risk of test failure due to premature sample clotting.

Disclosure: No significant relationships.

SPORTS RELATED INJURIES

O176

BONY LANDMARKS FOR ARTHROSCOPIC ELBOW ARTHROLYSIS

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Introduction: Nerve transection is a serious complication of elbow arthroscopy as Haapaniemi [1] reported. This cadaveric study describes the anatomic relation of bony landmarks to the median and radial nerve to avoid neurological complications in arthroscopic arthrolysis.

Materials and methods: In 12 fresh-frozen upper extremities the radial and median nerve were dissected and marked with a flexible wire. A 3D x-ray was performed in extension (E) and 90° flexion with (F+) and without (F-) joint insufflation to visualize aforementioned nerves. Their distance to bony landmarks was measured.

Results: Mean distance of the radial nerve to the radial head/capitulum increases from 4.7 (± 1.8)/5.5 (± 1.8) mm in E to 7.7 (± 2.7)/10.8 (± 3.2) mm in F- to 11.9 (± 3.0)/17.0 (± 3.1) mm in F+. The radial nerve is located in front of the middle capitulum third in extension and moves medial in front of the medial capitulum third in flexion. Mean distance of the median nerve to the coronoid tip/trochlea increases from 5.5 (± 1.1)/4.8 (± 1.5) mm in E to 8.8 (± 1.9)/8.4 (± 2.4) mm in F- to 12.3 (± 2.5)/13.4 (± 3.6) mm in F+. The median nerve courses in front of the medial trochlea quarter and moves medial of the trochlea in flexion.

Conclusion: Flexion and joint insufflation significantly increase the distance of the median/radial nerve to the distal humerus, coronoid

process and radial head. The median nerve is at risk during arthrolysis of the medial portion of the capsule. Other than previously reported by Omid [2] the radial nerve is located in front of the capitulum instead of medial to it.

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Disclosure: No significant relationships.

O177

DIAGNOSTIC PERFORMANCE OF THE BERNERSE VERSUS OTTAWA ANKLE RULES INTERPRETED BY ED RESIDENTS AND TRIAGE NURSES: RESULTS OF A RANDOMIZED CONTROLLED TRIAL

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Introduction: The Ottawa Ankle Rules (OAR) brought about a reduction of ankle X-rays on the emergency department, however 50 % of patients with ankle injuries would undergo unnecessary radiography. The Bernese Ankle Rule (BAR) has an acclaimed 84 % reduction in radiography without loss of sensitivity. The primary aim of this study was to compare the diagnostic accuracy and reproducibility of both rules. Furthermore, the ability of triage nurses to accurately interpret the BAR was assessed.

Materials and methods: Subjects were seen by both the emergency physician and the triage nurse, applying the OAR and BAR. After standardized data collection, ankle and foot radiography was performed in all patients. Sensitivity and specificity of the tests and observers were compared using Chi square statistics and the interobserver agreement was calculated with Cohen's kappa.

Results: 203 patients with ankle trauma were included. For the OAR, the sensitivity and specificity for the ED residents were 0.97 and 0.29, respectively. The BAR had a sensitivity and specificity of 0.69 and 0.45. As for the triage nurses, OAR sensitivity and specificity were 0.86 and 0.25, respectively. BAR sensitivity and specificity for the nurses were 0.86 and 0.40. The interobserver agreement of the OAR was 0.45 and for the BAR 0.48.

Conclusion: The reproducibility of both rules was moderate and would therefore not pose a contraindication for clinical application. However, although the BAR showed a superior specificity to the OAR, its sensitivity was too low to promote clinical usage. The triage nurses demonstrated too low sensitivities on both rules to allow for safe application.

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Trauma: Injury, Infection, and Critical Care. 2005;59(5):1268

Disclosure: No significant relationships.

O178

CHRONIC ELBOW INSTABILITY: IS THE MRI A RELIABLE DIAGNOSTIC TOOL?

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Introduction: Instability - most commonly posterolateral rotatory instability (PLRI) [3, 4] - represents a common cause for chronic elbow pain [1, 2]. There is a lack of reliable signs for elbow instability in MRI imaging. Thus the present study compared the MRI scans of arthroscopically proven unstable joints with clinically stable ones.

Materials and methods: We evaluated MRIs of 60 patients. Group A ($n = 30$) comprised "unstable" elbows confirmed by arthroscopy. Patients in group B ("stable", $n = 30$) were suffering from "simple" epicondylitis. Joint congruency was measured in a coronal, axial and two sagittal views. The values of both groups were compared. Inter- and intra-observer reliability was evaluated.

Results: The patients' mean age was 43.3 y (19–74). 57 % were male, 43 % female. On sagittal view through the radial head, mean joint space incongruity (MJSI) was 2.86 mm (+/-2.66) in group A and 1.28 mm (+/-0.97) in group B. On axial view through the coronoid tip, MJSI in group A/B was 1.29 mm (+/-1.1) and 0.69 mm (+/-0.39). These differences were significant ($p < 0.05$). MJSI on coronal and sagittal view through the coronoid did not provide significant differences.

Conclusion: Diagnostic arthroscopy represents the gold standard for diagnosis of chronic elbow instability [1]. Nevertheless, our measurements suggest that posterior translation of the radial head >2 mm and ulnohumeral joint space incongruity >1 mm - on an axial view through the coronoid tip - are highly suspicious of elbow instability. In conclusion, we provide a useful method to aid in diagnosis of elbow instability via MRI.

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Disclosure: No significant relationships.

O179

THE COURSE OF THE POSTERIOR INTEROSSEOUS NERVE IN RELATION TO THE PROXIMAL RADIUS

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Introduction: The posterior interosseous nerve (PIN) is closely related to the proximal radius and is at risk in a ventral and lateral approach [1, 2, 3] to the proximal forearm. This study aims to define landmarks to locate the PIN intraoperatively to avoid neurological complications.

Materials and methods: We dissected 6 fresh-frozen upper extremities. Mean age of patient was 81.2 years (74–95). 3 were male, 3 were female. 4 left-sided and 2 right-sided upper extremities were used. The PIN was dissected and marked with a 0.3 mm flexible wire on its course along the proximal forearm. 3D x-ray scans were performed and the location of the nerve was analyzed in neutral rotation, supination and pronation.

Results: On coronal view, the PIN crosses the radial neck/shaft at a mean of 33.4 (± 5.9) mm below the joint surface of the radial head in pronation and 16.9 (± 5.0) mm in supination. On coronal view, the PIN crosses 4.9 (± 2.2) mm distal of the most prominent point of the radial tuberosity in pronation and 9.6 (± 5.2) mm proximal in supination. On sagittal view, the PIN crosses the proximal radius 61.8 (± 2.9) mm below the joint surface in pronation and 41.1 (± 3.6) mm in supination. The nerve crosses 29.2 (± 6.2) mm distal of the most prominent point of the radial tuberosity in pronation and 11.0 (± 2.8) mm in supination.

Conclusion: Pronation effectively increases the distance of the PIN to the radial head surface [3]. With this novel investigation design, the radial tuberosity could be defined as a useful landmark for intraoperative orientation.

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Disclosure: No significant relationships.

O180

MINIOPEN RECONSTRUCTION OF NEGLECTED ACHILLES TENDON RUPTURE USING FREE SEMITENDINOSUS TENDON GRAFT

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Introduction: 10 % to 25 % of acute ruptures of the Achilles tendon go undiagnosed for some time beyond what would be optimal for repair. Managing these neglected ruptures is a surgical challenge, because the tendon ends retract and atrophy which produces a wide gap that may grow even wider after debridement. Our hypothesis was that reconstruction of neglected Achilles tendon rupture using free semitendinosus tendon graft could be successfully performed through a mini-open technique with a good functional outcome while minimizing wound complications.

Materials and methods: Fifteen patients underwent a miniopen repair of neglected Achilles tendon rupture using free semitendinosus tendon graft. Inclusion criteria were:

- A degenerative rupture of Achilles tendon
- Injury neglected more than 4 weeks.

- The degenerative segment >5 cm as measured by MRI

Exclusion criteria

- Traumatic tears
- Injury less than 4 weeks old.
- The degenerative segment shorter than 5 cm.
- Re-rupture of Achilles tendon.

Average follow up was 20.9 months. Ankle range of motion; thigh, calf and ankle circumferences of the injured leg and the contralateral side, time to return to activities were evaluated.

Results: All reconstructions healed successfully. The patients were able to return to preinjury level of activity after a mean of 4.1 months. The mean ATRS score improved from 17.8 preoperatively to 80.5 postoperatively. The mean Leppilahti ankle score was 61.7. Three patients had superficial wound infections which were successfully managed.

Conclusion: Reconstruction of neglected Achilles tendon rupture using free semitendinosus tendon graft could be successfully performed through a mini-open technique with a good functional outcome while minimizing wound complications.

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Disclosure: No significant relationships.

O181

BIMALLEOLAR EQUIVALENT ANKLE FRACTURES- IS MEDIAL EXPLORATION NECESSARY?

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Introduction: Fractures of the lateral malleolus with rupture of the deltoid ligament (Bimalleolar equivalent fractures) are unstable injuries often requiring operative fixation of the lateral malleolus in order to restore ankle stability. However, the diagnosis and treatment of the medial lesion in these cases remains controversial. The aim of this study was to compare, the postoperative radiographic outcome of bimalleolar equivalent ankle fracture with or without medial exploration

Materials and methods: 175 operatively treated isolated fibular fractures with medial joint instability between the years 2007 and 2011 were studied. Patients demographics, fracture type, mechanism of injury and whether medial exploration was done were the study variables. Radiographic data including medial clear space (MCS), talar tilt (TT), lateral clear space (LCS) on the mortise view and tibiofibular overlap on the AP view

Results: 175 patients with the age of 40 (range 16–78) were studied. Most of the injuries were sustained by low energy trauma (89%). Patients exhibiting larger MCS (6.5 mm in average) or increased TT (average 2.7 degrees) were more likely to undergo medial joint exploration ($p < 0.001$). Final follow-up demonstrated similar radiographic outcome in both patient groups (MCS = 3.7–4, TT = 1.1, LCS = 5.3–5.5, overlap = 6.1–6.7), even when controlled for initial MCS of >5 mm (postoperative was 4.4 mm and 4.2 mm, NS).

Conclusion: Our surgeons tend to use a medial approach when the initial MCS is larger. However, the radiographic outcome after fixation of the fibula with or without medial exploration is the same. The clinical significance of these findings is yet to be determined

Disclosure: No significant relationships.

O182

THE BARE AREA OF THE OLECRANON: AN ANATOMIC STUDY TO OPTIMIZE OLECRANON OSTEOTOMY

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Introduction: Distal humerus fractures are complex injuries. The gold standard of treatment is a dorsal approach with osteotomy of the olecranon [1] and subsequent double plate osteosynthesis [2]. Usually a transverse osteotomy is performed. Through radiological analysis of the bare area, this study aims to optimize the technique of olecranon osteotomy.

Materials and methods: The bare area of 20 formalin-fixed forearms was marked with a radio-opaque thread and analyzed radiologically by means of a 3D x-ray scan. The ideal angle of olecranon osteotomy (OA) was evaluated by dropping a perpendicular line upon the bare area and compared to a transverse osteotomy. 10 left-sided and 10 right-sided forearms were used. Mean age of patients was 78 years (71–87).

Results: The mean craniocaudal width of the bare area was 4.8 (+/- 1.1, 3.3–7.2) mm. OA was 30.7° (+/- 5.3, 20.0–40.0°). The mean hitting area of the bare area using a transverse osteotomy was 3.8 (+/- 1.05, 2.5–6.0) mm. The craniocaudal distance of the dorsal tip of the olecranon to the OA osteotomy entry point was 24.2 (+/- 3.0, 19.6–32) mm compared to 12.0 (+/- 3.0, 6.9–20.8) mm for a transverse osteotomy.

Conclusion: Our results of bare area width correlate well with other studies [3, 4]. Through inclination of the osteotomy saw of approximately 30° the hitting area of the bare area in olecranon osteotomy can be increased by – at average – 26° in comparison to a transverse osteotomy. This could help to decrease the risk of iatrogenic cartilage damage when performing olecranon osteotomy.

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Disclosure: No significant relationships.

INFECTION

O183

LOCAL ADMINISTRATION OF SDF1- α ENHANCES WOUND HEALING IMPAIRED BY SEPSIS

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Introduction: Sepsis is characterized by whole body inflammation that can cause further complications. Under septic conditions healing of wounds that are separated from the focus point of sepsis is impaired and a diminished inflammatory reaction with less immune cells can be found. Stromal derived factor (SDF)-1a exerts chemotactic effects on immune and regenerative cells. Thus, in the following study we investigated the effect of local SDF1- α application on wound healing during sepsis.

Materials and methods: Abdominal sepsis was induced in mice by cecal ligation and puncture (CLP). Directly after CLP wounds were created on the mouse ear using a punch and removing the epidermis. SDF1- α was applied locally on the right mouse ear using small methylcellulose platelet. The left ear was treated without SDF1- α . Mice without CLP procedure were used as control. Wound closure was evaluated by direct visualisation in a standardized model.

Results: Experiments were performed in SKH1 mice under anaesthesia and ethical approval. Wound healing was impaired in mice that underwent CLP procedure. Wounds of septic mice closed in median on day 12.50 ± 2.56 SD compared to non septic control that closed on day 8.36 ± 1.81 SD. Local application of SDF1- α enhanced wound healing as wounds closed on day 10.67 ± 2.49 SD in septic animals. ($p < 0.05$)

Conclusion: In the wound healing model used, the local application of SDF1- α ameliorated wound healing occurring during sepsis. Therefore, enhancing homing of immune cells, e.g. by SDF1- α , to the wound side might be a good strategy to improve poor wound healing during sepsis.

Disclosure: No significant relationships.

O184

BACTERIAL REDUCTION AND COMMUNITY SHIFT WITH NEGATIVE-PRESSURE WOUND THERAPY: THE RELEVANCE OF SURGICAL DEBRIDEMENTS IN THE OPERATING ROOM

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Introduction: Open wound management usually involves surgical debridement, negative-pressure wound therapy (NPWT) and antibiotics. However, controversies exist about the effect of this treatment regimen in the reduction and shift of the bacterial load (1).

Materials and methods: At a level one trauma center in 2011, primary (day 0) and secondary (\geq day 1) consecutive microbiological samples of 120 open wounds from 115 patients treated with surgical debridement in the operating room, NPWT, and antibiotics were analysed with regard to bacterial growth, gram-staining and oxygen use (2).

Results: Secondary samples ($n = 39$, 32 %) showed significantly less bacterial growth than primary samples ($n = 107$, 89 %) with a 17-fold reduction in the odds ($p < .001$) (3). They also contained less gram-positive bacteria (56 % versus 78 %) ($p = .013$), facultative anaerobic bacteria (64 % versus 85 %) ($p = .011$), and *Staphylococcus aureus* (10 % versus 46 %) ($p = .002$) than primary samples. Furthermore, they showed a trend toward higher percentages of Coagulase-negative *Staphylococci* (*CoNS*) and *Pseudomonas* species (44 % and 18 % versus 31 % and 7 %).

Conclusion: A reduction of the bacterial load and a bacterial shift away from gram-positive bacteria, facultative anaerobic bacteria, and *Staphylococcus aureus* as well as a trend of a relative shift toward *CoNS* and *Pseudomonas* species was achieved by surgical debridements, irrigation, NPWT in operating rooms, and antibiotics. We observed high rates of wound closure in a relatively short time, low revision rates, and a low risk of contaminating wounds with new bacteria.

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Disclosure: No significant relationships.

O185

WORSE OUTCOMES AND MORE INFECTIOUS COMPLICATIONS IN CRITICALLY ILL TRAUMA PATIENTS WITH PERSISTENT INADEQUATE CALORIC AND PROTEIN ADMINISTRATION

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Introduction: Major trauma leads to increased metabolic (caloric and protein) requirements. Adequate administration of calories and protein is crucial to avoid worse outcomes. However, little is known about the quantity of calories and protein administered in critically ill trauma patients over time.

Materials and methods: Prospective-observational study including 97 critically ill trauma patients admitted to the LAC + USC Medical

Center 03/2014-10/2014. Inclusion criteria were age >16 years, surgery at admission, ICU-admission, and no oral nutrition. Metabolic requirements were calculated daily (Harris-Benedict and Penn State equation, ESPEN guidelines). Administered calories and proteins were recorded daily for 28 days, or until oral nutrition was resumed. Calculated and administered calories and proteins were compared using Wilcoxon's test. Significance of caloric and protein deficits (difference of total calculated and administered values) on outcomes were tested using correlation, discriminant and regression analysis.

Results: Calculated daily metabolic requirements were significantly higher than daily administered calories (mean 3301 kcal vs 328 kcal, $p = 0.000$) and protein (mean 127.2 g vs 8.6 g, $p = 0.000$). Administered calories and protein increased during the observation period, but did not meet the calculated requirements at any time. Higher caloric deficit was independently associated with more infectious complications ($p = 0.000$), higher number of antibiotics used ($p = 0.000$), more ventilator days ($p = 0.000$), longer ICU LOS ($p = 0.000$), and longer hospital LOS ($p = 0.006$). Higher protein deficit was also independently associated with these variables.

Conclusion: Administered calories and protein were below calculated requirements up to 28 days after admission. Higher caloric and protein deficit is independently associated with worse outcomes. Aggressive assessment and treatment of caloric and protein deficits is therefore warranted in critically ill trauma patients.

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Disclosure: No significant relationships.

O186

SPLENIC NEUTROPHIL COMPARTMENTALIZATION IN A MOUSE MODEL WITH TRAUMA AND HEMORRHAGIC SHOCK

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Introduction: An inadequate immune response forms the basis for ARDS and MODS. Neutrophils (PMNs) are key effector cells in the immune response to trauma. We recently identified different neutrophil phenotypes in blood of traumapatiens. One subset of hypersegmented PMNs (CD16^{dim}/CD62L^{high}) inhibited Tcell proliferation in vitro. As this suppressive effect requires direct cell-cell

interactions, it is interesting to investigate where neutrophils co-localise with Tcells in vivo. We hypothesized that in a traumamodel of hemorrhagic shock, PMNs co-localize with Tcells in the splenic white pulp (WP).

Materials and methods: A mouse model of hemorrhagic shock/resuscitation (HS/R) combined with a unilateral femur fracture was employed in this study. As a positive control group we added lipopolysaccharide (LPS) induced inflammation. Splenic neutrophil localisation was determined by confocal microscopy and by flowcytometry. We used Ly6G/Gr-1 to identify PMNs, B220 for Bcells and CD3 for Tcells.

Results: Trauma with HS/R resulted in an increase of the absolute number of PMNs in the spleen at 2 and 6 hours ($P < 0.05$). Co-localization of PMNs with Tcells in the splenic WP was not encountered. In the control group there was a virtual absence of PMNs in the white pulp, whereas in the LPS-group migration of PMNs into the WP compartment was observed.

Conclusion: Similar to lipopolysaccharide induced inflammation, trauma with HS/R results in increased splenic neutrophil homing. However, in contrast to LPS, neutrophils do not migrate into the WP compartment. Therefore, it unlikely that white pulp splenic neutrophil-Tcell interactions play a major role in immune dysregulation after trauma.

Disclosure: No significant relationships.

O187

FIRST EXPERIMENTAL EXPERIENCES WITH A NATIVE COLLAGEN-ELASTIN SCAFFOLD FOR COVERAGE OF TRAUMATIC AND INFECTED WOUNDS

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Introduction: Infected wounds in trauma surgery are hard to heal, especially in cases with loss of soft tissue causing defects.

Materials and methods: In six complex trauma cases with infected defect wounds, an experimental method with repetitive use of a 2 mm native collagen-elastin scaffold in combination with repetitive surgical debridements and negative pressure technique (some in combination with instillation technique) was used. Aim was to achieve new granulation tissue for wound coverage, to limit extended infections and to prevent invalidating amputations.

Results: In all cases new granulation tissue could be achieved, due to repetitive surgical debridements, multiple use of the new scaffold in combination with negative pressure technique followed by either mesh graft transplantation or secondary free flap transplantation for final wound closure. During the surgical procedures and wound healing process, histological biopsies were taken to investigate wound healing and to follow up the process of remodeling of the native collagen-elastin scaffold. Compared to standard wound healing of traumatic wounds, a significant rise of ingrowth of new capillary vessels in granulation tissue supporting wound healing, compared to standard negative pressure wound therapy alone, could histological be observed.

Conclusion: First experimental impressions with use of a native collagen-elastin scaffold in infected defect trauma wounds show histological findings that formation of new granulation tissue with ingrowth of capillary vessels is supported, reducing wound healing time and can prevent extended amputations of serious injured limbs.

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Disclosure: No significant relationships.

O188

FDG-PET/CT: A DIAGNOSTIC TOOL FOR POST-TRAUMATIC OSTEOMYELITIS?

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Introduction: Early detection of infection following osteosynthesis can be challenging. FDG-PET/CT has proven to be a valuable modality for the detection of bone infections. However, visual interpretation of FDG-PET/CT can be hampered due to the difficult differentiation between aseptic and septic delayed union. Therefore the goal of this study was to improve this differentiation on FDG-PET/CT by measuring the FDG-uptake and to determine the diagnostic features of the FDG-PET/CT as a tool for suspected osteomyelitis.

Materials and methods: In this retrospective study, we first analyzed the FDG-uptake of 84 consecutive patients with non-injured bones, who underwent FDG-PET/CT mainly for oncological purposes. Subsequently, we analyzed the FDG-uptake of 28 consecutive patients with delayed fracture healing and suspicion of infection. FDG-uptake was measured by using the maximum Standardized Uptake Value (SUV_{max}). Diagnostic features were determined by calculating sensitivity, specificity and diagnostic accuracy at different cut-off points to differentiate between aseptic and septic delayed union.

Results: The mean FDG-uptake of non-injured femur and tibia were respectively SUV_{max} 0.81 and SUV_{max} 0.61. The mean FDG-uptake in patients with aseptic delayed union was SUV_{max} 2.59 and the mean FDG-uptake in the patients with septic delayed union was SUV_{max} 4.87 ($P < 0.01$). When using a cut-off point set at SUV_{max} 3.0 to differentiate between aseptic and septic delayed union; sensitivity, specificity and diagnostic accuracy of FDG-PET/CT were 95, 70 and 87 %, respectively.

Conclusion: FDG-PET/CT can differentiate between aseptic and septic delayed union by determining and comparing quantitative FDG-uptake values. FDG-PET/CT has a high diagnostic accuracy for the early detection of post-traumatic osteomyelitis.

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Disclosure: No significant relationships.

O189

BACTERICIDAL INCOMPETENCE OF A SUBSET OF NEUTROPHILS FOLLOWING SEVERE INJURY

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Introduction: Neutrophils (PMN), the most important cells of the innate immune system, protect the human body against invading pathogens and play a pivotal role in preventing fulminant infections. During the days following severe injury 3 subtypes of neutrophils are found in the circulation. In this study we elucidate the mechanism behind defective intracellular killing in a subset neutrophils.

Materials and methods: Blood was obtained from trauma patients admitted to the ICU at 5 different time points from admission until 15 days following the initial injury. Neutrophil subtypes were isolated based on expression of membrane receptors CD16(FcγRIII) and CD62L(L-selectin) using FACS-sorting. **Killing assay:** fibrin gels were formed containing neutrophils and GFP expressing *S. aureus*. Fluorescence intensity was a read out for active containment of bacterial proliferation during 20 hours. **Intraphagosomal pH:** *S. aureus* bioparticles were dual-labelled with the pH-sensitive probe pHRodo and the pH-insensitive probe AlexaFluor647. Studying neutrophils and fluorescent bioparticles entrapped in fibrin gels under the microscope enabled us to adequately determine intraphagosomal pH.

Results: CD16dim/CD62Lbright (banded) neutrophils blocked bacterial proliferation for at least 1200 minutes (SEM:0). CD16bright/CD62Ldim (hypersegmented) neutrophils very poorly contained bacterial outgrowth (TMO:540, SEM:80 min). CD16bright/CD62Lbright (mature) neutrophils exhibited an intermediate phenotype (TMO:970, SEM:110). Banded PMN are characterized by significantly lower intraphagosomal pH in comparison to hypersegmented PMN.

Conclusion: Hypersegmented neutrophils, which comprise over 40 % of all cells in the days following trauma, fail to eradicate bacteria since these cells lack the ability to create a profound acidified phagosome. We propose the appearance of hypersegmented PMN in the days following trauma as a possible cause for the occurrence of infectious complications and sepsis.

Disclosure: No significant relationships.

EPIDEMIOLOGY/EVIDENCE BASED TRAUMACARE

O190

INCIDENCE OF VERTEBRAL FRACTURES IN THE NETHERLANDS, 1997–2012

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Introduction: Approximately two million patients visit the Dutch Emergency Departments (ED) each year. Three percent of these patients sustain spinal injury. Resulting in a substantial workload. However, the overall incidence of spinal fractures in the Netherlands is unknown. The aim of this study was to analyse time-trends in vertebral fractures by analysing trends in emergency department visits, hospitalization rates and treatment after ED visit for patients with spinal fractures in the Netherlands.

Materials and methods: We performed a trend analysis of ED visits related to vertebral fractures between 1997 and 2012, using the Dutch Injury Surveillance System.

Results: The total number of ED visits related to a vertebral fracture more than doubled from 4483 in 1997 to 9682 in 2012 (216 %). The increase in the total number of vertebral fractures occurred in all age groups. But the hospitalization rate showed a decline from 75 % to 35 %. Incidence rates increased with age and were higher in males younger than 55 years. The percentage of surgical treatments decreased from 2 % in 1997 to 0.5 % in 2012. The incidence of spinal cord injury also decreased from 5 % in 1997 to 2.5 % in 2012.

Conclusion: Vertebral fracture related ED visits are increasing, independently of age or gender. The hospitalization rates and spinal cord involvement show a decline. There is a trend in favor of a non-operative treatment.

Disclosure: No significant relationships.

O191

OUTCOME OF SEVERELY INJURED PATIENTS OVER EIGHT YEARS IN A LEVEL 1 TRAUMA CENTRE: THE EFFECT OF FLUID RESUSCITATION EVOLVEMENT IN MORTALITY

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Introduction: The massive transfusion protocol (MTP) was implemented in 2009 in Helsinki University trauma center. The aim of the study was to review the changes in fluid resuscitation and its influence on outcome of severely injured patients with hemodynamic compromise treated in a single level one trauma center.

Materials and methods: Data from Helsinki University Hospital's trauma registry on severely injured patients (NISS > 15) was reviewed over 2006–2013. Patients with isolated head injury or without hemodynamic compromise on admission (sBP > 90 or BE > -5.0) were excluded. The primary outcome measure was 30-day mortality. The study period was divided into three phases: 2006–2008 (before MTP, 147 patients), 2009–2010 (introduction of MTP, 86 patients), and 2010–2013 (post-MTP, 120 patients). Expected mortality was calculated using the Revised Injury Severity Classification score II. The Standardized Mortality Ratio (SMR) as well as the amounts of crystalloids, colloids and blood products (RBC, fresh frozen plasma, platelets) administered in the emergency room were compared.

Results: A total of 354 patients were included. The SMR values decreased (indicating better survival) during the study period from

0.97 (before MTP), 0.87 (introduction of MTP), to 0.79 (post-MTP). The amount of crystalloids decreased from 3873 ml (before MTP), 2391 ml (introduction of MTP), to 2336 ml (post-MTP). The blood products' relation to crystalloids increased from 0.36, 0.70, to 0.74, respectively.

Conclusion: During the study period no other major changes in the protocols on treatment were implemented. Damage control fluid resuscitation and introduction of MTP in a trauma center has significant positive effect on the outcome of severely injured patients.

Disclosure: No significant relationships.

O192

PROPHYLAXIS OF VENOUS THROMBOEMBOLISM IN PATIENTS WITH A NONSURGICAL FRACTURE OF THE LOWER EXTREMITY IMMOBILIZED IN A BELOW-KNEE PLASTER CAST

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Introduction: Deep vein thrombosis is a well-recognized complication after trauma and subsequent immobilization. For the immobilization of the lower limb below the knee, no consensus exists on whether thromboprophylaxis is necessary.

Materials and methods: We performed a multi-center prospective controlled trial (the PROTECT-study) to evaluate the efficacy and safety of subcutaneous Nadroparin and Fondaparinux in 300 patients who required immobilization in a below-knee plaster cast for at least four weeks after an ankle or foot fracture. The study drug was given throughout the period of immobilization. Color duplex ultrasonography of the injured leg was performed after removal of the plaster cast.

Results: Results will follow after the analysis of the complete data-set. We expect to finish in December of 2014.

Conclusion: Conclusion will follow after the analysis of the complete data-set. We expect to finish in December of 2014.

Disclosure: We've received a grant of Glaxo Smith and Kline.

O193

PREDICTORS OF RETURN TO WORK AFTER MILD TO MODERATE INJURY

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Introduction: Traumatic injuries have a major economic burden on society, since the frequency of traumatic injuries is high among individuals of working age.¹ Research showed that - next to injury-

related factors - demographic factors, socio-economic factors, and psychosocial factors are predictors for return to work (RTW). However, most studies included patients with severe injuries (ISS > 15), but little is known about what factors predict RTW and the ability to (participate in) work after mild to moderate injuries.

Materials and methods: A prospective cohort study was conducted at the Department of Trauma Surgery of the University Medical Center Groningen, The Netherlands. The cohort included 73 patients (34 males, mean age: 44.6 (15), median ISS: 4 (1-9)). Data were obtained within 3 months following injury with questionnaires regarding pre-injury work status, level of education, comorbidities, and about patients' illness beliefs, coping and expectations about recovery (SPOC²). Demographic factors and injury characteristics were obtained from the medical files. One year later, patients filled in questionnaires about current work status, work ability (WAI³), and the ability to participate in work (subscale of WHODAS⁴). Multi-variable regression analyses were conducted.

Results: Fourteen (20 %) patients did not return to work. Low income, low level of education, comorbidities and low illness coping were significant predictors of RTW and the ability to (participate in) work. ISS was no significant predictor.

Conclusion: A significant proportion of patients with mild to moderate injuries does not return to work one year after injury. Socio-economic and psychosocial factors predicted return to work and the ability to (participate in) work.

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Disclosure: No significant relationships.

O194

E-BIKE RELATED TRAFFIC ACCIDENTS; A 21ST CENTURY PROBLEM DUE TO TECHNICAL EVOLUTION AND AGING? PROSPECTIVE ANALYSIS OF THE PATIENT CHARACTERISTICS AND SEVERITY OF INJURY

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Introduction: Cycling is a popular transportation mode in the Netherlands. In 2013, about 200,000 E-bikes were sold in The Netherlands. E-bikes are mainly used by the elderly who lack the strength for solely human pedaling and have a decreased responsiveness. These people might be at high risk for traffic accidents while riding on a relatively fast and more heavy bicycle. There is however a lack of literature on injuries caused by E-bike related traffic accidents.

Materials and methods: To analyze this possible growing problem, a prospective cohort study of patients with an E-bike related accident treated at the Department of Trauma Surgery of the University Medical Centre Groningen was started in July 2014. Data regarding

patient characteristics, type of injury, number of operations and length of hospital stay are collected from the patients' charts. The preliminary results of this ongoing study are presented in this abstract.

Results: Twenty-one patients (12 female, mean age 61 years) suffered an E-bike related traffic accident. The mean ISS was 12 (range 1–30, SD 9.9). Thirteen patients required hospitalisation (mean length of stay 13 days), and six needed surgery. There were eight traumatic brain injuries diagnosed, one of these patients did not survive. The other 13 patients suffered from musculoskeletal trauma: 1 cervical spine fracture, 5 upper extremity fractures, 3 lower extremity fractures, the others were wounds/contusions.

Conclusion: E-bike related traffic accidents lead to serious traumatic injuries. The growing sales of E-bikes can lead to an increasing healthcare problem. Further research is needed to define the scope of this problem.

Disclosure: No significant relationships.

O195

TRENDS IN VIOLENT INJURY IN AMERICA DURING THE GREAT RECESSION OF 2008–2009

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Introduction: Economic downturns and rises in unemployment have been historically associated with increased suicide and interpersonal violence. During the Great Recession of 2008–2009, the US unemployment rate doubled and median household income decreased by over 6 %. This study investigates the impact of this economic crisis on the incidence of violent injury and death in the United States.

Materials and methods: This is a retrospective analysis of national injury data from the CDC WISQARS database. Incidence of injuries from 2008–2009 (during the recession) were compared with those from 2005–2006 (before the recession) using the Pearson Chi squared test. Injuries were classified as self-inflicted or interpersonal/legal intervention, and as fatal or nonfatal.

Results: There were 4,187,577 violent injuries in 2008–2009 vs. 4,355,242 in 2005–2006, representing a significant decrease of 6.52 % ($p < 0.01$). Incidence of both fatal and nonfatal interpersonal/legal intervention injuries decreased by 8.33 % (35,401 vs. 37,545, $p < 0.01$) and 7.11 % (3,328,440 vs. 3,483,762, $p < 0.01$), respectively. While hospital visits for non-fatal self-inflicted injuries decreased by 4.96 % (750,792 vs. 767,998, $p < 0.01$), the rate of suicide increased by 7.55 % (72,944 vs. 65,937, $p < 0.01$).

Conclusion: The Great Recession of 2008–2009 was associated with a decrease in interpersonal violence and homicide, but an increase in suicide. These findings suggest that economic recession on a national level does not directly result in an increase in interpersonal violence, as has been hypothesized, but may contribute to an increase in suicide. Attention to mental illness and suicidality remains a significant public health concern during economic crises.

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male suicides in the Great Recession: cross-national analysis of 20 EU countries. *Eur J Public Health*. 2014

Disclosure: No significant relationships.

O196

SURVIVAL BENEFIT OF PHYSICIAN-STAFFED HELICOPTER EMERGENCY MEDICAL SERVICES (HEMS) ASSISTANCE FOR SEVERELY INJURED PATIENTS

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Introduction: In literature Helicopter Emergency Medical Services (HEMS) assistance resulted in an increased probability of survival for severely injured patients, especially for those suffering from blunt trauma. However those studies lack statistical power. The aim of the present study with a longer inclusion period and subsequently a larger cohort size was to determine the effect of physician-staffed HEMS assistance on survival of severely injured patients.

Materials and methods: All consecutive severely injured trauma patients (ISS > 15) between October 1, 2000 and February 28, 2013 were included. Assistance of physician-staffed HEMS was compared to assistance from the ambulance paramedic (i.e., EMS group) crew only. A regression model was constructed for calculating the expected survival and survival benefit.

Results: A total of 3,543 polytraumatized patients with an ISS > 15 were treated at the Emergency Department, of whom 2,176 patients remained for analysis; 1,495 (69 %) were treated by EMS only and 681 (31 %) patients received additional pre-hospital care of HEMS. The model with the best fit and diagnostic properties (H-L coefficient 2.959, p = 0.937; AUC 0.888; PPV 71.4 %; NPV 88.0 %) calculated that 36 additional patients survived because of HEMS assistance. This resulted in an average of 5.33 additional lives saved per 100 HEMS dispatches for severely injured patients.

Conclusion: The present study indicates an additional 5.33 lives saved per 100 dispatches of the physician-staffed HEMS. Given the excellent statistical power of the current study (>90 %), physician-staffed HEMS is confirmed to be an evidence-based valuable addition to the EMS systems in saving lives of severely injured patients.

Disclosure: No significant relationships.

MILITARY & DISASTER

O197

TELECONFERENCING ADVANCED DISASTER MEDICAL RESPONSE COURSE AS A DISASTER PREPAREDNESS METHOD FOR THE FIFA WORLD CUP

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Introduction: FIFA World Cup required special planning and disaster preparedness efforts in Brazil. The need for healthcare providers (HC) with expertise in disaster medicine was crucial. Teleconference plays an important whole to achieve this objective and improve knowledge in this specific subject. The aim of this study is to present the experience with the Advanced Disaster Medical Response (ADM) course broadcasted by teleconference in disaster preparedness education.

Materials and methods: The ADMR is a one-day long course developed by the Massachusetts General Hospital and organized by the Panamerican Trauma Society and Brazilian Trauma Society (SBAIT). To reach a major number of HC the course was performed, for the first time, by teleconference in order to better prepare for mass casualty situations and disasters. An online questionnaire was applied before and after the course.

Results: 157 HC from 15 cities in Brazil answered the query, 8 being host cities for the World Cup. Most participants were physicians followed by registered nurses, medical students and firefighters. Pre-test mean grade was 6.67 in a scale from 0 to 10, and moved up to 8.2 on post-test (22.9 % increased success). In the course evaluation, 93.2 % of attendees considered good or great to have the opportunity of interaction through videoconference, 88.6 % considered course quality as good or great.

Conclusion: Teleconference is an effective tool to prepare healthcare professionals on disaster management with low cost and great results. This method is able to reach many locations on a continental country as Brazil, with good or great quality.

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Disclosure: No significant relationships.

O198

URBAN WAR CASUALTIES TREATED IN CIVILIAN HOSPITALS-NATIONAL TRAUMA COORDINATORS

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Introduction: The Trauma coordinators in Israel recently have worked under war conditions. We are proposing a 60 minute session on “Urban War casualties treated in civilian hospitals” We believe with our experience of treating military as well as civilian injured, in addition to all of our collaborative work during this crisis, can contribute to this conference. War injuries are changing and armies are improving protective gear. Goal to eliminate preventable death

Materials and methods: We will present national data, case scenarios, treatment dilemmas, and ethical challenges learned from

treating war injured. Subjects we would like to present: Shrapnel-Remove or not? Army evacuations into civilian hospitals- when does the military responsibility end and the Civilian hospital takes charge? Case Mix of soldiers and civilian wounded. Using social networking for communication between hospitals. Ethical Dilemmas and War Casualties in the 21st century.

Results: During the conflict we received over 400 wounded soldiers and civilians in our hospitals. 30 % arriving with ISS >16, 35 % in ICU, combination of penetrating and blast injuries. 80 % helicopter transport from front line directly into hospitals, as a result of excellent protective gear most injuries were peripheral.

Conclusion: Our experience in treating these casualties and using our network of trauma nurses contributes to provision of optimal care to war wounded. We believe that it is imperative to share what we have learned with European trauma teams.

Disclosure: No significant relationships.

O199

PUBLIC MEDICAL PREPAREDNESS - EVALUATION OF 1533 PATIENTS TREATED AT THE LARGEST SPORTING EVENT IN SWITZERLAND

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Introduction: With 300,000 visitors, the “Eidgenössische Schwing- und Älplerfest” (ESAF) is the largest 3-day sports event in Switzerland. The aim of this study was to review the preclinical medical structure and the frequency and diagnosis of patients treated onsite.

Materials and methods: Retrospective study of prospectively collected data. Diagnosis of patients and public medical preparedness was reviewed.

Results: Overall, 1,533 patients were treated. Mean age was 37.3 ± 16.7 years. At all three festival days, the frequency of the treatments peaked between 12 am and 4 pm. In total, 30 physicians and 438 paramedics including members of the Swiss Armed Forces provided a total of 5,399 hours of medical support in one of three Medical Assistant Points (MAPs). Mean time spent within the MAP was 12.5 (range, 1–380 min) per patient. Overall, 52.9 % of patients (n = 811) were treated at the second largest MAP. In 1,063 of 1,533 cases (69.3 %) a diagnosis was documented. Of those, 503 patients (47.3 %) suffered bee/wasp stings, of which 71 (14.1 %) were potentially life-threatening. In 18.8 % (n = 200) of patients, minor wounds and in 9.2 % (n = 98) musculoskeletal injuries were the reason for MAP admission. The two most common non-trauma-related reasons for MAP admission were alcohol/drug abuse (4.1 %) and gastrointestinal diseases (4.0 %). In total, 58 patients (3.8 %) required transfer to the hospital.

Conclusion: In general, medical care at the ESAF worked well. However, a shortage of antihistaminic medicaments occurred and more than half of patients were managed at the second largest MAP. It is important, to prospectively evaluate medical preparedness to improve medical care in future events.

Disclosure: No significant relationships.

O200

SPECIFIC TRAUMATOLOGY IN AVALANCHE VICTIMS. RESULTS FROM A FRENCH TRAUMA CENTER DATABASE

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Introduction: Together with hypoxia and accidental hypothermia, trauma injuries are very common in avalanches victims. Trauma alone is considered as responsible for a fourth of death causes only¹. However, when considering all the victims (surviving or not), very few data are available on what type of traumas can be caused by avalanches. Objective of study was to evaluate mortality and specific traumas and the related predisposing factors in avalanche victims in the French Alps in order to develop a pre-hospital regulation score.

Materials and methods: French avalanche association (ANENA) maintains a prospective database of all avalanches with human involvement since 2001. Trauma settings, injury Severity Score (ISS), vital signs and environmental data were recollected. Study was approved by the local ethical comity.

Results: Forty-nine accidents including 114 victims occurred from 2001 to 2010 in Grenoble Area (French Alps). Overall mortality was 34 % (34/114). Victims were totally buried in 46 % (53/114). Higher mean AIS were for thoracic injuries (4) and head and spine injuries (3.5). Mean temperature and complete burial were predictive factors of worse outcome. ISS, Hard snow, wet snow and avalanche danger scale did not meet statistical requirement (missing data). Only 36 % injured patients underwent tomodensitometry. Creation of a pre-hospital predictive score was not possible.

Conclusion: Traumatic injuries are common in avalanche victims. New technologies designed to protect head, spine and thorax, prevent complete burial and avoid hypothermia appears to be of paramount importance. Prospective follow-up of new criteria and systematic tomodensitometry are now implemented in our institution for further studies of this trauma-exposed population.

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Disclosure: No significant relationships.

O201

ATTITUDES TO “BATTLEFIELD ATLS” & ATLS AMONG DUTCH MILITARY PHYSICIANS

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Introduction: Dutch military physicians attend both the Battlefield Advanced Trauma Life Support (BATLS) course and the Advanced Trauma Life Support (ATLS) course. So far it has never been

investigated how the military population appreciates the courses and how valuable they proved to be during deployment.

Materials and methods: In 2011, all Dutch military physicians received a survey asking: - Did you take the ATLS/BATLS course? If so, when and how would you appreciate the courses? - Were you ever deployed? - Which course proved more useful during deployment, ATLS or BATLS?

Results: 40 people responded, therefore a p-value much smaller than 0.05 is required before outcomes are significant. GDMOs allotted the ATLS an 8.60 and the BATLS a 7.89 ($p = 0.001$). 74.4 % (29/40) of the respondents had been deployed. During deployment 31.3 % of the GDMO's preferred ATLS and 18.8 % preferred BATLS versus 0 % and 67 % preference for the ATLS and BATLS respectively by the MGP ($p = 0.018$). The other respondents had either no preference or did not encounter trauma care.

Conclusion: BATLS and ATLS are appreciated with grades of 8.0 or higher on a 1–10 scale. Physicians deployed preferred the BATLS protocol.

Discussion Even though the response rate was only 66.7 % some correlation can still be discerned. There is a risk of a bias in favour of BATLS since all MGPs who responded followed the BATLS while only 56 % followed ATLS. This could explain why ATLS gets a higher grade but 40.7 % of the deployed physicians preferred BATLS during their deployment versus 18.8 % who favoured ATLS.

Disclosure: No significant relationships.

O202

COMBAT RELATED VASCULAR INJURIES: A DUTCH EXPERIENCE

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Introduction: Vascular trauma endures as the leading cause of death in combat. The Dutch Role 2 Medical Treatment Facility (MTF), provided supportive care in Uruzgan, Afghanistan. Aim of this study was to conduct a detailed analysis of the admitted vascular injuries.

Materials and methods: Participants eligible for this study came from the Role 2 MTF admission database, where they fitted the criterion 'vascular injury between August 2006 and August 2010'. Results were contrasted with studies from coalition partners.

Results: The query revealed 194 casualties sustaining 208 central vascular injuries (60 % abdominal, 40 % thoracic/neck) and 99 extremity vascular injuries, mostly caused by improvised explosive devices (IEDs). Mortality rate was 27.9 % for central vascular injuries, and 38.6 % for thorax/neck. Vascular repair or Damage Control Surgery techniques (e.g. shunting) were used in 11/84 cases of lower, and in 7/15 of upper extremity injuries. Primary amputation or ligation was needed in 73/84 of lower, and in 8/15 of upper extremity injuries. Survival was significantly better ($p < 0.05$) in extremity vascular injuries.

Conclusion: Vascular injuries were often part of more extensive injuries caused by IEDs, resulting in amputation. There was a significant difference in vascular repair or (temporary) shunting when comparing our results to coalition partners (Forward Surgical Teams [with multiple, in skillset complementary surgeons] or higher medical

echelons). Regardless of discrepancy in usage of definitions concerning (vascular) injuries, in current literature, and limitations of retrospective analysis, this difference warrants further assessment. Our results affirm the importance of vascular repair skills for military surgeons, considering the current stream of subspecialisation.

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Disclosure: No significant relationships.

O203

TRAUMA ROOM MANUAL - IMPROVING TRAUMA CARE BY IMPLEMENTING A TRAUMA ROOM MANUAL

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Introduction: "To err is human". Care of injured patients in the trauma room is a complex, time-critical and stressful process. Errors are made and must be expected. Eliminating errors by perfecting individuals is illusory, but it is worth striving for systems to reduce their frequency and to support their early detection to minimize negative effects on treatment and health of critical patients. A non-punitive view upon error is essential for constructive error management. Detecting errors is not to blame somebody but for resolving them as a team. That is tightly associated with the quality of communication as a basis for good teamwork.

Materials and methods: Our TRM including several checklists is to serve as a guide for better error management, communication and teamwork. It includes a detailed introduction to establish understanding for application methods, an organizational chart and a flow pattern to embed it into the workflow. To ensure high quality and acceptance the development is accompanied by a literature review and an exchange with an interdisciplinary panel of experts including psychologists, jurists and pilots. To evaluate its practicability and effects, the Manual will be pilot-tested in several trauma rooms in Germany (November 2014).

Results: The analysis of the first testing data will show the usability, comprehensibility, time and communication management. Further we will elucidate advantages and disadvantages of such a new system.

Conclusion: A good safety culture contributes to a high quality of care. The Trauma Room Manual possibly is a medium to implement the according philosophy and methods into a trauma room.

Disclosure: No significant relationships.

O204

2D VERSUS 3D FLUOROSCOPIC NAVIGATION IN POSTERIOR PELVIC FIXATION

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Introduction: Percutaneous sacro-iliac screw fixation is technically demanding due to variable S1/S2 bony corridors. Traditional fluoroscopy has a non-orthogonal arc, making uniplanar screw correction challenging. Multi-planar corrections are possible with 2D and 3D fluoroscopic navigation. We hypothesize that 3D fluoroscopic navigation is safer and superior to its 2D predecessor.

Materials and methods: The PubMed literature from 1990 to 2014 was searched for key words: “posterior pelvic ring fixation”, “sacro-iliac fixation”, “ilio-sacral fixation”, “percutaneous SI fixation”, “fluoroscopy and SI fixation”, “2D sacral fixation” and “3D sacral fixation”. Articles with closed posterior pelvic ring fixation using conventional fluoroscopy, 2D and 3D fluoroscopic navigation were included. Articles on sacral open reduction internal fixation were excluded. The techniques, costs and outcomes were assessed.

Results: The search yielded 340 articles but only 36 articles met the criteria and were reviewed by three authors. In 2D navigation, mean preparatory time was 12.5 minutes, operative time 49 minutes/screw, and average radiation dose was 1376 cGy/cm². Misplaced screws were reported in 20 % of normal sacral and 50 % of dysmorphic sacra. In 3D navigation, mean preparatory time was 5 minutes, operative time 38 minutes/screw, and average radiation dose was 181.1 cGy/cm². Screw malposition >2 mm was reported only in 7 %, regardless of sacral anatomy. The average cost of 2D navigation was \$170,000, versus \$400,000 for 3D navigation.

Conclusion: 3D fluoroscopic navigation has shorter preparatory and operation time, lower radiation and lower screw misplacement compared to 2D fluoroscopy. These advantages must be weighed with increased cost for 3D fluoroscopy.

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Disclosure: No significant relationships.

O205

A CLINICAL EVALUATION OF HEADLESS COMPRESSION SCREWS FIXATION FOR MEDIAL MALLEOLUS FRACTURES

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Introduction: The current standard of treatment for medial malleolus fractures is reduction and fixation using partially threaded screws and/or Kirschner wire (K-wire) fixation. However, there have been reports of nonunion rates up to 20 %. In addition, the patient may complain of prominent hardware.

Materials and methods: All patients with a medial malleolus fracture treated with headless compression screws between January 2010 and December 2012 were included in this study. Follow-up clinical records and radiographs were reviewed to determine the rate of union and perception of pain over the medial malleolus.

Results: 35 patients were treated with headless compression screws and had adequate follow-up for inclusion. There were 9 males and 26 females, median age was 54 years (range, 17–84). There were 18 patients with bimalleolar fractures and 17 with trimalleolar fractures. Average follow-up was 47 weeks (range, 4–108). All patients were followed until union and full weight bearing. One patient required hardware removal for non-union. One other patient requested removal because of ankle pain. All other patients did not request/require hardware removal from the medial malleolus.

Conclusion: We found headless compression screws are useful in providing effective compression of medial malleolus fractures, especially as traditional fixation techniques involve unicortical screw fixation. Our series found one nonunion. In addition, traditional cancellous screws or K-wires are often prominent and cause irritation, necessitating elective hardware removal. Only 1 patient in our series had hardware removal for this problem. Our series found treatment of medial malleolus fractures using headless compression screws resulted in good outcomes.

Disclosure: No significant relationships.

ABDOMINAL SURGERY

O206

RECTAL DISRUPTION FROM ABDOMINAL SEATBELT INJURY – DESCRIPTION OF CASES AND DISCUSSION OF INJURY MECHANISM

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Introduction: Hollow visceral injury following vehicular blunt abdominal trauma is well recognised but relatively unusual, and injury to the rectum is rarely seen¹. Delayed diagnosis of a rectal injury following blunt abdominal trauma can have fatal consequences. We report three consecutive cases of rectal injury following blunt abdominal trauma.

Materials and methods: Three belt-restrained female patients involved in a head-on collision sustained abdominal blunt trauma without obvious signs of rectal perforation on the emergency CT

scans.

Results: All patients underwent laparotomy after resuscitation. The first patient had a complete seromuscular degloving of the rectosigmoid and mesenteric injury. The second patient had transection of the upper rectum, perforation of the distal ileum and a segment of ischaemic mid-ileum from mesenteric injury. The third patient showed a perforation of the rectosigmoid and the ileum. In all patients the perforated part of the rectum was resected and the closed stapled ends were left inside the abdomen. The right sided open iliac wing fracture was stabilized after reduction of the herniated bowel. Perforated and ischaemic small bowel was also resected and left unjoined. In all patients the abdomen was temporarily closed with a negative pressure dressing. At planned re-look laparotomy after 48 hours, all patients underwent stapled colorectal re-anastomosis.

Conclusion: Damage Control Surgery was used effectively in managing these patients' abdominal injuries, the emphasis being on resuscitation and correction of deranged physiology rather than immediate restoration of normal anatomy. Rectal injury in blunt abdominal trauma probably occurs through a combination of mechanisms, including stress and shear waves generated by abdominal compression².

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Disclosure: No significant relationships.

O207

IS THE LAPAROSCOPIC (LA) APPROACH APPROPRIATE IN COMPLICATED APPENDICITIS? A COMPARATIVE STUDY WITH THE OPEN (OA) APPROACH

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Introduction: Laparoscopic appendectomy has become an increasingly prevalent intervention in acute appendicitis and complications are compared with standard open approach.

Materials and methods: From September 2013 to September 2014, 155 consecutive patients (83 males and 72 females) with a diagnosis of acute appendicitis underwent to surgical procedure in a teaching hospital. Mean age was 27 ± 12 years (range 5–83 years). The diagnosis was made on the basis of clinical signs, C-reactive protein, white blood cell count, ultrasonography and computed tomography. Patients were divided in complicated appendicitis (abscess or peritonitis) and uncomplicated (all the others). In OA and LA standard procedures were performed. Drains were liberally inserted. Antibiotic therapy was administered preoperatively and continued post-operatively. Postoperative wound infections and intraabdominal abscess were taken into account.

Results: Appendectomy was performed openly in 67 patients and laparoscopically in 88 patients. Mortality rate was 0 in all the groups. No significant difference was observed regarding age, sex, BMI, temperature, NRS scale and lenght of stay. In this series the conversion rate from LA to OA was 3 %. The postoperative infective complications rate was: wound infections 1 (1.4 %) in OA and 3 (3.4 %) in LA. Abscess in OA were 2 (2.9 %), respectively 1 each in uncomplicated and in complicated series. Abscess were 7 (7.0 %) in LA, respectively 3 in uncomplicated and 4 in complicated ones. All

the abscess were successfully drained by interventional radiology procedures.

Conclusion: LA shows more incidence of post-operative intra-abdominal abscess than OA, especially in complicated patients. This should be taken into account in the decision making to convert to OA

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Disclosure: No significant relationships.

O208

EPIDEMIOLOGY OF RUPTURED ABDOMINAL AORTIC ANEURYSMS IN A WELL DEFINED NORWEGIAN POPULATION

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Introduction: Ruptured abdominal aneurysms (rAAA) is a life-threatening condition where a considerable proportion of the patients die before admission to hospital. Mortality in patients undergoing repair are reported to be 30–50 %. The goal of this study is to investigate the epidemiology of rAAA in a well defined Norwegian population where both hospital and autopsy data is available.

Materials and methods: A retrospective, single-center population based study of rAAA. The study includes all patients diagnosed with rAAA in- and pre-hospital in the catchment area of Stavanger University hospital between 2000 and 2012. Incidence and mortality rates (crude and adjusted) were calculated using national demographic data.

Results: 223 patients where identified with rAAA, where 203 were hospitalized and 20 patients died outside of hospital and were diagnosed on autopsy. Adjusted incidence was calculated to 11.3 per 100,000 per year. Adjusted incidence for men was 18.1 (95 % CI 15.5–21.0) and for women 4.9 (95 % CI 3.6–6.4). Adjusted mortality was 7.8 per 100,000 (95 % CI 6.6–9.2). 90-day standardized mortality ratio (SMR) 37.9 (95 % CI 32.4–44.5). 90-day mortality was 68 %. Postoperative mortality was 52 % (51 % in men and 57 % in women). Average diameter of aneurysm in rAAA was 75 mm.

Conclusion: Total mortality for rAAA in this study was 68 %. This is lower than most other studies and meta-analyses. This is not due to lower perioperative mortality (52 %), but few patients died outside of hospital (9 %) and a high intervention rate (73 %). A bias in this study is the low autopsy rate and this may underestimate the number of patients that died prior to hospitalization.

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Disclosure: No significant relationships.

O209

HOW TO DECIDE DAMAGE CONTROL SURGERY IN TRAUMA CARE ? - DAMAGE CONTROL INDICATION DETECTING SCORE (DECIDE SCORE) -

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Introduction: Although damage control surgery (DCS) is an important strategy, we don't have any consensus in its indication. The purpose of this study is to detect the risk factors of DCS and establish DCS indication scoring system.

Materials and methods: We examined 159157 trauma patients from Japan Trauma Data Bank 2014 database and extract 4447 patients who received laparotomy. 532 patients underwent DCS (DCS group) and 3915 patients underwent normal surgery (no DCS group). We compared between the groups.

Results: There were statistically significant difference in systolic blood pressure at ER (78 mmHg vs 108 mmHg), level of consciousness (GCS 10 vs 12), positive ratio of abdominal fluid collection (84 % vs 75 %), mortality (59 % vs 20 %), injury mechanism (blunt injury 92 % vs 74 %) between the groups. Logistic regression analysis revealed that blood pressure, body temperature and injury mechanism are the independent risk factors of DCS.

Conclusion: Systolic blood pressure at ER, body temperature and injury mechanism are the independent risk factors of DCS. On the basis of this results, we introduce damage control indication detecting score (DECIDE score).

Disclosure: No significant relationships.

O210

NPWT AND OPEN ABDOMEN MANAGEMENT: A SINGLE HIGH VOLUME CENTER EXPERIENCE

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Introduction: NPWT has become nowadays a widely used device in abdominal surgery. The objective of this study is to evaluate the clinical outcome of NPWT in the management of open abdomen and its correlation with primary definitive fascial closure.

Materials and methods: A retrospective observational study was performed evaluating 72 patients with open abdomen treated in a period of 20 months in a single high volume center. Primary objective was to evaluate the correlation between NPWT use and primary

definitive fascial closure. Reason for open abdomen; Mannheim peritonitis index score; type of intra-abdominal contamination; number and frequency of abdominal surgical revisions were also considered.

Results: The most common indication for open abdomen was abdominal sepsis (49 %) with a mean Mannheim index at first treatment of 25,91. Trauma was the main indication in 8 % of the cases. Enteric contamination was found in 29,2 % of patients. Mean number of surgical revisions was 3,47 with an interval of 42,3 hours. NPWT was the most commonly used device (86 %) resulting in a 67 % of primary fascial closure. Open abdomen treatments lasted 6,1 days on average. Main complications during NPWT treatment were enteric fistulas (6,9 %) and bleeding (9 %). Overall mortality was 30 %.

Conclusion: Indications for open abdomen, even though there is no strong scientific evidence, may be wide. The use of NPWT in open abdomen is useful to obtain a definitive fascial closure in a good percentage of patients, if the treatment lasts less than 8 days. Mortality remains high, although it is correlated to patient comorbidities.

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Disclosure: No significant relationships.

O211

PERIOPERATIVE BIOMARKERS ASSOCIATED WITH IN-HOSPITAL MORTALITY IN PATIENTS WITH PERFORATION PERITONITIS

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Introduction: Various factors and scoring systems have been introduced to stratify the risk in peritonitis patients. However, it remains uncertain which perioperative biomarkers can be used to predict the mortality of perforation peritonitis patients. Thus, the aim of this study was to evaluate which biomarkers were associated with mortality in patients with perforation peritonitis.

Materials and methods: The medical records of 419 patients with perforation peritonitis, admitted between January 2006 and December 2012, were reviewed retrospectively. Patients were divided into two groups: survivors (n = 372) and non-survivors (n = 47). Perioperative biochemical and clinical parameters were compared in between the two groups. Logistic regression multivariate analysis was performed to determine the independent risk factors of mortality in patients with perforation peritonitis.

Results: In-hospital mortality rates were 11.2 %. Non-survivors had significantly lower preoperative base excess (BE; $-9.40 \pm 6.75 \text{ mmol/L}$; $p = 0.011$) and postoperative serum albumin ($2.00 \pm 0.51 \text{ g/dL}$; $p < 0.001$) than the survivors (BE, $-5.35 \pm 4.03 \text{ mmol/L}$; serum albumin, $2.52 \pm 0.71 \text{ g/dL}$) in univariate analysis. Multivariate analysis showed that perioperative biomarkers associated with in-hospital mortality are preoperative BE ($p = 0.045$; odds ratio [OR], 0.734; 95 % CI, 0.542–0.993) and postoperative serum albumin ($p = 0.035$; OR, 0.074; 95 % CI, 0.007–0.827).

Conclusion: In a population of patients with perforation peritonitis, preoperative BE and postoperative serum albumin were risk factors associated with in-hospital mortality. Our study shows that severe base deficit and/or hypoalbuminemia are needed to correct as early as possible during the perioperative period.

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Disclosure: No significant relationships.

SPINE & MISCELLANEOUS

O212

BEDREST LEADS TO CHANGES IN LUMBAR INTERVERTEBRAL DISC COMPOSITION

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Introduction: In spaceflight, intervertebral discs (IVDs) gain height and cause elongation of the spine up to several centimeters. The same phenomenon has been observed in head down tilt bedrest. The physiology of the processes occurring within the IVDs has not been fully understood. Purpose of the studies presented here was to assess changes in glycosaminoglycan content and T2-time through MRI measurements before and after head-down tilt bedrest.

Materials and methods: 8 human men participated in a European Space Agency-funded bedrest study. Subjects remained in 6° head down tilt bedrest in two campaigns of 21 days. MRI scans were taken 1. according to the delayed gadolinium-enhanced magnetic resonance imaging (dGEMRIC) protocol and 2. to measure T2 relaxation time before and after bedrest. Semi-automatic image segmentation and data analysis were conducted for the lumbar IVDs.

Results: Results from the dGEMRIC-measurements showed a significant decrease in T1-time in all lumbar IVDs, probably indicating an increase in glycosaminoglycan content ($p < 0.001$). Delta T1 decreased significantly throughout bedrest ($p < 0.001$) particularly in the nucleus pulposus, in L4/5 and in the posterior discs. Results from T2-relaxometry showed a significant increase in T2-time throughout bedrest in all IVDs ($p < 0.001$).

Conclusion: In healthy subjects, the glycosaminoglycan content of intervertebral discs likely increases during 6° head-down tilt bedrest. In addition, bedrest leads to a T2-time increase in IVDs.

Disclosure: No significant relationships.

O213

RADIOLOGICAL CHANGES IN PATIENTS WITH ANKYLOSING SPONDYLITIS: A SOURCE OF MISINTERPRETATION IN CASE OF CERVICAL TRAUMA

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Introduction: Following trauma, the differentiation of disease related “stable” cervical changes and cervical instabilities in patients with ankylosing spondylitis may be difficult, even with the utilization of CT scans. In order to reduce a false positive diagnosis, we carried out an analysis of CT scan measures to gain insights into radiological changes associated with ankylosing spondylitis.

Materials and methods: A retrospective analysis of blunt trauma patients in a level-1 trauma center receiving a cervical CT scan. Two sub-cohorts were studied: No cervical injury patients (11 patients [age 52.9 ± 20.9]); and no cervical injury patients with the diagnosis of ankylosing spondylitis: (11 patients [age 69.1 ± 12.7]). Different radiological parameters for cervical spine injuries were assessed. One-Way Analysis of Variance (ANOVA) was used to calculate the statistical significance ($P < 0.05$).

Results: Demographic parameters (age, gender) were comparable in both groups. Statistically significant differences in Basion-posterior axial line interval (BAI) ($P = 0.014$), C2–C3 angle (end-plate method) ($P = 0.047$), and C2-Ophistion distance ($P = 0.046$) were observed in the ankylosing spondylitis cohort when compared to healthy patients.

Conclusion: Our analysis identified the Basion-posterior axial line interval (BAI), the C2–C3 angle, and the C2-Ophistion distance to be significantly changed in patients with ankylosing spondylitis without cervical trauma. Therefore these radiological parameters are no useful radiological tools in patients with this disease following cervical trauma and may even result in a false positive diagnosis.

Disclosure: No significant relationships.

O214

PRE-HOSPITAL PREDICTION OF SPINE FRACTURES

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Introduction: Current guidelines have implemented that all trauma patients considered to be at risk of spine injury should have immediate pre-hospital spinal immobilization by the Emergency Medical Services to prevent neurologic deterioration. Incidence of spinal fractures after blunt trauma remains low in pre-hospital immobilized patients. And because spinal immobilization can have severe side effects and is time consuming we wanted to assess the paramedic accuracy to predict spine injury.

Materials and methods: Paramedics prospectively recorded the probability on spine fractures for patients that were presented to the emergency department of a Dutch level II trauma center. Inclusion period was from January 2013 till January 2014. Prediction on spine fractures was defined as 'Yes: <10 %, 11–50, 51–90 %, >90 %' or 'No'. Patients were considered to have no spine fracture when CT scanning was negative on presentation or if clinical examination remained negative during 3 months follow-up.

Results: In total one hundred and thirty-eight patients were included. 25 patients (18 %) had at least one spine fracture, of which 22 (88 %) were predicted by the paramedics. 34 of the 37 (92 %) patients without clinical prediction of a spine fracture were considered truly negative.

Sensitivity: 88 %

Specificity: 30 %

Positive predictive value: 22 %

Negative predictive value: 92 %

Conclusion: The positive predictive value of the paramedic prediction is 22 % and therefore much higher than the current protocol for immobilization based on mechanism of injury. In contrary the negative predictive value will drop to 92 % if immobilization would be done based on paramedic prediction.

References: Dutch National Protocol EMS (Landelijk Protocol Ambulancediensten) version 7.2 page 107 Asbeck et al., An epidemiological description of spinal cord injuries in The Netherlands in 1994, Spinal Cord (2000) 38, 420–424 Jim Morrissey, Time for change in prehospital Spinal immobilization, European Journal of Emergency medicine feb 2013, volume 20 issue 1
Disclosure: No significant relationships.

O215

POSTERIOR SHORT SEGMENT PEDICLE SCREW FIXATION WITH APPLICATION OF PEDICLE SCREWS AT THE FRACTURED LEVEL IN THORACOLUMBAR BURST FRACTURE

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Introduction: Thoracolumbar burst fractures are serious injuries and their management remains controversial. Short-segment pedicle instrumentation for thoracolumbar burst fractures is known to fail early because of the absence of anterior support. However, the use of pedicle screws at the fracture level may be useful in providing support. Our hypothesis was that posterior short segment pedicle screw fixation with application of pedicle screws at the fractured level could be a suitable method for treatment of thoracolumbar burst fracture with good maintenance of reduction and low morbidity.

Materials and methods: Twenty patients with average age 57 years (52–64) suffered from thoracolumbar burst fracture (T11-L2) type A3 according to AO/Spine classification were treated by Posterior Short Segment Pedicle Screw Fixation with application of pedicle screws at the fractured level. The followup period was from 12 to 30 months.

Results: All 13 patients with initial neurological deficit showed one to two Frankel grade improvement while the other 7 neurologically intact patients showed no deterioration. The early post-operative

radiographs showed significant improvement in the segmental kyphotic deformity and the vertebral body height which were nearly maintained till a solid bony healing in the fractured vertebrae was demonstrated in the followup. No patient suffered from any major complications such as DVT, deep infection, or implant failure. Only two cases had a superficial wound infection which was treated successfully.

Conclusion: Posterior short segment pedicle screw fixation with application of pedicle screws at the fractured level could be a suitable method for treatment of thoracolumbar burst fracture with good maintenance of reduction and low morbidity.

Disclosure: No significant relationships.

O216

OPERATIVE VERSUS NON-OPERATIVE MANAGEMENT OF FLOATING SHOULDER INJURIES

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Introduction: The scapula and the lateral clavicle are important parts of the superior shoulder suspensory complex. In fractures of the neck scapula and the clavicle, the complex tends to be unstable and requires operative stabilization. Neglected floating shoulder may lead to a foreshortened extremity with muscular weakness and the potential for chronic brachial plexopathy.

Materials and methods: Eighteen patients with a floating shoulder injury, age was 38.6 years, treated between 2007 till 2010. Ten patients had right and eight had left shoulder injuries. The injuries were traffic accidents in 16 patients and falling in 2. The period from injury to surgery was 10.4 days. 8 patients were surgically stabilized (group I) and 10 cases were treated non-operatively (group II). The procedure in group I included open reduction and internal fixation with the use of AO techniques. The stability of the glenoid fractures was assessed by image intensifier, and displaced fractures (2 patients) were treated by (ORIF) through a posterior approach. In group II, the shoulder was immobilized in an arm sling for 6 weeks. The follow-up period was 20 months. The Constant and Murley scoring system used for evaluation

Results: Fractures in both groups healed within 3 months. **In Group I** 7 patients showed good to excellent results. Bad to fair results found in 1 case. **In Group II**, Good to excellent results found in 7 patients. Fair results found in 3 patients.

Conclusion: We cannot recommend operative treatment for a double disruption of the superior suspensory shoulder complex. Treatment must be individualized for each patient.

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Disclosure: No significant relationships.

O217**OPEN REPOSITION AND FIXATION OF THE POSTERIOR MALLEOLUS VIA THE POSTEROLATERAL APPROACH**

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Introduction: Posterior malleolar fractures often lead to worse functional outcome and posttraumatic osteoarthritis. An anatomical reconstruction is one of the main predictors for successful recovery. In general, a percutaneous reduction and fixation is performed of posterior fragments >25 % of the articular surface. However, studies show that this leads to a persisting step-off in >40 % of cases. More recently, ORIF of the posterior fragment via a posterolateral approach in prone position is proposed. We present the technique and results of 30 consecutive patients with a trimalleolar fracture treated in this manner.

Materials and methods: Retrospective study. In the period 2010–2012, 30 patients suffering a trimalleolar ankle fracture were treated with ORIF via the posterolateral approach. Functional and radiological outcome was measured at least 1 year postoperative.

Results: Anatomical restoration of the intra-articular surface was found in 28 cases (93 %), the other 2 cases showed a persistent step-off of 1 mm. After fixation of the posterior fragment, the syndesmosis was stable in all patients, also in 44C-type fractures. In none of the cases syndesmosis screws were placed. There were no short-term complications, except postoperative neuropraxia in 2 patients which fully recovered. During follow-up, there was no loss of reduction and the mortise stayed congruent in all cases. Four patients developed post-traumatic osteoarthritis.

Conclusion: The posterolateral approach leads to a perfect visualisation of the posterior malleolar fracture, an anatomical reduction and stable fixation with a minimum of complications. Moreover, via this approach smaller posterior fragments can be fixed and the use of syndesmotic screws can be minimised.

Disclosure: No significant relationships.

O218**TENSION BAND WIRING OF OLECRANON FRACTURES, STILL THE BEST OPTION?**

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Introduction: Olecranon fractures are a common type of fracture, most often treated with tension band wiring (TBW). Although commonly used, only small sample size studies have been conducted to investigate complication and reoperations rates of TBW.^{1–5}

Materials and methods: All consecutive patients (≥ 16 years old) treated in our level 1 trauma center between 2004 and 2010 for a displaced olecranon fracture with TBW were included and analysed retrospectively. Primary outcome was the complications and

reoperation rate. Secondary outcomes were associated factors with these complications and reoperations.

Results: 119 patients with a mean age of 58 years (range 40–69 years) were included. Low-energy falls accounted for 83.5 % of all injuries, and 61.2 % of all fractures were a type 2A according to the Mayo-classification. Hardware complaints were the most frequent complication (56.2 %), whether or not more specified as hardware prominence (26.4 %), k-wire migration (33.1 %) or skin perforation (4.1 %). Another frequent complication was function limitation (47.9 %) with almost half of these patients having a limitation of extension. Eighty-five patients underwent a reoperation for hardware removal (69.4 %) or for revision surgery (5.8 %) due to hardware failure. Among the patients with hardware complaints, 91.2 % of them had their hardware removed eventually. The correlation between complaints and hardware removal was shown by the multivariate regression analyse (RE: 16.13; p = 0.006).

Conclusion: We found hardware complaints and function limitation as the main problem after TBW, which resulted in high reoperation rates. Hardware complaints were the largest predictor for reoperation and hardware removal.

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Disclosure: No significant relationships.

O219**PREVENTION OF EXCESSIVE MEDIALISATION OF TROCHANTERIC FRACTURE BY A BUTTRESS SCREW: A NOVEL METHOD AND FINITE ELEMENT ANALYSIS**

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Introduction: Excessive medialisation of the distal fragment relative to the proximal part is an important factor leads to failure of fracture fixation using sliding hip screw (SHS) for trochanteric fractures. Many factors that contribute to such femoral medialisation include; the fracture pattern, the comminution of medial cortex, the integrity of lateral wall and the obliquity of the lag screw placement. After excessive medialisation of the distal fragment, the contact fracture surface will be diminished which will delay in bone healing. The lag screw will be fully collapsed and later behave as a fixed angle device with subsequently result in cut out of the lag screw.

Materials and methods: This paper proposes a novel method of using a antero-posterior buttress screw at the distal fragment just below the fracture site in adjunction with the sliding hip screw (SHS) to resist the excessive femoral medialisation. The virtual assessment of its effectiveness was performed using the finite element analysis.

Results: The result shows that the SHS combined with a buttress screw can help resist the femoral medialisation better than the SHS with no buttress screw. The equivalent von Mises stress was also found to be in safety range which indicates the integrity of the lateral wall with the buttress screw.

Conclusion: The proposed method is simple and safe and will be helpful in certain unstable fracture pattern of trochanteric fractures especially in the elderly.

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Disclosure: No significant relationships.

PELVIC

O220

COMBINATION OF CT EXTRAVASATION SIGN AND RETROPERITONEAL HEMATOMA THICKNESS CAN ACCURATELY PREDICT NEED FOR TRANSCATHETER ARTERIAL EMBOLIZATION IN PATIENTS WITH PELVIC FRACTURE

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Introduction: It was believed that positive CT extravasation sign was a standard finding to indicate transcatheter arterial embolization (TAE) in patients with pelvic fracture. To achieve more accurate indication criteria for TAE in patients with pelvic fracture, we hypothesized that retroperitoneal hematoma thickness in combination with CT extravasation sign could be more accurate and sensitive in predicting need for TAE in comparison with CT extravasation sign alone.

Materials and methods: We included consecutive patients with pelvic fracture who hospitalized in the study hospitals. Combined model in this study was defined that positive extravasation sign or retroperitoneal hematoma thickness that is greater than or equal to 10 mm. Ordinal logistic regression analysis tested prediction of retroperitoneal hematoma thickness and CT extravasation sign for undergoing TAE in patients with pelvic fracture. Receiver operating characteristic analysis compared diagnostic accuracy of the combined model and those of CT extravasation sign alone.

Results: 218 consecutive subjects matched the selection criteria. Logistic regression analysis showed retroperitoneal hematoma

thickness that is greater than or equal to 10 mm was independent to indicate TAE (odds ratio 6.0, 95 % confidence interval 2.3–15.5, $P < 0.001$). Sensitivity, specificity, positive predictive value and negative predictive value of CT extravasation sign alone were 0.82, 0.85, 0.74 and 0.90. Those of the combined model were 1.00, 0.88, 0.80 and 1.00. ROC analysis demonstrated higher accuracy of the combined model (AUC of 0.87 versus 0.83, $P = 0.008$ in bootstrapping) in comparison with CT extravasation sign alone.

Conclusion: In this cohort, criteria with combined model for TAE in patients with pelvic fracture was sensitive and accurate.

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Disclosure: No significant relationships.

O221

PRECISION OF COMPUTER NAVIGATED VERSUS FLUOROSCOPIC GUIDED FIXATION OF PERCUTANEOUS ILLIOSACRAL SCREWS

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Introduction: Background/Purpose: Percutaneous iliosacral (IS) screw fixation is commonly applied to stabilize the posterior pelvic ring in patients with unstable pelvic fractures. The aim of this study is to compare computer navigation surgery with conventional fluoroscopy on the accuracy of IS screw fixation by reviewing post-operative CT scans.

Materials and methods: Methods: Patients with traumatic pelvic ring instability treated with percutaneous IS screws fixation at two Level I Trauma Centers in The Netherlands in the period 2008–2013 were studied. Insertion of the IS screws was assessed by postoperative CT scan and contrasted between CNS and CF.

Results: Results: The computer navigated group ($n = 55$) and the conventional fluoroscopic group ($n = 24$) were comparable in age (mean, 43 yr), gender (58 % male), BMI (25 kg/m^2), ISS (27), injury-surgery time interval (7 days) and Tile classification (40 % B, 60 % C on average). In the CNS patient group a total number of 109 screws were placed (2.0 per patient), of which 73 % adequately. In the CF group the findings were 40 screws (1.7 per patient), 75 % adequately. Inadequate fixation comprised neural foramina hit: CNS 19 screws [17 %] vs. CF 5 screws [13 %], $p = 0.90$; and extra osseous dislocation: CNS 11 screws [10 %] vs. CF 5 screws [12 %], $p = 0.63$ (see table). The reoperation rates did not differ between CF and CNS.

Conclusion: Conclusion: In contrast to what has been suggested by previous studies, we found no benefit from computer navigated iliosacral screw fixation compared to fluoroscopic technique regarding precision of screw placement on postoperative CT scans.

Disclosure: No significant relationships.

O222**ASSESSMENT OF OCCULT POSTERIOR PELVIC RING INJURIES IN ELDERLY PATIENTS**

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Introduction: Pelvic ring fractures of the elderly people are usually the result of low-energy trauma. Imaging studies performed during the primary examination usually reveal fractures of the anterior ring. The latest literature emphasizes the importance of posterior ring injuries accompanying anterior ring fractures. In our prospective study our aim was to examine the occurrence of posterior ring injuries accompanying anterior ring fractures.

Materials and methods: Between May 2013 and June 2014 we admitted every patients with anterior pelvic ring fractures. All patients underwent routine AP, inlet and outlet pelvic X-Ray and CT examination. We compared the positive data of X-Ray and CT evaluations. We classified the pelvic fractures according to the recently published Rommens' Classification System. In most of our cases we continued conservative treatment and early mobilization as tolerated. In one case we performed operative stabilization of pelvic fractures.

Results: Thirty-four patients with median age of 81 years (64–91) were involved into our study with anterior pelvic ring fractures. Imaging studies showed posterior ring fractures in 14/34 cases (41.2%). The X-Ray detected 3/14 posterior fractures, the other 11/14 (78.6%) were detected only by CT. Most of our cases belonged to the FFP Ia and FFP IIb groups.

Conclusion: Posterior ring injuries in osteoporotic elderly patients remain hard to recognize. Diagnostic criteria, evaluation of the stability, and the indication of surgical intervention is still a sensitive issue in the field of fracture care. CT evaluation determine the type of care, ranging from conservative therapy to minimal invasive techniques or complicated surgical reconstructive methods.

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Disclosure: No significant relationships.

O223**POTENTIAL OPTIMIZATION OF PERCUTANEOUS SACROILIAC JOINT FIXATION BY USE OF SPECIFIC ENTRY AND AIMING POINTS ON LATERAL PELVIC VIEWS ASSESSED IN CADAVERS**

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Introduction: Knowledge of entry and aiming points on lateral pelvic views for ideal pathways for sacroiliac screws at the level of S1 might enhance safety and efficiency of the standard procedure.

Materials and methods: Entry and Aiming points were defined as locations of the screw heads or tips at the crossings of lateral innominate bones' cortices or sacral midlines with centres of optimal screw pathways determined on CT scans. Entry and aiming points were transferred to lateral pelvic views using a specific protocol. Screws were placed in four human cadavers by a less-experienced surgeon; on one side without ("classic" technique), on the other side with ("new" technique) knowledge of individual entry and aiming points. The time needed for the procedure or for fluoroscopy and radiation exposure were documented. Screw positions were assessed for extraosseous displacement and their angles to respective sacroiliac joint lines in axial and coronal scans.

Results: The values (mean \pm SD) in the groups "classic" vs. "new" technique were for the operation time 16.2 ± 5.9 min vs. 8.9 ± 1.8 min, fluoroscopy time 2.9 ± 1.1 min vs. 2.1 ± 0.3 min, radiation exposure 24 ± 8 mGy vs. 15 ± 5 mGy; the axial angle measured $99 \pm 10^\circ$ vs. $91 \pm 6^\circ$, coronal angles $101 \pm 3^\circ$ vs. $88 \pm 4^\circ$. Differences for all comparisons were without statistical significance ($p = 0.068$; Wilcoxon signed-rank test). In neither of the groups a relevant extraosseous displacement was observed.

Conclusion: The availability of entry and aiming points enabled the less-experience surgeon by trend to place sacroiliac screws faster and less exposed to radiation without the risk for an extraosseous misplacement or being less efficient.

Disclosure: No significant relationships.

O224**MRI ASSESSMENT OF LIGAMENT INJURY IN PATIENTS WITH FRAGILITY FRACTURE OF THE PELVIS**

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Introduction: Fragility fracture of the pelvis (FFPs) is a fracture affecting primarily elderly people with underlying osteoporosis. Rommens stated that this is an injury free of a ligamentous component even in cases with unstable FFPs.

Materials and methods: Between February 2009 and July 2014, 139 patients with FFPs, all at least 65 years of age, were transported to our center or one of its affiliates. Of these patients, 25 classified as Type IIc or higher according to Rommens classification in whom MRI findings at first presentation were available were enrolled in this study. Evaluation of ligament injury: If MRI revealed ligament interruption, brightness changes within the ligament, or swelling of the ligament, a judgment of "ligament injury present" was made. Evaluation was based on the iliolumbar, sacrotuberous, sacrospinous, and anterior/posterior sacroiliac ligaments. Two physicians (an orthopedic surgeon and a radiologist) were in charge of conducting the evaluations.

Results: Of the 25 patients studied, 8 had ligament injury at one or more sites; according to disease type, 2 patients were classified as type 2c, 1 as 3a, 2 as 3b, 2 as 3c, and 1 as 4b case. Of the 8 patients with ligament

injuries, 3 had nonunion or underwent surgical treatment. The remaining patients achieved bone healing with conservative treatment. **Conclusion:** FFPs can occasionally be accompanied by ligament injury. Ligament injury tended to be more frequent in cases with Rommens Type 3 or higher. However, the outcomes of patients with FFPs accompanied by ligament injury were not always poor.

References: 1. Rommens PM, Hofmann A. Comprehensive classification of fragility fractures of the pelvic ring: Recommendations for surgical treatment. *Injury* 44:1–12. 2. Gary JL, Mulligan M, Banagan K, Sciadini MF, Nascone JW, Toole RVO. Magnetic Resonance Imaging for the Evaluation of Ligamentous Injury in the Pelvis : A Prospective Case-Controlled Study. *Journal of orthopaedic trauma*. 2014;28:41–7.

Disclosure: No significant relationships.

O225

TITLE: RADIOLOGICAL ANALYSIS OF THE ROOF IMPACTION IN FRACTURES OF THE ACETABULUM

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Introduction: Roof impaction (RI) represented by “gull sign” is one of famous prognostic factors in the treatment outcomes of the fractures of the acetabulum. This radiological feature generally have been associated with early failure after osteosynthesis. We investigated incidence and location of the roof impaction in our series.

Materials and methods: 142 acetabular fractures were included in this study. Mean age of the patients was 51 year-old. All the patients were evaluated by three standard radiographs and CT scan. We assessed the existence/nonexistence of the RI, the incidence and the location depending on the fracture type, and the size and the degree of the step off.

Results: There was a great discrepancy of the detection rate of the RI between plain radiograph (4.9 %) and CT assessment (21.8 %). According to the RI incidence of each fracture type, there were 2 of 3 anterior wall fractures, 4 of 17 anterior column, 1 of 6 transverse, 4 of 6 anterior with posterior hemitransverse, 1 of 5 posterior column with posterior wall, 1 of 17 transverse with posterior wall, 5 of 9 T-shape and 14 of 40 both column. The location of the RI was mainly in anterior column in 14 cases, mainly in posterior column in 15 cases and both in 2 cases. Mean step off of the RI was 4.6 mm.

Conclusion: The occurrence of the RI was not rare even in young patients. Careful preoperative assessment using with CT should be mandatory. There were several characteristic signs in multi-planar reconstruction and 3D-CT images and they were useful to detect the RI.

Disclosure: No significant relationships.

O226

RADIOGRAPHIC ANALYSIS OF ENTRY AND AIMING POINTS ON LATERAL PELVIC VIEWS FOR OPTIMAL SACROILIAC JOINT FIXATION USING SACROILIAC SCREWS

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Introduction: The study assessed entry and aiming point (EP, AP) positions for sacroiliac joint fixation on sagittal pelvic views with reference to patient demographics and sacral morphology.

Materials and methods: EP and AP were defined in 200 CTs of normal pelvis as locations of screw heads or tips at crossings of lateral innominate bones' cortices or sacral midlines, respectively, with centres of optimal pathways in horizontal (axial) and vertical (coronal) planes. A coordinate system was introduced on the sagittal planes with the zero-point in the center of the posterior cortex of S1 vertebral body (x-axis parallel to upper S1 endplate) to transfer entry and aiming point positions to lateral pelvic views. Influence of patient age, gender, side, pelvic incidence angle, transversal curvature angle (TCA), pelvic incidence length-index (PIL-index), and unilateral sacral width-index (USW-index) on horizontal and vertical distances of EP and AP from the zero-point was assessed in a multivariate analysis.

Results: Mean horizontal distance for EP and AP were 14 % (\pm 24) and -53 % (\pm 7) and mean vertical distance for EP and AP were -41 (\pm 14) % and 11 % (\pm 7). PIA, PIL-index, and USW-index significantly influenced EP and AP. Additionally, age, gender, and TCA significantly influenced EP.

Conclusion: The presented approach transferred optimal EP and AP from CT data to a single sagittal plane that can be used for intraoperative fluoroscopy and facilitates optimal screw fixation of sacroiliac joints. The study results and the approach may help in improving screw fixation, decreasing operating and fluoroscopy times as well as radiation exposure.

Disclosure: No significant relationships.

O227

OUTCOME AFTER OSTEOSYNTHESIS OF HIP FRACTURES IN NONAGENARIANS

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Introduction: Hip fractures in the elderly population are associated with high morbidity and mortality. However, there is still a lack of information on mortality and loss of independency in extremely elderly people with a hip fracture.

Materials and methods: Hospital charts of all patients over 90 years old operated for a hip fracture between January 2007 and December 2011 were reviewed. Outcome measures were mortality, pre- and post-operative mobility and loss of independency.

Results: 149 patients were included, 132 (89 %) women, median age 93.5 ± 2.45 years. Thirty-six (24 %) patients were classified as ASA 2, 104 (70 %) as ASA 3 and 9 (6 %) as ASA 4. The Charlson comorbidity index (CCI) score was 2 or less in 115 (77 %) patients and 34 (23 %) patients scored 3 or more points. Short-term survival was 91 % and 77 % on 30-day and 3-months respectively. Long-term survival was 64, 42 and 18 % at 1-, 3- and 5 years after surgery. Survival was significant better in patients with lower ASA score

($P = 0.005$). No significant difference in survival was measured between patients according CCI score ($P = 0.13$). Fifty-one percent of patients had to be accommodated in an institution with more care following treatment, and 57 % was less mobile after osteosynthesis of a hip fracture.

Conclusion: Our study shows that short-term mortality rates in very elderly patients with a hip fracture are high and there is no clear predictive value for mortality. ASA classification is the best predictive value for overall mortality. A large proportion of these patients lost their independency after osteosynthesis of a hip fracture.

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Disclosure: No significant relationships.

O228

PREDICTIVE VARIABLES OF OPEN REDUCTION IN INTERTROCHANTERIC FRACTURE NAILING

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Introduction: Lack of reduction is one of the main causes of failed fixation of intertrochanteric fractures. Factors that act by impeding closed reduction in this type of fractures are still unclear. The goal of our study is to establish variables that can predict open reduction in intertrochanteric fracture nailing.

Materials and methods: An observational prospective study is being carried out in our centre. We present the preliminary results of 122 patients who suffered an intertrochanteric fracture and were treated in our institution by intramedullary nailing. All fractures were classified using AO classification. A radiological evaluation was carried out before surgery, at the operating room and after surgery. Variables analyzed were disruption of the lateral wall, posterior buttress and calcar and lesser trochanter location.

Results: We obtained 33 fractures type A1, 74 fractures type A2 and 15 fractures type A3 in the AO classification. Lateral wall was disrupted in 56 cases, posterior buttress was disrupted in 58 cases and calcar was disrupted in 85 cases; Lesser trochanter was free in 67 cases and in 55 cases it was located at proximal or distal fragment. In 31 cases an open reduction was required. In 79 cases we achieved an anatomical reduction. Statistical analysis revealed significant association between open reduction and fractures type A2.3 and A3, lateral wall disruption and posteromedial buttress disruption ($p < 0.01$).

Conclusion: Factors associated with an open reduction are fractures type A2.3 and A3 of AO classification and lateral wall and posteromedial buttress disruption. These fracture patterns can be successfully reduced by approaching the fracture site.

References: Haidukewych G. J. Intertrochanteric fractures: Ten tips to improve results. *Instr Course Lect*. 2010;59:503–9. Review.

Disclosure: No significant relationships.

PEDIATRIC & HIP

O229

PEDIATRIC CERVICAL SPINAL CORD INJURY: A RETROSPECTIVE OUTCOME ANALYSIS

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Introduction: Spinal cord injury of children and adolescents is rather rare and in literature mostly described by case reports.

Materials and methods: We retrospectively analyzed 26 cases of traumatic tetraplegia regarding the level of injury and grade of palsy, kind of treatment and duration of ventilation during 2003–2013. Also complications were assessed. Outcome was measured by the SCIM score and AIS with regards to the EMSCI protocol.

Results: During a 10 year period 26 patients with an age under 18 years were included. Most injuries happened by traffic accidents, followed by header into dead water. The mean age was 15 years. Initially 18 cases showed a complete tetraplegia (AIS A) and after discharge it decreased to 16 cases. A downshifting of the level of injury was detected in one case. In 24 cases unstable fractures were observed and initially stabilized from anterior in 20 cases and by Halo in 2 cases. One was operated over anterior and posterior approach. Assisted ventilation was necessary for 6 weeks in mean after injury and a permanent ventilation was needed in 3 cases. During this period 2 pneumonia were assessed, one esophageal fistula had to be treated. One tracheal occlusion after traumatic percutaneous tracheotomy occurred. Regarding the functional outcome patients improved their functional skills up to 37/100 points (SCIM) and a shifting in the AIS was observed in 23 % towards better muscle values.

Conclusion: Young tetraplegic patients have a good outcome regarding the weaning potential but the SCIM values are lower than in mid-age patients.

References : Högel F, Mach O, Maier D.: Functional outcome of patients 12 and 48 weeks after acute traumatic tetraplegia and paraplegia: data analysis from 2004–2009. *Spinal Cord*. 2012 Jul;50(7):517–20.

Disclosure: No significant relationships.

O230

PELVIC FRACTURES IN CHILDREN

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Introduction: Pelvic fractures in children are rare, and often part of a multitrauma with major associated injuries. We reviewed the incidence, presentation, treatment and complications of paediatric pelvic fractures admitted to our level 1 trauma centre.

Materials and methods: A retrospective chart review was performed of children younger than 16 years with a pelvic fracture managed at a tertiary referral centre for pelvic surgery, the Radboud University Medical Center from January 1st 1993 to December 31st 2013.

Results: 51 patients with a pelvic fracture were identified; 6 of them had an additional acetabular fracture. Median age was 11 years, 58 % were boys. Traffic accidents accounted for 80 % of cases. The median Injury Severity Score was 24.5 (range 7–50). Associated injuries were present in 70 %. Sixteen (31 %) children sustained a Tyle type B2 fracture, 13 (26 %) a type A fracture and 7 (14 %) a type C fracture. 21 % of the pelvic fracture was managed operatively. 21 children required operative treatment for associated injuries. Three children died. Two due to their severe head trauma, and one as a result of a massive lung embolism. The mean follow up was 7 months, range 6 weeks to 6 years. Three children indicated a major disability in their life due to the pelvic fracture.

Conclusion: Paediatric pelvic fractures differ from adults in aetiology, fracture type and associated injuries. A high percentage were treated operatively, with good results. A significant part of the operations and mortality is not linked to the pelvic fractures, but to the associated injuries.

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Disclosure: No significant relationships.

O231

COMPLEX TIBIAL SHAFT FRACTURES IN CHILDREN INVOLVING THE DISTAL PHYSIS MANAGED WITH THE ILIZAROV METHOD

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Introduction: Segmental injury to the juvenile distal tibia with physis involvement presents specific challenges. Injury to the growth plate may be overlooked, potentially resulting in late sequelae and stabilisation is complex. Previous reports document management of such an injury by open reduction and internal fixation¹.

Materials and methods: Patients 16 or younger presenting to our unit with distal tibial metaphyseal fractures treated between March 2013 and August 2014 by ilizarov circular fine-wire fixation were identified. We recorded patient demographics; fracture classification, treatment pathways, fixation methods, post-operative follow up and outcomes/complications.

Results: 7 patients were selected. All had initial immobilization in either monolateral external fixator device (5 patients), or cast (2 patients). Patients were ambulant during treatment, being allowed unrestricted weight bearing immediately post-op. 2 patients had separate shaft and distal physis fractures, 5 patients had shaft fractures extending down into the distal physis. 2 patients presented with triplane fractures, 5 were Salter Harris type 2. 2 patients were Gustilo Anderson grade IIIa. 4 patients were treated with percutaneous screws around the physis and an Ilizarov frame, 3 were treated with fine wire Ilizarov frame only. Average frame

application time was 102.5 days (range 72–133 days). All fractures healed without deformity. No early complications, except minor pin-site infections. One patient presented with partial growth arrest of the medial distal tibia on CT, before any deformity occurred, treated with completion epiphysiodesis. Patient currently has no deformity or leg length discrepancy.

Conclusion: The Ilizarov method appears to represent a safe and effective technique for the management of these injuries.

References : 1. Rover W, Alazzawi S, Hallam P, Walton N. Ipsilateral tibial shaft fracture and distal tibial fracture with an intact fibula: a case report. *Journal of Orthopaedic Surgery* 2011;19:364–6

Disclosure: No significant relationships.

O232

ANALYSIS OF EARLY VASCULAR AND NERVE COMPLICATIONS OF SUPRACONDYLAR HUMERUS FRACTURES IN CHILDREN

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Introduction: Suprakondylar humeral fracture of the humerus is one of the most common elbow injury in children. It represents 60 % of elbow fractures and 16 % of all pediatric fractures.

Materials and methods: The aim of our study is the analysis of early vascular and nerve complications of supracondylar humerus fractures in 122 children hospitalized in the Pediatric Trauma-Orthopedic Ward, determine the types, duration of symptoms, as well as methods of early diagnosis and treatment. The study analyzed the cases of patients treated in the years 2004–2010.

Results: Acute neurovascular complications occurred in 15 % of patients with supracondylar fracture (18 children). Nerve damage was found in 11 % of patient with displaced fracture (12 children). The most injured nerve was median nerve, this complication occurred in 7 examined (58.5 %). From these patients three cases with damage of anterior interosseous nerve were selected (the pseudoanterior interosseous nerve syndrome). 4 patients presented damage of the ulnar nerve, and radial nerve injury occurred in 1 child, which accounted 33 % and 8 % of all damage to the nerves. Duration of symptoms ranged average of 49 days (from 2 days to 5 months). Symptoms of vascular injury occurred in 8 % children with displaced fracture (8 children) and characterized by the absence or weak pulse at the radial artery.

Conclusion: 1. Fracture reduction is a priority procedure in displaced supracondylar fractures, and only then further diagnostic steps and treatment of possible complications should be concerned. 2. The incidence of vascular and nerve complications positively correlates with the progression of fracture according to Gartland classification.

References : 1. Pretell-Mazzini J, Rodriguez-Martin J, Andres-Esteban EM: Does open reduction and pinning affect outcome in severely displaced supracondylar humeral fractures in children? A systematic review. *Strategies Trauma Limb Reconstr*, 2010; 5(2): 57–64 2. Douglas HCL Chin, Roy A Meals: Anterior interosseous nerve syndrome. *Journal of the American Society for Surgery of Hand*, 2001; 1(4): 249–57 3. Taco Gosens, Karst J Bongers: Neurovascular complications and functional outcome in displaced supracondylar fractures of the humerus in children. *Injury*, 2003; 34(4): 267–73

Disclosure: No significant relationships.

O233**THE CONSERVATIVE TREATMENT OF STABLE UPPER CERVICAL SPINE FRACTURES IN CHILDREN***R. Tomaszewski*

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Introduction: The anatomical and biomechanical features of the immature cervical spine make the upper segments at C1-3 especially susceptible to injury. 2–3 % of all cervical spinal injuries involve children. Approximately 75 % of these fractures in younger children, they are more likely to occur in the upper cervical region and fractures of odontoid are the most common. Spinal cord injury and cervical fractures occur at different levels in children than in adults. In children less than 8 years old 80 % of cervical fractures take place in first 3 vertebrae. The treatment of the upper cervical spine fractures without displacement and neurological damage in children and adolescents is generally conservative.

Materials and methods: From 2000 to the 2011, 8 stable upper cervical spine fractures were treated. There were 5 boys and 3 girls. The mean age was 6.8 years (4–12). The classification based on the patients age of 8 years old, shows 5 patients under 8 and 3 above. There was 1 patient with occipital condylar fracture, 4 with C1 fractures, and 3 with C2. Children were treated using Minerva orthosis for 85 days (66–125) after injury.

Results: The follow up was 55 months (9–96). CT scan 3 months after the injury has been done in all patients. Good bone consolidation was obtained in all cases.

Conclusion: In younger children spinal injuries concerned in upper cervical segments. The cervical orthosis provide sufficient stability during treatment.

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Disclosure: No significant relationships.

O234**CROSS FIXATION SUPERIOR TO LATERAL FIXATION OF SUPRACONDYLAR FRACTURES***A.R. Vahedi¹, R. Jeavons¹, A. Rangan²*

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Introduction: Suprakondylar fractures are the most common form of elbow fractures in paediatric patients. The main modes of fixation are lateral K-wires or Cross K-wires. There has been controversy with regard to the optimal pin placement and construct. The aim of this study is to review the outcomes of cross fixation and lateral fixation of

suprakondylar fractures in a single institution.

Materials and methods: A retrospective review was carried out of all paediatric Suprakondylar fracture operations between 2011 and 2013 at a single institution. Clinic letters and radiographs were reviewed to collect data on patient demographics, Gartland classification, mode of fixation, iatrogenic nerve injury, wound infection, loss of motion of the elbow and need for additional surgery.

Results: Total of 63 operations performed. Eleven had type 2a fracture, eighteen type 2b fracture, twenty eight type 3 fracture and six flexion type 4 fracture. No further operation was required in 48 patients who had cross fixation. Two patients developed posterior interosseous and ulnar nerve palsy respectively which eventually resolved. A second operation was required for two of ten patients whom had lateral fixation, with no complication recorded. Manipulation under anaesthesia was performed in 5 patients; one required a second operation. There was no clinically evident wound infection in either group. In both groups 20 % experienced some degree of loss of function.

Conclusion: Cross k-wire fixation results no loss of reduction as compared to 20 % in the lateral fixation group ($p = 0.00164$; statistically significant). However there is an increased risk of neurological injury ($p = 0.51$; not statistically significant).

References :

Disclosure: No significant relationships.

O235**THE EFFICACY OF STENT FOR BLUNT PANCREATIC INJURY IN PEDIATRIC PATIENTS**

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Materials and methods: A case report of 13 years old boy with pancreatic injury.

Results: 13 years old boy visited our hospital because of stomachache and fever after being kicked in the belly by his friend a day ago. Abdominal CT scan revealed the low density region sized about 30 mm in pancreatic tail and the deficiency of main pancreatic duct. Then MRCP and ERP obvious main pancreatic duct injury. His vital signs were stable and symptoms are not severe, so he was treated conservatively. On 4th day, pseudocyst became obviously in pancreatic tail and got high fever from 9th day. Emergency drainage was inserted with fluoroscopy endoscopic maneuver through the stomach wall on 14th day after injury. After the drainage, pseudocyst had decreased its size, and the culture was revealed *microaerobic streptococci*. On 32th day, pancreatic duct stent was inserted with the gastric endoscope at the main pancreatic duct successfully. He was discharged on 38th day after injury without any sequela.

Conclusion: Pancreatectomy is often performed for the pancreatic injury over grade III of AAST. However, our case suggests the possibility to be able to manage blunt pancreatic injury with pancreatic duct stent and endoscopic drainage for pancreatic cyst, even though higher graded injury type.

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Disclosure: No significant relationships.

EPIDEMIOLOGY/EVIDENCE BASED TRAUMACARE

O236

PREDICTION MODELS FOR VENOUS THROMBOSIS RISK AFTER CAST IMMOBILIZATION OF THE LOWER EXTREMITY

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Introduction: Guidelines concerning thrombosis prophylaxis during lower extremity cast immobilization vary considerably [1, 2, 3, 4]. Aims: to identify risk factors and develop a clinical prediction tool on the occurrence of venous thrombosis (VT) in these patients.

Materials and methods: We used data from a large population based case-control study (MEGA study 4,468 cases; 6,156 controls) into risk factors for a first VT [5,6]. Using multivariable logistic regression, three prediction models were created (Full, Restricted and Clinical), which were used for the calculation of an area under the curve (AUC). Validation was performed in two other case-control studies into the aetiology of VT (THE VTE and MILAN study) [7, 8].

Results: The Full Model (30 predictors) resulted in an AUC of 0.84 (95 CI; 0.77–0.91). The same AUC was found for the Restricted Model (9 predictors including 2 genetic and 1 biomarker). The Clinical Model (12 environmental predictors) resulted in an AUC of 0.75 (95 CI; 0.67–0.83). This model was converted to a Risk Score (AUC: 0.73 (95 CI; 0.64–0.82)). Validation in THE VTE data showed good performance (AUC: 0.83 (95 CI; 0.66–0.99)) for both the Clinical Model and Risk Score. Validation in the MILAN study resulted in an AUC of 0.94 (95 CI; 0.89–0.99) and 0.95 (95 CI; 0.91–0.99) for the Clinical Model and Risk Score respectively.

Conclusion: The Full and Restricted model resulted in a high accuracy in the prediction of VT risk. In practice, the Clinical Model may be the preferred model as its factors are easy to determine, whereas it has good predictive performance. These results may help provide substantiation for evidence based future guidelines concerning thromboprophylaxis in patients with lower extremity immobilisation.

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Disclosure: No significant relationships.

O237

CONTRAST-INDUCED NEPHROPATHY IN POLYTRAUMA PATIENTS

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Introduction: In trauma patients, admission of contrast medium may lead to an increase in the incidence of contrast-induced nephropathy. The aim of this study is to investigate the relationship between the admission of contrast medium and the development of (contrast-induced) nephropathy.

Materials and methods: Adult trauma patients with an Injury Severity Score (ISS) >15 were included. (Contrast)Nephropathy was defined as an increase of serum creatinine-concentration by at least 25 % or by at least 44 µmol/L with respect to the baseline within 72 h after infusion of contrast medium or within 72 h after admission to the hospital.

Results: In total, 1358 patients were included, with a mean age of 47.7 (SD = 19.9 years), 75.2 % were men. Patients without any risk factors (diabetes mellitus, heart failure, pre-existing renal failure or age >60) did not have an increased risk to develop contrast-induced nephropathy. The incidence of nephropathy in this group was 11.9 % (9.84–14.0 %). Compared to patients without infusion of contrast, the odds ratio of developing contrast-induced nephropathy was 0.51 (0.19–1.38, p = 0.18) and 1.28 (0.74–2.21, p = 0.37) in patients who received 1–100 ml and >100 ml contrast medium, respectively. However, the incidence of contrast-induced nephropathy in patients with at least one risk factor was 20.9 % (17.0–24.8 %). In this group, patients who received 1–100 ml and >100 ml of contrast medium had odd ratios of developing contrast-induced nephropathy of 1.80 (0.81–4.0, p = 0.146) and 2.29 (1.2–4.2, p = 0.009), respectively.

Conclusion: The risk of developing contrast-induced nephropathy is not increased in patients without risk factors. However, the risk is significantly increased in patients with at least one risk factor when administering more than 100 ml of contrast medium.

Disclosure: No significant relationships.

O238

THE VALUE OF ROUTINE RADIOGRAPHIC FOLLOW-UP IN PATIENTS WITH ANKLE FRACTURES IN THREE LARGE TEACHING HOSPITALS IN THE NETHERLANDS

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Introduction: Ankle fractures are common. In The Netherlands, follow-up protocols recommend radiographs at 1, 4, 8 and 12 weeks post-trauma. No justification was found in the literature for routine radiographs beyond 3 weeks follow-up without a clinical indication. The aim of this study was to evaluate the efficiency of follow-up radiographs for ankle fractures after 3 weeks post-trauma.

Materials and methods: This retrospective cohort study included adult patients with an ankle fracture treated in one academic and two non-academic teaching hospitals in the Netherlands in 2012. Baseline patient and fracture characteristics, and treatment strategies were recorded as well as the number, indication and subsequent policy changes of the radiographs.

Results: 442 patients were analysed. The mean number of radiographs taken beyond 3 weeks follow-up per patient was 2.2 in the academic hospital, and 2.0 and 1.6 in the two non-academic hospitals ($p < 0.0001$). Of the 892 radiographs taken beyond 3 weeks follow-up, in 130 (15 %) cases an explicit clinical reason for the radiograph was mentioned in the chart. In only 8 (0.02 %) patients a policy change was made based on the radiographs.

Conclusion: In current practice, only a small number of radiographs during the follow-up of ankle fractures are made for an explicit reason. Almost all radiographs are routinely made according to protocol and do not affect clinical decision-making. These results suggest that considerable numbers of radiographs can be omitted during follow up. This could lead to cost-reduction without compromising quality of care. A randomized-controlled-trial has started to confirm these retrospective results.

Disclosure: No significant relationships.

O239

RISK ADJUSTED TRAFFIC RELATED MORTALITY DECREASED IN PARALLEL TO A LOWER NUMBER OF ACCIDENTS DURING 2001–2011 IN SWEDEN

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Introduction: A major contributor to injury related mortality is traffic accidents. In Sweden reports of a decreasing number of traffic accidents is published. Often at national level there are no specific trauma registries. ICISS ICD-based codes, can be used as for case-mixed adjustments. This study, comprising the years 2001–2011, is to evaluate if also the risk adjusted mortality has decreased and whether the ICISS model is adequate for such a study.

Materials and methods: Data was derived from the Swedish National in Patient- (NPR) and Cause of Death-Registries (CDR) and including patients with a serious injury, using ICD codes for external causes (V00–V99). ICISS for the main diagnosis and the subsequent nine secondary diagnoses were calculated and together with sex, age and length of stay we constructed a mortality prediction model of death within 30 days based on logistic regression.

Results: During the period (2001–2011) 180261 hospitalizing traffic accidents occurred, equalling 8.4 % of all trauma related hospital admissions in Sweden. Numbers decrease significantly over time ($p < 0.001$). Factors for increased mortality were age (4 %/year), male sex (increased 30 %) and prolonged length of stay. Risk adjusted mortality in the ICISS model (ROC 0.91) showed a decreasing trend from 2001 to 2011 reaching an OR of 0.56 at 2011.

Conclusion: We found a clear decrease in the number of hospitalizing traffic accidents. A new finding in our material is that the risk adjusted mortality decreased almost linearly over time. Another finding is that female sex appears life saving despite case mix adjustment. Our ICISS model performed well.

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Disclosure: No significant relationships.

O240

RISK ADJUSTED ASSAULT RELATED MORTALITY REMAINS UNCHANGED IN THE PERIOD OF 2001–2011 IN A NATIONWIDE STUDY IN SWEDEN

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Introduction: A common reason for hospital admissions in trauma is assault related accidents. The number of assaults seems to remain unchanged despite a population increase. The aim of our study is to examine the risk adjusted mortality with particular emphasis on the effect of sex and age in an ICISS mortality model.

Materials and methods: Data was derived from the Swedish National in Patient (NPR) and Cause of Death Registries (CDR) including patients with a serious injury, using codes for external causes (X85–Y09). ICISS for the main diagnosis and subsequent nine secondary diagnoses were calculated and together with data on sex, age and length of stay we constructed a mortality prediction model of death within 30 days from the injury based on logistic regression.

Results: During the period (2001–2011) 29183 assaults required hospital care. This was 1.4 % of all trauma related hospital admissions in Sweden. In the model factors important for increased mortality were age (7 %/year), male sex (increased risk of 45 %) and length of stay decreased. The risk adjusted mortality using the ICISS model (ROC 0.86) remained unchanged during the entire period.

Conclusion: In contrast to traffic related accidents the risk adjusted mortality remained unaltered during the study period. In parallel to traffic related mortality both age and sex contributed significantly to mortality. An interesting finding is that female sex appears life saving despite case mix adjustment. The ICISS model performed well under these conditions.

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Disclosure: No significant relationships.

O241

INJURY PREVENTION IN THE CHILEAN WORK FORCE

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Introduction: Chile has, since 1968 a health system created to prevent and treat work related injuries. With non profit companies and hospitals that has as a priority to asses this injuries.

Materials and methods: Using government data, we aim to show the importance of the existance of a system specialized in work related injuries and how, since its creation in 1968, work related injuries, have been decreasing.

Results: In 1968, 3 non profit organizations were created in Chile, to work in developing a system that prevents and treat work related injuries, and provide pension for workers who do not go back to work. The affiliated workers from industries that choose one of these organizations has increased in 60 %, from 2.8 million in 2004 to 4.6 millions workers in 2013. In 1968, work related injury rate was 35 %, improving to 4.3 % in 2013. This is attributed to injury prevention programs, targeted to each different area involved in work related injuries, from mining companies, farming and construction among others. Interesting, men present a higer rate of work related injury, being 70 % of all accidents, in spite of being 59 % of the chilean work force. Mortality rates has also improved, reaching 4.8 % in 2013. Mining accounts for 16.7 % of these deaths, and transport related accidents for 15.9 %. Of the latter, in most cases a truck was involved.

Conclusion: The number of work related injuries in Chile and its associated mortality, have improved, since the creation in 1968, of a system that prevents and treats these type of injuries.

Disclosure: No significant relationships.

O242

THE RELIABILITY AND REPRODUCIBILITY OF THE AO CLASSIFICATION SYSTEM FOR HUMERAL SHAFT FRACTURES

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Introduction: Humeral shaft fractures are most widely classified using the Arbeitsgemeinschaft für Osteosynthesefragen (AO) classification

system, which discriminates three types (12-A, 12-B, 12-C) and nine groups (12-A1/2/3, 12-B1/2/3, 12-C1/2/3). The aim of this study was to determine the inter-observer reliability and intra-observer reproducibility of the AO classification for humeral shaft fractures.

Materials and methods: To determine inter-observer agreement, 30 observers (25 orthopedic trauma surgeons and five general orthopedic surgeons) independently classified 90 humeral shaft fractures according to the AO classification system. Patients of 16 years and older were included. Periprosthetic, recurrent and pathological fractures were excluded. Radiographs were provided in random order, and observers were blinded to clinical information. To determine the intra-observer agreement, all radiographs were reviewed again after two months in a different random order. Inter- and intra-observer agreement were assessed using kappa statistics (SPSS).

Results: Inter-observer agreement for the nine groups was moderate ($\kappa = 0.482$; 95 % CI 0.480–0.485). It was highest for 12-A3 fractures ($\kappa = 0.677$; 0.641–0.713) and 12-C3 fractures ($\kappa = 0.628$; 0.598–0.658) and lowest for 12-C1 fractures ($\kappa = 0.241$; 0.210–0.272). The inter-observer agreement for the three types was moderate ($\kappa = 0.600$; 0.593–0.607). It was substantial for type A fractures ($\kappa = 0.768$; 0.698–0.838), and moderate for type B ($\kappa = 0.520$; 0.461–0.579) and type C fractures ($\kappa = 0.461$; 0.418–0.505). Observers classified 64 % of fractures identically in both rounds. Intra-observer agreement was moderate for the nine groups ($\kappa = 0.795$; 0.773–0.816) and for the three types ($\kappa = 0.789$; 0.766–0.812). No differences were found between orthopedic trauma and general orthopedic surgeons.

Conclusion: The AO classifications for humeral shaft fractures has a moderate inter- and intra-observer agreement.

Disclosure: No significant relationships.

HIP

O243

A SYSTEMATIC REVIEW OF THE EFFECT OF TRANEXAMIC ACID IN REDUCING BLOOD TRANSFUSION REQUIREMENTS IN HIP SURGERY

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Introduction: Recent adoption of Tranexamic acid (TXA) for shocked trauma patients has led to a renewed interest in wider applications of this cheap, readily available and generally well tolerated drug. No previously published systematic reviews have examined the effect of perioperative intravenous administration of TXA on blood use in hip surgery.

Materials and methods: A search of Medline, Embase and the Cochrane Central Register of Controlled Trials was conducted to identify randomised controlled trials comparing TXA v.s. Placebo in primary elective Hip surgery in which blood loss and blood transfusion were reported outcome measures. Trials were excluded if multiple antifibrinolytics were used. Abstracts from the returned searches were assessed and the full text of those deemed eligible was then subject to quality appraisals. Data extraction and metaanalysis were performed using the Cochrane Collaborative's Revman software.

Results: From 50 unique studies, 13 were relevant and a final 9 were methodologically robust enough to allow meta-analysis. For blood loss the pooled mean difference (MD) of tranexamic acid versus

control was -293 mL (95 % CI -381 mL to -206 mL). Indicating a statistically significant difference. For blood transfusion versus no transfusion the pooled relative risk (RR) of tranexamic acid versus control was 0.56 (95 % CI 0.41–0.76). This was also statistically significant.

Conclusion: Administration of a 10 mg/kg dose of tranexamic acid is quick, safe, and easy to incorporate into the usual regime of drugs at induction. In addition, in the UK 1 g of tranexamic acid costs £3.10 whereas one unit of red cells costs £122.00 resulting in significant potential cost savings.

Disclosure: No significant relationships.

O244

THE TREATMENT OF FEMORAL NECK FRACTURES AND THE RESULTS OF THE GANNET

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Introduction: The osteosynthesis of intracapsular hip fractures results in a 19 %-48 % failure rate. The combination of an anatomical reduction and a low volume, dynamic implant, providing angular and rotational stability seems to be crucial factors in the treatment of intracapsular hip fractures. This assumption formed the starting point for the development of the Dynamic Locking Blade Plate (Gannet).

Materials and methods: In a prospective multicentre cohort study internal fixation by means of the DLBP was performed in 190 consecutive patients with an intracapsular hip fracture. Failure in fracture healing due to non-union, avascular necrosis or implant failure was the primary outcome measurer. Secondary outcome measurers were the quality of reduction, the position of the implant in the femoral head, impaction at the fracture site and the mobility of the patient.

Results: The overall failure rate was 11 %. The overall rate of failure for the non-displaced fractures was 4.6 % and for the displaced fractures 13.1 %. Re-analysing the results depending on the quality of reduction showed that after an adequate fracture reduction the failure rate of the displaced fractures was reduced to 9.8 %.

Conclusion: It is hypothesized that when internal fixation is performed the device used to fix the femoral neck fracture must be a low volume, axial-dynamic implant providing angular- and rotational stability and is placed deep and centrally in the femoral head. The Gannet is developed according these characteristics. The results of this multicentre study show that this implant results in a marked reduction in the failure rate compared to the currently used implants.

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Disclosure: I am together with Baat Medical Engineering founder of the Gannet BV so far without any significant interest.

O245

STABILITY OF FIXATION OF PROXIMAL FEMUR FRACTURES: A RADIOSTEREOMETRIC ANALYSIS

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Introduction: Rotational instability of the fracture-implant complex is thought to be a significant cause of fixation failure in hip fractures and may even be a key denominator and predictor of the most common fixation-related complications. Therefore, the aim of this study was to use RSA to quantify the movement of proximal femur fragments after fixation with the most commonly used methods of osteosynthesis.

Materials and methods: Fifteen patients with a non-displaced femoral neck fracture, treated with either a dynamic hip screw (DHS) or three cannulated hip screws (CS), and 16 patients with an AO31-A2 trochanteric fracture treated with a DHS or an intramedullary nail (IM), were included. Radio stereometric analysis (RSA) was used at 6 weeks, 4 months and 12 months post-operation (PO) to track shortening along the fixation material and rotation around the implant as a measure of postoperative fracture instability.

Results: Migration could be assessed in 10 patients with femoral neck fractures and 7 patients with trochanteric fractures. By 4 months PO, a mean shortening of 5.4 mm (range: -0.04 to 16.1 mm) had occurred in the group with femoral neck fractures and 5.0 mm (range: -0.13 to 12.9 mm) in the trochanteric fractures group. A wide range of rotation occurred in both fracture types.

Conclusion: This prospective study shows that fracture instability occurs continuously during the first 4 months, after which fracture stabilization occurs. This information on fracture rotation, shortening and consolidation may be of future use in the early recognition of patients at risk of fixation failure.

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Disclosure: No significant relationships.

O246**PERIPROSTHETIC CORTICAL BONE REMODELING IN PATIENTS WITH OSSEO-INTEGRATED PROSTHESES**

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Introduction: Stress shielding in periprosthetic bone may lead to decrease of cortical thickness resulting in periprosthetic fractures and insufficient bone stock for possible future revision surgery. This study quantified the effect of osseointegrated prostheses on periprosthetic bone changes and skeletal remineralization.

Materials and methods: All patients with transfemoral or through-knee amputation who underwent implantation of osseointegrated femoral prostheses in 2009–2012 were included. Periprosthetic cortical thickness was analyzed by one researcher from standard AP radiographs taken directly postoperative, at 12 months and 24 months. The periprosthetic area was divided into 6 zones and the cortex was digitally measured in the middle of each zone and corrected for radiologic distortion. DXA scans provided bone mineral density (BMD) at the femoral neck of healthy and amputated leg pre-operative, at 12 and 24 months. This study was approved by the institutional ethical committee.

Results: 27 patients with transfemoral (1 bilateral, 2 through-knee) amputations were included. Post-operative scans compared to scans at 12 months showed a significant increase of 9.6 % ($p = 0.020$). Post-operative scans compared to scans at 24 months showed a significant increase of 8.9 % ($p < 0.001$). A non-significant trend towards increase in BMD at the hip neck of the amputated side was measured.

Conclusion: Instead of bone resorption, which was observed in previous studies, significant periprosthetic cortical bone growth was observed in patients with an osseointegrated leg prosthesis. No additional risk of periprosthetic fractures is to be expected with sufficient bone stock for future revision surgery when indicated.

Disclosure: No significant relationships.

O247**HIP FRACTURE: RESULTS OF SURGICAL TREATMENT WITHIN 48 HOURS AFTER ADMISSION AT TRAUMA CENTER IN TURIN, ITALY**

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Introduction: Hip fractures are serious injuries that often result in long term functional impairment and increase mortality. As our population ages, the number of hip fractures is likely to increase. The relative risk of death is 4.5 times greater if surgery is performed after 24 hours from admission. (Halmet et al. 1997).

Materials and methods: Aim of our study was to analyze the multidisciplinary treatment of the patient with hip fracture admitted to our

hospital and the timing of surgery. Since October 2010 we have treated hip fractures in a dedicated operating room (fast track).

Results: In 2011 we have treated 365 patients with hip fractures, 277 over 65 y.o., mean age 82.7, 29.2 % treated within 24 hours after admission, 54.4 % treated within 48 hours after admission, 2.16 days average waiting time for surgery, 14 days average of hospitalization. In 2012 473 patients, 331 over 65 y.o., mean age 82.1, 29.6 treated within 24 hours, 57.4 within 48 hours, 1.6 days average waiting time for surgery, 12.3 days average of hospitalization. In 2013 526 patients, 400 over 65 y.o., mean age 82.3, 34.8 treated within 24 hours, 74.3 within 48 hours, 1.2 days average waiting time for surgery, 11.4 days average of hospitalization.

Conclusion: Earlier surgery was associated with a lower risk of death and lower rates of postoperative complications. These results suggest that reducing delays may reduce mortality and complications.

References: Kondo A, et al. Jpn J Nurs Sci. 2014. Halmet et al. 1997

Disclosure: No significant relationships.

O248**INFLUENCE OF FRAILTY IN OUTCOME OF FEMORAL PERIPROSTHETIC FRACTURES**

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Introduction: A traumatic periprosthetic fracture (PPF) is a long-term complication of a total hip replacement. Treatment options include revision, open reduction internal fixation (ORIF) and minimal invasive techniques [1]. To select the optimal surgical procedure the level of frailty has to be considered, especially in geriatric trauma patients [2–3]. The aim of this study is to determine whether a frail patient has a better outcome postoperatively after less invasive treatment.

Materials and methods: 49 patients with a PPF were analysed in this retrospective study. The level of frailty was obtained by the complex-fracture frailty index (CFFI), which combines comorbidities, laboratory tests, physical abilities, social factors and cognitive functions. Outcomes in this study are mortality, minor complications and three major complications (deceased, re-operation or immobility after 1 year).

Results: 32 frail patients have lower survival rates ($p = 0.014$) and develop significantly more major complications with an average of 0.95 complications per patient versus 0.18 in non-frail patients ($p = 0.017$). Furthermore more minor complications arise after revision (average 2.6) compared to ORIF (1.3) or minimal invasive techniques (0.5) ($p = 0.004$ and 0.026). Specifically in frail patients this difference was 3.22 minor complications per patient in revision surgery compared to 1.37 in ORIF and 0.5 in minimal invasive techniques ($p = 0.005/0.000$).

Conclusion: This study shows that frail patients regardless the type of surgery have a lower survival rate. Furthermore, in frail patients more invasive operation has a negative influence on the outcome of the treatment. Therefore it is of great importance to assess and use the patients level of frailty to determine the surgical procedure for a PPF.

References : 1. Zide JR, Gary JL, Huo MH. Management of periprosthetic femur fractures. Oper Tech Orthop 2009;19(3):155–62. 2. Lindahl H, Garellick G, Regnér H, Herberts P, Malchau H. Three hundred and twenty-one periprosthetic femoral fractures. J Bone Joint Surg Am. 2006;88(6):1215–22. 3. Patridge JS, Harari D, Dhesi JK. Frailty in the older surgical patient: a review, Age Aging 2012;4(2):142–7

Disclosure: No significant relationships.

O249

COMPARING THE MINIMALLY INVASIVE ANTEROLATERAL APPROACH TO THE TRADITIONAL ANTEROLATERAL APPROACH FOR HEMIARTHROPLASTY IN ELDERLY PATIENTS WITH FEMORAL NECK FRACTURES

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Introduction: In recent years an increase is seen in the use of the anterolateral minimally invasive (MI) approach for the treatment of inclined femoral neck fractures. In trauma surgery little research has been done to back its supposed effectiveness compared to the traditional anterolateral approach. The aim of this study is to compare clinical results after MI and traditional approach for hemiarthroplasty.

Materials and methods: A retrospective chart review of a prospectively collected hip trauma database was performed at a single regional Level II trauma center between January 1, 2009 and December 31, 2011. A total of 141 patients met our inclusion criteria. Data was collected pre-, postoperatively and on discharge.

Results: The study cohort consisted of 141 patients (mean age 81.9 ± 8.6), 71 in the MI group (82.8 ± 7.8) and 70 (81.1 ± 9.4) in the traditional group ($p = 0.29$). No significance was found with respect to gender ($p = 0.91$), mean ASA score ($p = 0.66$) or comorbidities in general ($p = 0.29$). The traditional group had lower diabetes mellitus, 26.8 % vs 11.4 % ($p = 0.02$). Other comorbidities like COPD ($p = 0.4$), dementia ($p = 0.3$), CVA ($p = 0.6$) or cardiac morbidity ($p = 0.55$) weren't significant. The mean operating time for a MI approach was shorter (63 vs 80 minutes, $p < 0.01$), as well as the mean blood loss (0.15L vs 0.225L, $p < 0.01$) and the need for postoperative walking aids ($p = 0.03$). No significance was found regarding blood transfusion ($p = 0.05$), hospitalized days ($p = 0.83$) or postoperative complications ($p = 0.76$).

Conclusion: Hemiarthroplasty using the minimally invasive anterolateral approach has significantly better results with respect to perioperative blood loss, operation time and the postoperative use of walking aids.

References : Goosen, J.H.M., et al., (2010). Minimally invasive versus classic procedures in total hip arthroplasty. *Clinical Orthopaedics and Related Research* 469 Pospischill, M., et al., (2010). Minimally invasive compared with traditional transgluteal approach for total hip arthroplasty: a comparative gait analysis. *The Journal of Bone and Joint Surgery* 92-A Roy, L., et al., (2010). A randomized clinical trial comparing minimally invasive surgery to conventional approach for endoprosthesis in elderly patients with hip fractures. *Injury* 41 Yang, C., et al., (2009). Minimally-invasive total hip arthroplasty will improve early postoperative outcomes: a prospective randomized controlled trial. *Irish Journal of Medical Science* 179

Disclosure: No significant relationships.

PANCREATIC INJURY AND PANCREATITIS

O250

ADMISSION SERUM LIPASE AND AMYLASE AS A PREDICTOR OF PANCREATIC INJURY IN POLYTRAUMATISED PATIENTS

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Introduction: Serum lipase has been shown to be a more responsive marker in the diagnosis of acute pancreatitis than amylase, however the utility of lipase in the setting of blunt abdominal trauma is unknown. We aim to establish the diagnostic value of an abnormally high serum lipase and amylase for intra-abdominal injuries.

Materials and methods: We undertook a retrospective analysis of prospectively collected data from a longitudinal cohort of polytraumatised patients presenting having sustaining blunt mechanism injuries to a regional major trauma centre. Patients admitted between December 2005 and September 2014 were included. Patients who did not have admission serum lipase measured at presentation were excluded.

Results: We recruited 233 patients over 9 years. Mean lipase was 219 U/L (SD 504) with 51 abnormally high values. Overall 56.2 % ($n = 131$) had CT proven intra-abdominal injuries; 29.6 % ($n = 69$) involving the liver, 30.9 % ($n = 72$) the spleen with just 5.6 % ($n = 13$) involving the pancreas. In those 13 patients with a pancreatic injury, mean lipase and amylase were significantly elevated compared to those without. An elevated lipase was significantly predictive of intra-abdominal ($p < 0.0001$), liver, splenic and pancreatic ($p = 0.001$) injury. An elevated lipase was more sensitive (69 % vs 31 %) and specific (81 % vs 80 %) for pancreatic injury.

Conclusion: Serum lipase is sensitive and specific for pancreatic but not general intra-abdominal, liver or splenic injuries and can be used as a diagnostic marker at initial admission for pancreatic injuries. An elevated lipase at admission predicted all forms of injury studied versus no injury.

References: Nil

Disclosure: No significant relationships.

O251

A COMPARISON OF LIPASE AND AMYLASE IN DIAGNOSIS OF ACUTE PANCREATITIS

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Introduction: Acute pancreatitis is one of the most important and life-threatening emergency cases in surgery. Patient who present with right upper abdominal and epigastric pain are suspicious for acute pancreatitis. The diagnosis of acute pancreatitis depends on a

combination of clinical assessment and laboratory evaluation (serum amylase, lipase and urine amylase). In our study we evaluated the sensitivity of the three pancreatic enzymes in patients with acute pancreatitis.

Materials and methods: In Istanbul University, Istanbul Medical Faculty, Department of Trauma and Emergency Surgery, we conducted a study with 40 consecutive acute pancreatitis cases between September 2012 to October 2014. Data collection was made prospectively and the evaluation was made retrospectively. In our study amylase and lipase levels at least 3 times above the reference range were considered diagnostic for acute pancreatitis.

Results: In 40 patients with acute pancreatitis. Most of them was biliary pancreatitis (95 %). Thirty two patients had high serum amylase levels (80 %), 36 had high urine amylase levels (90 %), 37 had high serum or urine amylases (92 %). Whole patients had high serum lipase levels (100 %) according to our criterion.

Conclusion: Serum lipase level has the highest sensitivity of 100 % compared to serum amylase with %80, urine amylase with %90, and serum or urine amylases with %92. According to our study we suggest to evaluate serum lipase value for the diagnosis of acute pancreatitis which is more accurate and cost-efficient.

Disclosure: No significant relationships.

O252

BONES IN THE BELLY: HETEROTOPIC MESENTERIC OSSIFICATION AFTER BLUNT ABDOMINAL TRAUMA AND MULTIPLE ABDOMINAL SURGERIES

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Introduction: Heterotopic Mesenteric Ossification (HMO) or Intra-abdominal Myositis Ossificans is a rare entity which has been reported sparsely. It occurs following blunt abdominal injury or abdominal surgery, first described by Hansen in 1983.

Materials and methods: Heavy machinery fell on a 44-year-old Chinese male from a height of 12 m and he suffered severe blunt abdominal trauma: Liver laceration, Complete duodenal transection at D1, perforation at D1/D2, Complete pancreatic transection at neck and Transverse colon perforation. He underwent Emergency exploratory laparotomy and subsequently eleven more, with temporary abdominal closure, over the next 28 days. He hence had: Liver hemostasis, Distal gastrectomy with Billroth II Gastro-jejunostomy, Tube duodenostomy, Distal pancreatectomy preserving spleen and Right hemicolectomy/ileo-colic anastomosis. During his admission for over a year!, he had an array of complications: hypovolemic shock, septic shock, duodenal blow-out, biliary leak, bleeding hepatic artery pseudo-aneurysm, gastric stump blow-out, entero-cutaneous fistula and nutritional complications. After eleven months from his first trauma, he underwent: completion of pancreateo-duodenectomy, choledocho-jejunostomy, gastric stump repair, HMO extraction and abdominal closure with bio-synthetic mesh. During this laparotomy, HMO was noted and on retrospective comparison of Computed tomography scans, it was demonstrated radiologically to be present since two months after his abdominal trauma.

Results: The mechanism for HMO is unproven, but its morphologic appearance is quite similar to Myositis ossificans, and it is likely to

occur similarly. Only very few patients who have surgical or mechanical trauma develop HMO.

Conclusion: HMO should be recognised as a differential for intra-abdominal densities post-abdominal trauma or surgical exploration.

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Disclosure: No significant relationships.

O253

OUTCOMES OF FORTY-THREE SURGICALLY MANAGED CASES OF BLUNT PANCREATIC INJURY

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Introduction: Among blunt abdominal trauma cases, pancreatic injuries are relatively rare, and their management protocols are yet to be established. Notably, delayed diagnosis and treatment of main pancreatic duct (MPD) injuries are associated with increased mortalities, but their optimal management remain controversial [1,2]. The purpose of the study is to compare the background, diagnostic and surgical procedures of the cases, with their outcomes, and to investigate optimal management.

Materials and methods: We examined the records of 43 patients with blunt pancreatic injury who underwent surgical management in Saitama Medical Center from 2007 to 2012. The background, grade and location of injury, hemodynamical status, injury severity score (ISS), operative procedure and the outcomes including operative complications were investigated.

Results: The cases were 35 males and 8 females with the median age of 41 years (range, 4 to 81 years) and the median ISS of 26 (range, 9 to 54). Operative procedures were 3 panreatico-duodenectomies (PD), 17 distal resections, 13 simple sutures, and 11 peritoneal drainages. We performed duodenotomy and MPD catheterization in 9 cases, with no appreciable complications. Following the assessment by intraoperative pancreatography, we kept the catheters indwelled for drainage and decompression. This technique prevented PD in 2 out of 5 cases with severe injury of pancreas head.

Conclusion: The intraoperative pancreatography and MPD decompression is safe and useful technique for the diagnosis and treatment of MPD injury, especially in conservative surgery for severe injury of pancreas head.

References: 1. Eastern Association for the Surgery of Trauma Practice Management Guidelines Committee. EAST guidelines for the diagnosis and management of pancreatic trauma. 2009. <https://www.east.org/resources/treatment-guidelines/pancreatic-trauma-diagnosis-and-management-of>. Accessed 24 Oct 2014 2. Asensio AA, Petrone P, Britt, LD. Pancreas. In: Britt LD, Trunkey DD, Feliciano DV, editors. Acute care surgery Principles and practice. New York:

Springer; 2007. pp. 497–512.

Disclosure: No significant relationships.

O254

LEFT GASTRIC ARTERY PSEUDOANEURYSM IN NECROTIZING PANCREATITIS A RARE CAUSE OF FATAL BLEEDING: IS THERE A STANDARD OPERATIVE APPROACH

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Introduction: Hemorrhage complicating acute necrotizing pancreatitis (ANP) is rapid and often fatal, especially in patients with arterial pseudoaneurysm. Pancreatitis associated pseudoaneurysm is multifactorial and left gastric artery (LGA) pseudoaneurysm is rarely described. This case report describes an unconventional surgical approach to a bleeding LGA pseudoaneurysm.

Materials and methods: Retrospective Chart Review

Results: 38 year male admitted to SICU with acute pancreatitis, secondary to hyperlipidemia. He rapidly developed ANP requiring multiple pancreatic necrosectomy. On day 33, patient developed massive abdominal bleeding. Mesenteric angiogram revealed LGA pseudoaneurysm with active blush (Figure 1), coiling was unsuccessful. Operative exploration was also unsuccessful, so the lesser sac was packed and patient was transferred to SICU for continued resuscitation. The bleeding temporarily stopped. However after few hours patient started to bleed again. Second attempt of endovascular approach also failed. In the IR suite the patient lost pulse, ACLS protocol was initiated and immediate resuscitative thoracotomy was performed including aortic cross clamping to control sub diaphragmatic bleeding and open cardiac massage. There was ROSC and he was rushed to the operating room. We performed an unconventional thoracotomy by cutting across the left lower cartilages and incised the diaphragm to gain accesses to left upper quadrant. Left gastric and splenic arteries were suture ligated along with splenectomy to stop bleeding. Patient tolerated the procedure and recovered with minimal post-operative complications.

Conclusion: In conclusion, bleeding from visceral arterial pseudoaneurysm is rapidly fatal, endovascular approach is not uniformly successful. Distorted anatomy in ANP makes standard operative approach difficult and one should be prepared for more radical and unconventional approach.

Disclosure: No significant relationships.

O255

PREDICTIVE FACTORS FOR SEVERE EVOLUTION IN ACUTE PANCREATITIS

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Introduction: The acute pancreatitis presents a various spectrum from mild illness to multiple organ failure and death. There are a lot

of prognostic scores who tries to predict the severity of disease. This study aimed to compare the prognostic scores according to sensitivity and specificity. Statistical correlation with disease severity, length of hospital stay, mortality and complication rates.

Materials and methods: Retrospective analysis of the clinical data of patients admitted to Surgery Department with the diagnosis of acute pancreatitis in 2013. Evaluation of prognostic scores: Ranson, Glasgow-Imrie, Balthazar, and C-reactive protein (48 hours), was carried out as well as statistical analysis using SPSS 16®. The confidence interval used was 95 %.

Results: Data from 367 patients was collected. However, 96 were excluded due to incomplete information. According to the Atlanta criteria, 212 cases were deemed as mild and 59 severe. The mortality rate was 6,27 % and the local complication rate was 9,3 %. Ranson, Glasgow APACHE II scores had significant correlation with mortality. We didn't find significant correlation with disease severity for C-reactive protein levels.

Conclusion: In a retrospective study APACHE II scoring scale and serum creatinine were the parameters that demonstrated the highest association with mortality in acute pancreatitis.

Disclosure: No significant relationships.

POSTERS

MILITARY MEDICINE

P001

RUBBER BULLET HEART INJURY: A CASE REPORT

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Introduction: Rubber bullets is one of the most effective and therefore the most increasingly used nonlethal weapon.

Materials and methods: Case Report A case of a 15-year-old male accidentally shot by his brother to chest is described. On admission: BP- 60/40, Beck's triad. The patient was operated- penetrating trauma to left ventricle and cardiac tamponade was found.

Results: Primary repair of left ventricle was performed. Patient discharged on 14th postoperative day.

Conclusion: Although rubber bullet is a type of non-lethal weapon it can penetrate to deep tissues, internal organs.

References: 1. Kalebi A, Olumbe AK. Death following rubber bullet wounds to the chest: case report. East Afr Med J. 2005;82:382–384. 2. Hiss J, Hellman FN, Kahana T. Rubber and plastic ammunition lethal injuries: the Israeli experience. Med Sci Law. 1997;37:139–144.

Disclosure: No significant relationships.

P002

SALVAGE CRANIECTOMY FOR WAR PENETRATING BRAIN INJURIES. EXPERIENCE OF FRENCH FORWARD SURGICAL TEAMS DURING THE WAR IN MALI (2013-2014)

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Introduction: Traumatic brain injury (TBI) is a common battle-related injury. It represents approximately 15 to 20 % of injuries incurred in combat in the recent wars. This increase in prevalence is thought to be a paradoxical consequence of the remarkable improvements in medical care and protective body armor. Treatment goals in the first 72 hours of care for the injured patient with TBI are to provide clinical stability, arrest any element of ongoing injury, preserve neurological function, and prevent medical complications secondary to multisystem trauma.

Materials and methods: The authors report 3 clinical cases of war penetrating TBI treated by non neuro-surgeon, in isolated French forward surgical team during the war in Mali in 2013 and 2014. Demographics, profil of injuries and outcomes are reported.

Results: These 3 observations illustrate several clinical situations: - Temporal TBI with polytraumatism and ongoing hemorrhagic shock - Fronto occipital TBI with a Glasgow coma scale >12 - Temporal TBI with a Glasgow coma scale <8 and associated penetrating injuries. All the patients required an emergency decompressive craniectomy because of sign of neurologic distress or low level of consciousness. The goals of the craniectomy were to control the intracranial pressure, preserve cerebral blow flow and prevent infections. Only patient 1 survived. After a 1-year follow up, he has a hemiplegia and aphasia with a beginning of recovery for motor functions.

Conclusion: TBI are common during armed conflict. The indications of salvage craniectomy remain however very specific to optimize the long-term benefit of the surgery

Disclosure: No significant relationships.

DISASTER MEDICINE

P003

HUMANITARIAN OBSTETRIC CARE FOR REFUGEES OF SYRIAN WAR. THE FIRST 6 MONTHS EXPERIENCE OF GYNÉCOLOGIE SANS FRONTIÈRES IN ZAATARI REFUGEE CAMP (JORDAN)

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Introduction: The aim is to report the first 6 months experience of a non-governmental organization (NGO) managed obstetric care unit in a war refugee camp, with problems encountered and solutions implemented.

Materials and methods: A prospective observational study was conducted at Gynecologie Sans Frontières's maternity unit, in Zaatar camp (Jordan). Population of the study was all pregnant women who came to the unit for delivery, among Syrian refugees. The GSF's maternity unit is a light structure built with 3 tents, permitting low risk pregnancies care and childbirth. Emergency cesarean deliveries were performed in the Moroccan army field hospital. High risk

pregnancies were transferred to Al Mafraq (Jordan) Hospital after assessment. Main outcome measures were deliveries characteristics, indications for referral.

Results: From September 2012 to February 2013, 371 women attended the unit and 299 delivered in it. Delivery rates increased from 5 per month to 112 per month over the period. Mean gestational age at birth was 39^{+3} WG (SD = 1.9). The median birth weight was 3100 g (25–75 % IQR, 2840–3430). Vaginal deliveries were dominant and the major maternal complication was postpartum hemorrhage (n = 13). 82 women were referred to Al Mafraq or Amman hospital, mainly for preterm threatening labour (32 %) and congenital malformations (11 %). We managed one case of stillbirth. Maternal mortality was nil.

Conclusion: Despite the difficult wartime, high-risk pregnant women were properly identified, permitting referrals when required. Cooperation with other NGOs, of which United Nations High Commissioner for Refugees, was essential for the management of situations at risk of complications and perinatal and maternal mortality.

Disclosure: No significant relationships.

P004

SHORT-TERM RESPONSE TO THE TREATMENT OF A PATIENT WITH THE SEVERE POLYTRAUMA AND NEGATIVE PROGNOSIS FOR SURVIVAL (A CASE REPORT)

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Introduction: Car accidents are often accompanied by severe polytrauma

Materials and methods: A 30 y.o. male was taken by the resuscitation-surgical first aid team to the shock unit in a terminal state. He was a car driver under the alcohol influence. At the pre-hospital stage circulatory dynamics are unstable, vitals: ABP - 80/20 mmHg, heart rate - 140 beats per minute, SpO - 92 %. Vitals at the shock unit on examination: ABP - 70/30 mmHg, HR - 130 beats per minute, SpO - 82 %. For diagnosis update following was completed: 5 zone CT scan, laparocentesis. Diagnosis: severe multisystem head, chest and extremities injury. Open craniocerebral trauma. Severe brain contusion. Front, temporal, left side occipital region lacerated (tear-contused) wound. Chest nonpenetrating trauma. Right side 2–7 ribs fracture of the axillary region. Right and left pulmonary contusion. Cordis contusion. Extremities multitrauma. Left radius and ulna closed multifragmentary fracture AO\ASIF Muller 22-B3. Closed left and right femoral bone multifragmentary fracture AO\ASIF Muller 32-B2. Cerebral fat embolism. Severe acute hemorrhage with the third-degree hemorrhagic shock progression. ISS score 26—severe injury.

Results: After the patient condition stabilization surgical reconstruction of extremitas - intramedullary nailing of femur (bilateral) open reduction internal fixation of forearm bones with the angle plates completed. At the present time the patient has been verticalized and dismissed from the in-patient clinic for further rehabilitation course.

Conclusion: Negative prognosis for life is not a contraindication for early surgical treatment. All operations in the acute period have to be quick on time and with minimal volume.

Disclosure: No significant relationships.

P005

TEACHING TRAUMA MANAGEMENT IN DISASTER SCENARIOS

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Introduction: The Medical School for International Health, Ben Gurion University, Israel, runs practical workshops in Global Health for medical students. A workshop in disaster management was designed in order to give students practical experience in emergency care after a simulated earthquake set in a post-conflict developing country.

Materials and methods: The entire class (32 students) participated as a compulsory exercise. Each was assigned a specific medical role and background reading in keeping with their preference of specialty in the future. Sixteen students organized medical priorities in a refugee camp and 16 organized emergency surgical services in order to deliver the best care in the face of obstacles. A complete scenario with maps and demographic data was drawn up and facilitators (trauma surgeons, paediatricians, infectious disease specialists and humanitarian sector doctors) and non-medical personnel playing roles were briefed in advance. The workshop was filmed.

Results: After the workshop, students and facilitators watched themselves on film and contributed verbal feedback. Written feedback (both positive and negative) was a requirement for completion of the workshop. There was 100 % agreement that the workshop had been useful, relevant and well worth repeating. Drawbacks were the level of preparation and organization required for the scenario and the time available for students and facilitators to prepare in advance. Eleven students complained that the reading material beforehand was too lengthy or irrelevant.

Conclusion: Scenario-based workshops provide useful learning environments for students who are likely to pursue careers in Global Health. Scenarios highlight key emergency and trauma concepts that students should be exposed to early.

Disclosure: No significant relationships.

P006

THE VOLUNTEER ACTIONS OF PREVENTION, PREPARE AND RESPONSE TO NATURAL DISASTER: STUDY OF CASE OF THE NUDEC'S OF NITERÓI CITY

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Introduction: The Natural Disasters happen in communities, and consequently, they are the first to respond to them. So, these communities are the ones that have to be most prepared to face critical situations.

Materials and methods: This paper aims to examine the volunteer work at the Brazilian National Civil Defense System, analyzing and understanding the relationship between Civil Defense and Community through the work of Centers for Civil Defense (NUDECs) and volunteer work. The approach to the issues is based on two distinct phases, the first was done by analyzing the social groups before the creation of the Civil Defense agency as government accountability. The second, it can be observed that the participation of people and social groups is of relevant importance in the search for self-protection, being essential in the structure of Civil Defence. The participation of NUDEC is key in any field activity, since the residents are the true connoisseurs of the scene and can assist with important information about the pre and post disaster scenario.

Results: In the communities, as in any area of population growth, there are intense personal relationships of mutual aid in keeping the adverse living conditions there, such as poor transportation, lack of resources and infrastructure, causing a neighbor to help each other and thus creating a sense of community. The Civil Defense following the National Plan for Civil Defense began implementing Community NUDECs

Conclusion: The group of thirty volunteers, who receive training in first aid, fire fighting, awareness of geohazards, an alarm system and alarm and volunteer management.

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Disclosure: No significant relationships.

BURNS

P007

CLINICAL UTILITY OF NEGATIVE PRESSURE WOUND THERAPY FOR PARTIAL AND DEEP THICKNESS BURNS

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Introduction: In this report we assess the effectiveness of topical negative pressure wound therapy for those patients with partial and deep thickness burns.

Materials and methods: Topical negative pressure therapy have been developed to minimize burn wound progression to involve deeper tissue in the acute phase and promote the wound healing process. Negative pressure or vacuum assisted closure (VAC) dressing uses a suction force to drain excess fluids and reduce oedema, provide an adequate protection against infection, increase blood flow promoting perfusion and provide a moist environment, promote cell migration and proliferation during granulation tissue formation and improves graft take in burns patients.

Results: Patients with partial and deep thickness burns that do not require transfer to a burn unit, can be successfully treated with VAC dressing combined with excision procedures.

Conclusion: We describe a single institution experience with the VAC dressing used to manage partial and deep thickness burns, with excellent results together with satisfaction of the patients.

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Disclosure: No significant relationships.

P008

EIGHT PATIENTS WITH BURNS OF JOINTS FOR WHOM NPWT WAS EFFECTIVE TO ACHIEVE SKIN GRAFT FIXATION

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Introduction: The effectiveness of negative pressure wound therapy (NPWT) to achieve skin graft fixation has been reported. Here, we report favorable results on using the technique for the fixation of skin grafts at sites of joint lesions caused by burns.

Materials and methods: The subjects were 8 joint burn patients for whom NPWT was applied for skin graft fixation. We evaluated its merits and demerits compared to conventional fixation methods.

Results: Burn sites were the neck, shoulder, dorsum of the hand, hip joint, and foot joint in 2, 2, 2, 1, and 1 case, respectively. Split-thickness skin grafting was performed in all cases, and engraftment was favorable. Arthrodesis was not performed for any patient, and range-of-motion exercise was initiated a day later in all cases. There were cases in which film application to surrounding areas was difficult, and disorders developed involving the surrounding healthy skin.

Conclusion: When NPWT is applied for skin graft fixation, the skin graft ‘take’ rate is favorable. It is particularly useful for fixation at sites with irregular surfaces, which is difficult with conventional methods. Furthermore, it facilitates early rehabilitation as it does not require joint fixation. Therefore, it helps prevent contracture and deep vein thrombosis, and can be used when immobilization of the affected site is difficult to achieve. The use of other cover materials and a lower negative pressure setting in NPWT should be considered when the surrounding healthy skin is vulnerable and film application is difficult.

Disclosure: No significant relationships.

P009

LET'S SNIFF SOME DEODORANT

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Introduction: Inhalation of volatile agents is becoming popular once more as a form of recreational drug abuse. These substances are well recognised as causing elevated mood and hallucinogenic effects.

Materials and methods: We received a pre-hospital alert from the

Ambulance Control Unit of a house explosion. We received 4 teenagers aged 13–14 years, all of whom had burns and were in a critical but stable condition. They had been inhaling deodorants when one lit a cigarette and there was an explosion which partially blew out a wall. Twenty five cans of deodorant were found in the room.

Results: All 4 patients had 35–45 % burns with 20–25 % being full thickness. They were managed as per ATLS guidelines for suspected blast injuries as well as burns. One patient with airway and facial burns was intubated in the Emergency Department. One required a CT of the abdomen which was normal. They were all transferred to the Regional Burn Unit. All were hospitalised for 2 months.

Conclusion: Sniffing deodorant is becoming more popular between the teenagers. These agents are cheap and freely available. In the presence of a naked flame, this practice can potentially lead to serious injuries and a prolonged hospitalisation period.

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Disclosure: No significant relationships.

EPIDEMIOLOGY/EVIDENCE BASED TRAUMACARE

P010

'SILVER' TRAUMA: PREDICTING MORTALITY IN ELDERLY MAJOR TRAUMA BASED ON INJURY LOCATION

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Introduction: Elderly trauma now accounts for more than 20 % of UK major trauma.¹ Clearly, elderly trauma patients are at increased risk of morbidity and mortality, but current evidence is limited to correlations between poor outcome and complex, difficult-to-calculate pre-morbid frailty indices.² A simple, evidence-based prognostic marker is needed to guide early management. We hypothesised that elderly patients suffering severe injury at home indoors are frailer, and therefore more likely to succumb to their injuries, than those injured outdoors.

Materials and methods: All patients admitted to a London major trauma centre in 2013 aged ≥65 years old with an Injury Severity Score (ISS) >15 were identified using Trauma Audit & Research Network data. Patient demographics, date of death, and injury location ('at home indoors' or 'outside the home') were recorded and mortality rates compared.

Results: 124 patients were included (M:F = 1.4:1). 58 patients (46.8 %) were injured at home indoors; 66 patients (53.2 %) outside the home. The groups were equivalent in age ($p = 0.44$) and ISS ($p = 0.52$). 6-month mortality among patients injured at home indoors was 36.2 %, nearly double that of patients injured outside of the home (18.2 %) ($p = 0.0267$).

Conclusion: Our study found significant correlation between injury location and mortality, suggesting that severe injury inside the home could represent a rough marker of frailty, and therefore, outcome. This may have important implications for prognosticating elderly patients in the resuscitation room, where quick management decisions by clinicians, patients and relatives are vital. Further studies are

needed to assess pre-morbid frailty and functional outcome of both groups.

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Disclosure: No significant relationships.

P011

A DATA ANALYSIS OF THE POSSIBLE LEADING CAUSES OF TRAFFIC ACCIDENTS

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Introduction: WHO approves that, every year, there are more than 50 million wounding and 1 million 300 thousand death incidents causing by traffic accidents. This article was planned for analyze the studies about traffic accidents occured in developed and developing countries.

Materials and methods: Pubmed, WHO and TUIK reports were examined, 192 articles were found and 20 more related study of them were evaluated.

Results: 62 % of accidents occure in China, India, USA, Indonesia, Russian Federation, Brasil, Egypt, Mexico, Iran and South Africa. Regarding the level of education in 2012; for 35 %, Sweden 100 %, Holland 97 % Germany 88 % and Turkey 74.9 % (2013). Researches shows the relation between level of education and number of traffic accidents. In developing countries, most of traffic accidents arise from excessive speed, 70 % of them have two wheeler vehicles. Most of the traffic accidents occurred with cars in Japan (63 %), Germany (84 %), America (54 %) and Australia (73 %) Turkey (50 %). Only 40 % of the developing countries have a standart regulation for helmet use and 29 % of them have speed limit regulations. Reports noted also that public transport vehicles are not safe

Conclusion: It appears that problems were; level of education, economic power, breaking the rules, lack of information and supervising. Laws and regulations should be made and training, audit and in particular prehospital health care must be enabled.

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Disclosure: No significant relationships.

P012

A RETROSPECTIVE INVESTIGATION OF THE ADMISSION INR LEVELS AND ASSOCIATED OUTCOMES AT THE INKOSI ALBERT LUTHULI CENTRAL HOSPITAL LEVEL 1 TRAUMA UNIT, DURBAN, SOUTH AFRICA

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Introduction: Acute coagulopathy can occur on admission to trauma unit and is said to be associated with worse outcomes. This

relationship to early mortality that is ascribed to haemorrhage remains consistent regardless of mechanism of injury. Haemorrhage and haemorrhagic shock are increasingly amenable to interventions that result in reductions in morbidity and mortality. The study aims to assess the prevalence of the Coagulopathy of Trauma as defined by INR at the Inkosi Albert Luthuli Central Hospital (IALCH) level 1 trauma unit, and further correlate it with outcome.

Materials and methods: A retrospective analysis of all patients admitted to the Level 1 trauma unit during the period 2007–2011 was performed. The first 1000 patients were analysed. The variables obtained were: INR, Coagulation profile, lactate, base deficit, clinical parameters and in-hospital mortality. The data was analyzed using the R statistics program and Microsoft Excel.

Results: There were 1000 patients, 752 male. Direct scene admissions were 261 whilst 74 % where in-hospital transfers. The INR levels were obtained in 939 patients. The mean INR value among live patients was 1.33 and 1.92 among dead (p value <0.001). The overall prevalence of coagulopathy was 48.7 %, 47.8 % in Scene patients. The mortality rate of patients with abnormal INR levels directly from scene was 41 % versus 25 % of in-hospital transfers.

Conclusion: There is a high prevalence of coagulopathy in the level 1 trauma unit patients. Raised admission INR levels are associated with worse outcomes. We have identified overall cutoff INR and ISS values which offer predictive capabilities in resource depleted environments.

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Disclosure: No significant relationships.

P013

ADDITIONAL VALUE OF PRE-OPERATIVE CHEST RADIOGRAPHS FOR PATIENTS WITH A HIP FRACTURE

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Introduction: Pre-operative chest-radiographs (POCR) are performed in many patient with a hip fracture that needs operative treatment. Abnormal POCR can lead to an adjournment of the operation. Probably very few POCR abnormalities demand a change in policy1. With 17.900 hip fracture patients in The Netherlands in 20072, a possible significant reduction of costs could be made by performing selective POCR. This study assessed the need for a POCR in every hip fracture patient.

Materials and methods: Retrospective analysis of patients older than 18 years treated for an acute hip fracture in a five year period. All preoperative diagnostics and consultancies were reported and analyzed. If an operation was adjourned, the indication was assessed. **Results:** A total 712 patients were included, 68 % female and 32 % male. POCR showed abnormalities on 159 out of the 690 (23.0 %). Five patients were treated non-operatively. In four of the 159 (2.5 %), the POCR lead to an adjournment of the operation (0.58 % of total group). These patients suffered from a pneumonia. The POCR in these cases acted as a confirmation of the clinical diagnosis. If the POCR was only made in these cases, the costs would have been reduced with €34,300.

Conclusion: In 0.58 % of all performed POCR's, an abnormality lead to the adjournment of the operation. In all four cases, the POCR matched the clinical findings. Because the additional value of the POCR in hip fracture patients was extremely limited we think that its selective use in clinical abnormalities is safe and will reduce unnecessary costs.

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Disclosure: No significant relationships.

P014

AN EPIDEMIOLOGICAL STUDY OF 600 HAND INJURY PATIENTS PRESENTING TO A TERTIARY REFERRAL CENTRE

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Introduction: Hand injuries are a common presentation of trauma, with fractures alone having an annual incidence of 3–4/1000. The impact on healthcare services is therefore great, with consequences for the workforce and local economy. It is hoped that by better understanding our population of hand-injury patients, we can adopt better prevention strategies and tailor rehabilitation programmes accordingly.

Materials and methods: Our study was conducted in the emergency department of a tertiary referral centre. The inclusion criteria for participants was an injury sustained to the hand or soft tissues of the forearm, as a direct result of trauma, between August 2012 and August 2013. An epidemiological study was then performed on patients presenting within the identified busiest month of that year.

Results: Our results demonstrated a high incidence of hand injuries presenting to the emergency department in the summer months. Two-thirds of our population were male, and 61 % were aged below 35 years. Closed fractures and wound injuries, related to work and sport, were the most common presentation. The majority of our patients presented in the afternoon and evening, and there was a correlation with socioeconomic class.

Conclusion: Our tertiary centre continues to receive high volumes of patients with trauma to the hand, with an increased service demand over the summer months and out of hours. The results of our study shall be used to target those patients identified as being at risk from hand trauma injuries, in both prevention and management strategies, including local construction workers.

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Disclosure: No significant relationships.

P015

AN EVIDENCE BASED BLUNT TRAUMA PROTOCOL

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Introduction: Currently computed tomography (CT) is rapidly implemented in the evaluation of trauma patients. In anticipation of a large international multicenter trial, this study's aim was to evaluate the clinical feasibility of a new diagnostic protocol, used for the primary radiological evaluation in adult blunt high-energy trauma patients, especially for the use of CT.

Materials and methods: An evidence-based flowchart was created with criteria based on trauma mechanism, physical examination and laboratory analyses to indicate appropriateness of conventional radiography (CR), sonography and CT of head, C-spine and trunk. To evaluate this protocol, we prospectively included 81 consecutive patients. Collected data included protocol adherence and number and type of performed CR and CT scans. We also determined time needed to perform radiological investigations, adverse events in the CT room and clinically relevant missed injuries after one-month clinical follow-up.

Results: There was 99 % adherence to the protocol concerning CT. Seventy-nine patients (98 %) received one or more CT scans: 72 (89 %) had thoracoabdominal, 78 (96 %) C-spine and 54 (67 %) had cranial CT. In thirty patients one or more CT scans of body regions could be omitted. In 38 % CR was wrongly omitted or performed incorrectly at a variance with the protocol. No major adverse events occurred in the CT room and no clinically relevant injuries were missed.

Conclusion: We introduced a diagnostic protocol that seems feasible and safe for the evaluation of adult blunt high-energy trauma patients. Implementation of this protocol has the potential to reduce unnecessary radiological investigations, especially CT scans.

Disclosure: No significant relationships.

P016

ASSOCIATION OF MALE GENDER WITH INCREASED MORTALITY IN FALLS

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Introduction: Trauma is a leading cause of premature mortality. Differences in clinical outcomes by patients' gender have been reported in common diseases. However, whether gender affects the mortalities of trauma patients remains controversial. We tested the hypothesis that gender altered the mortality from trauma.

Materials and methods: A retrospective review of trauma patients ($n = 80,813$, 185 institutions across Japan) in the Japan Trauma Data Bank. Patients in ten categories of injury mechanism and three sub-categories of fall were tested for the primary outcome variable (28-day mortality). The secondary outcome was seriously injured body regions (AIS ≥ 3). Propensity score matching was performed.

Results: Of ten injury categories examined, injury due to fall was significantly associated with altered hospital mortality by gender (adjusted $P = 7.2 \times 10^{-10}$). Further analysis in the three sub-categories of fall by the levels of height revealed that the male patients who fell from ground level had significantly increased hospital mortality (male vs. female, 0.083 vs. 0.036) and had a significant increase in the hazard of death over the 28-day period ($P = 1.0 \times 10^{-13}$, hazard ratio 1.96, 95 % CI 1.66–2.32). Such difference by gender remained significant after propensity score matching. Male patients of ground level fall had significantly increased serious injury of head, thorax and spine, and decreased serious injury of extremity compared to the female patients ($P < 1.0 \times 10^{-5}$).

Conclusion: Male gender was associated with increased mortality in patients who had injuries from fall, in particular fall from ground level. The serious injury regions of ground level fall were different by gender. Gender difference appears to be important for fatalities from ground level falls.

Disclosure: No significant relationships.

P017

BONE METASTATIC DISEASE AND SKELETAL RELATED EVENTS: SLOVENIAN NATIONAL RECOMMENDATIONS

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Introduction: Consensus meeting of traumatologists, orthopaedics, oncologic surgeons, haematologists and physiatrists of the Slovenian medical association

Materials and methods: The national recommendations for bone metastasis disease, diagnostics and treatment options were defined at the interdisciplinary consensus meeting of basic scientists and clinicians.

Results: It is estimated that half of carcinomas metastasize in bone, one fourth of bone metastatic disease results in pathologic bone fracture, presumably in proximal femur, proximal humerus and axial skeleton.

Conclusion: Recommendations:

1. Process reorganization and interdisciplinary team approach is obligatory: internal medicine, oncology, radiology and surgery for preparing plan of treatment.
2. Prospective data collection and patients' registry is needed on local and national level for quality assurance programmes.

3. Timing of operative: fracture treatment preferred in 48–72 hours.

4. Each bone metastasis must be carefully analysed to define the threat of pathological fracture. In this case bone augmentation procedure is recommended before the fracture occurs.

5. Spinal metastases need treatment in specialized spinal centres.

6. For the metastatic bone disease treatment interdisciplinary approach for strategic therapeutic plan, preoperative planning, appropriate fracture stabilization and postoperative medical rehabilitation is obligatory. In absence of these criteria referral to specialized institution is needed.

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Disclosure: No significant relationships.

P018

CAN WE COMPARE INCIDENCES AND STUDY RESULTS ON ANTERIOR KNEE PAIN AFTER TIBIAL NAILING? A COMMON PROBLEM, NO COMMON DEFINITION

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Introduction: The aim is to analyze literature criteria to report anterior knee pain (AKP) following tibial nailing and define the entity using our study results.

Materials and methods: A group of 60 patients with 62 tibial shaft fractures. The follow-up range was 12–84 months, age 20–87 years.

Results: As AKP we recorded any newly developed chronic pain or discomfort in the anterior region of the knee noticed after the introduction of a tibial nail irrespective to pain intensity or functional impairment. It was present in 35 % of cases. In 10 cases (16 %), patients classified it as moderate. None reported severe or constant pain. Mean Lysholm knee score in the group without AKP was 90.8. In mild AKP group it was 88.4 and in moderate 79.9. Of the 22 cases with AKP, in 73 % the pain was noticed 6–12 months after the injury, related commonly to kneeling, hard labour or sports and weather changes. It lasted mostly for few minutes (11/22) or seconds (8/22). No effect regarding the time elapsed from surgery was noticed in 21/22 patients. Ten patients (16 %) reported chronic pain in the knee of the fractured calf present before, with no changes after the osteosynthesis. Total incidence of knee pain on the injured side was 52 %, in contralateral knees 28 %.

Conclusion: Literature definition criteria for AKP are unknown or heterogeneous. We find necessary to approve a common definition to publish reliable and comparable results. Minimal follow-up should be 1 year. Although we couldn't identify clinical significance of mild AKP, these cases should be accounted.

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Disclosure: No significant relationships.

P019

CARE OF THE OLDER TRAUMA PATIENT: AN URBAN TRAUMA CENTER'S EXPERIENCE

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Introduction: Trauma remains a major cause of death in the United States. With the much anticipated “Silver Tsunami” of baby-boomers now hitting America, the fastest growing trauma population is now that of adults over the age of 65. We aimed to better describe the outcomes of these patients.

Materials and methods: We conducted a retrospective chart review of patients in our trauma registry from July 1st, 2001 and June 30th, 2011. Patients were divided into the following cohorts by age: 65–74, 75–84, and over 85. Demographics included age, mechanism and ISS. Differences in mortality and length of stay were considered.

Results: LOS for 65–74 was 5.0 ± 8.6 days with 0.8 ± 3.6 days ICU LOS for an ISS <16 and 10.0 ± 13.0 days with 4.3 ± 3.3 ICU days for ISS >16 ($p = <0.05$). For 75–84, LOS was 5.9 ± 13.5 with 1.1 ± 4.6 ICU days and 9.6 ± 11.5 with 4.1 ± 7.2 days ICU LOS respectively ($p = <0.05$). For 85 and older, LOS was 5.3 ± 5.6 and ICU LOS 0.8 ± 2.1 for an ISS <16 and 9.6 ± 8.8 hospital days with 3.2 ± 5.3 days for an ISS >16. For an ISS <16 mortality of the 65–74, 75–84 and 85 and older groups was 3.3, 4.1 and 5.6% ($p \leq 0.05$). For ISS >16 this changed to 16.9, 21.5 and 24.3 percent respectively ($p \leq 0.05$).

Conclusion: Elderly trauma patients represent a distinct, under studied and growing sub-population of trauma victims. Their injury epidemiology, outcomes and medical needs are unique and represent a potential challenge to the those caring for them. With proper research and training, we can understand and address their unique requirements and improve trauma outcomes for the elderly.

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Disclosure: No significant relationships.

P020

CENTRALISATION OF TRAUMA SERVICES WITHIN A UK TRAUMA NETWORK HAS SHOWN CHANGES IN CLINICAL OUTCOMES AT A MAJOR TRAUMA CENTRE

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Introduction: A major reorganisation of trauma services occurred in the England in 2012. This involved the creation of major trauma networks with a centralized specialist trauma centre, receiving patients from significant geographical distances. This reconfiguration is reviewed with respect to clinical outcomes.

Materials and methods: Data were analysed from a prospectively maintained trauma database from a Major Trauma Centre in Liverpool, UK between November 2011 and June 2014. Primary outcomes included basic demographics, ISS, intervention and mortality rates. Data were compared pre and post centralisation, utilising Fisher's exact test.

Results: The pre-centralised study period was from January 2012 to October 2012 and the post-centralisation period was November 2012 to June 2014. Mean monthly admissions increased significantly 15.7 vs 63.1 ($p < 0.005$). There were no significant differences in demographic statistics and GCS levels. There are more patients with an injury severity score >15 in the pre centralisation group, 58 % vs 27 % ($p < 0.0001$). Less patients required radiological or operative intervention, 28 % vs 13 % ($p < 0.0001$), fewer patients required intensive care, 18 % vs 12 % ($p = 0.0569$). Similar numbers of patients required neurosurgical transfer, 12 % vs 11 % ($p = 0.506$). There was a non-significant decrease in mortality rate, 7 % vs 5 % ($p = 0.23$).

Conclusion: There has been a significant increase in volume of major trauma at our institution since November 2012, with a small decrease in overall mortality. The management has become more refined with fewer patients requiring intervention or higher-level care, with no worsening of morbidity or mortality, demonstrating the effect of this institutional increase in volume.

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Disclosure: No significant relationships.

P021

CEPHALOMEDULLARY NAIL FAILURE IN OPERATIVE TREATMENT OF TROCHANTERIC FEMORAL FRACTURES

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Introduction: Mechanical failure of cephalomedullary nailing is a rare complication attributed to delayed fracture union or nonunion. This study presents a series of cases of breakage and secondary lag screw dislocation after cephalomedullary nailing.

Materials and methods: In a retrospective study between 02/2005 and 12/2013 we analyzed all patients with trochanteric fracture who

had been treated by cephalomedullary nailing. Fractures were classified according to AO/OTA classification. 13 patients with third generation Gamma nail breakage were included.

Results: 7 patients were women, and 6 men with a mean age of 72 years (range 35–94). Implant breakage occurred 6 months post-operatively (range 1–19 months). In 10 cases breakage was secondary to delayed or nonunion, which was thought to be mainly due to insufficient reduction of the fracture, and in two cases due to loss of the lag screw because of missing set screw. In 1 case, breakage was apparent during elective metal removal following complete fracture healing. Short-term outcome was evaluated 6 months after operative revision using Harris Hip Score in 11 out of 13 patients showing a mean score of 84 %. Complete radiological fracture healing has been found in 11 patients available for follow-up within 6 months after revision surgery.

Conclusion: The results of our study demonstrate that revision surgery is warranted and provides good clinical and radiological short-term results. Failures of trochanteric fractures are related to lack of surgeon performance. Therefore, application of the implant requires accurate preoperative planning, advanced surgical experience to evaluate the patient and the fracture classification, and precise surgical technique.

Disclosure: No significant relationships.

P022

CLINICAL AND RADIOLOGICAL RESULTS OF LOCKING PLATE FIXATION FOR PERIPROSTHETIC FEMORAL FRACTURES AROUND HIP ARTHROPLASTIES: A RETROSPECTIVE MULTI-CENTER STUDY

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Introduction: The purpose of this study was to ascertain the clinical results, particularly recovery of activities of daily living (ADL), as well as the radiological results and potential complications arising from the use of locking plate fixation for periprosthetic femoral fractures around hip arthroplasties.

Materials and methods: We conducted a retrospective, multi-center study. Patients with periprosthetic femoral fractures around hip arthroplasties who were treated by osteosynthesis using locking plates and who underwent follow-up for at least six months postoperatively were enrolled in this study. Patient recovery of ADL in terms of social status and ambulatory status, and Parker mobility score were compared before fracture and at the latest follow-up for each patient. Post-operative complications were investigated. Bony union, loss of reduction, and malunion were assessed radiologically.

Results: Thirty-two patients were enrolled in this study, with a mean follow-up of 25.1 months. For 84.4, 68.8, and 53.1 % of the patients, social status, ambulation and Parker mobility score at the latest follow-up were determined to be equal to that before the fracture. Bony union was observed in 30 patients within the follow-up periods. There was no loss of reduction, malunion, or implant failure, and no infection. In one patient each, partial pullout of the locking screws and a supracondylar fracture at the plate end was observed, and an

additional surgery was required.

Conclusion: Locking plate fixation provides sufficient stability for the satisfactory recovery of ADL in the majority of elderly patients with periprosthetic femoral fractures around hip arthroplasties.

Disclosure: No significant relationships.

P023

COMPLICATION ANALYSIS AND CLINICAL RESULTS IN A LOCAL CENTER OF THE GAMMA3 FOLLOW-UP STUDY: 12 MONTH FOLLOW-UP

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Introduction: The multinational Gamma3 Follow-Up study focuses on more than 500 patients foreseen after introduction of the 3rd Generation of gamma nail systems. Local results could also help to analyse clinical results. We presented the results of 70 consecutive patients at 4-month follow-up in 2013, now we amend the results of 100 patients after a 12-month follow-up.

Materials and methods: From 9/2009–3/2011 we included 100 patients (69 % female). Mean age was 77.5 years. Fracture classification showed a dominance of type 31A2.2 (20 %) and 31A1.2 (19 %). The data included different scoring systems (e.g. Parker mobility score, Sahlgrenska mobility chart). Relevant clinical data was collected. Statistical analysis used SPSS. Monitoring was performed by an external CRO.

Results: In 81 % operative treatment was performed within 24 hours after trauma with mainly nails of 180 mm (69.4 %) were used. 12-months Follow-up was possible in 71 % of the patients. Due to mortality (14 %), cut-out (7 %), revision (1 %) and denial (3 %) we lost 25 %, only 4 % were “Lost to follow-up”. Complication analysis showed no in-hospital mortality, 16 complications at 12 month FU and 2 device related events. Whilst before trauma 70 % had good to excellent results (Merle d’Aubigne), after 12 month this were 49.3 %. In 40.9 % the pretraumatic mobility had been regained.

Conclusion: Compared to study results of the second-generation implant series, there is a clear reduction of morbidity, mortality and device related adverse events. This is the largest study assessing the Gamma3 implant and gives a good and rare view to the long term results concerning mobility and daily living.

Disclosure: No significant relationships.

P024

CULTURAL VARIABILITY AND MECHANISMS OF INFANT FALL INJURY IN JERUSALEM POPULATION

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Introduction: In Israel 2.3 million children ages 0–17 and 150 of them die every year as a result of traumatic injury, 24,00 are

hospitalized and 180,000 are evaluated in emergency rooms yearly. **Aims:** to define injury patterns in subgroups of the pediatric population, in order to focus prevention programs on vulnerable groups.

Materials and methods: 4 year retrospective study was performed using data from Institutional and National trauma registry. To characterize the study population, identify risk factors for childhood falls and develop a risk stratification model of falls injury (CART), all pediatric records ages 0-3 hospitalized for falls during 2009–2012 (N = 422).

Results: Two leading vectors of falls are furniture (30 %) and slipping (26.5 %). Next are care giver hands (18.6 %), playground (6.7 %), building (9.3 %) and stroller (8.6). Most of the traumatic falls result head injury (74 %), with 81 % low ISS (1-14). The majority of children (73.9 %) are hospitalized for 1 to 3 days; 9.5 % in Intensive care. Arab children are less likely to traumatically fall ($p = 0.000$) both in Jewish and Arabic children males. 46 %Jewish children's falls are at 0–12 months; Arab children 38 %. Jewish 4 times more fall in playground; Arabic children are 3 times fall from buildings; more Arabic 4.6 % compared Jewish 2.4 % head injury. Falls from buildings at study institution are 4 times higher compared national (9.3 %; 2.4 %); ISS-moderate-severity of injury (16-24) is higher at study institution (15.2 %; 4.4 %); 4 times PICU admissions

Conclusion: Differences in mechanism of injury reflect cultural variation. Imperative to implement outreach community intervention.

Disclosure: No significant relationships.

P025

CUMULATIVE INCIDENCE AND TREATMENT OF NON-SIMULTANEOUS BILATERAL FEMORAL NECK FRACTURES IN A COHORT OF 1,250 PATIENTS

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Introduction: In the Netherlands, over 20,000 patients sustain a hip fracture yearly. A first hip fracture is a risk factor for a second, contralateral fracture. Data on similarity of the treatment of bilateral femoral neck fractures are only scarcely available. The objectives of this study were to determine the cumulative incidence of non-simultaneous bilateral femoral neck fractures and to describe the patient characteristics and treatment characteristics of these patients.

Materials and methods: A database of 1,250 consecutive patients with a femoral neck fracture was available. Patients with a previous contralateral femoral neck fracture were identified by reviewing radiographs and patient files. Patient characteristics, previous fractures, hip fracture type and details on treatment were collected from the patient files.

Results: One hundred nine patients (9 %, 95 % confidence interval 7–10 %) had sustained a non-simultaneous bilateral femoral neck fracture. The median age at the first fracture was 81 years; the median interval between the fractures was 25 months. Overall, 73 % was treated similarly for both fractures in terms of non-operative

treatment, internal fixation or arthroplasty. In patients with identical Garden classification (30 %), treatment similarity was 88 %.

Conclusion: The prevalence of non-simultaneous bilateral femoral neck fractures was 9 %. Most patients with identical fracture types were treated similarly. The relatively high risk of sustaining a second femoral neck fracture supports the importance of secondary prevention, especially in patients with a prior wrist or vertebral fracture.

Disclosure: No significant relationships.

P026

DEMOGRAPHIC CHARACTERISTICS OF TRAUMA PATIENTS OVER A DECADE: THE STAVANGER UNIVERSITY HOSPITAL EXPERIENCE

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Introduction: Little is known about the characteristics and eventual changes in injury profiles of trauma patients in Norway. Here we describe the demographic characteristics and explore change in patterns of admitted trauma patients over a decade in a defined population.

Materials and methods: Stavanger University Hospital (SUH) receive trauma patients from a catchment area of approximately 500 000 inhabitants. We provide 24/7 services of all surgical specialties, including interventional radiology and neurosurgery. SUH has systematically collected prospective registered injury patients in a Trauma registry since 2003. We included data from 2003 til 2013. Descriptive statistic analyses was done by SPSS v. 22 to evaluate the data.

Results: There are 4042 patients in the register, of which 1171 were female (29 %) and 2871 men (71 %). Median age was equal for men and women (32 years). 285 (7.1 %) patients were children (<15 years old). 550 (13.6 %) were elderly (>65 years old). Patients mortality overall was 4.6 % (n = 186). 1060 patients had severe injury, defined by ISS >15. There were 251 (23.7 %) women and 809 (76.3 %) men with ISS >15. In 180 cases (4.5 %) penetrating injuries were dominating, while 3816 injuries (94.4 %) had blunt dominating injuries. Admission increased from about 200 in 2003 to almost 600 in 2013.

Conclusion: We have seen a steady increase in the number of admitted trauma patients in our region without any change in 30 days mortality.

Disclosure: No significant relationships.

P027

DEMOGRAPHICS OF PATIENTS TREATED FOR OSTEOPOROTIC HIP FRACTURES AT UNIVERSITY HOSPITALS GASTHUISBERG BETWEEN 2001 AND 2010: A RETROSPECTIVE ANALYSIS

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Introduction: Osteoporotic hip fractures are a frequent injury and show an increasing incidence. The goal of the actual study is to

analyse the evolution of demographics and treatment characteristics of patients treated for osteoporotic hip fractures between 2001 and 2010 at the University Hospitals Gasthuisberg.

Materials and methods: This retrospective single center patient file analysis compares 2 groups of patients treated in 2001 and 2010. The inclusion criteria were that the patients were above 65 years of age and had sustained an osteoporotic hip fracture.

Results: We did not find a significant change in mean age or gender ratio. There was a significant increase in comorbidity, the number of patients with a history of osteoporosis doubled and the number of patients treated for osteoporosis tenfolded. Time to surgery was in both groups on average more than 48 hours and independent from comorbidity or age of the patients.

Conclusion: The age of patients with osteoporotic hip fractures did not increase in the 10-year interval and the proportion of male patients did not increase. We did find an obvious increase in overall comorbidity. Finally, the number of patients with a history of osteoporosis prior to the fracture doubled and the number of people who received treatment for osteoporosis before the fracture was 10 times higher in 2010. In both groups time to surgery was not linked to comorbidity or age of the patients. However only little improvement could be observed in reducing the time to surgery.

Disclosure: No significant relationships.

P028

DOES ALCOHOL SERVE AS A MARKER FOR PAIN MANAGEMENT AFTER TRAUMATIC INJURY?

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Introduction: Pain management and patient satisfaction are increasingly used as surrogates for appropriate care. Alcohol is associated with over 50 % of all traumatic injuries and may serve as a marker for depression, poor pain control, and patient satisfaction. This study was done to determine if there is a correlation between pain control and ETOH levels (on admission).

Materials and methods: An IRB approved retrospective study of patients admitted to a level one trauma center was performed. 3500 patients were available for review. 216 patients met criteria for the study. Data obtained included age, injury type, ETOH, Drug Screen data, Opiate and Sedative drug use, ISS, AIS, BMI, Smoking, and aggregate pain score. Morphine equivalence (ME) was used to compare total pain management treatment.

Results: No correlation was found between ETOH on admission and ISS, AIS Smoking, BMI, or pain scores during admission. Measured Morphine Equivalence for pain control did not appear to be influenced by prior ETOH use.

Conclusion: Although ETOH is involved in a large percentage of traumatic injuries and may serve as marker for depression ETOH does

not appear to influence perceptions of pain due to traumatic injury.

Disclosure: No significant relationships.

P029

EFFECTS OF DISTANCE ON URGENT TRANSFERS TO A MAJOR TRAUMA CENTRE WITHIN A UK TRAUMA NETWORK

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Introduction: A major reorganization of trauma services occurred in the England in 2012, with the creation of major trauma networks with a centralized specialist trauma centre receiving patients from significant geographical distances. We aim to compare patients treated from local incidents to those travelling from further away.

Materials and methods: Data was analysed from a prospectively maintained database located at a major trauma centre in Liverpool, England, from June 2012 to Jun 2014. Outcomes included basic demographics, ISS, intervention and mortality. Primary outcomes were compared between a group of patients transferred from incidents local to the centre and a second group of patients transferred from geographically greater distances bypassing their local hospital. Data was analysed using Fisher's exact test.

Results: 1261 patients were admitted between June 2012 and June 2014, with 840 in the local cohort and 421 in the bypass group. No significant differences exist between demographic data and injury severity scores. There were more patients with GCS < 8 in the local group, 16 % vs 10 % ($p = 0.002$). More patients required intervention, 16 % vs 11 % ($p = 0.03$) and were admitted to intensive care, 16 % vs 10 % ($p = 0.006$) in the local group. There was no change to patients requiring neurosurgical transfer, 11 % vs 11 % ($p = 1.000$). There was a slightly higher mortality in the bypass group but not statistically significant: 6 % vs 4 % ($p = 0.09$).

Conclusion: Mortality between patients transferred geographically longer distances, bypassing their local hospital, was similar to those patients injured locally.

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Disclosure: No significant relationships.

P030**EPIDEMIOLOGY OF SPINAL INJURIES IN THE UNITED ARAB EMIRATES**

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Introduction: We aimed to assess the risk factors, mechanism of injury, and clinical outcome of hospitalized patients with spinal injuries in order to recommend preventive measures.

Materials and methods: Patients with spinal injuries admitted to Al Ain Hospital, United Arab Emirates (UAE) for more than 24 hours or who died after arrival to the hospital were studied over 3 years. Demography, location and time of injury, affected body regions, hospital and ICU stay, and outcome were analyzed.

Results: 239 patients were studied, 90 % were males, and 84 % were in the productive years of 25-54. Majority were from the Indian subcontinent (56 %). Road was the most common location for spine injury (47 %), followed by work (39 %). The most common mechanism of injury was traffic collisions (48 %) followed by fall from height (39 %) and fall from the same level (9 %). UAE nationals were often injured at road and home compared with non-UAE nationals, who were more injured at work ($p < 0.0001$). Patients falling from the same level were older ($p = 0.001$) and predominantly females ($p < 0.0001$) when compared with other mechanisms. Spinal fractures were more common in the lumbar region (57 %). Eleven patients (5 %) sustained paraplegia and five (4 %) patients died.

Conclusion: Traffic injuries and falls were the leading causes for spinal injury in the UAE. Expatriate males are at high risk for fall from height, UAE national males for traffic injuries, and females for falls at the same level at homes. Prevention should focus on traffic and home injuries for UAE nationals and occupational safety for expatriate workers.

Disclosure: No significant relationships.

P031**EVALUATING THE COST OF ‘ALCOHOL ON BOARD’ AS A SIGNIFICANT CONTRIBUTOR TO ACCIDENTAL BLUNT TRAUMA**

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Introduction: Blunt trauma is one of the major reasons for acute admission to a trauma unit. The Trauma Audit & Research Network (TARN) is an initiative between hospitals in 18 European countries; it is the largest trauma database in Europe with 250,000 cases approved. **Materials and methods:** We accessed TARN on 28th October 2014 and exported all records for Our Lady of Lourdes, Drogheda. Hospital In-Patient Enquiry (HIPE) provided Mechanism of Injury (MoI), Injury Severity Score (ISS), Length of Stay (LoS) and Cost of Admission (CoA). Multivariate analysis was performed in

the R statistical environment.

Results: Initial analysis revealed two key insights: (a) penetrating trauma is less than 3 % of total admission volume; (b) 3 categories of blunt trauma account for over 90 %. “Fall <2 m” corresponds to 46 % of total admission volume, with “Road Traffic Accident” (RTA) exactly half this amount. Both have a strong relationship with alcohol as the primary MoI. A second salient factor is Injury Severity Score (ISS): 22 % of admissions had an ISS under 9, 43 % were between 9–15, with 35 % over 15. Multivariate analysis provides important lessons for management of trauma patients where the primary MoI is alcohol.

Conclusion: Every major injury due to trauma costs in excess of €65,000. Alcohol-related blunt trauma accounts for 28.7 % of all trauma admissions presenting at OLOL. We investigate the relationship of alcohol-related MoI and ISS, to LoS and CoA in a major regional trauma centre.

Keywords traumatic injury, alcohol on board, mechanism of injury, injury severity score, length of stay, cost of admission

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Disclosure: No significant relationships.

P032**EVALUATING TRAUMA CARE : RISC FACTORS & OUTCOME OF THE ELDERLY INJURED PATIENTS IN A SICU OF TERTIARY TRAUMA CENTER HOSPITAL IN ATHENS GREECE**

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Introduction: It is known that trauma in elderly age has increased morbidity and mortality. The geriatric trauma is an extreme age category, comorbidity caused, followed by indicated trauma guidelines. The study of their outcome from a SICU is important for the updating needed research.

Materials and methods: This retrospective study was designed to registry all trauma patients over 60 years old, in 36 months observation (2011–2013), in order to identify risk factors associated with their SICU outcome. We enrolled elderly trauma patients (Age >60) in the multivalent 1st SICU of KAT-EKA with LOS more than 5 days. Clinical and demographic data, gender, age, ISS score, the type of injuries, SICU LOS, comorbidities and SICU outcome was registered. Statistical analysis was performed (t-student, Chi square).

Results: From 106 trauma patients were 35 injured with Age >60 , 27♂ & 8♀. Severe TBI had 25 patients, 11 thoracic injuries, 3 abdominal injuries 6 & limp injuries. Mortality arised to 43 % with sepsis major cause of death in 86 %. The age (AV 69.8 ± 9.2 SD), gender, type of injuries & ISS (23.5 ± 9.2 SD) had no association with the outcome. SICU LOS (40.6 ± 39.7 SD) was sorter in

discharge patients ($p < 0.05$). Comorbidities were associated with mortality ($p < 0.05$).

Conclusion: In our SICU elder injured patients have longer LOS and increased mortality. The comorbidities seems to be the major factor of mortality.

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Disclosure: No significant relationships.

P033

EVALUATING TRAUMA CARE :POST TRACHEOSTOMY SURGICAL ICU OUTCOME OF THE INJURED PATIENTS IN A TERTIARY TRAUMA CENTER HOSPITAL OF ATHENS GREECE

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Introduction: The bedside Tracheostomy (T) is one of the most often surgical technique needed in the Surgical ICU, on the multitrauma patients.

Materials and methods: This retrospective study was designed to registry all trauma patients who underwent in Tracheostomy, in 60 months observation (2009–2013), in order to identify factors associated with their ICU outcome. From 1.346 SICU patients, 403 injured, we enrolled patients who went under T technique in the multivalent 2nd SICU of KAT-EKA General Hospital Trauma Center .Clinical and demographic data, gender, age, ISSScore, the type of injuries,ICU LOS,T day and ICU outcome was registered.

Results: Was performed Tracheostomy (T), by Seldinger or open technique, in $n = 182$ (13.52 %) SICU patients με AV age 63.54 ± 17.32 SD (19/93), ♂ $n = 112$ (63.3 %), και ♀ $n = 66$ (37.5 %). The injured patients were $n = 78$ (42.85 %) AV61 age ± 19.95 SD, ♂ $n = 58$ AV 59.29 age and ♀ $n = 20$ AV age 74.7 (19/93). The total length of ICU stay recorded was 2098 days AV 26.89 ± 16.31 SD (4/95).T was performed on Av 12th day ± 6.15 SD (1/23). The ISSScore is recorded AV 24.49 ± 14.54 SD (9/75).The type of trauma was: TBI $n = 44$ (56.4 %) following Thoracic Trauma. The ICU overall survival with discharge to the yard resulted in $n = 31$ patients (39.75 %) all ♂with ISS 23.45 & SICU LOS 924 days. Mortality rate arises to $n = 47$ cases (60.25 %), ISS 26.17 & SICU LOS 1174 days because of infectious/non infectious nosocomial complications and multiorgan dysfunction syndrome. The statistic analysis was performed (t-student, Chi square).

Conclusion: The Age ($p < 0.01$) following ISS &TBI are important factors on this special category of injured patients went under Tracheostomy technique for their SICU outcome.

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Disclosure: No significant relationships.

P034

FACTORS AFFECTING OVERALL MORTALITY AFTER HIP FRACTURES

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Introduction: Hip fractures are a common geriatric condition, and are associated with increased age-adjusted mortality. Numerous factors have been mentioned in relation with mortality but the exact correlation still remains unknown. Timing from admission to treatment, effect of anticoagulant treatment and associated co-morbidities remain major prognostic issues. The aim of this study was to investigate the prognostic factors affecting early and late mortality in the geriatric population with hip fractures

Materials and methods: A retrospective analysis of 521 surgically treated geriatric fragility hip fractures in 3 years. The following data was reviewed: patients' demographics, fracture type, time to surgery, prescribed medication, co-morbidities and mortality. Prescribed medications were used both as an independent factor and as an indication for the severity of pre-existing medical condition. Statistical analysis was performed using Chi square and ANOVA analysis.

Results: The mean time from admission to surgery was 45 hours (range 1–745). mortality rates were 3.3 % at one month, 7.5 % at three months, 10.6 % at six months, 15.9 % at one year. Age, co-morbidities and delay to surgery were significantly associated with increased mortality ($p < 0.05$). Delay for surgery was associated with a higher mortality rate, peaking at 25 % (>96 h delay). IHD, renal failure and hypertension were associated with increased mortality/patients receiving steroids, diuretics, nitrates were in a higher risk of mortality. Bisphosphonate treatment was associated with a lower mortality rate

Conclusion: We found several medical factors associated with increased mortality rate following hip fractures. Specific medical conditions as well as delay to surgery play a major role in these.

Disclosure: No significant relationships.

P035

FALL-RELATED INJURIES TREATED IN AMSTERDAM, RISK FACTOR AND PATIENT CHARACTERISTICS

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Introduction: In the elderly population unintentional falls are a common occurrence, leading to an increased healthcare utilization and even death. To allocate resources properly, it is important to examine epidemiological trends in trauma-related morbidity and mortality. In Europe alone fourteen percent of all disability-adjusted life years and seven percent of all deaths are the result of trauma, and of these injuries the majority are unintentional injuries. The aim of this study is to describe the trends in fall related morbidity and mortality and to assess fall settings and risk factors, with special focus on the geriatric patient and staircase related falls in our region.

Materials and methods: This is a retrospective observational cohort study. Data on all patients who visited the ED of one of three hospitals in Amsterdam with a fall-related injury in the year 2013 were included. Variables that were retrieved were: patient demographics. Details on the trauma mechanism and outcome parameters.

Results: 3217 patients were included, majority were female. Logistic regression analysis showed a significant influence of alcohol consumption, involvement of stairs, EMV, RTS, ISS, age and gender as a risk factor for mortality on length of stay. Patients above 65 years had a significant higher mortality and a longer length of hospital stay.

Conclusion: Elderly people, in particular women are at risk for sustaining a fall related injury. Female gender is furthermore associated with increased length of stay in the hospital after sustaining a fall related injury. Prevention should focus especially on these frail patients.

Disclosure: No significant relationships.

P036

GAIT ANALYSIS AND ENERGY COST OF WALKING IN TRANSTIBIAL AMPUTEES DURING UPHILL WALKING: A COMPARISON BETWEEN PERIPHERAL ARTERIAL DISEASE AND POSTTRAUMATIC ETIOLOGY

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Introduction: Ambulatory independence is essential to improve the quality of life in amputees with peripheral arterial disease.

Materials and methods: We aimed to compare gait parameters and energy cost of inclined walking between peripheral arterial disease and posttraumatic transtibial amputees. Our study included ten peripheral arterial disease and eight posttraumatic patients that have had transtibial amputees for a minimum of 2 years. Gait analysis was performed using Zebris CMS-HS ultrasound spatial detection instruments. The patients were asked to walk on a treadmill set at 15 % incline at comfortable, 1.2 m/s and maximal speeds. The energy cost was estimated using the physiologic cost index.

Results: Patients with peripheral arterial disease have slower comfortable (0.51 ± 0.23 vs 0.82 ± 0.19 , $p = 0.007$ and 1.27 ± 0.61 vs 1.94 ± 0.42 , $p = 0.0179$) and maximal speeds as well as decreased corresponding physiologic cost indexes (0.68 ± 0.19 vs 0.50 ± 0.14 , $p = 0.0402$, 0.89 ± 0.21 vs 0.57 ± 0.15 , $p = 0.002$ and 1.03 ± 0.23 vs 0.61 ± 0.15 , $p = 0.000$).

Conclusion: Vascular transtibial amputees present with important functional deficit compared to posttraumatic etiology that is aggravated during uphill walking. Their ability to ambulate is impaired by limited metabolic resources.

Disclosure: No significant relationships.

PEDIATRIC & HIP

P037

HORMONE REPLACEMENT THERAPY IN PROXIMAL HUMERUS FRACTURE PATIENTS: EFFECT ON FRACTURE SEVERITY AND FRACTURE HEALING

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Introduction: This retrospective comparative study examines the relationship between hormone replacement therapy and severity of proximal humerus fracture among women > 45 years as well as fracture healing.

Materials and methods: 822 patients met the inclusion criteria. 110 patients underwent surgical fixation. The cohort ($n = 822$) was divided according to whether or not they received HRT. This was compared to the severity of the fracture and outcome of fracture and soft tissue healing.

Results: Patients who never used HRT were more likely to sustain 4-part fracture when compared to patients who are receiving HRT ($p = 0.002$) or have received HRT for < 3 years ($p = 0.003$) or ≥ 3 years ($p < 0.001$). The surgical fixation group of patients who never received HRT had an increase delay in fracture healing (15 weeks) when compared to the surgical fixation group of patients receiving or have received HRT (11 weeks). Further analysis revealed a significant correlation when it comes to delayed wound healing ($p = 0.032$), postoperative pain ($p = 0.03$) and infections ($p = 0.05$). The conservatively managed group of patients who never received HRT had an increase delay in fracture healing (13 weeks) when compared to the conservatively managed group of patients receiving or have received HRT (10 weeks). Further analysis revealed a significant correlation when it comes to soft tissue healing ($p = 0.042$) and postoperative pain ($p = 0.01$).

Conclusion: Current and past use of HRT for more than 3 years appears to be associated with a reduced severity of fracture at the proximal humerus. Furthermore, these patients were less likely to suffer from delayed union and other soft tissue problems.

Disclosure: No significant relationships.

P038

IMPROVED OUTCOMES AFTER THE TREATMENT OF PERIPROSTHETIC HIP AND INTERPROSTHETIC FEMUR FRACTURES WITH MINIMAL INVASIVE TECHNIQUES AND RECENT IMPLANTS?—A SYSTEMATIC LITERATURE

REVIEW OF 1571 CASES

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Introduction: Our aim was to summarize available clinical data on periprosthetic femur fractures after hip arthroplasty and to identify risk factors occurring during treatment and influencing outcomes. Special focus was put on operation techniques and implants used.

Materials and methods: A systematic literature review was done by searching the MEDLINE and Cochrane databases. Articles describing patients with postoperative periprosthetic femur fractures sustained around a hip arthroplasty and with interprosthetic fractures treated with plates, nails, screws and/or cerclage were included. Considered articles were from 2000 or newer. Eligible abstracts were screened by two independent persons and discrepancies were resolved by consensus. Absolute numbers of complications and/or reoperations events along with their corresponding rates were calculated according to operation technique and type of implant. Additionally, relative risks were estimated.

Results: A total of 49 prospective and retrospective studies (mainly case series) were included. Of a total of 1574 fractures, 81.7 % were treated with plating. For 83.0 % of all fractures, an open approach was applied. The overall complication rate was 14.3 %. Fixation failure and nonunion were most often reported (rates: 4.4 and 3.9 %, respectively). Nonunion and refracture occurred significantly more often after open approaches than after minimal invasive osteosynthesis (nonunion: 4.5 vs 0.0 %, p = 0.001; refracture: 3.8 vs 0.6 %, p = 0.024, respectively). For non-locking plates, the relative risk for nonunion was 11.9 times higher than for locking plates (rates: 13.0 vs 1.1 %).

Conclusion: The clinical evidence of published studies is low. Contradictory literature supports the need for high level prospective trials.

Disclosure: Karl Stoffel is a consultant for Mathys, Zimmer and DePuy-Synthes and holds grants from Mathys and DePuy-Synthes. Christoph Sommer is a board member of the AO Technical Commission (AOTK) and the Swiss Society of Trauma and General Surgery and he is a cons

P039

INCIDENCE AND MANAGEMENT OF MALROTATION AFTER INTRAMEDULLARY NAIL FIXATION OF FEMORAL SHAFT FRACTURES IN A TEACHING HOSPITAL

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Introduction: Gross rotational malalignment is a rare occurrence following intramedullary nailing of femoral shaft fractures. The objective of this study was to determine the incidence of malrotation in a teaching hospital as well as to identify feasible diagnostic and corrective measures.

Materials and methods: We performed a retrospective study of femoral shaft fractures treated at our teaching facility between 2007 and 2014. The medical records of patients with intramedullary nail osteosynthesis of femoral shaft fractures were reviewed to identify the occurrence of rotational malalignment, methods for diagnosis of such malrotations and type of corrective therapy.

Results: The analysis included 123 femoral shaft fractures with intramedullary osteosynthesis between 2007 and 2014. Antegrade nailing was performed in 62 % (77 of 123) and retrograde nailing in 38 %. Mean patient age was 44 years. Incidence of malrotation greater than 15° was 8.1 % (10 of 123), in 80 % after antegrade nailing. Clinical evaluation of femoral rotation was performed in 57 patients (46.3 %). Minor trochanter sign was documented in 18 cases (14.6 %). In two patients correction was performed during the primary operation, eight cases were corrected secondarily. Correction was performed by removing the distal locking bolts, torsional correction and relocking.

Conclusion: Clinical and radiological tests should be implemented to evaluate femoral rotation during and after osteosynthesis to detect possible rotational abnormalities early. The incidence of significant malrotation in a teaching hospital is higher than expected even when following strict prevention guidelines. Therefore liberal use of post-operative CT is advisable in doubtful cases to detect those requiring correction, which should be done immediately.

Disclosure: No significant relationships.

P040

INCIDENCE AND MANAGEMENT OF METASTATIC FEMORAL FRACTURES: A RETROSPECTIVE STUDY

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Introduction: Bone metastases are the commonest bone tumours and they represent 60 % of all skeletal tumours. Bones are often a site of metastasis for certain tumours, especially breast, prostate and lung cancers (60 %–85 %), followed by kidney and thyroid carcinoma (30–40 %). According to the literature the spine is the most common site involved. Other common sites are pelvis, ribs, scull and long bones, especially femur.

Materials and methods: We performed a retrospective review of the medical documentation of patients with pathological fractures or impending pathological fractures treated at our hospital from 2009 to 2012. The following demographic and clinical data were analyzed: gender, age, type of primary cancer, incidence of pathological fractures and localization in femur, applied operative management and complications.

Results: There were 36 patients, mean age 75 years. During four year period, the incidence of pathological or impending pathological fractures among all treated patients at our department was 0.7 %. Men (52.77 %) women (47.22 %) ratio was 1:1. Bone metastases were due to lung cancer (22.2 %), breast (22.2 %), prostate (22.2 %), kidney (8.33 %) and others (25 %) (different 8 types of tumours). Diaphyseal fractures were present in 50 %, proximal in 46.6 % and distal femoral fractures in 3.33 %. We used IM nail among 16 patients (53.3 %), DHS among 6 (20 %), plate among 4 (13.3 %) and prosthesis among

4 (13,3 %). All prostheses were cement type. Complications were registered in three patients.

Conclusion: Bone metastases were mostly due to lung, breast and prostate cancers. Pathological fracture of femur was the most common type of fracture we operate. If there are no contraindications, the first choice should be IM nail for diaphyseal and metaphyseal fractures and cemented prosthesis for periarticular and juxtaarticular fractures.

References: 1. Weber KL, O'Connor MI. Operative treatment of long bone metastases: focus on the femur. Clin Orthop 2003;415(Suppl):276–8. 2. Wedin R, Bauer HCF, Wersäll P. Failures after operation for metastatic lesions of long bones. Clin Orthop 1999;358:128–39. 3. Mirels H. Metastatic disease in long bones: a proposed scoring system for diagnosing impending pathologic fractures. Clin Orthop 1989;249:256–64. 4. Hansen BH, Keller J. The Scandinavian Sarcoma Group Skeletal metastasis registry: survival after surgery for bone metastases in the pelvis and extremities. Acta Orthop Scand Suppl 2004;75:11–15.

Disclosure: No significant relationships.

P041

INCIDENCE OF RURAL AND URBAN OSTEOPOROTIC FRACTURES IN ELDER

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Introduction: In this retrospective study the authors analyse the incidence ratio in a rural group and urban group population of osteoporotic fractures which include three main types: distal radius, vertebral corpus compressive and proximal low energy femur fractures. The aim is to analyse the difference in bone fragility of an older population of 65yrs onward due to their lifestyle in sense of dietary habits and food quality, physical activity, air pollution and amount of daily stress.

Materials and methods: The study was done in two different regions in Croatia, the rural area of Koprivnica (pop.115000) and an urban area (pop.23000) of Zagreb the capital. Analysis was performed using database from 01.01.2012.–01.01.2014. The rural/urban ratio 320/350 hospitalized patients with osteoporotic fractures out of 934/774 overall hospitalized patients 65yrs in age and above.

Results: There is a significant difference in the two groups which favors the rural lifestyle health wise. Densitometry was not analysed due to earlier studies that found it irrelevant and time consuming.

Conclusion: Perhaps this could be a predictive analysis though retrospective and an alarm to what could happen to the upcoming generations due to urbanization trend.

References: • Fracture rates lower in rural than urban communities: the Geelong Osteoporosis Study; Sanders KM, Nicholson GC, Ugoni AM, Seeman E, Pasco JA, Kotowicz MA. J Epidemiol Community Health. 2002 Jun;56(6):466–70. • Urban versus rural differences in the occurrence of hip fractures in Japan’s Kyoto prefecture during 2008–2010: a comparison of femoral neck and trochanteric fractures; Motoyuki Horii et al. BMC Musculoskeletal Disorders 2013, 14:304.

Disclosure: No significant relationships.

P042

IN-HOSPITAL IMMOBILIZATION FOR SUSPECTED SPINAL FRACTURE: IS IT BENEFICIAL?

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Introduction: Spinal immobilization is assumed to be of vital importance in trauma care. Next to patients being immobilized in the pre-hospital setting, there is also a group of patients suspected of having vertebral injury, yet arriving at the emergency department (ED) without spinal immobilization. We studied the incidence of vertebral fractures and the characteristics of this group of patients.

Materials and methods: All patients suspected of vertebral injury after blunt trauma and presenting within a 2,5 year time-frame at a level II trauma center in the Netherlands were included in a database. We performed a retrospective analysis of the group presenting without spinal immobilization.

Results: 563 patients presented at the ED without spinal immobilization. Of this group, 57 patients were immobilized in-hospital; the other 506 remained without immobilization. In the in-hospital immobilized group, five patients (8.8 %) had a vertebral fracture. One (1.8 %) needed operative treatment and suffered permanent neurological damage. This group had a median age of 34 (IQR 19–60) and a median injury severity score (ISS) of 5 (IQR 3–9). In the other group, 77 patients (14.6 %) suffered a vertebral fracture and two needed treatment using a halo-frame (0.4 %). This group had a median age of 45 (IQR 22–68) and a median ISS of 4 (IQR 2–8).

Conclusion: There were less vertebral fractures in the group of patients receiving in-hospital immobilization than in the group remaining without immobilization. Criteria for the use of in-hospital immobilization are unclear and it is doubtful that applying spinal immobilization after arrival at the ED is beneficial to the patient.

Disclosure: No significant relationships.

P043

INVESTIGATION OF SURVIVAL OF PATIENTS ADMITTED TO THE ICU AND TRANSFERRED TO SURGERY CLINIC IN RELATION TO VARIOUS PATIENTS' CHARACTERISTICS

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Introduction: This study aims to investigation of life expectancy of surgical patients and patients with thoracic or brain injury admitted to ICU and then transferred in Surgery Clinic, in relation with various patients' features.

Materials and methods: 56 patients who were transferred from ICU to Surgery Clinic-Xanthi Hospital (April 2012–August 2014) were selected and age, sex, chronic illnesses, ASA score, type of surgery, postoperative complications, days in ICU, hospitalization days and each patient's health status 2 months after leaving hospital were

recorded. Descriptive statistics were calculated and independence χ^2 -tests were performed to measure associations between above characteristics and patients' survival.

Results: There were 30 males (53.6 %) and 26 females (46.4 %), with average age 72.57 ± 11.04 years. Moreover, 75 % suffered from chronic illness, with arterial hypertension the most frequent (57.14 %), while 19.0 % were classified as ASAII, 51.1 % ASAIII and 29.8 % ASAIV. 60.71 % of patients were submitted to lower gastrointestinal operation. Most prominent overall complications were arrhythmia (17.9 %), deep surgical site infection (12.5 %) and cardiac arrest (12.5 %). Average time in ICU and hospitalization time were estimated 7.67 ± 11.97 and 17.05 ± 14.47 days, respectively. Data analysis reveals a 66.0 % survival rate.

Conclusion: No significant association of survival with sex, age, ASA, chronic diseases, and surgery was ascertained. Contrariwise, survival depends on postoperative complications and significantly varies among patients hospitalized in ICU up to 3 days and those from 4 days and over. Hospitalization time is correlated with time in ICU (Spearman's coefficient = +0.617). An extension of the investigation to a greater number of patients could indeed provide stronger information.

Disclosure: No significant relationships.

P044

LOSS OF FOLLOW-UP IN ORTHOPAEDIC TRAUMA: WHO IS GETTING LOST TO FOLLOW-UP?

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Introduction: Non-compliance with postoperative follow-up visits remains a common problem in orthopaedic trauma [1,2]. The aim of this study was to identify risk factors for loss of follow-up after orthopaedic trauma.

Materials and methods: A retrospective review of patients undergoing surgical treatment of their orthopaedic injuries was performed. This study was conducted at an urban level 1 academic trauma center. A total of 307 (226 male/81 female) patients undergoing surgical treatment of their orthopaedic injuries were included in this study. The average age was 40.4 ± 17 years. The main outcome measure of this study was non-compliance with follow-up appointment at six months after injury. The secondary outcome measure was non-compliance with any follow-up appointment.

Results: Over a six-month postoperative period, a total of 215 patients were non-compliant with at least one of their follow-up appointments between hospital discharge and the six-month follow-up. A logistic regression showed male gender, uninsured or government insurance, and smoker to be statistically significant risk factors for non-compliance with the six-month follow-up ($p < 0.05$). Non-compliance with any follow-up appointment was significantly increased in patients with illicit drug abuse ($p = 0.02$) as per logistic regression analysis.

Conclusion: Loss of follow-up remains a common problem in orthopaedic trauma. Our study suggests different risk factors for non-compliance including male gender, smoker, lack of commercial health insurance, and illicit drug abuse. Health care providers may consider establishing protocols for facilitating follow-up appointments to patients who are at risk for non-compliance.

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Disclosure: No significant relationships.

P045

LOW BLOOD PRESSURE MAY BE A RISK FACTOR FOR HYPERKALEMIA IN TRAUMA PATIENTS WHO HAVE RECEIVED MASSIVE TRANSFUSION

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Introduction: Massive transfusion (MT) has been implicated in the development of hyperkalemia. Hyperkalemia can cause fatal arrhythmia. We aimed to investigate the risk factors of hyperkalemia in trauma patients who received MT.

Materials and methods: We assessed trauma patients who received MT and were admitted to our hospital between April 2008 and March 2014. MT was classified as receiving ≥ 10 units of red blood cells within 24 hours of admission. Hyperkalemia was defined as potassium (K^+) > 5.5 mmol/L. We retrospectively compared the hyperkalemia patients and the control group were patients receiving MT who did not develop hyperkalemia and determined risk factors for hyperkalemia using logistic regression analysis.

Results: A total of 142 patients were included in the study (hyperkalemia: $n = 16$, 11.27 %). In hyperkalemia patients, baseline plasma K^+ and blood glucose levels were significantly higher than those in the control group ($p = 0.0017$ and $p = 0.05$). Haemoglobin levels and systolic blood pressure were significantly lower in hyperkalemia patients than in controls ($p = 0.033$ and $p = 0.002$). Using logistic regression analysis, systolic blood pressure was independently associated with the risk of hyperkalemia in patients receiving MT (odds ratio = 0.971, 95 % confidence interval 0.944–0.998, $p = 0.04$).

Conclusion: On the basis of the findings of this study, an increased risk of hyperkalemia is associated with a significant decrease in systolic blood pressure in trauma patients requiring MT.

Disclosure: No significant relationships.

P046

MORTALITY AFTER MOTOR VEHICLE ACCIDENTS; A FORENSIC AND PATHOLOGICAL ANALYSIS FROM A MAJOR TRAUMA CENTRE

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Introduction: Major progress in road safety has come from the understanding of risk factors and mechanisms in fatal incidents. We have formed a collaborative approach to data collection surrounding road traffic deaths, forming a locally-focused but nationally representative database from which further improvements in road traffic safety can be made.

Materials and methods: Data was collected prospectively for in ($n = 12$) and out ($n = 23$) of hospital deaths from 1st January 2013 to 31st July 2014. Police forensic traffic reports and post mortem results were reviewed for a wide range of variables for mechanisms and clinical outcomes.

Results: The population had a 1:6 female:male ratio and mean age 53 (sd 21). Proportions of deaths for both pedestrians (41 %) and car occupants (27 %) are not significantly different to national averages ($P = 0.082$ & 0.052 respectively). One-third of in-hospital deaths were within 24 hours.

No special road conditions applied to deaths in this time period. 73 % of incidents had one casualty and 65 % involved a single vehicle. 56 % of pedestrian fatalities occurred away from marked pedestrian crossings; 44 % while crossing from the drivers nearside. Failing to look properly and judging vehicle path/speed made up 30 % of contributing factors ($P < 0.002$) outweighing alcohol impairment (6 %) or excessive speed (8 %).

Conclusion: We have established a working multi-agency partnership creating a detailed database of epidemiology and mechanisms of injury in fatal road traffic incidents. Early results suggest a large proportion of deaths occur in apparently benign road conditions due to reduced vigilance. Trauma networks should promote the use of pedestrian crossings and support training in situational awareness.

References: *Linking Police and Hospital data on Road Accidents in England: 1999 to 2009 results*. Department for Transport, UK. February 2012. *Number of fatalities resulting from road accidents in Great Britain, by road user group: 2000 to 2013*. Making roads safer. Department for Transport, UK. September 2014. *Global status report on road safety 2013: supporting a decade of action*. World Health Organisation, Switzerland. 2013.

Disclosure: No significant relationships.

P047

PREDICTING LOSS OF HEIGHT IN SURGICALLY TREATED DISPLACED INTRA-ARTICULAR CALCANEAL FRACTURES

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Introduction: The goal of calcaneal fracture surgery is to restore anatomy and thereby function. However, at follow-up the height of the calcaneus occasionally collapses. An objective measurement of calcaneal height is the Böhler's angle. The aim of this study was to assess risk factors for collapse of the calcaneus following surgery.

Materials and methods: In a retrospective cohort study, all consecutive patients treated with open reduction and internal fixation (ORIF) via an extended lateral approach (ELA) between 2000–2013 were included. Böhler's angle was measured directly following ORIF and at one-year follow-up. The difference between both Böhler's angles was divided into two groups (< 10 and ≥ 10 degrees difference). The following characteristics were collected: gender, age,

diabetes, smoking, alcohol and substance abuse, psychiatric history, ASA classification, type of fracture (Essex-Lopresti; Sanders classification) and the occurrence of postoperative infection.

Results: A total of 262 patients were included with 276 calcaneal fractures. The number of patients with ≥ 10 degrees collapse was 46 (16.7 %). A postoperative (deep) wound infection ($n = 34$) was associated with a decrease of more than 10 degrees in Böhler's angle ($p < 0.001$). Substance abuse ($n = 55$) was also associated with a decrease in Böhler's angle ($p = 0.041$).

Conclusion: The occurrence of a postoperative wound infection and substance abuse were associated with a significant postoperative collapse of calcaneal height. This might be a result of delayed healing as a result of the infection or due to non-compliance with post-operative non-weight bearing. These findings may aid in future patient selection and treatment.

Disclosure: No significant relationships.

P048

PREGNANCY AND OBSTETRIC COMPLICATIONS IN TRAUMA: UK MAJOR TRAUMA CENTRE 10 YEAR RETROSPECTIVE REVIEW

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Introduction: Trauma in pregnancy is the leading non-obstetrical cause of maternal death and remains the most common cause of foetal demise¹. Trauma complicates between 6 – 8 % of pregnancies², 0.4 % require hospital admission³. 0.1 % of cases will be victims of major trauma (Injury Severity Score (ISS) > 15)⁴.

Materials and methods: Retrospective review for the 10 year period between 2004–2014 was conducted to evaluate for the incidence and outcomes of pregnancy in trauma patients.

Results: Over the period analysed, a total of 7 pregnant trauma patients presented to the trauma centre. Mean age was 26 years old, mean gestational age was 21 weeks, ranging from 8 to 39 weeks. Mean ISS was 10, ranging from 4 to 22, with three patients sustaining single domain AIS Grade 3 injuries and two patients sustaining major trauma (ISS > 15), ISS 17 & 22. 1 patient sustained penetrating abdominal trauma and 3 sustained blunt abdominal or pelvic trauma. Foetal outcomes were recorded for 5 patients, with 2 cases of foetal demise. 4 patients underwent emergency caesarean section during the trauma admission, with a mean gestational age of 32 weeks in surviving foetuses. No maternal fatalities were recorded in this series.

Conclusion: The incidence of pregnancy in trauma is rare, however importance should be given to the potential for pregnancy by all clinicians involved in trauma. A greater understanding of the overall national burden and specific challenges faced in the UK for the pregnant trauma patient is required to establish the best clinical path.

References: 1. Petrone P, Talving P, Browder T, Teixeira PG, Fisher O, Lozornio A & Chan LS. (2011). Abdominal injuries in pregnancy: a 155-month study at two level 1 trauma centers. Injury, 42(1), 47–49 2. Hill CC & Pickinpaugh J. (2008). Trauma and surgical emergencies in the obstetric patient. Surgical Clinics of North America, 88(2), 421–440 3. Lavin JP, Polsky SS. (1983). Abdominal trauma during pregnancy. Clin Perinatol.; 10:423–438 4. Sperry JL, Casey BM, McIntire DD, Minei JP, Gentilello LM & Shafi S. (2006). Long-term foetal outcomes in pregnant trauma patients. The American journal of

surgery, 192(6), 715–721

Disclosure: No significant relationships.

P049

RISK FACTORS IN PROXIMAL HUMERUS FRACTURES: MALES VS. FEMALES

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Introduction: The purpose of the present research was to identify additional risk factors for proximal humerus fractures between males and females.

Materials and methods: 2317 patients were treated with humerus fractures. Fractures were classified as per the Neer system. Mechanism of injury was a mechanical fall in 94 %. 177 underwent surgical fixation.

Results: Proximal humerus fracture occurred more frequently in females, with a male:female ratio of 1:4. In males, the risk factors most strongly associated with these low-energy fractures were > 65 years of age (RR 1.57, CI 95 % 1.49–1.78), diabetes type I (RR 2.45, CI 95 % 2.21–2.63), hypothyroidism (RR 1.89, CI 95 % 1.64–2.09), mental health problems (RR 1.7 CI 95 % 1.65–1.74), fragility (RR 2.68, CI 95 % 2.42–2.81), recurrent falls (RR 3.43, CI 95 % 3.25–3.67) and smoking (RR 1.87, CI 95 % 1.8–2.21). In females, the risk factors most strongly associated with these low-energy fractures were > 55 years of age (RR 3.27, CI 95 % 3.05–3.51), diabetes type I (RR 2.11, CI 95 % 1.84–2.26), hypothyroidism (RR 2.47, CI 95 % 2.12–2.74), fragility (RR 2.89, CI 95 % 2.62–3.28), recurrent falls (RR 3.56, CI 95 % 3.33–3.89), previous fracture (RR 2.61, CI 95 % 2.19–2.73) and high body mass index (RR 3.87, CI 95 % 3.61–3.92).

Conclusion: Proximal humerus fracture is a common injury in > 55 years of age females. Type I diabetes, hypothyroidism, recurrent falls and fragility are few of the most commonly known risk factors. Mental health problems and tobacco smoking appear to be male-related risk factors; while previous fracture and high BMI appear to be female-related risk factors.

Disclosure: No significant relationships.

P050

ROAD TRAFFIC ACCIDENTS AND THE PATTERN OF INJURIES IN OCTOGENARIANS

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Introduction: Due to the decreased physiological abilities, elderly people are under high risk to sustain life threatening injuries caused by RTA, especially as pedestrians.

Materials and methods: We analysed retrospective 65 patients who sustained injuries in road traffic accidents on the territory of Belgrade in period from 2010–2013. The epidemiological data, mechanism of injury, type of injuries and mortality had been evaluated using

standard protocols of hospitalisation in Emergency Center of Belgrade. For the data analysis we used methods of descriptive analysis and for the significance of prediction we used analysis of variance.

Results: 51 patients were males and 14 were females. 53 (81 %) had multiple injuries and 13 (19 %) had isolated injuries. 39 (60 %) patients sustained their injuries as pedestrians. 56 % of patients had brain injuries, 45 % of patients had injuries of skeletal system, 43 % had chest injuries and 27 % had abdominal injuries. The significant predictive factors of mortality were: multiple injuries ($p = 0.007$), cardiological comorbidities ($p = 0.006$), spine injuries ($p = 0.005$), time of prehospital treatment ($p = 0.004$). Weak predictors of intra-hospital mortality were: mechanism of injury ($p = 0.06$), noncardiological comorbidities ($p = 0.08$), type of prehospital transport ($p = 0.05$).

Conclusion: Olderly people became very demanding regarding quality of life. Hence, they are exposed to high risk of injuries caused by RTA. Due to the fact that these injuries are followed by very high mortality, prevention strategy of these injuries and special intensive care during hospitalisation has to be considered.

References: Yee WY, Cameron PA, Bailey MA. Road traffic accidents in elderly. *Emerg Med J* 2006;23(1):42–46.

Disclosure: No significant relationships.

P051

SEVERE TRAUMA IN ESTONIA: 256 CONSECUTIVE CASES ANALYSED AND THE IMPACT ON OUTCOMES COMPARING TWO REGIONS

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Introduction: The incidence and outcomes of severe civilian trauma in Estonia has not been evaluated. We set out to investigate epidemiology of severe injuries in Estonia while comparing outcomes at the regional trauma facilities.

Materials and methods: After IRB approval, all consecutive trauma admissions with Injury Severity Score (ISS) > 15 to North Estonia Medical Center/Tallinn Children's Hospital (NEMC + TCH) and Tartu University Hospital (TUH) were identified from emergency department registries between 1/1/2013 and 31/12/2013. Data collection included demographics, admission data, injury severity variables, interventions, and in-hospital outcomes. Primary outcome was in-hospital mortality. Secondary outcomes were adverse events (AE) per Clavien-Dindo classification and hospital LOS. Logistic regression analysis was used to compare the adjusted mortality at the two regional hospitals.

Results: A total of 256 patients met inclusion criteria. The mean ISS for the cohort was 23.6 ± 7.8 , 13.3 % were hypotensive, and 44.1 % had a GCS < 9. A total of 74.6 % required surgical interventions. Overall rate of AE was 40.2 % that did not differ between the facilities. The mean HLOS at the NEMC + TCH and TUH were 20.1 ± 25.1 and 10.5 ± 11.2 days ($p < 0.001$), respectively. Overall mortality was 20.7 % ($n = 53$). Logistic regression analysis resulted in comparable mortality at the regional trauma facilities (adj. OR,

1.38; 95 % CI, 0.66–2.92; *p*-value 0.39).

Conclusion: The annual incidence of injuries with ISS > 15 was 256 cases with overall mortality at 20.7 % in Estonia. We observed comparable adjusted in-hospital outcomes at regional trauma facilities.

Disclosure: No significant relationships.

P052

SPECIFIC TRAUMATOLOGY IN AVALANCHE VICTIMS. RESULTS FROM A FRENCH TRAUMA CENTER DATABASE

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Introduction: Together with hypoxia and accidental hypothermia, trauma injuries are very common in avalanches victims. Trauma alone is considered as responsible for a fourth of death causes only¹. However, when considering all the victims (surviving or not), very few data are available on what type of traumas can be caused by avalanches. Objective of study was to evaluate mortality and specific traumas and the related predisposing factors in avalanche victims in the French Alps in order to develop a pre-hospital regulation score.

Materials and methods: French avalanche association (ANENA) maintains a prospective database of all avalanches with human involvement since 2001. Trauma settings, injury Severity Score (ISS), vital signs and environmental data were recollected. Study was approved by the local ethical comity.

Results: Forty-nine accidents including 114 victims occurred from 2001 to 2010 in Grenoble Area (French Alps). Overall mortality was 34 % (34/114). Victims were totally buried in 46 % (53/114). Higher mean AIS were for thoracic injuries (4) and head and spine injuries (3,5). Mean temperature and complete burial were predictive factors of worse outcome. ISS, Hard snow, wet snow and avalanche danger scale did not meet statistical requirement (missing data). Only 36 % injured patients underwent tomodensitometry. Design of a pre-hospital predictive score was not possible.

Conclusion: Traumatic injuries are common in avalanche victims. New technologies designed to protect head, spine and thorax, prevent complete burial and avoid hypothermia appears to be of paramount importance. Prospective follow-up of new criteria and systematic tomodensitometry are now implemented in our institution for further studies of this trauma-exposed population.

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Disclosure: No significant relationships.

P053

STANDARDIZATION OF RESUSCITATION ROOM IN EMERGENCY UNITS

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Introduction: Simplicity, privacy, opportunity of emergency and easy intervention are important concepts for standardization of resuscitation room architecture.

Materials and methods: For to provide easy access from ambulance entrance, treatment and observation area to emergency resuscitation room, architectural planning must be done correctly

Results: Single bed resuscitation rooms should be min. 35m², for multi-bed resuscitation rooms should be 25m² more area for each be, should be enough area for moving and easily accessing to patient from 360 degree. Equipment, monitors, storage, washing and destruction areas should be planned. Reception should be easy for patients came from ambulance. Stored or in-use drugs and equipments should be adjacent to the resuscitation room, and there should be a code chart for pediatric and adult drugs. An area should be reserved for patient relatives in resuscitation area. Dead patients can transfer without being seen by other patient relatives.

Conclusion: Resuscitation is a very critical process. If resuscitation area was done in convenient architectural standards; can reduce possible difficulties, ethical issues and trauma which patients, relatives and emergency team will live.

References: Kirbaş C., Architecture -Mechanical Project Design in Hospital and Application Guidelines. Plumbing Engineering (2012) - 127/29 – January/february Australasian For Emergency Medicine Emergency Department Design Guidelines Nr G 15 Trauma and resuscitation rooms January 2014 American College of Emergency Physicians Policy *Emergency Department Planning and Resource Guidelines Statement Page 9* Health Building Note 15-01:Accident & emergency departments Planning and design guidance April 2013, www.gov.uk/government/organisations/department-of-health

Disclosure: No significant relationships.

P054

STANDARDIZATION OF RESUSCITATION ROOM IN EMERGENCY UNITS

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Disclosure: No significant relationships.

P055

THE CHARACTERISTICS OF THE BICYCLE FALL TRAUMA TRANSPORTED TO OUR HOSPITAL

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Introduction: That regulations on drunk driving of automobile have become stricter, bicycle accidents have increased. In particular bicycle fall injured patients after drinking seemed to have increased. We thought to be trying to evaluate the impact of drinking in bicycle fall accident. We aimed to understand the characteristics of bicycle fall trauma patients transported to our hospital.

Materials and methods: This was a retrospective study (April 2012 to September 2014) in our hospital. We divided them into drinking group (the A group: n = 15) and non-drinking group (the B group: n = 21). We compared them patient background (age, gender), Injury Severity Scores (ISS), and the injury site.

Results: The patients characteristics were as follows: gender (group A; male 14, female 1 vs. group B; male 18, female 3, p = 0.47), age (54.3 ± 14.9 years old vs. 57.3 ± 23.3 years old, p = 0.33). There was no significant difference in patient characteristics, such as age and gender. There was no significant difference in ISS (10 ± 4.3 vs. 10.6 ± 6.6 , p = 0.38). Head and neck injury was common in drinking group, and extremity and torso injury was more often in non-drinking group (head and neck 11, extremity and torso 4 vs. head and neck 8, extremity and torso 13, p = 0.04).

Conclusion: We summarized the characteristics of the bicycle fall trauma in our hospital.

Disclosure: No significant relationships.

P056

THE INFLUENCE OF TRAUMA SEVERITY ON FRACTURE HEALING IN DISTAL FEMUR FRACTURES TREATED BY LOCKED PLATING

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Introduction: Distal femur fractures occur in bimodal distribution, high-energy trauma in young men and low-energy trauma in elderly women¹. The standard treatment is locked plating. Although early

studies showed promising results with non-union rates ranging between 0–14 %, more recent studies showed non-unions up to 20 %^{1,2}. Known risk factors for complications in fracture healing are obesity, diabetes, stainless steel implants, open fractures, and highly comminuted fractures^{1,2}. For tibial fractures a relation between trauma severity and fracture healing has been shown³. This has not yet been investigated in the distal femur.

Materials and methods: A retrospective cohort study was performed on patients with distal femur fractures treated with locked plating techniques between 2007 and 2013. Patient and fracture characteristics were recorded and high-energy trauma patients were compared to low-energy trauma patients

Results: Forty-one fractures were analyzed: twenty-four due to high-energy trauma. The patients in the high-energy group were significantly younger and had more open fractures than those in the low-energy group. Other risk factors were equal. Mean time to clinical healing was 13 months in the high-energy group versus 5.9 months in the low-energy patients (p = 0.009). In the high-energy group 6 patients developed a delayed union and 11 a non-union versus 2 delayed unions and 3 non-unions in the low-energy group (p = 0.032). In the high-energy group 54.2 % required a secondary surgery, compared to 11.8 % in the patients suffering low-energy trauma (p = 0.016)

Conclusion: Distal femur fractures following high-energy trauma heal slower and show more complications than after low-energy trauma

References: 1. Rodriguez EK, Boulton C, Weaver MJ, Herder LM, Morgan JH, Chacko AT, Appleton PT, Zurakowski D, Vrahas MS. Predictive factors of distal femoral fracture nonunion after lateral locked plating: a retrospective multicenter case-control study of 283 fractures. Injury 2014;45(3):554–559 2. Ricci WM, Streubel PN, Morshed S, Collinge CA, Nork SE, Gardner MJ. Risk factors for failure of locked plate fixation of distal femur fractures: an analysis of 335 cases. J Orthop Trauma 2014;28(2):83–89 3. Karladiani, AH, Granhed, H., Kärrholm, J. & Styf, J. The influence of fracture etiology and type on fracture healing: a review of 104 consecutive tibial shaft fractures. Arch Orthop Trauma Surg. 2001;121:325–8

Disclosure: No significant relationships.

P057

THE RELATION BETWEEN THE ECONOMIC CRISIS AND THE AMOUNT OF (POLY)TRAUMA'S

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Introduction: BACKGROUND: In the year 2007 the subprime mortgage crisis started in the United States which expanded as a mondial credit crunch. From the third quarter of 2008 until the fourth quarter of 2013 The Netherlands found themselves in a economic recession. In a certain unstable period it might be possible that people would show less riskful behavior. Our hypothesis is that the amount of patients with (poly)trauma during this crisis would decrease. OBJECTIVE: Evaluating the relation between the economic climate/parameters and the amount of patients with (poly)trauma's

Materials and methods: Comparing multiple economic parameters like the economic climate, consumer confidence, AEX index, CAO wage development with the amount of patient's with polytrauma's (ISS > 5) locally, VUMC region and nationwide as well as with the

nationwide amount of patients that had to visit the emergency posts. We only included patients during the period from January 2007 until December 2013

Results: The total amount of patients with polytrauma's slowly rises through the years, for patients that had the visit the emergency posts the same development applies. The month of the years seems to be the most important factor in the fluctuations in the amount of (poly)-trauma's. There does not seem to be a significant correlation between the economic environment and the amount of (poly)trauma's

Conclusion: The recent economic crunch in The Netherlands does not show a correlation between the economic climate and the quantity of (poly)trauma patients. Other variabeles are responsible for the slowly rising amount of patients with (poly)trauma's per year

References: M. Suhrcke, D. Stuckler. Will the recession be bad for our health? It depends. *Social Science & Medicine* 2012 Vol 74(5):647–653 ME Falagas, EK Vouloumanou, MN Mavros, DE Karageorgopoulos. Economic crises and mortality. *Int J Clin Pract.* 2009 Vol 63(8):1128–35.

Disclosure: No significant relationships.

P058

TRAUMA IN PREGNANCY: RECOGNISING THE RISK FACTORS IN THE UK POPULATION

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Introduction: Trauma in pregnancy is the leading non-obstetric cause of maternal and foetal death, and 0.4 % of all pregnant patients require hospital admission for treatment following trauma¹. We looked the most common mechanisms of injury in the UK pregnant population and the patterns of injury that emerged.

Materials and methods: Data was collected from patients registered on the Trauma Audit and Research Network (TARN) between January 2009 and July 2014.

Results: 173 obstetric patients were identified from an initial cohort of 15,140 females aged 15–50. Pregnant patients were significantly more likely to sustain injuries from road traffic collisions (56 % vs 36 %, P-Value < 0.001), and firearms or knives (5.2 % vs 2.2 %, P-Value 0.009). They were at less risk of injury from falls, particularly over 2 metres (18 % vs 31 %, P-value < 0.001). An Injury Severity Score (ISS) greater than 15 was recorded in 41 % of pregnant patients, compared to 36 % in the non-pregnant group. The obstetric patients were noticeably younger on average (median age 28 vs 34) and had a slightly higher fatal outcome (5.1 % vs 4.2 %). An Abbreviated Injury Score (AIS) of 3 or more affecting the chest was the most prevalent injury in the pregnant cohort (31 %), in contrast with head injuries for the non-pregnant group (23 %).

Conclusion: Identifying and reducing risk is an important element of managing trauma within a population. This study highlights the need for improved patient education in pregnancy with regards to road safety and recognising those at risk from assault.

References: Lavin JP, Polsky SS. (1983). Abdominal trauma during pregnancy. *Clin Perinatol.*; 10:423–438.

Disclosure: No significant relationships.

P059

TREATMENT FOR ATYPICAL BASICERVICAL FRACTURES OF THE FEMUR WITH CORONAL SHEARING FRACTURE LINE

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Introduction: Characteristics of basicervical fractures of the femur is a controversial issue such as the type of hip fracture, which can be regarded as either extra or intra-capsular fracture. There is an atypical type among these fractures, which has the fracture line existed between subcapital portion at anterior aspect and base of the neck at posterior aspect, running through the neck with a shearing fracture line shown in the coronal plane. We here report investigation of the characteristic and result of this fracture in our cases.

Materials and methods: We treated seven cases, the mean age was 85(57–101) years old, the mean follow-up period was sixteen (3–27) months, and the cause of injury was fall in all cases. We evaluate treatment method, radiological and clinical outcomes.

Results: Four cases were treated with hemiarthroplasty and three were treated with osteosynthesis. Bone union was obtained within six months in all cases of the osteosynthesis group. There was no incidence of complications.

Conclusion: We treated an atypical type of basicervical fracture with coronal shearing fracture. We should do careful preoperative radiological assessment and perform proper treatment depending on the degree of the displacement and the condition of the patient. The vascularity of femoral head is considered to be preserved, the best treatment method should be selected whether ORIF or arthroplasty more suitable. If obtaining of primary stability or stable fixation seems to be difficult because of severe osteoporosis, arthroplasty should be considered. Then, we should prepare for calcar replacement and/or cement fixation.

References: Malicky A et al. Injury 2004 Bartonicek, J et al. JOT 2007 Nowotarski, P. J et al. Injury 2012

Disclosure: No significant relationships.

P060

TREATMENT FOR DISTAL FEMORAL SHAFT NONUNION

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Introduction: Distal femoral shaft fracture, so called infra-isthmial fractures of the femur, is sometimes fallen into delayed union or nonunion due to insufficient fixation of the distal fragment. We report

the experience of the treatment of three infra-isthmal nonunion of the femur, who were treated by exchange nailing combined with bone graft.

Materials and methods: They were 25, 71, 80 years old, all cases have been treated with intramedullary nailing at first operation (one was retrograde nailing, two were antegrade nailing). After five to eleven months, they have been diagnosed as atrophic nonunion and exchange nailing combined with bone graft was performed.

Results: The length of the exchanged nail was longer (ave. 40 mm longer) and thicker (ave. 2.7 mm) than first ones. The number of distal inter-locking screw was increased. The autologous bone graft was performed. All cases obtained bone union within five months after exchange nailing.

Conclusion: Exchange nailing is an appropriate choice for nonunions of femoral shaft fractures. But the treatment outcome is different on various reports and it is reported that the treatment outcome is especially worse in the case of infra-isthmal nonunion because its difficulty of obtaining distal fragment fixation. We should pay careful attention to obtain the stable fixation of distal fragment by using thicker and longer nail, increasing distal inter-locking screws. The criteria of bone graft is still unclear and the need of bone graft should be considered in each cases.

Disclosure: No significant relationships.

P061

TRENDS IN INCIDENCE, HEALTH CARE CONSUMPTION AND COSTS DUE TO HUMERAL FRACTURES IN THE NETHERLANDS SINCE 1986

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Introduction: The aim was to examine long-term population-based trends in the incidence of patients admitted for a humeral fracture and give a detailed overview of costs for health care consumption and productivity loss.

Materials and methods: Data of all patients admitted to a hospital in the Netherlands between 1986 and 2012 were extracted from the National Medical Registration.

Results: Between 1986 and 2012 112,910 patients were admitted. The incidence rate increased from 17.8 to 40.0 per 100,000 person years in 2012. The incidence rate of proximal fractures increased most, especially in elderly women. Falling was the dominant trauma mechanism. In 2012, 69 % of all patients underwent surgery. The mean LOS decreased from nine (1997) to five days (2012). The cumulative LOS of all patients in 2012 was 28,880 days; 73 % were caused by women and 81 % were 50 years or older. The cumulative medical costs in 2012 were

M€55.4, of which M€43.4 was spent on women. Costs consistently increased with age for all anatomical regions. Costs for hospital care contributed most to the overall cost per case until 70 years of age, after that the main costs were hospital care, rehabilitation/nursing care, and home care. The cumulative costs due to lost productivity were M€23.5 in 2012.

Conclusion: The incidence rate of patients admitted for a humeral fracture increased with 124 % in 25 years, and was associated with age and gender. Especially proximal fractures in elderly women caused this increase and most of the costs. The main cost determinants were hospital care and productivity loss.

Disclosure: No significant relationships.

P062

UNDERTRIAGE IN MINOR TRAUMA: ANALYSIS OF RISK FACTORS

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Introduction: In trauma triage, criteria for the definition of severity code rely on physiological parameters, dynamics of trauma and involved anatomical site. In Italy this code is between white (least severe) and Red (serious harm to vital functions). This study aimed to assessing Undertriage (UT) in our Emergency Department (ED) within the admissions for Minor Trauma (MT).

Materials and methods: We performed a retrospective analysis of Torino Nord Hospital ED database including patients classified at the first assessment as MT codes (White or Green) along a period of three years. Within a total of 39,390 consecutive visits, we included 833 patients hospitalized or transferred. Several variables have been analyzed, such as: gender, age, nationality, GCS, physiological parameters, comorbidities, dynamics, anatomic region of trauma (ART), means of transport, and more. We considered UT White or Green code with ISS score > 15. We used a Logistic Regression Models to investigate the associations of UT with the variables above mentioned (covariates). P-values under 0,05 have been considered significant in Univariate (UA) and Multivariate analysis (MA).

Results: We identified 103 cases of UT, 20 transferred because of lack of specialist care. The UA analysis showed a statistically significant association between UT and the following covariates: trauma region, dynamics, altered physiological parameters, comorbidities, nationality, reserved prognosis. The MA showed a statistically significant relationship with ART, dynamics and physiological parameters.

Conclusion: Although UT is rare in minor trauma, our study recommends to pay attention to ART, especially abdomen, head or when multidistrict; dynamics: road accidents, aggression, burns;

Physiology: heart rate > 100 bpm.

References: Practice Management Guidelines for the Appropriate Triage of the Victim of Trauma. The EAST Practice Management Guidelines Work Group © 2010 – Eastern Association for the Surgery of Trauma

Disclosure: No significant relationships.

P063

UNINTENTIONAL MILD HYPEROXIA QUITE COMMONLY FOUND IN DUTCH PRE-HOSPITAL NEUROTRAUMA PATIENTS

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Introduction: After traumatic brain injury patients should receive an adequate dose of oxygen in order to prevent hypoxia. The Guidelines for the Management of Severe Traumatic Brain Injury contain recommendations for hypoxia but not for hyperoxia. Pre-hospital Trauma Life Support (PHTLS) suggests the use of a non-rebreathing mask at 15L O₂/min. to prevent hypoxia, even though the untoward effects of hyperoxia are not known. The objective of this study is to define the degree of oxygenation in neurotrauma patients in the pre-hospital setting.

Materials and methods: Retrospective cohort analysis of neurotrauma patients that were transported to and treated in a Level 1 trauma centre over a six-year period.

Results: The cohort comprised 703 polytraumatized patients with traumatic brain injury (AIS ≥ 3). In 528 patients the PaO₂ was measured upon arrival; the mortality rate was 25 %. The mean PaO₂ at admission was 216 mm Hg (median 198 mm Hg, range 18–593). Moderate to severe hypoxia (PaO₂ < 60 mm Hg) was seen in 20 patients (3.8 %); the mortality rate was 50 %. Mild-to-moderate hyperoxia (PaO₂ 110–487 mm Hg) was established in 376 patients (71.2 %); 26.3 % of them died during hospitalization. Finally, 19 patients (3.6 %) had severe hyperoxia (PaO₂ higher than 487 mm Hg). The mortality rate in this category was 21.1 %.

Conclusion: In guidelines the focus is on the prevention of hypoxia. As a result, hyperoxia occurs frequently in Dutch pre-hospital neurotrauma patients. However, recent studies show that hyperoxia has negative effects. Further research into the optimal PaO₂ level is required, in order to develop an evidence-based pre-hospital approach.

Disclosure: No significant relationships.

P064

USING EXTRAFOCAL OSTEOSYNTHESIS IN THE TREATMENT OF PATHOLOGICAL BONE FRACTURES

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Introduction: Malignant bone tumors occur in 1.3 cases per 100 thousand. Long bones and pelvic bones are affected in 80 % of cases, the joints – 50–60 %. Bone metastases in 8–30 % of cases lead to pathological fractures. One of the types of surgical treatment of bone tumors is transosseous extrafocal osteosynthesis.

Materials and methods: Transosseous extrafocal osteosynthesis was performed in 21 patients with pathological fracture on the background of malignant bone tumors. Morphologically: metastatic tumors - 13, primary malignant tumors - 8. Localization bones: the proximal part of the femur - 10, femoral shaft - 4, the distal femur - 3, diaphysis shoulder - 2, tibial shaft - 2. Functional outcome of the operated limb was calculated by scale MSTS. Quality of life was assessed by questionnaire EORTC-QLQ-C30. Survival is estimated using the Kaplan - Meier method.

Results: Postoperative complications in 1 (4.8 %) patient, tumor recurrence - 1 (4.8 %). The consolidation of the fracture after chemoradiotherapy occurred in 19 patients. Overall three-year survival rate of $64.2 \pm 0.18\%$. Functional outcome: the proximal femur - 50 % of the femoral shaft - 68 %, distal femur - 52 % diaphysis shoulder - 80 %, tibial shaft - 60 %. Quality of life of patients increased from 30 to 52 balls after extrafocal transosseous osteosynthesis.

Conclusion: Using extrafocal transosseous osteosynthesis in pathological fractures of the long bones in the background of the tumor lesion showed the effectiveness of this method, which provided a favorable functional outcome of the operated limb and improved the quality of life of these patients.

Disclosure: No significant relationships.

P065

VASCULAR INJURY IN OPEN FRACTURES - UK MAJOR TRAUMA CENTRE EXPERIENCE

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Introduction: Open fractures represent the most severe spectrum of injuries sustained in extremity trauma. Open fractures with associated vascular injury are a significant challenge for clinicians, requiring urgent treatment, as well as possibly threatening the life of the patient.

Materials and methods: Retrospective review for the 2 year period between November 2011 – October 2013 was conducted to evaluate for the incidence and outcomes of open fractures with associated vascular injury in trauma patients.

Results: 14 patients, having 19 open fractures with associated vascular injury were identified in this series. Average age 37 years old, 3 females. Mechanisms of injury: 7 RTC, 3 blast injuries, 4 other. 9 patients sustained polytrauma/non-extremity injuries. 5 traumatic amputations were recorded, along with 3 additional amputations at primary surgery. Mean duration of antibiotic administration was 30 days. Debridement surgery was delayed > 24 h in 3 patients due to their critical condition. 5 patients had external fixation at debridement surgery. Definitive surgery consisted of 5 fractures having open reduction internal fixation and 1 Ilizarov frame. Plastic

reconstruction required for patients: 5 primary skin closure, 4 split skin grafts and 2 free flaps. 1 mortality was recorded in this series. Mean hospital stay was 53 days (12 – 120 days). 2 patients suffered with soft tissue infection/osteomyelitis.

Conclusion: Ortho-plastic extremity trauma is a major challenge for the major trauma services of the United Kingdom. Initial management can bear significantly upon long term outcomes and patient rehabilitation. Vascular injury increases the complexity of management and carries a high rate of amputation.

Disclosure: No significant relationships.

P066

WHICH FACTORS INFLUENCE THE INDEPENDENCE AND POSTOPERATIVE MORTALITY IN ELDERLY HIP FRACTURE?

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Introduction: The intertrochanteric fractures represent a high rate of increase dependency and mortality in elderly population. We try to describe that surgical and nonsurgical factors influence this situation.

Materials and methods: Prospective study of 122 patients treated in our center between 2012 and 2013 for intertrochanteric hip fracture treated by intramedullary nailing. All fractures were classified using AO classification system and Evans classification. Epidemiological data from patients, personal history, dependence and direct approach for the fracture if needed were recorded.

Results: According to the AO system we obtained 32 fractures A1, 76 A2 and 14 fractures fractures A3. During the follow-up time, an average of 12 months (6–18 m), the total number of exitus was 16, uniformly distributed across all fracture types. The percentage of loss of autonomy was 37 %. According to statistical analysis mortality was associated with significant direct approach to focus ($p = 0.043$), while the loss of autonomy was associated with significantly worse preoperative autonomy ($p = 0.034$) and poor postoperative reduction ($p = 0.046$), there was no significant association with more complex types of fracture ($p = 0.087$).

Conclusion: It is critical for elderly patients, much more than in other age groups suffering intertrochanteric hip fracture, an exquisite fracture reduction (allowing early weight bearing and decreasing the need for postoperative immobilization) in addition to carefully assess whether or not approaching the fracture. Furthermore we must know the worst outcome of patients with more preoperative dependence and more complex fracture patterns.

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Disclosure: No significant relationships.

SPORTRELATED INJURY/INJURIES OF THE SHOULDER

P067

MIPO IN PROXIMAL HUMERUS FRACTURE WITH TRANSDELTOID LATERAL APPROACH

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Introduction: The locking plating of proximal humerus is attended by DP approach leads sometimes to AVN of the humeral head, penetration of the screws and iatrogenic damage of the cavitas glenoidalis, infection and debridement.

Materials and methods: For a period of 3 years, 67 patients at the average age of 65/31 – 89/. Fracture spread was as follows: there were 19 3-part and 7 4-part varus impacted, 18 3-part and 18 4-part valgus impacted and 5 were Neer VI.

The intervention was made with a front access between the 1st and 7th day of the trauma. The transdeltoid lateral approach was used in all patients.

We applied variax locking plate. The mean operative time was 60 min/45 – 100/. X-ray exposure up to 2 min. Mean blood loss 150 ml. In 21(31 %) patients ABG (tree cortical bone of the iliac crest) was used.

Results: The observed complications were: varus deformation - 4 cases (6 %), impingement of the shoulder (high level of the plate) - 10 (15 %), AVN – 3 (4 %) cases and screws cut-aut in 4 (6 %) cases. All of the fractures healed without neurological deficit after intervention. The functional outcome according to Constant score was 84.

Conclusion: MIPO with transdeltoid lateral approach keeps the micro movements, decreasing the mean operative time and the blood loss and preserved soft tissue and humeral head nutrition. The disadvantages of the method are the X-ray exposure, danger of neurological injury (n. axillaris) and the difficult removing of the implant.

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Disclosure: No significant relationships.

P068**ASSESSMENT OF MANAGEMENT, FOLLOW UP AND FUNCTION OF SURGICALLY MANAGED GLENOID FRACTURES***C. Dawkins, M.M. Diamant, R. Jeavons, A. Rangan*

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Introduction: Glenoid fractures are often a high energy injury, frequently associated with other injuries. They are intra-articular and often unstable requiring surgical management to enable optimal return of function.

Materials and methods: Retrospective analysis of 28 cases of surgically managed glenoid fractures between 2005 and 2014. Fractures were classified and time of injury, initial imaging, CT, surgery, discharge, follow up and function were analysed. Other injuries and further surgical intervention were noted. Oxford shoulder score and quick DASH questionnaires used to assess patients' function.

Results: Of 28 glenoid fractures 9 were Ideberg I, 4 II, 5 III and 10 V. These were associated with 14 other injuries. Imaging was on average 0.4 days post injury, with CT 4 days and surgery 8 days following injury. 13 cases underwent fixation with plates, 9 with screws, 3 with soft tissue repair and 3 with EUA and clavicle fixation. Patients were followed up for on average 7 months with 67 % (16/24) returning to functionally normal range of movement. 14 further surgical episodes were required. 55 % response rate achieved from patient questionnaires. The mean Oxford Shoulder Score was 40.3 for the injured shoulder and 45.3 for the uninjured shoulder. The mean Quick DASH score was 19.5 for the injured shoulder compared with 13.9 for the uninjured shoulder. 7 patients (39 % of responses) reported significantly reduced function. 4 had further intervention (3 removal of metalwork and 1 AC joint reconstruction and capsule release). There was no correlation with Ideberg classification, associated injuries or surgery performed.

Conclusion: A spread of fractures was shown with various associated injuries. Further imaging was required prior to surgery which was after a further time delay. There was a high requirement for further intervention with only two-thirds of patients returning to normal function.

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Disclosure: No significant relationships.

P069**BILATERAL ATRAUMATIC TIBIAL TUBERCLE AVULSION FRACTURES: CASE REPORT AND REVIEW OF THE LITERATURE***A. Khoriati, S. Guo, R. Thakrar, R. Deol, K.Y. Shah*

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Introduction: An avulsion fracture of the tibial tubercle is an uncommon injury, comprising less than 1 % of all physeal injuries (1).

The occurrence of such injuries bilaterally is even rarer. We report a case of bilateral atraumatic tibial tubercle avulsion fractures.

Materials and methods: A 17 year old healthy male presented to the emergency department with severe pain on the anterior aspect of both knees and unable to weight bear after jogging. On clinical examination, there was significant swelling of both knees which were held in extension and a prominent deformity on the region of the tibial tubercle with a palpable gap, although no open skin wound. He was unable to actively move either knee joint. Plain radiographs revealed bilateral tibial tubercle avulsion fractures. These were classified as Watson Jones type 3 on the right and type 2/3 on the left.

Results: Postoperatively, full weight-bearing was permitted at the one month stage and he was advised to avoid any sporting activity until the 8 week stage and contact sports until the 10 week stage. Full movement of both joints was regained and the patient returned to full sporting activity in the absence of symptoms.

Conclusion: Tibial avulsion fractures are rare - comprising less than 1 % of all physeal injuries. Bilateral fractures are even rarer with just over a dozen cases reported. This case emphasises the need for a high degree of vigilance when faced with such a presentation and a low threshold for further investigation and surgical intervention.

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Disclosure: No significant relationships.

P070**CLINICAL RESULTS OF LISFRANC JOINT INJURY***T. Uchino¹, N. Shioita²*

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Introduction: The purpose of this study is to evaluate the clinical and radiographic outcomes of operative treatment for Lisfranc joint injuries.

Materials and methods: We performed a retrospective study of patients who underwent operative treatment for Lisfranc joint injuries in a 7 year period. There were 14 patients with 14 injuries. The mean age was 41.1 years (range, 13 to 75 years) and the average follow-up was 11.6 months (range, 2 to 28 months). The mechanism of injury included traffic accident in 4 cases, high energy falls in 3 cases, low energy falls in 4 cases, crushing in 3 cases. There were 4 cases of purely ligamentous injury, 10 cases of fracture dislocations. We performed closed reduction and internal fixation for 3 cases and open reduction and internal fixation for 11 cases. The clinical outcomes were evaluated according to American Orthopaedic Foot and Ankle Society (AOFAS) score. Using the radiography, we evaluated the reduction position by measuring the distance between 1st toe and 2nd toe.

Results: The average AOFAS midfoot score was 84.2 points (range, 67 to 100 points), with patients losing points for mild pain, decreased recreational function, and footwear requirements. The average distance between 1st toe and 2nd toe was 4.6 mm (range, 2.3 to 10.8 mm) at the preoperation and 2.4 mm (range, 1.3 to 4.2 mm) at the postoperation. In relation to the postoperative distance, only 0.8 mm was longer than that of the contralateral side.

Conclusion: Operative treatment of Lisfranc joint injuries can provide satisfactory short- and mid-term clinical and radiographic outcomes.

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Disclosure: No significant relationships.

P071

CLINICAL RESULTS OF RE-RUPTURES OF THE ACHILLES TENDON

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Introduction: Achilles tendon re-rupture is a rare injury. It can be treated with open release and repair. This article describes the results of open repair of re-ruptures after initial minimally invasive repair.

Materials and methods: Achilles tendon re-rupture is a rare injury. It can be treated with open release and repair. This study describes the results of open repair of re-ruptures after initial minimally invasive repair.

Results: Eleven patients had a re-rupture. In all eleven patients the Achilles tendon repair was achieved open and without a lengthening technique. In one patient a new rupture was found during follow up, minor wound problems were seen in two patients. The average Leppilahti score was 74, range of motion was slightly decreased and plantarflexion strength was significantly decreased compared to the contralateral side.

Conclusion: Re-rupture of the Achilles tendon after percutaneous repair occurs in about 5 % of the population. Treatment consists of open debridement and reconstruction of the tendon. Results after this second reconstruction vary but are overall good. Range of motion was just slightly less in most patients. Plantarflexion strength was significantly less compared to the unaffected side. However, this loss of strength did not result in any clinical complaints in most of the cases.

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4. Metz R et al. Persistent disability despite sufficient calf muscle strength after rerupture of surgically treated acute achilles tendon ruptures. Foot Ankle Spec. 2011;4 (2): 77–81.

Disclosure: No significant relationships.

P072

INTEROBSERVER VARIATION IN CLASSIFICATION OF MALLEOLAR FRACTURES

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Introduction: Classification of malleolar fractures is a matter of debate. In the ideal situation, a classification-system is easy in use, shows good inter- and intraobserver agreement and has implications for treatment or research.

Materials and methods: Interobserver study. Four observers classified 100 X-rays to the Weber, AO and Lauge-Hansen classification. In case of a trimalleolar fracture, size of the posterior fragment was measured. Interobserver agreement was calculated with Cohen's Kappa. Agreement in size of posterior fragment was calculated with the Interclass Correlation Coefficient.

Results: Moderate agreement was found in all classification systems: Weber ($K = 0.52$), AO ($K = 0.45$) and the Lauge-Hansen classification ($K = 0.47$). Interobserver agreement of the presence of a posterior fracture shows a substantial agreement ($K = 0.63$). Estimation of the size of the fragment shows a moderate agreement ($ICC = 0.59$).

Conclusion: Classification according to the classical systems show a moderate interobserver agreement. Probably due to the unclear trauma-mechanism or the difficult relation between the level of the fibular fracture and the syndesmosis. Substantial agreement in posterior malleolar fractures is mostly due to small (< 5 %) posterior fragments. A classification system which describes presence and location of fibular fracture, presence of medial malleolar fracture or deep deltoid ligament injury and presence of a relevant and dislocated posterior malleolar fracture is more useful in daily setting than the traditional systems. In case of a trimalleolar fracture a CT-scan is in our opinion very useful in detection of small posterior fragments and pre-operative planning.

Disclosure: No significant relationships.

P073

INTRAMEDULLARY FIXATION OF CLAVICLE MIDSHAFT FRACTURES – IS ANY AVAILABLE DEVICE SUPERIOR?

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Introduction: Established indications for surgical treatment of clavicle midshaft fracture, also approved by AAOS, are well known. Unfortunately, an osteosynthesis standard does not exist. Mainly different plate types and intramedullary devices are used, each having proponents and opponents. Described complications (nonunion, infection), observed while using plates, was the reason to search for an effective intramedullary system. Many intramedullary implants are used, but none of them have significant advantage over the others. We compare all these with each other, as well as our own technique using cannulated cancellous screw, which we have used successfully in our department.

Materials and methods: Based on available reports and our experience we compared the results and complications of use of the following intramedullary implants: Kirschner wires, Steinmann pins, Hagle pins, Knowles pins, Rockwood pins, elastic titanium nails, Sonoma CRx nails, cannulated cancellous screws. All of these can lead to bone healing with good functional outcome, but described complications of a few systems resulted in the end of their usage, reaching market withdrawal.

Results: Intramedullary device can be a good solution in surgical treatment of clavicle midshaft fracture provided that implant's diameter corresponds to the anatomical condition and it is thick enough

to carry the mechanical loads. We used our technique in over 60 patients with good results. Bone union was achieved without shortening of the clavicle and with good functional effect.

Conclusion: Clavicle midshaft fractures can be successfully treated using intramedullary devices. Our technique may be one of the therapeutic options and we strongly believe that it is superior over others.

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Disclosure: No significant relationships.

P074

IS SYNTHETIC LIGAMENT AUGMENTATION A VIABLE OPTION TO ENHANCE THE STRENGTH OF AN ACHILLES TENDON REPAIR?

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Introduction: The literature demonstrates the on-going debate regarding the most effective treatment of Achilles tendon rupture. Operative intervention generally achieves lower re-rupture rates, although the lack of statistical difference between the re-rupture rates following non-operative management leads some authors to conclude that the invasive approach does not provide sufficiently greater patient benefit.

Materials and methods: This study investigated the potential to further reduce re-rupture rates through integrating a LARS synthetic ligament when performing operative repair. Ten human Achilles tendons were “ruptured” and repaired using either a standard 6-strand repair, or a comparable repair integrating a LARS synthetic ligament. Each tendon was exposed to a series of tensile tests to determine the tensile failure load and, secondarily, the extent of creep.

Results: A significantly greater strength ($p = 0.024$) was identified between the control (229.8 N SD \pm 58.3) and experimental (340.9 N SD \pm 67.6) groups, with a greater incidence of rupture away from the suture site evident with the latter repair technique. Secondary outcomes demonstrated some statistical differences in creep throughout the various testing phases.

Conclusion: Subsequently, this study appears to demonstrate how integration of the LARS synthetic ligament distributes stress away from the sutures, thereby potentially enhancing the repair strength and thus reducing the tendon re-rupture risk.

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Disclosure: No significant relationships.

P075

IS THERE A ROLE FOR SHOULDER ULTRASOUND SCANNING IN PRIMARY CARE?

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Introduction: Patient waiting lists are longer for ultrasound scanning (USS) of the shoulder than for MRI's in our institution. We aimed to determine the pattern of requests for USS, whether USS changed treatment outcomes, and if referrals were made with a specific diagnostic question in mind.

Materials and methods: We prospectively reviewed shoulder USS requests over a five month period. USS requests were analysed to determine whether the request had come from primary care or an orthopaedic practitioner. Outcomes were reviewed and patients divided into two groups: 1) active intervention (injection/surgery), and, 2) conservative treatment (physiotherapy).

Results: 672 USS requests were reviewed. Requests from non orthopaedic practitioners, 483 (Mean age, 57 years Male 228). Requests from orthopaedic practitioners 189 (Mean age 60 years, Male 99). Only 32 % of USS from primary care were initially investigated with an x-ray. Two-fifths of primary care requests gave inadequate clinical information and did not ask a diagnostic question. Orthopaedic practitioners conversely gave inadequate information in less than one-fifth of cases. 103 patients (54 %) who had an USS request from orthopaedic specialists went on to receive further treatment whilst only 116 (24 %) of patients who had a GP USS request required further treatment. Chi Squared testing showed a statistically significant difference between the two groups ($p < 0.05$).

Conclusion: The probability of a patient requiring surgical treatment is significantly higher when the original referral for USS is from an orthopaedic surgeon as opposed to from primary care. We argue that referrals for shoulder USS be restricted to orthopaedic specialists.

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Disclosure: No significant relationships.

P076

LIFE-THREATENING INJURIES FROM EXTREME SPORTS: NO RISK - NO FUN?

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Introduction: Extreme sports involve an outstanding risk and extend of potential injuries, due to a high amount of kinetic energy, height and environmental variables. The impact is potentially life-changing, in terms of medical, psychological and social aspects. While there is an expanding group of popular high-risk sports, there is still a remarkable literature paucity regarding extreme sports related injuries. The objective of our study was to evaluate demographics, severity/patterns of injury related to high-risk sports activities, in order to characterize “patients at risk” and induce alertness among athletes.

Materials and methods: The German Trauma Registry was screened for sport related injuries. Equestrian (n = 749) and snow sports (n = 256) were excluded. We analyzed demographics, types/severity of injuries (AIS/ISS), early physiology (GCS/SBP/hypothermia), rescue modality, surgical care, length of stay and major complications using SPSS statistics.

Results: A total of 278 athletes were identified (1993–2012), and 4 groups were formed: Kiting/parachuting (n = 105) was associated with the highest mean injury severity (ISS 22.4 ± 14.6), followed by mountaineering/climbing (n = 35, ISS 16.5 ± 12), skating (n = 67, ISS 15.2 ± 10.3) and contact sports (n = 71, ISS 10.4 ± 9.2). The injury patterns were different among the groups: While high falls resulted in a high rate of spinal injuries in kiting/parachuting (68.6 %) and mountaineering/climbing (45.7 %), skating was associated with highest rate of loss of consciousness at scene (27.1 %), intubation rate (33.3 %) and highest mortality (15.2 %), due to head injuries.

Conclusion: Major sports related injuries predominantly affect young male individuals. Athletes recognizing sport-specific hazards might modify their injury potential by reducing their risk behaviour and by optimizing their appropriate protective gear.

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Disclosure: No significant relationships.

P077

LONG TERM FOLLOW-UP AND PROMS OF PATIENTS WITH A LATERAL CLAVICLE FRACTURE

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Introduction: Clavicle fractures are a common fracture and often occur in younger individuals and elderly patients. Most of these fractures occur in the middle third and are treated non-operatively. The fractures in the distal third are believed to have a higher rate of non-union and might require operative treatment. The goal of the study is to evaluate the long-term (> 2 years) patient reported outcome measures in both conservatively and surgical treated patients with a distal third clavicle fracture.

Materials and methods: 720 patients were included from January 2007 to July 2012. Patients characteristics were retrieved from our trauma registry and hospital information system. Clinical results were assessed with the DASH, and a demographic questionnaire. Plain

radiographs were reviewed and scored. The data were analyzed with IBM® SPSS® Statistics 20.

Results: 277 lateral clavicle fractures (38 %) in 161 male and 116 females. Traffic accidents where the cause in 41 % followed by low energy fall in 32 %. Right sided fracture in 46 %. Comminuted fracture was present in 29 % and in 4 cases (1.4 %) there was an open fracture. In 48 patients (17 %) a plate osteosynthesis was performed, in 96 % the material was after consolidation removed. The cosmetic result was experienced as good in 89 %, while still 27 % has pain during activities, 16 % sleeping disorders because of pain after 2 years and 19 % limited in ADL.

Conclusion: After 2 years follow up a substantial number of patients after a lateral clavicle fracture still experience limitations in ADL and persistent pain.

Disclosure: No significant relationships.

P078

MAJOR TRAUMA RELATED TO WINTER SPORTS: AN ANALYSIS INCLUDING INJURY SEVERITY, PATTERNS OF INJURY AND MORTALITY

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Introduction: The objective of this nationwide data base analysis was to compare the injury patterns and associated mortality of three common high-energy winter sports. **Hypothesis:** The injury patterns and associated mortality are different among alpine skiing, snowboarding and sledging.

Materials and methods: We recruited individuals who sustained major trauma related to winter sports from the german trauma registry (TR-DGU). We analyzed demographic data, types and severity of injuries (body regions/ISS), early physiology (GCS/blood pressure/hypothermia), rescue modality, surgical care, length of stay and major complications (e.g. hemorrhagic shock/mortality) using IBM-SPSS 21.

Results: A total of 243 winter sport athletes with major trauma were identified (1993–2012). Groups: alpine skiers (n = 174), snowboarders (n = 29) and sliders (n = 40). Skiing was associated with the highest mean injury severity (ISS 20.8 ± 14), followed by snowboarding (ISS 18.7 ± 14) and sledging (ISS 13.8 ± 9.5). Snowboarding was associated with the highest rate of loss of consciousness (LOC) at scene (31.8 %) and high prehospital intubation rate (40.9 %). Athletes were predominantly male and presented hypothermic at emergency room (ER) arrival, despite a large proportion of air rescue (77 %). The injuries were different among the three groups: skiing was associated with significant head (47.1 %), chest (40.2 %) and spine injuries (40.9 %). Skiing was also associated with the highest rate of hemorrhagic shock and mortality.

Conclusion: Skiing, snowboarding and sledging involve various age groups, patterns of injury, and due to high-energy mechanisms, the risk of sustaining severe trauma. Involved rescue/emergency personal should be aware of specific features and special attention is warranted for the prevention of hypothermia.

References: Hunter: Am J Sports Med 1999 Ferrera: Am J Emerg Med 1999 Heim: Injury 2014 Franz: Br J Sports Med 2008 Furrer: J Trauma 1995 Warne: Am J Sports Med 1995

Disclosure: No significant relationships.

P079

MULTIPLE FRACTURES OF THE BONES UPPER EXTREMITIES AT CHILDREN (TACTICS TREATMENT)

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Introduction: To one of the difficult sections of the modern children traumatology are concerning multiple fractures of the bones upper extremities.

Materials and methods: During last 10 years under our observation were passing the treatment 87 patients with supracondylar fractures of the humerus and osteo- or epiphysiolytic of the distal epiphysis both forearm bones or one radius with dislocation of the fragments on one named side. The boys were 72, the girls were 15. The age of the patients was from 5 till 12 years old. Under general anesthesia were providing the Kirshner's wire through the proximal metaphysis of the ulna and forced it at the Kirshner's staple. Then were providing the closed hand reposition fragments of the forearm and were laying plaster bandage till upper one-third of the forearm. Vertical skeleton extension were doing on Balkan frame with sides pulls, the forearm was putting on cotton-gauze hammock. On the 2 day was done roentgen control. The terms for skeleton extension are 15–17 days. At satisfied staying fragments of the forearm though 5 days the plaster bandage were removing to bandage from polyurethane on 4–6 weeks.

Results: The far distant results were examined at 75 patients at the period from 2 till 10 years after trauma. At all observed the functional & anatomic indices are excellent (full volume of the movements at the elbow and radiocarpal joints).

Conclusion: Provided by us the treatment at 87 patients with multiple fractures of the upper extremities was timely and adequate, the good results are the evidence of it.

Disclosure: No significant relationships.

P080

NOVEL ARTHROPLASTY STRATEGIES FOR PROXIMAL HUMERAL FRACTURE/DISLOCATIONS

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Introduction: The best care paradigm for the older patient with proximal humeral fracture/dislocation is typically hemiarthroplasty, yet post-operative instability and suboptimal functional outcomes are commonplace. This study is to compare innovative treatment strategies to improve outcomes including: hemiarthroplasty combined with capsulolabral repair versus reverse total shoulder arthroplasty.

Materials and methods: Analysis was performed on patients treated

with arthroplasty for proximal humeral fracture/dislocation. Functional results and evidence of complication including instability (subluxation, dislocation) was determined. rTSA and hemiarthroplasty with capsulolabral repair were compared to hemiarthroplasty alone (control group).

Results: 21 patients with proximal humeral fracture/dislocation (OTA 11-B3 & 11-C3) met inclusion criteria and underwent hemiarthroplasty ($n = 8$), hemiarthroplasty with capsulolabral repair ($n = 7$), or rTSA ($n = 6$). Patients managed with rTSA had superior outcomes compared to hemiarthroplasty with or without capsulolabral repair. Forward flexion following rTSA was 115 degrees compared to hemiarthroplasty (85 degrees) and hemiarthroplasty with capsulolabral repair (85 degrees). Forward flexion was equivalent for both hemiarthroplasty groups but greater variability was noted for hemiarthroplasty without capsulolabral repair compared to hemiarthroplasty with capsulolabral repair reflected by a standard deviation of 48 vs 13 respectively.

Conclusion: The best treatment option for the older patient with proximal humeral fracture/dislocation is yet to be determined. The addition of capsulolabral repair to hemiarthroplasty is a novel approach to improve stability yet stiffness continues to plague the hemiarthroplasty technique. Reverse TSA improves functional outcomes for proximal humeral fracture/dislocation compared to hemiarthroplasty yet long term implant durability and lack of significant revision options should be considered when this treatment option is utilized.

Disclosure: No significant relationships.

P081

OPEN TALAR DISLOCATION ASSOCIATED WITH FIBULAR FRACTURE IN CYCLING ACCIDENT

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Introduction: We present the case of a 48 y.o. man who was involved in a cycling accident with a car. He was brought to the ED of Voghera hospital with an open displacement of the left tibio-talar joint and fracture of distal fibula and posterior malleolus. Both anterior and posterior tibial pulses were palpable and the patient did not show any sensitive or motor deficit.

Materials and methods: The man was taken to the OR after pre-liminary examination in the ED. A surgical debridement was performed at the exposure site, then the displacement was than reduced and finally the fibular fracture was synthesized with a locking plate and screws. The limb was put in a below the knee cast. An appropriate antibiotic therapy was set, and the patient was given LMWH. The patient was discharged 11 days after surgery. No weight bearing was allowed. Follow-up was planned at 2 weeks, 1, 2, 3 and 6 months.

Results: One month after surgery weight bearing was allowed using two crutches and a brace with limited ROM. Rehabilitation was started. Two months after surgery full weight bearing was allowed. Rehabilitation was addressed to regain ROM. Actually the patient is still under treatment. Next follow-up will be in december.

Conclusion: Open talus displacement is an extremely rare eventuality, frequently associated with high energy trauma and ankle fracture as in our case. Being still in follow-up, in these 6 months no

signs of AVN was found. The patient complains only minor pain. ROM is comparable to the other ankle.

References: Treatment and outcome of open dislocation of the ankle with complete talar extrusion: A case report. Marco Breccia et al. The Foot 24 (2014) 89–93. Total talar extrusion: a case report. Justin Fleming et al. The Journal of Foot and Ankle Surgery 48 (6).

Disclosure: No significant relationships.

P082

OPEN VERSUS PERCUTANEOUS REDUCTION OF DISPLACED INTRA-ARTICULAR CALCANEAL FRACTURES: WHAT IS THE BEST OPTION?

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Introduction: Fracture of the calcaneus is the most frequent tarsal bone fracture. 75 % are intra-articular and caused by high-energy trauma, affecting predominantly young male in their prime working years. Treatment of displaced intra-articular calcaneal fractures remains controversial, but recent studies suggested superior results with surgical reduction and fixation. Our purpose is assess functional outcomes and complications of percutaneous (PR: Indirect fragment manipulation fixed with percutaneous K-wires) versus ORIF (Open reduction and internal fixation with plate/screws) technique.

Materials and methods: Retrospective cohort study that included operated patients with displaced intra-articular calcaneal fractures between January/1998 and December/2012. We assessed: Gender; Age; Laterality; Associated fractures; Time to surgery after injury; Sanders Classification; Bohler/Gissane angles; Height/Width of calcaneus (pre and post-operatively); Complications rate; AOFAS ankle hind-foot (from Excellent (90–100) to Poor (< 50))

Results: ORIF group: 22 patients with 26 fractures (19♂; 3♀); mean age of 40,6 years. PR group: 16 patients with 18 fractures (12♂; 4♀); mean age of 35,1 years. Type IIB (Sanders classification) was the most frequent (OR- 27 %; PR- 44,4 %), in both groups. Bohler/Gissane angles and Height/Width of calcaneus improved after surgery by an average of 25,8°/111,7° and 57,1/48,7 mm in OR group with 28,9°/118,4° and 52,4/45,4 mm in PR group. Average AOFAS score was 76,2 in OR group and 81,75 in PR group, with no significant difference between them. 1 Deep infection and 4 minor wound complications occurred in OR group.

Conclusion: In our study percutaneous technique minimizes complications and achieves/maintains extra-articular reductions as well as the standard extensile ORIF.

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Disclosure: No significant relationships.

P083

ORIF OF SCAPULAR FRACTURES – THE PROBLEMS

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Introduction: Scapular fractures are an increasingly common occurrence at large trauma centers.

Materials and methods: 38 patients with 38 scapular fractures have been treated operatively and followed up. 35 fractures of direct high-energy trauma – 18 MVA, 11 motorcycle accidents and 6 falls from height. According to Goss classification, fracture spread was: 22 intra-articular (type I-3, type II-5, type III-2, type IV -4, type V - 6, type VI -2) and 16 extra-articular (8 with translation, 7 with an angular dislocation and 1 with a bony "Goss ring" disruption). 16 (42 %) patients were diagnosed with a floating shoulder – 7(18 %) clavicle fractures, 5(13 %) proximal humerus fractures, 4(11 %) acromioclavicular joint dislocation. 33(87 %) patients were treated for chest trauma, there were 20 (53 %) lung contusions, 22(58 %) cases of pneumothorax, and same side rib fractures in 28 (55 %) of the cases. In 29 approaches according to Judet, 4 through a limited posterior and 5 DP.

Results: There were 14(37 %) excellent, 17(45 %) good, 4(11 %) fair and 2(7 %) poor results according to CSIn 4 (11 %) patients screws penetrated glenohumeral joint and were removed. Humeral head impingement due to a prominent plate was found in 3 (9 %) patients and joint incongruity in excess of 3 mm was diagnosed in another 4(11 %) cases.

Conclusion: In intra-articular fractures with a gap or step of more than 3 mm, extra-articular fractures with fragment translation of more than 10 mm and angulation exceeding 40 deg. or GPA of less than 20 deg and in cases of "floating shoulder" and associated upper extremity fracture, ORIF was indicated to achieve better functional results.

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Disclosure: No significant relationships.

P084

ORTHOPAEDIC SPORTS INJURIES – THE EXPERIENCE OF A DISTRICT GENERAL HOSPITAL IN SURREY

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Introduction: Following the success of the Olympics and Commonwealth Games we have seen an increase in uptake of sports by all age groups. Competitive cycling and horse riding have a significant number of injuries and on going analysis of all sporting injuries is

essential if we are to continue correctly managing injured players. We present an analysis of patients with injuries related to sport seen by the orthopaedic team at St Peter's Hospital.

Materials and methods: We have collected retrospective data from our orthopaedic handover data-base between August 2013 and August 2014. All patients injured whilst undertaking a sport were included. Motor sports were excluded. Data collected included patient demographics, sport, mechanism of injury, the injury pattern and subsequent management.

Results: Cycling was the most hazardous sports with 43 presentations to the orthopaedic team. The most common injury pattern was a fracture of the distal radius, followed by fractures to mid-shaft of the radius and ulnar. The growth plates were involved in 17 % of paediatric patients. Upper limb fractures outnumbered lower limb injuries 6:1. 72 % of injuries seen by orthopaedics required operative fixation, usually occurring within 24 hours. 9 patients were admitted following a full trauma assessment.

Conclusion: The majority of sports injuries are low impact and affect a single limb. Those referred to orthopaedics often need operative fixation. With the dynamic nature of sport, injury patterns will change over the coming decades. Analysis and comparison of orthopaedic injuries will be essential if we are to continue diagnosing and treating players successfully.

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Disclosure: No significant relationships.

P085

PERCUTANEOUS VERSUS OPEN REPAIR OF ACUTE ACHILLES TENDON RUPTURES

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Introduction: The incidence of acute Achilles tendon rupture has increased with increased sports participation. It can be treated conservatively or surgically. Conservative treatment is in the form of the application of a fixed cast or dynamic bracing for 6 weeks. Surgical management can be open or percutaneous repair. There is a trend towards surgical repair.

Materials and methods: Prospective series of 20 patients who were treated surgically. The patients (14 men and 6 women) with a mean age 37 years were followed up for one year. Percutaneous repair (group 1) was performed in 11 patients and open repair (group 2) in 9. The functional outcome was based on AOFAS and VAS for pain.

Results: There was one superficial infection which improved on oral antibiotics, and one case of wound dehiscence (group 2)), and no re-rupture or sural nerve involvement was noted in both groups. In the open repair group, patients required one day stay at the hospital while in the percutaneous group patients were discharged home on the same day of surgery. The average AOFAS was 94 and the VAS was 0.5. All patients returned to previous work and sports activities.

Conclusion: The results of surgical treatment of ruptured Achilles tendon are good overall. Percutaneous repair has a reduced superficial infection rate better patient outcome compared to a conventional open repair.

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Disclosure: No significant relationships.

P086

PROXIMAL HUMERUS FRACTURES IN DIABETIC PATIENTS: SURGERY VERSUS CONSERVATIVE MANAGEMENT

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Introduction: In this study, we investigated the association between patients with Diabetes Mellitus sustaining proximal humerus fractures and the effect on fracture and soft tissue healing outcomes.

Materials and methods: 98 patients met the inclusion criteria. 12 patients underwent surgical fixation. An age and sex matched control group (n = 98) was randomly identified. For the operative group, baseline serum glucose was documented at 4 time-points. Primary outcome factors studied were degree of glycaemic control in the operative group, time to fracture union and soft tissue healing. Secondary outcome factors analysed included postoperative/post injury complications.

Results: In the operative group, DM I patients were more likely to suffer from poor glycaemic control postoperatively. Further analysis showed significant difference in time to fracture union between DM I and DM II (13 vs. 9 weeks) and DM I and controls (13 vs. 8 weeks). Delayed and poor wound healing were more likely to occur in surgically treated DM I when compared to DM II ($p = 0.021$) and controls ($p = 0.013$). In the conservatively managed group, there was significant difference in time to fracture union between DM I and DM II (11 vs. 9 weeks) and DM I and controls (11 vs. 8 weeks). DM I patients were more likely to suffer delayed soft tissue healing when compared to DM II ($p < 0.021$) and controls ($p < 0.029$).

Conclusion: Patients with type I diabetes and poor peri-operative glycaemic control sustaining proximal humerus fractures are more likely to suffer from increase in time to union, delayed union and wound healing problems.

Disclosure: No significant relationships.

P087

RECONSTRUCTION PLATE AS A METHOD OF CHOICE IN OPERATIVE CLAVICLE MID SHAFT FRACTURE TREATMENT

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Introduction: Authors present a retrospective analysis of 40 patients that undergone ORIF with reconstruction plate in mid shaft clavicle fracture in a period of five years in a regional hospital with highly satisfactory results.

Materials and methods: The study presents a retrograde analysis from year 2009–2014. In 40 patients treated with a reconstruction plate. Patients in a beach chair position, a minimal skin incision, operation time in average 63 min., minimal X-ray exposure.

Results: show highly satisfactory recovery in 38 patients after a minimal follow up of six months with a full ROM controled with two X-ray controls in each patient. One case of lateral screw loosening and one case of wound healing “per secundam” as complications.

Conclusion: Reconstruction plate in ORIF of midshaft clavicle fracture when operation indicated follows the anatomy with minimal tension thus stable and allows immediate physical activity of patients with prompt return to daily activities.

References: •Treatment of acute midshaft clavicle fractures: systematic review of 2144 fractures: on behalf of the Evidence-Based Orthopaedic Trauma Working Group.; Authors: Zlowodzki M, Zelle BA, Cole PA, Jeray K, McKee MD; J Orthop Trauma. 2005 Aug;19(7):504–7. •A three-dimensional reconstruction plate for displaced midshaft fractures of the clavicle; Authors J.-W. Shen, MD, Orthopaedic Surgeon; P.-J. Tong, MD, PhD, Orthopaedic Surgeon, Professor; and H.-B. Qu, MD; J Bone Joint Surg Br November 2008 vol. 90-B no. 11 1495–1498

Disclosure: No significant relationships.

P088

RESULTS OF OPERATIVE TREATMENT AC DISLOCATION BY HOOK PLATE

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Introduction: AC dislocation is often injury in young age, especially man population. We can see this injury after fall on straight arm or direct violence to the shoulder.

Materials and methods: AC dislocation is classified by Rockwood classification. We indicate for operative treatment AC dislocation Rockwood III and more. On our departments we use saber cut incision and hook plate implants which is angle stable.

Results: We use this implant for four years and we have good experience with result of treatment. We have only one knew AC dislocation, but it was after new fall.

Conclusion: In our opinion is hook plate good implant for treatment AC dislocation. We indicate young or people that are working with arm above the head. One negative of this procedure is that extraction of implant is necessary after 3 months

References: Surgical Treatment of Orthopaedic Trauma James P. Stannard(Editor), Andrew H. Schmidt(Editor), Philip J. Kregor(Editor) Rockwood and Green's Fractures in Adults: Two Volumes by Robert W. Bucholz MD(Editor), James D. Heckman MD(Editor), Charles M. Court-Brown MD FRCS Ed (Orth)(Editor), Paul Tornetta III MD(Editor)

Disclosure: No significant relationships.

P089

SURGICAL TREATMENT OF DISTAL CLAVICLE FRACTURES USING SCORPION®

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Introduction: We have been using the Scorpion® plate (Ai-medic Co, Ltd) for surgical treatment of unstable distal clavicle fractures since 2000. This plate provides stable fixation of the distal fragment with a screw and two hooks without affecting the acromioclavicular joint. We report favorable results using this plate.

Materials and methods: Since August 2000, we have treated 28 patients with unstable distal clavicle fractures using the Scorpion plate at our hospital. The subjects of the recent study were 21 patients with available postoperative follow-up data. They consisted of 19 men and 2 women with a mean age of 42.9 years. The fracture types according to the Craig classification were: four type IIa, 15 type IIb, and two type V. The mean observation period was 13.9 months. Each patient was evaluated for bone union time, complications, and the Japanese Orthopaedic Association shoulder scoring system (JOA score). The JOA score is a 100-point scoring system, with 100 points indicating the best outcome.

Results: Bone union was achieved in all patients. The mean bone union time was 4.3 months. Postoperative complications were heterotopic ossification in one, screw loosening in one, plate exposure through the skin in three, and pseudobursa formation around the distal plate in one patient. The postoperative mean JOA score was 98.8.

Conclusion: The Scorpion plate provides fixation of the distal fragment with a screw and hooks without affecting the acromioclavicular joint. In our experience, this plate can contribute to the recovery of shoulder joint function after surgery by allowing early range-of-motion exercise without restriction.

Disclosure: No significant relationships.

P090

TIBIAL FRACTURES IN ALPINE SKIING AND SNOWBOARDING IN FINLAND; A RETROSPECTIVE STUDY ON FRACTURE PATTERN IN 372 PATIENTS

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Introduction: Aim was to examine the fractures patterns and injury mechanisms of tibial fractures caused by skiing and snowboarding. Patients of all ages treated in Helsinki, Kuopio and Oulu university hospitals as well as in Rovaniemi Central Hospital between 2006–2012 were reviewed.

Materials and methods: All patients with tibial fracture due to alpine skiing or snowboarding accident were analyzed. The hospital

records were reviewed for data collecting: equipment used, age, gender, and mechanism of injury. Fractures were classified according to AO classification.

Results: There were 342 skiing or 30 snowboarding related tibial fractures. Of all tibial fracture sites, tibial shaft fracture (AO 42) was the most common fracture among skiers with 215 cases (63 %), followed by proximal tibial fractures (27 %) and distal tibial fractures (10 %). Snowboarders were most likely to suffer from proximal tibial fracture (13 cases, 45 %) or tibial shaft fracture (11 cases, 38 %). The prevalence of proximal tibial fractures was significantly higher in adult skiers than in children (49 % vs. 16 %, $p < 0.05$) and larger proportion of the injuries to the proximal tibia were tibial plateau fractures in adults compared to children (37 % vs. 3 %, $p < 0.05$). Skiers typically injured due to falling down on same level (70 %) and snowboarders due to loss of control while jumping (46 %).

Conclusion: The injury patterns between snowboarding and skiing were different. Children had more simple fractures than adults. This suggests that children have different injury mechanisms and risk factors. The high number of difficult tibial plateau injuries is alarming.

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Disclosure: No significant relationships.

P091

TREATMENT OF PROXIMAL HUMERAL FRACTURES THAT EXTEND INTO THE DYAPHYSIS WITH TARGON PH LONG NAIL

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Introduction: Proximal humeral fracture which extends into the diaphysis is not common and its treatment is not easy. In this study, we treated these fractures with Targon PH long nail.

Materials and methods: Five cases were treated with Targon PH long nail. One male and 4 female, average age at surgery was 60.4 years old (37–80 years old). One male case was fracture dislocation and two cases had other bone fracture. Status of bone union and clinical results with Scoring System of Japanese Orthopaedic Association (JOA Score:0–100 points) were investigated.

Results: Mean follow-up period was 15.6 months (7–36 months). Bone union was recognized in all cases. However, the displacement of greater tubercle remained in one case and deformity of proximal fragment occurred in one fracture dislocation case. Mean JOA score was 85 points (69–94).

Conclusion: Such proximal humeral fractures which extend into the diaphysis, the treatment option is limited. Long plate or long nail is usually chosen. In long plate, conventional approach is large invasion and MIPO technique needs much experience. Also attention to neurovascular is very important. Long PH nail is easier in approach and gets good stability not only proximal humerus but also diaphysis. This study shows Targon PH long nail is one of the good choice for the fracture which fracture line extends from proximal to diaphysis.

Disclosure: No significant relationships.

PANCREATIC DISEASE/TRAUMA

P092

COLONIC NECROSIS AND PERFORATIONS OF SEVERE ACUTE PANCREATITIS

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Introduction: Colonic necrosis and perforation are rare in acute pancreatitis but potentially fatal. Although several mechanisms have proposed, the exact pathogenesis remains unknown. The anatomic relationship of the colon to the pancreas is an important factor in the localization of the lesions.

Materials and methods: Retrospectively (2000–2013), twelve patients admitted in our service with severe acute pancreatitis and colonic necrosis and perforation were included. Demographic data, clinical and anatomo-lesional findings, preoperative CT scans, the surgical procedures performed and early postoperative follow-up were analyzed.

Results: Of the 12 patients, in seven patients (58 %), the diagnosis of the colon perforation was established preoperatively by clinical and imagistic data and for 5 patients the lesions were discovered at the time of laparotomy for pancreatitis. The perforation was located to the transverse colon (5 cases), the splenic flexure alone (5 cases) and the splenic flexure and descending colon in 2 cases. All patients underwent partial colectomy and exteriorization (proximal colostomy) in 9 cases and resection with primary anastomosis and protective ileostomy in 3 cases. Five patients (41.6 %) died between 4 days and 3 weeks after surgery by septic and MSOF evolution. It is noted a specific morbidity of 66.6 %. Retroperitoneal spread of the necrotizing process was seen in 10 cases and for 2 cases, acute mesenteric ischemia caused by pancreatitis, contributed to colonic infarction.

Conclusion: Although surgical intervention may be difficult and complicated, it remains the choice of treatment when perforation of the colon is determined.

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Disclosure: No significant relationships.

P093**COMPLICATIONS AFTER MINIMALLY INVASIVE LCP FIXATION OF HIGH-ENERGY DISTAL FEMORAL FRACTURES**

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Introduction: To present and analyse the complications after MIO with LCP of high-energy fractures of the distal femur.

Materials and methods: For the period 2005–2013 17 patients had been treated with high-energy fractures. Among them 7 were women and 10 were men with mean age 36 years. The average duration of follow up was 36 months. Fractures were divided according AO classification: Type A3 – 6, Type C2- 5 and Type C3 – 6. Closed fractures were 7 and the rest were open (Type II -4, Type IIIA,B,C-6). Temporary treatment with Ex Fix and skeletal traction was used in 11 fractures. Definitive fixation is carried out averagely on the 30th day. MIO with LCP was used in all but 3 cases. Bone grafts had been used in a second procedure in 9 cases from which 5 closed fractures.

Results: All cases were evaluated and analysed for the suspicion of valgus and varus malalignment, neurological complications and functional recovery of the knee joint. There were 3 infected non-unions, 6 delayed unions (5 open, 1 closed fracture) and 2 amputations. The average volume of movement of the knee joint (Lysholm Knee score) was 85°.

Conclusion: Staged treatment is the right choice in these fractures. The percentage of fractures with problematic bone healing is high due to the bone defects and soft tissue injuries. MIO with LCP with high-energy fractures of the distal femur is a reliable method however the treatment of these fractures is still problematic.

Disclosure: No significant relationships.

P094**PANCREAS TRANSECTION AND DUODENAL PERFORATION WITH NECROTIZING FASCITIS DUE TO SLIP DOWN STAB INJURY ON BACK TREATED BY TOTAL PANCREATECTOMY AND NEGATIVE PRESSURE WOUND THERAPY**

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Introduction: Pancreas transection and duodenal perforation with necrotizing fascitis due to slip down stab injury on back treated by total pancreatectomy and negative pressure wound therapy Traumatic injury to the pancreas is rare due to its retroperitoneal location. Most injuries are penetrating injuries such as gunshot or stab wounds. Furthermore, posterior penetrating pancreatic injury with duodenal perforation is even rarer due to the protection offered by the back muscle or vertebra, and is associated with high

morbidity and mortality due to the accompanying vascular injuries. .

Materials and methods: Here, we report a case of pancreaticoduodenal injury due to a posterior penetrating stab injury treated with total pancreatectomy and negative pressure wound therapy. A 59-year-old man was admitted to our department after presenting to the emergency department with severe abdominal pain. He had slipped at a construction site and was stabbed by an iron bar in his right lateral back, which he subsequently removed himself. Computed tomography (CT) showed injury to the duodenal forth portion and pancreas. Emergency laparotomy revealed near total transection of the neck of the pancreas and duodenal perforation.

Results: A pancreaticoduodenectomy was performed. On postoperative day 10, the color of the drain fluid changed to green, and CT showed anastomosis destruction. Hence, emergency total pancreatectomy was performed. The patient's back was incised and the phlegmon removed. Subsequent negative pressure wound therapy was employed.

Conclusion: The patient's blood sugar level was controlled by regular insulin injections, and he was discharged on postoperative day 88 without complication

Disclosure: No significant relationships.

P095**USEFULNESS OF BONE SCANNING IN THE DIAGNOSIS OF HIDDEN FRACTURE IN MAJOR TRAUMA PATIENTS**

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Introduction: Major trauma patients have high risk of missing fracture. In these cases, bone scan can be helpful in diagnosing the hidden fracture. We investigated the usefulness of bone scan in the diagnosis of hidden fracture of major trauma patients.

Materials and methods: This study is retrospective study from January to December, 2013. Major trauma patients who had ISS score of 15 or higher, and had bone scanning were enrolled in this study. The result of bone scan was compared with the CT scan to verify the existence of fracture. We calculate the sensitivity, specificity of bone scan. Furthermore we stratified the body into four parts which are chest, upper limb, lower limb, spine and compare the results of bone scan between each part.

Results: For 16 out of 115 patients, the fracture was not diagnosed before bone scan. The sensitivity of bone scan was 94 %, specificity was 58 %, positive and negative predictive values were 63 % and 92.7 %. When the body is separated as four parts, the highest sensitivity was chest part(98.5 %) and lowest part was upper limb (86.5 %). Of total 74 cases of rib fracture, the number of fracture between bone scan and CT are not identical in 65 cases (88 %). In that cases, bone scan has average 3.9 more number of fractures than that of CT scan

Conclusion: Bone scan is useful to screening of hidden fracture of major trauma patients. Also, it will be useful to confirm that there is no additional fracture after negative bone scan because of high negative predictive value.

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Disclosure: No significant relationships.

THORACIC INJURY

P096

PREHOSPITAL THORACOSTOMY: RESULTS FROM A PHYSICIAN-STAFFED HELICOPTER EMERGENCY MEDICAL SERVICE

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Introduction: Until recently, traumatic cardiac arrest (tCA) was believed to be associated with high mortality and low survival rates. New data suggest better outcomes. The most common error in the management of tCA is not treating a tension pneumothorax (TP). In the prehospital setting, we prefer thoracostomies for decompression of a potential TP in tCA. Interventions can only be recommended with adequate information about their results. Therefore, we reviewed the results of thoracostomies performed by our helicopter emergency medical service (HEMS).

Materials and methods: Our HEMS database was reviewed for all patients who had a single or bilateral prehospital thoracostomy. We evaluated the incidence of TP, return of circulation in tCA, the incidence of infections, sharps injuries and patient survival.

Results: 322 Thoracostomies were performed in 184 patients. Patients trauma-related injuries were analysed (n = 181). Of these, 37 patients had a thoracostomy with spontaneous circulation, the other 144 patients, thoracic decompression was performed to rule out a TP. TP was found in 18 patients; the incidence of TP in tCA was 10 %. Of patients with tCA, two patients were discharged from the hospital alive; neither had clinical signs of TP. No infections or sharps injuries were observed.

Conclusion: Outcomes of patients with tCA who underwent pre-hospital thoracostomy were poor in our group. Early identification of TP and strict algorithm adherence in tCA may improve outcomes. In the future, to reduce the risk of unnecessary thoracic interventions in tCA, ultrasound examination may be useful to identify TP before thoracic decompression.

Disclosure: No significant relationships.

P097

A PENETRATING CARDIAC INJURY BY FIREARM

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Introduction: Penetrating cardiac injuries by firearms are rare, but they are associated with a high mortality rate. Most of the patients

with these injuries die before reaching the hospital.

Materials and methods: We present a case with penetrating thoracoabdominal trauma caused by a firearm who endured a penetrating cardiac injury of the right ventricle.

Results: A 25-year-old male, with penetrating thoracoabdominal trauma caused by a firearm, was admitted to our hospital in severe hemorrhagic shock. The patient was immediately intubated and mechanical ventilation was started. In physical examinations we found bullet entrance holes in the precordial region and exit holes in the right gluteal region. Ultrasonography detected large amounts of liquid in the pleural, pericardial and abdominal cavities. A left anterolateral thoracotomy in the fifth intercostal space was performed immediately. We found a penetrating injury of the right ventricle, which was repaired. After the thoracotomy we did a laparotomy, which revealed rupture of the diaphragm, rupture of the fifth segment of the liver, and rupture of the urinary bladder. All these injuries were treated by primary repair. The clinical course was uneventful and the patient was discharged from the hospital on the tenth post-operative day.

Conclusion: The survival rate of patients with penetrating cardiac trauma, who reach hospital alive, depends on fast diagnosis and immediate surgical intervention.

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Disclosure: No significant relationships.

P098

DISSECTION OF THE BRACHIOCEPHALIC TRUNK CAUSED BY BLUNT CHEST TRAUMA

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Introduction: The supra-aortic arteries injury is a rare and a potential catastrophic condition and usually results from an open chest trauma. Such injuries are usually fatal.

Materials and methods: We present a case report of a blunt chest trauma with a rare lesion.

Results: A 41 years-old men, victim of a boat accident, was admitted to our emergency room with a blunt chest trauma. The patient presented pain in his right hemi-thorax, in both shoulders and along the spine. The arterial blood gas and electrocardiogram were normal and the x-ray revealed fracture of both clavicular bones, right scapula, the apophysis of the second dorsal vertebra and second, third, and fourth right ribs. The thoracic scan showed a small hemopericardium and a brachiocephalic dissection. There was no alterations in brain tomography. The patient was then transferred to a teaching hospital with a cardiothoracic surgery department and hipocoagulation was started. After 24 hours the thoracic scan was repeated and revealed a false aneurysm and the brain scan showed contusions in his occipital and parietal cortex. A bypass into the aorta and distal brachiocephalic trunk was performed with a PTFE prosthesis. The post-operative period was uneventful.

Conclusion: The brachiocephalic trauma may be asymptomatic and x-ray may not reveal any relevant alteration. An elevated level of suspicion is needed to perform the correct exams, which are angiography or angiotomography. The surgical treatment is usually done by interposition graft.

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Disclosure: No significant relationships.

P099

EMERGENCY THORACOTOMY INDICATIONS AND TECHNIQUE

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Introduction: Emergency thoracotomy is a rare procedure with mostly poor outcome. The objectives of emergency thoracotomy are decompression of cardiac tamponade, control of acute cardiac and acute intrathoracic haemorrhage, occlusion of the descending thoracic aorta for control of acute abdominal haemorrhages, control of bronchopleural fistulae and direct cardiac massage.

Materials and methods: We are presenting examples from experience at our department and literature data. Conditions that may require emergency thoracotomy are penetrating cardiac injuries, penetrating chest injuries with no cardiac involvement, injuries to the large abdominal vessels for occlusion of the descending thoracic aorta, major lung laceration following blunt injuries, massive hemoptysis, chest drainage > 1500 ml initial or > 200 ml/h, large unevacuated clotted hemothorax, developing cardiac tamponade, chest wall defect, massive air leak or incomplete lung expansion despite adequate drainage, esophageal injury and diaphragmatic laceration. Contraindications for emergency thoracotomy are severe head trauma, no possibility of definitive treatment of injury and blunt chest trauma in most cases.

Results: Mechanism of injury is an important factor determining survival following emergency thoracotomy. In the systematic review, survival was the highest for isolated penetrating cardiac injuries at 19.4 %. Overall survival for thoracic injuries was 10.7 %. Survival for abdominal injuries was 4.5 %. Survival for multiple injuries 0.7 %. Survival for multiple injuries to the great vessels is essentially zero.

Conclusion: Chest tube is sufficient in most cases of complicated blunt injuries and penetrating injuries in stable patient and it provides additional informations for decision making. In our experience Indications should be strictly followed to avoid unnecessary surgery.

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Disclosure: No significant relationships.

P100

HEART RATE AND SYSTOLIC BLOOD PRESSURE VARIABILITY ARE INDEPENDENT PREDICTORS OF MORTALITY IN SEVERE CHEST TRAUMA

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Introduction: Heart rate variability (HRV) and systolic blood pressure variability (SBPV) are considered to be predictors of mortality in a prehospital setting. The purpose of this study was to evaluate the accuracy of HRV and SBPV as predictors of mortality in severe chest trauma.

Materials and methods: Trauma patients admitted to a level 1 trauma center from October 2013 to October 2014 were analyzed retrospectively. Inclusion criteria were severe chest trauma (AIS ≥ 3), Injury Severity Score (ISS) ≥ 16, age 18–60. All patients were instrumented with spiroarteriocardiograph (SACR-2, “Intox”, Russia) upon admission. Spectral analysis of HRV and SBPV was performed simultaneously from 5-min BP and electrocardiogram recordings. The following parameters were analyzed: total power (TP, 0–0.5 Hz), very low frequency (VLF; 0–0.07 Hz), low frequency (LF; 0.07–0.15 Hz), high frequency (HF; 0.15–0.40 Hz), ratio of LF to HF (LF/HF) and normalized LF and HF units (LFnu, HFnu). Mortality score was calculated using the canonical discriminant function and groups of centroids.

Results: Thirty-nine patients were included. 12/39 (31 %) died; these were more seriously injured than survivors (ISS: 34.8 [Interquartile range (IQR), 27.0–39.5] versus 24.1 [IQR, 19.0–31.0]; p = 0.003). We identified the most sensitive predictors of death (p < 0.05): LFnu_{SBPV}(Wilks’ Lambda (WL = 0.2, F = 39.3), VLF_{SBPV}(WL = 0.08, F = 10.6), LF/HF_{SBPV} (WL = 0.1, F = 14.8), LFnu_{HRV}(WL = 0.08, F = 9.7) and obtained the following equation: Mortality score (MS) = 0.20631 × LFnu_{SBPV} – 0.04289 × VLF_{SBPV} – 1.41765 × LF_{SBPV} + 0.09101 × LFnu_{HRV} – 9.64788 (WL = 0.044, Chi square = 45.1, R = 0.977, p < 0.05). A MS < -1.5 predicted mortality with 92.5 % accuracy. A patient with MS > -1.5 is likely to be survive.

Conclusion: Measured together, HRV and SBPV can be a useful adjunct to predict mortality in severe chest trauma.

Disclosure: No significant relationships.

P101

MASSIVE SUBCUTANEOUS EMPHYSEMA SECONDARY TO CHEST TRAUMA

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Introduction: Subcutaneous emphysema occurs when air is trapped under the skin and if severe, can lead to airway and cardiovascular compromise. Air forced into the interstitial tissues around the pulmonary vasculature travels back toward the hilum, leading to pneumomediastinum, and this eventually tracts into the soft tissue of the neck, face, chest and abdominal wall. Herein a case of blunt thoracic trauma with rib fractures presenting as a massive emphysema is reported.

Materials and methods: Case report

Results: A healthy 69 year-old man was admitted to emergency room confused and providing no medical history after being found unconscious in the street. He was hemodynamically stable, dehydrated, with jaundice and with massive subcutaneous emphysema of the face, neck, chest, upper limbs, thoracic and abdominal wall. His heart sounds was muffled and pulmonary examination clear. Both hyponatremia and hypocloremia were present. Blood gas analysis and electrocardiogram showed no significant changes. Chest radiograph showed bilateral extensive subcutaneous emphysema and identified 9th and 10th right rib fractures. Brain CT scan was normal and thoracic CT scan showed massive subcutaneous emphysema, rib fractures, bilateral pleural effusion, minimal right pneumothorax, suspicious lung metastasis, and large pneumomediastinum and pneumopericardium. Abdominal CT scan detected a large pancreatic mass and probable hepatic metastasis. Patient was hospitalized and experienced a favorable evolution with partial consciousness recovery. A substantial reduction in subcutaneous emphysema, pneumothorax and pneumomediastinum was observed and electrolytic abnormalities were corrected.

Conclusion: This case shows that even pneumomediastinum/pneumopericardium and massive subcutaneous emphysema can be managed conservatively.

Disclosure: No significant relationships.

P102

MITRAL VALVE RUPTURE BY BLUNT CHEST TRAUMA

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Introduction: The valvular heart lesion as a consequence of a blunt trauma is a rare condition. The most common valve injury is in the mitral valve. Such lesions may occur in moderate energy trauma and the clinical course could be indolent or catastrophic. The surgical treatment is the gold standard in such conditions.

Materials and methods: We present a case report of a blunt chest trauma with a rare lesion.

Results: A twenty years old men, victim of a car accident, was admitted in the emergency room. The patient presented no signs of external trauma. He showed a high heart frequency with normal blood pressure. He presented no signs of respiratory distress. The imaging studies showed a fracture of C1, the first right costal arch, bilateral massive pulmonary contusion associated with type I laceration, grade II spleen injury and grade III left renal injury. The patient developed an acute respiratory distress syndrome which promoted his transfer to an intensive care unit. Due to a lack of response to conservative treatment, the patient was submitted to extracorporeal membrane oxygenation (ECMO). The ECMO allowed the patient to be transferred to a teaching hospital where an echocardiogram revealed a severe mitral insufficiency as

consequence of papillary muscle rupture. A mitral valve replacement was then performed.

Conclusion: A high index of suspicion is essential for the diagnosis of mitral valve injury in a blunt chest trauma. The ECMO is useful for keeping the patient alive long enough to achieve a correct diagnosis and proceed to proper treatment.

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Disclosure: No significant relationships.

P103

OCCURRENCE OF CONCOMITANT SPINE FRACTURES IN PATIENTS WITH BLUNT CHEST INJURY AND RIB FRACTURES

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Introduction: To identify the occurrence, types, and severity of associated spine injuries among patients diagnosed after blunt chest trauma with rib fractures and to analyze whether there are special requirements for management of these injuries.

Materials and methods: During the period from July 1998 till 2011 a total of 511 cross-sectional patients diagnosed with rib fractures after blunt chest trauma were included. The collected data were analyzed with IBM SPSS® 22.

Results: Associated spine injuries were observed in 120 patients (23 %) consisting of 83 male and 37 females. Multiple level spine injuries were seen in 62 % of patients. In 60 patients (50 %) at least one thoracic spine level was involved. Concomitant sternal fractures occurred in 5 %, cor contusion in 4 % and flail chest in 2,5 %. Less than 3 rib fractures were seen in 43 % and 6 or more rib fractures in 19 %. The mortality rate in this subgroup was 10 %.

Conclusion: Associated spine injuries are frequent among patients who have sustained rib fractures after blunt chest trauma. The results underscore the importance of high suspicion on spine injuries in primary evaluation of blunt chest trauma patients.

Disclosure: No significant relationships.

P104

OPERATIVE MANAGEMENT OF FLAIL CHEST INJURY: GENERAL HOSPITAL CELJE EXPERIENCE

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Introduction: A flail chest occurs when three or more ribs are fractured in more than one location. It results in a paradoxical chest movements. Because of that and injured lung parenchyma, breathing and ventilation are compromised. Management of flail chest injury is

directed towards protecting the underlying lung, preventing infection and achieving adequate oxygenation and ventilation.

Materials and methods: Aim: The aim of this paper is to analyze surgical management of flail chest injuries at Department of Traumatology of General Hospital Celje and give a review of actual literature and guidelines. Methods: This retrospective review study included all surgically treated patients with flail chest injury in our hospital between 2004 and 2014.

Results: We were surgically treated 7 patients with flail chest injuries during period from 2004 until 2014. Among them 5 men and 2 women. Average age was 63 years (53–74). At first, all of them were treated with pain killers, endotracheal intubation and mechanical ventilation (PEEP). Indication for the surgical treatment was inability for weaning from mechanical ventilation. All patients were extubated approximately three days after the operation and transferred to HDU. With surgical treatment we have been reduced hospital stay, decreased pain and improved the quality of life.

Conclusion: Surgical stabilisation of flail chest injury aims to allow earlier weaning from mechanical ventilation, reduce acute complications and avoid chronic pain sometimes associated with permanent malformation of the chest wall. According to the literature review, guidelines and our own experience, we think that we should decide to operate more easily.

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Disclosure: No significant relationships.

P105

PAINFUL FLOATING RIB

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Introduction: Two male patients presented themselves with motion dependent local pain at the lateral side of the thorax. The pain symptoms existed for over 2 years and had started after falling from low height on the thorax, respectively left and right. Both patients were evaluated after there trauma in an emergency department where multiple rib fractures were diagnosed (3 respectively 4 rib fractures).

Materials and methods: The primary treatment consisted of administration of adequate pain medication. Both of these patients developed a painful non-union of the 11th (floating) rib, while the

other rib fractures including in both patients a rib 12 fracture healed uncomplicated.

Results: Developing a non-union of a rib fracture at this location is probably associated with the low stability in the relatively long unilaterally fixed 11st rib dorsal to the spine. The more anterior stability should come from a combination of the intercostal muscle, diaphragm, chest- and abdominal muscles that may allow a relative high flexibility.

Conclusion: Treatment of a painful non-union of the 11th rib can consist of fixation with plate and screws. However in the case of a floating rib, resection of the anterior part can also be an effective treatment that was applied in these two patients. Four weeks after the procedure both patients were pain free.

Disclosure: No significant relationships.

P106

PEDIATRIC THORACOABDOMINAL TRAUMA – THE IMPORTANCE OF SYSTEMATIC EVALUATION

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Introduction: In pediatric population the vast majority of diaphragmatic hernias (DH) are congenital. Acquired DH are rare and can result from blunt, penetrating or inadvertent iatrogenic injury. If this situation is unrecognized the results can be catastrophic.

Materials and methods: Clinical-Case

Results: **Case 1:** A 14 year old boy was run over by car while riding a bicycle. At the initial clinical examination he presented hypotension, symmetric chest expansion but reduction of breath sound in the left hemithorax. Chest X-ray and CT-scan identified changes suggestive of left diaphragmatic eventration/rupture, hemopneumothorax and spleen laceration.

An exploratory thoracotomy showed intrathoracic stomach, small bowel and spleen. A laparotomy with diaphragmatic repair was performed. After spleen evaluation conservative treatment was chosen. He was discharged home at day 14 without complications.

Case 2: A 13 year old girl victim of a car accident was admitted to our emergency department. She was hemodynamically stable and referred pain in the left hypochondrium. She presented tachypnea and absent breath sound in the left hemithorax. Imaging studies showed left DH, left hemothorax and spleen laceration.

A DH repair with prosthesis was performed and splenectomy was made due to a grade V laceration. She was discharged home at day 15 post-op without complications.

Conclusion: Traumatic DH while uncommon should be considered in cases of pediatric thoracoabdominal injury due to its potential life-threatening condition and to avoid delayed presentations with increased morbimortality. Additionally the majority of these patients have other significant injuries. The operative approach depends on localization, size, stability of the patient and associated injuries.

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Disclosure: No significant relationships.

P107

PENETRATING SHRAPNEL INJURY TO THE NECK PRESENTING AS A DELAYED TRACHEO-ESOPHAGEAL FISTULA

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Introduction: The majority of traumatic trachea-esophageal fistulae (TEF) are due to penetrating injuries. We report a case of a delayed tracheo-esophageal fistula caused by shrapnel from a blast.

Materials and methods: A 25 year old male was admitted to the hospital after sustaining a blast injury. A contrast CT scan of the chest and neck revealed the presence of metallic shrapnel in close proximity to the tracheo-esophageal groove. Bronchoscopy revealed 0.5 cm tear in the membranous trachea while esophagoscopy and contrast swallow were normal. The patient started experiencing recurrent aspirations and coughs after fluid intake and passed the shrapnel through his rectum 3 days after his presentation. A repeat endoscopy showed a large tracheoesophageal fistula at 22 cm from the incisors. The patient proceeded to surgery through a collar incision that was extended into a limited sternotomy. The TEF was divided; the trachea communicated with the esophagus through a longitudinal anterior tear extending for a length of 2 cm. The esophagus was repaired in two layers. The membranous trachea was sutured primarily. A pedicled strap muscle flap was then interposed in the tracheo-esophageal groove. A contrast swallow on postoperative day 7 revealed the presence of a small leak into the trachea. A nasoduodenal feeding tube was inserted under radiological guidance to optimize nutritional support.

Results: The fistula closed completely two weeks later and oral feeding was resumed safely.

Conclusion: In penetrating cervical injuries, initial absence of a TE fistula can be misleading. High index of suspicion and prompt diagnosis are of paramount importance.

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Disclosure: No significant relationships.

P108

PRIMARY, URGENT STERNAL COMPOSITE PLATE AND WIRE FIXATION WITH RADIAL PLATES

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Introduction: Sternotomies are the most common osteotomies performed in the world. Sternum osteosynthesis is usually performed with wire cerclages by a cardiothoracic surgeon. Although there is evidence that sternal plate osteosynthesis is biomechanically superior to wire cerclage, sternal plating is rarely performed.

Materials and methods: We present a case of a plate osteosynthesis with steel radial plates in a patient with a median sternotomy done because of an aortic valve insufficiency. The patient was 50 years old male without previous injuries or procedures to the sternum. During the sternotomy the cardiothoracic surgeon noticed an unusually thick sternum. After the procedure a wire cerclage osteosynthesis was attempted but this was only possible in a distal part of the sternum. Reduction and retention of the manubrium sterni was not possible with cerclage wires. None of the needles loaded with a steel suture available at our hospital were big enough to pass through the sternum.

Results: A trauma orthopedic surgeon was included in the operative team and a reduction of proximal sternum with pointed reduction forceps was made. Then an osteosynthesis with three steel radial plates in region of manubrium sterni was performed. These plates were used for osteosynthesis of distal radial forearm fractures in the past at our hospital. Although sternal osteosynthesis with plates has been described in the literature to the authors knowledge this is the only case where radial plates have been used.

Conclusion: Sternal plate osteosynthesis can be done safely by orthopedic trauma surgeons in cases where sternal osteosynthesis with wires cannot be performed.

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Disclosure: No significant relationships.

P109

THE ROLE OF THORACOSCOPY IN STAB WOUNDS OF LEFT LOWER THORACAL REGION WITH CONCOMITANT SOLID ORGAN INJURIES

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Introduction: Diagnostic laparoscopy or thoracoscopy was performed in stab wounds of left lower thoracal region, to minimize acute and long term morbidity and mortality. In this study we analyzed the role of performing DT instead of DL due to prevent re-bleeding of injured solid organs as a result of intra-abdominal manipulations in cases with concomitant solid organ injuries.

Materials and methods: Between January 2007 and August 2013, 101 cases who underwent DL or DT in stab wounds of left lower thoracal region with/without concomitant solid organ injuries were analyzed retrospectively.

Results: DT was performed 8 of 101 cases in stab wounds of left lower thoracal region with concomitant solid organ injuries (%8). In 4 cases there were single left lower thoracal injury and in the other 4 cases there were multiple. In 2 cases of multiple LLTRI there were isolated liver injuries, in one of them liver and spleen injuries and in one of them only spleen injury. In the 2 cases with liver injuries it hasn't been noted any diaphragm injury. Diaphragm injuries were seen in all 6 patients with spleen injury. No perioperative or postoperative short-term complications and mortality were observed.

Conclusion: There will certainly be diaphragm injury in all stab wounds of left lower thoracal region with spleen injury. DT or DL should be performed in all cases order to prevent acute or chronic complications of diaphragm hernia. It's more suitable to perform the diagnostic and therapeutic interventions thoracoscopically in order to prevent re-bleeding of the solid organs with intra abdominal interventions.

Disclosure: No significant relationships.

P110

THORACIC TRAUMA SEVERITY SCORE VALIDATION AT A SECOND LEVEL HOSPITAL. IS IT USEFUL IN A POPULATION WITH MAINLY MILD THORACIC TRAUMA?

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Introduction: Thoracic Trauma Severity Score was developed to help in the early evaluation of blunt chest trauma identifying patients with high risk of complications. The original study was performed in a population of severe trauma patients. The aim of our study was to validate this score in our population of chest trauma patients.

Materials and methods: Retrospective review of patients admitted to our emergency department with diagnosis related to thoracic trauma (ICD 9 codes 807, 860, 861, 862, 959.11, 959.19 y 959.8). TTSS, complications and mortality were studied. Statistical analysis was performed with Mann–Whitney U test, Chi square test and predictive values were calculated using ROC curve ($P < 0.005$).

Results: We identified 238 patients with thoracic trauma. Patients were mainly men, $62.2 \pm 15(M \pm SD)$ years old. Main mechanism of injury were falls (79 %). Although 42 patients were considered politrauma at triage and 33 (13.8 %) had associated injuries, only 9 (4.8 %) had ISS > 15 and mean ISS was 3 ± 6 . Six patients (2.5 %)

developed major complications and 5 (2.1 %) died related to thoracic injury. Patients who developed complications or died had higher TTSS (4.6 ± 1.8 vs. 8.8 ± 3.3 , $p < 0.001$ and 4.7 ± 1.9 vs. 7.6 ± 2 , $p = 0.005$). Score components, analyzed separately showed significant association with complications/mortality except PaO₂/FiO₂ points, that were only associated with complications ($p = 0.01$ / $p = 0.07$). The area under the curve for TTSS to predict complications/mortality showed a value of 0.848/0.856. A TTSS cut-off value of 7.5 points had 66 % sensitivity, 94 % specificity for complications but 80 % sensitivity, 94 % specificity for mortality.

Conclusion: TTSS is a good score to predict mortality in a population with a high percentage of mild thoracic trauma patients.

Disclosure: No significant relationships.

P111

TIME-BASED MORTALITY IN TRAUMATIC CHEST INJURY: A 3-YEAR OBSERVATIONAL ANALYSIS

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Introduction: We aimed to study time-based mortality in traumatic chest injury (TCI) over a 3-year period in a fast developing country.

Materials and methods: We conducted a retrospective observational study for TCI patients admitted between 2008 and 2010 in Qatar. Patients were classified according to time of death postinjury into 3 groups (group1:within 24 h, group2 between 2nd–7th day, and group3: > 7 days).

Results: Of 5,118 cases admitted to the Trauma section, 1,355 (26.5 %) had TCI. Blunt trauma constituted the major mechanism of injuries (96 %) in terms of traffic-related (63 %), fall (24 %), and others(13 %). The main traffic-related injuries included MVCs, followed by pedestrians. Victims of MVCs were drivers (60 %), followed by front and back-seat passengers. The mean ISS was 17.5 ± 11 . Seatbelt use was reported in only 19 % of MVC cases. Overall mortality was 13 % ($n = 177$). The death rate was higher in pedestrians, followed by MVCs and fall (24 vs 13 vs 7 %, respectively, $p = 0.001$). The highest mortality was observed within Group1 (65 %), followed by group2 (24 %) and group3 (11 %). Eighty-seven percent of deceased children was within group1, whereas the majority of late deaths occurred in the elderly. Comparing the 3 groups, group1 were the youngest (26 ± 19 years, $p = 0.03$), group2 had the highest rate of lung contusion (86 %, $p = 0.001$), whereas group 3 showed the highest rate of rib fracture (68 %, $p = 0.02$) and pneumonia (11 %, $p = 0.03$). The associated head injury and ISS were comparable in the 3 groups.

Conclusion: In TCI, the mortality rate is high particularly within the first day affecting the young population. This is alarming finding that needs well designed injury preventive measures and integrated trauma system.

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Disclosure: No significant relationships.

P112

TRAUMATIC HEMORRHAGE DEATH IS CAUSED BY NON-COMPRESSIBLE TORSO HEMORRHAGE

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Introduction: Hemorrhage is the leading cause of potentially preventable death after trauma. This retrospective study of trauma deaths due to bleeding aimed to identify type of injury, anatomic location of bleeding, and time to death.

Materials and methods: All trauma deaths at our institution from 2007 to 2011 were reviewed. Deaths from hemorrhage within 24 hours were identified. All autopsy reports were reviewed. The demographics, injury characteristics, and time of death were recorded.

Results: During the study period there were 50 trauma deaths due to hemorrhage. Median age was 32 years (IQR: 18–93); 18 % women. Blunt trauma represented 68 % of cases and penetrating trauma 32 %. Median Injury Severity Score (ISS) was 56 (10–75) and median time from arrival to death was 1.0 hour (3 minutes–15 hours). There were 25 hemorrhagic deaths (50 %) within the first hour of arrival and chest trauma was here dominating (64 %; 16/25). Fourteen patients were classified as dead on arrival. In total, hemorrhagic death from chest trauma was most common (50 %; 25/50), followed by trauma to multiple body regions (28 %; 14/50) and abdominal trauma (22 %; 11/50). The major sources of hemorrhage were in general from multiple injury locations in the chest, abdomen, and pelvis. Exsanguination from specific vascular injuries included thoracic aorta (n = 6), innominate artery (n = 1), and abdominal aorta (n = 1).

Conclusion: Early death from traumatic hemorrhage is due to non-compressible torso hemorrhage with exsanguination from chest trauma as the dominating cause. Future strategies will require novel approaches to reduce mortality of these complex injuries.

Disclosure: No significant relationships.

P113

TRAUMATIC TRICUSPID VALVE RUPTURE AFTER BLUNT CHEST TRAUMA- CASE REPORT

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Introduction: Cardiac valve injury after blunt chest trauma is extremely rare. The most frequently involved valve in blunt chest trauma is the aortic valve, followed by the mitral and tricuspid valves.

Traumatic tricuspid regurgitation is usually well tolerated and the tricuspid valve replacement has been the conventional procedure, especially in cases with delayed presentation.

Materials and methods: We present a case of a female 38 years old, admitted in level I trauma center, after she suffered a road accident.

Results: After CT scan and primary assessment the injury balance was head trauma, left hemopneumothorax and right pneumothorax due to bilateral ribs fracture, liver contusion, bilateral femoral bone fracture, fracture of the tibial bone, fracture to the lumbar spinal column. After the placement of the thoracic drainage tubes the patient becomes hemodynamically unstable and she was admitted to the ICU. A Doppler echocardiography was performed and showed acute severe tricuspid regurgitation due to ruptured chordae tendineae of the anterior leaflet. The ISS was 36. During hospitalization the patient suffered numerous orthopedic surgery for repairing the fractures, ultimately the tricuspid valve was replaced with a tilular one. The total in hospital stay period was 122 days.

Conclusion: This case reminds the physicians in the emergency department should be aware of this potential complication following non-penetrating chest trauma and echocardiography is useful and should play an early role and the multidisciplinary approach of complex lesions, secondary to an road accident, offer better outcomes for the patient.

Disclosure: No significant relationships.

P114

TREATMENT OF POSTTRAUMATIC RETAINED HAEMOTHORAX: A RETROSPECTIVE SINGLE INSTITUTION STUDY

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Introduction: A retained haemothorax is an accumulation of blood within the pleural cavity 24 hours after treatment was started. It is directly related to a significantly increased morbidity, mortality, length of hospital stay and costs.

Materials and methods: A single institution retrospective study of posttraumatic haemothoraces from 2002 to 2011 has been completed. Using the Fisher's exact test, the statistics have been analysed for 190 patients.

Results: Analysing our retrospective study, we found that placing a chest tube at the day of admission can markedly decrease the number of retained haemothoraces. Unlike retained haemothoraces and pulmonary complications, the correlation between VATS or thoracotomy and pulmonary infection was not found statistically significant. Only a tendency between tube duration and pulmonary infection was rated. Tube duration is found significantly longer in retained haemothoraces. Surgery is more effective in draining the haemothorax in less than 24 hours compared to tube thoracostomy. The lower the injury score, the more retained haemothoraces developed.

Conclusion: Treatment of a haemothorax should not be delayed and the injury severity of the patient may not disturb the decision-making. Early drainage of the haemothorax is the best treatment to prevent complications. Tube thoracostomy, VATS and thoracotomy all have an important position in the treatment plan. No difference in pulmonary infection rate was found between thoracotomy and VATS. Using the past to improve the future, CT scans and prophylactic periprocedural antibiotics will be used in a prospective study. Early

evacuation by tube thoracoscopy or surgery will be the standard, using a flowchart as an aid in decision-making.

References: Femke De Haes is an Officer at the Belgian Army.

Disclosure: No significant relationships.

P115

WHAT IS THE OPTIMAL EVIDENCE-BASED METHOD OF ANALGESIA IN RIB FRACTURES?

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Introduction: Blunt thoracic trauma with rib fractures can lead to serious morbidity and mortality. Pneumonia and other complications are responsible for longer stay in hospital and thus high costs for health care. The impact of rib fractures is significantly increased in the elderly population. Not only extra-thoracic injuries but growing number of rib fractures increases the risk. An optimal analgesia pathway could be a very beneficial influence on the outcome of rib fractures.

Materials and methods: A search was conducted in PubMed and Cochrane for English, German and Dutch literature between 1974 and 2012 on the basis of the following terms: rib fracture/thoracic injuries/ chest injuries AND analgesia/pain management/opioids/pca/epidural/ nerve block AND trauma. This search initially brought 520 articles on. 19 articles were included. From cross references of these studies came another five articles, which brought a total of 24 articles for review.

Results: - Oral analgesia is only effective in the treatment of < 3 rib fractures; - Intravenous analgesia is a good method when oral analgesia provides insufficient pain management, or in patients under 65 with more than three rib fractures; - Intercostal block and interpleural block have no place in the treatment of rib fractures; - Epidural block is the most effective form of analgesia, but relatively often contraindicated and not always technically possible; - Para-vertebral block provides the same benefits as epidural block, with fewer contraindications.

Conclusion: We created a evidence based clinical guideline with flow chart for the management of pain associated with rib fractures after blunt thoracic injury.

Disclosure: No significant relationships.

PELVIC

P116

A SERVICE REVIEW OF ISOLATED PUBIC RAMUS FRACTURE REFERRALS TO THE ORTHOPAEDIC DEPARTMENT AT A DISTRICT GENERAL HOSPITAL

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Introduction: Established management goals of pubic rami fractures are pain control and early mobilisation; however, at this hospital there is no referral policy for these injuries. As a consequence it is our belief that this group of patients are being inappropriately admitted to the acute orthopaedic unit rather than more appropriate local rehabilitation services.

Materials and methods: A retrospective study of patients referred to the orthopaedic department with isolated pubic rami fractures over a 16 month period was conducted. Orthopaedic and medical treatment, length of stay and destination of discharge were assessed to determine whether a new policy of direct referral to rehabilitation services of this cohort would adversely affect their outcomes.

Results: Of 15 patients who met our inclusion criteria, none required any specialist orthopaedic or medical input. Mean length of stay on the acute orthopaedic ward was 8.8 days; two-thirds of patients were transferred to rehabilitation units on discharge.

Conclusion: Whilst our study is limited by our small cohort size none of these patients required any specialist input, suggesting no role for acute hospital admission of these patients; thus a policy of referral direct to rehabilitation services would be unlikely to impact patient care, and would reduce demand on acute services.

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Disclosure: No significant relationships.

P117

CLINICAL AND RADIOLOGICAL OUTCOME OF MINIMALLY INVASIVE TENSION BAND PLATING FOR UNSTABLE DIFFICULT SACRAL FRACTURES

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Introduction: Vertically unstable sacral fractures are difficult to achieve stable fixation. More difficulties are encountered in multi-fracture or bilateral fractures. This study aims to evaluate the outcome of minimal invasive posterior plate osteosynthesis of unstable multi-fracture or bilateral sacral fractures.

Materials and methods: Twenty-four patients presented with unstable sacral fractures either multifragmentary or bilateral were included. They were treated by closed fracture reduction and percutaneous insertion of a bridging plate. Standard 12-hole narrow DCP was inserted through a small oblique incision (3–4 cm) parallel and lateral to the sacroiliac joint, pushed submuscularly, retrieved from another similar incision on other side. It was precisely contoured to fit to the anatomical site and to help fracture reduction. Preoperative planning by CT measurement of posterior iliac inclination angle was done to help precise plate pre-contouring. The plate was fixed to the iliac bone on each side.

Results: Mean age was 31 years. Sixteen were males and 8 females. 67 % (16/24) were polytraumatized (ISS averaged 33). Tile fracture types were 14 C1-3, 8 C2 and 2 C3. 25 % (6/24) had neurological involvement. 4 patients had significant Morel-Lavallae lesion. Mean blood loss was 140 ml and mean operative time was 53 minutes. According to Tornetta&Matta, reductions were excellent in 13, good

in 9, and fair in two. All sacral fractures united without implant failures. Majeed score was excellent in 16, good in 7, and fair in 1. Three patients did not return to pre-injury work.

Conclusion: Minimal invasive posterior plate fixation of vertically unstable multifragmentary sacral fractures is effective with good outcome.

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Disclosure: No significant relationships.

P118

COMPLEX ACETABULAR FRACTURES: COMBINED ANTERIOR AND POSTERIOR APPROACH. A TWO-STAGED PROCEDURE

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Introduction: It is essential to obtain an anatomic reduction in complex acetabular fractures. There are some fractures in which it is not possible to achieve a good reduction by a single approach, leading therefore to an indication for a combined ilioinguinal and Kocher-Langenbeck approach.

Materials and methods: 16 cases of complex acetabular fractures out of 122 surgically treated, needed a two-staged ilioinguinal and Kocher-Langenbeck approaches. Postoperative reduction quality was evaluated according to the Matta radiological systems. The presence of heterotopic ossification, avascular necrosis and narrowing of the joint space after 1 year were also evaluated. The Harris hip scoring system was used for the functional results.

Results: Average follow-up was 66 months. We performed a two-staged combined approach with a mean time between the two surgeries of 6.6 days. We observed 13 both column fracture and 3 T-type fractures. The ilioinguinal approach was first used in all cases. Reduction was anatomical in 9 cases and satisfactory in 7. The Harris score was excellent in 10 patients, good in 4, and poor in 2. We observed 2 cases of avascular necrosis, one case with a poor functional outcome, that had to be revised to a total hip replacement. We had one case of hip osteoarthritis with excellent functional score. One patient developed deep infection that required material removal, with an excellent functional outcome.

Conclusion: A two-staged combined approach for complex acetabular fractures is a safe and useful technique that allows anatomical reduction in a large number of patients with a low rate of intraoperative and postoperative complications.

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Disclosure: No significant relationships.

P119

FACTORS INFLUENCING THE ACCURACY OF PERCUTANEOUS ILIOSACRAL SCREW POSITIONING

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Introduction: Exact percutaneous-iliosacral-screw-placement cannot be assessed correctly in many situations.

Materials and methods: Cohort study performed between 03/2007 and 03/2013 in a Level I Trauma center. Inclusion criteria: 1. unstable pelvic injury, 2. percutaneous placed transiliosacral-screws. Exclusion criteria: 1. screw implantation after open reduction, 2. other stabilizations of the posterior pelvic ring. Fractures were classified regarding the Tile and the Denis Classification. Analyzed parameters were demographic data, severity of injury, body-mass-index, number of screws, length of operative procedure and complications. Screw placement accuracy was graded from grad 0 no perforation; grade 1 perforation < 2 mm, grade 2 perforation from 2–4 mm to grade 3 more than 4 mm perforation using postoperative CT-scans.

Results: 102 (53 women) of 325 patients with mean age of 48.5 years could be included. 130 screws were analyzed. The ISS and the NISS was 18.9 (ISS) respectively 22.3 (NISS). No major complications occurred. Overall, 86.9 % (113) of all screws were placed optimal or suboptimal (< 2 mm perforation). Consequently 13.1 % (17) screws fulfilled radiological revision requirements. None of the analyzed factors (age, gender, BMI, type of pelvic or sacral fracture, number of screws, ISS or NISS) was associated with a significant reduced accuracy of screw positioning.

Conclusion: None of our analyzed parameters alone diminished the accuracy of screw positioning in a statistical relevant amount. We infer that none of our analyzed parameters showed a contraindication for this procedure.

Disclosure: No significant relationships.

P120

FEMORAL PERIPROSTHETIC FRACTURE: TREATMENT WITH LISS REVERSE PLATE

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Introduction: Femoral periprosthetic fractures, are more and more frequent, and represent a challenge for the orthopaedic surgeon for their difficulty in treatment. Some authors describe the use of LISS femoral reverse (for example right distal femur used for the left proximal side) in proximal diaphyseal femoral fractures.

Materials and methods: In our department, within 1 year, 8 patients (5 females and 3 males, mean age 82 years, mean follow-up 12 months) affected by femoral multifragmentary and displaced Vancouver B1 periprosthetic fracture, were treated with this plate. All patients were positioned in lateral decubitus, a large side access to the femur was practised, post-operative non weight-bearing for 60 days. All patients were clinically and radiographically re-evaluated at 30 60 90 days, 6 months and 1 year.

Results: At the follow-up, no radiographic loosening of the synthesis or secondary dislocations, and no patient required additional surgery. All patients started walking after 60 days.

Conclusion: Even if it is the preliminary results of a few cases, we believe that the use of these synthesis devices can be a useful tool in the hands of the orthopedic surgeon for the treatment of this type of fracture.

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Disclosure: No significant relationships.

P121

HEMATOMA SIZE PREDICT THE NEED FOR POSSIBLE EMBOLIZATION IN HEMODYNAMICALLY UNSTABLE PELVIC TRAUMA

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Introduction: The purpose of this study is identify the early predictive factor for possible embolization in hemodynamically unstable pelvic trauma patients.

Materials and methods: Among 120 major trauma patients who arrived within 24 hours during three years, 46 pelvic trauma patients were under shock. 44 of 46 patients were scanned with CT (computed tomography). Two patients excluded due to CPR on arrival.

Results: Among 46 hemodynamically unstable patients, 15 patients were expired (32.6 %). The severity was so high that the average ISS was 37.8, Systolic BP is 67.4 mmHg, total transfused RBC was 29.6 pack and lactic acid was 6.4 mmol/L. In initial CT scan, 25 patients (56.8 %, 25/44) showed active bleeding in pelvis and 17 patients not. The 17 patients who didn't show bleeding evidence in CT scan didn't need additional hemostatic procedures. However, Except for two patients who were not resuscitated, 23

patients underwent emergent angiography. 17 patients were performed embolization. The sensitivity of initial CT scan to identify active pelvic bleeding was 100 %, specificity was 76 %, positive predictive value 73.9 %, and negative predictive value was 100 %. In multivariate analysis the predictive factor for the need of embolization is the hematoma size (2.5 ± 2.4 vs 5.7 ± 3.9 , p-value = 0.013). Odds ratio for hematoma size is 1.061. The cut-off value was 3.35(cm) (Table 1).

Conclusion: The size of pelvic hematoma can predict the need for possible embolization in hemodynamically unstable pelvic trauma patients.

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Disclosure: No significant relationships.

P122

INGUINAL PENETRATING TRAUMA THROUGH THE SCROTUM

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Introduction: The exposed and dependant nature of the scrotum makes it vulnerable to traumatic injury but its mobile nature often offers protection from serious injury. The great majority of testicular injuries are a result of blunt trauma.

Materials and methods: We present a case report of a penetrating trauma into the abdomen through the scrotum without relevant lesions.

Results: A 33 year-old man was admitted in the emergency room with an penetrating trauma in the left scrotum caused by a foreign-body (a wood stick) after falling from a wall. The patient had no complaints. On physical examination, the patient presented a wound on the left scrotum and the foreign body was palpable on the left flank which presented tenderness.

Tomography demonstrated a foreign body (19 cm length and 2 cm of diameter) with a cranial path through the scrotum, inguinal canal, subcutaneous region of the left iliac fossa, oblique flank muscles to the abdominal cavity, lying in contact with the descending colon. It was noted gas throughout the entire path which could not exclude a hollow viscera perforation.

An exploratory laparotomy was performed which showed no penetration of the foreign body in the abdominal cavity. A exploration of the inguinal canal was performed and the foreign body was removed without any lesion found.

The post-operative period was uneventful.

Conclusion: Penetrating injuries to the scrotum have indication for surgical treatment, debridement of nonviable tissue and exploration of the elements of the spermatic cord.

The suspicion of a hollow viscera perforation is an indication for laparotomy.

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Disclosure: No significant relationships.

P123

MANAGEMENT OF HEMODYNAMICALLY UNSTABLE PATIENT WITH FRACTURE PELVIS, MAFRAQ HOSPITAL EXPERIENCE UAE

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Introduction: Multidisciplinary team and multiple approaches were introduced to improve the outcome after significant pelvic trauma. In our study we are evaluating our national management modalities for unstable patients with unstable pelvic fractures using angio-embolization, pelvic packing with or without angio-embolization and conservative management with surgical intensive care unite (SICU) admission.

Materials and methods: We reviewed 108 patients admitted with pelvic fractures between January 2013 to September 2014, 19 patients (17.5 %) were hemodynamically unstable with pelvic fracture. Massive transfusion protocol was activated in all patients. FAST scan was done. CT trauma with angio for responder and transient responder patients.

Results: Out of 19 patients, 7 patients (36.8 %) were good responders to resuscitation with maintaining of their hemoglobin stable, with no extravasation of dye, admitted to SICU for conservative management. 4 patients (21 %) were responders with CT trauma revealed dye leak so they underwent angio-embolization, SICU admission. 8 patients (42.1 %) were non responders underwent preperitoneal packing, one of them had additional angio-embolization.

Conclusion: Properitoneal packing is a good choice for non-responder patients, while angio-embolization can be done for responder and transient responder patients with evident dye extravasation. This study needs more evaluation on a wider clinical scale

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Disclosure: No significant relationships.

P124

MIDLINNE LONGITUDINAL FRACTURE OF THE SACRUM WITH PUBIC DIASTASIS: CASE REPORT

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Introduction: Sacral fractures are common in pelvic ring injuries (30–45 %). According to DENIS classification zone III fractures involve primarily the sacral canal and are usually transversely oriented but may rarely occur longitudinally (60 % risk of neurologic injury

both to nerve roots and the cauda equina).

Materials and methods: A 34 year old man was involved in a motor vehicle accident suffering from multiple injuries including a displaced midline longitudinal fracture of the sacrum (lysis of the sacrum – coccyx with max. distance of 6 cm), displaced superior-inferior left rami fractures, anterior columns of both acetabuli and gross diastasis of pubic symphysis. He also suffered from bladder rupture followed by gross hematuria for which has been operated immediately. For the stabilization of the pelvis and the control of hemorrhage, a pelvic external fixator was applied. One month later, the patient - while in UTI - was operated again and sacral reduction was performed via posterior approach using a sacral bar and reconstruction plate.

Results: The Ex-Fix and Folley catheter have been removed 3 months post-injury. The patient walked FWB 4 months after the accident, having scrotal and perineal dysesthesia and he returned back to work 7 months post-injury. Three years after his accident has a normal sexual life and physical activities without any disturbances apart from dysesthesia of the scrotum (right side).

Conclusion: The combination of midline longitudinal fracture of the sacrum with pubic diastasis results in severe instability of the pelvic ring requiring reconstruction of both structures. We believe that restoring posterior arc is mandatory for achieving the less sufficient pelvic stability.

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Disclosure: No significant relationships.

P125

MY STRUGGLE WITH THE QUDRILATERAL PLATE IN FIXING THE QUADRILATERAL WALL WITH CENTRAL ACETABULAR FRACTURES

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Introduction: Central acetabular fractures is seen predominantly in the elder population. These severe central protrusion of the hip into the true pelvis are not always amenable for prosthetic surgery. Osteosynthesis is difficult because of the concomitant osteoporosis. Some years ago special designed plates came onto the market for reduction and contention of the quadrilateral plate. We were not able to corroborate the initial enthusiasm of previous authors in using this plate.

Materials and methods: We looked at our patients records from the last three years. We were able to identify 12 cases within the cohort of pelvic fractures, with a central acetabular fractures. One male and eleven females with a mean age of 72 years (56 and 82 years). In all cases except one was a simple side fall the origin of the fracture.

Results: In six cases we couldn't manage to keep the reduction of the central retroacetabular region with this plate. In near all the cases we had a difficult time the put the plate onto the anterior brim of the

pelvis or to find the slot with our screw. In three cases the long screw perforated the acetabulum.

Conclusion: In our society we see more and more elderly with central acetabular fractures. In our hands the specially designed quadrilateral plate (Synthes) did not meet our desire to reduce and keep these luxated fragments into place. We changed our policy to cable fixation between the incisura ischiatica and lower part of the foramen obturatorius and the anterior placed plate.

References: Central acetabular fractures, Giannoudis et al. Injury 2012.

Disclosure: No significant relationships.

P126

PATHOLOGICAL HIP FRACTURE IN A REGIONAL TRAUMA CENTRE

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Introduction: Primary bone malignancies are rare, representing less than 1 % of all diagnosed malignancies. Bone tumours tend to occur in particular age groups: myeloma is rare under 40; Ewing sarcoma mostly occurs between 5 and 20.

Materials and methods: We discuss the cases of pathological hip fracture which presented to our service over a 12-month period. In 2013, 304 hip fractures (mean age = 77 years; 29.3 % male, 70.7 % female) presented to our regional trauma centre; 12 (or 3.9 %) due to pathological aetiology.

Results: Of the 10 fractures secondary to malignancy, 3/10 (30 %) were male and 7/10 (70 %) female; the same gender distribution as the total. Male cases had a mean age of 53 years [36–78], whereas females were on average 14 years [11–11] older than the male group. Stress fractures of the proximal femur are relatively uncommon, with most reports involving athletes or military recruits ("march fracture"). In 2013, only 2 such cases presented to our service.

Conclusion: We discuss in detail the investigation and management of these 12 cases due to pathological fracture. In so doing, we highlight the involvement of pathology, oncology and orthopaedic surgery in atypical cases at a regional trauma centre.

Keywords pathological fracture, trauma centre, bone malignancy, stress fracture

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Disclosure: No significant relationships.

P127

PELVIC EMERGENCY CONTAINMENT IN PELVIC POSTTRAUMATIC INSTABILITY

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Introduction: Unstable pelvic ring disruptions have been associated with high rates of morbidity and complications. Early accurate reduction with fixation lowers the hemorrhage, pain and permits early patient mobility, allowing the pelvic ring to heal.

Materials and methods: Retrospective study including 30 polytraumatized patients with unstable pelvic lesions, stabilized with external fixator between March 2006 and January 2013, minimum follow-up of 12 month. Parameters recorded: age, sex, etiology, associated lesions (lesional score ISS), pelvic containment methods, obtained results. Demographics: 17 males (57 %) and 13 females (43 %) with a mean age of 42.5 years, (ranging 18–62 years). Injury causes: car accidents 67 %, work accidents 27 %, and railway accidents 6 %. Distribution based on the injury severity scale was: 2 patients with ISS ranging between 16–24; 14 patients with ISS ranging between 25–40; 14 patients with ISS > 40. Tile Classification was used to classify the pelvic ring lesions. According to this classification Type C unstable pelvic ring lesions prevailed (60 %) while 40 % of the cases had type B rotational instability. Of the 30 patients, 2 presented type IIIA Gustilo-Anderson anterior opened pelvic ring fractures.

Results: According to Majeed functional score, 18 patients (78 %) had an excellent functional score, 4 patients reported good, and one patient had a fair functional outcome. Malunions have been recorded in 4 patients with Tile C that were stabilized only by external fixation.

Conclusion: The external fixatot is a versatile method, used as a unique fixation treatment only in hemodynamic unstable cases or in type B partially stable fractures.

Disclosure: No significant relationships.

P128

PIPPIK IV AND FEMORAL NECK FRACTURE: CASE REPORT

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Introduction: Hip dislocations (HD) associated with fractures of femoral neck (FNF), femoral head (FHF) and posterior wall of acetabulum (PWAF) are really rare, with consequential diagnostic and therapeutic difficulties and a high potential for a poor outcome.

A case of the associated FHF, FNF, PWAF and HD (Pipkin type IV) was not yet presented in literature. Clearly various ways of management are disposable. The main complications associated with this type of injury are avascular necrosis of the femoral head, heterotopic ossification, peripheral nerve damage and osteoarthritis.

Materials and methods: We present a case of a 23 Y/O driver who sustained complex right hip injury without associated injuries in a motor vehicle accident. X-ray imaging indicated HD with FHF, FNF and PWAF. Urgent open reduction and internal fixation (ORIF) was performed. Open reduction of HD and ORIF of FHF and PWAF was done through the Kocher Langenbeck approach in a prone position. After that, closed reduction and internal fixation (CRIF) of FNF in supine position with canulated screws was done.

Results: Fracture healing occurred for three months after the operation without complications and the patient had been able to walk with full weight-bearing. Two years after the operation, secondary complications were not observed.

Conclusion: Pipkin IV fractures need urgent treatment due to neurovascular reasons. A posterior approach in a prone position allows simultaneous ORIF of FHF, PWAF and HD. Further ORIF in supine position provides correct management of FNF.

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Disclosure: No significant relationships.

P129

PREPERITONEAL PELVIC PACKING IN THE EMERGENCY ROOM FOR UNSTABLE PATIENTS WITH PELVIC FRACTURE

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Introduction: The aim of this case is to evaluate the feasibility of preperitoneal pelvic packing (PPP) in the emergency room(ER) for unstable patients with pelvic fracture.

Materials and methods: Angioembolization (AE) is effective method to control arterial bleeding due to unstable pelvic bone fracture. However, when the patient has unstable vital sign or severe venous or bone bleeding, AE is not recommended. For venous or bone bleeding, PPP can be used effectively. In case of delayed preparation of operation room or general anesthesia, PPP can be performed in ER, because it is not too difficult to take a long time.

Results: At midnight, a 62 year-old woman who was crushed under a car was transferred from the local clinic. In the ER, she had shock and drowsy mentality. Severe fractures of right iliac bone and Rt. acetabulum were found through pelvic AP x-ray and CT. Though emergency operation was decided because of unstable vital sign, the operation would be delayed for about 1 hour owing to three emergency operations in progress. Eventually, PPP was

performed on the resuscitation bed of ER with IV infusion of Ketamine and it took 25 minutes. After PPP, the patient's SBP was restored up to 100 mmHg. She was sent to ICU for resuscitation. The patient underwent AE of right internal iliac artery on the 2nd POD and the second operation for gauze removal on the 3rd POD successfully.

Conclusion: In case of unstable vital sign to transfer to the OR, or delayed OR preparation, PPP in the ER deserves consideration.

Disclosure: No significant relationships.

P130

RESULT OF OUR “PACKING FIRST” PROTOCOL FOR HEMORRHAGE CONTROL OF PELVIC RING FRACTURES

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Introduction: On primary treatment for pelvic ring fractures, control of bleeding is the most important step. Therefore it is necessary to prepare a systematic protocol and strategy. We adopt the “Packing first” protocol for cases of severe hemorrhagic shock with pelvic ring fractures. In this study, we inspect the effectiveness of our strategy.

Materials and methods: 160 cases of pelvic ring fractures sustained by high energy trauma are included. Non-responder patients with severe shock (SBP < 80) on arrival are managed by immediate retroperitoneal packing, and followed by TAE and enhanced CT (Group 1). For moderate shock cases (SBP 80–90), we indicate emergency TAE (Group 2). Responder and transient responder cases are firstly surveyed by enhanced CT, and if extravasations are obtained, we perform TAE (Group 3). In each group, number of patients, distribution of severity of injury with ISS and PS score, and mortality are investigated retrospectively.

Results: In 160 cases, 19 patients (12 %) are included in group 1, mean ISS: 45 and mean Ps: 0.37 and mortality is 47.3 %. Group 2 has just one case (0.6 %), ISS: 29 and Ps: 0.76 with patient surviving. 26 patients (16 %) in group 3, mean ISS: 40.6 and mean Ps: 0.54, and mortality: 15.4 %. Total mortality of 160 patients (including CPA on arrival) of high energy trauma with pelvic ring fractures is 29 %, and in non-CPA cases, mortality is 14.5 %. However, we had 16 unexpected survival cases (Ps < 0.5 and survived), and 2 unexpected deaths (Ps ≥ 0.5 and fatality).

Conclusion: Packing first protocol is a good strategy for pelvic ring fractures with severe hemorrhagic shock.

Disclosure: No significant relationships.

P131

SHORT SEGMENT PLATING AND PERCUTANEOUS PERIACETABULAR SCREWS THROUGH MINI PARA-RECTUS APPROACH IN ANTERIORLY DISPLACED ACETABULAR FRACTURES

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Introduction: Acetabular fractures are complex and need extensive surgical approaches to be stabilized. Due to complications of

extensive exposures, MIS has been evolved, where the concept still depends on achieving anatomical reduction and stable fixation but with the least soft tissue dissection. Minimal invasive fixation is achieved by using percutaneous peri-acetabular screws after fracture reduction either by closed means or by limited open reduction through mini-windows. It is indicated in simple acetabular fracture. Sometimes after achieving anatomical reduction of the fracture and fixing the fracture temporarily by a guide wire, because of geometry of the fracture or complexity of the fracture pattern, the fracture may be displaced when a peri-acetabular lag screw is inserted. In this study, we report the use of short segment plating beside percutaneously placed peri-acetabular lag screws through mini para-rectus approach in acetabular fractures.

Materials and methods: This report included 5 cases of anteriorly displaced acetabular fractures. All fractures were reduced anatomically using mini para-rectus approach and fixed by short segment 3–5 holes narrow DCP acting as anti-glide plate and then having rigid fixation with anterior column percutaneous lag screw. Surgical technique was described. They have been followed up for 6 months for union, re-displacement of the fracture, and functional outcome using Merle d'Aubigné score.

Results: Union was achieved in all cases without redisplacement or misplacement of percutaneously placed peri-acetabular screws. Merle d'Aubigné score was excellent in all cases.

Conclusion: Short segment plate beside percutaneous peri-acetabular screws increases indications of MIS to involve more complex fractures without need to perform more extensive approaches

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Disclosure: No significant relationships.

P132

SURGICAL MANAGEMENT OF BLAST PELVIS

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Introduction: Blast pelvis is a severe injury of war and civilian trauma. Patients present with multiple injuries, like pelvic fracture & bleeding, amputation of extremity, genito-urinary tract, rectum, anal sphincters, vascular, intra-abdominal, etc.

Materials and methods: Case report of 56 years old man with blast pelvic injured in January 2014. The patient had bleeding from multiple wounds in the perianal, gluteal, upper thigh, scrotum, rectum, lower abdomen. Chest-abdominal-pelvic X-Ray showed multiple foreign bodies in the pelvis, no fractures. Abdominal Ultrasound showed no injury to the bladder, unique kidney, retroperitoneal hematoma. Abdominal CT showed partial rupture of the lower left

ureter (Grade II), retroperitoneal hematoma. Proctoscopic & digital examination showed rectal injury (Grade IV), with extension in the perineum & sphincters rupture (Grade III).

Results: At Emergency Unit we did diversion with colostomy, ureteral stent (double JJ), extirpation of foreign bodies, rectal washout, local debridement, drainage, hemostasis. On day 17 renal scintigraphy revealed no leakage. The rupture of ureter was closed. On day 27 we performed flap reconstructive surgery. At 3 months we did overlapping sphincteroplasty. At 5 months colostomy was closed.

Conclusion: In blast pelvis associated injuries are significant predictors of morbidity. Multi-disciplinary team is important for managing this trauma. The 4D (diversion, debridement, drainage, distal rectal wash out) is the base of surgical treatment.

References: The open blast pelvis: the significant burden of management.

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Disclosure: No significant relationships.

P133

SURGICAL TREATMENT OF ACETABULAR FRACTURES THROUGH THE MODIFIED STOPPA APPROACH IN HIROSHIMA

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Introduction: Recently, variety of reports about modified Stoppa approach¹⁾ (MSA) is published. We introduced Modified Stoppa approach for the operative treatment of acetabular fractures in 2008. In this study, results of our 6-years experience were presented.

Materials and methods: 24 patients were included. There were 15 males and 9 females. The mean age of injury was 52.3 years. The fracture type according to Judet-Letournel classification were; 12 Both column, 4 Anterior column (AC), 4 T shaped, 3 AC + posterior hemi-transverse, and 1 transverse. Dome impaction was seen in 4 cases. Combined with MSA, iliac window was opened in 23 cases. Posterior approach was combined in 5 cases. The mean follow-up period was 29.1 months.

Results: Mean operative time and blood loss were 223.6 minutes and 1128.3 g, respectively. Postoperative X ray grading according to Matta was; 13 Anatomical, 9 Satisfactory, and 2 Unsatisfactory. Venous thrombosis was seen in 7 cases, and pulmonary embolism was seen in 4 cases, but none of them were fatal. 3 cases had post-operative infection, but 2 of 3 cases were healed without removing implants. All fractures were united. There were 1 muscle weakness of adductors and 2 lateral thigh numbness. Clinical results were; Excellent: 6, Good: 14, Fair: 3, Poor: 1.

Conclusion: As well as previously reported²⁾³⁾⁴⁾, our results were also satisfactory. MSA is not only minimally invasive but also can reduce and put buttress plate on the quadrilateral surface. MSA can be the alternative for the surgical approach for acetabular fractures.

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Disclosure: No significant relationships.

P134

THE SELECTION OF DIAGNOSTIC MODALITIES IN THE MANAGEMENT OF PELVIC FRACTURE PATIENTS REQUIRING TRANSFERS

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Introduction: Pelvic fractures can result in life-threatening hemorrhage or other associated injuries. Therefore, pelvic fracture patients must usually be transferred to a trauma center (TC) for additional management. We attempted to analyze these transferred patients to determine the role of primary pelvic X-ray (PXR) at local hospitals (LHs). The selection of diagnostic modalities among different treatment settings is also discussed.

Materials and methods: We compared the post-transfer conditions of the patients with unstable and stable pelvic fractures according to the pre-transfer PXR. The role of computed tomography (CT) in the decision-making process at the different institutions was discussed. The patients who underwent additional angiembolization in the TC were also analyzed; the emergency department (ED) length of stays (LHs or TC) were compared between the patients who did or did not receive a pre-transfer CT scan.

Results: A total of 751 patients were enrolled in the current study. There was no significant difference in the use of pre-transfer CT scans in the LHs between the patients who did and those who did not undergo angiembolization (53.8 % vs. 50.3 %, $p = 0.472$). Furthermore, among the patients who underwent further TAE in the TC ($N = 156$), patients who underwent a pre-transfer CT scan had a significantly longer ED length of stay in the LHs (6.8 ± 2.4 hours vs. 3.6 ± 3.3 hours, $p = 0.018$).

Conclusion: Pelvic fracture management may be complicated and require advanced care facilities. PXR could serve as a screening tool for early patient transfer. Additional CT to help guide a patient's subsequent treatment could be performed after transferring the patient to the TC.

Disclosure: No significant relationships.

P135

TRANSFUSION RATES IN HIP FRACTURE PATIENTS: WHAT EFFECT DOES THE FRACTURE CONFIGURATION HAVE?

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Introduction: Hip fractures remain an important source of morbidity and mortality in the elderly¹, with allogeneic blood transfusions (ABTs) being associated with increased mortality². This study assesses the ABT rates between the most common patterns of hip fracture i.e. intertrochanteric (IT) and intracapsular (IC).

Materials and methods: A retrospective study of all the patients entered on the National Hip Fracture Database over a 1 year period in a teaching hospital was performed. In total 560 patient records were reviewed and following exclusion criteria, 475 were evaluated (198 IT, 277 IC). Baseline haematological parameters and blood transfusions were identified through the hospital systems. Statistical analyses were performed in SPSS using both Independent Samples t-tests and Chi square tests.

Results: Fracture types were matched for gender, anaesthetic type, ASA grade, cognitive score and coagulation parameters. The results showed a greater proportion of IT patients than IC patients required an ABT during their stay (39.4 % vs 22.4 %, $p < 0.001$), although the average number of units transfused for each were equivalent (2.69 vs 2.44 units, $p = 0.293$). The pre-operative haemoglobin levels were significantly lower in IT patients (mean haemoglobin was 11.79 g/dl and 11.7 g/dl for males and females respectively), compared with IC patients (mean haemoglobin was 13.09 g/dl and 12.5 g/dl for males and females respectively) ($p < 0.05$).

Conclusion: Patients with IT hip fractures were significantly more likely to require a blood transfusion than those with IC hip fractures. This may be secondary to the lower pre-operative haemoglobin, but for those needing a transfusion the amounts are equivalent.

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Disclosure: No significant relationships.

P136

TRAUMATIC PELVIC FRACTURE ACCORDING TO THE MECHANISM OF INJURY: A SINGLE CENTER EXPERIENCE

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Introduction: Pelvic fracture is a significant injury, commonly associated with other injuries and carries potential serious outcomes. We aimed to study the incidence, associated injuries and outcome of pelvic fracture according to the mechanism of traumatic injury (MOI).

Materials and methods: It is a retrospective descriptive analysis of all cases of pelvic fracture admitted to the level I trauma center in Qatar from 2010 to 2012. Data included demographics, associated injuries, injury severity score and outcome. Cases were analyzed

according to the MOI into 3 groups; Motor vehicle crashes (MVC), falls from height, and pedestrians

Results: A total of 580 pelvic fracture cases were identified with a mean age of 31 ± 14 , of whom 90 % were males. The common MOI was MVC (n = 247), followed by falls (n = 162) and pedestrians injury (n = 111). MVC group were significantly younger ($p = 0.001$) with higher rate of associated head and chest injuries as compared to the other 2 groups ($p = 0.001$). Falls group had significantly higher associated spine ($p = 0.02$) and upper limb injuries ($p = 0.02$) and low head ($p = 0.001$) and chest injuries ($p = 0.001$) as well as ISS ($p = 0.001$). While, pedestrians were older and had higher association with lower limb injuries ($p = 0.02$), ISS ($p = 0.003$), need for blood transfusion ($p = 0.003$) and sepsis ($p = 0.02$). The mortality was significantly higher in MVC and pedestrians (10 % each) as compared to falls (2 %), $p = 0.006$.

Conclusion: the pattern of associated injuries with pelvic fracture differs according to the MOI. In contrast to falls, pelvic fracture due to traffic-related accidents tends to be associated with greater overall rate of morbidity and mortality

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Disclosure: No significant relationships.

P137

WHY DOSE PELVIC RING FRACTURES IN THE ELDERLY PATIENTS REVEAL THE HIGH MORTALITY?

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Introduction: While Europe is also becoming the elderly society as same as Japan, elderly trauma patients are increasing. In our study, the mortality rate of pelvic ring fractures (PRF) in the elderly patients was more than twice in the non-elderly patients. The purpose of this study was to reveal of high mortality rate of PRF in the elderly patients.

Materials and methods: We reviewed the record of PRF treated in our facility from September 2009 to December 2013, retrospectively. A total of 229 patients with PRF were identified. Of those, we examined 68 patients as elderly group (E group; >65 year) admitted to the ICU compared with 99 patients of non-elderly group (N group). The Orthopaedic Trauma Association (OTA) type 61 as the classification of pelvic ring fractures was evaluated.

Results: 24-hour and 30-day mortality rate was significantly higher in the E group than the N group. In addition, rate of the head injury was significantly higher in the elderly group (47.1 % vs 24.2 %, $p = 0.01$). RTS was also significantly lower in E group. Although PT-INR at the ED and ICU admission was no significant differences between two groups, PT-INR at the ICU admission was significantly lower compared with ED admission in the E group.

Conclusion: Our results suggested that the mortality rate of elderly patients was significantly higher than the non-elderly in PRF regarding the head injury and the coagulopathy in acute phase. Therefore, it is necessary in the elderly to stop bleeding and improve the coagulation, immediately.

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Disclosure: No significant relationships.

PEDIATRIC FRACTURES

P138

CLINICAL AND RADIOGRAPHIC RESULTS OF LATERAL HUMERAL CONDYLE FRACTURES IN CHILDREN

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Introduction: Lateral humeral condyle fractures represent 10 %–20 % of all elbow fractures occurring in children. Although long arm cast immobilization, closed reduction and internal fixation can provide effective treatment for the undisplaced or minimally displaced fractures, open reduction and internal fixation (ORIF) is the preferred option for most lateral condylar fractures because it prevents complications caused by inaccurate reduction. Our purpose is assessing clinical and functional outcomes, and complications associated with surgical treatment of displaced lateral humeral condyle fractures in children.

Materials and methods: Retrospective cohort study with children submitted to ORIF with K wires for displaced lateral humeral condyle fractures, between January/2005 and December/2012. We assessed: 1) Demographic data- Gender; Age; Laterality 2) Radiological assessment (pre and post-operative) - Milch and Jakob classification; Radiological carry angle 3) Functional outcome - Range of motion 4) Complication rate

Results: 18 patients (10♂; 8♀), with mean age of 8 years. Type II and III were the most frequent fracture according to Milch and Jakob classification, respectively, with a slight predominance on the right side (55, 6 %). Average removal of K wires was 4.86 weeks. Average time of immobilization was 5.71 weeks (long arm cast). Functional outcome of 18 patients (mean follow-up 15.1 months): - Mean radiological carry angle 8.2° - Cubitus varus (1case); Superficial infection (1case); Lateral condylar overgrowth (2cases) There was no limitation on elbow's range of motion (compared with contralateral) and no need for surgery to correct complications.

Conclusion: Surgical treatment for displaced lateral humeral condyle fractures in children allows bone healing associated with excellent functional results.

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Disclosure: No significant relationships.

HAND/WRIST INJURY

P139

« SPARE UPPER LIMB » IN TRAUMA SURGERY: ABOUT 1 CASE OF CHIMERICAL FREE FLAP RECONSTRUCTION USING A RADIAL FOREARM FLAP AND A POSTERIOR INTEROSSEOUS FLAP

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Introduction: The spare-part concept, using tissues from a nonreplantable limb segment, has mostly been described for hand surgery. After a severe upper limb trauma, the possibility of using a « spare upper limb » is rare. However, it is sometimes appropriate to harvest a compound or chimerical flap in order to optimize the salvage of the remaining limb, as we show in this case report.

Materials and methods: After falling under a subway train, a 26 years old right-handed patient presented with a proximal left upper limb subtotal traumatic amputation, and a complex right forearm trauma associating bone and soft tissue defects. The left upper limb was not replantable, and required amputation. On this “spare upper limb”, we were able to harvest a bone segment, in order to graft and repair the right radial defect. We then sutured the tendons. And in order to repair respectively the right forearm’s palmar and dorsal defects, we harvested a chimerical free flap combining a radial forearm flap and a posterior interosseous flap, based on the left humeral pedicle.

Results: The early surgical outcome was positive. The tissue for tissue replacement, using the patient’s amputated limb, allowed us to reconstruct his dominant forearm bone, tendons and soft tissues, with satisfying functional and aesthetic results within the first 3 months.

Conclusion: In case of a severe trauma involving the two upper limbs with one of them being amputated, the nonreplantable segment can be used as described in the spare-part concept to transplant composite tissue in order to salvage the remaining limb.

Disclosure: No significant relationships.

P140

APPLICATION OF LOW-INTENSITY PULSED ULTRASOUND (LIPUS) FOR CARPAL FRACTURES

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Introduction: There are few reports on the clinical application of low intensity pulsed ultrasound (LIPUS) for fractures of the hand. The aim of this study was to investigate the clinical outcomes of the carpal fractures treated with LIPUS.

Materials and methods: We conducted a retrospective study to

investigate the clinical characteristics of patients with the carpal fractures treated with LIPUS and their clinical outcomes.

Results: Fifteen patients with carpal fractures underwent LIPUS in our institute. The average age was 31.6 years old. Ten scaphoid, 4 hamate (3 hook and 1 body), and 1 triangular fractures were included. One scaphoid fracture and 3 hamate hook fractures were treated conservatively, and the mean duration from injury to LIPUS application was 2.5 months. The other 11 patients received surgical treatment at an average of 26.5 months after injury, and the mean duration from surgery to LIPUS application was 2.2 months. Bone union was achieved in all 4 cases treated conservatively and in 9 of 11 cases treated surgically. The mean periods from LIPUS application to bone union was 4.3 months in the conservative treatment group and 4.2 months in the surgical treatment group.

Conclusion: Although bone union was not achieved in 2 cases which received surgical treatment, it is thought to be caused by insufficient screw fixation in one case and bone defect at the fracture site in another case. Similar to other fractures, LIPUS could be useful as adjuvant therapy for carpal fractures as long as adequate mechanical stability at the fracture site is achieved.

Disclosure: No significant relationships.

P141

ARE SMS REMINDERS WORKING EFFICIENTLY IN PREVENTING DID NOT ATTENDS FOR PATIENTS ATTENDING HAND CLINICS IN A TRAUMA CENTRE ?

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Introduction: SMS reminders are currently being used at our institution for hand clinic appointments but there is currently no data to determine if these are proven effective in preventing Did Not Attend (DNAs).

Materials and methods: To determine whether patients find SMS hand clinic reminders effective, if they are received at an appropriate time and if they feel that the service can be improved. We also determine whether DNAs were due to SMS communication errors.

Results: 191 patients attended all hand clinics in the 2 week period. 42 patients completed the questionnaires. 48 % did not receive any SMS before their appointment, 7 % 2–4 days before. 50 % thought SMS was a useful reminder. 12 patients (8.3 %) were listed as DNA. 6 patients completed the telephone survey and missed their appointment either because the problem had resolved or from another illness preventing them from attending clinic

Conclusion: Almost half of patients completing the questionnaire did not receive an SMS reminder, although those that did found it a useful communication modality. The majority felt that receiving 2 text messages would be ideal, followed by e-mails. This was communicated to our informatics department who are working on piloting these changes. DNAs were not due to the failings of the SMS reminder service and were due to patient factors.

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Disclosure: No significant relationships.

P142**COMPARISON OF MRI, CT AND BONE SCINTIGRAPHY FOR SUSPECTED SCAPHOID FRACTURES**

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Introduction: The aim of this study was to compare MRI, CT and bone scintigraphy for the diagnosis of occult scaphoid fractures.

Materials and methods: Thirtythree patients with a clinically suspected scaphoid fracture without a fracture on the scaphoid radiographs, were evaluated with MRI, CT and bone scintigraphy.

Results: Three of the 33 patients had a scaphoid fracture. MRI missed one scaphoid fracture. CT missed two scaphoid fractures. BS missed no scaphoid fractures and over-diagnosed one scaphoid fracture in a patient with a fracture of the trapezium.

Conclusion: This study shows that neither MRI, nor CT and BS are 100 % accurate in diagnosing occult scaphoid fractures.

Disclosure: No significant relationships.

demand experience and knowledge of the operative technique. The observed unusual complications like instability and dislocation of the elbow joint emphasize the role of meticulous soft tissue handling.

Disclosure: No significant relationships.

P144**EXAMINATION OF THE HAND: AN AUDIT TO ASSESS THE EFFECTIVENESS OF HAND TRAUMA ASSESSMENT**

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Introduction: Competent initial examination after hand trauma is fundamental in guiding and planning the treatment of the presenting patient. It is assumed that the professional seeing the patient (nurse-practitioner or doctor) is able to appropriately examine the patient. Inadequate examination could lead to missed diagnoses, mis-management and poor patient care. This study aimed to evaluate the knowledge of those examining patients with hand trauma at Sunderland Royal Hospital. A self-defined 'gold standard' was used: all professionals have been certified as competent to examine patients safely in order to gain their primary qualification, therefore 100 % should be able to answer questions about hand examination correctly.

Materials and methods: 54 orthopaedic and emergency department professionals anonymously completed a quiz about hand examination. Grades ranged from nurse-practitioner to senior registrar. Papers were completed without conferring and were immediately collected, ensuring 100 % returns. Papers were marked independently by both auditors.

Results: Overall, knowledge of examination of the hand was poor, particularly in the emergency department (average score 52 %). Orthopaedic doctors (including trainees) scored 70 %. Nurse practitioners in both departments scored just 43 %.

Conclusion: Knowledge of hand examination is below the gold-standard in both departments. As UK rotas are progressively stretched, gaps are increasingly filled with nurse practitioners: their relative lack of training and experience needs to be taken into account. With inadequate examination, the true severity of injuries may be missed. The authors recommend teaching sessions about hand examination to be integrated into emergency department and orthopaedic induction for all staff.

Disclosure: No significant relationships.

P143**COMPLICATIONS AFTER ORIF OF DISTAL HUMERAL FRACTURES TYPE C3**

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Introduction: To analyse the complications after ORIF of the distal humeral fractures Type C3.

Materials and methods: From 1996 to 2013 57 patients (33 women and 24 men) with Type C3 fractures were operated. The average age was 42 years. The average duration of the follow up was 8 years. All fractures had been operated with dorsal approach, 5 cases (Alonso Llames), and the rest with chevron olecranon osteotomy. Ulnar nerve was transposed in 31 cases. The fractures were as follows Type C3.1 – 21, Type C3.2- 23 and Type C3.3 – 13. According Gustilo and Anderson classification there were Type I – 5, Type II – 3 and Type IIIA - 2.

Temporary Ex fix had been applied in 3 patients. In 52 cases fractures had been stabilized with 2 plates and the rest had been fixed with 3 plates. Bone grafting was used in 5 cases and shortening in 3 cases. Cast was used in 3 cases.

Results: 37 major complications had been observed – debricoleage and non-union - 3, malunion – 2, stiff elbow (MES) – 7, HO (Type II A) - 4, n.ulnaris dysfunction (McGowan II,III) - 3, olecranon osteotomy – 3, posttraumatic arthritis (Knirk and Jupiter II,III) – 9, infection – 3 and unusual complication instability with dislocation of the elbow joint - 3.

Conclusion: These fractures remain challenging unfortunately. They

P145**INITIAL EXPERIENCE OF SPECT/CT IN THE DIAGNOSIS OF OCCULT SCAPHOID FRACTURES**

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Introduction: Purpose: Planar bone scintigraphy (PBS) is often advocated for the triage of clinical suspected scaphoid fractures as it detects the presence of occult fractures not visible on conventional scaphoid radiographs.¹ PBS is a sensitive diagnostic modality, but lacks specificity, which may result in over-diagnosis.^{2–4} In this pilot study we examined the potential additional value of Single Photon Emission Computed Tomography combined with low dose Computed Tomography (SPECT/CT) for the diagnosis of an occult scaphoid fracture.

Materials and methods: All patients who underwent a SPECT/CT and a PBS for a clinically suspected scaphoid fracture, not evident on conventional scaphoid radiographs, were included in this pilot study. The PBS and SPECT/CT results were both independently and separately evaluated by a nuclear physician for scaphoid fractures and other injuries.

Results: Ten patients were included. PBS was positive for a scaphoid fracture in four patients and in three patients for other fractures. SPECT/CT gave unambiguous and specific injury location information. It showed five scaphoid fractures and one other fracture. The three discrepant SPECT/CT - PBS results concerned two patients that were PBS diagnosed with a trapezoid fracture and a scaphoid fracture on SPECT/CT. The other patient was diagnosed with a scaphoid fracture on PBS, whereas SPECT/CT showed bone bruise of other carpal bones.

Conclusion: SPECT/CT has the potential to be more accurate as it uses anatomical information of the CT to discriminate between the scaphoid, other carpal bones and bone bruises. Larger studies are needed for confirmation of these preliminary data.

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Disclosure: No significant relationships.

P146

LONG-TERM COMPLICATIONS AFTER VOLAR LOCKING PLATE FIXATION OF DISTAL RADIUS FRACTURES

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Introduction: There is an increasing tendency in the use of locking plates as a method of fixation of distal radius fractures. We reviewed and analyzed the complications of reduction and internal fixation with a volar plate in a series of 306 patients 1 year after surgery. Our goal in this review is to identify and estimate the incidence of these and determine which fracture patterns are associated with more

complications.

Materials and methods: This retrospective study collected patients operated between February 2009 and October 2013. A series of 305 patients treated with locked volar plates (117 men and 188 women) aged between 20 and 84 years were included. We classified fractures by AO classification (91 type A, 65 type B and 149 type C)

Results: A total of 80 complications (26.22 %) were observed, complications like tendon injuries (6.3 %), median nerve compression (9.8 %), problems with osteosynthesis material (4 %), Sudecks syndrome (1.3 %) and others.

Conclusion: The complication rate found gives us information that can be used to improve the informed consent process presurgical patients who will be operated and also that we have to improve and correct surgical techniques used today.

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Disclosure: No significant relationships.

P147

RADIATION EXPOSURE DUE TO CT OF THE SCAPHOID IN DAILY PRACTICE

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Introduction: The aim of this study was to measure radiation exposure including scatter radiation, resulting from CT of the scaphoid in different settings as used in daily practice and to calculate the effective dose (ED) using a wrist phantom.

Materials and methods: The radiation exposure was quantified for five different CT protocols, all used in daily practice for the scaphoid CT. Two protocols concerned a CT of the scaphoid with a plaster cast of the hand and three protocols without. For all protocols the Computed Tomographic Dose Index weighted (CTDIw), the scatter dose to the brain and scatter dose to the torso were derived from the CT and measured externally with the Piranha dose meter .

Results: The average CTDIw was 2.18 mGy. The average scatter to the brain and torso was 0.011 mSv. The average estimated ED was 0.02 mSv (range 0.02–0.04) of which 0.0008 mSv (range 0.0003–0.0012) was due to the scatter radiation. The three CT protocols of the scaphoid performed with a plaster cast resulted in a 90 % higher ED, although the power of the study was too low to demonstrate this statistically.

Conclusion: The CT protocols used for scaphoid analyses in a plaster cast immobilized hand may result in higher radiation exposure than without plaster cast. We therefore recommend, whenever possible, performing CT of the hand and wrist without a plaster cast.

Disclosure: No significant relationships.

P148

STAGED SURGERY FOR THE COMMINUTED DISTAL RADIUS FRACTURE IN ELDERLY PATIENTS

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Introduction: The aim of this study is to evaluate the clinical outcome and radiographic results of the comminuted distal radius fracture in elderly applying the external fixation before open reduction and internal fixation (ORIF).

Materials and methods: We retrospectively analyzed five cases. The mean patient age was 80.6 years and follow-up period was 17 months. We examined the clinical outcome and radiographic results at final follow up.

Results: The AO classification of the five cases were as follows: A3; 1, C2; 1, C3; 3. The distal ulnar open fractures were associated in all cases. The average interval between injury and external fixation was twelve hours. After initial surgeries, the ORIF with locking plate was performed after 11.6 days on average. ROM at the final follow up was dorsi-fixation 71°, volar-flexion 70°, supination 87°, pronation 90°. Radiographic outcome was radial inclination 21°, volar tilt 19.8°, ulnar variance 1.8 mm.

Conclusion: The external fixation enable the correction of the length and articular surface by the ligamentotaxis effect. The immediate reduction makes the evaluation of the fragments position easier and contributes to the correct reduction in the definitive surgery and clinical results. We concluded that the staged operation for the distal radius fracture with comminution is safe and useful protocol.

Disclosure: No significant relationships.

P149

THE COMPARISON OF SURGICAL RESULTS OF RUPTURED AND FRACTURED ULNAR COLLATERAL LIGAMENT INJURY OF THE THUMB

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Introduction: We analyzed the functional results of free tendon graft reconstruction of ulnar collateral ligament rupture and closed reduction and percutaneous K wire fixation of ulnar collateral ligament avulsion fraction.

Materials and methods: We controlled 19 patients who had ulnar collateral ligament rupture followed mean 14.26 ± 4.65 months, 32

patients who had ulnar collateral ligament avulsion fraction followed mean 16.81 ± 7.54 months. We used a free tendon graft for ulnar collateral ligament reconstruction in ulnar collateral ligament rupture group. Both ends of a free tendon were stabilized with bioabsorbable suture anchor which was used as bio-tendonitis interference screw. Closed reduction and K wire fixation was used in ulnar collateral ligament avulsion fraction group.

Results: There were no statistically difference between operated and contralateral healthy first metacarpophalangeal joint in both groups according to grip strength, tip pinch strength, the flexion, extension, palmar abduction, and radial abduction motions in final follow-up. Therefore grip strength tip pinch strength, palmar abduction and radial abduction motions were significantly better in fracture group than rupture group. All patients regained full stability at metacarpophalangeal joint in fracture group. 16 patients regained full stability, 3 patients had mild laxity in rupture group. Glickel grading system was obtained as functional score that of excellent for 30 patients and good for 2 patients in fracture group. In rupture group, excellent for 17 patients and good for 2 patients was found.

Conclusion: Close reduction and K wire fixation of acute displaced ulnar collateral ligament avulsion fraction is a simple technique and achieves adequate stability of ulnar collateral ligament. For ulnar collateral ligament injury, a free tendon reconstruction with bioabsorbable suture anchor provides adequate stability.

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Disclosure: No significant relationships.

P150

THE FUNCTIONAL RESULTS OF OSTEOSYNTHESIS WITH MINIPLATE + SCREWS IN METACARPAL FRACTURES

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Introduction: The aim of our study is to evaluate the effect of early motion on the results of osteosynthesis with mini-plate + screws in metacarpal fractures.

Materials and methods: 43 patients who were operated between 2009 and 2012 were included in our study. The patients were followed-up for 19.76 ± 5.61 months. The mean age of patients was 31.11 ± 7.81 years (7 females, 36 males). The fracture types were

oblique for 19 patients, spiral for 15 patients and transverse for 9 patients. The patients were operated after a mean of 3,4 days (range, 3 hours–6 days) after the fracture had occurred. Patients were immobilized for 2 weeks with a splint after surgery. Passive joint movements were started on the third days, and active joint movements were started in the second (2rd) week. The patients were assessed by total joint range of movement of the finger, grasping strength and Quick-DASH scores.

Results: No significant differences were detected between fingers of the operated hand with same finger of the healthy hand according to total joint range of movement and grasping strength. Total joint range of movement values were measured perfect for 38 patients, good for 4 patients and medium for 1 patient. Bone union was observed in all patients in a mean of 6 weeks (range, 5–7 weeks). The time to return to work was 31.6 ± 8.9 days after the surgical treatment of the fracture.

Conclusion: Mini-plate + screws fixation of unstable metacarpal fractures produces anatomical reduction of fractures with stabilization that is rigid enough to allow early mobilization, thereby preventing stiffness and hence good functional results.

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Disclosure: No significant relationships.

P151

TREATMENT OF ISOLATED ULNAR FRACTURES

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Introduction: The optimal treatment of isolated ulnar shaft fractures is unknown. Although the AO Surgery reference advocates operative treatment, a recent Cochrane review finds no difference between operative and conservative treatment.

Materials and methods: Retrospectively, the records of all patients with an isolated ulnar shaft fracture were reviewed. Only patients with closed epiphysis and an isolated fracture of the distal 2/3 of the ulna shaft were included. Furthermore, all patients received a questionnaire by phone to determine their present function.

Results: Over the period 2009–2013, 50 patients were included, of which 2 underwent immediate osteosynthesis. The fracture was located in the shaft in 35 cases and at the metaphysis in 13 patients. Cast therapy was used in 47 patients, 1 patient received a soft bandage therapy. An upper arm cast was used in 37 patients, of which 11 patients were switched to a forearm cast. Only forearm casting was used in 10 patients. Consolidation was found in 45 patients, mean duration of cast therapy was 5 weeks. Secondary osteosynthesis was performed in 2 patients, 1 patient underwent a correction osteotomy after 18 months. Mean follow-up was 35 months, most patients had a good to excellent function. Type of fracture, degree of fracture translation or angulation was no predictor of outcome.

Conclusion: Conservative treatment is a feasible treatment in isolated ulnar shaft fractures. Optimal duration and type of immobilisation is still to be determined. Future prospective studies should provide further evidence.

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Disclosure: No significant relationships.

INFECTIONS

P152

ANALYSIS OF THE SURFACE ANTIGEN PROFILE OF THE PERIPHERAL MONOCYTES IN TRAUMA PATIENTS

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Introduction: It has been suggested that CD14+/CD16- or CD14+/HLA-DR- monocytes increase in trauma patients, which may increase the susceptibility to infection. Especially, it has been considered that HLA-DR antigen on monocytes is associated with immune response capability. In this study, the surface antigens of the peripheral blood mononuclear cells from patients with trauma injuries were analyzed for clarifying the biological reactions involving blood monocytes in response to trauma injury.

Materials and methods: The subjects were five patients with trauma admitted to our hospital: case 1: 45-year-old male (Injury Severity Score (ISS) was 9); case 2: 45-year-old male (ISS was 17); case 3: 69-year-old male (ISS was 16); case 4: 33-year-old male (ISS was 34); case 5: 44-year old male (ISS was 41). All patients' outcome were good, and the sepsis as a complication was not recognized. Peripheral blood samples were collected on the day of admission and at different time-points during treatment; monocytes were then separated from the samples for analysis of the expression profile of the cell surface antigens by flowcytometry.

Results: The ratio of CD14+/CD16- phenotypes of the blood monocytes were basically similar to those of healthy persons. The HLA-DR expression on the CD14+ monocytes in case 1, 2, 3, and 4 were similar to those of healthy persons. But in case 5, the expression disappeared thereafter day 4.

Conclusion: In high ISS cases, it was suggested that the reduction of expression of HLA-DR on CD14+ monocytes induces compensatory anti-inflammatory response syndrome (CARS) after trauma.

Disclosure: No significant relationships.

P153

ANIMAL BITE RELATED INJURIES AND THE FINANCIAL IMPLICATIONS

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Introduction: It is estimated that about 13 million households in the United Kingdom have pets (1). We looked into the financial

implications that were incurred due to pet related injuries. To our knowledge, no literature is available reporting on financial burden secondary to pet related injuries.

Materials and methods: Records of patients seen in the Accident and Emergency (A&E) department between 2012 and 2014 as a result of animal bites were extracted using specific codes. Patients were divided into 3 categories including - admitted, discharged from A&E and followed up in clinics. Cost estimates for the above categories were obtained by the hospital financial department.

Results: There were 868 patients including 447 males and 421 females with an average age of 35.6 years (2 months–91 years). 39 out of 868 patients (4.5 %) were admitted, 130 patients (15 %), excluding the admissions, were seen in the clinics and 699 patients (80.5 %) discharged from A&E. One patient (2 month old) died secondary to dog bite. The cost estimate calculated were as follows: admissions - £29,250.00; clinic review - £6,370.00 and A&E review - £122,250.00; total - £157,140.00.

Conclusion: It can be concluded that animal bite related injuries are not trivial and pose a substantial public health problem. These also result in a significant amount of healthcare budget being utilised on a potentially preventable cause.

References: 1. <http://www.pfma.org.uk/pet-population-2014>

Disclosure: No significant relationships.

(range, 2–28 months). Retrospectively, we assessed presence of postoperative infection.

Results: Only in 2 fractures which waiting period was over 3 weeks, postoperative infection was observed. One of the infections was GustiloIIIB open fracture.

Conclusion: Except GustiloIIIB open fractures, infection risk with this procedure might be acceptable when waiting period is within about 2 weeks. In this regard, however this procedure requires pre-vision of definitive internal fixation at the time of initial external fixation.

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Disclosure: No significant relationships.

P155

CLINICAL REVIEW OF VENTILATOR-ASSOCIATED PNEUMONIA (VAP) IN POLYTRAUMA PATIENTS

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Introduction: Severely injured patients are required an intensive cardiopulmonary support depending on the intensity of the injury. Especially, the patients who are unconscious, or underwent brain or chest injury, need long-term mechanical ventilator support, resulting inevitably in VAP. The aim of this study was to assess attributable risk factors, clinical outcomes and bacterial pathogens of VAP in polytrauma patients.

Materials and methods: In this retrospective study, we reviewed 118 patients requiring mechanical ventilation for >48 h among polytrauma patients admitted in surgical intensive care unit (ICU) between Jan 2011 and Dec 2013. The factors associated with clinical status and trauma and clinical outcomes were analyzed between VAP-negative group ($n = 72$, 61 %) and VAP-positive group ($n = 46$, 39 %).

Results: Regarding the incidence of VAP, the age (43.8 ± 18.4 Vs. 54.6 ± 20.1 , $p = 0.03$), AIS of chest (1.79 ± 1.59 Vs. 2.85 ± 1.48 , $p = 0.00$) and unconsciousness on arrival (22 (30.6 %) Vs. 28 (60.9 %), $p = 0.002$) showed statistically significant differences. VAP-positive group had significantly longer stay in the ICU (11.15 ± 10.98 Vs. 22.39 ± 14.9 , $p < 0.001$), ventilator day (9.43 ± 10.72 Vs. 19.83 ± 15.62 , $p < 0.001$) and higher rate of tracheostomy (19 (26.4 %) Vs. 35 (76.1 %), $p < 0.001$) than the VAP-negative group. However, there were no significant differences in hospital LOS (27.78 ± 19.98 Vs. 36.57 ± 18.65 , $p = 0.18$) and mortality (12 (16.7 %) Vs. 3 (6.5 %), $p = 0.157$).

Conclusion: Because of the older age, unconsciousness on arrival and high AIS of chest were relevant with VAP, those who have these risk factors should be monitored and treated carefully in respect to the incidence of VAP.

Disclosure: No significant relationships.

P154

CAN TEMPORARY EXTERNAL FIXATOR FOR THE INITIAL TREATMENT OF LOWER EXTREMITY FRACTURES BE USED IN THE OPERATIVE FIELD OF THE INTERNAL FIXATION SAFELY?

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Introduction: Recently, the concept of a staged approach for polytraumatized or high-energy lower extremity fractures has become common. In order to keep reduced alignment and protect soft tissue, some reports described the internal fixation using temporary external fixator for the initial treatment as an intraoperative reduction tool. However, infection risk with this procedure has not been examined sufficiently.

Materials and methods: Between 2012 and 2014, we performed internal plate fixation using this procedure in 16 lower extremity fractures of 13 patients among 2 hospitals. Ten patients were males and 3 patients were females. Mean age at injury was 52 years (range, 33–81 years). Three were femur fractures and 13 were lower leg fractures. Twelve were open fractures (GustiloI:2, IIIA:7, IIIB:3). Mean waiting period from initial external fixation to internal fixation was 11.0 days (range, 2–28 days). In the internal fixation, we sterilized the operative field using ethanol-containing antiseptic and povidone iodine with a brush. After the scrub, we sterilized using povidone iodine again and covered the external fixator with sterile stockinette or plastic-cover. Mean follow-up period was 13.9 months

P156**COLLAGEN BASED HEMOSTATIC COLLATAMP G IN TREATING BONE INFECTIONS**

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Introduction: Treating bone infections require sequestrectomy and bone grafting, cancellous or cortical. This paper describes a possibility to cover bone defects without cancellous bone grafting, a system performing localized drug-delivery consisting of a collagen sponge saturated with gentamicin, which proved to be effective in treating post-traumatic bone infections. Although the released dose is much lesser than those used within systemic usage, it creates considerably higher local concentrations, thus it kills bacteria that may be antibiotic-resistant at lower doses, while avoiding the risk of systemic toxicity and associated side effects.

Materials and methods: The authors present 8 cases where Collatamp G was an adjacent method to the treatment of osteitis of long bones following closed or open fractures. Surgical debridement was performed prior to Collatamp usage. The patients were skeletally mature (18–52 years), had no known allergic reaction to collagen. The patients were periodically evaluated clinically and radiologically to evaluate the outcome.

Results: In all the cases, the collagen matrix enhanced the granulation reaction, thus helped healing; the subsequent cultures were negative, so the anti-microbial activity was proven. When the bone defect was small, no bone graft was necessary (3 cases), while in 5 cases, the Papineau method was applied, with secondary bone grafting. In all the cases, the local and general tolerance was optimal, and the duration of treatment was considerable less than expected prior to Collatamp application.

Conclusion: The presented cases analyse an useful method in treating bone infections, especially since it can overrun the necessity of cancellous bone graft

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Disclosure: No significant relationships.

P157**COMPARATIVE ANALYSIS OF DISSEMINATED INTRAVASCULAR COAGULATION SYNDROME BETWEEN SEVERE ACUTE PANCREATITIS AND OTHER INFECTIOUS DISEASES**

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Introduction: Disseminated intravascular coagulation syndrome (DIC) and multiple organ dysfunction syndrome develop in severe acute pancreatitis (SAP) through a whole-body inflammatory response. However, it is unclear whether DIC associated with SAP is different from DIC caused by other infectious diseases.

Materials and methods: To clarify this, we retrospectively analyzed 30 patients admitted to our critical care medical center who were diagnosed as having DIC from April 2011 to December 2013.

Patients were divided into the pancreatitis group (n = 11) and non-pancreatitis group (n = 19) depending on the cause of DIC. Peritonitis, pneumonia, and extensive burn were the causes in the non-pancreatitis group. We investigated changes in the Japanese Association for Acute Medicine DIC (JAAM DIC) score, SOFA score, and antithrombin III (AT-III) activity in both groups for 7 days after DIC onset.

Results: JAAM DIC score and AT-III activity of both groups at DIC onset were not significantly different. However, JAAM DIC scores in the pancreatitis group on days 3 (3.8), 5 (3.5), and 7 (2.9) were significantly lower, and AT-III activity on days 5 (79.0 %) and 7 (76.7 %) was significantly higher, than those in the non-pancreatitis group. SOFA score in the pancreatitis group was significantly lower than that in the non-pancreatitis group throughout the study period.

Conclusion: These data showed that the severity of DIC in SAP was comparable with that of DIC caused by other infectious diseases, but the pancreatitis group showed better response to our treatment for DIC. This suggests that DIC in SAP developed at a stage when organ dysfunction had not fully progressed.

Disclosure: No significant relationships.

P158**DETERMINATION OF PATHOGENS IN POSTOPERATIVE WOUND INFECTIONS IN SURGICALLY TREATED CALCAEAL FRACTURES (AND IMPLICATIONS FOR TREATMENT)**

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Introduction: Surgical treatment is considered the golden standard for displaced intra-articular calcaneal fractures. The most commonly used approach is the extended lateral approach (ELA). However, high rates of up to 20 % of postoperative wound infections (POWIs) are reported. There is limited data on the type of pathogens causing infection following ELA. The aim was to determine causative agents and subsequent treatment.

Materials and methods: All patients with ORIF through the ELA between 2000–2014 were included. Patient-, fracture- and surgical characteristics were collected from the medical charts. POWIs were classified according to the CDC criteria. Perioperative cultures and potential following treatment were documented.

Results: 381 surgically treated calcanei were included in 357 patients. In 91 cases a POWI occurred (23.9 %: 57 % deep/43 % superficial). In 75 % a culture was taken, of which 59 % showed growth of >1 microorganism. Top 3 most frequently cultured microorganisms were *Staphylococcus aureus* (43 %), *Enterobacter cloacae* (18 %) and coliform rods (16 %). In superficial POWIs this was 46, 13 and 28 % and in deep POWIs 38, 29 and 21 % respectively. Superficial POWIs were treated with oral antibiotics in 95 %, 5 % of received no antibiotics. A surgical debridement, in combination with intravenous antibiotics, was performed in 58 % of deep POWIs. Four percent were solely treated with intravenous antibiotics and 38 % implants needed removal.

Conclusion: A POWI occurred in a quarter of calcaneal fracture surgeries and was mainly caused by *Staphylococcus* and/or *Enterobacteriaceae*. Most *Enterobacteriaceae* are resistant to empirical treatment

(Augmentin). This data shows that the standard empirical treatment may not be sufficient. Recommendations are made accordingly.

Disclosure: No significant relationships.

P159

EXTRA-ANATOMIC BYPASS GRAFTING IN A PATIENT WITH AN INFECTED FEMORAL DEFECT CAUSED BY A ROLLOVER ACCIDENTINJURIES: CASE REPORT

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Introduction: Vascular injuries in the extremities can result in loss of limb, functional disability. Furthermore, main arterial injury is potentially fatal lesion, and a soft tissue defect to the lower extremity with combined skeletal and vascular injuries can be difficult to manage. This is a case report of a successful treatment with extraanatomic graft reconstruction after postoperative infection.

Materials and methods: Case report: A 59-year-old male presented to the emergency department from a tractor rollover accident. The injury severity score was 41 points. He had multiple pelvic bone fractures and a left common femoral artery injury with soft tissue loss. An endarterectomy and primary repair were done. In the postoperative course, an infection from skin defect was not controlled.

Results: We performed five times reoperations due to bleeding but had failed. In spite of severe sepsis, we performed the 6th operation, which was an anastomosis with prosthetic graft from common iliac artery to femoral artery above knee avoiding wound through anterior superior iliac spine lateral. After revascularization, the patient recovered uneventfully.

Conclusion: In this case, if there is a tissue defect with combined vascular and skeletal injuries and postoperatively uncontrolled bleeding and infection is present despite the appropriate antibiotics therapy and repeated operation, extraanatomic graft interposition could be early considered when the autologous vein was unsuitable.

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- Disclosure:** No significant relationships.

P160

FACTORS AFFECTING RECURRENT DEBRIDEMENT FOR PERIANAL ABSCESS: EXPERIENCE IN ONE YEAR

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Introduction: Perianal abscesses are very common proctological diseases in general surgical emergencies [1,2]. This disease may require immediate surgery. In this study, we aimed to present the perianal abscess.

Materials and methods: The patients diagnosed with perianal abscess and managed by drainage between January 2014- September 2014 in the department of surgery were retrospectively included in the study. Demographic data, laboratory findings, length of hospital stay, number of debridements were revealed. The statistical analysis with p-value less than 0.05 was considered as significant difference.

Results: Of the 26 patients, 5 (19.2 %) were women and 21 (80.8 %) were men and the average age was 41.5 years (range 22–60). Eight patients (30.8 %) had recurrent abscess. Five of patients had no abnormal laboratory. The mean number of debridements was 1.6 (range 1–4) and the mean length of hospital stay was 7.6 days (range 1–47). There was no significant difference between leukocytosis and number of debridement.

Conclusion: The disease affect most commonly the young men [2,3]. In our study, we didn't find any association of leukocytosis. The incidence of recurrent abscess after perianal abscess excepted to be high.

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Disclosure: No significant relationships.

P161

INDICATIONS OF OPEN DRAINAGE IN BREAST ABSCESS

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Introduction: In breast disease requiring urgent surgical intervention is the only disease of breast abscess. At any age breast abscesses can be observed lactational as well as nonlactational. In this article we shared drained cases in emergency conditions due to breast abscess.

Materials and methods: Between October 2010 and October 2014 74 of 266 patients diagnosed with mastitis abscess drainage was applied with physical examination and radiologic imaging. Abscess culture and especially tissue biopsy from the nonlactational group has been taken from the patients.

Results: All of the 74 patients who diagnosed as breast abscess were female, the mean age was 27 (16–74) years. 47 of patients were in lactational period and 27 were in nonlactational period. 17 of patients in lactational period were drainaged with USG guide. 30 of patients were drainaged under general anaesthesia because of systemic infection findings, including septation and unsuccessful drainage with USG guide. Open surgery were used for tissue biopsy in nonlactational cases.

Conclusion: Drainage with radiological guide has been used more frequently in breast abscess. But some cases need open drainage.

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Disclosure: No significant relationships.

P162

INDUCED MEMBRANE TECHNIQUE (MASQUELET TECHNIQUE) FOR RECONSTRUCTION OF TRAUMATIC BONE DEFECTS: A CASE SERIES

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Introduction: The induced membrane technique, proposed by Masquelet in 1986, can treat larger bone defects than conventional autologous bone graft technique. The peripheral membrane of bone cement has a potential to improve autologous bone graft. We investigated clinical results of patients with traumatic bone defect in lower extremity using this method.

Materials and methods: This series included six patients who were treated to traumatic bone defect from 2009 to 2012. The patients aged 18–66 years old with injured lower extremities. We assessed injury mechanism, fracture classification (Gustilo and AO/OTA classification), length of bone defect, the period of cement spacer placed and fracture union time.

Results: All patients are injured in high energy trauma (four traffic accident, one fall down and one farm injury). Four patients with open fractures were classified into one Gustilo 3A and three 3B. The locations of bone defects were two subtrochanter of femur, one distal femur, two proximal tibia and one distal tibia. Length of bone defect was 2.8–5.8 cm. Cement spacers in bone defects were placed 4–8 weeks. Three cases were mixed antibiotics (vancomycin or minomycin) into bone cement. Fracture union was accomplished from 6–9 months after bone grafting operation in all cases.

Conclusion: Induced membrane technique provided fracture union for traumatic bone defect. Large bone defect is treated by bone transport and vascularized fibula, also induced membrane technique is an effective and convenient procedure. In our series, bone cement mixed antibiotics provided fracture union and helpful for infectious control.

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Disclosure: No significant relationships.

P163

INFECTIOUS RISK FOR SUICIDE BOMBERS VICTIMS

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Introduction: In suicide bomber attacks (SBA), the explosive forces may disperse fragments from the body of the bomber to which the device is attached. This biologic material can cause physical injury to bystanders and may represent a source of severe infectious diseases.

Materials and methods: We report the case of a 38 years-old French soldier, victim of a SBA in Mauritania in 2009, who were admitted at Percy Military Hospital. He sustained injuries caused by bony fragments that had been converted into projectiles by the explosive device. We decided to realize some blood test for HIV VHC and VHB à 0, 3, and 6 months. The decision not to commence antiretroviral therapy has been discussed and taken with the Infectious disease specialists.

Results: Literature review reports a blast injury caused by a human SB, that led to a penetrating bone fragment containing tissue positive for hepatitis B surface antigen. In London, after the July 7th bombings, all patients were vaccinated against Hepatitis B, and all survivors did not receive HIV exposure prophylaxis. Military recruits receive the hepatitis B vaccine or are screened for immunity on entry into the services. For hepatitis C there is currently no good vaccine or postexposure prophylaxis. The regional HIV prevalence breakpoint, at which to start victim antiretroviral therapy if the SB cannot be reliably tested, seems to be a significant issue.

Conclusion: These infectious risks have been discussed in some military and law enforcement literature. It should be a risk-based decision supported by medical intelligence.

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Disclosure: No significant relationships.

P164**IS THE PERITONEAL DRAINAGE OF PERITONITIS AFTER PERFORATED GASTRODUODENAL ULCER STILL NECESSARY ?**

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Introduction: Peritonitis from perforated gastroduodenal peptic ulcer is a life-threatening emergency leading to death in 5–10 % of cases. If the laparoscopic approach with suture of the perforation is recognized to be the gold-standard, the place of peritoneal drainage is still debated. Objective: To study the impact of a peritoneal drainage in peritonitis from perforated gastroduodenal peptic ulcer.

Materials and methods: It is a monocentric and retrospective study including patients with peritonitis from perforated gastroduodenal peptic ulcer treated by a surgical approach. Were excluded tumoral perforations and peptic ulcers from previous digestive anastomosis. Peri-operative data were analyzed: tobacco consumption, ASA score, hospital length of stay, the length of nasogastric decompression, infectious complications and peritoneal drainage.

Results: 50 patients were included from january 2008 to june 2013. There was no statistical significant difference between « drainage » and « no-drainage » groups for age, gender, ASA score, morbidity and mortality. The nasogastric tube was removed earlier in the group « no-drainage » and the hospital length of stay was shorter in the « no-drainage » group with respectively 1. 47d vs 3d ($p = 0.01$) and 4.47d vs 7.88d ($p < 0.01$).

Conclusion: Peritoneal drainage for peritonitis after perforated gastroduodenal peptic ulcer doesn't modify morbidity or mortality but increases the length of nasogastric decompression and the hospital length of stay. No postoperative drainage could become the rule for peritonitis after perforated gastroduodenal peptic ulcer.

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Disclosure: No significant relationships.

P165**LIFE AND LIMB THREATENING INFECTED MULTIPLE OPEN CRUSHING INJURIES OF THE LOWER LIMB-CASE PRESENTATION**

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Introduction: Seriated open injuries of one limb are quite rare, but their severity threatens first the life of the patient, due to their systemic impact; then, the limb is threatened due to severe septic complications, requiring complex treatment and a multidisciplinary approach in order to save the life and the integrity of the patient.

Materials and methods: The patient, 15 years, was admitted 4 h. after trauma – severe crushing of the inferior limb with bifocal open III B femoral fracture, severe bleeding, bifocal open III B tibia fracture (with injury of the Achilles tendon and posterior nerve and artery contusion); at admission- haemodynamically unstable, resuscitation protocol was immediately applied, simultaneously with surgical hemostasis, followed by debridement of the extended injuries (total degloving of the femoral shaft, skin defect of the whole posterior aspect of the shank)-cleaning, hemostasis and necrectomy were performed; post-operative complex treatment (ICU) was performed compensating the initial traumatic shock, including complex antibiotic therapy with Imipenem, Metronidazole and Vancomycin. Repeated surgical debridements were performed, and the skin defect was successfully grafted; despite the complex treatment, osteitis of the femoral shaft with St.aureus appeared, extended to the whole diaphysis; instillation-aspiration was the first therapeutic choice, then negative-pressure therapy, but these were inefficient. MRI showed a large sequestrum and septic edema extended to all the femur and the adjacent joints; amputation was first indicated due to the extension of the septic complications, but, considering the age of the patient, it was excluded and sequestrectomy, peroneal vascularized graft and external fixation were performed, followed by hyperbaric oxygen-therapy

Results: The local and general outcome was favorable, with remission of the signs of infection and no septic recidive (2.5 years. from surgery) thus demonstrating the efficacy of the method.

Conclusion: This case illustrates the difficulty of treating seriated open injuries of the limbs, which can sometimes lead to dramatic situations and require complex and prolonged treatment in order to save the patient and then, to preserve the infected limb

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Disclosure: No significant relationships.

P166**PATIENT SAFETY: THE POINT OF VIEW OF TUNISIAN MEDICAL INSPECTION**

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Introduction: PATIENT SAFETY: THE POINT OF VIEW OF TUNISIAN MEDICAL INSPECTION Authors: DR EL AMRI ISSAM Making quality suggestions to the ill and making them benefit from

good care is becoming a key imperative in the increasingly demanding and competitive socio-economic context. Beside relational aspects (empathy, intimacy, dignity,), safety of care is a fundamental dimension of this much sought after quality. Indeed, the safety of users of health facilities is a basic concept in medicine since Hippocrates; this concept is refreshed with the important advances in medicine and technology complexities of medical care. On the other hand, the increase in accidents and incidents related to the care and development of the concept of patients' rights, which are becoming increasingly sophisticated and enlightened, henceforth make this concept a matter of actuality. The causes of these risks are many: • Lack of training and supervision of staff, • Lack of communication and coordination of benefits • Information not available for caregivers, • Competence/credibility, • Spreading Information In this logic, the medical inspection plays a major role in the systematic control of the availability of means of safe work and the strict application of organizational and technical procedures in the investigation of complaints related to the negligence of the measures pending to implement other solutions and in particular the culture of voluntary reporting of incidents and adverse effects of care following a recognized technical errors reported by the caregivers themselves. Dr Issam El Amri Tunisia

Materials and methods: Literature on the relationship between patient participation and patient safety.

Studies published up to the year 2005.

Results: 10 % of patients suffer from undesirable event 55 % of adverse events: errors chir procedures.

21 % Therapeutic errors

60 % of these errors are avoidable

21 % of victims of these errors are dead...

570 additional hospital days + consumption of a significant proportion of hospital resources

Conclusion: In this logic, the medical inspection plays a major role in the systematic control of the availability of means of safe work and the strict application of organizational and technical procedures in the investigation of complaints related to the negligence of the measures pending to implement other solutions and in particular the culture of voluntary reporting of incidents and adverse effects of care following a recognized technical errors reported by the caregivers themselves.

References: 1. Recommendation Rec(2006)7 of the Committee of Ministers to Member States on management of patient safety and prevention of adverse events in health care. (Adopted by the Committee of Ministers on 24 May 2006 at the 965th meeting of the Ministers' Deputies.) Strasbourg, Council of Europe, 2006

2. European Council recommendation of 9 June 2009 on patient safety, including the prevention and control of healthcare associated infections (2009/0003 CNS). Brussels,

3. Directive 2011/24/EU of the European Parliament and of the Council of 9 March 2011

Disclosure: No significant relationships.

P167

POST OPERATIVE INFECTIONS AFTER OPEN RECONSTRUCTION INTERNAL FIXATION OF ANKLE FRACTURES

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Introduction: One of the most common surgical complications is surgical site wound infection (SSWI). Surgical treatment of ankle fractures are common practice in trauma centres. This study was designed to determine the incidence rate of SSWI in our facility, and to determine possible risk factors.

Materials and methods: 161 with an ankle fracture that were treated with an open reduction and internal fixation in our level 2 trauma facility during 2 years were included. Risk factors for SSWI, patient-related and procedure-related, were registered in our database.

Results: The total incidence of wound infections was 18 out of 161 patients (11.2 %). Gender, obesity and Diabetes Mellitus were not a risk factor for developing a SSWI. Smoking ($p = 0.014$) and age ($p = 0.04$) were defined as risk factors. Type of osteosynthesis was not a risk factor ($p = 0.538$), as was the usage of a tourniquet ($p = 0.863$) and duration of its use ($p = 0.633$). Duration of surgery was not different between the SSWI and the control group ($P = 0.520$). Mean time between the trauma date and the date of surgery had no effect on developing SSWI ($p = 0.192$)

Conclusion: The incidence of SSWI in our clinic was comparable to the incidence described in the literature. The statistical analysis had a large confidence interval due a relative small cohort of patients. Significant risk factors were age and smoking. Further research is necessary to determine the risk factors for SSWI in our population.

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Risk factors for deep surgical site infection following operative treatment of ankle fractures.

Ovaska MT¹, Mäkinen TJ, Madanat R, et al.

Disclosure: No significant relationships.

P168

PREVALENCE AND VARIATIONS IN RESISTANCE PATTERNS IN SECONDARY PERITONITIS

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Introduction: Apart from a surgical source control, the adequate medical treatment is fundamental for treating secondary peritonitis, so it is imperative to know the prevalence of antibiotic-resistant microorganisms.

Materials and methods: An unicentric prospective, observational study was conducted of 359 consecutive patients diagnosed of secondary peritonitis, between January 2010 to December 2013. The peritonitis had to have at minimum two affected abdominal quadrants. Intraoperative cultures were obtained in 353 patients (98 %).

Results: The mean age was 61 years (16–101). There were 620 microorganisms isolated (1.72 per patient). The 49 % of patients had monomicrobial peritonitis. *E.coli* was the most prevalent pathogen

(39 %), 14 % of which were Extended-Spectrum Beta-Lactamase (ESBL). It was followed by *Enterococcus spp.* (21 %, 61 % of which were *E. faecium*); anaerobes (16 %), *Streptococcus spp.* (16 %) and *Candida spp.* (16 %). *Enterococcus spp.* (11 % vs. 50 %; P = 0.0001), *Klebsiella spp.* (8 % vs. 17 %; P = 0.003), and *Enterobacter spp.* (3 % vs. 10 %; P = 0.001), were significantly higher in NP. Overall, the antibiotic resistance was: 33 % to quinolones, 28 % to amoxicillin-clavulanate, 28 % to piperacilllin-tazobactam. Only 3 % were carbapenem resistant. There were 4 cases of resistance to vancomycin and only one case of intermediate sensitivity to linezolid. *E. coli* resistances were 31 % to amoxicillin-clavulanate, 29 % to piperacilllin-tazobactam and 27 % to ciprofloxacin. There were no *E. coli* resistances to carbapenem. The most prevalent microorganisms in reinfection and sobreinfection were *Candida spp.* and *E. coli* respectively.

Conclusion: ESBL have increased notably since the last decade. *E. coli* remains as the most prevalent pathogen. *Enterococcus spp.*, *Klebsiella spp.* and *Enterobacter spp.* are more prevalent in NP.

Disclosure: No significant relationships.

P169

TREATMENT OF SEGMENTAL BONE INFECTIONS-PROBLEMS, RESULTS

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Introduction: Bone infections require complex treatment, starting with debridement and sequestrectomy; consequently, a bone defect results, thus necessitating complex procedures in order to graft it. This paper analyses the type of surgery required to completely heal a bone infection in order to establish a potential algorithm for treating these complications

Materials and methods: Authors retrospectively analyze 12 patients with segmental bone infections operated between 01.01.2009–01.06.2014, regarding: age, gender, type of fracture - closed or open, initial treatment, microbiology, type of injuries time from trauma to surgical treatment, number and type of surgical procedures, mean time of hospitalization, local and systemic complications.

Results: Mean age was 34 years. (14–62 years.); high energy trauma were responsible for he fracture in 10 cases.; there were 8 open fractures, 1 case type I, 1 type II, 1 type III A, 4 cases III B, 1 case IIIC, The medium value of the number of surgical procedures was 5, and bone defects were 6–20 cm long. External fixation was used in all the cases; Local procedures (peroneum pro tibia) was used in 4 cases and vascularised peroneal graft for the rest in all the cases, the alternative in case of failure would have been amputation

Conclusion: Our experience with microvascular transfer of fibular grafts has shown that, with negligible donor site morbidity, massive autogenous bone grafting with an intact vascular pedicle can provide healing in bone infection, when debridement generated a defect larger than 6 cm.

References: Minami A, Kaneda K, Itoga H, Usui M: Free vascularized fibular grafts. *J Reconstr Microsurg* 1989, **5**(1):37–39

Disclosure: No significant relationships.

SHOCK CONTROL

P170

HEMOGLOBIN IN DIAGNOSING HAEMORRHAGIC SHOCK: STILL NEED FOR IT?

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Introduction: Hemoglobin level is still regarded in the diagnosis of traumatic hemorrhagic shock in Italy. It's not seldom thought that a normal or near-normal level can exclude ongoing bleeding as well as impending shock. Aim of this study is to analyse data from our new prospective registry: we hypothesize that shock can coexist with a normal level of hemoglobin.

Materials and methods: Data come from our six-months-old prospective registry. We consider traumatic unstable patients (A&E systolic blood pressure <90 mmHg). Injury Severity Score, lactate level, base excess and hemoglobin level are considered, as well as first emergency maneuver and eventual subsequent urgent surgery. Lactate, base excess and hemoglobin are compared, coming from first blood gas analysis.

Results: From March to September 2014 we had 453 Trauma Team activations, with 238 (52.3 %) admissions. Median Injury Severity Score (ISS) of admitted patients was 14 (IR 9–21). 14.3 % of patients underwent an emergency surgical maneuver, while 29 % underwent whatever type of surgery during admission. Median hemoglobin level was 14.6 (13.1–15.6), lactate was 2.8 (2.2–3.6) and base excess was –2.0 (–4.0 to 0.0). 21 patients were unstable (systolic blood pressure at admission <90 mmHg), with a median ISS of 29 (19–34). 42.9 % underwent emergency surgery and 66.7 % a surgical procedure during admission. In this group median hemoglobin level was 12.8 (10.5–14), lactate was 4.1 (3.1–5.5) and base excess –3.5 (–5.3 to –0.7).

Conclusion: Our conclusion is that hemoglobin level has not to be regarded as a marker of traumatic shock. Acidosis monitoring (pH, base excess and lactate) is far more sensitive.

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Disclosure: No significant relationships.

P171

INCIDENCE OF PRECLINICAL INTERVENTIONS IN MULTIPLE TRAUMA PATIENTS: AN AUTOPSY STUDY

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Introduction: According to recent literature up to 60 % of severely injured patients die directly on scene. Initial diagnostics and treatment

may prevent life threatening conditions and save patients' lives. In this autopsy study we analyzed the incidence of medical (professional) interventions in severely injured patients that died on scene or prior to admission.

Materials and methods: Patients deceased in the year 2004 and 2005 due to a multiple trauma within the city of Munich and Southern Bavaria were subjected to an autopsy. Patient were included if they died on scene or prior to hospital admission. Signs of medical interventions (ECG, resuscitation, placement of thoracic drain, intubation and ventilation, etc.) were confirmed by an autopsy.

Results: We have identified 178 patients, who died prior to admission to the hospital. Mean age 43.5 ± 22 years; male 72.5 %; median ISS = 75, 58 % MAIS6. The head was the most frequent body region which was most severely injured, followed by thorax. Resuscitation was performed in up to 50 % of patients (ISS 16–32), 31.8 % (ISS 33–66) and 45.2 % (ISS 75). Independently of the injury severity less than 6 % received a thoracic drain. Moreover, only a low percentage of patients was ventilated (12.5 % ISS 16–32; 5.8 % ISS 33–66; 4.8 % ISS 75).

Conclusion: Patients died prior to clinical admission are associated with very severe injuries. The majority of these injuries were not treatable. Only minority of patients were subjected to emergency interventions. More attention should gain preventable caused of death in this patient group.

Disclosure: No significant relationships.

P172

INHIBITION OF C-JUN VIA D-JNK-1 DECREASES IMMUNE RESPONSE AFTER HEMORRHAGE BUT BEFORE RESUSCITATION (H/R) IN MICE WITH NORMAL LIVER FUNCTION BUT NOT IN MICE WITH CHRONIC ALCOHOLIC LIVER DISEASE (ALD)

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Introduction: Multiple trauma patients with a chronic alcoholic liver disease (ALD) suffer more complications, stay longer in the ICU and show increased mortality. Previously, we have demonstrated that H/R in the presence of ALD increases liver damage and the pro-inflammatory response. Also inhibition of c-Jun blunted H/R-induced inflammation and liver damage. Here, we evaluate effects of selective inhibition of c-Jun by D-JNKI-1 in a model of H/R in mice with pre-existing ALD.

Materials and methods: Chronic ethanol (EtOH) abuse was simulated feeding male cis-NFkB-EGFP-reporter gene mice pairwise with an ethanol containing liquid diet for 4 weeks according to Lieber/DeCarli. Then, H/R (32 ± 2 mmHg, 90 min) was performed. Before resuscitation, D-JNK or a vehicle (NaCl) was applied. Animals were sacrificed after 2 h, and blood and tissues were harvested. Data are given as mean \pm sem, a p < 0.05 was considered significant.

Results: EtOH feeding resulted in elevated serum AST levels, reflecting liver damage. D-JNKI-1 decreased significantly AST levels after H/R in mice without ALD from 1162 ± 298.2 to 694.3 ± 147.9 . In mice with ALD, inhibition of c-Jun did not provide beneficial

effects upon reflected by serum AST levels: 2577 ± 699.9 (H/R ALD vehicle) vs. 2893 ± 577.4 (H/R ALD D-JNKI-1). Inhibition of c-Jun resulted in decreased serum IL-6 (182 ± 31.35 vs. 127.8 ± 11.27 pg/ml) in the control group but not in the ALD group (337.7 ± 73.63 vs. 468.6 ± 106.3 pg/ml).

Conclusion: D-JNKI-1 decreases IL-6 levels and liver injury in mice with normal liver function after H/R, however there are no relevant effects in mice with chronic ethanol abuse.

Disclosure: No significant relationships.

P173

MANAGEMENT OF HYPOVOLEMIC SHOCK SECONDARY TO VASCULAR TRAUMA; CASE REPORT AND LITERATURE REVIEW

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Introduction: Vascular injuries are a frequent cause of admission in the emergency room, these condition hypovolemic shock due to bleeding, the main cause is penetrating trauma; given its complexity, making a fast diagnosis allows us to treat this kind of patients efficiently in order to accomplish their stabilization, reducing mortality and short and long term complications.

Materials and methods: Case report and literature review

Results: In this paper we present the case of a 27 years old male patient without any important comorbidities, presenting with a penetrating gunshot wound in the right pelvic limb with both entrance and exit orifices in the popliteal fossa; the patient also had an exposed fracture compromising the distal third of the femur's metaphysis, with vascular injuries in the popliteal artery and absence of distal pulses, the patient was unconscious with the following gasometric values: pH 7.04, PCO₂ 39 mmHg, PO₂ 26 mmHg, HCO₃ 10.5 nmol/l and Hto 25 %, intubation was indicated. Vital signs were measured at the moment of admission and the following results were obtained: Blood pressure: 58/36, HR 136, RR 27 and urine output of 0.35 cc/kg/h, crystalloid solutions and hemoderivatives were administrated to treat the class IV hypovolemic shock; because the fracture was exposed, profilactic treatment based on ceftriaxone was established. Once stabilization was accomplished the patient was referred to a third level hospital in order to continue with his definitive treatment

Conclusion: it is important to mention that therapeutic goals in this cases include plasmatic volume control, limb immobilization, bone stabilization, sepsis prevention and preserving the patient's capability to function.

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Disclosure: No significant relationships.

P174**SCORING SYSTEM FOR THE EARLY PREDICTION OF MASSIVE TRANSFUSION REQUIREMENT IN ELDERLY SEVERE TRAUMA PATIENTS**

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Introduction: We investigated the effectiveness of scores in elderly patients with severe trauma and created a scoring system to predict the need for massive transfusion (MT) in elderly patients.

Materials and methods: We retrospectively reviewed the medical records of a cohort of severe trauma patients (ISS ≥ 16) who were admitted from September 2006 to June 2014. Patients aged 16–64 years were included in the younger group, while those aged ≥ 65 years were included in the older group. Nine variables that could be easily measured in the emergency department were subjected to stepwise logistic regression.

Results: In total, 617 patients met the inclusion criteria for this analysis. In the younger group, 38 patients needed MT, while 236 patients did not. In the older group, 64 patients required MT, while 279 patients did not. The area under the ROC curve (AUROC) for the TASH scores of the older group patients was 0.780, showing not moderately effective. The seven variables that significantly predicted the need for MT in elderly patients were heart rate ($>100/\text{min} = 1$ point), Glasgow coma scale score ($<14 = 1$ point), unstable pelvic fracture (7 points), open fracture in the long bone of the lower leg (6 points), FAST showing positivity (2 points), base deficit ($>4 \text{ mmol/L} = 1 \sim 3$ points), and lactate levels ($>2 \text{ mmol/L} = 1 \sim 2$ points). The AUROC was 0.856, showing moderate effectiveness.

Conclusion: This study findings suggest that MT prediction scores that attach great importance to the severity of anatomical symptoms are more effective in elderly trauma patients.

Disclosure: No significant relationships.

P175**THE LACTATE CLEARANCE IN MASSIVELY TRANSFUSED TRAUMA PATIENTS**

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Introduction: The massive transfusion is one of the important contents in the trauma resuscitation. However, there is no clear indicator to judge whether the resuscitation succeed or not. Rapid clearance of lactate is associated with improved outcome in patients with septic shock, but the efficacy of the lactate clearance in trauma resuscitation is unknown.

Materials and methods: We reviewed the records of adult trauma patients who admitted to our center from January 2008 to March 2014, admitted to ICU after definitive care, and were massively transfused. Lactate was checked at ER admission and ICU admission, and the lactate clearance was defined by the following equation: $(\text{Lactate}_{\text{ER}} -$

$\text{Lactate}_{\text{ICU}})/\text{Lactate}_{\text{ER}}) \times 100/\text{Time}_{\text{ER} \rightarrow \text{ICU}}$ (expressed as %/h). We assessed the ability of the lactate clearance to predict the early death (defined as death within 48 hours from ER admission) by AUC. Similar subgroup analysis was performed in the high initial lactate group ($\text{Lactate}_{\text{ER}} >/= 4 \text{ mmol/l}$: High Group) and the not high initial lactate group ($\text{Lactate}_{\text{ER}} < 4 \text{ mmol/l}$: Low Group).

Results: 124 patients were enrolled. There were 58 patients in the High Group, in which 16 patients died within 48 hours. There were 67 patients in the Low Group, in which 15 patients died within 48 hours. In all patients, AUC of the lactate clearance for early death was 0.853 (cutoff = -20.81 %/h). In High Group, AUC was 0.905 (cutoff = 0.06 %/h). In Low Group, AUC was 0.927 (cutoff = -22.69 %/h).

Conclusion: The lactate clearance can predict early death in massively transfused trauma patients, and it can be useful indicator for appropriate trauma resuscitation.

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Disclosure: No significant relationships.

P176**TRANSFUSION RELATED ABDOMINAL INJURY (TRABI) IN TRAUMA PATIENTS - A CASE REPORT AND REVIEW OF THE LITERATURE**

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Introduction: The abdominal compartment syndrome (ACS) is a known and dangerous complication in a wide variety of critically ill patients. It is characterized by a potentially life-threatening elevation of intra-abdominal pressure (IAP) over 20 mmHg, deteriorating several organ systems. Massive fluid resuscitation has been identified as one of the risk factors in the development of an ACS. The literature shows, that the time span from admittance to the hospital to development of a manifest ACS is usually greater than 24 hours.

Materials and methods: Case report and review of the literature.

Results: We report the case of a 74 old female patient with multiple fractures of the extremities and a B-type pelvic ring fracture in the absence of any intra-abdominal injuries after a traffic accident. Applying standardized resuscitation protocols, the patient received 12× packed red blood cells (PRBCs) and 3,5 l of crystalloids in the first 4 hours after trauma. This led to a breathing (B-) problem originating from a highly tense and rigorous abdomen. A mechanic cardiopulmonary resuscitation (CPR) had to be performed. After a crash laparotomy under CPR-conditions, 2 l of ascites-like fluid disgorged and the ventilation situation immediately improved.

Conclusion: With this report, we describe for the first time a case of secondary ACS in a trauma-patient, which was very likely associated with the massive-transfusion of PRBCs in a very short period of time. In accordance to the transfusion related acute lung injury (TRALI) and potential pathophysiological similarities, we coined the term transfusion related abdominal injury (TRABI).

References: 1. Balogh, Z., et al., *Secondary abdominal compartment syndrome: a potential threat for all trauma clinicians*. *Injury*, 2007. **38**(3): p. 272–9. 2. Atema, J.J., et al., *Clinical studies on intra-abdominal hypertension and abdominal compartment syndrome*. *J Trauma Acute Care Surg*, 2014. **76**(1): p. 234–40. 3. Daugherty, E.L., et al., *Abdominal compartment syndrome is common in medical*

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Disclosure: No significant relationships.

NEW TECHNOLOGY

P177

BIOMECHANICAL COMPARISON OF OSTEOSYNTHESIS AFTER TYPE III FRACTURE OF THE CORONOID PROCESS OF THE ULNA USING A NEW ELBOW TESTING DEVICE

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Introduction: The elbow is known as complex articulation and location of multiple fracture types. Even when statistically rare, functional outcome after fracture is often devastating. To evaluate new osteosynthetic techniques biomechanical testing devices close to reality are needed. After development of a new testing machine simulating dynamic, cyclic and physiological load during fracture healing this study was designed to evaluate this device in a comparison of coronoid process fractures and different osteosynthesis in cadaveric bones.

Materials and methods: 25 fresh human elbows were used with a minimal bone density of 100 mg/ccm. All soft-tissue except articular capsules were dissected. The coronoid fracture type III (Regan and Murrey) was cut and osteosynthesis performed with AO-miniplates or retrograde cannulated Screws. 9 elbows were used for calibration. Testing aim were 5.000 movements with a range of motion of 100° in a sinusoidal physiological way and a frequency of 0.67 hertz. The maximum torsion moment was 35.3 Nm (flexion) and 30.7 Nm (extension). Implant failure was defined as fracture movements (>2 mm) or brokage.

Results: Only 9 of 16 test joints reached 5.000 cycles (8/10 male, 1/6 female). There were no significant difference between plate and screws ($p = 0.47$), also age and bone density had no influence. Implant failure occurred significantly earlier in female joints.

Conclusion: This biomechanical comparison showed no difference between screw and AO-plate. The applied torsion moments correlate more likely to male and exceeded the typical female load of 20–50 %. Even the testing device is nearer than ever to reality further development is necessary for more adaptable results.

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Disclosure: No significant relationships.

P178

BIOMECHANICAL GROUNDING OF TROCHANTERIC FRACTURES FIXATION WITH PROXIMAL FEMORAL NAIL

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Introduction: For modern traumatology very important is choice of bone fragments fixation method ensuring optimal biomechanical and biological conditions for bone union, consequently the research is very essential.

Materials and methods: Using finite elements method based on Mize's loading intensity indexes, we studied bone-implant system conditions on models of fractures 31A1, 31A2 and 31A3 fixed with trochanteric IM nail fixed and two locking screws. Loading indexes were studied in fixing structures and in central and peripheral fragments of fracture area. For loading the model we accepted the loading of recalculated body mass $F = 750$ N (75 kg - average weight of human body is). For the maximum endurance we accepted the critical indications: 10–25 MPa for cortical layer, 3.5–4.5 MPa for cancellous layer, 568 MPa for steel fixing elements in fracture area, 590 MPa for titanium ones. Stress and strain calculations of bone-fixator 3D-model was performed with ANSYS software.

Results: Fracture surface loadings analysis revealed local tensions in models 31A1, 31A2 and 31A3 (23.42 MPa, 16.03 MPa and 17.24 MPa respectively). Maximum loadings on fixing structures in all fracture types was localized on first turns of upper locking screws (126.88 MPa, 98.51 MPa and 205.11 MPa respectively). Load concentrations for models 31A1 and 31A3 exceeded the bone tissue endurance limits in the lower screw insertion area - 15.14 MPa and 11.85 MPa respectively.

Conclusion: Fixation of IM nail with two screws for trochanteric fractures treatment is necessary only in case of 31A2. But 31A1 and 31A3 fractures do not require two screws for achieving stability.

References: ANSYS Workbench. User's guide. Release 12.1, 2009. - 124p.

Disclosure: No significant relationships.

P179

COMPREHENSIVE CHARACTERIZATION OF HUMAN SOMATIC STEM CELLS DERIVED FROM DIFFERENT TISSUES IN RESPECT TO BONE AND CARTILAGE TISSUE ENGINEERING

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Introduction: Somatic stem cells (SSCs) are characterized as undifferentiated cell with ability of long term self-renewing and plasticity. Due to these properties SSCs represent promising tool for regenerative medicine. The goal of this study was characterization and comparison of biological properties of SSCs obtained from bone marrow, adipose tissue and umbilical cord in respect to bone and cartilage tissue engineering.

Materials and methods: SSCs were isolated and cultured using standard protocols. They were maintained in D-MEM with 10 % of FBS and antibiotics up to the third passage. The proliferation was analyzed by CEDEX XS and expression of selected markers was assessed by flow cytometry. They were morphologically analyzed by inverted microscope and TEM. Pellet cultures and chondrogenic medium containing TGF- β were used to induce chondrogenic differentiation. Osteogenic differentiation was induced by osteogenic medium containing dexamethasone, L-ascorbic acid-2-phosphate and beta-glycerophosphate. Chondrogenic and osteogenic differentiation was analyzed by real-time PCR.

Results: SSCs from all sources were attached on the Petri dishes after 24 h and started to proliferate. After 7–10 days they reached 80 % confluence and were passaged. In next 3 passages they displayed fibroblastoid morphology. They showed similar kinetics of proliferation and shared expression of CD29, CD44, CD73, CD90, CD105 and CD166 and were negative for CD14, CD34, CD45 and HLA-DR. TEM showed similar morphology of all analyzed MSCs. Cells from all sources underwent chondrogenic and osteogenic differentiation.

Conclusion: SSCs from bone marrow, adipose tissue and umbilical cord share biological properties. They possess chondrogenic and osteogenic potential and therefore they may be utilized in cartilage and bone regeneration.

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Disclosure: No significant relationships.

P180

DENTAL TRAUMA: A TOOL FOR PREVENTIVE EDUCATION

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Introduction: The aim of the study was to conduct a literature review of dental injuries with making an informative video, serving as teaching material and to guide patients who are treated at the clinics of the Faculty of Dentistry, of the Federal Fluminense University.

Materials and methods: A literature search was conducted and papers were selected from the database of the Coordination of Improvement of Higher Education Personnel (Capes), using dental injuries and dental trauma as descriptors. Fifty-two articles were

found, and we excluded those who did not have all the information needed for analysis.

Results: As for the types of fracture, it can be stated that the crack and/or enamel fractures are the most frequent type of injury, followed by avulsion fracture of enamel dentin without pulp exposure, complicated crown fracture, luxation extrusive, intrusive luxation, lateral luxation. In general, when it comes to dental trauma, there is a higher prevalence in males, aged between 1 and 29 years. The most affected teeth are the upper central incisors. The most common site of injury is the street and the most common cause is the fall.

Conclusion: This survey contributes to the work of preventing such accidents since the disclosure of such data promotes knowledge and the possibility of creating a preventive education in the target audience.

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Disclosure: No significant relationships.

P181

EXTRAARTICULAR DISTAL HUMERAL FRACTURE - CASE REPORT

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Introduction: Fractures of the distal humerus in adults are often challenging. The focus of this article is comminuted extraarticular distal humeral fracture. The principal objective of treating extraarticular distal humeral fractures is restoring alignment and achieving stable fixation aimed at facilitating early elbow range of motion, essential for a good functional outcome. However, fixation of these fractures remains a challenge due to the restricted space for instrumentation at the distal segment and the need to maintain repair integrity under a large range of motion and low to moderate loading.

Materials and methods: The article presents a case of non-union extraarticular distal humerus fracture with extensive comminution as a failed state after plate osteosynthesis done in a regional hospital a year before. Reosteosynthesis of non-union distal humeral fracture was performed with anatomically pre-configured LCP plate for distal tibia on radial column and reconstruction plate on ulnar column with autologous bone grafting. Reviewing of literature we have not found an article where the LCP plate for distal tibial fracture was used for treatment of acute or non-union distal humerus fracture.

Results: Patient is monitored on an outpatient controls. Radiological images and photo documentation of the final functional status were presented. After a year the non-union has healed.

Conclusion: Poor initial fixation distal humeral fracture, which is not easily manageable in the presence of extensive comminution, can be the main factor for hardware failure. Maximizing stability between

the distal fragments and the shaft of the humerus at the metaphyseal level should be the focus of the fixation strategy.

References: 1. Prasarn ML, Ahn J, Paul O, Morris EM, Kalandiak SP, Helfet DL, Lorig DG. Dual plating for fractures of the distal third of the humeral shaft. *J Orthop Trauma* 2011;25(1):57–63. 2. Jawa A, McCarty P, Doornberg J, Harris M, Ring D. Extra-Articular Distal-Third Diaphyseal Fractures of the Humerus. A Comparison of Functional Bracing and Plate Fixation. *J Bone Joint Surg Am* 2006 Nov;88(11):2343–7. 3. Sabalic S, Kodvanj J, Pavic A. Comparative study of three models of extra-articular distal humerus fracture osteosynthesis using the finite element method on an osteoporotic computational model. *Injury*. 2013 Sep;44 Suppl 3:S56–61.

Disclosure: No significant relationships.

P182

GRADUAL CORRECTION OF LOWER LIMB POSTTRAUMATIC ANGULAR DEFORMITIES USING UNICORTICOTOMY AND MITKOVIC TYPE V EXTERNAL FIXATOR

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Introduction: Posttraumatic deformities of lower limb are desirable to be corrected as soon as possible because of gait normalization and also to prevent further osteoarthritis process. Gradual correction of these deformities by external fixation is a method with minimal invasive surgery.

Materials and methods: In presented group of four patients with posttraumatic angular deformities of femur and tibia unicorticotomy and gradual angular correction by Mitkovic type external fixator had been performed at Clinic for orthopaedic surgery and traumatology in Clinical center Nis, Serbia. This type of external fixator has hinge joint on the bar. One model of this external fixator perform indirect correction by distraction-device and other model has device for direct control of angle in the bar's hinge joint.

Results: Average value for operative time was 49 min and for hospitalisation was 7.5 days. Two superficial infections at paroxysmal pain on tibia were occurred. After pin removal and everyday wound toilette infection was retired. In one patient with distal femur deformity mild contracture had occurred. After physical therapy this patient had better knee range of movement. There were no thrombosis after surgery.

Conclusion: Unicorticotomy and external fixation using hinged bar had been approved as an advisable method for correction of lower limb posttraumatic angular deformities regarding to operative time and functional results.

References: Milenkovic S, Mitkovic M, Radenkovic M, Stanojkovic M, Mcic I, Karalejic S: Open wedge osteotomy and callus distraction by means of the external fixator in distal femur and proximal tibia in knee arthrodesis with valgus and varus deformity. *Srp Arh Celok Lek* 2004 Sep-Oct;132(9–10):318–22.

Disclosure: No significant relationships.

P183

HUMAN PSUEDOARTHROSIS TISSUE CONTAINS CELLS WITH OSTEOGENIC POTENTIAL

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Introduction: Nonunion is a challenging problem that may occur following certain bone fractures. The treatment of nonunion is closely related to the type of nonunions. Among various types of nonunions, the result of treatment for pseudoarthrosis was reported to be especially poor. Furthermore pseudoarthrosis is a distinct pathologic entity which is histologically and grossly different from the other type of nonunions. To understand the pathology of pseudoarthrosis, we investigated the cellular properties of pseudoarthrosis tissue-derived cells (PCs) in vitro.

Materials and methods: PCs were isolated from four patients suffering from pseudoarthrosis and cultured as previously reported [1]. Cells were evaluated for cell-surface protein expression using flow cytometry. Osteogenic differentiation capacity was assessed by alkaline phosphatase (ALP) activity assay, reverse transcription polymerase chain reaction, and mineralization assay after osteogenic induction.

Results: PCs were consistently positive for mesenchymal cell-related markers, CD29, CD44, CD105. The level of ALP activity under osteogenic conditions was significantly higher than that under control conditions. Gene expression of ALP, runt-related transcription factor 2, osterix, osteocalcin, and bone sialoprotein were observed in PCs cultured under osteogenic conditions. Alizarin Red S staining revealed that PCs formed a mineralized matrix rich of calcium deposits after osteogenic induction.

Conclusion: We have shown for the first time the cellular properties of pseudoarthrosis. Our results indicated that osteogenic cells still exist in the pseudoarthrosis tissue. This study might provide insights into understanding the pathology of pseudoarthrosis and improving the treatment of pseudoarthrosis.

References: [1] Iwakura T, et al. *J Orthop Res* 2009;27:208–215.

Disclosure: No significant relationships.

P184

IMPROVED WOUND HEALING IN ACUTE WOUNDS OF NONDIABETIC WITH LOCAL USE OF INSULIN

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Introduction: The vascularization plays a critical role in wound healing. New therapies provides a strategy to enhance angiogenesis and improve wound healing. The aim of this study was to investigate the effect of local insulin administration in acute nondiabetic wounds.^{1–2}

Materials and methods: Ten nondiabetic patients presenting with full-thickness acute wounds. Five by trauma, three by burn, and two by pressure. The wounds were divided into two parts of equal size; and a randomization table was used to select the side where insulin was going to be applied. After débridement of the wound, 10 units of neutral protamine Hagedorn insulin was applied daily in the selected zone, which corresponds to 1-cm² middle region at a depth of 1 to 2 mm in the center of the area; saline was applied in the other part of the wound. Insulin was applied 1 hour after breakfast. Capillary blood glucose was measured 3 hours after the insulin was applied. Biopsy specimens of the two sides were obtained on days 0 and 14. The presence of amount of blood and fibrosis were evaluated.

Results: Significant differences in the number of vessels were observed on the insulin-treated side (107 ± 55.73) when compared with the saline side (64.4 ± 42.95) ($p < 0.046$). The percent of fibrosis (insulin 66.3 ± 21.5 versus saline 57.1 ± 63.5) without significant differences. No adverse events related to the study occurred.

Conclusion: Our results show how the use of local insulin improves the formation of blood vessels, without adverse event. Future studies that include investigate the dosing and treatment.

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Disclosure: No significant relationships.

P185

IS NANOTECHNOLOGY THE NEXT BIG STEP: REVIEWING A CONCEPT, ITS LIMITATIONS AND POSSIBLE APPLICATIONS IN TRAUMA CARE

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Introduction: Not only have we seen a rise in nanotechnology with the turn of the millenia, we have also started to approach trauma patients with understanding of tissue biology. Nanotechnology currently seems to be the next logical step into a future concept of molecular level patient treatment. This work shall focus on its possible applications in trauma care.

Materials and methods: A thorough literature review was made in order to obtain an all around knowledge of the current advances in nanotechnology. Thorough brainstorming and debate the authors assessed how nanotechnology could aid the surgeon in his everyday routine. Emphasis was given to performing everyday procedures less invasively, difficult procedures with less effort and performing new

procedures enabled by nanotechnology.

Results: We have found many theoretical advantages nanotechnology could offer a surgeon in the fields of osteosynthesis, arthroplasty, ligament reconstruction, surgical infections, haemostasis, scar management etc. Sadly, the greatest limitation of nanotechnology still seems to be nanotechnology itself, as it is not yet patient ready on a global scale. Consequently, there is insufficient data regarding effectiveness, short/long term results.

Conclusion: Nanotechnology could provide progress in trauma care patient management. In theory, it promises to ease everyday surgery, but In order to fully understand the application of technology and more importantly - its practical limitations, additional data and research is needed.

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Disclosure: No significant relationships.

P186

LOCAL DELIVERY OF CEFAZOLIN USING CALCIUM PHOSPHATE CEMENT: AN IN VITRO STUDY

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Introduction: Antibiotic therapies for open fractures target gram-positive cocci, including methicillin-susceptible *Staphylococcus aureus*, which are also important pathogens for post-traumatic osteomyelitis. Intravenous administration of cefazolin (CEZ) is the standard treatment protocol. The purpose of this study was to assess the feasibility of local delivery of CEZ using calcium phosphate cement (CPC).

Materials and methods: Biopex-R Advance® CPC (Hoya) was prepared by mixing the CEZ (0.25 g) with the powder component (12 g) and then with either 3.4 mL of the liquid component (soft condition, CPC-S) or 2.8 mL (hard condition, CPC-H). Polymethyl-methacrylate (PMMA) cement (Surgical Simplex P®, Stryker) was used for comparison by mixing CEZ (0.25 g) with the powder (12 g) and liquid (6 mL) components. Each test specimen ($n = 5$) was immersed in phosphate-buffered saline, and the eluates obtained were evaluated by high performance liquid chromatography. The compressive strength and pore-size of each specimen were evaluated.

Results: The average elution concentrations of CEZ on days 1, 3, and 7 were 335.3, 21.4, and 2.5 in the CPC-S; 149.6, 13.3, and 1.0 in the CPC-H; and 30.0, 0.93, and 0.95 µg/mL in the PMMA. Compared with cement without CEZ, the compressive strength of CPC-S was 65.3 % and that of CPC-H was 68.3 % on day 1. The average pore diameter was largest in the CPC-S and smallest in the PMMA.

Conclusion: CPC may be clinically useful for local delivery of CEZ. This in vitro study suggests that CPC elutes more CEZ than PMMA, likely owing to larger pore sizes.

Disclosure: This study was conducted by collaboration with Hoya.

P187

MATCH FOR AUTOMOBILE ACCIDENT REDUCTION ~ ANALYSIS OF THE SUB MARINE WITH COMPUTER SIMULATION AND THE SUB MARINE GENERATION RISK WHICH IS SEEN FROM THE COEFFICIENT OF FRICTION OF THE FIBER

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Introduction: Recently, the injury form of motor vehicle driver changed according to improvement of motor vehicle. In spite of any abdominal injury reports with seat belt due to submarine position. Actually the coefficient of friction by the fiber of the car sheet and the pants which have been used is beneficial in order to prevent the submarine.

Materials and methods: Because submarine is important for automobile accident, we analyzed the effects of both the reclining angle of an occupant seat and slipping between hip, computer simulations were carried out using multi-body models of whole-body of a human. And we measured the coefficient of friction of the pants with the seat in the real world. Was measured for each of the 108 patterns sexual friction and dynamic friction relationship between nine pants and six sheet material.

Results: Simulation studies showed that compression of the abdomen occurs due to upward sliding of the lap belt in the case of a “submarine” belt with a lower friction coefficient between the hip and a more backward recline of the seat back. And we showed that the friction coefficient of more than three times born by the material of the pants and the material of the sheet. The coefficient of friction, from maximum 1.33 to minimum 0.38. Dynamic friction was from maximum 1.23 to minimum 0.43. This difference shows the big change of motor vicle driver movement with simulation.

Conclusion: We shown submarine prevention measures in the real world from the friction measurement of material and risk factor of submarine with computer simulation for automobile accident reduction.

Disclosure: No significant relationships.

P188

NEW EXTRA-ARTICULAR TECHNIQUE FOR INTRAMEDULLARY NAILING OF TIBIAL FRACTURES

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Introduction: The conventional semiextended nailing technique damaged the cartilage. While small capsular tears often occurred with the extra-articular technique. We describe a new extra-articular technique that does not violate the capsule and the cartilage.

Materials and methods: The curvilinear incision begins at the medial border of the middle of the patella to the tibial tubercle and dissected above the capsule. We evaluated the capsular tear, anterior knee pain and the knee range of motion in 5 patients.

Results: There were no the capsular tear and anterior knee pain. All patients had the full range of motion.

Conclusion: This new extra-articular technique may not occur the articular cartilage damage and the capsular tear and may eliminate the concern about intra-articular reaming debris. We believe this technique could get over the all complications previously.

References: Erik N. et al.: Extra-articular technique for semiextended tibial nailing. J OrthopTrauma. 24(11), 2010.

Disclosure: No significant relationships.

P189

NONOPERATIVE TREATMENT OF STABILE WEBER-B FRACTURES JUDGED BY WEIGHTBEARING RADIOGRAPHS

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Introduction: Next to gravity stress radiographs, the stability of type Weber B lateral malleolar fractures with regard to nonoperative treatment can be judged by weightbearing radiographs.(1) The technology has been successfully used for our patients for 6 years.

Materials and methods: The stability in 88 patients with type Weber B lateral malleolar fractures was evaluated by gravity stress and weightbearing radiographs. 7 patients were lost to follow-up. Functional outcome after 1 years was assessed by FFI, SF36 und AOFAS scores. Ankle arthrosis and stability were evaluated by radiographs.

Results: 85 type Weber B lateral malleolus fractures were judged stable by weightberaing radiographs, only 54 by gravity stress radiographs. 3 patients were treated operatively. All patients available for follow-up had good and excellent functional outcomes, and neither onset or progression of ankle arthrosis, nor instability was seen at 1 year follow-up radiographs.

Conclusion: Weightbearing radiographs allow appropriate judgment of ankle stability for non-operative treatment of type Weber B lateral malleolus fractures. By applying the new technology indication for nonoperative treatment of this fracture type can be extended.

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Disclosure: No significant relationships.

P190

OPTIONS OF FIXATOR-ASSISTED INTERNAL FIXATION IN PERIPROSTHETIC FRACTURES OF THE FEMUR

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Introduction: Gaining of proper length and alignment in periprosthetic femoral fractures, nonunions and deformations can be problematic. Fixator-assisted technique can be helpful but its use in different periprosthetic fracture patterns have not yet been defined. Aim of our study was to define optimal implementation of fixator-assisted internal fixation in femoral periprosthetic fractures.

Materials and methods: Fixator-assisted internal fixation was used in the treatment of 64 patients with periprosthetic fractures about total hip implants (52) with stable (20/52) and loose stems (Vancouver B2 and B3) – 32/52, in 19/32 with stem subsidence, and 12/64 fractures above total knee prostheses. Locked intramedullary nails with connection to the stem were used for definitive stabilization in fractures about total hips (52/64). In fractures above knee implants (Rorabeck-Lewis II) antegrade nailing was performed (10/12). Plating was used in 2/12 cases of interprosthetic fractures. Simplified Ilizarov frames were used to gain alignment and length.

Results: Frame application allowed to restore length and alignment of the segment in cases of stable stems (B1 and C). In loose stems (B2 and B3) not only fixation was performed but also reduction of subsided stems (19/19) and correction of pre-existed deformity and acute femoral lengthening up to 3 cm (8/32). Three main frame types were defined.

Conclusion: Fixator-assisted internal fixation provides easy control of length and alignment including reduction of subsided stem and lengthening of the femur in periprosthetic fractures. Position of the stem tip inside or outside medullary cavity and Vancouver classification appear to be key factors defining optimal frame configuration.

Disclosure: No significant relationships.

P191

PLATE AUGMENTATION FOR FEMORAL NONUNIONS: MORE THAN JUST A SALVAGE TOOL?

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Introduction: Plate augmentation over a retained intramedullary nail is emerging as a viable care plan for managing selected femur fracture nonunions. Rigid stability is achieved and the open approach necessary for application allows for the opportunity for biologic supplementation and deformity correction when necessary. This study will evaluate the largest series to date of femoral nonunions treated with augmentation plating over an intramedullary nail, and to assess the efficacy of this technique as a primary nonunion reconstruction versus a salvage procedure when for example dynamization or exchange nailing has failed.

Materials and methods: A multicenter retrospective study was conducted of all femoral nonunions treated operatively at three institutions from 2006 to 2014. The first study cohort of patients were managed with plate augmentation as a primary nonunion reconstruction. The second study cohort consisted of patients that had multiple attempts at union (>2) before the plate augmentation strategy was employed. Thirty patients were identified, 15 treated with plate augmentation as their primary nonunion procedure and 15 patients treated with multiple procedures, such as dynamization and exchange nailing, prior to plate augmentation.

Results: Fracture union was achieved in 100 % of the patients treated with the primary procedure of plate augmentation for femoral nonunion. Fracture union was achieved in 100 % of the patients treated with plate augmentation following multiple salvage procedures.

Conclusion: Plate augmentation as a primary procedure for femoral diaphyseal nonunions is as effective as when used as a salvage procedure after multiple surgeries have been performed. Union occurred reliably with few complications.

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Disclosure: No significant relationships.

P192

RADIOLOGICAL EVALUATION OF INTRAMEDULLARY NAILING FOR THE PROXIMAL AND DISTAL TIBIAL FRACTURES

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Introduction: It is sometimes difficult to achieve good alignment of fracture site in intramedullary nailing for metaphyseal fractures. The purpose of this study is to evaluate radiological findings of the proximal and distal tibial fractures treated with intramedullary nail in our hospital.

Materials and methods: 16 consecutive patients of proximal and distal tibial fractures treated with intramedullary nail were examined. In 5 cases, external fixator was applied as primary treatment and two staged surgery was performed. In two cases, fasciotomy was done at primary surgery for compartment syndrome. For these cases, time to bony union was assessed and mediolateral and anteroposterior alignment of fracture site were measured.

Results: Delayed union which required over 6 months to bony union was seen in two cases excluding one pathological fracture. Over 5 degrees of angulation in anteroposterior view was seen in one distal tibial fracture. There were no cases of over 5 degrees of angulation in lateral view.

Conclusion: Intramedullary nailing is sometimes selected for proximal and distal tibial fractures because of less invasiveness for surrounding soft tissues and possibility of early weight bearing. Suprapatellar approach is useful for proximal tibial fractures because flexion deformity can be avoided. In distal tibial fractures, radiation free distal locking of intramedullary nails by electromagnetic tracking measurement system is effective procedure not to be interfered with reduction clamp or plate for fibula fracture.

References: Hoffmann M et al. next generation distal locking for intramedullary nails using an electromagnetic X-ray-radiation-free real-time navigation system. *J Trauma Acute Care Surg*. 73: 243–248, 2012

Disclosure: No significant relationships.

P193
THE ROTATIONAL THROMBOELASTOMETRY IS AN ACCURATE MEASURE TO DIAGNOSE TRAUMA INDUCED DISSEMINATED INTRAVASCULAR COAGULATION (DIC)

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Introduction: The aim of this study is whether the rotational thromboelastometry (ROTEM[®]) accurately evaluate the status of trauma induced DIC diagnose based on JAAM DIC criteria.

Materials and methods: 36 blunt trauma patients transported to the Saga University Hospital with ROTEM performed in the emergency department from January 2013 to August 2014 were enrolled in this study. All patients were divided into two groups based on the presence of DIC diagnosed according to JAAM DIC criteria. ROTEM findings (EXTEM/FIBTEM) were retrospectively analyzed in each group. We further evaluated as to what factor within the JAAM DIC criteria is most strongly correlated with trauma induced DIC.

Results: Twelve patients were diagnosed DIC by JAAM DIC criteria. There were statistical significances in the clot amplitude at 5–30 min (A5-30) of EXTEM/FIBTEM ($p < 0.001$ - $p = 0.023$), maximum clot firmness (MCF) of EXTEM/FIBTEM ($p = 0.004/0.018$), clot formation time (CFT) of EXTEM ($p = 0.005$), alpha angle ($p = 0.003$) of EXTEM and lysis index at 45 and 60 min (LI45/60) of EXTEM ($p = 0.011/0.017$) in the DIC group. The international normalized ratio of prothrombin time (INR) of 1.2 or more had the most significant correlation with DIC ($p < 0.001$), and it showed the highest accuracy (86.1 %) and specificity (100.0 %) among all factors of JAAM DIC criteria.

Conclusion: The clot amplitude of EXTEM/FIBTEM and CFT/alpha angle and LI45/60 of EXTEM are reliable predictors to diagnose trauma induced DIC. Furthermore, the INR of 1.2 or more is the highest accurate parameter among JAAM DIC criteria for the diagnosis of trauma induced DIC.

References: Gando S, et al. Natural history of disseminated intravascular coagulation diagnosed based on the newly established diagnostic criteria for critically ill patients: Results of a multicenter, prospective survey. Crit Care Med 2008;36:145–150.

Disclosure: No significant relationships.

P194
USE OF A PEG-COATED COLLAGEN PATCH FOR SUTURELESS REPAIR OF SEVERE ARTERIAL BLEEDING IN A PORCINE MODEL OF CARDIOVASCULAR SURGERY

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Introduction: A novel polyethylene glycol-coated collagen patch (PCC, Hemopatch) has been successfully used for treatment of bleeding from parenchymal and peripheral vascular lesions in non-clinical surgical models (1). However, PCC has not been evaluated

for the sutureless treatment of severe arterial bleeding. Therefore, the efficacy of PCC and a fibrin-thrombin coated collagen patch (FTC, TachoSil) were compared using a porcine aortotomy model.

Materials and methods: Nine heparinized pigs were subjected to a series of full thickness incisions of the thoracic aorta. The lesions were subsequently treated according to a randomized scheme with either PCC ($n = 28$) or FTC ($n = 29$). Hemostatic success was assessed up to 10 minutes after application.

Results: Overall median pre-treatment bleeding rate after aortotomy was 150 (37–292) mL/minute at a systolic blood pressure between 95 and 105 mmHg. Time to hemostasis between PCC and FTC controlling for differences in pre-treatment bleeding rates was significantly different ($p < 0.001$). Statistical model-estimated time to hemostasis was 19 times longer with FTC compared with PCC with a corresponding two-sided 95 % confidence interval of 4–82. FTC provided 24 % hemostatic success within 3 minutes, the minimum manufacturer recommended application time. In contrast, PCC provided 96 % hemostatic success within 2 minutes and 100 % hemostatic success within 3 minutes.

Conclusion: The combination of the procoagulant collagen with the synthetic sealing component (PEG based cross-linker) provides rapid and firm adhesion to tissue. Under the conditions of this study, PCC provided superior hemostasis compared to FTC. Furthermore, treatment with PCC alone, without suturing, successfully controlled severe arterial bleeding in a porcine aortotomy model.

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Disclosure: B.B., G.L., J.M., and K.M.L. were employees of Baxter Healthcare Corporation at the time of this work. A.B. was an employee of Baxter Innovations GmbH at the time of this work.

NECROTIZING SOFT TISSUE INFECTIONS
P195
COMPLEX TREATMENT OF COMPLICATED CRURAL DECOLLEMENT INJURY IN A DIABETIC PATIENT

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Introduction: Treatment of diabetic wounds is a big burden to surgical units. We present a case requiring complex soft-tissue management after suffering lower-limb trauma.

Materials and methods: A 68-year-old male patient with trimalleolar fracture and massive soft-tissue contusions was admitted to a lower-level trauma unit after a forklift accident. Following fracture-fixation the wounds were closed. The extensive decollement was undiscovered and no adequate treatment was initiated. A few days later the patient was referred to our department. On admission the patient was septic with unstable glycaemic status, showing signs of extensive necrosis of the crural soft-tissues.

Results: Extensive surgical debridement was performed including removal of the necrotised skin. Microbiological analysis of the swab samples showed a mixed bacterial infection. After consultation the adequate antibiotic treatment was introduced. Surgical debridement and jet lavage was repeated every 2 days for the first 10 days,

followed by 2 weeks of VAC therapy. With the assistance of a plastic surgeon the skin was treated with Integra® skin-replacement system, followed by split-thickness skin grafting. During the hospital stay patient's compliance drastically dropped, requiring psychological support. Repeated removal of his dressings resulted in fly larvae growing in the skin-grafted area. Bioptron light therapy and D'oxyva® treatment was applied to enhance wound-healing. After 3 months of treatment the patient was discharged home in good condition.

Conclusion: Multidisciplinary approach is mandatory to avoid amputation of a limb with massive soft-tissue damages in a diabetic patient after skeletal trauma. Even a serious soft tissue damage can heal after applying adequate therapy.

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Disclosure: No significant relationships.

P196

NECROTIZING ENTEROCOLITIS: ONE YEAR EXPERIENCE AT TANTA UNIVERSITY HOSPITAL, EGYPT

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Introduction: Necrotizing enterocolitis (NEC) is the most common gastrointestinal surgical emergency among neonates. Aim of this study is to assess epidemiology, management, and outcome of NEC.

Materials and methods: A prospective study on 20 cases, aged between 1-30 days (10 full-terms and 10 preterm) with NEC among NICU admissions. According to modified Bell's classification, stage III cases were treated surgically (peritoneal drainage and/or laparotomy). All results were statistically analyzed by SPSS, v16.

Results: Incidence of NEC in our study was 8.5 % with mean presenting-age 11.8 days and mean gestational age 34.9 weeks. Abdominal distension was a constant presenting feature in all the cases, respiratory distress was observed in 12 cases and 8 cases presented with neonatal sepsis in the form of hypothermia and lethargy. Thrombocytopenia and hyponatremia were present in the twenty cases, metabolic-acidosis in 18 cases and CRP was positive in 16 cases. Pneumo-peritoneum was found in all the cases while free intraabdominal fluid was present in 14 and pneumatoisis-intestinalis in 3 cases. Between the 20 cases of stage III; 6 cases subjected to immediate Laparotomy (33.3 % survival), 14 cases treated with peritoneal drainage, 4 survived, 2 cases were in need for subsequent laparotomy and survived. Stoma formation was done in 4 cases, resection & primary anastomosis in 1 case while primary repair in 3 cases. The overall survival in the study was 40 %.

Conclusion: Early diagnosis and intensive medical and surgical treatment were mandatory to minimize both morbidity and mortality

from NEC. However, the optimum choice between peritoneal drainage and laparotomy remains controversial.

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Disclosure: No significant relationships.

P197

NECROTIZING FASCIITIS OF THE CHEST WALL AFTER SPINAL SURGERY

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Introduction: Necrotizing fasciitis (NF) is a bacterial infection of the soft tissues with a fulminant course and a high mortality rate. Early diagnosis is essential and it may require emergent surgery with aggressive surgical debridement.

Materials and methods: We present a case and we made a bibliographic review.

Results: Clinical case: a 16-year-old male with Duchenne muscular dystrophy and scoliosis of dorso-lumbar spine with convexity to right of T8 over L3 was scheduled for surgery. Six days after surgical wound showed erythema and large volume drainage. Two weeks later scheduled surgery patient presented thoracic pain with signs of septic shock that include tachycardia, hypotension that required resuscitation with energetic fluid expansion and high doses of vasopressor agents, hypothermia, and high levels of PCR, procalcitonin and leukocytes. We performed a thorax scan that release cellulitis, unlimited fluid collection and the presence of gas in the soft tissues of chest wall and mediastinum. Surgical emergency involving debridement of the affected areas, aggressive antibiotic therapy and hyperbaric oxygen treatment were done with clinical improvement.

Conclusion: Necrotizing fasciitis (NF) is a bacterial infection of the soft tissues with a fulminant course and a high mortality rate. Early recognition, immediate surgical debridement, aggressive antibiotic therapy and support of systemic effects of NF are essential to decrease morbidity and mortality. Only early recognition and surgical treatment will improve the prognosis.

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Disclosure: No significant relationships.

ENDOVASCULAR THERAPIES/WHO STOPS THE BLEEDING?

P198

ANTICOAGULANTS IN THE PREVENTION OF VENOUS THROMBOSIS AND EMBOLISM DURING ORTHOPEDIC OPERATIONS: RUSSIAN EXPERIENCE

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Introduction: The problem of development of venous thrombosis and thromboembolism (VTE) currently remains a huge problem in the field of traumatology and orthopedics, and especially in emergency trauma care. Analyzed the possibility of using oral anticoagulants in patients after hip or knee joints and after operations, conducted an emergency based on the Russian experience.

Materials and methods:

Currently in the Russian Federation registered and can be used for clinical practice for the prevention of VTE after major orthopaedic surgeries following anticoagulants:

- low molecular weight heparins: dalteparin, nadroparin, enoxaparin,
- fondaparinux,
- dabigatran etexilate,
- rivaroxaban,
- apixaban,
- vitamin K antagonists (warfarin) in RF patients and orthopaedic profile is used to extend the course of thromboprophylaxis after parenteral anticoagulants.

Results:

In 2012, N. Rosencher with co-authors presented the results of two independent meta-analyses, which summarizes the effective-ness and safety data anticoagulants obtained in randomized phase III studies, including 5292 patients after knee or hip joints. Conducted observational research on the use of dabigatran at a dose of 220 mg per day after the holding of THA and TKA.

Conclusion: Because of dabigatran etexilate, rivaroxaban and apixaban efficiency comparable with that of low molecular weight heparins, the ease of use exceed all parenteral anticoagulants, and safety of warfarin, especially in the treatment of patients at the outpatient stage, the new anticoagulants can be considered as a new “gold standard” for use in patients undergoing knee or hip joints, and in particular dabigatran etexilate because it has minimal side effects.

References: 1. Dahl, O.E. Efficacy and safety profile of dabigatran etexilate compared with enoxaparin in primary venous thromboembolism prevention after total knee or hip replacement surgery in patients over 75 years/O.E.Dahl [et al.]//Blood. – 2008. – Vol. 112. 2. Dahl, O.E. Efficacy and safety profile of dabigatran etexilate for the prevention of venous thromboembolism in moderately renally impaired patients after total knee or hip replacement surgery/O.E. Dahl [et al.]//Blood. – 2008. – Vol. 112.

Disclosure: No significant relationships.

P199

BLUNT AORTIC INJURY: CASE REPORT

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Introduction: Blunt aortic injury (BAI) is a rare condition in the emergency room (ER) since most patients have instant death at the scene of the accident. Most literature found results from individual case reports making the clinical approach controversial and raising difficulties in creating a uniform classification and management of these patients. Surgical treatment of patients with abdominal trauma involving the aorta presents as a challenge to vascular surgeons but had an enormous expansion with the dawn of endovascular treatment options.

Materials and methods: Case report of a patient, male, 19 years old, victim of motor vehicle collision, that arrives at the ER with back pain and hemodynamic stability. Abdominal computed tomography reveals an intramural hematoma and dissection of the infrarenal aorta with concomitant fracture of the lumbar 1 (L1) vertebra.

Results: The patient was submitted to an endovascular treatment – implantation of a infra-renal aortic stent graft, and L1 fixation was done 3 days latter. He was discharged under anti-platelet aggregation and is free of disease at 1 year follow-up.

Conclusion: Medical treatment and conventional surgery of BAI are now relegated to a second plan. Endovascular treatment is safe and has excellent results. Systematic review of the literature allowed the creation, by the Society for Vascular Surgery, of a simple classification in 4 grades – I: intimal tear, II: intramural hematoma, III: pseudoaneurysm, IV: rupture - with prognostic and treatment options implications. Morbility and mortality rates decreased significantly with minimal invasive resolution of vascular life threatening conditions allowing the promptly resolution of concomitant major lesions.

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Disclosure: No significant relationships.

P200

EXTENSIVE ISOLATED INFERIOR VENA CAVA INJURY FOLLOWING BLUNT ABDOMINAL TRAUMA: A PERSPECTIVE IN SURGICAL STRATEGY

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Introduction: Although endovascular treatment has been addressed in the management of vascular trauma, surgery is the mainstay in IVC injury as endovascular technique for venous system has not developed widely. We report a case of successful surgical repair of extensive IVC laceration following falling down.

Materials and methods: Case: A 31-year-old woman was brought in our emergency department (ED) following falling down from a height of 7th floor 30 minutes ago. Initial blood pressure in ED was 60/40 mmHg. Initial trauma radiographs revealed multiple fractures on extremities and pelvic. CT scan showed no signs of hollow viscous organ injury but huge retroperitoneal hematoma and active bleeding around the infrarenal IVC was seen. The patient was immediately taken to the operating theatre for exploration. For proximal and distal vascular control, both iliac veins were exposed and a medial visceral rotation from the right side was carried out to expose IVC. After hematoma around IVC was carefully dissected, active bleeding from hematoma continued and IVC laceration of anterior wall in length of 5 cm from infrarenal IVC to iliac bifurcation was identified. Even though proximal and distal vessels were controlled, hemorrhage from lumbar veins and internal iliac veins were not controlled well and continued. Using several sponge sticks and suctions, laceration was visualized and closed with a continuous 5-0 Prolene suture.

Results: The patient recovered well and discharged healthy without any complication.

Conclusion: In case of extensive IVC injury, surgical repair is technically feasible and safe strategy.

Disclosure: No significant relationships.

P201

IATROGENIC TRAUMA OF THE FEMORAL ARTERY WITH ACUTE SURGERY

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Introduction: The common femoral artery is the most common access point for heart catheter and peripheral angiography. We reviewed our data with respect to acute surgery after angiography via the common femoral artery.

Materials and methods: Between January 2002 and June 2012 there were 197 acute surgical procedures in 190 patients. Our database and written patient documents were reviewed retrospectively.

Results: Indications for the angiography were heart catheter 65 %, peripheral revascularisation 19.3 % and others 15.7 %. Complications were pseudoaneurysms 38.1 %, haematoma 23.4 %, active bleeding 20.1 %, dissection with ischemia 1.5 % and others 16.2 %. The surgical procedure was direct closure and removal of the haematoma 60.4 %, direct closure 15.7 %, removal of the haematoma 7.1 %, implantation of a peripheral bypass 1 %, femoral artery interposition 1 % and others 14.7 %. Additionally there are some cases with acute bleeding that did not reach theatre in time. We do not have data of those cases.

Conclusion: Surgical complications after angiography via the common femoral artery are rare, but in case they represent a life threatening situation. Any possible effort should be done to reduce the complication rate like extensive guided training with ultrasound support.

Disclosure: No significant relationships.

P202

MASSIVE HEMOTHORAX DUE TO CENTRAL VENOUS CATHETERIZATION TREATED WITH ANGIOGRAPHIC STENT IMPLANTATION

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Introduction: Central venous catheterization is widely used procedure. In surgical patients, central venous catheterization is performed for massive fluid resuscitation in hypovolemic shock, massive transfusion, total parenteral nutrition, central venous pressure monitoring, hemodialysis and so on. But, many complications are developed in central venous catheterization. These complications are pneumothorax, hemothorax, hematoma, hydrothorax, hydromediastinum, air embolism, thrombosis, infection and myocardial puncture. Among these complications, hemothorax is rare but fatal complication when developed.

Materials and methods: Here, we present a rare case of massive hemothorax during central venous catheterization. We successfully treated with angiographic stent graft implantation.

Results: Here, we present a rare case of massive hemothorax during central venous catheterization. We successfully treated with angiographic stent graft implantation. We describe such a rare case with a review of the literature so that lethal complication of central venous catheterization like hemothorax and adequate treatment should be understand.

Conclusion: Multicenter study and consensus should be needed to decide proper treatment for hemothorax due to central venous catheterization.

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Disclosure: No significant relationships.

P203

NON-OPERATIVE MANAGEMENT OF SPLENIC TRAUMA – THE ADVANTAGE OF ANGIOEMBOLIZATION

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Introduction: The treatment of blunt abdominal trauma has significantly changed over time due to a multidisciplinary approach and an increased accuracy in imaging methods. Angioembolization in splenic trauma is a major achievement that can provide an excellent clinical outcome with bleeding resolution and spleen preservation using less invasive manoeuvres. It can decrease by 20 % the failure rate of non-operative management (NOM) in grade 4 and 5 injuries/AAST. In order to proceed to a NOM of splenic trauma patients must be criteriously selected. The only known absolute contraindication for NOM is haemodynamic instability.

Materials and methods: The authors present a case of a 19 year old male that suffered a blunt abdominal trauma in a car accident. He entered the emergency department complaining of pain in the left upper quadrant and his vital signs were stable. The CT scan showed a laceration in the upper spleen pole with an active hemorrhage, peri-splenic haematoma (grade IV/AAST and grade 4a/Baltimore Computed Tomography Grading System) and a hemoperitoneum. He was submitted to an angioembolization of the superior polar artery with two metal coils 3×2 mm Tornado®, Cook (Bloomington, USA), presenting no active hemorrhage after the procedure.

Results: He was discharged after 21 days with a residual perisplenic haematoma and hemoperitoneum. Complete radiologic resolution was achieved 6 months later.

Conclusion: This case report shows that NOM can be safely used with splenic preservation and a good patient recovery. This is a minimal invasive procedure easily reproducible and can be applied in non-specialized trauma centers avoiding major abdominal surgery.

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Disclosure: No significant relationships.

P204

THE DEADLY DUO : OUTCOMES AND MANAGEMENT OF COMBINED HEPATIC AND PELVIS BLUNT TRAUMA

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Introduction: Association of pelvic fracture to liver traumatic lesion is reputed to dramatically increase the mortality. Simultaneous management of both bleeding lesions represents a double challenge, especially if these decisions must be taken in operative room.

Materials and methods: A retrospective analysis of data from patients who underwent blunt hepatic traumas between January 2007 to September 2012 in Grenoble University Hospital was realized.

Results: We reviewed 106 blunt hepatic traumas. Ten patients had associated pelvic fracture. Four patients were successfully treated by nonoperative option. One patient severely traumatized died by

exsanguination before surgery. Five hemodynamically unstable patients were treated by damage control surgery with: systematic peri-hepatic packing, associated in two cases with pelvic packing for non contained haemoperitoneum. Three patients died from exsanguination during surgery or during post-operative transfer in embolization. Both survivors benefited from pelvic packing and a postoperative angiembolization. Mortality rate of blunt hepatic traumas was 6.8 %, while mortality rate in combined liver and pelvis traumas was 40 %, with 4 exsanguinations deaths.

Conclusion: This traumatic duo « liver and pelvis » remains a difficult surgical challenge, and is a life-threatening for unstable patients requiring damage control laparotomy. Especially if haemorrhagic retroperitoneum is not contained, and/or if no ability interventional radiology is available. Peri-hepatic packing must be done in front of any hepatic active bleeding. When pelvis is also bleeding, pelvic packing should be performed only when hemoperitoneum is not contained. If hemoperitoneum appears contained, arteriography for immediate postoperative hemostasis is more efficient.

Disclosure: No significant relationships.

P205

THE IMPACT OF INTRAOPERATIVE HAEMORRHAGE ON PLASMA FIBRINOGEN VALUES - A PILOT STUDY

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Introduction: Bleeding control during perioperative period has been frequently debated in the scientific community, with increasing interest on the role of plasma fibrinogen on the prevention and treatment of blood loss as it is the first coagulation factor to reach critical values. Therapeutic usage of fibrinogen concentrate effectively improves fibrinogen polymerization and clot strength. Singbartl et al. mathematical model estimated that the concentration of fibrinogen will be lower than 1.5–2.0 g/L after a blood loss of approximately 1.0–1.5 L or higher, with consistent haemorrhage. In order to draw further conclusions in clinical practice, we propose to estimate the intraoperative blood loss level that should trigger fibrinogen replacement therapy. As so for elective surgery, we can guide our approach in massive haemorrhage trauma patients.

Materials and methods: Observational, prospective, non-randomized study with a convenient, consecutive sample. Adult patients proposed for major elective surgery with expected blood loss of at least 1000 mL. Intraoperatively, fluid therapy will be strictly controlled with a crystalloid baseline solution at 4 mL/Kg/h. Blood losses will be replaced with crystalloids at a 1:3 ratio or colloid at 1:1, depending on haemodynamic variables. The study will require four blood samples at different times: Pre-operative, perioperative after 500, 1000 and 1500 mL blood loss. In the samples collected, it will be evaluated: Prothrombin Time, Partial Thromboplastin time, INR, Haemoglobin, Platelets, Fibrinogen, D-Dimers, Base Excess, Lactate, EXTEM, FIBTEM ([CT] and [MCF]).

Results: The authors intend to show the preliminary results of this study.

Conclusion: We believe that the results, in elective context, can improve our therapeutic approach in trauma patients.

References: 1.Singbartl K, Innerhofer P, Radvan J, et al. Hemostasis and hemodilution: a quantitative mathematical guide for clinical practice. *Anesth Analg.* 2003; 96: 929–35.

Disclosure: No significant relationships.

TRAUMA SYSTEMS/TRAUMA REGISTRATION

P206

A NEW TECHNIQUE IN TREATING PROXIMAL TIBIAL FRACTURE USING WITH COMBINATION OF BIOABSORBABLE SCREW FOR POSTERIOR ASPECT AND METALLIC IMPLANT FOR ANTERIOR ASPECT

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Introduction: In some cases of proximal tibial plateau fractures, combined anterior and posterior fixation is needed. I developed a new technique to fix with metallic implant for anterior aspect and bioabsorbable screw for posterior aspect.

Materials and methods: A thirty-six year old male injured proximal tibial plateau fracture with posterior cruciate ligament avulsion fracture by traffic accident. Under general anesthesia, the patient was placed in prone position. I used dorsal approach reported by Burks and Shaffer. Posterior cruciate ligament avulsion fracture had been reduced, fixation was performed with cannulated bioabsorbable screw. I pierced through anterior skin by the guide pin inserted cannulated bioabsorbable screw and bended not to go back behind. And posterior soft tissue and skin closed. Then the patient was placed in supine position and redraped. The anterior curved incision was made proximal tibia anterolaterally. Articular fracture was reduced by reduction impactor under fluoroscopic imaging and arthroscopy. And fixation was performed with metallic plate and screws. At last the guide pin pierced through anterior skin was removed forward.

Results: All metallic implants which were used anterior side of the fracture were removed after fracture union. Bioabsorbable screw which was used posterior side did not have to remove. Follow-up period was 20 months. The Rasmussen functional and anatomic grading scale was excellent.

Conclusion: The technique to fix with metallic implant for anterior aspect and bioabsorbable screw for posterior aspect was safe and useful for anterior and posterior instability of proximal tibial fracture require anatomical reduction and fixation.

References: Burks R.T., Schaffer J.J., Clin Orthop Relat Res., 254, 104–108, 1990 Rasmussen PS., J Bone Joint Surg., 1973, 55A, 1331–1350, 1973

Disclosure: No significant relationships.

P207

A NEWLY ESTABLISHED TRAUMA REGISTRY IN A LEVEL I ITALIAN TRAUMA CENTRE: NEW QUESTIONS FOR TRAUMA SYSTEMS?

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Introduction: In March 2014 a newly established registry was implemented in our Level I Trauma Center in Bergamo, Northern Italy. Aim of this study is to present the first 6 months results with a particular focus on patients centralization for dynamics.

Materials and methods: A prospectively collected registry was initiated in March 2014. This database is filled on a daily/weekly basis by a dedicated data manager. Clinical and demographic data, as well as Injury Severity Score, time to CT, first emergency maneuver, length of stay and mortality are recorded. All Trauma Team activations are recorded, according to a protocol for centralization shared with the local Emergency Medical Service.

Results: 452 patients were treated, median age was 45 years (IR 31–58). 52.4 % was admitted, mortality was 3.5 % for a mean Injury Severity Score of 9 (SD 10). 176 patients, 45.7 %, were admitted after a Trauma Team activation just for dynamics, 8.7 % of whom underwent an emergency surgical maneuver. 95 patients presented an ISS >15, with a mean age of 52.6 (SD 19.1). 53.7 % come from activations only for dynamics. Overall 27.3 % of admitted patients with activations for dynamics underwent a surgical procedure and 29.7 % of these patients had an ISS >15. Mortality for these patients was 2 %. Given our population, expected incidence of severe trauma is 172/year/1 million of inhabitants.

Conclusion: Our results confirm that dynamics is an important source of severe trauma and must be taken into account in centralization protocols. Moreover incidence seems to be lower than in the past.

References: Di Bartolomeo S, Nardi G, Sanson G, Gordini G, Michelutti V, Ciminello M,

Giugni A, Cingolani E, Cancellieri F. The first Italian trauma registry of national relevance: methodology and initial results. *Eur J Emerg Med.* 2006 Aug;13(4):197–203

Disclosure: No significant relationships.

P208

A SIX-YEAR EXPERIENCE WITH SPLENIC BLUNT TRAUMA IN ONE CENTRE: RETROSPECTIVE ANALYSIS

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Introduction: In this study, we aimed to analyze strategies of operative management (OM) and non-operative management (NOM), and evaluate experiences of splenic blunt trauma patients.

Materials and methods: We retrospectively reviewed patients with splenic trauma at the department of general surgery between December 2008 and October 2014. Data on demographics, mechanism of trauma, Revised Trauma Score (RTS), Injury Severity Score (ISS), and outcome were revealed. The p values <0.05 were considered to be statistically significant.

Results: During 6 years, we evaluated consecutive 81 patients blunt abdominal trauma with splenic trauma. Eighty-one patients treated splenic trauma with associated injury of other organs was noted in 42 patients. Of the 81 patients, 60 were men and 21 were women and the average age was 30.02 years (range 4–69). Hemoglobin was normally in 59 patients. Average RTS was 7.42 (range 1.02–7.84) and average

ISS was 18.13 (range 4–57). Forty-four patients were transfused blood. Sixty patients treated with NOM. In NOM group, average ISS was 12.86 and average RTS was 7.82. In OM group, average ISS was 33.19 and average RTS was 6.31. RTS and ISS was found Statistically significant between NOM and OM groups. The most prevalent injury was grade III (n = 32), followed by II (n = 25), IV (n = 18), and I (n = 6). Eight patients deceased in OM group and one patient in NOM group.

Conclusion: NOM for splenic trauma was found successful and safe in our study. Patients with multipl injuries can be managed with NOM selectively [1,2,3]. ISS and RTS are useful score and determining score for NOM.

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Disclosure: No significant relationships.

P209

ACUTE CARE SURGERIES PERFORMED BY SURGEONS AT A RURAL HOSPITAL IN JAPAN

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Introduction: There is a lack of public trauma centers in Japan. This study aimed to examine Acute care surgeries performed and the diversity of conditions encountered by rural surgeons such as a trauma and injured caused by farming tools among elderly patients, during a 3 years

Materials and methods: Trauma patients who presented at applied to the Emergency room(ER) between August 2012 And October 2014 were analyzed.

Results: There were 3800patients.of whom 67 % were men. The mean age was 75 ± 13.3 years. Five patients died in the ER, including 4 patients who was declared to be Dead on arrival (DOA). Motor vehicles injury were the most common cause of injury (78.5 %).The injury Scales Score ranged from 8 to 43 (mean 16).Traditional and Emergency general surgical procedures accounted for 22.3 % of surgeries, and with endoscopies were performed in another 2 % of injury cases. The other surgeries performed included orthopaediee surgery (56.6 %), neurosurgeries (15.5 %), thoracic surgeries (5 %) and IVR (5 %).The multiple operation procedures were performed 22 % of patients. Chest injury was mainly due to trauma caused by farm tools.

Conclusion: Surgeons at serving small rural communities need to perform to carry out a varioosity of procedures for multi-trauma patnets in rural communities, our hospital provides prompt and safety medical services in coordinating with various surgeons.

Disclosure: No significant relationships.

P210

AGRICULTURAL AND FARMING INJURIES IN THE IRISH MIDLAND

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Introduction: The agricultural and farming business are an important source of employment in the Midlands. This is a retrospective study examining the demographics, characteristics, and outcomes of agricultural and equestrian related injuries presenting to the Midland Regional Hospital, Tullamore, Co. Offaly.

Materials and methods: Every presentation to the Accident & Emergency Department at the Midlands Regional Hospital in 2013 was assed retrospectively to determine if an injury had been sustained in an agricultural or equestrian environment. Patient characteristics and injury details were collected for 345 patients who attended the Accident & Emergency Department. Patient demographics, month of occurrence, mechanism of injury, radiology results, management and follow up data were collected and analysed.

Results: There were 196 agricultural related presentations to the Accident & Emergency Department and 149 equestrian related presentations. 23 % of the agricultural injuries and 36 % of the equestrian injuries had confirmed radiological evidence of a fracture or joint dislocation. There were significantly more males involved in agricultural injuries than females (98 % vs 2 %, p < 0.001). There were significantly more females involved in equestrian injuries than males (58 % vs 42 %, p < 0.05). 10 % of farming injuries and 15.4 % of equestrian injuries required admission. Farming machinery accidents contributed to significantly more admissions than any other cause in the agricultural category (p < 0.01).

Conclusion: agricultural and farming related injuries in the Irish midland are common presentations to orthopaedic surgeon. Increased attention to occupational health hazards seems required in the equestrian environment as Prevention of adverse health outcomes.

Disclosure: No significant relationships.

P211

AIRWAY MANAGEMENT OF A MAXILLOFACIAL TRAUMA PATIENT: CHALLENGES IN NURSING CARE AND IMPLICATIONS TO PRACTICE

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Introduction: Trauma is a major health concern and the first cause of death and disability in the developing countries. In the emergency department, the care of the trauma patients usually begins with assessment of life-threatening injuries such as cranial trauma, thoracic

trauma and trauma involving major solid organs and vessels. The trauma nurses have also a fundamental role in the care of multiple trauma with their organisational abilities, communication skills and early recognition of red flags in trauma management. In this case report, we aimed to discuss airway management of a multiple trauma patient from a nursing viewpoint.

Materials and methods: Care of trauma patients in the emergency department with an initial assessment of the potential for serious injury begins. First assessment of vital threatening situations immediately identification and treatment, concurrent resuscitation and treatment- quickly assume is the (Brunett PH et al. 2013).The multi-injured trauma patient is complex and requires increased coordination and communication to ensure effective care.

Results: The trauma care management role is diverse and rewarding, enabling the case manager to be involved in and make a difference to trauma patient care from resuscitation to rehabilitation.

Conclusion: In addition, the trauma care management role assists greatly in identifying systemic problems and staff education Nurses are in an occupation that has interpersonal communication at its core and with their communication and organisational abilities are well suited to the trauma care management role (Curtis K 2007). The aim of this case report the multi-injured trauma challenging in trauma patients, and the importance of fast and furious intubation is to recreate the nursing care.

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Disclosure: No significant relationships.

P212

AMSTERDAM, TRAM & TRAUMA: A RETROSPECTIVE ANALYSIS

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Introduction: The tram has been an unmistakable part of Amsterdam for over a century. It has developed into a widely used vehicle of transportation for its inhabitants and visitors. Despite the increased level of safety in traffic over the last decades, we are frequently faced with patients who sustained an injury through tram-related accidents in our hospital. Our desire was to provide a detailed look on this group of trauma-patients that is particular for our city.

Materials and methods: Retrospective analyses of all patients seen at our emergency department after a tram-related accident over a period of 3 years (between 1 January 2009 and 31 December 2011). Evaluation on the mechanism of the trauma, the number and types of injuries sustained, the need for admission and/or surgery and morbidity and mortality.

Results: A total of 438 patients were analyzed. Median age was 40 years (range 2–95 years). After being seen at our emergency room, 58 patients needed admission (13.2 %), of which 14 (3.2 %) at the intensive care unit. A total number of 41 interventions was performed in 33 patients. The majority of patients suffered trauma because of a fall on the tracks of the tram (48.0 %). In total of 2 patients succumbed (0.45 %).

Conclusion: We conclude that tram-related accidents are commonly seen at our hospital. Almost half of them are due to a fall on the

tramtracks. One in eight patients needed admission and one in thirteen patients needed at least one intervention.

Disclosure: No significant relationships.

P213

ANALYSIS OF INJURY RELATED DEATH IN 2012

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Introduction: Injury is one of the leading causes of death in Western Europe at people between the age of one and 45. The Medical University Hospital Graz is the only Level-one-Trauma-Centre at the state of Styria with a population of 1.2 million and a frequency of about 200 severely injured patients a year. The objective is to determine the rate of preventable mortality for cases of traumatic death occurring Styria – a state of Austria.

Materials and methods: Retrospective case review of death attributed to mechanical trauma throughout the state occurring between January 1, 2012 and December 31, 2012. Cases were reviewed and death where judged into preventable, possibly preventable and non-preventable.

Results: During the period 137 patient with an ISS more than 16 were treated. 37 of them died in direct relation to the trauma. Gender distribution was 29 (78 %) male and 8 (22 %) women. Mean age was 43 years and the average ISS was 32. The mean GCS was 7.31. 35.14 % of deceased were initial unstable, 16.22 % of prehospital unstable patients were resuscitated. Prehospital time takes about 65 min. Of the 37 cases studied 0 were preventable, 6 possibly preventable. The remainder 31 were judged non preventable.

Conclusion: Trauma care is a serious, ubiquitous and common problem of our society. Death following a traumatic event is often perceived by population as an unavoidable fatality. But nevertheless preventable trauma death studies are the best available methodology to learn from mistakes and give an impulse to trauma care systems.

Disclosure: No significant relationships.

P214

BIOCHEMICAL AND CLINICAL CORRELATIONS - GUIDELINES IN DAMAGE CONTROL SURGERY FOR POLYTRAUMA PATIENTS WITH FEMORAL FRACTURES

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Introduction: Establishing guides for treating femoral fractures in polytrauma patients is challenging since both the fracture and its' treatment have impact upon these patients. Although everybody agrees that early stabilization is an absolute indication, the type of stabilization (Early Total Care ETC or Damage Control Surgery DCS) is still under debate. The purpose of this study is to evaluate whether a correlation between clinical and biochemical criteria might be used for establishing the proper method of treatment.

Materials and methods: This prospective study evaluates 25 polytrauma patients with femoral fractures, treated between 1.01.2014–1.10.2014, 10 by intramedullary nailing (IMN), 15 by DCOS. Clinical and biochemical parameters are analysed in order to evaluate whether there is any correlation between them and the incidence of complications, general (death, MSOF, ARDS) and local (wound infections, pin track infections, implant failure, non-unions).

Results: The results show that the most reliable information are given by the inflammatory tests; statistic analysis also revealed a significant correlation between the incidence of complications and disturbances of the coagulation tests, as well as with initial anemia and its resistance to treatment. The rates of MSOF and that of ARDS were comparable for the ETC and DCS groups but they were significantly influenced by anemia and persistent inflammation.

Conclusion: Pluridisciplinary evaluation using clinical and biochemical criteria has been proven to be useful in polytrauma patients with femoral fractures. Our results suggest that different steps of treatment can be established using these correlations.

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Disclosure: No significant relationships.

P215

CAN HEAD TRAUMA BE AVOIDED?

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Introduction: Head trauma take an important place among the patients admitted to the emergency units and continue to be a serious public health problem around the world.

Materials and methods: 292 patients with head trauma admitted to the emergency service of a state hospital between February 2014 and April 2014 are examined retrospectively in terms of age, gender and trauma causes.

Results: 74 % of the cases were male and 26 % were female, 11 % of the cases were between 0–18 years old, 62 % were between 18–64 years old and 27 % were 65 years old and over. It was also found that head trauma occur; between 0 and 18 age particularly from high drop, between 18 and 64 age in-vehicle traffic accidents, over 65 years old out of vehicle accidents and crashing objects.

Conclusion: Increase in the epidemiological studies related with head trauma is important with regard to the prevention of head trauma especially when taking the age groups into consideration. A suitable treatment and care must be planned in order to avoid brain damage by taking the intracranial pressure under control and correcting the hypoxia. Also prehospital emergency care is very important for prognosis.

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Disclosure: No significant relationships.

P216

CANNULATED HIP SCREWS FIXATION VERSUS HEMIARTHROPLASTY FOR DISPLACED INTRA-CAPSULAR FEMORAL NECK FRACTURES IN MEDICALLY UNSTABLE GERIATRIC PATIENTS

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Introduction: The treatment of choice for elderly with a displaced intra capsular femoral neck fractures is prosthetic replacement. This is however a major surgical procedure for geriatric patients with multiple severe co-morbidity. In this study we compare the outcome of cannulated hip screws (CHS) with hemiarthroplasty (HA) for management of intra-capsular femoral neck fractures in elderly with severe systemic conditions.

Materials and methods: We conducted a retrospective cohort study of all patients with a femoral neck fracture between January 2009 and June 2011. Inclusion criteria are: 70 years or older, ASA 3 or higher, a displaced femoral neck fracture and treatment with either CHS or a HA. The primary outcome was mortality during follow up.

Results: 74 patients met our inclusion criteria. The medical records retrieved 34–64 months after surgery. Two peri-operative deaths due cement implantation syndrome were found in HA group and none in CHS group. Twelve patients (21.8 %) in HA group died during first postoperative month and none in the internal fixation group ($P = 0.03$). There were significantly more implant related complications in CHS than HA group (31.6 % vs 9.1 % respectively, $P = 0.009$). There was no difference in the mortality rate between the groups after first postoperative month.

Conclusion: The CHS is associated with more implant related complications than HA. However intra-operative cardiovascular event may be less frequent with CHS, and the mortality within first post-operative month may be lower with CHS. Therefore CHS may be appropriate for serious ill or disabled patients with displaced femoral neck fracture who are unfit for HA and require nursing care.

Disclosure: No significant relationships.

P217

CHANGES IN UTILISATION OF THE TRAUMA ROOM SINCE THE INFUX OF CIVIL WAR WOUNDED FROM SYRIA

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Introduction: Since the admission of the first Syrian civil war casualty to the Trauma Room of Ziv Medical Center (a level 2 trauma center closest to the Israel-Syria border) in February 2013, Trauma Room activity has increased exponentially.

Materials and methods: The trauma-co-ordinator has audited the utilisation of the Trauma Room since 2010. Data from patient records

and the hospital Trauma registry were also analysed with ethics committee approval in order to monitor Trauma Room activity and standards since the influx of the Syrian patients.

Results: Comparative data shows that before 2013 an annual average of 105 patients were admitted to the Trauma Room (82 % road traffic crashes, 11 % falls and 7 % gunshot injury). In 2013, 306 patients were admitted (201 Syrian war-wounded) and up to October 2014, 238 patients were admitted (180 Syrian war-wounded). Utilisation data shows, as examples: the average number of chest drains inserted in the Trauma Room before 2013 was 20 per year. In 2013 this increased to 65 and up to June 2014 the figure was 40. The number of units of blood transfused in the Trauma Room has increased from 6 in 2012 to 26 in 2013.

Conclusion: Although busier, the impact on nursing and medical staff of managing life-threatening trauma has increased interest and confidence, especially as staffing issues have warranted nurses from other departments, such as the Intensive and Coronary Care Units, attending to patients in the Trauma Room. They attend practice sessions in the Trauma Room (which we record and feedback) to improve trauma skills.

Disclosure: No significant relationships.

P218

CHARACTERISTICS OF SURGICAL ACTIVITY IN SEVERE TRAUMA PATIENTS : EXPERIENCE OF A FRENCH LEVEL 1 TRAUMA CENTER

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Introduction: The trauma center of Toulon-Sainte Anne French Military Teaching Hospital has achieved Level 1 status and provides a daily continuum of trauma care. The goal of this study was to identify the distribution of generated surgical activity in a monocentric cohort of severe trauma adult patients during the last 2 years.

Materials and methods: All injured patients transferred to the ED between January 2013 and September 2014 and meeting any of the French standard prehospital Vittel triage criteria were prospectively included in an electronic database. Different data were collected about the injury profile, the severity scores and the undertaken treatments (resuscitation, interventional radiology and surgery). The types and number of surgical acts were specifically analyzed.

Results: 471 trauma patients were included. Median values of ISS was 22. 66 % were related to road traffic accidents, 25 % to a fall, 8 % only to a penetrating trauma. 68 % of patients were finally considered as polytrauma (ISS >16). Distribution of the surgical acts is fully described (number and types of surgical interventions). The majority of interventions involved orthopaedics, but also thoracic, neurosurgery, visceral, vascular, maxillofacial,... from initial damage control to definitive and reparative surgery.

Conclusion: The distribution of trauma surgery in our hospital is similar to that of other similar centers. Orthopaedic surgery is preponderant. Although the surgical management of blunt truncal injuries has changed to more frequent nonoperative management, polytrauma patients generate a significative surgical activity, requiring many medical specialities and representing a true

challenge. High-volume trauma centers need a dedicated specific organization.

Disclosure: No significant relationships.

P219

CLINICAL INDICATORS OF BOWEL AND/OR MESENTERIC INJURY DUE TO SEAT BELT INJURY REVEALED BY IN-DEPTH ACCIDENT INVESTIGATIONS THROUGH MEDICINE-ENGINEERING COLLABORATION

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Introduction: An association has been suggested between bowel and/or mesenteric injury and seat belt use in traffic accidents. However, no individual clinical finding is pathognomonic of such injuries. Medicine-engineering collaboration can now determine equivalent barrier speed (EBS) from many kinds of crash data. Therefore, through such collaboration, here we aimed to identify indicators of bowel and/or mesenteric injury from seat belt use in automobile collisions.

Materials and methods: This retrospective study was conducted between September 2009 and March 2013. Of 2560 adult trauma patients admitted to our facility during the study period, in-depth accident investigations were conducted in 135 cases and data was analyzed for 63 cases involving a head-on collision, seat belt use, and CT examination. These cases were divided into two groups: patients with bowel and/or mesenteric injury (group I, n = 12) and those without such injury (group N, n = 51). We defined "seat belt sign on CT" (SBS-CT) as a high-density area under the skin on abdominal CT.

Results: In the 63 cases, median age was 51 (interquartile range, 33–67) years and median injury severity score was 9 (4–17). No significant differences were found in patient characteristics, type of vehicle, or riding position between the two groups. Compared with group N, group I had a higher ISS (13 vs 6, p = 0.03), significantly higher occurrence of SBS-CT (100 % vs 35.3 %, p < 0.01) and higher EBS (40 vs 30 km/h, p = 0.02).

Conclusion: SBS-CT may be a useful finding when bowel and/or mesenteric injury is suspected. Higher EBS may also be a useful indicator of such injury.

Disclosure: No significant relationships.

P220

DEFINITE CARE OF BILATERAL LOWER LEG NONUNION FRACTURES BY ILIZAROV APPARATUS IN POLYTRAUMATIZED PATIENT

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Introduction: The aim of this case report is to highlight the possibilities of Ilizarov apparatus in the treatment of fracture nonunions of

lower legs treated by other methods and to show that it's not necessary to remove intramedullary nail in every case when nonunion occurs on the field of prior osteosynthesis.

Materials and methods: Male 62 years old was injured in traffic accident as a pedestrian in 2012, when he experienced polytrauma wherein among other injuries he suffered shaft fracture of right femur, segmental open fractures of right (Gustillo-Anderson gradus I) and left (Gustillo-Anderson gradus II) lower leg. Initially fractures of right femur and right tibia were stabilized with intramedullary nails, while fracture of left lower leg was treated by unilateral external fixator. After 5 months we did not notice clinical and radiographic signs of union on lower legs, therefore patient underwent re-surgery. Ilizarov apparatus was applied on both lower legs. Patient was early verticalized and after 4 months both apparatus were removed. According to modified protocol of Association for the Study and Application of Methods of Ilizarov (ASAMI), lower leg bony results were good and excellent, yet functional results were excellent on both sides.

Results: This is case study

Conclusion: One of the advantages of external fixation by Ilizarov apparatus is possibility to achieve early weight-bearing on the operated extremity. Ilizarov method also proved as a successful choice in treatment of lower leg fracture nonunion, especially after failure of other methods.

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Disclosure: No significant relationships.

P221

DOES MAJOR TRAUMA DELAY THE CARE OF EMERGENCY PATIENTS AT A UK MAJOR TRAUMA CENTRE ?

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Introduction: The resource intensive nature of major trauma (MT) patients potentially may impact on the care of patients within the emergency department (ED). This study was designed to define the impact of major trauma on the time in department (LOS) and time to see an ED doctor for emergency patients (EP).

Materials and methods: Retrospective analysis comparing data for one-hour preceding and post trauma call (TC). Data collected from the emergency department information system and major trauma database from January 2012 to December 2013. A 2X24 Factorial ANOVA was carried out comparing waiting times an hour before and an hour after a trauma.

Results: The LOS in ED before (159 min) or after MT (160 min) was not significant, $F(1,3095) = 0.063$, $p > 0.05$. There was no significant difference in LOS in ED between multiple simultaneous (158 min) or single trauma calls (152 min); $F(1,3139) = 0.014$,

$p > 0.05$ compared to before a trauma call. These results were replicated for waiting times to see a Dr in ED. The LOS for emergency patients was significantly greater when the trauma patient had an ISS above 45 ($n = 20$) ($p < 0.001$), with the effect starting before the arrival of the MT.

Conclusion: Adequate resourcing of the trauma team neutralises the impact of single or multiple simultaneous trauma patients on other emergency patients in the department. MT only have a significant impact when the patient is severely injured.

Disclosure: No significant relationships.

P222

EQUESTRIAN INJURY PRESENTATIONS TO A REGIONAL TRAUMA CENTRE IN IRELAND: A RETROSPECTIVE STUDY

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Introduction: The Irish Equestrian industry provides over 12,500 full time job equivalents contributing in excess of €708 million to the Irish economy annually. For such an important industry there is a paucity of information relating to equestrian injuries. This is a retrospective study examining the demographics, characteristics, and outcomes of equestrian related injuries presenting to the, Co. Offaly.

Materials and methods: Retrospective analysis of all 30,700 presentations to the emergency department in the Midland Regional Hospital, Tullamore for 2013 was performed to identify equestrian related presentations. Patient demographics, mechanism of injury, radiology results, management and follow up data were collected and analysed using Microsoft Excel software.

Results: A total of 149 equestrian related presentations were identified during the study period. There were significantly more females involved in equestrian injuries than males (58 % vs 42 %). Falls from horses contributed to significantly more presentations and admissions than any other cause ($p < 0.01$). 36 % of presentations had a radiological abnormality. Types of injuries identified included skeletal fractures (33 %), joint dislocation/subluxation (5 %), concussion (7 %) and splenic laceration/intraperitoneal haemorrhage (1 %). Admission or transfer to tertiary care was required for 19 % of equestrian injuries. Only 43 % of presentations were discharged back to primary care from the emergency department.

Conclusion: Our study identifies a high incidence of significant morbidities associated with equestrian presentations. In addition we recognised populations at risk of specific injuries and described high risk mechanisms of injury. Lastly, we identified substantial utilization of resources in the management and follow up of such presentations.

Disclosure: No significant relationships.

P223

EXTRA-ARTICULAR DISTAL HUMERAL DYAPHYSEAL FRACTURES TREATED WITH POSTEROLATERAL PLATE THROUGH A POSTERIOR APPROACH

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Introduction: Surgical treatment of extra-articular distal humeral dyaphyseal fractures provides a more predictable alignment and potentially quicker return of function. The purpose of this study was to evaluate the clinical and radiological outcomes of this fractures treated through a posterior approach with a posterolateral plate

Materials and methods: We performed a retrospective study of 18 patients surgically treated in our centre between 2012 and 2014. The procedures were performed through a posterior approach (10 trans-tricipital, 8 triceps-reflecting technique) and the fracture was fixed with an anatomically precontoured posterolateral distal humerus plate. Average follow-up was 17.7 months (range from 12 to 25 months). Patient and fracture characteristics were recorded, as were Quick DASH score, Mayo Elbow Performance score, and visual analog scale score for pain.

Results: Eighteen (100 %) patients went on to union. The incidence of radial nerve palsy prior to surgery was 44 % (8 patients), whereas the incidence after surgery was 5 % (1). There was no failure of internal fixation, and one postoperative superficial infection. After 1 year, the average QuickDASH score was 6.43 (range, 0–22.7), the average visual analog scale scores was 0.66 (range, 0–5), the average Mayo Elbow performance score was 88.88 (range, 60–100). There were 12 excellent results (MEPS, 90–100 points), three good (75–89) and three fair (60–74), with no poor results.

Conclusion: Surgical fixation of extra-articular distal humeral dyaphyseal fractures through a posterior approach with an anatomically precontoured posterolateral distal humerus plate results in high union rates and overall excellent functional results with low incidence of complications for patients with this injury.

Disclosure: No significant relationships.

P224

HEMS FOR TRAUMATIC CARDIAC ARREST IN JAPAN : SINGLE CENTER 5 YEAR EXPERIENCE

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Introduction: The resuscitation for traumatic out-of-hospital cardiac arrest (T-OHCA) is challenging attempt, and one of the most essential factors in severe trauma resuscitation is the timing of medical intervention by physician. Japanese Helicopter emergency medical services (HEMS) can provide physician at the scene and initiate various medical interventions. The aim of this study is to evaluate the rate of return of spontaneous circulation (ROSC) of T-OHCA in our HEMS and compare it with previous reports.

Materials and methods: We conducted a retrospective study. T-OHCA patients who were treated by our HEMS with physician from February 2009 to March 2014 were enrolled. The following pre-hospital clinical data were collected: age, sex, the time of onset to physician arrival, the presence of bystander CPR, initial cardiac rhythm, on-scene vital signs, direct light reflex, and kinds of interventions. We also calculated revised trauma score (RTS), injury severity score (ISS) and trauma injury severity score (TRISS).

Results: 66 patients were enrolled in this study, and the mean age was 60 years. The mean time of onset to physician arrival was

31.6 minutes, and Twenty-seven (40.9 %) patients exhibited ROSC.

Conclusion: Our Japanese HEMS with physician shows equivalent or better rate of ROSC compared with other reports. Swiftly pre-hospital intervention by physician and increasing rate of ROSC, HEMS can be useful procedure for T-OHCA.

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Disclosure: No significant relationships.

P225

HIGHLY COMMINUTED DISTAL TIBIA FRACTURES. STAGED INTERVENTION VERSUS PRIMARY ARTHRODESIS. REVIEW OF THE LITERATURE

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Introduction: Comminuted AO43C3 pilon fractures are challenging. Traditional treatment is staged with external fixation followed by formal ORIF 2 wks later. Many patients frequently require revisions with ultimately poor outcomes, ankle stiffness and PTOA. We review the literature of the last 25 years on closed AO43C3 fractures for treatment, complications, and clinical outcomes and review the literature on primary ankle arthrodesis as a potential primary management.

Materials and methods: Literature from 1990–2014 was searched and all obtained articles independently reviewed. ORIF articles were reviewed for fracture type/fixation/open/closed/time to surgery/complications/ROM/pain/amputations/PTOA/secondary fusions and average follow-up. Primary arthrodesis articles for arthrodesis methods/time to union/malunion/nonunion/infections, and amputations. Discrepancies in outcomes for each group were resolved by consensus.

Results: 48 articles were found but only 18 matched inclusion criterias. None of the 18 had complete data in the reviewed categories. Most common reason for exclusion was lack of differentiation in outcomes, AO fracture type, open vs. closed, combination of both and series with <5 AO43C3 injuries. For staged ORIF mean follow up was 13.1 months, 100 % limited ankle ROM, 41 % PTOA, 18 % wound complications/infections and 8.6 % nonunion. For primary arthrodesis mean follow up was 30 wks with average union at 19 weeks, 0 % nonunion and 7 % wound complications.

Conclusion: The literature on AO43C3 fractures is severely limited and lacks on proper long-term evaluation and PTOA rates. Most studies are biased reporting positive outcomes that are believed to be good. Considering the lower morbidity and acceptable success rate primary arthrodesis may be warranted. Longterm outcomes should be studied to proper direct patients care.

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blade-plate: a preliminary report. FAI 1999 Beaman; Fracture reduction and primary ankle arthrodesis: a reliable approach for severely comminuted tibial pilon fracture. *CORR* 2014

Disclosure: No significant relationships.

P226

IMPLEMENTATION OF A MAJOR TRAUMA NETWORK: FIRST TWO YEARS EXPERIENCE FROM EAST MIDLANDS MAJOR TRAUMA CENTRE

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Introduction: The East Midlands Major Trauma Centre (EMMTC) was established April 2012. The first 2 years of major trauma admissions were analyzed for age distribution, mechanism of injury (MoI) and length of stay (LoS) related to Injury Severity Score (ISS). **Materials and methods:** Patient data for submission to TARN was analysed.

Results: 2200 patients were admitted, 979 year 1, 1221 year 2, (25 % increase in). Patients with ISS >15 was n = 439 year 1, and n = 549 year 2 (25 % increase). Analysis revealed three peak age ranges (total & ISS >15): 17–34 years (n = 452, ISS >15 = 150), 43–66 years (n = 687, >15 = 152), 79–91 years (n = 402, >15 = 34). Blunt trauma in >92 %. Patients with ISS >15 had MoI; road traffic collisions (RTC) 40 % and falls 51 %. Within these age groups RTC was the MoI in 63 % of 17–31 year olds; 43–66 RTC in 43 % and falls 50 %; 79–91 age group falls in 87 %, with the majority being <2 m in height. Median LoS in 17–31 (n = 162) with ISS >15 was 9 days (range 1–121), 43–66 years (n = 152) 10 (1–176), 79–91 years (n = 39) 10 (1–124). Median LoS in 79–91 (n = 78) with ISS <15 was 15 (1–89), compared to 5 (1–68) in 17–31 (n = 506) and 7 (2–123) in 43–66 (n = 251). There was no significant LoS difference in 79–91 (ISS <15) compared to the other two age groups with ISS >15.

Conclusion: The numbers of severely injured has increased with time. The injured elderly represent a cohort, that has an increased LoS, whatever ISS. This has major resource implications with bed days, rehabilitation and repatriation and must be managed by a multidisciplinary team approach.

Disclosure: No significant relationships.

P227

IMPORTANCE OF KINEMATICS OF TRAUMA

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Introduction: Trauma still remains the leading cause of deaths in many countries. It is important to know type of accident and the mechanic for reduce morbidity and mortality. Kinematics introduces the basic physical concepts that dictate how injuries occur and affect the human body.

Materials and methods: Evaluation of three different stage is important for understanding the etiology of traumatic injuries: **1) precrash** (All of events that precede the incident), **2) crash** (begins at the time of impact between a first and a second moving object. Ends when all motion has stopped), **3) postcrash** (begins as soon as the energy from the crash is absorbed and the patient is traumatized). Every phases of trauma is important but for fast and accurate diagnosis we need to evaluate the mechanism of case. Because the most critical and important phases of traumatic injuries is moment of trauma.

Results: If human body collides with a solid object, or vice versa, energy exchange occur. Trauma mechanism evaluation should include; 1) The direction of energy exchange 2) The amount of energy exchanged 3) The effect of force on the patient. Most critical step of injuries is to establish the causes

Conclusion: Pre-hospital health teams are the primary source of this important phases For reduce mortality and morbidity of traumatic injuries they should receive special simulated training about trauma mechanism, human anatomy and physiology.

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P228

INCIDENCE AND PREDICTORS FOR TRACHEOSTOMY IN THE PATIENTS WITH TRAUMATIC CERVICAL SPINAL CORD INJURY

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Introduction: In the patients with cervical spinal cord injury (CSCI), respiratory compromise and the need for tracheostomy are common. The purpose of this study was to evaluate the incidence and identify predictors for the need for tracheostomy after CSCI.

Materials and methods: Data from 105 trauma patients with CSCI admitted in our institution from Apr. 2008 to Feb. 2014 were retrospectively analyzed. Patients underwent tracheostomy were compared with those who did not undergo tracheostomy.

Results: 21 (20.0 %) patients required tracheostomy. The majority patients were male and traffic accident predominated. Patients undergone tracheostomy were more severely injured (higher ISS, lower GCS and lower SBP <90 mmHg on admission, p < 0.005) and required intubation more frequently in ER (52.4 % vs 3.6 %, p < 0.001) and had a higher rate motor dysfunction: American Spinal Injury Association impairment scale A & B (ASIA A&B) (81.0 % vs 10.7 %, p < 0.001). Patients undergone tracheostomy had a higher rate of Injury above C6 level, however, there was no

statistical significance. (95.2 % vs 75.0 %, p = 0.068). After multivariate analysis, injury above C6 level (OR: 27.6 (1.1 – 702.7), p = 0.044), ISS ≥16 (OR: 11.0 (1.6 – 74.0), p = 0.013), intubation in the ER (OR: 18.8 (2.3 – 155.3), p = 0.006) and motor dysfunction (ASIA A&B) (OR: 25.0 (4.4 – 140.0), p < 0.001) were predictors for the requirement of tracheostomy after CSCl.

Conclusion: Tracheostomy was performed in 20.0 % in patients with CSCl. Injury above C6, ISS ≥16, intubation in the ER and ASIA A&B were independently associated with tracheostomy after CSCl.

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Disclosure: No significant relationships.

P229

IS THERE ROOM TO IMPROVE DONORSHIP IN DECEASED POLYTRAUMA PATIENTS?

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Introduction: The demand for organ transplantation is rapidly increasing in Europe. Finding a solution to the organ shortage is therefore of great importance. Aim of this research is to determine the baseline percentage of potential deceased donor polytrauma patients, current effective donation of organ or tissue and how to improve the effective rate of donation.

Materials and methods: In the period 01-07-2004 till 01-01-2011 a total of 222 deceased polytrauma patients (aged from 0 to 91 years) at the trauma unit of the VU University Medical Centre Amsterdam were included in this study. There were 82 females and 140 males. Potential donors were identified according to NTS donorship criteria and were compared with the effective rate of donation.

Results: A total of 74 potential donors, 46 male and 28 female, only 24 actually donated. The average age was 38 years (range 10–69). Further evaluation showed that in a subgroup of 24 potential donors who did not donated, in 22 patients this was driven by family's choice.

Conclusion: There is a dissimilar rate of potential donors and the rate of effective donation. It is of great importance to improve the amount of donorships, especially in the young deceased trauma patients.

Disclosure: No significant relationships.

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LISFRANC INJURIES TREATED OPERATIVELY : A RETROSPECTIVE REVIEW.

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Introduction: The aim of this study is to review the outcomes of patients following surgery for Lisfranc injuries.

Materials and methods: This is a retrospective review of 20 out of 26 patients, who have been treated operatively for Lisfranc injury (6 patients did not appear for follow-up). Data about their age, gender, mechanism of injury, operative technique, peri -post operative complications and return to everyday activities/work have been collected.

Results: Follow up ranged from 2–10 years. Age ranged from 18–58 years. 12 patients were male and 8 female. 16 were closed Lisfranc injuries. In 14 cases, Lisfranc injury has been the result of a road traffic accident. 14 patients have been treated with ORIF using k-wires and 6 patients with closed reduction and percutaneous fixation using k-wires. K-wires were removed in mean time of 6–8 weeks. Superficial pin tract infection developed in 3 cases. There were 7 patients with posttraumatic osteoarthritis. All patients returned to pre-injury everyday activities.

Conclusion: Early recognition and treatment of Lisfranc injuries are crucial. Stable anatomical reduction leads to good long-term outcomes. Both techniques seem to have satisfactory and comparable results.

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Disclosure: No significant relationships.

P231

MANAGEMENT OF BLUNT LIVER TRAUMA: A SIX-YEAR EXPERIENCE

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Introduction: Liver is commonly injured abdominal organ in blunt trauma with high morbidity and mortality. Nonoperative management (NOM) is a selective conservative method used for liver trauma. In this study, we aimed to analyze strategies and evaluate experiences of blunt liver trauma in adults.

Materials and methods: We retrospectively reviewed patients with blunt liver trauma at the department of general surgery between December 2008 and October 2014. Degree of liver trauma was graded according to the American Association for the Surgery of Trauma (AAST) guidelines. Data on demographics, Revised Trauma Score (RTS), Injury Severity Score (ISS), and outcome were recorded. The p values less than 0.05 were considered as statistically significant.

Results: During six years, we evaluated 54 patients blunt abdominal trauma with liver trauma. Of the 54 patients, 48 were men and 6 were women and the average age was 36.1 years (range 7–86). Forty patients treated with NOM. In NOM group, average RTS was 7.84 and average ISS was 15.3. In operative management (OM) group, average RTS was 5.45 and average ISS was 35.1. RTS and ISS were significantly different between NOM and OM groups ($p < 0.05$). The most prevalent injury was grade I ($n = 28$), followed by II ($n = 11$), III ($n = 10$), IV ($n = 2$) and V ($n = 3$). Fifteen patients underwent surgery. Six of 15 patients was operated not for liver. Eight patients deceased in OM group and in 1 patients in NOM group.

Conclusion: RTS and ISS were useful and safe for deciding treatment in patients with blunt liver trauma for NOM.

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Disclosure: No significant relationships.

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PERCEPTIONS OF UNDERSTANDING AND MEDICAL ERRORS IN THE SICU

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Introduction: Patient care in the Surgical Intensive Care Unit (SICU) is demanding and prone to communication challenges that can lead to medical error. This study examines the understanding of goals of care by bedside Registered Nurses (RN) and resident physicians in a busy Level I Trauma Center SICU.

Materials and methods: A 26 item on-line survey was administered to SICU RNs and residents who worked in the SICU within the past 2 years. The survey included the individual's understanding and opinion of daily goals of care for SICU patients and

medical errors.

Results: A total of 24 RNs and 50 residents completed the survey for a response rate of 56 % and 69 %, respectively. 53 % of RNs “always” understood the daily goals of care compared to 14 % of residents ($p < 0.01$). 41 % of RNs felt they devoted more than 70 % of their time to meaningful clinical work, compared to 18 % of residents ($p = \text{NS}$). 92 % of RNs and 94 % of residents stated that they witnessed medical errors affecting patient care at least 4 times a week ($p = \text{NS}$), with a lack of communication being the primary cause. Both RNs and residents felt they were most responsible for the care of their patients. 71 % of RNs and 67 % of residents felt rushed or overwhelmed when providing care ($p = \text{NS}$).

Conclusion: Both RNs and residents in the SICU feel responsible for providing clinical care to patients. Nonetheless, residents indicated they rarely understood daily goals of care compared to RNs. Multidisciplinary communication is key to reducing medical error.

Disclosure: No significant relationships.

P233

PRE-EXISTING DELETERIOUS HABITS IN POSTOPERATIVE RECOVERY IN PATIENTS REQUIRING FACIAL RECONSTRUCTIVE SURGERY AFTER TRAUMA

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Introduction: The deleterious habits can be defined as atypical neuromuscular patterns that can determine the development of malocclusions due to the damage they cause, especially in the position of the teeth. These can be emotional origin or learned and their losses will be determined in particular by the frequency, intensity and duration. Can be classified as breathing, sucking lips, sucking nipples, biting objects, handhold in the jaw. The performance of speech therapy professionals in post surgical patients undergoing reconstructive surgery following trauma, encompasses the prevention and elimination of deleterious habits considered to estomatológico system, preventing the maintenance of them compromise the success of surgery.

Materials and methods: Research on secondary sources, in order to verify the presence of pre-existing deleterious habits in postoperative recovery in patients who require reconstructive surgery after trauma. The search took place on the basis of SCIELO - Scientific Electronic Library and LILLACS - Base BIREME data under the following inclusion criteria: full articles, chapters of books in Portuguese and English.

Results: It works, mostly, tended to confirm the relationship between the presence of pre-existing deleterious habits in postoperative recovery in patients with post-traumatic facial reconstructive surgical indications were found.

Conclusion: The occurrence of harmful habits in pre-existing deleterious effects on postoperative recovery in patients with post-traumatic facial reconstructive surgery is indicated, tends to modify the stomatognathic system and may lead to significant changes and often permanent. Studies should be developed in order to seek new tools for assessing and treating these patients.

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Disclosure: No significant relationships.

P234

PROTOCOL OF THE DENIM STUDY: A DELPHI-PROCEDURE ON THE IDENTIFICATION OF TRAUMA PATIENTS IN NEED OF CARE BY PHYSICIAN-STAFFED MOBILE MEDICAL TEAMS IN THE NETHERLANDS

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Introduction: Dutch standard prehospital trauma care is provided by EMS and can be supplemented with advanced trauma care by Mobile Medical Teams (MMT). Due to over and undertriage in dispatch of the MMT for major trauma patients, the accuracy of the criteria are disputed. In order to obtain recommendations to invigorate the dispatch criteria, this study aimed at reaching consensus in expert opinion on the question; which acute trauma patient is in need of care by a MMT? This paper describes the protocol of the DENIM study.

Materials and methods: A national three round Delphi study will be conducted to reach consensus. Literature was explored for relevant topics. After agreement on the themes of interest, the steering committee constructed questions for the first round. In total, 120 panellists with following backgrounds; MMT physicians and nurses, trauma surgeons, ambulance nurses, emergency medical operators are invited to participate. Group opinion will be fed back between rounds, allowing panellists to revise their opinions and so, converge towards consensus.

Results: Non to report, this is a protocol paper.

Conclusion: Prehospital treatment of trauma patients greatly depends on autonomous decisions made by the different professionals along the chain of prehospital care. Trauma patients in need of care by the MMT need to be identified in order to invigorate deployment criteria and improve trauma care. The Delphi technique allows for group consensus to be reached in a systematic and anonymous fashion amongst experts. The anonymous nature allows experts to state their opinion whilst eliminating the bias of dominant/hierarchical individuals on group opinion.

Disclosure: No significant relationships.

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REAMED NAILING FOR TREATMENT OF HUMERAL SHAFT NONUNION: REPORT OF TWO CASES

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Introduction: A rare complication after surgical treatment of humeral shaft fracture is aseptic nonunion. Its current treatment is usually compression plate and bone graft. Intramedullary reamed nail give good result for femur non union. Based on this observation, we present 2 cases of humeral shaft non union treated by successfully by intramedullary reamed nail.

Materials and methods: A 47-year-old woman and a 28-year-old man sustained a high energy trauma resulting in closed humeral shaft fracture, AO type 12B2 and 12C3, respectively. Both fractures were treated with plate fixation. The first patient presented a post-traumatic radial nerve palsy while the other one presented a iatrogenic radial nerve palsy postoperatively. Both patients fully recovered from their neurologic impairment after 6 months but suffered from fracture nonunion requiring a second surgical treatment in a period of 8 months for the woman and 15 months for the man.

Results: This treatment consist in minimal invasive removal of the screws and plate without exploration of the radial nerve followed by the introduction of an anterograde reamed locked intramedullary nail. Both fractures healed, respectively, 3 and 6 months after the surgical revision and no radial nerve palsy was observed

Conclusion: Intramedullary nailing showed encouraging results for treatment of nonunion of humeral shaft fracture after plate fixation. Additionally, this method didn't involve direct exploration of radial nerve which avoid risk for iatrogenic damage.

Disclosure: No significant relationships.

P236

ROMANIAN TRAUMA REGISTRY – RESULTS OF A LEVEL I TRAUMA CENTER IN 2012

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Introduction: The global burden of injury is enormous, especially in developing countries. Trauma systems in high income countries have reduced mortality and disability. An important component of trauma quality improvement programmes is the trauma registry which monitors the epidemiology, processes and outcomes of trauma care.

Materials and methods: Analytical retrospective study of cases introduced in the romanian trauma registry from January–December 2012, cases admitted in Bucharest Emergency Hospital, and evaluate the initial data from the database.

Results: Of 141 patients meeting inclusion criteria in Romanian trauma registry, the most common mechanisms of injury were motor vehicle collisions (39 %), road traffic accidents involving pedestrians (23 %) and falls from height (14 %). The most frequently involved were men (72 %) and the mean age was 43 years old. Most of the patients were transferred to our hospital, being a level 1 trauma center (60 %). The mean ISS was 27 and the overall mortality rate was 30 %.

Conclusion: The trauma registers have the potential to significantly improve public health and can collect high quality data for the refinement of a trauma system performance ultimately leading to better management for trauma patient

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THE EFFECTIVENESS OF POSTMORTEM COMPUTED TOMOGRAPHY IN INVESTIGATING THE CAUSE OF TRAUMATIC DEATH IN THE EMERGENCY DEPARTMENT

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Introduction: In Japan, religious and cultural beliefs restrict the use of autopsy in all but a handful of cases. The purpose of our study was to investigate the diagnostic performance of postmortem computed tomography (PMCT) for the detection of fatal findings related to causes of traumatic death in the emergency department (ED).

Materials and methods: This study included 53 traumatic deaths of subjects who were died before or immediately despite resuscitation attempts in the ED and examined with PMCT. All major injuries were classified on the Abbreviated Injury Scale (AIS) with ratings from 3 (serious) to 6 (maximum).

Results: The fatal findings were found at a total of 114 injuries in all subjects: 44 were thoracic injuries, 35 were head injuries, 17 were pelvic injuries, 13 were cervical spinal injuries, and 5 were abdominal injuries. The most frequent site of AIS 6 findings were in cervical spine ($n = 7$), and AIS 3~5 findings were in thoracic location ($n = 43$).

Conclusion: In this study, PMCT plays an important role in detecting of lethal thoracic injuries such as tension pneumothorax, which were difficult to detect with the conventional autopsy. Although it is clear that autopsy is the standard investigative approach in the detection of the cause of traumatic death, PMCT is a feasible tool for detecting morphological fatal findings when forensic autopsy is not available.

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Disclosure: No significant relationships.

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THE IMPACT OF MAJOR TRAUMA ON EMERGENCY PATIENTS REQUIRING CT SCAN AT A UK MAJOR TRAUMA CENTRE

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Introduction: The time critical nature of their injuries means that major trauma (MT) patients are prioritised over other emergency patients for CT. This study aimed to define whether MT patients negatively impacted on the time from request to scan or request to report for emergency patients (EP).

Materials and methods: Retrospective analysis comparing data pre & post trauma call. Data was collected on 711 patients from the emergency department information system from 23rd March 2014 to 21st of April 2014, 618 of which were EPs and 93 MTs.

Results: The request to scan times of EPs were significantly longer one hour and two hour following a trauma call (29.9 min to 42.4 min) $F(5,610) = 4.136$, $p < 0.005$ than EPs not temporally close to a Trauma CT, but were not significantly longer than EPs done an hour pre the Trauma CT. CT following a MT took 12 minutes longer from request to scan than before. However the scan to report time was not significantly increased, $F(5,610) = 0.382$, $p > 0.05$. The overall request to report times were not significantly different following a MT (83.1 min) compared to prior to the MT (60.3 min), $F(5,610) = 1.150$, $p > 0.05$.

Conclusion: In a busy MTC within a large emergency department, MT increases the time from request to CT acquisition for emergency patients, however there is no impact on the time from request to report. Trauma therefore does not negatively impact on the management of emergency patients requiring CT.

Disclosure: No significant relationships.

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THORACOABDOMINAL WOUNDS

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Introduction: Review of 203 cases managed by digestive and emergency surgery department of the University Hospital of Grenoble between 2004 and 2013, for chest and/or abdominal wounds.

Materials and methods: Were excluded blunt trauma, high cervical, cephalic, limb, perineal and non traumatic injuries. Were included crash room cases managed during the same period.

Results: Mortality was 7 % (14 cases). 27 cases (13 %) were hemodynamically unstable upon arrival to hospital. The average age was 35 years, with a majority of men (185 cases; 91 %). Weapons used were mostly knives (158; 78 %) and wounds were self-inflicted in 44 cases (22 %). Wounds were multiple in 109 cases (54 %). Simultaneous abdomen and chest cavities involvement was confirmed by radiological and/or surgical exploration in 29 cases, which 11 (38 %) were hemodynamically unstable. The first procedure performed was on thorax in 19 cases, 65.5 %), and it was a chest tube insertion in 11 cases (38 %). Total cases, 28 thoracotomy were performed, which 7 (25 %) by a digestive surgeon. 16 diaphragmatic injuries were found during surgical exploration, which 2 (12.5 %) performed by a coelioscopic approach. Concerning the 164 abdominal explorations (81 %), a laparotomy was preferred in 78 cases (48 %), but coelioscopic procedures were performed in 46 cases (28 %~9 converted).

Conclusion: Management of thoracoabdominal wound is a current medical and surgical challenge, because of anatomic convergence of several compartments in the thoracoabdominal region, which impose to establish efficient protocols.

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Disclosure: No significant relationships.

P240

TIBIOTALOCALCANEAL JOINT ARTHRODESIS USING ILLIZAROV APPARATUS – A RETROSPECTIVE OBSERVATIONAL STUDY

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Introduction: Ankle arthrodesis represent the most common surgical treatment for various diseases which leads to ankle joint destruction, postoperative complications, unsuccessful operative and nonoperative procedures performed on this joint.

Materials and methods: In our Clinic from 2008 to 2012 years, 15 consecutive patients were treated with ankle, subtalar and talonavicular arthrodesis using Ilizarov method. Average age of patients was 50 (range 25–64). There were 10 male and 5 female patients. The median time wearing the frame was 24 weeks (range 10–60 weeks). A mean postoperative follow-up was 33 months (range 15–60 months). We allowed patients weight-bearing for ambulation as tolerated, except one patient with Charcot neuroarthropathy. After frame removal, patients wore a cast for 6 weeks for partial weight-bearing. Patients then transitioned to a walker boot with full weightbearing allowed for a minimum of 6 weeks. Assessment of functional results was represent according to AOFAS (American orthopedic foot and ankle society) hindfoot score.

Results: Number of successful fusions was 13 (87%). Nonunion was recorded in 2 (13%) cases. Average time of healing was 23 weeks (range 10–58 weeks). Criteria for nonunions were existence of large lucency between articular surfaces, and passive motion at planned fusion site. Among major complications we had: nonunion in 2 cases, malunion on 1 case, broken pins in 2 cases. Minor complications were: pin site infection in 5 cases, and collapse of calcaneus in 1 case.

Conclusion: Our results indicate that the Ilizarov method is an effective alternative means of correcting complex foot deformities, especially in feet that previously have undergone surgery.

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six-axis deformity correction of the distal tibia. *Foot Ankle Int*. 2011;32:986–993.

Disclosure: No significant relationships.

P241

TIME TO CT SCAN FOR TRAUMA PATIENTS ADMITTED TO A LARGE DISTRICT GENERAL HOSPITAL TRAUMA UNIT

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Introduction: Trauma is the leading cause of death in the first four decades of life^{1, 2}. Following a severe injury Computed Tomography (CT) scanning is invaluable in the management of trauma patients. Guidance from the Royal College of Radiologists¹ recommends that a CT scan be commenced within 30 minutes of arrival in the Emergency Department (ED).

Materials and methods: A retrospective cohort study of all admissions (311) to the trauma unit between January 2012 and May 2014. Information was collated onto an anonymous local database at time of admission. Standards: (i) All qualifying patients should have CT scanning commenced within thirty minutes of arrival in the ED. (ii) Trauma lead should be of ST4 competency or above. Objectives: (i) To ascertain whether the absence of a consultant in the department influenced time to scan.

Results: Overall, 27 % (66/248) of eligible trauma patients reached the CT scanner within thirty minutes of admission. In 2014, 35 % (15/43) of patients were scanned within thirty minutes, with 93 % (40/43) being scanned within one hour. A doctor of ST4 competency or above lead 88 % (273/311) of trauma calls. In the absence of a consultant at night, 19 % (15/76) of patients were scanned within thirty minutes compared with 24 % (42/172) of patients during daytime hours.

Conclusion: Although this study provided evidence of improved practice in all parameters from 2012 to 2014, only 27 % of trauma cases met the standard of care required. The trauma unit is currently seeking funding for a dedicated ED scanner to ensure timely patient management.

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Disclosure: No significant relationships.

P242

TRAUMA IN A DEVELOPING COUNTRY, 2 YEARS OF REVIEW. ARE WE MISSING SOMETHING?

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Introduction: Trauma from injuries or violence is one of the main causes of death worldwide. Despite the unpredictable nature of

trauma, certain risk factors as drug abuse, age, financial status, work, and others, can be related with their condition and it can be preventable. By analyzing these risk factors we can take preventive measures to minimize the rate of patients with trauma.

Materials and methods: We retrospectively reviewed our data during a 2 years and 6 months period from January 2012 to June 2014 at Hospital Santo Tomas, an urban Trauma center. We include all the patients that required hospital management. Our primary objective was to determine all types of trauma susceptible of any preventive measure. Epidemiological data, type of injury, interpersonal violence trauma, work accidents, drug abuse, between others were recollected and analysed.

Results: The study included 1219 patients, 191 females (15.7 %), 1028 males (84.3 %). From this patients 662 (54.5 %) injuries were related to interpersonal violence. 5.3 % of our patients already had a history of previous surgery from a past injury. The most prevalent causes of injuries were the following: 290 (23.9 %) stab wounds, 407 (33.0 %) vehicle injuries and 337 (27.7 %) gunshot wounds.

Conclusion: Victims of violence face multiple challenges, the vast majority of our trauma patients suffer injuries related to a violent act. Understanding barriers, challenges, and the complexity of healing for victims of violence can help to provide appropriate care. Preventive measures should be taken in our hospital to avoid recidivism in groups of risk.

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Disclosure: No significant relationships.

P243

TRAUMCAT: EARLY RESULTS OF THE CATALANIAN TRAUMA REGISTRY

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Introduction: Being part of a realignment of trauma care in Catalunya, Traumcat (Catalan Major Trauma Registry) started collecting hospital trauma cases in July 2012. Data collection follows Utstein style guidelines (1). The registry has been designed by a multidisciplinary experts group and is hosted by the catalanian health authority (Catsalut) fulfilling all the data confidentiality requirements. On the trauma care process, patients are classified on scene according to its trauma severity with a specific emergency code (PPT code) and transported to labeled trauma center hospitals (when available). PPT code establishes four priorities according to patient situation. Priority 0 physiologic involvement, priority 1 relevant anatomic injuries, priority 2 accident biomechanical characteristics, priority 3 others. (2)

Materials and methods: Inclusion criteria: - PPT code priorities 0 and 1 - Admitted to ICU due to trauma admission - Death during a trauma admission According to hospital criteria, priorities 2 could

also be submitted to the registry. Deaths on scene are excluded.

Results: Up to 18 different hospitals have submitted trauma cases to Traumcat. 12 % of the patients were pediatric (<16y.o). 84 % of the cases were unintentional. Up to 54 % were related to road traffic accidents and 27 % to height falls. About 5 % were violence cases. About 51 % of the patients presented a NISS >15. Global mortality rate was 9 %, showing a clear relationship with age: in older than 60 years it raised to 25 %.

Conclusion: Despite its youngness and lack of “professionalization”, Traumcat is a useful tool to analyse trauma care process in Catalonia.

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Disclosure: No significant relationships.

P244

UNUSUAL COMPLICATION OF STRYKER TRIGEN S2 INTRAMEDULLARY NAIL FIXATION

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Introduction: We present an unusual case of early failure of Stryker Trigen® S2 Intramedullary nail due to proximal migration of nail presenting with early anterior knee pain in a young adult. IMN is gold standard in treatment of tibial fractures. Unfortunately, complications after intramedullary fixation of tibial fracture are too common. For our knowledge this case has never been reported till date.

Materials and methods: 21 year old University Student sustained a closed mid-shaft left tibia and fibular fracture following a road traffic accident. Immediate post-operative period was uneventful. He was on Routine non-weight bearing rehabilitation and outpatient follow up. On week-two follow up, his wound healed, his pain subsided. Check x-ray was deceptively unchanged compared to intra-operative films. No complication identified. He was commenced on touch weight bearing. On week four, he made early visit complaining anterior knee pain, shortening of his leg and external rotation of his foot. Repeat x-rays/fluoroscopic examination showed proximal migration of IMN and the 2 proximal locking screws did not engage into the nail.

Results: He underwent revision IMN using Stryker Trigen S2 device to distract the fracture site and lock proximal screws. Proximal targeting device failed to target the static and dynamic holes. Freehand technique used to engage the proximal screws. We achieved to regain tibial height, correction of mal-rotation procedure was concluded uneventfully.

Conclusion: Proximal migration of IMN causing anterior knee pain has not been reported. This case demonstrates that seemingly easy proximal locking of IMN may be followed by detrimental complication. Caution is advised to avoid this complication.

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Disclosure: No significant relationships.

P245

UNUSUAL LATE ONSET OF MASSIVE PULMONARY EMBOLISM AFTER FEMORAL SHAFT FRACTURE - A CASE REPORT

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Introduction: Pulmonary embolism syndrome (PE) is usually associated with skeletal trauma or chest injury. Symptoms usually occurs within 72 hours after traumatic injury. We presented a young patient with unusual delayed onset of PE after femur fracture about 3 wks later. Acute right heart failure developed due to huge pulmonary artery embolus.

Materials and methods: Review his history, the association injury was ipsilateral common peroneal nerve palsy by direct contusion for fibula neck area with presentation of right drop foot with paraesthesia. Right L5 transverse process fracture without neurological deficiency was noted. Neither rib fracture nor hemopneumothorax developed after the thoracic injury. Open reduction and internal fixation with femur interlocking nail was performed 14 hours after the falling incident. No clinical sign for suspicion of DVT was noted during the admission.

Results: 3 weeks later after initial injury, sudden onset of chest tightness and dyspnea attacked. The electrocardiogram showed typical S1Q3Ts pattern of PE. Chest CT was emergently performed and massive pulmonary artery thrombus was found. Open chest thrombectomy was emergently performed after ECMO resuscitation and two huge thrombus was evacuated. Fortunately he recovered without neurological deficiency. Chemical thrombolytic agent was given after thrombectomy. Pathology revealed a picture of thrombus without lipid content.

Conclusion: Most trauma related PE occur with 3 days after injury. Although supportive treatment is suggested for most PE. Massive PE maybe life threatening and prompt treatment can greatly reduce the risk of death. Immediate diagnosis and intervention for massive PE is critical in prognosis.

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Disclosure: No significant relationships.

THE ACUTE CARE SURGEON

P246

ACUTE ABDOMINAL PAIN: DO WE ALWAYS NEED ABDOMINAL PLAIN X-RAY?

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Introduction: Abdominal X-rays (AXR) is routinely considered part of the basic work-up in acute abdominal pain (AAP), however it gives useful information mainly in case of bowel obstruction or hollow viscus perforation (associated to chest X-rays). Nevertheless when AXR is routinely used in all patients with AAP this approach leads to extra length of stay in Emergency Department(ED) and additional useless radiation exposure. Aim of the study: evaluate the effectiveness of an algorithm (image below) focused on proper request of AXR in patient with AAP admitted to ED.

Materials and methods: We analyzed, in collaboration with our radiologists, the volume of AXR requested in ED for patients with AAP, highlighting requests without a correct diagnostic hypothesis. We analyzed all AXR requests in ED within 14 days before (GroupPRE) and after (GroupPOST) the introduction of an AAP-algorithm, referring diagnostic adequacy and final report.

Results: Before algorithm introduction 65 AXR had been requested but diagnostic hypothesis seemed to be inappropriate in 56 pts (86 %). Furthermore we analyzed negative and positive reports. A positive report was found in 8 cases even if diagnostic hypothesis was inappropriate, but a re-analysis confirmed that there were not consequences for patients: 1 doubtful free air (normal objective and lab exams); 4 air fluid levels in patient with diarrhea; 2 fecal impaction; 1 gastrectasia. After algorithm introduction 29 ARX were requested with an inappropriate diagnostic hypothesis in 17 pts (45 %).

Conclusion: In patients presenting with AAP, the algorithm reduced the volume of AXR (65 vs 29) during the first line investigations with a decreased inappropriate request (PRE 86 % vs POST 45 %), thereby reducing cost and improving overall patient care.

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Disclosure: No significant relationships.

P247

AN UNSUCCESSFUL TREATMENT OF A SEVERE MONOTRAUMA OF A LOWER EXTREMITY

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Introduction: In 2014 we cured a severe monitrauma of a right lower extremity with death of the patient after urgent treatment.
Materials and methods: Male, 47, injured with a large drilling rod falling from a truck (height 3 m) at 1:40 PM January 18th, 2014 Case study

Results: Prehospital care 105 minutes: Apneusis, asystolia, massive blood loss - arterial bleeding. CPR with intubation (40 minutes), defibrillation, volume resuscitation – circulation restored. In admission: GCS 3, ISS 17, mydriasis, hemorrhagic shock, BP 40/20, Hemoglobin 57 g/l, Quick test 38 %, Fibrinogen 0,6 g/l Right lower extremity ischaemia with pulseless periphery, MESS 9 Wound tamponade, continuing volume resuscitation, urgent abdominal ultrasonography – negative. Urgent operation (4:15 PM – 5:45 PM) 8 cm long ventral wound of the right groin enlarged to 28 cm: Laceration of femoral vessels and muscles, open subtrochanteric fracture. Intraluminal shunt Osteosynthesis of the fracture with a nail (while waiting for the vascular surgeon) End to end vessel to vessel prosthesis 8 cm – restoration of the circulation. Anaesthesiology and Resuscitation Unit (5:55 PM – 10:08 PM) Continuous Noradrenaline Intensive volume resuscitation (EBR, FFP, platelets, Fibrinogen) Mydriasis, tachycardia, bradycardia, exitus Death - Hemorrhagic shock

Conclusion: During the surgery the patient was stable due to continuous supplementation of the volume. At the end of the operation after restoration of the extremity circulation a warning sign appeared – diffuse bleeding from the soft tissues in the wound without possibility of surgical intervention. The patient died of hemorrhagic shock. Urgent exarticulation in the hip joint (or „salami amputation“ in the level of the fracture) may have lead to the patient's survival.

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Disclosure: No significant relationships.

P248

AWFUL ‘PAT PAT’ INJURIES IN WESTERN BLACK SEA

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Introduction: In Turkey, farm machinery accidents are an important factor for morbidity and mortality (1). In western black sea a specific farming tool is used, called ‘Pat Pat’. In our clinic we operated two patients with multiple lower extremity injuries that depending on Pat Pat machines.

Materials and methods: First case had a right Gustilo-Anderson type IIIC open tibial fracture, anterior tibial artery disruption, and also he had a left massive soft tissue defect with popliteal nerve and artery disruption as determined by Digital subtraction angiography (DSA) (Figure 1, 2). And the second case had a right Gustilo-Anderson type IV open proximal tibial fracture, distal femoral fracture, and popliteal artery disruption (Figure 3). All injuries of popliteal arteries and veins were repaired with saphenous vein interposition.

Results: In control examination, we observed that the saphenous vein

grafts have been thrombosed. We think that vascular injuries occurred in these cases due to both penetrating and blunt mechanisms (2). Repeated thrombectomy was performed and the patency of the grafts were achieved. Heparin infusion (1000 U/hour) was administered first 24 hours postoperatively and the patient was followed hourly ACT ≥200 s. Consequently, saphenous veins of both cases were protected from thrombosis.

Conclusion: In conclusion, combination of penetrating and blunt trauma generating fractures and vascular injury to lower extremities can be managed in coordination of orthopedics, vascular and plastic surgeons. Prompt diagnosis, early intervention, first 24 hour heparin infusion with continuing LMWH resulted successful management with palpable distal pulses and limb salvage of these difficult injuries.

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Disclosure: No significant relationships.

P249

COMPARISON OF THE CLOSED REDUCTION AND SCREWS FIXATION IN CALCANEAL FRACTURE TREATMENT VERSUS PLATE FIXATION - A 5 YEAR REVIEW

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Introduction: A study to compare the results of minimally invasive CRP/SF (closed reduction and pin/screw fixation) vs. open reduction and plate fixation (ORPF) of the calcaneal fractures.

Materials and methods: Between April 2009 and December 2013, 279 patients were treated in our institution with calcaneal fractures. Only 160 patients were followed up due to employment regulations. We used the Sanders classification of the calcaneal fractures. All patients who were smokers, diabetic, had vasculopathy or non-compliant underwent CRSF. Non weight bearing mobilization was indicated for all patients.

Results: From the 160 patients, 28 (17.5 %) had multitrauma, and 11 (6.88 %) who suffered bilateral calcaneal fracture. 71 (44.38 %) patients were treated conservatively, and 89 (55.62 %) underwent surgery. Among those patients who underwent surgery, 57 (35.63 %) fractures were pinned or underwent CRSF, and 32 (20 %) patients underwent ORPF. The best postoperative results were noticed with the patients who had extraarticular and Sanders type I fractures. The Böhler angle was corrected easily with those patients who underwent CRSF using the reduction instrument (Zadravec ligamentotaxis theory), but the articular surface reduction was better in those who underwent ORPF. Radiation time lower to CRP/SF. 2 mm posterior facet articular surface step had similar postoperative functional results. There were 5 (3.1 %) postoperative superficial wound healing complications but not infections, but none with those patients who were treated with CRP/SF.

Conclusion: Clinical/ambulation better with CRP/SF. Functionality no difference between the two methods. There is a need of rigid criteria of selection between the two methods

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Disclosure: No significant relationships.

P250

COMPARTMENT SYNDROME OF THE FOOT: CURRENT CONCEPTS OF DIAGNOSIS AND TREATMENT IN RELATION TO A RARE CASE OF ACUTE ONSET.

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Introduction: The compartment syndrome (CS) of the foot is a clinically underestimated complication of a wide variety of traumata. Missed or late diagnosis of CS often leads to irreversible tissue damage and persisting functional disabilities. Knowledge of the existence of the CS is essential and helps to recognize the typical symptoms, swelling and neuromotor dysfunction, in an early stage.

Materials and methods: The current concept of surgical treatment involves fasciotomy of all 9 separate compartments as soon as possible. Measuring the intramuscular pressure (>30 mmHg) helps in pre-operative diagnostics and intra-operative management. The anatomy and exposure of all 29 compartment of the foot is addressed as it is essential to perform a full fasciotomy through a typical 3 incisions exposure, one the medial side and two on the dorsal side of the foot over the second and fourth metatarsal bone. The operative technique and postoperative management is described extensively. A rare case of sudden onset CS caused by an arterial bleeding in the calcaneoplantar space secondary to a fracture of the calcaneus type IV is described with acute sensorimotoric loss off the foot.

Results: The adapted surgical decompression technique that was used is related to the standard approach. In this case early recognition and surgical treatment resulted in full recovery of the patient.

Conclusion: In case of swelling and neuromotor dysfunction of the foot following trauma in diagnostics a CS should be excluded.

Knowledge and recognition of CS should lead to early treatment and prevent irreversible tissue damage and invalidation

Disclosure: No significant relationships.

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EARLY OR DELAYED CHOLECISTECTOMY IN ACUTE CALCOLOUS CHOLECISTITIS: A FIVE YEAR SINGLE CENTER PRELIMINARY COST ANALYSIS.

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Introduction: Early (ELC) or Delayed Laparoscopic Cholecistectomy (DLC) in Acute Calcolous Cholecistitis (ACC) is still a matter of debate

Materials and methods: a single center retrospective analysis was undertaken from January 2008 to April 2013; on May 2010 the approach to ACC moved from a single surgeon based model to an Institutional model oriented to surgery at the index admission. The cost were calculated as the difference between mean daily cost of hospital stay and reimburse from Medical National Service.

Results: 502 patients, mean age 62.9 years, Charlson comorbidity Index 3. Early colecystectomy (EC) was performed in 44.3 %, Delayed colecystectomy (DC) in 23.5 % and no surgery in 32.2 % of cases. EC produced a reduction in readmission rate from 2.13 vs. 1.03 time and a 5.3 days decrease in cumulative hospital stay ($p < 0.0001$), no difference in post operative complications, conversion rate and post operative stay. The difference between reimburse and hospital stay cost produced a positive Δ of 751 € in EC compared to a negative Δ of 431€ in the DC. After May 2010 there was a significant ($p < 0.0001$) inversion in the EC rate: from 24.6 % to 57.5 % while DC moved from 39.4 % to 13 %. The implementation of surgery at the index admission produced a mean money savage of 744 € for each patient.

Conclusion: our single center results underline that EC for ACC could save money and suggest that an Intititutional pathway compared to single surgeon model can be used as an economic instrument for money savage.

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Disclosure: No significant relationships.

P252

EARLY PREDICTION OF MASSIVE TRANSFUSION IN SEVERE TRAUMA PATIENTS WITH INITIAL HYPOTENSION

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Introduction: Early prediction of massive transfusion is important in the management of major trauma patients. The purpose of this study is to determine the prediction factors of massive transfusion in severe trauma patients with initial hypotension.

Materials and methods: A retrospective study was performed within the Eulji University Hospital. Review of trauma registry data identified 679 major trauma patients (ISS, Injury severity score >15). From January 2011 to December 2013, all major trauma patients with initial systolic blood pressure that was lower than 90 mmHg were included (N = 77). The patients were divided into two groups – those who received massive transfusion (MT group) and those who didn't receive massive transfusion (non-MT group) – and the differences in initial values were compared between the two groups. Univariate analysis determined significant factors between those who received MT and those who did not.

Results: Out of a total of 77 patients, 31 patients were MT group and 46 patients were non-MT group. MT group had higher mortality than non-MT group ($p = 0.005$). The data showed almost no difference in systolic BP, heart rate, RR, GCS, ISS, and BE between the two groups. The only statically significant factor was INR, MT group was higher INR than non-MT group ($p = 0.036$, 1.30 vs 1.15).

Conclusion: From this study, the INR has demonstrated good predictability for MT in severe trauma patients with initial hypotension. Early aggressive resuscitation of the patients with initial prolongation of INR along specific guidelines is justified and may further improve outcome in severe trauma patients with initial hypotension.

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Disclosure: No significant relationships.

P253

EIGHT YEARS EXPERIENCE OF MANAGING GUNSHOT INJURIES IN A NORTHWEST LEVEL ONE TRAUMA CENTRE IN THE UK.

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Introduction: Gunshot trauma is on increase in the UK. While the overall proportion of gun related trauma is low, the absolute numbers have increased over the last decade. There has been an increase in number of admissions to our department related to gunshot injuries over the last 2 years. We wanted to evaluate the care received by these patients and to better understand the trends in gun related injuries.

Materials and methods: This study was collaboration between various departments. Data was collected retrospectively for 8 years starting from April 2005. Data collected included demographics, surgery, complications and role of microbiology sampling and antibiotics. **Results:** 138 patients were seen with gunshot injuries, a 2.5 times increase between 2005 and 2013. Shotguns were the most common weapon followed by air weapons. 46 % of the patients were managed conservatively and 47 % of patients were admitted. 74 % of patients

admitted needed surgery. The most common surgical procedure was debridement of wounds. Complication rate was 4 % while mortality rate was 3 %. For uncomplicated gunshot injuries, no routine microbiology testing or antibiotics are indicated.

Conclusion: Gunshot injuries are on the increase in the UK. Almost half our patients were managed on an outpatient basis. We are performing well in managing these patients. We are creating a pathway specifically for gunshot injuries which will improve our managing of these patients in our hospital. We also have reviewed the current guidelines and provided medical guidance on the legal issues including when police should be involved.

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Disclosure: No significant relationships.

P254

EUROPEAN RULES FOR THE DEFINITIVE SURGICAL TRAUMA CARE COURSE?

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Introduction: The recognition of the complementarity between ATLS and ETC and of the latter as ESTES official course was a clarifying step and a clear sign of affirmation of European autonomy in this matter. In the same sense, the question of the need for European courses within emergency surgery was raised on several previous occasions.

Materials and methods: Regarding non-trauma emergency surgery, we are witnessing the emergence of new projects, one of ESTES, ESC, others of the initiative of different entities, such as the EASC, from Ireland, all pointing to a common model. Regarding trauma damage control surgery, given the development of the DSTC in several member countries, here too, Europe should acquire more autonomy, taking into account the recurrent final comments of those attending the course, about the little adaptation to our reality, in addition to an excessive dependence on persons acting outside Europe. **Results:** One of the most limiting aspects is the lack of recognition of the right of free movement. The concept of National Faculty urgently needs to be replaced by the European Faculty, encompassing all European Union countries as well as those with whom there are close relationships.

Conclusion: In parallel with the existing proposal for an European qualification in this area, could ESTES, through negotiation with the parties responsible for DSTC, start working towards the establishment of an autonomous training model, an European Definitive Surgical Trauma Care Course.

References: No references, since it is only a proposal based on a personal opinion.

Disclosure: No significant relationships.

P255

FEMORAL VESSELS INJURY: A CLINICAL CASE

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Introduction: Trauma to the extremities restricted to skin and muscle-skeletal structures is one of the most common injuries in the emergency room (ER). Sometimes, it involves major vessels and becomes a limb-threatening situation. The most common scenario involves femoral vessels, corresponding to 70 % of all peripheral vascular injuries.

Materials and methods: Clinical Case A 45 years old patient, male, admitted to ER with an open injury of the right thigh. He arrived conscious but pale and hypotensive, with a cold injured extremity and without distal pulses. He was immediately sent to the operating room. It was found a complete transection of the superficial femoral artery, which was repaired with interposition of autogenous reverse left saphenous vein. Prophylactic fasciotomies were performed. He was discharged at the 8th postoperative day, walking with help of crutches. Six months later, the patient returned to his normal life.

Results: Despite the relatively low mortality associated with these injuries, the morbidity is significantly high and the repair is complex. Early recognition and treatment is very important to obtain successful outcomes. The limb morbidity increases when arterial injury is associated with venous one. Reparation of damage vessels can be performed with an end-to-end anastomosis or with an interposition of autologous conduit. Prophylactic fasciotomies must be performed to avoid compartmental syndrome.

Conclusion: Femoral vascular injury remains one of the most common peripheral vascular injuries. It's very important to recognize and treat them, avoiding the mortality and minimizing the high morbidity.

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Disclosure: No significant relationships.

P256

FUNCTIONAL OUTCOMES OF OSTEOSYNTHESIS OF THE PROXIMAL FEMUR

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Introduction: Currently interlocked intramedullary osteosynthesis of the proximal femur is the most effective method of treatment for patients with severe fractures of the upper part of the femur, especially in patients of older age. At present, we observed a sharp increase in injuries of this localization.

Materials and methods: Osteosynthesis (75 operations) with the subsequent examination was performed in 75 patients with fractures of the proximal femur. Localization of damage, the patients were distributed as follows: intertrochanteric fractures - 46 (61 %) patients, subtrochanteric fractures 29 (39 %) patients. Applied the following types proximal intramedullary nails: Aesculap (PFN) - 55 %, Striker - 25 %, Synthes (PFNA) - 20 %.

Results: In the first group score on a scale of Neer 1 year after execution of osteosynthesis of the proximal femur was 84.5 ± 2.0 points in 2 years and 88.5 ± 1.0 points, consistent with excellent results, respectively. In the second group score from the scale Neer through the year amounted to 82.3 ± 1.5 points in 2 years – 87.4 ± 1.0 points, which is also consistent with good and excellent results. In the third presents the group's assessment 1 year after osteosynthesis was 82.5 ± 1.5 points, after 2 years, 86 ± 2.0 points, which corresponded to good and excellent result.

Conclusion: The results of a comprehensive clinical and biomechanical studies have shown that when the osteosynthesis of the proximal femoral bone using an intramedullary structures Aesculap, compared with others, is characterized by a more rapid recovery of function of the musculoskeletal system of patients and more optimal biomechanical indicators have the first year after surgery.

Disclosure: No significant relationships.

P257

HAART TOXICITY MASQUERADE AS A SURGICAL ABDOMEN

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Introduction: Intussusception is a rare disease in adults and poses a challenge to identify and manage. In adults, surgical resection is the preferred treatment since half are due to malignancy. This case reveals an association between highly active antiretroviral therapy (HAART) and intussusception.

Materials and methods: Retrospective chart review

Results: A 44 year-old female with history of HIV on highly active antiretroviral therapy (HAART) presented with 3 month history of epigastric pain, nausea, emesis, weight loss, and lactic acidosis. CT of abdomen showed two small bowel intussusceptions and pericolic fat infiltration. A diagnosis of mitochondrial toxicity secondary to HAART medication was made. HAART medication was discontinued with resolution of symptoms. Further work-up to exclude a mechanical cause for her symptoms including colonoscopy, small bowel follow through, esophagogastroduodenoscopy, and repeat CT were performed. All established an absence of malignancy and intussusception.

Conclusion: Mitochondrial toxicity (MT) is a well-known complication of HAART. A hallmark of MT is lactic acidosis which when untreated can be fatal. Although MT is known to cause gastrointestinal symptoms, intussusception has not been previously reported. In our patient with MT, prolonged usage of HAART medication resulted in severe gastrointestinal symptoms and intussusception mimicking a surgical abdomen. Laparotomy has been recommended on adult patients with intussusceptions because of the high likelihood of identifying a pathologic lesion. The doctrine of adult

intussusception is to operate for concern of malignancy. Surgeons, gastroenterologist and internist caring for patients on HAART therapy must be aware of the possibility of MT when evaluating HIV patients for possible surgical abdomen.

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Disclosure: No significant relationships.

P258

INTERNAL CAROTID DISSECTION – A DIAGNOSTIC CHALLENGE

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Introduction: The internal carotid dissection is rare and a potential catastrophic condition. It may result from a direct trauma or an extreme extension and rotation of the neck.

The diagnosis is often a challenge. The patient can present with neurological symptoms, Horner syndrome, cranial nerve paralysis or cerebral ischemia. Exams like magnetic resonance (MRI) are essential for a correct diagnosis.

Materials and methods: Case report of a 30 year-old man with a carotid dissection, in result of a motorcycle crash, and literature review of the subject.

Results: The patient presented pain in his abdomen, right arm and hand. There were no neurological symptoms at the initial assessment. Radiological exams revealed a fracture of the pelvis, radio and fifth metatarsus on his right arm. The brain tomography (CT) was normal. During the observation in the emergency department the patient's neurological status deteriorated and developed a right-side hemiplegia. The patient's brain CT was, again, normal but the MRI revealed strokes in different cerebral territories such as parietal-occipital lobes, left thalamic and frontal cortex. The angiography showed the dissection of the left internal carotid.

There was no evidence of other causes of embolism, and no evidence of other arteries dissection. The patient started anticoagulation therapy. At the time of discharge, the patient presented aphasia without paralysis of any cranial nerve.

Conclusion: This case highlights the difficulty in accurate and rapid diagnosis of carotid dissection. Clinicians must maintain an elevated level of suspicion for this injury. Treatment options include conservative therapy, like anticoagulation, or invasive techniques.

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Disclosure: No significant relationships.

P259

MANAGEMENT OF POST-OPERATIVE THR AND TKR WOUND OOZE

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Introduction: Wound ooze is common following Total hip replacement (THR) and Total Knee Replacement (TKR). Persistent wound ooze is a risk factor for increased length of stay (LOS) and cost of hospitalisation. In the first few days following surgery this is likely to be attributed to haematoma rather than infection. The aim of this retrospective audit was to determine the number of patient in our institution with post THR or TKR wound ooze and if the timing of Enoxaparin (low molecular weight heparin) administration was a contributing factor.

Materials and methods: NICE guideline CG42 states Low molecular weight heparin (LMWH) should be commenced 6–12 hours following surgery provided no contraindications. 50 casenotes were randomly selected and examined for the time of Enoxaparin administration, wound ooze and LOS.

Results: Of the 50 patients, 21 had undergone THR and 29 TKR. 33/50 (60%) received Enoxaparin within the recommended timeframe. 6/50 patients experience wound oozing (3 THR and 3 TKR) of which 5 received Enoxaparin within 6–12 hours and 1 patient received >12 hours. 2 patients had wound ooze 1 day post-operative (LOS 5 days), 1 patient 3 days post-operative (LOS 10 days) and 3 patients 4 days post-operative (LOS 6–7 days). 5/6 patients were managed with antibiotics.

Conclusion: All patients with wound ooze received Enoxaparin >6 hours after surgery, therefore Enoxaparin administration was unlikely to be a causative factor here. There was a high degree of variation regarding management of post-operative wound ooze, and formation of an antibiotic administration protocol when managing this complication would be useful.

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Disclosure: No significant relationships.

P260**NUTRITION IN THE SICU: TIME TO START AT GOAL RATE?**

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Introduction: Calorie/protein deficit in the surgical intensive care unit (SICU) has been associated with worse clinical outcomes. It is customary practice when initiating enteral nutrition (EN) in the SICU to begin at a low rate and gradually increase to the final goal rate (RAMP-UP). We sought to determine what proportion of total calorie/protein deficit were caused by RAMP-UP.

Materials and methods: We prospectively enrolled adult patients admitted to the SICU between 7/2012–6/2014 who were prescribed enteral nutrition for at least 72 h. As per local standard of care, patients were started at 10 cc/h and gradually increased to goal (RAMP-UP period). Subjects who were kept deliberately at low rates (“trophic feeds”) or who had interruptions in EN during the RAMP-UP period were excluded. Caloric deficit was defined as the difference between prescribed calories and actual calories received. RAMP-UP deficit was defined as the caloric deficit accrued between EN initiation and arrival at goal rate.

Results: 109 subjects were enrolled. 72 % were male and median BMI was 26.6. The median days to EN initiation was 8. The median caloric and protein deficits were 2185 kcal and 98.5 g respectively. The RAMP-UP deficit accounted for 42 % of the total caloric deficit and 34 % of the total protein deficit.

Conclusion: Initiating low on tube feeds accounts for over a third of the overall caloric and protein deficit in SICU patients. Macronutrients deficiency has been reported to worsen clinical outcomes, starting EN immediately at goal rate may eliminate a significant proportion of this caloric and protein deficit.

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Disclosure: No significant relationships.

P261**PENETRATING NAIL GUN HEAD INJURY AFTER A SUICIDE ATTEMPT: CASE REPORT**

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Introduction: Multiple cranial injuries by a nail gun are a rare event. Most are accidental cases and involves lesions only in the soft tissues and skull, however in self inflicted cases penetrating injuries are frequent and when that happens it's usually associated to epilepsy, neurologic deficits, vascular lesions, infections of the central nervous system or even, in severe cases, death.

Materials and methods: We report a case of a 46 year old male with a self inflicted injury by 11 nails in the head caused by a pneumatic nail gun. At the admission the patient had a Glasgow Coma Scale score of 15, didn't have any neurological deficit, fever or meningism. The cranial radiography and the brain CT show 11 nails in the head, most of them entering the brain. The angio-CT didn't show any vascular damage.

Results: The patient was submitted to a surgical procedure to remove the nails, followed by a period of antibiotics and anti-epileptic drugs and was discharged 2 weeks after, without any neurological deficits.

Conclusion: Conservative treatment can be an option in very selective cases, mainly when the surgical risk is considerable for neurologic and/or vascular damage. Nevertheless, the optimal treatment is the removal of the nails after a careful evaluation of the neuroimaging and angiographic studies, in order to prevent complications.

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Disclosure: No significant relationships.

P262**PENETRATING TRAUMA IN INTIMATE PARTNER VIOLENCE VICTIMS**

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Introduction: Intimate partner violence (IPV) refers to abuse by ones current or previous partner. Only little is known about severe injury associated with it. We previously showed that IPV victims have potentially life threatening musculoskeletal injuries. We now broadened the study to examine the self-reporting IPV victims with penetrating injuries admitted to two large trauma centers in the Helsinki Central Hospital. Further aims were to find out factors and features associated with penetrating trauma in IPV.

Materials and methods: All patients with penetrating injuries, who self-reported as victims of IPV during 8/2012–8/2013, were included in this study. The clinical files were reviewed in detail for demographics, trauma related circumstances, and treatment. The Injury Severity Score (ISS) was calculated for each patient.

Results: We identified nine patients, four men and five women, aged between 26 and 69 years. The average number of injuries was 4.1 (range 1–10) and the most common sites of injury were thorax, upper limb and the neck. Eight patients were stabbed and there were no gunshot injuries. We recorded 37 injuries including four intra-abdominal, four thoracic and two retroperitoneal injuries and two combined forearm wounds with one arterial and two tendon and neural injuries. The mean ISS score was 7 (range 1–25), eight patients were hospitalized, three patients needed ICU-care and six patients needed emergency surgery.

Conclusion: Self-reporting IPV victims with penetrating injuries are infrequent. Severe IPV related injuries were found on both sexes, and the treatment required considerable hospital resources.

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Disclosure: No significant relationships.

P263

PIT VIPER BITE

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Introduction: Pit viper bite is a rare event in Portugal, though the exact incidence isn't known. Limb compartment syndrome is a potential complication in up to 9 % of bites.

Materials and methods: We present the case of a 28 y/o lady, with no previous medical history, that was bitten by a pit viper on her right hand. She arrived at the ER one hour latter presenting with upper limb compartment syndrome. As antivenom was not available and because of a rapidly progressing picture she underwent upper limb fasciotomy, and was transferred to the ICU, where antivenom arrived and was administered.

Results: Two days latter, we started to progressively close the skin, using the shoelace technique. She was operated on two more times for skin traction and finally we were able to completely close the incisions. The patient was discharged home on the 12th day, and observed on outpatient clinic 2 months after with fully preserved motor and sensitive functions.

Conclusion: Facing a compartment syndrome after pit viper bite, antivenom should be given immediately, as it usually suffices to resolve. When not available, fasciotomy is a paramount measure as to save the limb. Compartment syndrome warrants an early diagnosis and expeditious treatment.

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Disclosure: No significant relationships.

P264

RARE CASE OF ISOLATED POPLITEAL VASCULATURE INJURY WITHOUT KNEE DISLOCATION OR FRACTURE AFTER BLUNT TRAUMA

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Introduction: Blunt trauma to lower extremities has been associated with a 28 % to 46 % rate of injury to the popliteal artery. It is mainly associated with supracondylar femur fractures, knee dislocation and fractures. High amputation rate resulted from failure to revascularize. This is a second case report of popliteal artery injury resulting from blunt injury.

Materials and methods: A 74 year old man was brought to the emergency department after being hit by a train. Examination revealed a tensed left calf region. X-ray of the left lower limb revealed no fractures or dislocations. He was noted to have left lower limb compartment syndrome and underwent a left lower limb 4-compartment fasciotomy. US Doppler study of the left lower limb revealed that there was left knee and below knee occlusive disease affecting the popliteal artery. The patient underwent a left femoral angiogram, thrombectomy of tibial vessels, repair of transected popliteal artery with vein graft and balloon angioplasty of ATA and DP.

Results: Emergent treatment is advised for popliteal injury as popliteal artery injury has been reported to result in amputation rates of nearly 30–60 %. Serial examination is justified for minimally 48 hours in patients. The success rate of arterial repair with direct anastomosis is lower in patients with complete ischemia due to a blunt trauma.

Conclusion: Blunt knee injury producing a pulseless extremity should alert the clinician immediately to a probable arterial injury. The overwhelming morbidity of limb amputation associated with a delay in diagnosis or missed injury mandates that a high degree of suspicion must be maintained.

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Disclosure: No significant relationships.

P265

REFEEDING HYPOPHOSPHATEMIA: COMMON IN THE CRITICALLY ILL BUT UNRELATED TO EARLY ENTERAL NUTRITION

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Introduction: Refeeding hypophosphatemia (RH) occurs when carbohydrates are reintroduced into starved or chronically malnourished

patients. Our goal was to estimate the incidence of RH in the surgical intensive care unit (SICU) and whether nadir phosphate (PHOS) level is associated with clinical outcomes.

Materials and methods: Patients receiving enteral nutrition (EN) between 03/2012–05/2014 were retrospectively identified. Pre- and post-EN serum PHOS levels were assessed. Patients were divided according to whether they experienced RH, (post-EN PHOS level decrement >0.5 mg/dL to a nadir <2.0 mg/dL). We performed multivariable analysis to identify risk factors for RH and to assess for its association with worse clinical outcomes. We sought to determine if hypophosphatemia <2.0 mg/dL (whether RH or not) was associated with worse clinical outcomes.

Results: 213 were identified. 83 (39 %) experienced RH, while 47 (22 %) experienced a nadir PHOS level (<2.0 mg/dL) not related to EN initiation. Logistic regression, including age, sex, BMI acute APACHE II score, timing of EN initiation, and presence/absence of gastrointestinal surgery demonstrated that only BMI was an independent predictor for RH (OR = 0.93, 95 %CI 0.88–0.98). While controlling for plausible confounders RH was associated with prolonged mechanical ventilation (IRR = 1.12, 95 %CI 1.03–1.24) and increased hospital LOS (IRR 1.06, 95 %CI 1.01–1.11). PHOS <2.0 mg/dL during ICU admission was also associated with prolonged hospital LOS (IRR 1.08, 95 %CI 1.01–1.12).

Conclusion: Refeeding hypophosphatemia occurs commonly in the SICU and low PHOS levels are associated with important clinical outcomes such as duration of mechanical ventilation and hospital LOS. The development of RH was not related to timing of EN initiation.

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Disclosure: No significant relationships.

P266

REFRACTORY CHRONIC EXPANDING HEMATOMA OCCURRED AFTER OPEN REDUCTION AND INTERNAL FIXATION OF FOREARM SUCCESSFULLY TREATED BY LIGATION OF ULRNAR ARTERY: A CASE REPORT

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Introduction: In this case study, we present a rare case of refractory chronic expanding hematoma (CEH) occurred by unknown cause after the open reduction and internal fixation of the left ulna shaft

fracture of young healthy male, successfully treated by ligation of ulnar artery.

Materials and methods: Case: 21 year-old male fell off his bicycle Diagnosis: left ulna shaft fracture (AO22B-2) Treatment: LC-LCP small Postoperative course: No complications

Results: 6 months after the surgery, marked swelling of the left forearm Osteolytic lesion of ulna on radiograph matching the site of hematoma on contrast CT image Treatment: Trans-arterial embolization (TAE) for extravasation prior to the capsulectomy and removal surgery. No sign of infection or malignancy. However, swelling of the left forearm was observed again in 3 weeks. Extravasation and hematoma in contrast CT image again. Treatment: secondary surgery Intra-operatively no active bleeding, but new capsulization surrounding the hematoma. After the thorough removal of the hematoma, ulnar artery was ligated followed by application of fibrin glue and tranexamic acid to the surgical site. Pathology: hyperplasia of collagen fibers, fibroblasts and fibrin clot. Currently no recurrence of hematoma 10 months after surgery and fracture healed well without any complications.

Conclusion: The exact cause of CEH still remains unclear. In this study, hematoma was aggressive enough to cause osteolysis and showed the recurrence even after the preoperative TAE followed by resection of hematoma. In such a refractory case, after the confirmation of collateral circulation by angiography, ligation of the responsible vessel could be the effective means.

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Disclosure: No significant relationships.

P267

SELF-TAMPOONADING COMPLETE COMMON CAROTID ARTERY TRANSACTION WITH HOME-MADE RIFLE INJURY: A UNIQUE CASE..

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Introduction: With an increasing incidence in penetrating neck trauma, the acute surgical management of such cases is an evolving and important area of trauma care. The outcome of neck trauma with vascular injury is determined by a rapid and interdisciplinary approach. Such patients normally present with shock and rapid management is required. Up to this submission, a literature search failed to show an accurate incidence rate of such trauma or management guidelines.

Materials and methods: One case report and literature review

Results: A 32-year-old man presented to our Emergency Department with no neck bleeding and in a stable condition after accidentally injured himself with a home-made spring loaded rifle. In this unique case the spring completely transected the right common carotid artery. This spring causes a bolt and nut mechanism resulting in self-tamponade. Thus despite the extent of the neck injury, with this tamponading effect the patient remained stable preoperatively. This injury was repaired with autologous saphenous graft. The patient was discharged with no postoperative complications. This highlights the importance of not manipulating foreign bodies in uncontrolled clinical environments.

Conclusion: These injuries remain challenging due to the large number of vital structures lying in the confined neck area. It is the authors' intention to describe this unusual mechanism of neck penetration and to stress the vital importance of the treatment

paradigm that foreign objects should not be removed/manipulated until the patient arrived in the operating room.

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Disclosure: No significant relationships.

P268

SUBSTANCE ABUSE AND PERIOPERATIVE PAIN MANAGEMENT IN TRAUMA PATIENTS

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Introduction: When pain is poorly controlled in the perioperative trauma setting, patients may suffer needlessly and develop untoward health effects¹. In managing the pain of a patient with substance abuse, providers must be prepared to deviate from standard narcotic management. Patients with substance abuse histories may not only be experiencing a hyperalgesic state but increased tolerance must also be taken into account².

Materials and methods: Appropriate IRB approval was obtained and retrospective analysis of over 200 patient charts was completed.

Results: When comparing patients with prior alcohol use and those without, no significant differences were found among: BMI, ISS, patient-reported pain scores, and total ME's (morphine equivalent) administered. When comparing patients presenting with positive vs negative urine drug screens(UDS), both groups were similar in: BMI, ISS, length-of-stay, and non-verbal days. However, significant difference was found in total ME's administered. The most common medications administered were Morphine, Oxycodone, Fentanyl, Norco, and Hydromorphone.

Conclusion: Although alcohol is a common denominator in a large percentage of traumatic injuries, a history of alcohol use does not appear to alter a patient's perception of pain or their response to narcotic pain medication. In patients presenting with a positive UDS, their average ISS and self-reported pain scores did not differ from those without recent illicit drug use. However, patients with positive drug screens required a great deal more of narcotic pain medication to achieve similar pain management. Additionally, when Fentanyl was used in any patient, regardless of admission UDS status, those patients required greater ME's than the average patient in their cohort.

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Disclosure: No significant relationships.

P269

THE EFFECT OF ALCOHOL ON HEAD INJURY RELATED HOSPITAL ADMISSIONS

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Introduction: Traumatic head injury is a common cause for hospital admission and therefore, carries a significant financial burden to healthcare. It often falls to the other specialities to look after these patients until they are safe for discharge. The aim of this study was to investigate the impact of alcohol related injuries on hospital admissions and resources.

Materials and methods: We retrospectively studied the hospital notes of a random sample of 104 patients admitted with head injuries (HI) to the surgical triage unit in a busy UK district general hospital over a 30 month period.

Results: The mean age was 48 years (range 16–97). Male to female ratio was 69:35. 98 patients (94 %) underwent CT head imaging, of which 10 (9.6 %) demonstrated abnormalities. 50 patients had alcohol associated head injuries (48 %), of which 18 (17 %) were known alcoholics. 19 patients (18 %) had co-existing musculoskeletal injuries, in 8 of whom admission was related to alcohol. Other specialities were involved in 51 patients (49 %), of which 25 patients' admissions were related to alcohol. The mean inpatient stay was 4 days.

Conclusion: Head injury admissions are increasing, representing an increasing burden to NHS resources. Alcohol is associated with a significant percentage of HI in our population. Significant cost and manpower input is associated with these injuries putting serious strain on resources. The issue of alcohol excess in should be addressed in the community in order to attempt to decrease admissions.

Disclosure: No significant relationships.

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THE IMPACT OF INCREASED IMAGING ON OPERATIVE FINDINGS IN PATIENTS OPERATED FOR ACUTE APPENDICITIS

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Introduction: To determine the incidence of noninflamed appendix, noncomplicated appendicitis and complicated appendicitis (gangrenous, perforated) in patients undergoing surgery for acute appendicitis and the relation of these to increasing use of imaging in

the workup of patients with abdominal pain.

Materials and methods: Sampled patients operated for acute appendicitis between 1.12.2006 and 31.12.2012.

Results: 554 patients were included: 336 males and 218 females; median age 23y' (range 2–82y'). Operative findings were: noninflamed appendix in 36 (6.5 %) patients, noncomplicated appendicitis in 362 (65.3 %) patients and complicated appendicitis in 156 (28.2 %) patients. The incidence of complicated appendicitis was 50 % in patients aged up to 5 years, 26.4 % in patients aged 6–64y' and 66.7 % in older patients ($p = 0.0011$). No difference was found in the incidence of normal appendices between those operated following no imaging (9.1 %) and those operated following imaging (5.4 %), ($p = 0.1294$). Incidence of complicated appendicitis was higher in patients who underwent imaging compared to no imaging, 32.8 % vs. 23.5 % ($p = 0.0442$). Subanalysis comparing only those patients undergoing imaging while in the emergency department to those not undergoing imaging at all did not reveal any difference in the incidence of complicated appendicitis ($p = 0.1158$). The proportion of patients undergoing imaging as part of their workup increased gradually from 27.9 % in 2007 to over 90 % in 2011–2. During these years, no real difference occurred in the proportion of patients with noninflamed appendices ($p = 0.1186$) and proportion of patients suffering from complicated appendix ($p = 0.2944$).

Conclusion: A real impact of imaging on incidence of noninflamed appendices and complicated appendicitis was not demonstrated in this study.

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Disclosure: No significant relationships.

P271

THE POSTERIOR APPROACH IN TREATMENT OF PROXIMAL TIBIAL FRACTURES

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Introduction: The increasing number of high-energy injuries makes us to use posterior approach to the knee joint. Comminutive fractures are common in youth. Therefore anatomical reduction and stable internal fixation is necessary for good functional results. X-ray and CT are the first steps in accurate diagnosis and treatment. It is often necessary to exclude vascular injury by sonography or CT – angi and prevent compartment syndrome. We routinely use buttress plates to treat these fractures.

Materials and methods: Prospective study was conducted from 2007 to 2013, with the total of 19 patients with diagnosed comminutive fracture of the dorsal part of the proximal tibia. Surgical treatment with the plate or lag screws applied from the dorsal approach was done in 18 patients and evaluated with the Rasmussen anatomic and functional score.

Results: The mean operating time was 147 min. The mean anatomic score was 14.9 (range 10–16), the mean functional score was 24.5 (range 18–29), the mean range of motion was 115° (range 90°–135°). Anatomic outcome was excellent in 12 patients, good in 7 patients. Functional outcome was excellent in 12 patients, good in 4 patients and acceptable in 3 patients.

Conclusion: Accurate diagnosis, appropriate approach, stable anatomical osteosynthesis and early rehabilitation is necessary for good results. Use of posterior approach to the proximal tibial fractures is beneficial in hands of an experienced surgeon.

Disclosure: No significant relationships.

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THORACIC DUCT LESION IN THE CERVICAL REGION: CASE REPORT

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Introduction: Cervical lymph fistulas are an unusual event in trauma. They occur more frequently in the left side and the most common cause is iatrogenic, followed by trauma and tumor. The initial symptoms results from the compressive effect of the leakage of lymph and manifests as local swelling, dysphagia and/or dyspnea. The diagnosis is confirmed with biochemical studies of the lymphatic liquid and the treatment includes conservative approach, embolization of the lymphatic paths and/or surgical intervention of the lymphatic paths.

Materials and methods: We report a case of a 37 years old male victim of a cervical trauma after a fall of a bucket of water for about 10 meters, resulting in a paraparesis secondary to a traumatic cervical herniation of C6-C7. It was performed a discectomy and arthrodesis, with an approach from the left side. During the dissection of the muscles it was identified a crystal liquid of unknown source. A few days after there was a cervical tumefaction, resulting in dysphagia and dyspnea. Studies confirmed a cervical fistula extending to the mediastinum.

Results: After an unsuccessful conservative approach it was performed a thoracic duct ligation, resolving the fistula.

Conclusion: Although unusual, this condition may have very serious consequences: nutritional, metabolic, immunologic and death in 15 % of the cases. In most cases the treatment is effective with conservative approach. Invasive approaches are recommended when conservative treatment is unsuccessful.

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Disclosure: No significant relationships.

P273

TOWARDS BETTER TRAUMA CARE, INTRODUCING AN ACUTE TRAUMA & ORTHOPAEDIC FELLOWSHIP AT KING COLLEGE HOSPITAL, A MAJOR LEVEL I TRAUMA HOSPITAL, LONDON (UK)

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Introduction: After a major consultation in 2009 four major trauma centres were introduced to improve trauma care across London, United Kingdom. One of these designated Level I Trauma Centres is King's College Hospital. To further enhance trauma care a new Fellowship was developed, combining General Trauma and Orthopaedic Surgery.

Materials and methods: July 7th 2013 this project started in which five Fellows cover Trauma and Emergency Surgery, for 24/7 within a 5-week rotor. The Trauma Fellows perform the primary survey following ATLS® during assessment of the patient together with the rest of the Trauma TEAM on A&E. Trauma Surgical procedures, Definitive Surgical Trauma Care (DSTC) and Orthopaedic Surgical procedures are also performed by the Trauma Fellow, supervised by the Trauma Surgery and Orthopaedic Consultant. Secondly, all clinically admitted Trauma patients are under the care of this fellow, coordinating the care between all involved specialties.

Results: Monthly 160 patients (range 145–170) were admitted for trauma. Per month an average of 30 acute surgical procedures, 30 life saving general surgical procedures, 8 acute orthopaedic and 60 elective orthopaedic surgical interventions were performed by each fellow. Hospital stay was reduced from an average of 10 days to 8 days since introduction of the fellowship.

Conclusion: The coordination of Trauma and Emergency Surgery within one position has reduced hospital stay. The combination of General Surgery and Orthopaedic Surgery within one position epitomizes the teamwork approach necessary for treating multi-injured patients. This combination has not been reported within one post before in the UK.

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Disclosure: No significant relationships.

P274

TREATMENT OF POST-TRAUMATIC CHRONIC BONE DEFECT OF FEMURS USING NON-VASCULARIZED FIBULAR GRAFTS WITH PRESERVATION OF THE PERIOSTEUM; TWO CASES REPORT

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Introduction: Management of post-traumatic large bone defects can be very challenging especially when the defect was in the chronic

condition. Here we present two cases successfully treated large bone defects occurred after sequestrectomy of osteomyelitis and incompleteness of bone transport for lengthening, by the application of free non-vascularized fibular bone grafts harvested subperiosteally.

Materials and methods: Case 1: A 30 year-old male, injured in traffic accident Diagnosis: left femur shaft open fracture (GustiloIIIA) Treatment: several debridements and external fixation ~ Osteomyelitis occurred eventually. Treatment: sequestrectomy, insertion of bone cement rod containing the antibiotics several times ~ After infection disappeared, Treatment: free non-vascularized fibular strut grafts with preserved periosteum into a 7 cm defect. 1.5 years after surgery, transplanted bone had united without infection, and he ambulates independently.

Results: Case 2: A 26 year-old male, injured in a traffic accident Diagnosis: left femur shaft open fracture (GustiloIIIA) Treatment: debridement, external fixation ~ a large bone defect of 8 cm Treatment: After the soft tissue healed, intramedullary nailing and the bone transport for lengthening using external fixation ~ bone transport was not completed with approximately 5 cm remained bone defect Treatment: free non-vascularized fibular strut grafts with preserved periosteum into the void. The fracture was bridged 5 months after surgery, and he can walk with a cane.

Conclusion: Non-vascularized fibular graft with preserved periosteum, compared to microvascular reconstruction and Ilizarov techniques, is a simple procedure that is still valid to bridge a large chronic bone defect caused by sequestrectomy for osteomyelitis and the uncompleted bone transport for lengthening in selected cases.

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Disclosure: No significant relationships.

P275

USE OF SUPERFICIAL FEMORAL VEIN GRAFT FOR RECONSTRUCTION OF FEMORAL ARTERY BY COMBINED VASCULAR INJURY WITH GUNSHOT

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Introduction: Due to the combination of vascular, nervous, bone and soft tissues injuries, complex trauma of the extremities requires evaluation and precise and quick handling to achieve good prognosis. Patients who suffer from this type of trauma are at high risk of ischemia, wound infection, delayed wound healing and chronic pain. Therefore, the principle of reducing the surgery damage and the operating time constitutes the goal of the trauma surgery for getting good prognosis.

Materials and methods: Reporting a superficial femoral vessels injury with emphasis on the other opportunities for veins graft and the interposition of a femoral superficial vein graft for reconstruction of the injured artery.

Results: Patient with gunshot wound, four hours before, in third proximal of the right thigh, on vascular trajectory of the femoral

trigon. Right extremity pulseless, pale and hypothermic. During surgical exploration was visualized complete transection of the femoral superficial vessels and the dissection showed a femoral superficial vein stump with collateral veins to great saphenous vein. Femoral superficial vein was used for interposition and reconstruction of the injured artery, avoiding the use of the ipsilateral great saphenous vein. Fasciotomies were performed due to prolonged ischemia. The patient was followed on the next 3 months progressing to partial weakness and paresthesia, but returning to activities without vascular complications.

Conclusion: We have highlighted the rapid assessment of local vascularization, looking for alternatives to the standard graft vessels because it can provide opportunities for treatment that may influence the morbidity and mortality by reducing surgical trauma and operation time.

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Disclosure: No significant relationships.

P276

UTILITY OF COMPUTED TOMOGRAPHY AS A SURGICAL INDICATION FOR PENETRATING NECK TRAUMA. ASSESSMENT OF 26 CASES OF PENETRATING NECK WOUNDS.

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Introduction: Cuts and stabs in the neck region is often life threatening. Neck injury is a chocking hazard as well as high risk of vascular lesions. In recent years, computed tomography (CT) has remarkably progressed in its detectability. We retrospectively investigated 26 cases of penetrating neck trauma and the use of CT as a surgical indication.

Materials and methods: A cross- sectional observational study was performed of all patients attending with neck injury to the Shock Trauma and Emergency Medical Center of Matsudo City Hospital from January 2007 to September 2014. Various penetrating injuries of neck region are described in 26 cases with respect of age, gender, course of events of injury, type of injury, CT findings, involved structures, operative procedures and outcome.

Results: Range of age was 12–85 years and 81 % (21 patients) were male. 88 % (23 cases) were self-inflicted. Multiple injuries were seen in 77 % (18 cases), mean ISS score was 7.0. One patient died (fatality rate 3.8 %), 12 patients presented shock on admission but all responded to the initial resuscitative efforts. We performed CT in all 14 cases which penetration was deeper than sternocleidomastoid muscle. In 4 cases, damaged vital structure or vascular

injuries presented in CT scan. We performed emergency exploration in all 4 cases, all appeared to have either vacular injuries or brachial, tracheal damage. For the remaining 10 cases without any significant CT finding, we made a primary closure, resulting no post operative complication.

Conclusion: CT scan should be performed as a surgical induction for penetrating neck trauma if vital signs are stable.

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Disclosure: No significant relationships.

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VASCULAR INJURIES ASSOCIATED WITH TRAUMATIC BONE INJURIES IN A REGIONAL HOSPITAL

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Introduction: Vascular injuries associated with limb bone fractures are relatively uncommon. The aim was to determine the mechanisms of injury and evaluate the outcome of combined orthopaedic and vascular injuries.

Materials and methods: associated with limb bone fractures between January 1992 and July 2008 was performed. Data collected included demographic details, clinical presentation, assessment, management and outcome.

Results: Of 22,340 fractures treated during the 14 years period 36 patients sustained a vascular injury that required surgical intervention. Of those, 18 patients (50 %) had a concomitant fractures or other orthopaedic injury this group form the basis of the audit. The median age was 31.1 (range 3–80) years, and 66 % were male. Road traffic accidents accounted for 12 injuries (66 %), other accidents 4 (22 %), iatrogenic injury 1 (6 %), and 1 gunshot injury (6 %). Four patients had an associated nerve injury with varying severity. Skeletal fixation preceded vascular repair in most of the cases. Peroperative arterial shunting was not used in any patient. The primary vascular procedures included end-to-end anastomosis 2 (11 %), bypass grafting 1 (6 %), interposition vein grafts 8 (43 %), vein patch 1 (6 %), direct arterial repair 2 (11 %), ligation 2 (11 %), primary amputation 1 (6 %), reposition of normal course of artery 1 (6 %). During a 17 months follow-up period, the upper and lower limb preservation rate was 100 and 89 %, respectively. Nine patients (50 %) were symptom free; three patients (16.6 %) had a neurological deficit.

Conclusion: Vascular injury is uncommon in the orthopaedic patients. High suspicion and early intervention is essential to optimise outcome and function.

Disclosure: No significant relationships.

P278**WHAT ARE THE RISKS OF PARATHYROIDECTOMY?-RETROSPECTIVE STUDY FOR 189 CASES**

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Introduction: The anatomy of the parathyroid glands is complicated by two important structures: the recurrent laryngeal nerve and the thyroid gland.

Materials and methods: We analysed a number of 189 patients with secondary hiperparathyroidism. Complication found to be associated with this type of surgery was: damage to the recurrent laryngeal nerve with resultant weakness or paralysis of the vocal cord or cords, bleeding or hematoma, need for further and more aggressive surgery, need for a limited or total thyroideectomy, prolonged pain, impaired healing, need for prolonged hospitalization, permanent numbness of the neck skin, poor cosmetic result, and/or scar formation, recurrence of the tumor or failure to cure the tumor despite effective therapy.

Results: Weakness or paralysis of one vocal cord causes a breathy weak voice, and difficulty swallowing thin liquids. Weakness or paralysis of both vocal cords causes difficulty breathing. In rare situations, the parathyroid adenoma is found within the thyroid gland, and it is necessary to remove the thyroid gland as well. The main goal of the parathyroidectomy operation is to remove the offending glands while protecting the remaining normal parathyroid glands as well as the recurrent laryngeal nerves and the thyroid gland.

Conclusion: Every surgeon must weigh the potential risks and complications against the potential benefits of the surgery or any alternative to surgery. Preoperative imagistic investigations is mandatory for success. Parathyroid surgery has to be done in specialized centers with minimum 50 interventions/year.

Disclosure: No significant relationships.

lid part of the osteotomy also broke. After the osteotomy the explantation of the femoral stem was possible and remaining bone cement was cleared from femoral canal by chiseling and femoral reaming. The attempt to insert a revision cemented stem was not successful since the femoral canal was too narrow, so more reaming was done to ensure the revision stem femoral fit. No fit was achieved but a significant false route was created.

Results: The authors decided for a bail out scenario which included a per partes cementation of the smallest femoral stem with the use of cerclage wires which were tightened before the cement hardened. The procedure provided a stable hemiarthroplasty. The patient proceeded with non-weight bearing for 8 weeks and gradually progressed to full weight bearing mobilisation.

Conclusion: All hip arthroplasties present a challenge which should never be taken lightly.

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Disclosure: No significant relationships.

P280**COMPLETE TRACHEAL RUPTURE ASSOCIATED WITH THORACIC DUCT INJURY AFTER BLUNT THORACIC TRAUMA**

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Introduction: In the United States, thoracic injuries after blunt thoracic trauma are responsible for 8 % of emergency department admissions. Most of these injuries can be managed conservatively with up to 40 % being managed just with a chest tube. Complete tracheal section and chylothorax are infrequent injuries.

Materials and methods: Retrospective chart review of 1 patient presenting with a complete tracheal rupture associated with thoracic duct injury after blunt thoracic trauma, and review of the literature.

Results: We present a 21 years old previously healthy man, that presented to our emergency department after being run by a truck in the chest. He presented hypotensive responding to crystalloids, with no desaturation, patent airway, GCS 15, tachypneic, dysphonic, and with upper thoracic ecchymosis. Chest x ray showed left pneumothorax and a left chest tube was inserted with 1500 of blood coming out. Head and chest CT were done, findings suggestive of tracheal rupture. Fibrobronchoscopy was done and circumferential rupture of the trachea was seen. Airway was secured with endotracheal intubation and patient was taken to operating room. Medial sternotomy performed. Complete transection of the trachea was identified, and repaired was done over endotracheal tube using Vicryl 2-0. Thoracic duct section was identified in the jugulosubclavian confluence and was repaired using a Vicryl 3-0. Drains were left in the left chest and mediastinum. Patient was discharged at day 17 post

WORST CASE SCENARIO**P279****A HIP HEMIARTHROPLASTY GONE SOUR**

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Introduction: A 71 year old women, capable of walking, with rheumatoid arthritis, antiphospholipid syndrome, systemic lupus erythematosus and prior below the knee amputation, broke the neck of her left femur.

Materials and methods: A cemented hemiarthroplasty was performed but intraoperative stability testing revealed a luxation of the prosthesis. During the intraoperative analysis of the luxation the authors concluded that the position of the femoral stem was suboptimal. It was decided for an explantation of the stem. Because of the patients comorbidities the bone was brittle and small proximal periprosthetic fractures began to occur. To prevent further chipping and loss of bone a osteotomy of the proximal femur was performed during which the

operation. With no signs of complications, having done CT and fibrobronchoscopy controls.

Conclusion: We present a rare case of tracheal injury after blunt trauma that was successfully managed.

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Disclosure: No significant relationships.

P281

COMPLEX RECTAL AND ANAL CANAL INJURIES SECONDARY TO UNUSUAL BLUNT PERINEAL TRAUMA.

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Introduction: Perineal trauma can be very complex especially when it includes composite fractures, intra-abdominal and genitourinary injuries. We report on a rare mechanism of trauma leading to a complex injury including combined retroperitoneal and intraperitoneal rectal perforation.

Materials and methods: This is a 27 year old female who sustained a trauma to her perineal area when she was ejected from the Jet Ski on the surface of the water at high speed. After the accident, the patient went home asymptomatic. About four hour later she presented to Emergency department with blood streaking from her anal canal. Imaging revealed pneumoperitoneum. The patient then underwent an exploratory laparotomy and intraperitoneal rectal injury with stool spillage was noted. Heavy irrigation was performed and the perforation was primarily repaired. A Hartman's procedure with proximal diverting colostomy was performed. She had an uneventful post-operative course and was discharged home 6 days later.

Results: The patient underwent a follow up anorectal manometry study documenting physiologic rectal tone. Two and half months later, she underwent an uncomplicated takedown of her colostomy and had a complete and uneventful recovery.

Conclusion: The high pressure of the water jet secondary to falling on the surface of water at high speed could result in devastating anorectal injuries injuries and to our knowledge this is the first report of a rectal injury caused by this sort of accident.

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Disclosure: No significant relationships.

P282

FATAL OUTCOME OF BLUNT COMMON CAROTID ARTERY INJURY COMPLICATING TRAUMATIC BILATERAL SCAPULAR FRACTURE

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Introduction: Traumatic bilateral scapular fracture and blunt common carotid artery injury are rare injuries separately, rarer still in combination. Most cases of bilateral scapular fracture are related to epileptic seizures or electrical shock.

Materials and methods: A 59 year-old construction worker was brought to the Emergency Room having fallen from scaffolding after being hit by swinging timber. He was conscious on arrival and hemodynamically normal. Physical examination revealed bruises to the upper back and a fractured right forearm. Neurological examination was normal. Chest X-ray showed bilateral scapular fractures; therefore, CT scan with intravenous contrast was performed of the head, neck and chest. During stabilisation of the forearm fracture, the patient developed left sided weakness. Urgent CT angiogram of the aortic arch, neck arteries and head showed total occlusion of his right common carotid artery extending to the internal carotid and ophthalmic arteries. There was no contralateral vascular injury. In view of further neurological deterioration, a cerebral perfusion imaging was performed, demonstrating cerebral hypoperfusion and irreversible damage. Hours later the patient died.

Results: Carotid injury is rare, often undetected and may present late with neurological symptoms (usually hemiparesis). Pathology begins with intimal disruption and may progress to dissection and finally thrombosis and occlusion or full thickness tear resulting in pseudoaneurysm or arterio-venous fistula (e.g. cavernous sinus fistula).

Conclusion: A high index of suspicion for vascular trauma in the upper chest, neck and brain should be maintained when assessing high energy upper chest and back injuries.

References: none

Disclosure: No significant relationships.

P283

GASTRIC OUTLET SYNDROME CAUSED BY GALLSTONE (BOUVERET SYNDROME)

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Introduction: We want to present a very rare case to inform emergency physicians.

Materials and methods: Retrospective evaluation of the patient.

Results: A 62-years old women presented with mechanical icterus and anemia. She was complaining of abdominal pain and jaundice. She had

no previous surgeries or got treatment for any diseases. Her physical examination revealed right upper quadrant sensitivity. Her laboratory findings revealed anemia and an increase in cholestatic enzymes. An abdominal ultrasound and magnetic resonance cholangiopancreatography (MRCP) showed a dilated choledoc duct and a diffuse thickening in the distal part of the choledoc duct. Due to these findings we perform an ERCP, which revealed massive bleeding after sphincterotomy. The following CT-angiography detected a pseudoaneurysm in the fourth segment of the liver, which in turn was obliterated with coil embolisation. Five months later the patient was complaining of nausea and abdominal pain. On physical examination upper abdominal tenderness and clapping were determined. Her full blood test, plain chest and abdominal X-ray revealed no specific pathologies. Abdominal CT-Scan showed a distended stomach, air in the gallbladder and a hypodense area in the third part of the duodenum. Esophagogastroduodenoscopy revealed a gallstone in the 2nd part of the duodenum, which obliterated the lumen and led to an gastric outlet syndrome. We removed the gallstone and detected a cholecystoduodenal fistula.

Conclusion: Bouveret Syndrome is a rare entity and must be remind at situation that with a dilated stomach containing old digested food from gastrointestinal obstruction together with a hard and nonfleshy mass at the obstruction.

Disclosure: No significant relationships.

P284

IN-HOSPITAL CARDIAC ARREST IN TRAUMA PATIENTS [IHCAT]: AN EPIDEMIOLOGIC ANALYSIS FROM A NATIONAL TRAUMA CENTER

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Introduction: Much has been studied/recommended for both in and pre hospital non-traumatic arrests but not for in-hospital cardiac arrests in trauma [IHCAT]. Describing the patients who have IHCAT, their response/s to resuscitation and their final outcomes will inform trauma care providers of the necessary steps to take when faced with IHCAT. These findings will have many ramifications for the practice, training, costs and conduct of IHCAT in trauma centers globally. This study will describe the epidemiologic characteristics of IHCAT patients in a Level I Trauma Center.

Materials and methods: A retrospective analysis of data on all patients who experienced IHCA, from 1 January 2010 to 31 December 2013, was conducted from the trauma registry of the Hamad Trauma Center, the national Level I trauma center of Qatar. The epidemiologic characteristics and clinical outcomes of these patients are described and compared with historical controls.

Results: 370 [5.4 %] of 6910 trauma patients admitted had an IHCA. The majority were males [92.4 %] and expatriate [84 %]. Occupants [38.1 %] and pedestrians [30.3 %] were disproportionately represented in this study population. The age ranged from 2 months to 91 years. The rate of ROSC from IHCAT was 6.5 % with a discharge survival rate of 5.4 %. The most common discharge destinations were to rehabilitation centers [40 %] and home [30 %].

Conclusion: IHCAT is a relatively common occurrence in a national trauma center with a 5.4 % discharge survival rate. Future research must be conducted on determinants of survival, focusing on processes, pharmaceuticals and duration of CPR.

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Disclosure: No significant relationships.

P285

SELF-INFILCTED NECK WOUND

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Introduction: The authors present a case of self-inflicted neck wound, resulting in major vascular injury and profound hemorrhagic shock. Using the lumen of the injured vessel for catheter placement was the only solution as vascular collapse hindered vascular access.

Materials and methods: A 58 years old male, was brought to the ER in profound hemorrhagic shock, bleeding from a collar neck wound. 15' prior to his arrival, he attempted suicide with a single motion of 20 cm blade hedge shears. He went straight to the OR where we found a deep bilateral wound, with severed anterior jugular veins and right internal jugular vein. There were no other injuries. Vital signs were BP 30/20 mmHg, Pulse 160 bpm. All the venous injuries were ligated. No vascular access could be obtained for fluid, blood products or drugs administration, so a catheter was inserted directly in the distal stump of the right internal jugular vein. Temporary neck closure was performed and he went to ICU.

Results: Over the next 14 hours he received 8 units os PRBC, 8 units of FFP and 2 platelet pools. He then returned to the OR for a subclavian CVC and definitive neck closure. His following course in the ICU was complicated with a bilateral pneumonia eventually leading to his death on the 34th post operative day. During this time he never regained acceptable neurological status.

Conclusion: The authors stress the importance of swift action and damage control surgery, despite the dismal result of this case. Direct use of an injured vessel, in desperate cases, may be needed.

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Disclosure: No significant relationships.

ABDOMINAL AND VISCERAL PATHOLOGY

P286

A RARE CAUSE OF DEEP VENOUS THROMBOSIS

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Introduction: Inferior vena cava (IVC) agenesis is a rare congenital abnormality, with an estimated prevalence of 0.0005–1 % in the general population. Etiology is controversial. Only 71 cases have been described worldwide.

Materials and methods: We present a case of a 31 years old female who arrived to the ER with bilateral increasing lower limb swelling and pain, as well as lower back pain lasting for 3 days. She had no prior medical history and was on oral contraceptives for 3 months. Clinically she had bilateral deep venous thrombosis (DVT). Blood workup showed very elevated d-dimer (48,000/N < 200). Suspecting of IVC thrombosis a CT was ordered, showing bilateral ilio-femoral thrombosis and absent infrahepatic IVC. Both iliac veins came together to the hemiazygos vein, which was very dilated, as well as the azygos vein.

Results: She was put on continuous iv heparin and lower limb elevation with fast improvement of the swelling and pain and was discharged on the 5th day with oral anticoagulation therapy and compression stockings. No clinically relevant thrombophilia was found.

Conclusion: Although rare, IVC agenesis can be a cause of DVT in young patients, so it should be suspected when confronted with the typical pattern (proximal DVT, unknown cause, bilateral). Lifelong anticoagulation is warranted.

References: *Inferior vena cava agenesis and deep vein thrombosis: 10 patients and review of the literature* - Marc Lambert et al. Vasc Med 2010 15: 451 *Agenesis of the inferior vena cava associated with lower extremities and pelvic venous thrombosis* - Roberto Jiménez Gil et al. Journal of Vascular Surgery Nov 2006 Vol 44, 5 Pages 1114–1116 *Deep venous thrombosis associated with agenesis of IVC* - Konopka CL et al. J Vasc Bras 2010, Vol. 9, No 3

Disclosure: No significant relationships.

P287

A SCORING SYSTEM TO PREDICT THE SEVERITY OF APPENDICITIS IN CHILDREN PREOPERATIVELY

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Introduction: Non-operative treatment for acute simple appendicitis in children has recently been opted as a new treatment modality. However a correct preoperative diagnosis is crucial in selecting the patients beneficial for this treatment. The aim of this study was to develop a scoring system to accurately determine the severity of appendicitis in children and to select the patients who might benefit from this new treatment modality.

Materials and methods: Historical cohort study of paediatric patients with appendicitis treated between January 2010 and

December 2012. Division into simple, complex appendicitis or another condition based on preset criteria. Multiple logistic regression analysis was used to build the prediction model with subsequent validation.

Results: There were 64 patients with simple and 66 complex appendicitis. Four variables explained 63 % of the variation. Validation in the second cohort (13 simple appendicitis and 18 complex appendicitis patients) showed it to have 94 [71–100] % sensitivity, 69 [38–90] % specificity, a PPV of 81 [57–93] % and a NPV of 90 [54–99] %. The LR + was 3.07 [1.35–6.99] and LR- was 0.08 [0.01–0.57]. Diagnostic accuracy was 84 %.

Conclusion: Our scoring system consisting of four variables can be used to exclude complex appendicitis in clinical practice.

Disclosure: No significant relationships.

P288

AN EPIGASTRIC HERNIA WITH SURPRISING CONTENT

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Introduction: A woman was admitted to the ED with suspicion of strangulated epigastric hernia, which finally proved to be a herniated acute calculous cholecystitis.

Materials and methods: 85-year old female patient complained of abdominal pain in epigastrium for 2 days, without nausea, vomiting or temperature. Clinical examination suggested for a strangulated epigastric hernia. The patient underwent a sternotomy a few years before for double mechanical valve replacement. Laboratory findings showed an inflammatory syndrome with CRP 54 mg/L and leukocyte count equal to $15 \times 10^9/L$. The CT scan demonstrated a gallbladder and left liver herniation in the epigastric region of the sternotomy's scar. We decided for an emergency operation. We found the hernia sac with an abscess and a surrounding cellulitis. The content of the sac was an acute lithiasic cholecystitis with an atrophic left liver lobe. After relocation of the liver lobe we performed an antegrade cholecystectomy with cholangiography, showing a normal biliary tree. After resection of the sac, the fascia was closed directly with absorbable suture. We treated the wound with a negative pressure dressing. The patient was treated in the postoperative period with intravenous antibiotics for 5 days. The patient was discharged on postoperative day 13

Results: One similar case was found in literature, in this case the etiopathogenetic mechanism consisted in incarceration. In our case the etiology was represented by the presence of gallstones, herniation was a coincidental event.

Conclusion: Nowadays, CT scan is crucial for correct diagnosis and careful planning of surgical approach. We preferred a laparotomic approach in order to perform a cholecystectomy and the closure of the abdominal wall defect.

References: Gideon Goldman, Alon J. Rafael and Kashtan Hanoch - Acute acalculous cholecystitis due to an incarcerated epigastric hernia - Postgraduate Medical Journal (1985) 61, 1017

Disclosure: No significant relationships.

P289**AN EPIGASTRIC HERNIA WITH SURPRISING CONTENT**

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References: Gideon Goldman, Alon J. Rafael and Kashtan Hanoch - Acute acalculous cholecystitis due to an incarcerated epigastric hernia - Postgraduate Medical Journal (1985) 61, 1017

Disclosure: No significant relationships.

P290**ASPECTS OF MALPRACTICE INVOLVEMENT IN THE PROBLEM OF IATROGENIC BILIARY DUCT LESIONS**

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Introduction: Malpractice litigation is a problem spread and controversial worldwide, in the matter of biliary duct lesions the interpretation is different.

Definition (Bismuth) Accidental damage to any part of the extrahepatic bile ducts, except cystic stump and bile ducts in the liver bed of the gallbladder.(...)

Materials and methods: Although the number of cholecystectomies performed worldwide is growing, especially after the introduction of

minimally invasive techniques, morbidity and mortality is still high. The rate of iatrogenic biliary lesions is 0.4–0.6 % in laparoscopic cholecystectomy and 0.2–0.3 % in open cholecystectomy.

All begins with the informed consent – patients are required to sign it, but a study among surgeons says if the complication appears less than 1 % the patient does not know about this. So if the surgeon correctly informs the patient about the risks (considering that in selected cases such as chronic cholecystitis the incidence is higher) than malpractice is improbable.

Results: Decreasing the incidence of iatrogenic lesions must be a constant concern for any surgeon performing cholecystectomy. An important problem is the difference between error and mistake, the general conduit in a certain situation and the fact that could be a matter of preventable error. Respecting the recommendations - SAGES Guidelines: correct identification of relevant anatomy and performing intraoperative cholangiogram that may reduce the rate or severity of injury and improve injury recognition, is an important aspect during dissection.

Conclusion: In conclusion if the guidelines are respected, the patient is correctly informed and the surgeon spares no effort than he is highly protected from malpractice accusations.

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Disclosure: No significant relationships.

P291**BLEEDING PANCREATICO-DUODENAL PSEUDOANEURYSMS, ENDOVASCULAR TREATMENT AND FOLLOW UP IN A HEROIN ABUSER: A CASE REPORT**

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Introduction: Pancreatico-duodenal artery pseudoaneurysms are rare and potentially life-threatening vascular conditions. They are usually the sequel to pancreatitis, surgery or trauma. Optimal surgical or angiographic management of pancreatic pseudoaneurysms remains unclear. We present a case of ruptured pancreatico-duodenal artery pseudoaneurysm, its endovascular management and post interventional follow-up in a patient with a history of heroin abuse.

Materials and methods: A 55 year-old man resented with right sided abdominal pain for 7 days prior to presentation to the Emergency department. This was associated with vomiting of undigested food and a low grade temperature. He has a history of heroin usage but no other significant medical history or trauma. Contrasted CT scan of the abdomen-pelvis revealed hemoperitoneum with three enhancing peripancreatic pseudoaneurysms arising from branches of the GDA without active haemorrhage. He was managed non-operatively with angioembolisation of the pseudoaneurysms. This however complicated by intra-procedural intimal dissection of the SMA artery

and subsequent episodes of mesenteric angina.

Results: Treatment is usually advocated due to the risks of rupture and mortality. Conventional open surgery has high mortality and morbidity. Advances in interventional radiology has resulted in percutaneous endovascular methods becoming first-line management with lower morbidity and mortality. However, there are also potential pitfalls with percutaneous endovascular management of these pseudoaneurysms.

Conclusion: Transcatheter embolisation of pseudoaneurysms are effective alternative to open surgery in patients who present with bleeding. However, endovascular methods are not without complications such as intimal dissections and subsequent mesenteric angina.

References: 1) High-dose intranasal snorted heroin: a new cause of pancreatitis. Pancreas. 1998 Aug;17(2):213–5. 2) Management and outcome of hemorrhage due to arterial pseudoaneurysms in pancreatitis. Surgery. 2005 March; 137(3): 323–328

Disclosure: No significant relationships.

P292

CHANGING TRENDS IN THE MANAGEMENT OF APPENDICITIS – A TEN YEAR STUDY

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Introduction: Appendicitis is the most common cause of the acute abdomen and is always a diagnostic challenge. Traditionally it has been considered to be a clinical diagnosis with no available test being diagnostic. Over the past decade, laparoscopy has been increasingly used both as a diagnostic tool and a therapeutic procedure and it might be expected that such an intervention may reduce the negative appendectomy rate. This study analysed the use of laparoscopy in suspected appendicitis with particular emphasis on the negative appendectomy rate and compared this to the more traditional procedure of open appendicectomy.

Materials and methods: A retrospective analysis of all appendicectomies was undertaken in one Health Board over a ten year period. Data were obtained from the theatre, pathology and radiology databases to assess type of surgery, histology of appendicectomy specimens and findings of preoperative imaging.

Results: Data was obtained on 831 patients who underwent appendicectomy during the 10 year period. Of these 383 underwent open appendicectomy and 448 underwent laparoscopic appendicectomy. The negative appendicectomy rate for the open group was 27 % (170/619) and for the laparoscopic appendicectomy group was 16 % (98/622). There was no difference in the percentage of patients undergoing pre-operative imaging in either group (14 % laparoscopic vs 10 % open).

Conclusion: This study has demonstrated a significant increase in the use of laparoscopy in the diagnosis and management of suspected

appendicitis over the past ten years. This has been associated with a nearly 50 % reduction in the negative appendectomy rate.

Disclosure: No significant relationships.

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CHOLECYSTECTOMY AFTER EMERGENCY DEPARTMENT ADMISSION: EARLY VERSUS DELAYED APPROACH

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Introduction: Laparoscopic cholecystectomy (LC) is the goldstandard for acute cholecystitis (AC), biliary pancreatitis, symptomatic cholelithiasis, choledocolithiasis. Nevertheless timing of surgery remains controversial. Aim: evaluate the outcome of patients that underwent surgery after ED admission in relation to surgery timing.

Materials and methods: From 01/01/2014 to 05/31/2014, 54 patients underwent LC after ED admission. We divided patients in two groups: early cholecystectomy within 72 hours (GroupA), delayed cholecystectomy after 72 hours (GroupB). In GB we considered also patients discharged to scheduled delayed elective surgery. We compared following outcomes: mean surgery time, conversion rate, Intraoperative Complications Rate (ICR), mean Length Of Stay, Morbidity Score (MS), mortality. In GB 40 % had more than two ED admissions, 88 % of these had been admitted for conservative treatment. Furthermore 18 % in GB had Emergency Cholecystectomy after readmission for AC.

Results: Mean surgery time in GA was 118 min vs 123 min in GB. Conversion rate was 7,14 % in GA, 7,5 % in GB. ICR was 0 % in GA, 5 % in GB. Mean LOS was 4,8 days in GA, 4,3 in GB. Mortality was 1/14 in GA, 1/40 in GB. For the rest of patients mean MS was 2 in GA (4/13), 3,44 in GB (9/39).

Conclusion: From the two groups comparison most significant results were lower ICR and lower postoperative complications rate at 75 days in GA. Although further analysis regarding outcome and costs of patients (18 %) in GB that were readmitted to ED for AC should be made, an early approach to acute biliary disease seems to be the treatment of choice.

References: 1 Masahiko Hirota et al. “Diagnostic criteria and severity assessment of acute cholecystitis: Tokio Guidelines” J Hepatobiliary Pancreat Surg (2007) 14:78–82. 2. Kilian Weigand et al. “Acute Cholecystitis-early laparoscopic surgery versus antibiotic therapy and delayed elective cholecystectomy: ACDC-study”. Trials 2007, 8:29. 3. Carsten N. Gutt et al. “Acute Cholecystitis. Early Versus Delayed Cholecystectomy, a multicenter randomized trial” Ann Surg 2013; 258:385–393.

Disclosure: No significant relationships.

P294**CONSERVATIVE MANAGEMENT OF SPLENIC TRAUMA - A SUCCESSFUL CASE**

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Introduction: The diagnosis and management of splenic trauma has evolved over the past decades. Today, 95 % of splenic injuries in the pediatric population are successfully managed non-operatively, even with high grade injuries. Although non operative management (NOM) is an option of excellence in pediatric population, it presents some complications, such as unpredictable time period for a second potential bleeding, post-traumatic splenic pseudocyst or abscess, blood spread infection/sepsis, splenosis, pulmonary complications or deep venous thrombosis.

Materials and methods: The authors present a case of a 13-year-old boy, Jehovah witness, who suffered a blunt abdominal trauma while playing football. He was admitted in the emergency department complaining of pain in his left upper quadrant and was haemodynamically stable. The abdominal CT scan presented a haemoperitoneum, a splenic hematoma (11 × 9 cm) grade III/AAST and a hepatic laceration, grade II/AAST.

Results: Due to his clinical stability, he was submitted to NOM. This was managed without any blood transfusion and he was discharged 50 days after. During the hospital admission he developed a splenic pseudocyst (15 × 13.5 cm) that was fenestrated by laparoscopic approach 9 months after the trauma.

Conclusion: This case of NOM proves that with a good patient selection, a good outcome can be successfully achieved despite some potential morbidity, which can be managed through a minimal invasive procedure.

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Disclosure: No significant relationships.

P295**EMERGENCY SURGERY OF ENCAPSULATED PERITONEAL SCLEROSIS**

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Introduction: Encapsulated peritoneal sclerosis is a rare biological clinical entity, most often diagnosed intraoperatory during complications. It is associated with high mortality (about 50 % at one year

from diagnosis) by intestinal obstruction and malnutrition.

Materials and methods: The study was conducted retrospectively during 2013–2014 at the Surgical Clinic of Nephrology Hospital “Dr.Carol Davila” Bucuresti. There were included 19 patients with removal of the catheter in peritoneal dialysis.

Results: In the studied group of patients were diagnosed and confirmed histologically 3 cases of EPS, in one case death occurred within 1 year after diagnosis. EPS is the leading cause of peritoneal dialysis and is associated with: abdominal surgery, decompensated cirrhosis, peritonitis, beta-blockers, cancer, idiopathic. The longer the peritoneal dialysis is carried on, the greater is the risk of EPS. The surgery was carried on in emergency, the catheter was extracted and the patient was transferred to hemodialysis, but the fibrosis may continue. We tried removal of the fibrous membrane of the intestine, or multiple incisions of fiber membrane for stress relief, we performed limited intestinal resections. Interventions were followed by frequent complications: anastomotic fistulas and intestinal perforation.

Conclusion: EPS is a condition followed by many complications that lead to death of the patient in a short period of time after diagnosis. Keywords: SPI, emergency surgery, peritoneal dialysis.

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P296**GALLSTONE ILEUS**

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Introduction: Mechanical obstruction of the gastrointestinal tract by a gallstone is rare. Concomitant illness, such as diabetes and cardiovascular disease contribute to the significant morbility and mortality associated with gallstone ileus.

Materials and methods: Two female patients over 85 years (1 e 2), with hypertension, diabetes mellitus, chronic renal failure (1) and congestive heart failure, admitted to the ER for vomit, abdominal pain, constipation and productive cough (2). Admitted to the Internal Medicine Department for worsening of renal function (1) and respiratory infection (2). Surgery consultation was requested for abdominal pain. CT revealed aerobilia, small bowel distention and a calcified image in the intestinal lumen in both patients. Laparotomy confirmed the diagnosis (subjected to enterolithotomy). Patient 1 discharged after 13 days. Patient 2 died from cardiac arrest on the 3rd day.

Results: Gallstone ileus results from the presence of an colecistenteric fistula. Is more common in over 65 age females. The radiographic triad of intestinal obstruction, pneumobilia and aberrantly located gallstone occurs only in about 30 % of patients therefore early use of CT plays a vital role in early and accurate diagnosis (high mortality rate). The treatment should be

individualised and the enterolithotomy should be accompanied by cholecystectomy if the patient has good cardiorespiratory reserve and with absolute indications for biliary surgery.

Conclusion: Although rare, gallstone ileus should be included in the differential diagnosis of bowel obstruction, especially in elderly women. Enterotomy is the preferred treatment. The approach of the fistula in same surgery should be reserved for young, clinically stable and without significant concomitant illness.

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P297

GALLSTONE ILEUS.

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Introduction: Gallstone ileus is a rare complication of cholelithiasis, occurring in 0.3–0.5 % of all patients with gallstones, with a female predominance. It accounts for 1–4 % of all admissions with bowel obstruction and for up to 25 % of small bowel obstruction in patients over 65 years old. High mortality rates associated with gallstone ileus have been reported (12–27 %) comparing with mortality rates for small bowel or colon obstruction from other etiology. Clinical presentation is usually non-specific, predominating symptoms of intestinal obstruction. Only 50 % of all patients presenting with gallstone ileus have a history of biliary disease. Despite high sensitivity of abdominal computed tomography the diagnosis is typically made during laparotomy for unexplained small bowel obstruction.

Materials and methods: Case report

Results: We present the case of an 81 year old female who came to the emergency department of our hospital with symptoms of bowel obstruction. Abdominal radiography was consistent with small bowel obstruction. Exploratory laparotomy revealed several gallstones in the small bowel, the largest in the terminal ileum causing the obstruction. Enterotomy with stone removal was performed. A cholecystoduodenal fistula was found during gallbladder dissection therefore cholecystectomy and duodenal repair was performed. She had an uneventful postoperative course.

Conclusion: The optimal management of gallstone ileus remains controversial. One-stage procedure may prevent recurrent disease however enterotomy with stone removal alone appears to be the safest approach. If poor systemic or local conditions like severe inflammation or adhesions are present, simply relieving the obstruction may be more appropriate to avoid increased operative time, morbidity and mortality.

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Disclosure: No significant relationships.

P298

GASTROINTESTINAL STROMAL TUMORS: A RARE CAUSE OF GASTROINTESTINAL BLEEDING

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Introduction: Gastrointestinal stromal tumors (GIST) origin from mesenchymal tissue and result from mutations in active receptor proteins of tyrosine kinase. Gastric GIST are the most common subtype (60–70 %). Small tumors are most commonly found incidentally and are asymptomatic.

Materials and methods: We present a case of a 60-years-old female patient with previous iron deficiency anemia, who presented to our emergency room with hematemesis, melena, epigastric abdominal pain and hypotension. At physical examination, was hypotensive, with epigastric abdominal pain. Hemoglobin was 8.3 g/dL and normal abdominal ultrasound. Transfusion of two units of red blood cells before the upper gastrointestinal endoscopy, which showed a nodular lesion at the stomach's body with adherent hematic tissue, rising the suspicion of GIST. The patient had another GI bleeding that induced an hypovolemic shock. The patient was submitted to another upper endoscopy that revealed active bleeding. The maintenance of haemodynamic instability and continuous bleeding determined urgent surgical treatment.

Results: During surgical treatment we observed a gastric wall tumor at posterior region of stomach's body. An atypical gastrectomy was performed. The patient had a good postoperative status with hospital discharge at the ninth day of hospitalization. Anatomopathological exam reveal a 5.5 × 5 × 5 cm tumor lesion of mesenchymal tissue with fusiform cells; without atypical cells or necrosis; low mitotic index and free surgical margins. Immunohistochemistry compatible with GIST. No additional treatment was decided.

Conclusion: GIST are a rare cause of gastrointestinal bleeding. The size, the mitotic index and the anatomic localization of the tumor are very important to determine the prognostic evaluation and therapeutic decision.

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Disclosure: No significant relationships.

P299

HEMORAGIC SHOCK LIVER HEMANGIOMA- A CASE REPORT

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Introduction: We present the case of a 55 year old male who presented to the Emergency Department with abdominal pain and shock.

Materials and methods: Case report : 55 year old male patient presented to the Emergency department (ED) transferred by ambulance complaining of severe abdominal pain radiating to the back for the last 5 days getting worse. On arrival in ED patient vital signs were : Blood Pressure (70/40), Oxygen saturation 89 %, Respiratory rate 23. Past Medical History included : diabetes type 2 on insulin, atrial fibrillation on warfarin, congestive heart failure. On examination patient was clammy, sweating profusely, crackles left base. Abdominal examination revealed : diffuse tenderness with rebound and guarding. Laboratory results: leukocytosis, platelets normal, iir 4.3 CRP 4.3 Crea 243 Urea 9.2 Na 136 K 5.3, venous gas ph 7.283 BE -11 lactate 4.8. working diagnoses were : rupture abdominal aortic aneurism, perforated bowel with septic shock.

Results: Findings on the CT : in the inferior aspect of the segment IVb of the liver, there was a $3.5 \times 3.6 \times 3.9$ mixed density mass. Inferior to the liver and superior to the stomach there was a large haematoma measuring 17 by 9 cm. There was contiguous with the hepatic mass. There was evidence of extravasation of the contrast into the haematoma indicating active bleeding. Blood was noticed in the peri-hepatic and peri-splenic regions.

Conclusion: Although liver hemangiomas are not rare the risk of spontaneous bleed without history of trauma is rarely documented in the literature.

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Disclosure: No significant relationships.

P300

HOW CAN WE MANAGE TO AVOID IATROGENIC BILIARY DUCT LESIONS?

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Introduction: Iatrogenic biliary duct lesions appeared along with the introduction of cholecystectomy as the gold standard for patients requiring gallbladder removal .

Definition (Bismuth) Accidental damage to any part of the extrahepatic bile ducts, except cystic stump and bile ducts in the liver bed of the gallbladder.

Materials and methods: Nowadays the development of mini invasive techniques doubled the rate of iatrogenic lesions of bile ducts. Personally I developed a preoperative algorithm (a score system) that can predict the susceptibility of an iatrogenic lesion to be produced.

The algorithm is based of the fact that iatrogenic lesions appear as a result of a sum of defavourable factors.

My algorithm is based on simple criteria (age, sex, BMI, ultrasound aspects, leukocytosis, experience of the surgical team) and result a score that can range between 1 and 12 points.

For a value exceeding 5 points I proposed :

Further preoperative investigation (MRI, ERCP)

- Making compulsory intraoperative cholangiography (or ultrasound)

Those investigations are made in order to decrease the incidence of injuries.

Results: A study that will clarify the valability of this algorithm is ongoing. Thus far the results are encouraging, we had no iatrogenic lesion in 3 months and 50 patients enrolled, by calculating the pre-operative score.

Conclusion: The main concern is to prevent producing an iatrogenic lesion and for this purpose performing pre or intra operative investigations is a must.

It is a general conclusion that these lesions will continue to appear, but the most important aspect is to lower the rate of appearance.

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Disclosure: No significant relationships.

P301

OCCULT BLADDER CANCER IN INCARCERATED INGUINAL HERNIA

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Introduction: Explanation of hidden bladder cancer in incarcerated inguinal hernia case and literature view.

Materials and methods: The literature review, photographs and explanation of case that include abscess. 57 years ol patient applied to emergency clinic with pain and lump in inguinal region and urinate frequently. After physical examination and radiological imaging patient took into operation immediately. In operation while exploration there were a mass because of abscess, ileum and bladder included papillo-solid cancer that attacked cord components. Partial cystectomy and orchiectomy carried out. Segmental resection of ileum, hernia vesiculectomy and anatomical repair was caried out. Prolen mesh was not used because of infection.

Results: Patient was looked for 6 days after operation. Patient was discharged without complication. The togetherness of abdominal wall hernia especially inguinal hernia and malign tumor does not seen frequently.

Conclusion: In the literature only 8 cases have been reported from 1965 to 1995, accounting for 5.3 % of all hernia sac-associated tumors. The location of this type of tumor delays diagnosis and the outcome is generally poor.

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Disclosure: No significant relationships.

P302

OPERATIVE TIMING OF CHOLECYSTECTOMY FOR ACUTE CHOLECYSTITIS: INFLUENCE ON MORBIDITY AND MORTALITY

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Introduction: Cholecystectomy is the definitive treatment for patients with acute cholecystitis (AC). The choice between emergency or delayed surgery is controversial. Most surgeons agree that early cholecystectomy is safe and should be the procedure of choice in AC. We aimed to determine how the operative timing influenced on morbidity and mortality of our patients.

Materials and methods: Observational and retrospective study of a cohort of patients diagnosed with AC who underwent surgical treatment from September 2009 through June 2012. Univariate and multivariate analysis were performed to identify the relationship between operative timing (<48 hours vs >48 hours) and variables representing comorbidities, mortality, ASA score, type of surgery and postoperative complications. A level of $p < 0.05$ was accepted as significant.

Results: A total of 430 patients were included. Out of these, 283 (65.82 %) underwent an early cholecystectomy (<48 hours) while 147 (34.18 %) were surgically managed more than 48 hours after onset of symptoms. The univariate analysis identified heart diseases, male sex, high ASA score and conversion to open technique as factors for early surgery, while patients with delayed surgery had higher mortality rates. Furthermore, the multivariate analysis revealed sex (odds ratio (OR) 1.84; $p < 0.05$) and high ASA score (OR 3.42; $p < 0.01$) as independent prognostic factors for early surgery, while mortality (OR 3.65; $p < 0.01$) was associated with delayed surgery. **Conclusion:** In our experience, patients who should undergo surgical treatment within 48 hours after the onset of symptoms, are those with heart disease, high ASA score and male sex. As it has been ratified, mortality rate is higher in delayed procedures.

References: -

Disclosure: No significant relationships.

P303

PNEUMOPERITONEUM POST ERCP DUE TO A PRE-EXISTING LIVER ABSCESS

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Introduction: The incidence of post endoscopic retrograde cholangiopancreatography (ERCP) complications is around 5 % to 10 %. The ERCP – related perforation incidence rate is 0.14 % to 1.6 %, commonly related to ERCP sphincterotomies, results in a high mortality of 4.2 % to 29.6 %. We present a unique case of post ERCP pneumoperitoneum due to pre-existing liver abscess prior to the ERCP procedure.

Materials and methods: One case report and literature review

Results: A 39-year-old gentleman presented to our Surgical Department with epigastric pain and an elevated amylase. A Computer tomograph (CT) showed calculi in the distal common bile duct causing obstruction and a liver abscess in liver segment 2/3. CT guided drainage of the cyst revealed thick fluid. An ERCP was performed and no stones were present in the CBD and sphincterotomies were performed. The patient unfortunately required a laparotomy due to pneumoperitoneum following the procedure. At laparotomy the CBD and duodenum was noted to be intact however the previous liver collection was noted to be leaking pus. The abscess cavity was drained and following the laparotomy the patient made an uneventful recovery.

Conclusion: The literature search showed that a similar case occurred following ERCP in a patient with liver metastasis. The potential mechanism of this is the increased pressure in the biliary ducts during the ERCP led to rupture of the liver abscess. This may illustrate the need to avoid excessive air insufflation to prevent such a potential rare complication with ERCP in patients with liver abscess and/or following percutaneous drainage of liver abscesses.

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Disclosure: No significant relationships.

P304

PROGNOSTIC FACTORS IN SURGICAL TREATMENT OF ACUTE CHOLECYSTITIS

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Introduction: Cholecystectomy is the treatment of choice for acute cholecystitis. The management of pluripathological patients is still disputed. This study aims to compare the evolution of surgically treated patients depending on different associated comorbidities, in order to predict the prognostic profile of patients who will develop perioperative complications and a higher risk of mortality.

Materials and methods: Observational and retrospective study, including all patients diagnosed with acute cholecystitis from September 2009 through June 2012. The relationship between morbidity, mortality and variables representing comorbidities, American Society of Anesthesiologists risk score (ASA score), type of treatment and complications were analyzed by performing univariate and multivariable analysis. All records were obtained from Clinical Database Unit and the statistical analysis was performed using IBM SPSS 19.0®.

Results: A total of 467 patients were included, mean age 16–69, 55 % men and 45 % women. 436 patients underwent surgical procedure: 74 % undergoing laparoscopic cholecystectomy, 17 % with an open approach and 9 % undergoing conversions. Global mortality was 12 (2.75 %) patients. ASA score, cardiovascular and respiratory diseases and diabetes mellitus were related to an increased perioperative morbidity of those patients. Furthermore, elderly patients, respiratory diseases, delayed timing of cholecystectomy and open surgery revealed a higher mortality rate of the population studied.

Conclusion: Patients with concomitant pathologies associate higher comorbidity and torpid postoperative course, some of them showing strong evidence of a higher mortality rate.

Disclosure: No significant relationships.

P305

RARE COMPLICATION OF MECKEL DIVERTICULUM IN ADULT

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Introduction: Although rare, Meckel Diverticulum (MD) is the most common congenital anomaly in gastrointestinal tract. Is more prevalent in males and their clinical presentation arises, usually in the form of its complications: obstruction, inflammation, perforation, hemorrhage.

Materials and methods: 81 years old male, with chronic obstructive pulmonar disease. Entered in the emergency department for vomit, abdominal pain and prostration. He was hypotensive, tachycardic, with painful and distended abdomen. Abdominal radiography presented air-fluid levels. Abdominal ultrasound was inconclusive and abdominopelvic CT was suggestive of intestinal ischemia. Underwent to exploratory laparotomy - segmental small bowel ischemia conditioned by intussusception of MD. Proceeded to segmental resection. Admitted to the intensive care unit by hemodynamic instability and global respiratory failure. The patient died after 10 days due to the worsening of his respiratory failure.

Results: MD is a variant of the persistence of the omphalomesenteric canal, located on the anti-mesenteric edge, often found in the last 90 cm of the terminal ileum. Is present in about 2–4 % of the general population, being asymptomatic in most cases. Intestinal occlusion is the most common complication in adults, followed by intussusception, inflammation, bleeding, perforation, malignancy, fistula and heterotopic mucosa.

Conclusion: The authors describe a complicated case of DM with intestinal occlusion, whose importance comes from the extreme rarity of presentation in this age group. The differential diagnosis is mainly

made by ischemic or neoplastic diseases, where prognosis and clinical approach are different. Despite the final outcome that was conditioned decisively by the comorbidities of the patient, only laparotomy allowed the correct diagnosis.

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Disclosure: No significant relationships.

P306

RECTOSIGMOID PERFORATION IN AN EFFORT TO DEFECATION: DEFINITION, MANAGEMENT AND PROPOSALS FOR THIS NEW PATHOPHYSIOLOGICAL ENTITY

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Introduction: Recto-sigmoid perforation in an effort to defecation represents a diagnostic and therapeutic problem, with potentially high morbidity and mortality due to fecal peritonitis. We report 5 cases of spontaneous perforation of the recto-sigmoid junction in an effort to defecation on a non-pathological colon.

Materials and methods: This is a retrospective, monocentric study. Between May 2009 and September 2013, we had 5 patients with a perforation of the recto-sigmoid junction. There were 3 men and 2 women, median age 48 years (35–65). They presented a generalized peritoneal syndrome after a severe abdominal pain following defecation. The CT scan suggested a hollow organ perforation. One patient had a morphine treatment, another an anti-depressive treatment and neuroleptics, and the remaining patients had no chronic therapy prior

Results: Intervention revealed for each patient a perforation of the rectosigmoid junction on its anti-mesenteric side. It was too deep for an external deviation. For these 5 patients, the colon was macroscopically healthy and showed no diverticulosis. Laparoscopy was primary performed in 2 patients. A manual suture of the perforation by laparotomy and a sigmoidostomy were performed. The immediate postoperative course was uneventful, with an average hospital length of stay of 8th days. Various hypotheses seem to explain the fragility of the rectosigmoid junction: precarious vascularization, angulation of the rectosigmoid hinge realizing a “pseudo-sphincter”, etc. However, the exact pathophysiology of this disease is not yet established.

Conclusion: The rectosigmoid hinge perforation in an effort to defecation makes its knowledge essential for any surgeon who has to take care of abdominal emergencies

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Disclosure: No significant relationships.

P307**SPONTANEOUS DUODENAL HEMATOMA: A RARE CAUSE OF UPPER GI TRACT OBSTRUCTION**

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Introduction: Spontaneous intestinal hematoma is a rare complication of anticoagulation therapy, with subsequent small bowel obstruction being even rarer.

Materials and methods: An 83 years old female was admitted to the ER with bowel obstruction symptoms (abdominal pain, nausea, vomiting and unable to pass gas or stool) lasting for a week. She was on oral anticoagulation (AVK), due to a previous pulmonary embolism. Blood work showed INR of 22.49 (N:1). Upright abdominal radiography showed gas-fluid levels and an abdominal CT revealed a concentric thickening of the small bowel wall, beginning at the third portion of the duodenum extending for about 30 cm, suggesting an hematoma. She denied previous abdominal trauma.

Results: The patient was submitted to conservative management with good clinical outcome, and discharged on the seventh day being able to eat and pass stool, without vomit or pain. Observed on outpatient clinic 3 months afterwards, asymptomatic, INR 2.5.

Conclusion: Bowel obstruction due to bowel hematomas secondary to anticoagulation is a rare event and should be suspected in the presence of abdominal pain and increased INR. Abdominal US or CT are useful to confirm the diagnosis and should be performed if available. The mainstay of treatment is medical management, discontinuing anticoagulation drugs, correction of prothrombin time and correction of anemia. Complete resolution of the hematoma usually occurs within 3 weeks. Early diagnosis is paramount because most patients can be treated nonoperatively with excellent results.

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Disclosure: No significant relationships.

P308**THE CHOOSE OF TREATMENT FOR ACUTE CALCOLOUS CHOLECYSTITIS: FACTORS INVOLVED**

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Introduction: Early Laparoscopic Cholecystectomy(ELC) should be the treatment of Acute Calcolous Colecystitis(ACC) but Delayed Laparoscopic Cholecystectomy(DLC) approach still represents a diffuse alternative. Main reasons refer to a surgeon supposed “difficult cholecystectomy” and to organizational reasons. Aim of the study was

to analyze the factors involved in the choose between ELC and DLC.

Materials and methods: A retrospective analysis of patient discharged home with ACC diagnosis was undertaken from January 2008 to April 2013. Data were analyzed for demographics, pre-operative features, operation, complications and readmissions. The two different clinical approaches, ELC and DLC were compared

Results: The total population study was 341, 222 in the ELC group with a mean age of 55.84(\pm 16.56), 52.3 % were male and with a mean Charlson's index of 2.21(\pm 1.6); cholecystectomies were performed after a mean of 90(\pm 117.87) hours. In DLC group patients were 119, mean age was 60.83(\pm 15.37), 58.8 % were male with a mean Charlson's index of 2.72(\pm 1.64) and cholecystectomies were performed after a mean of 119(\pm 85.26) days. At univariate analysis elevated CRP, lower age, lower Charlson comorbidity index and admission into a surgical ward resulted associated with ELC; at multivariate analysis only the admission directly into the surgical ward was related to the choose of ELC approach($p < 0.001$).

Conclusion: Our results show that when ACC patients are admitted in a surgical unit they are likely to be operated on at the indexed admission. This suggest that an Institutional surgical oriented pathway could offer to the patient the best treatment available for ACC.

Disclosure: No significant relationships.

P309**VACUUM-ASSISTED CLOSURE AND MESH MEDiated FASCIAL TRACTION (VAWCM) IN THE MANAGEMENT OF THE OPEN ABDOMEN IN THE TRAUMA PATIENT. A CASE REPORT.**

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Introduction: The VAWCM technique, involves the use of a mesh attached to the fascial edge, which will approximate sequentially in consecutive surgeries. A negative pressure system will be attached to the mesh with a protected intraabdominal plastic sponge and another sponge subcutaneously, all connected to a vacuum system.

Materials and methods: A case of a 35 year old patient, injured by a double penetrating thoracoabdominal stab proceeding to urgent exploratory laparotomy, multiple visceral and vascular injuries is diagnosed. The estimated PATI was 30 %. Primary fascial closure is performed. In 9th postoperative day, the patient suffers an evisceration resolved by a Bogotá bag closure given the gut edema.

Results: 72 hours after, the surgical team decides to apply a VAWCM, the aponeurotic edges were dissected with posterior fixation of a 30 × 25 PPL mesh to both edges with a 0 Prolene continuous suture, leaving an interfacial distance of 19 × 34 cm. The mesh is closed with 1/0 Prolene suture. The system is replaced every 3–4 days for 5 times with 5–7 cm of approximation each time. The airway pressure never exceed a pressure higher than 6 mm Hg with respect to the pressure at the beginning of surgery. Complete fascial closure is achieved on the 17th day after the placement of the VAWCM.

Conclusion: Conclusion. We conclude therefore, that the continuous traction, with progressive closeness of fascial edges, seems to provide a definitive closure in those patients with open abdomen that can benefit of negative pressure therapy.

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Disclosure: No significant relationships.

ABDOMINAL EMERGENCY

P310

A SURGICAL EMERGENCY SERVICE OPTIMISING DIAGNOSTIC PERFORMANCE IN APPENDICITIS.

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Introduction: Appendicitis remains the commonest major general surgical emergency¹. Negative appendectomy for clinically suspected appendicitis is not without both short and long-term complications². Optimising diagnosis is a fundamental aspect of delivering excellent surgical care. This study examined the diagnostic accuracy of a consecutive series of patients admitted with right iliac fossa pain and managed operatively at Letterkenny Hospital emergency surgery service in 2014.

Materials and methods: An ethically-approved, retrospective review of all patients undergoing appendectomy between January–October 2014 was undertaken. Histologically-proven cases of acute appendicitis were correlated with operative findings through chart reviews and operation notes.

Results: There were a total of 100 patients during the study period. The mean (standard deviation) age was 23.22 (\pm 14.53) years and 40 % (40) of the patients were females. 51 (51 %) underwent an open appendectomy, 47 (47 %) had a laparoscopic appendectomy whilst 2 (2 %) were converted from laparoscopic to open because of faecal peritonitis. Forty-six patients had pre-operative radiological investigations, including a computed tomography (CT) scan in 23 (23 %), an abdomino-pelvic ultrasound (US) in 22 (22 %) or both in 1 case (1 %). The histological concordance rate was 94 % (94/100). 5 of the remaining 6 (5 %) had histologically-proven findings but not acute appendicitis. Of the 6 patients who had a normal appendix histologically, 3 had preoperative radiological investigations compared to 45.7 % in those with acute appendicitis.

Conclusion: Letterkenny Hospital emergency surgery service had a very low negative appendectomy rate at 6 %, supporting the benefits of a consultant led service in conjunction with the utilisation of appropriate radiological investigations.

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Disclosure: No significant relationships.

P311

ABDOMINAL AND TOTAL ADIPOSITY INFLUENCES THE MORBIDITY OF ACUTE PANCREATITIS

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Introduction: Previous research has indicated that obesity may be linked to the severity of acute pancreatitis. However, the association between abdominal and total adiposity seems to be a better risk factor indicator in the development of acute pancreatitis in the patients of Istanbul University Medical Faculty Surgery Services. Our research revolves around abdominal adiposity or total adiposity, which is more significant for morbidity of acute pancreatitis.

Materials and methods: Between 2013 and 2014, the findings of 60 consecutive acute pancreatitis patients were analyzed in a prospective trial. We used Ranson scores, CT severity indexes, hospital stay of > 7 days, and complications for morbidity of acute pancreatitis. We examined BMI, which was classified into 5 categories (underweight BMI < 18.5, normal range 18.5–24.9, preobese 25–29.9, obese class 30–34.9, obese class II–III > 35), and waist circumference for the analysis and investigated the relationship between each category and risk of morbidity of acute pancreatitis.

Results: Severe acute pancreatitis was confirmed in 16 patients (% 26,6), and local and systemic complications were recorded in 5 patients (% 12). Obesity, which was calculated by BMI, was identified as a significant risk factor for local and systemic complications. Moreover, in this study, obesity was also categorized by waist circumference and was confirmed as a risk factor.

Conclusion: Total and abdominal adiposity has a negative impact on the prognosis of severe acute pancreatitis patients. These patients have higher incidence of local and systemic complications. Adiposity seems to be a negative prognostic factor in severe acute pancreatitis patients.

Disclosure: No significant relationships.

P312

ACUTE ABDOMEN AFTER SEXUAL INTERCOURSE

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Introduction: A uncommon cause of pneumoperitoneum in our ER is vaginal rupture due to sexual intercourse. The patient presents with an acute abdomen with signs of small bowel perforation, thus confusing the clinical picture. A detailed sexual history is important and provides a good clue, especially if it happens in women with previous hysterectomy or surgery.

Materials and methods: A 36 years-old woman was admitted to our ER with complaint of insidious onset of abdominal pain with intensity progression. Her medical history showed a hysterectomy six months earlier.

Results: At our observation she was hemodynamically stable, with diffuse and moderate abdominal pain that improved with analgesics. She

was observed by a gynecologist that dismissed gynecological pathology. X-ray showed gas under the diaphragm, suggesting the possibility of hollow viscera perforation. A CT-scan was performed because the clinic did not match with the X-ray image. CT-scan confirmed the free air but not helped with the differential diagnosis. The decision was an explorative laparotomy. The site of perforation was identified in the vagina suture of the previous hysterectomy. The tear was repaired and was ruled out any other intra-abdominal injury. The postoperative went well and the patient was discharged four days after surgery.

Conclusion: When assessing young women presenting as an emergency with an acute abdomen, it is important to have a high index of suspicion and consider all etiologies, including coital trauma. This case reminds us that acute peritoneum can occur after sexual intercourse and also reiterates the importance of a detailed sexual history and vaginal examination.

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Disclosure: No significant relationships.

P313

ACUTE ABDOMINAL PAIN: MIND THE SUPERIOR MESENTERIC ARTERY DISSECTION

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Introduction: We report the case of a 51-year-old-man, who presented at the emergency department with abdominal pain of an abrupt onset. Abdominal contrast computed tomography (CT) scan revealed a spontaneous isolated dissection of the superior mesenteric artery (SMA).

Materials and methods: The entry-tear of the dissection was located 2 cm from the SMA origin, creating a retrograde thrombosed cul-de-sac on one centimeter and a circulating false lumen extending up to the inferior pancreaticoduodenal artery where a distal re-entry tear was identified. Downstream, the false lumen was thrombosed but extended up to the 5th jejunal artery. The SMA true lumen remained patent, there was no aneurismal dilatation and there were no signs of small bowel or colic ischemia. A conservative approach was decided. Treatment was based on transient bowel rest, antiplatelet, and thorough clinical observation.

Results: As a result, the patient's abdominal pain improved significantly. The 24 hours monitoring of blood pressure was normal and he was discharged at 72 h. The follow-up consisted in a CT angiogram at 1, 3, 6 and 12 months. No evolution was observed and both lumens remained patent.

Conclusion: Because SMA dissection is rare, there is no standard therapeutic approach. Treatment involves medical, surgical and endovascular procedures. Four schemes of evolution are possible: stability, implying regular follow-up, spontaneous thrombosis of the false lumen and artery remodeling, true lumen thrombosis, often

compensated through duodenopancreatic arcades, and aneurysmal dilatation, which may be the worst case. In the absence of intervention, a follow-up CT scan every 6 months, or yearly in case of strict stability, seem consistent.

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Disclosure: No significant relationships.

P314

ACUTE CHOLECYSTITIS. IMPROVEMENT OF RESULTS AFTER IMPLEMENTATION OF AN EMERGENCY UNIT.

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Introduction: AIM:

To analyze the results obtained by an Emergency Unit since its inception after initiating a new action protocol against acute cholecystitis.

Materials and methods: Materials and methods:

The patients included, were classified by acute cholecystitis Tokyo scale.

In elderly patients, high surgical risk, evolution > 72 h, abdominal plastron... underwent percutaneous cholecystostomy and later reassessment of the possibility of programmed surgical approach. In the rest, laparoscopic emergency surgery was planned as the first option.

Measures introduced by the Unit: sonographic management, early surgery, proprietary laparoscopic approach, subphrenic local anesthetic application for postoperative pain control, use of c-reactive protein analysis to supply short antibiotic therapy when needed.

Results: In about an 80 % of all the patients with acute cholecystitis emergency laparoscopic surgery was performed without complications further. Out of this percentage, a 6,25 % was converted to open surgery. The average hospital stay decreased to 3.43 days and the readmissions to 2.08 %.

Conclusion: CONCLUSIONS:

At present, early laparoscopic cholecystectomy is regarded as preferable approach in most patients.

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Disclosure: No significant relationships.

P315**ACUTE MESENTERIC ISCHAEMIA CAUSED BY VENOUS THROMBOSIS IN A PATIENT WITH LEIDEN V FACTOR MUTATION**

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Introduction: Acute venous thrombosis is a rare cause of abdominal pain, responsible of only 5–15 % of acute mesenteric ischaemia cases. Its diagnosis is difficult, specially if unsuspected.

Materials and methods: We report a case of a 55 yo male with past medical history of obesity (BMI 30.6 kg/m²), leg deep vein thrombosis and heterozygosis for Leiden mutation of coagulation factor V. He came to Emergency with 6 days of abdominal pain and vomiting, associated with watery diarrhea. On exam 36.5 °C, with normal haemodynamic status. Abdomen was distended, painful on palpation and with no bowel sounds. Blood test showed mild leukocytosis, normal haemoglobin, CK and amylase levels. Chest and abdominal X rays were normal and the patient finally underwent a CT scan that showed congestive small bowel with mesenteric fat enhancement and free fluid.

Results: Exploratory laparotomy was performed and a 60 cm of ischaemic jejunal loop was resected. End to end jejunostomy manual anastomosis was carried out. Immediate postoperative heparine (6000 U) was given and patient was discharged without complications on POD 6.

Conclusion: Mesenteric ischaemia secondary to venous thrombosis is a difficult diagnosis specially in early stages, because of insidious course and non specific clinical signs. High index of suspicion is the only means to conservative treatment with anticoagulants, but frequently patients arrive to hospital with peritoneal signs making surgery the only therapeutic option. Advice patients with known hypercoagulability syndrome to consult Emergency Department in case of vague abdominal pain and suspicion may trigger prompt diagnostic workout in order to avoid surgery in this patients.

Disclosure: No significant relationships.

P316**AN UNUSUAL CASE OF VAGINAL DISCHARGE**

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Introduction: IVF is an increasingly common method of fertility treatment with 34855 women treated in 2006. The commonest complications associated with egg retrieval include: bleeding, infection and damage to surrounding organs. The incidence of severe complications such as intraperitoneal bleeding or ovarian abscess formation is low.

Materials and methods: We present a case of vaginal discharge in a young woman following ultrasound guided egg collection for IVF who attended A&E with abdominal pain and clear discharge.

Results: An abdominal ultrasound revealed enlarged ovaries

consistent with previous stimulation, a normal uterus and a distended bladder. No evidence of free fluid in the pelvis. A CT IVU demonstrated extravasated contrast pooling in the area of posterior fornix of vagina, tracking through the vaginal wall on the right originating from the right distal ureter. Treatment was insertion of a JJ stent.

Conclusion: The mechanism of injury appears to be the result of any of a series of possibilities; hyper-mobile ovaries, abnormal anatomy (possibly secondary to previous infection of pelvic inflammation), the natural location of the ureters and the difficulty in identifying the ureters using ultrasound. Ureteric injury during IVF treatment is potentially under reported and most patients are asymptomatic. We believe in the case reported, the patient was symptomatic because of urinary reflux and symptoms stopped when the patient was catheterised. This case report demonstrates the diagnosis of ureteric injury in a patient presenting with abdominal pain and vaginal discharge should make up part of the differential diagnosis as if treated in a time appropriate manner can be managed successfully.

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Disclosure: No significant relationships.

P317**CLINICAL PRESENTATION IS IN SPITE OF THE INCREASING USE OF CT-SCAN STILL CRUCIAL FOR DECISION-MAKING AND URGENCY FOR SURGICAL INTERVENTION WHEN SMALL-BOWEL STRANGULATION IS SUSPECTED**

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Introduction: The clinical presentation has traditionally been of vital importance for decision-making when strangulation is suspected. Diagnostics in intestinal obstruction has however changed with the use of CT-scan. We evaluated the importance of clinical course compared to findings at CT-scan regarding the presence of strangulation demanding small-bowel resection.

Materials and methods: Forty-five consecutive patients (median-age 72 (20–90), 18 male) with clinical suspicion of small-bowel obstruction who all had a laparotomy where strangulation was diagnosed were included. All had been examined with a preoperative CT-scan. Prehospital duration of pain, preoperative need for morphin-analgesia and whether a suspicion of strangulation at CT-scan was present or not were prospectively registered.

Results: CT-scan resulted in the suspicion of small-bowel strangulation in 9 patients who were not subjected to further analysis. CT-scan did not result in the suspicion of strangulation in 36 patients. Fifteen of those had strangulation requiring resection; in 21 the strangulation did not require resection. Patients subjected to resection had (median) a pre-hospital duration of pain of 5 hours, were given 10 mg morphin pre-operatively divided into 3 injections and time

between arrival and surgery was 21 hours. Corresponding figures for non-resected patients were 18 hours, 5 mg in 1 injection and 15 hours.

Conclusion: Clinical course is in spite of CT-scan still of vital importance for decision-making regarding the need for surgery. Patients in this study were few but a short pre-hospital period of pain as well as larger amounts and multiple injections of morphine per time-unit seems to be associated with a more pronounced ischemia at laparotomy.

Disclosure: No significant relationships.

P318

COULD CHOLECYSTO-DUODENAL FISTULA PRESENTS SIMULTANEOUSLY IN TWO COUNTRIES? BOUVERET'S SYNDROME, THE SURGICAL MANAGEMENT AND REVIEW OF LITERATURE.

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Introduction: Cholecysto-duodenal fistula (Bouveret's syndrome) is a rare complication of gallbladder disease and it accounts for 1–4 % of all mechanical obstruction caused by gallstones. Bouveret's syndrome tends to occur more commonly in women (65 %) with a median age of 74.1 years at presentation. Since the first publication of two cases by Bouveret in 1896, only 300 cases have been published in the literature up till 2008. Early diagnosis in patients with Bouveret's syndrome is important as the mortality rate in such patients is reported to be between 12 % to 33 %

Materials and methods: Two case reports and literature review.

Results: In this review we present two cases treated in two different countries, during the month of June 2014. A 55-year-old man and 88-year-old women were treated in Malta and United Kingdom respectively. Two different surgical approaches were used. Laparoscopic gastrostomy was performed for the 55-year-old gentleman and removal of a 10 cm stone was successfully removed. A laparotomy with gastrostomy was performed for the 88-year-old gentleman with the stone being successfully removed with this surgical technique. Both patients were discharged with no postoperative complications

Conclusion: A literature review did not show any standardized emergency surgical management for Bouveret's syndrome. Therefore the emergency surgical approach should be individualised. Endoscopic treatment for stone extraction is usually unsuccessful. These two cases show that the use of gastrostomy (laparoscopic or laparotomy) for stone extraction is a safe surgical technique. Other surgical options include enterolithotomy with or without cholecystectomy. The repair of the cholecysto-duodenal fistula is still controversial.

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Disclosure: No significant relationships.

P319

DAMAGE CONTROL LAPAROTOMY IN MANAGEMENT OF NON-TRAUMATIC EMERGENCY IN VISCERAL SURGERY

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Introduction: Damage control surgery is currently used in the management of abdominal trauma. Same approach can be applied in patients with acute nontraumatic abdominal pathology, mainly ischemic or septic.

Materials and methods: A retrospective analysis of data from patients who underwent damage control surgery (DCS) between 2005 and 2013 in Grenoble University Clinic of Visceral Surgery (France). Demographics, and physiological parameters, surgical indications and procedures, type of abdominal closure, mortality, morbidity were compared. Observed mortality were compared to those calculated from the Simplified Acute Physiology Score (SAPS II).

Results: We include 215 patients, among them 165 patients had a non traumatic DCS. The mean age was 65, 59 % were males. Indications for non-traumatic DCS include peritonitis (ischémie, post opérative...), acute pancreatitis, non-traumatic bleeding (aortic aneurysm), bowel obstruction. 122 patients (74 %) were initially hemodynamically unstable. Two abdominal closure techniques employed: Laparostomy with Vacuum Assisted Abdominal Coverage (VAAC) (41 %: n = 88), or exclusive skin closure (ESC) (59 %: n = 125), without significant difference on mortality or morbidity between VAAC and ESC. Mortality rates for non traumatic DCS were 46 % and 54,9 % in observed and calculated mortality respectively ($p < 0,05$). The average length of stay in the Intensive Care Unit was 17 days.

Conclusion: Damage control surgery concept (bleeding control, necrotic areas with limited resection, intestinal resection without restoration of continuity and without stomy, VAAC or ESC, automatic reoperation after resuscitation) may be applied to non-trauma patients. Especially ischemic peritonitis and acute pancreatitis are excellent indication for DCS.

Disclosure: No significant relationships.

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DELAYED SPLENIC RUPTURE WITH MEDIAL FEMORAL NECK FRACTURE

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Introduction: Injury of the spleen result from penetrating or blunt trauma of the left abdomen or the lower thorax. A 79 year old female patient presented in the emergency department with a fracture of the

right medial femoral neck six days after a fall on her right body side and a cemented hemiprosthesis was implanted. Six days later, she presented with haemorrhagic shock and was diagnosed with a delayed splenic rupture and a splenectomy was performed. Coincidence of a femoral neck fracture and a splenic rupture after a low energy trauma has not been reported before.

Materials and methods: Case report of a 79 year old female patient that presented in the emergency department of our level I trauma centre.

Results: CT-scan of the abdomen after haemorrhagic shock showed a huge intraabdominal haematoma, the patient underwent laparotomy and splenectomy. Histopathological examination showed a delayed splenic rupture of a normal spleen twelve days after trauma. After splenectomy the patient developed a pneumonia and died 34 days after trauma in septic shock. Even careful reevaluation of the case did not provide any clue to expect an injury of the spleen according to trauma mechanism. We found no case in literature that describes a delayed rupture of a previously healthy spleen in combination with a medial femoral neck fracture in a low energy trauma.

Conclusion: This case shows that delayed splenic rupture of a normal spleen can occur even after low energy trauma in a certainly unusual combination of injuries. Injury to the spleen should always be considered even with uncharacteristic anamnesis. Physical examination after trauma should include careful reevaluation for the presence of symptoms of splenic rupture.

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Disclosure: No significant relationships.

P321

DIAPHRAGMATIC TRAUMATIC HERNIA - LATE PRESENTATION

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Introduction: The late presentation of Diaphragmatic Traumatic Hernia (DTH) is a rare but well described situation. The accurate incidence and prevalence of chronic DTH is very difficult to determine. Diaphragmatic injuries are often missed at the time of trauma for various reasons (small defect, other obvious and important injuries, “plugging” effect of organs and omentum).

Materials and methods: Retrospective study of clinical case.

Results: Male patient, 57 years old, with a history of thoraco-abdominal blunt trauma - crushed by a pine tree fall, 18 months previously. Presented in the Emergency Department with abdominal pain in the left upper quadrant with thoracic and lumbar irradiation, constipation and absence of flatus with 3 days duration. The exams performed confirmed the diagnosis of intestinal obstruction and

diagnosed an incarcerated left diaphragmatic hernia. Submitted to surgery – reduction of the hernia contents (colon and greater omentum), partial resection of omentum and suture of diaphragm by left sub costal laparotomy.

Conclusion: Because it may course largely asymptomatic or with unspecific symptoms and signs, DTH can be difficult to diagnose and present only months to years later. Treatment of choice is surgical repair, although the thoracic approach is considered by many authors the route of choice in chronic diaphragmatic hernias, the abdominal approach may be superior in the acute abdomen setting or related to the experience of the surgical team.

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Disclosure: No significant relationships.

P322

ENEMA-INDUCED PERFORATION OF THE RECTUM

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Introduction: Traumatic rectal perforation is an uncommon diagnosis. Most frequent causes are iatrogenic rectal perforation during colonoscopy, insertion of a foreign body and, less often, enema-induced in chronically constipated patients.

Materials and methods: The authors present a case of a 76-year-old male who was admitted to our Emergency Room with complaints of sudden onset of severe abdominal pain and rectal bleeding after performing a rectal enema for its chronic constipation. He had been previously submitted to an anterior rectal resection for a rectal cancer.

Results: Physical examination revealed signs of acute abdomen and fresh blood on digital rectal examination. He was hemodynamically stable. No findings were detected on a plain abdominal radiography and the CT-scan demonstrated the presence of free air near the rectal anastomosis, suggesting rectal perforation. The patient proceeded to emergency explorative laparotomy. The site of perforation was identified and an Hartmann's procedure was performed. The recovery period was uneventful and the patient was discharged on the seventh postoperative day.

Conclusion: The use of retrograde irrigation enemas is common in the treatment of chronic constipation, especially in the elderly. In this case report, the relevant information relating the enema administration to the patient's condition was given by himself but, sometimes, the information might be vague or misleading. Awareness of the possible injury from enemas administered to chronically constipated patients should be stressed. Different approaches in the management of traumatic rectal perforations are experienced ranging from primary closure alone in early presented cases to fecal stream diversion, which stays as a mainstay of management.

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Disclosure: No significant relationships.

P323

FIRST-TRIMESTER RUPTURED BICORNuate UTERUS IN A PRIMIGRAVIDA: CASE REPORT

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Introduction: Incomplete fusion of the two Müllerian ducts during embryogenesis leads to varying degrees of separation between two symmetrical uterine cavities (1, 2). Herein, we report a rare case of primigravida with first trimester rupture of bicornuate uterus (BU). BU was diagnosed by ultrasound scan at the 7th week of gestation before rupturing at the 9th week.

Materials and methods: Case report A 24-year-old primigravida in the first trimester (9 weeks) presented complaining of epigastric pain and vomiting for one day. Ultrasound scan performed at the 7th week of pregnancy showed a BU with single intrauterine gestational sac and viable fetus in the right horn. On examination, the patient was pale and irritable, her pulse rate was 120 bpm and blood pressure was 110/70 mmHg. Abdomen was soft with tenderness in the epigastric area. Ultrasound scan has shown viable fetus in the right horn of the BU, free fluids in Morrison's pouch. In the next few hours the pain increased and hemoglobin dropped to 6.8 g/l.

Results: Laparotomy has shown BU with pregnancy in the ruptured right horn. Placental tissues and a fetus were seen in the peritoneal cavity. Both the ovaries and fallopian tubes were normal. The defect in the uterus was sutured. The post-operative period was uneventful and the patient was discharged on the 4th postoperative day. She was advised to use contraceptive pills for at least one year.

Conclusion: Rupture of BU in first trimester is a potentially life-threatening condition. Early sonographic diagnosis has a major contribution for evaluation and management.

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Disclosure: No significant relationships.

P324

HOW TO MANAGE A COMPLEX ABDOMINAL TRAUMA

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Introduction: Abdominal gunshot trauma can cause a wide spectrum of lesions, depending on caliber, velocity, bullet trajectory and shooting distance. The most affected organs are small bowel (50 %), colon (40 %), liver (30 %) and vascular structures (25 %), leading to surgical intervention in 85 to 95 % of cases.

Materials and methods: We present a case of abdominal gunshot trauma.

Results: We report the case of a 40 years old man, admitted due to suicide attempt with a gunshot, in hypovolemic shock. Entrance wound was located in the left abdominal flank and exit wound in the lumbar region. We performed a laparotomy and found a complete section of small bowel and transverse colon, gastric perforation, destruction of the lower pole of left kidney, complete section of left psoas and lumbar muscles and two fractured ribs with intra-abdominal bone splinters. We executed a closure of sectioned small bowel tops and distal top of transverse colon, a colostomy with the proximal transverse top, gastrorrhaphy, left nephrectomy and haemostatic packing in retroperitoneal muscle damage, in 1 hour surgery. Peroperatively transfusion and aminergic support was necessary. 72 hours later we did a second look surgery, where it was possible to perform anastomoses of small bowel loops and place a double-face mesh in lumbar region, keeping the colostomy. The patient was discharged after 23 days of hospitalization.

Conclusion: The abdominal gunshot trauma can be dramatic, needing an immediate and appropriate approach, most of the times with a damage control surgery like the case that we presented.

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Disclosure: No significant relationships.

P325

IMPROVEMENT OF INTRAABDOMINAL ABSCESS RATE AND RESTAY OF ACUTE APPENDICITIS PERFORMED BY LAPAROSCOPIC APPROACH.

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Introduction: AIM. To analyze results of the changes applied in preoperative, intraabdominal and postoperative phases in the management of acute appendicitis performed by laparoscopic approach.

Materials and methods: Materials and methods. A emergency surgery section was set up mainly to decrease the occurrence of postoperative abscess and hospital restay of acute appendicitis performed by laparoscopic approach. A retrospective study from June of

2012 to August of 2014 was tackled comprehending 56 patients. Grades of appendicitis were: 26.7 % I, 16.07 % II, 41.07 % III and 17.85 % IV. The applied changes were: preoperative(early diagnosis, abdominal ecography performed by the new section itself, right antibiotic treatment), intraoperative(change of antibiotic according to surgical findings, application of endogia when the cecal appendix base is in bad condition, suction and/or cleansing in III grade, extraction of the cecal appendix through the trocar or by bag), postoperative(C-reactive protein one day after surgery and previous to hospital discharge decision about antibiotic supply at home, short antibiotic treatment, drainage at home in III and IV grades).

Results: Hospital stay average has been 3.5 (1–8) days. In 92.95 % of patients acute appendicitis was approached by laparoscopic surgery. Restay rate was 3.4 % due to 2 abdominal postoperative abscesses. 3 postoperative complications happened: 1 pneumonia, 1 intra-abdominal abscess and 1 phlebitis. In 3 patients acute appendicitis was treated by open procedure: 2 for anaesthesia problems and 1 for technical problems.

Conclusion: CONCLUSION. Acute appendicitis can be performed by laparoscopic approach with the same rate of intraabdominal abscess as open procedure.

References: Intraabdominal collections following laparoscopic versus open appendicectomy: an experience of 516 consecutive cases at a district general hospital. Daniel GG. Wilson et al.

Disclosure: No significant relationships.

P326

INGESTION OF FOREIGN BODIES BY PRISONERS. A COMPLICATED PROBLEM THAT MAY NEED SURGICAL INTERVENTION. PRESENTATION OF INTERESTING CASES.

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Introduction: Ingestion of foreign bodies by prisoners is quite common. Usually they don't need admission and they can be managed conservatively. Sometimes endoscopic treatment is required. Rarely some of them need surgical intervention.

Materials and methods: 1: Ingestion of a ventilation tube about 10 cm long. Imaging revealed the object inside the stomach. The patient underwent laparoscopic incision of the anterior wall of the stomach, removal of the foreign object and stapling of the stomach. 2: Ingestion of batteries and lighters. Imaging revealed some inside the stomach, the duodenum, the ileum and the ascending colon. The patient underwent exploratory laparotomy, incision of the anterior wall of the antrum and enterotomy. 3: Ingestion of batteries by the same patient a month after the previous surgery. Imaging revealed one of them inside the duodenum and two inside the jejunum. He underwent laparotomy and incision of the jejunum. 4: Ingestion of a long (10 cm) metal tap opener. Imaging revealed the object into the duodenum causing obstruction. The patient underwent laparotomy, and incision of the anterior wall of the antrum.

Results: The past six months, four prisoners who had swallowed foreign objects needed surgical intervention, using open or minimal

invasive technics. One of the patients underwent a second laparotomy within a month for the same reason. The post operative course of all the patients was uneventful.

Conclusion: Ingestion of foreign bodies is a common reason for prisoners to be referred to the ED. The problem is complicated and prevention is always better than surgery.

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Disclosure: No significant relationships.

P327

INTUSSUSCEPTION OF SMALL BOWEL PERITONEAL CYST AS A POSTOPERATIVE COMPLICATION

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Introduction: Peritoneal cyst is chronic encapsulated serous fluid collection in peritoneal cavity formed after laparotomy. In patients with peritoneal hyperreaction the risk of peritoneal cyst formation is higher.

Materials and methods: Case Report A 62-year-old white female was admitted to Vladimir City Clinical Hospital of Emergency Medicine with clinical signs of intestinal obstruction. 4 months before admission she was operated for gastric outlet stenosis of ulcer etiology. Billroth I gastrectomy was performed. The patient was operated for intestinal obstruction. Small bowel peritoneal cyst invaginated to underlying small bowel was found. Desinvagination of small bowel and cyst excision was performed.

Results: To identify possible reasons of cyst formation previous case history of the patient was analyzed.

Conclusion: Peritoneal cyst is a very rare complication of laparotomy. Intussusception by itself is a rare cause of intestinal obstruction in adults. So intussusception of small bowel peritoneal cyst is almost the rarest cause of intestinal obstruction. Patients with very active serous fluid discharge from abdominal cavity via draining tubes are of higher risk for peritoneal cyst formation.

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Disclosure: No significant relationships.

P328

IS MISCELLANEOUS, IDIOPATHIC AND SPONTANEOUS FREE PERFORATIONS OF THE SMALL INTESTINE A RISING BEAST ?

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Introduction: Although rare in the western world, miscellaneous, idiopathic and spontaneous free perforations (MISFP) of small bowel (SB) have begun to rise as a newly recognized clinical entity due to mass migrations of people to the west. A teaching state hospital was a good laboratory to detect the ever changing parameters.

Materials and methods: The patients were evaluated in two groups: Group 1 consisted of patients of the previous decade(n:15; 8 males and 7 females) and Group 2(n:39; 32 males and 7 females) were from the last decade. Common outcomes such as hernia, trauma, inflammatory bowel disease, malignancy, brid, endoscopy or peritonitis were compared to MISFP such as infections like salmonella or CMV, cocaine ischaemia, narcotic transfer within gastrointestinal system, medication related causes or parasites.

Results: Groups were compared according to diagnosis (Fischer's exact test(FET)):0.0331), age (FET: 0.0276), gender (FET: 0.0426) and mortality. Except for mortality, the former 3 parameters were statistically different between groups. Although insignificant, mortality has also raised from 20 % to 25 % despite improved diagnostic and therapeutic measures between decades studied.

Conclusion: The results may be fascinating, however they can be attributed to unresistable mass migrations consisting of mostly young males and the bridge position of Istanbul between east and west. Globalism may be speculatively blamed since it leads to acquaintance of different populations. Our results can identify a new but small population with risk of MISFP in the western world until a hybrid world population of the far future comes into being.

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Disclosure: No significant relationships.

P329

IS OUTPATIENT FOLLOW-UP OF EPIPLOIC APPENDAGITIS WITH ONLY NSAIDS AND NO ANTIBIOTICS POSSIBLE?

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Introduction: To assess the clinical course of patients diagnosed with “epiploic appendagitis” who are given only NSAIDs without antibiotic treatment.

Materials and methods: Between December 2010 and November 2013, 12 patients presented to the Istanbul University Istanbul Medical Faculty Emergency Surgery Department with abdominal pain and were diagnosed with “epiploic appendagitis”. Diagnoses were made by the information gathered from patients’ complaints, physical examination, biochemical results, and radiologic imagings (Abdominal X-Ray, Abdominal Ultrasonography [USG], and Contrast-Enhanced

Computerized Tomography [CT]). Age distribution, sex difference, laboratory results, radiologic images, length of hospital stay, and control exams after discharge were evaluated.

Results: 12 out of 35574 (0.033 %) patients who presented to our Emergency Surgery Department with abdominal pain and hospitalized were diagnosed as ‘epiploic appendagitis. Of these 12 patients, 7 were male (58.3 %), and 5 were female (41.7 %). Mean age of the patients was 43.5 (range: 22 to 60). Mean time passed between the beginning of the symptoms and presentation to the hospital was 1 day. Period of hospital stay was 1 to 2 days with a mean of 1.3 day. All patients were followed-up non-invasively under NSAID treatment without antibiotherapy. No complications were observed throughout the hospitalization period.

Conclusion: Epiploic appendagitis is a self-limiting, benign disease, but differential diagnosis should be done carefully. Patients who are diagnosed with epiploic appendagitis may be followed-up with NSAIDs only without hospitalization or antibiotherapy.

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Disclosure: No significant relationships.

P330

MESENTERIC LIPOMA : AN UNUSUAL CAUSE OF ACUTE ABDOMEN.

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Introduction: A lipoma of the mesentery is an uncommon clinical entity that even rarely causes any intestinal symptoms. The aim of the current report is the presentation of a rare case of giant mesenteric lipoma presenting with clinical features of acute abdomen.

Materials and methods: An obese 56 year old woman presented to the emergency claiming of fever and acute abdominal pain since a two day period of time. The clinical evaluation confirmed signs of acute abdomen, distension, tenderness, re-bound. Laboratory testing indicated raised inflammatory markers (raise of CRP and WBC). Therefore, an urgent exploratory laparotomy was performed. A giant mesenteric tumorous mass near the final part of ileum was recognised and resected.

Results: Pathology examination of surgery specimen revealed a tumor of adipose tissue 10 x 6.5x 9 cm in size that was characterized as a lipoma with haemorrhagic, inflammatory lesions and abscesses.

Conclusion: Mesenteric lipomas are rarely reported. According to literature data, they are incidental findings that produce symptoms only when extend in size and are complicated. Total excision of the mesenteric lipoma is the definite treatment.

Disclosure: No significant relationships.

P331**MONOCYTE COUNTS IN EMERGENCY SURGICAL PATIENTS – ARE THEY WORTH MEASURING?**

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Introduction: Serial monocyte counts are routinely measured in critically ill emergency general surgical [EGS] patients. However, evidence to guide interpretation of these values is lacking. We aimed to determine whether trends in monocyte count were associated with outcome.

Materials and methods: We reviewed a prospectively compiled database of adult EGS patients requiring ICU admission at our institution between 2002–2013. Only patients with evidence of organ dysfunction on admission to ICU were included. Monocyte counts obtained from the day of ICU admission through to day 7 were recorded. The primary outcome measure was survival to hospital discharge.

Results: 173 patients were included, all of whom had acute intra-abdominal pathology and evidence of organ dysfunction. Survivors and non-survivors had similar monocyte counts from ICU admission [0.45 vs 0.46, $p = 0.98$] through to day 4. On day 5, survivors had higher monocyte counts than non-survivors [0.68 vs 0.45, $p = 0.007$], a pattern which persisted until day 7. The presence of a low monocyte count on day 5 was associated with a significantly higher mortality compared to the remainder of the cohort (61 % vs 33 %, $p = 0.006$).

Conclusion: Monocyte counts appear to be of limited value during the early phase of critical illness in EGS patients. However, low monocyte counts from the fifth day of ICU admission onwards are associated with increased mortality.

Disclosure: No significant relationships.

P332**MOVING TO URGENT DAY-CASE FROM EMERGENCY INPATIENT LAPAROSCOPIC CHOLECYSTECTOMY IS SAFE AND LEADS TO A COST SAVING**

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Introduction: There has been a paradigm shift in recent years to the performing of Laparoscopic Cholecystectomy during patient's index admission with cholecystitis. Much focus has been put on a safe time window within which to undertake the procedure. Changes to contracts in much of the UK have resulted in a reduction in payments for emergency work. Purported to be implemented as a drive to push care towards preventative medicine and admission avoidance the effect has been a significant loss in revenue for emergency procedures. Where possible therefore, emergency surgery is deferred to urgent elective lists which attract full tariff. We set up an elective operating list, ring-fenced for patients who had been recently admitted with cholecystitis or pancreatitis. This work presents the outcomes.

Materials and methods: As a pilot a half day list on alternate

weeks was allocated for the use of post-emergency admission patients requiring cholecystectomy. A single surgeon undertook all procedures. Outcomes were recorded including time between admission and surgery, complication/conversion/readmission rates.

Results: In the trial period (01/10/13–30/09/14) 38 patients were operated, 25 following inpatient admission, 13 after attending the ED or outpatients. Time between emergency admission and surgery was 35 days (Median IQR 23–48) 25 were for Cholecystitis, 13 for Gallstone Pancreatitis. 31(82 %) were discharged within 23 hours. 2(5 %) were converted to open procedures. 5(13 %) were readmitted, 4 with pain required analgesia only, one with haematoma requiring laparoscopic washout. There were no biliary injuries.

Conclusion: This project demonstrates urgent-elective results are comparable with true elective surgery. In this pilot the revenue implication was a difference in approx £25000.

Disclosure: No significant relationships.

P333**NPWT IN TREATMENT OF ABDOMINAL WALL DEFECTS FOLLOWING “DAMAGE CONTROL SURGERY”**

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Introduction: The concept of “damage control surgery” also known as “staged laparotomy” is very useful in treatment of trauma or other emergency cases. Common consequence of this procedure is abdominal wall defect. Treatment of these serious and often life-threatening defects may also involve NPWT (Negative Pressure Wound Therapy).

Materials and methods: We observed 32 patients with an abdominal wall defect following damage control surgery who were treated using NPWT. We evaluated the length of treatment, wound size, onset of infection, level of pain and the price of treatment. We assessed wound size using the WHAT method and to assess the risk of infection we used W.A.R. classification.

Results: The patient's average age was 52.7 years, ranging between 19 and 73. The wound sizes varied from 8cmx5 cm to 38cmx35 cm. Treatment with NPWT averaged 13 days and dressings were changed every 4.5 days. All wounds were infected, no mortalities occurred and all the wounds healed. A split-thickness skin graft or secondary suture were used. No significant complications occurred. The wounds detracted by 21 to 90.4 % during the NPWT treatment.

Conclusion: The NPWT is very good method of treatment for abdominal wall defects following damage control surgery.

Disclosure: No significant relationships.

P334**OPEN ABDOMEN IN NON-TRAUMATIC ABDOMINAL EMERGENCIES: FREQUENCY OF USE, TIME TO CLOSURE AND MORTALITY DURING THE LAST THREE YEARS**

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Introduction: Damage control surgery (DCS) seems to improve survival in selected patients with non-traumatic abdominal emergencies. The time to closure of the open abdomen (OA) varies in relation to etiology, and it's usually longer than DCS for trauma. We wanted to assess the recent experience in our center focusing on certain parameters.

Materials and methods: Retrospective descriptive study from January 2012 to September 2014, describing demographic data, ASA, etiology, type of temporary abdominal closure (TAC), number of reinterventions, ICU length of stay, time to closure, and mortality.

Results: 54 (7 %) patients underwent DCS out of 737 emergency non-trauma laparotomies. The mean age was 66.5, and the main etiology was peritonitis (33 %), bowel ischemia (31.5 %), and hemoperitoneum (26 %). ASA I, II, III and IV scores were 16, 22, 48, and 13 %, respectively. The methods of TAC used were: Barke's vacuum-sandwich technique 54 %, Bogota Bag 24 %, and zip closure 22 %. The mean number of take-back operations before closure was 1.4. Mean ICU LOS was 16 days. In 77 % a definitive closure was achieved, with a mean time to closure of 2.6 days. The mortality rate for peritonitis, hemoperitoneum, and bowel ischemia was 72, 64 and 35 %, respectively, for an overall mortality rate of 55 %. Two patients developed entero-atmospheric fistula as OA-related morbidity.

Conclusion: The percentage of DCS procedures for non-traumatic abdominal emergencies is slightly superior to that in trauma in our center, and the mortality rate is high. Time to definitive closure was short in a majority of patients. Surgeons involved in trauma teaching and care preferred the Barker technique as TAC.

References: Damage control surgery in non-traumatic abdominal emergencies]. Cir Esp. 2012 Jun-Jul;90(6):345–7.

Disclosure: No significant relationships.

P335

OUR STRATEGIES FOR THE REMOVALS OF FOREIGN BODY IN DIGESTIVE TRACT AT THE LOCAL HOSPITAL

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Introduction: Foreign body ingestions were observed in adults as well as in children. The need for an intervention for foreign body ingestion depends on the patients' age, clinical condition, and time since the ingestion. The aim of this study is to evaluate the efficacy of endoscopic or surgical removal of the foreign bodies in digestive tract in our hospital located in the rural area.

Materials and methods: Endoscopic or surgical intervention was adopted for treating each 52 or 4 patients who ingested foreign body, respectively from 2007 to 2013. Indication for each approach was made by the findings of plain X-Ray, abdominal CT or abdominal

sign of peritonitis. Patients' age and gender, ingested object(s), and anatomic location were studied in both groups.

Results: Endoscopic removal of the foreign objects was performed successfully in 52 patients. Most patients were adults aged over 50 year-old. The objects were food bolus, Anisakis (parasites), package press, dental prosthesis, and fishbone. Most of them were located in esophagus, stomach and duodenum. Surgical removal was performed for four patients; 2 patients had perforation in esophagus or colon due to dental prosthesis or toothpick and 2 patients had repeatedly eaten many foreign bodies due to psychiatric disorder or mental retardation. There was no death and postoperative complication among the patients.

Conclusion: Approach for removing foreign body in digestive tract varied with the region where the foreign body located and the sign whether the foreign body perforated the digestive wall. In our institute, endoscopic or surgical approach was performed appropriately for foreign body ingestion.

Disclosure: No significant relationships.

P336

PREDICTIVE FACTORS FOR ILEOCECTOMY OR RIGHT HEMICOLECTOMY IN COMPLICATED APPENDICITIS WITHOUT ABSCESS ON PREOPERATIVE COMPUTED TOMOGRAPHY

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Introduction: Appendiceal inflammation may sometimes be enclosed by the omentum and small bowel surround the inflamed appendix to prevent the spread of inflammation, and is often undiagnosed preoperatively. The aim was to determine predictive factors for extended bowel resection in patients with complicated appendicitis without abscess on preoperative CT.

Materials and methods: This study was a retrospective review of 44 patients without abscess on preoperative CT who underwent surgical treatment beyond simple appendectomy from March 2010 to July 2014. Twenty-three patients underwent partial cecectomy and 21 patients underwent ileocecostomy or right hemicolectomy.

Results: There were no differences in gender, age, fever, and increases in immature neutrophils between the partial cecectomy group (PCG) and the extended cecectomy group (ECG). Time from the onset of symptoms (1.9 ± 0.9 days vs. 3.6 ± 2.8 days, $P = 0.015$), white blood cell count ($13,340.9 \pm 4,527.8/\mu\text{L}$ vs. $10,942.4 \pm 2,965.0/\mu\text{L}$, $P = 0.046$), and C-reactive protein level ($3.9 \pm 4.5 \text{ mg/dL}$ vs. $8.4 \pm 5.6 \text{ mg/dL}$, $P = 0.011$) showed significant differences between the PCG and the ECG. The length of stay for the ECG was significantly longer than that for the PCG (11.2 ± 3.9 days vs. 8.7 ± 2.7 days respectively, $P = 0.015$). The complication rate was higher in the ECG than in the PCG, but not significantly so (33.3 % vs. 26.1 %, $P = 0.599$).

Conclusion: The present study suggests that low WBC counts, high CRP levels, and longer time from the onset of symptoms may be predictive factors for ileocecostomy or right hemicolectomy in patients with complicated appendicitis.

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Disclosure: No significant relationships.

P337

PREDICTIVE FACTORS OF MORTALITY IN OCTOGENARIANS UNDERGOING DIGESTIVE SURGERY IN EMERGENCY.

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Introduction: Emergency digestive surgery in elderly patients is increasing due to the aging of the population. The aim of our study was to investigate predictors of mortality in elderly patients undergoing digestive emergency surgery.

Materials and methods: We retrospectively analyzed a series of patients aged 80 years and older, who underwent an emergency digestive surgery between January 2011 and December 2013.

Results: One hundred and two patients were included. The mean was 85 years (80–104 years). The mean Charlson comorbidity index was 5.7 ± 1.7 . Hypertension (64.7 %) was the most common comorbidity, followed by diabetes and heart disease (17.6 % each). The patients came from home ($n = 74$), a unit of care ($n = 24$) and a nursing home ($n = 4$). Pathologies were dominated by the bowel obstruction (57 %) and peritonitis (36.3 %). Tumor was the cause in 27 cases. Hospital mortality was 24.5 %. Predictors of mortality were the provenience from a nursing home ($p = 0.039$), presence of pulmonary ($p = 0.006$, OR = 7.7) or cardiovascular pathology ($p = 0.04$, OR = 3.1), colorectal cancer ($p = 0.035$, OR = 2.9), gastrointestinal site ($p = 0.031$, OR = 7.1), and a cause other than obstruction ($p = 0.012$, OR = 4).

Conclusion: In conclusion, pulmonary and cardiovascular comorbidities, cancer and the gastrointestinal pathology are predictors of mortality in patients 80 years and older undergoing digestive surgery in emergency setting.

Disclosure: No significant relationships.

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PREVENTIVE EMBOLIZATION AFTER ENDOSCOPIC HAEMOSTASIS MAY REDUCE RATE OF REBLEEDING IN HIGH RISK PATIENTS WITH NONVARICEAL UPPER GASTROINTESTINAL HAEMORRHAGE.

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Introduction: Nonvariceal upper gastrointestinal (UGI) bleeding is a frequent medical emergency with an high overall mortality. Peptic ulcer is the most common cause of UGI bleeding comprising 35–50 %. [1] The aim of study was preliminary analysis of treatment results after preventive embolization in high risk patients with non-variceal UGI bleeding.

Materials and methods: Medical records of high risk patients treated in our institution from 2010 with nonvariceal UGI bleeding were analysed and selected patient group with high re-bleeding risk. Inclusion criteria were: bleeding peptic ulcer; large size of ulcer, comorbidities, high re-bleeding risk according to Forrest classification (Ia–IIb).

Results: Totally 163 high risk patients complied with inclusion criteria. Median age of cohort was 60 (IQR = 72–52) years with predominance of male patients, $n = 119$ (70 %). After endoscopic haemostasis re-bleeding was observed in 32 (19.6 %) patients median one day (IQR = 3–1) after endoscopy and 25 of them underwent surgery. Preventive embolization was done in 6 patients with high re-bleeding risk within 24 h from endoscopy. Embolization of a. gastrica sinistra in 4 cases and a. gastroduodenalis in 2 cases was done with coils and microparticles. Re-bleeding was not observed after embolization. Five patients from 32 died.

Conclusion: Preventive embolization may reduce re-bleeding rate number of surgical interventions and mortality in high risk patients with upper nonvariceal gastrointestinal bleeding. Indications of preventive embolization should be analysed in a greater study population.

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Disclosure: No significant relationships.

P339

QUALITY IMPROVEMENT: TRAIN OF PEER TUTORS IN SURGERY

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Introduction: Many studies show that peer assisted learning can be comparable to teaching delivered by health care professionals regarding basic practical skills. However, the studies differ regarding the necessity and the extent of a didactic training. At our medical school, peer tutors perform the training of basic surgical skill such as sutures and wound dressing in the obligatory surgical training week for 4th year undergraduate students. Here for, they observe some trainings prior to perform it by themselves as peer tutor under supervision of experienced tutors. The aim of the present study was to evaluate the effect of a 3-day training on the peer tutors' performance.

Materials and methods: The 3-day training included presentations and role plays of teaching methods, as well as a half day feedback training. Furthermore, students simulated in role plays their teaching units followed by peer feedback.

Results: A total of 7 peer tutors participated in the training. Peer tutors received a significantly higher ratings from their blinded peers after 3-day training compared to prior to the training and compared to the not-specifically trained tutors. Even experienced tutors (2–3 years practice) stated after the training that they increased their teaching performance and confidence. At present we evaluate the effect of the training on students' practical surgical skills using a 8 station OSCE. **Conclusion:** The peer tutor training was implemented as obligatory training for all peer tutors in surgery a tour medical school and will be implemented for further subjects such as internal medicine.

Disclosure: No significant relationships.

P340

REDUCTION OF SONOGRAPHIC IVC DIAMETER IN ABDOMINAL COMPARTMENT SYNDROME

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Introduction: Inferior vena cava (IVC) diameter is used in monitoring fluid resuscitation of hypotensive patients. We have recently noticed that IVC diameter was not useful to determine the resuscitation in two cases of abdominal compartment syndrome in severe acute pancreatitis. We are not aware that this has been previously reported in the literature.

Materials and methods: Bedside ultrasound IVC diameter is used regularly to determine adequate fluid resuscitation in our ICU. We have recently repeatedly measured IVC diameter by ultrasound in two patients with severe acute pancreatitis one had intrabdominal pressure of 45 while the other had an intraabdominal pressure of 38.

Results: The IVC diameter did not increase with fluid resuscitation but was negatively related with the increased intra-abdominal pressure. One of these patients died after decompression laparotomy. We could follow the relationship between IVC diameter and intraabdominal pressure in a patient who was treated conservatively. IVC diameter was 6 mm with IAP of 38, 1 cm when IAP became 29, and 2.2 when IAP became 22.

Conclusion: IVC diameter is not reliable to monitor fluid resuscitation in cases with abdominal compartment syndrome.

Disclosure: No significant relationships.

P341

SELECTIVE NON-OPERATIVE MANAGEMENT IN PENETRATING ABDOMINAL STAB INJURIES

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Introduction: Penetrating abdominal stab injury is still one of the major causes of death and disability especially in young people. The decision in favor of surgery or non operative conservative treatment in penetrating abdominal trauma requires a precise diagnosis. Clinicians have been hesitant to move to non operative management. In

this work we evaluate efficacy and safety of selective non operative management of penetrating abdominal stab wounds. .

Materials and methods: This prospective study was conducted on patients with penetrating abdominal stab wounds admitted to ED, Tanta University Hospital, Egypt, over six months period. All patients with inclusion criteria subjected to full history taken, complete clinical examination, serial vital data monitoring, laboratory investigations, Chest X ray, serial abdominal ultrasound and abdominal CT. Urgent laparotomy considered if there is any apparent risk during any stage of intensive observation.

Results: Thirty cases were included in this study with thirty-nine stab wounds as some patients had more than one stab. The age of our patients ranged from 7 to 45 years with a mean (\pm SD) of 24 ± 0.5 years. Males accounted for (93.3 %) while (6.7 %) were females. Hospital stay was ranged from 36 h to 72 h with a mean (\pm SD) of 45 ± 9 h as regards cases with successful selective non operative management. The conservative treatment had succeeded in 87 % of cases but failed in 13 % of cases. The failed cases were subjected to exploratory laparotomy without complications or mortality.

Conclusion: Selective non operative management of penetrating abdominal stab wounds is safe, efficient, and cost-effective in the appropriate clinical setting and can lead to fewer unnecessary operations in patients with penetrating wounds to the abdomen.

Disclosure: No significant relationships.

P342

SINISTER IN DISGUISE – A VIRTUALLY APPARENT DIAGNOSIS OF ACUTE PERFORATED PEPTIC ULCER THAT RESULTED IN SALVAGE IVOR-LEWIS ESOPHAGOGASTRECTOMY.

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Introduction: Esophageal perforation is rare, leading to limited experience in management, especially in the acute setting. Its often non-specific presentation may procrastinate prompt diagnosis and management. These are the main contributors for increased related morbidity and mortality rates.

Materials and methods: A 47-year-old male, with a 12-year past history of mental illness, was admitted to the ED of our hospital, complaining of excruciating epigastric pain with onset of four days. One and a half year before presentation, the patient had been hospitalized elsewhere following intentional corrosive ingestion, consequently complicated by lower esophageal stricture recalcitrant to endoscopic dilatations. Emergency imaging studies revealed free intra-abdominal air and after initial resuscitation the patient was rushed for exploratory laparotomy with the indication of perforated hollow viscus, most probably acute perforated peptic ulcer.

Results: Intraoperative findings showed esophageal perforation at the gastroesophageal junction, with extensive necrosis of the lesser curvature. Salvage Ivor-Lewis esophagogastrectomy and end-to-end gastro-esophageal anastomosis was undertaken, with abdominal and thoracic dissection. His postoperative course was uncomplicated, except a lower respiratory infection, which was treated with antibiotics. The patient was discharged on POD 25, following normal barium swallow studies and uneventful oral intake.

Conclusion: The decision to proceed with a major intervention, such as the Ivor-Lewis procedure, on an emergency basis was made upon the team's experience and available resources and was tailored to the intraoperatively assessed extent of disease and the patient's physiologic reserve.

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Disclosure: No significant relationships.

P343

STAB INJURY AND PSEUDOANEURYSM OF THE SUPERIOR MESENTERIC ARTERY: SURGICAL AND ENDOVASCULAR TREATMENT

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Introduction: Superior mesenteric artery (SMA) injuries remain a challenge to the most trauma surgeon and continue to carry a significant mortality in spite of aggressive management.

Materials and methods: We report a case of successful management for the proximal SMA injury with life threatening bleeding and its pseudoaneurysm after incipient laparotomy in a 56-year-old man with stab injury to the epigastrium.

Results: He underwent an emergency primary repair of penetrated wall of stomach and an exploration of the mesenteric root with hematoma on an injury day. Computed tomography (CT) on post-injury day (PID) 1 due to the massive bloody drain of the abdomen showed an extravasation on the right side of the SMA trunk. A reoperation was immediately performed to achieve bleeding control with primary arteriorrhaphy. A follow-up abdominal CT angiography on PID 6 showed a pseudoaneurysm on the left side of the SMA trunk. A covered stent was inserted percutaneously to exclude the pseudoaneurysm.

Conclusion: Aggressive management of patient with a penetrating injury to the proximal SMA could offer the chance of survival by surgical or endovascular intervention.

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Disclosure: No significant relationships.

P344

TEMPORARY ABDOMINAL CLOSURE WITH VACUUM-ASSISTED THERAPY: OUR EXPERIENCE OVER 6 YEARS (2008–2013)

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Introduction: Temporary abdominal closure (TAC) is an increasingly used technique in emergency surgery, especially in case of intra-abdominal hypertension, septic abdomen, acute pancreatitis or in trauma patients^{1–4}. This is an observational retrospective review that examines our experience over 6 years.

Materials and methods: A retrospective review of the medical records of patients who underwent TAC from January 2008 to December 2013 at Donostia University Hospital was completed. Data were collected from MBDS (Minimum Basic Data Set) and statistical analysis was performed with SPSS 22.0

Results: One hundred and fifteen patients underwent TAC during the study period. Most cases were treated in our Department of Surgery. Demographic dates were: 67 % men and 33 % women. Mean age was 60,54 years old. The most frequent diagnoses were: 44,3 % septic abdomen, 35,7 % abdominal compartment syndrome and 11,3 % acute pancreatitis. In addition, an increasing trend in the use of vacuum is observed over the study period. The most used technique for TAC was Vacuum-Assisted Therapy (94,8 %). Median number of re-explorations was 3 (range 1–20). Definitive fascial closure was accomplished in 72,2 % of our patients and skin closure in 78,2 %, with a median time to closure of 14 days. Vacuum Assisted Wound Closure with Mesh (VAWCM) was used in 6 cases, getting abdominal closure in 5 of them. Morbidity was 77 % and mortality 27 %.

Conclusion: TAC is a successful technique for complex abdominal closure. Use of TAC must be individualized, following strict protocols by trained teams to improve outcomes.

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Disclosure: No significant relationships.

P345

THE ROLE OF HYPERBILIRUBINAEMIA AS A DIAGNOSTIC AND PREDICTIVE FACTOR IN ACUTE APPENDICITIS

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Introduction: Our aim was to establish the role of hyperbilirubinemia as a diagnostic tool for the prediction of either acute, or gangrenous/perforated appendicitis as well as to compare other parameters in a similar role.

Materials and methods: Medical files of the patients who underwent appendectomies between 2013 and 2014 were evaluated. Age, gender,

WBC/neutrophil counts, neutrophil percentage, CRP, total/direct/indirect bilirubin levels, and the postoperative histopathological findings were recorded. Fisher's exact test, Pearson's Chi squared test, and logistic regression for multivariate analysis were performed.

Results: The study group of 162 patients consisted of 97(59.9 %) men and 65(40.1 %) women. Mean age was 36.01(18–90). Histopathological examinations revealed normal appendix in 21(12.96 %) patients, acute appendicitis in 141(87.04 %) patients, and appendiceal gangrene/perforation in 41(25.31 %) patients. WBC/neutrophil counts, neutrophil percentage, and CRP levels were detected to be significantly higher in cases of acute appendicitis ($p < 0.05$). Total bilirubin levels were in normal range in all negative appendectomy cases where as elevated in 24.1 % of patients with acute appendicitis ($p < 0.05$). Direct bilirubin levels were elevated in 9.5 % of negative appendectomy cases while this parameter was found to be elevated in 56 % of patients with acute appendicitis revealing high diagnostic sensitivity ($p < 0.05$). According to multivariate analysis, elevated CRP levels were related with 13.8 times, elevated total bilirubin levels were related with 4.69 times, and elevated direct bilirubin levels were related with 35.3 times greater risk for appendiceal gangrene/perforation ($p < 0.05$).

Conclusion: Hyperbilirubinaemia is an important marker for the diagnosis of acute appendicitis, and patients with hyperbilirubinaemia are also more likely to have appendiceal gangrene/perforation.

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Disclosure: No significant relationships.

VISCERAL TRAUMA AND DISEASE

P346

A COMPLEX PENETRATING TRAUMA OF THE DUODENUM DURING AFGHAN WAR. WAS THE DUODENAL EXCLUSION JUSTIFIED?

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Introduction: Penetrating duodenal injury (PDI) represents 3 to 4 % of all trauma laparotomy and evidences for the management of are poor. Duodenal exclusion (DE) is one of the common options to manage injuries with high risk of suture line dehiscence and fistula. Although there is consensus to perform primary repair (PR) for simple perforations, the management of more complex PDI remains controversial. Based on a clinical case, this study aims to present the current recommendation for complex PDI.

Materials and methods: We report the case of a 30 year-old French military injured in Afghanistan in 2012. Initial assessment: hemorrhagic shock, PDI of D2 with more than 75 % of the circumference, diaphragmatic, right colic, right kidney and liver injuries. The initial surgical management was: duodenal drainage (petzer drain), right colectomy and abdominal packing (damage control). During the 2nd look laparotomy, a definitive repair and a DE were performed. The patient presented a high flow fistula with a spontaneous drying at D45. This management was then compared to an international literature review (Medline, Pubmed).

Results: Three retrospective studies (including 44, 50 and 75 patients with PDI) and one prospective study (including 66 patients) matched the research criteria and were reviewed. DE for PDI do not improve mortality or morbidity compared to PR only (Level 4 of evidence).

Conclusion: Duodenal exclusion is not necessary even for patient with severe penetrating duodenal injuries. An application of basic damage-control techniques leads to improved survival and an acceptable incidence of complications

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Disclosure: No significant relationships.

P347

CONSERVATIVE TREATMENT OF BLADDER RUPTURE

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Materials and methods: We present a case with extraperitoneal bladder rupture with a diagnostic and treatment approach.

Results: A 66-year-old man sustained injuries from a motorcycle accident and was sent to the nearest hospital. There, after receiving first aid, he was examined and a large diastasis of the pubic symphysis and gross hematuria was found. After three days, he was brought to our hospital for specialized treatment. Upon arrival, the patient was in hemodynamically stable condition with normal vital parameters. Chest X-ray and focused assessment with sonography for trauma were normal. The patient had macroscopic hematuria and the cystography showed extravasation of contrast material into the perivesical space. The patient was re-catheterized with a 22 Fr. catheter and external fixation of the pubic symphysis diastasis was performed. He was treated with antibiotics, anticoagulants, sedatives, and an H2 blocker. Control cystography performed 18 days after the injury showed the lesion completely healed. The patient was uneventfully discharged from the hospital 25 days after injury.

Conclusion: Conservatively, extraperitoneal urinary bladder injuries can be treated successfully. Early diagnosis and adequate bladder catheterization play an important role in the success rate of conservative treatment. Conservative treatment of these injuries is less traumatic with a lower economic cost.

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Disclosure: No significant relationships.

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DAMAGE CONTROL SURGERY IN COMPLEX PANCREATIC AND VASCULAR GUNSHOT INJURIES

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Introduction: Damage control surgery, as a life-saving procedure, has extended its usage even in complex pancreatic injuries, particularly when these injuries are associated with other organs or major vascular injuries.

Materials and methods: We present a case with complex pancreatic and vascular injuries, medical records, and its treatment strategy.

Results: A 19-year-old woman was presented with hemodynamic instability in our hospital after she injured herself with a handgun. She underwent immediate laparotomy; we found 1.8 liters of intraperitoneal blood, a left-sided retroperitoneal hematoma, the rupture of the neck pancreas, as well as the laceration of the left renal vein (1.5 cm long) that was repaired by lateral venorrhaphy. The patient was transfused with 10 units of packed red blood cells and 10 units of fresh frozen plasma. Laboratory examinations revealed INR = 2.1, pH = 7.2 and the body temperature 35.3 °C. Based on this data, we decided to treat the patient according to the damage control surgery principles. The pancreas was packed, drainage and we performed the temporary abdominal closure. 48 hours later, after the physiological derangement was corrected, the patient returned to the operating theatre. In the second surgical stage, the distal pancreatectomy with splenic preservation was performed. The patient’s clinical course after the second operation was complicated by the right pneumonia. After 45 days, she recovered and was discharged from the hospital.

Conclusion: Hemodynamic instability in complex pancreatic and vascular injuries dictates the need to apply DCS. The time in the decision-making process of DCS is essential in the success rate of treatment.

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Disclosure: No significant relationships.

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DAMAGE CONTROL SURGERY: HOW FAMILIAR ARE WE WITH THIS PHILOSOPHY? A NATIONAL SURVEY

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Introduction: Damage control surgery (DCS) is the optimal choice for the treatment of severe trauma patients who have a tendency of falling in the “triad of death”. The aim of this study was to assess the education and experience of Albanian trauma team leaders (TTL), and allow them to describe their perceived educational needs.

Materials and methods: This descriptive cross-sectional study was made using an anonymous written questionnaire. We directly contacted all trauma team leaders in 16 Albanian hospitals during October 2014.

Results: Response rate was 95 %. The knowledge for DCS principles was: 4 % better, 9 % partial, and 87 % did not have. The knowledge of clinical indications to perform DSC was: 3 % better, 18 % partial, and 79 % did not have, while the knowledge of laboratory indications was: 1 % better, 9 % partial and, 90 % did not have. The knowledge of possible complications was: 4 % better, 6 % partial and, 90 % did not have. The international normalized ratio (INR) and partial thromboplastin time (PTT) were conducted every time in 12 % of hospitals, and arterial blood gases (ABGs) in 18 % of hospitals. 97.5 % of TTL considered training in damage control surgery the most needed educational objective.

Conclusion: The level of knowledge and experience among team leaders was highly varied. Only 3 % of participants had a better knowledge of the DSC concept, 10 % had partial knowledge, and 87 % did not have such knowledge. The laboratory equipment necessary to realize INR, PPT, and ABGs are insufficient. Theoretical and practical courses should be immediately organized to ensure equal access to high quality trauma care.

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Disclosure: No significant relationships.

P350

DIAGNOSTIC LAPAROSCOPY AND LAPAROSCOPIC ASSISTED DIVERTING LOOP SIGMOID COLOSTOMY IN PATIENT WITH RECTAL INJURY

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Introduction: In general rectal injury due to trauma needs a laparotomy and the fecal diversion to prevent peritonitis and sepsis. In this present study, we performed novel method which combines diagnostic laparoscopy and diverting loop sigmoid colostomy without laparotomy

Materials and methods: Three patients with rectal injury due to trauma were included. The rectal injury was diagnosed by rectal examination, CT scan and rectosigmoidoscopy. We performed diagnostic laparoscopy to exclude intraperitoneal rectal injury. All patients were managed with laparoscopic assisted diverting loop sigmoid colostomy without laparotomy to prevent pelvic sepsis

Results: By diagnostic laparoscopy we did not find the evidence of peritonitis or intraperitoneal rectal injury in all patients. All patients recovered without any complications related rectal injury and diverting colostomy. All patients were able to avoid laparotomy. All stomas have been closed after several months without any complications

Conclusion: Diagnostic laparoscopy with diverting loop colostomy is useful option in patients with traumatic rectal injury. This method allows to exclude intraperitoneal rectal injury and avoid laparotomy

Disclosure: No significant relationships.

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DIFFERENTIATED APPROACH IN PENETRATING ABDOMINAL TRAUMA: OUR CENTRE EXPERIENCE

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Introduction: The main goals of the trauma approach are early identification of life-threatening injuries and avoidance of unnecessary laparotomy. Management of penetrating abdominal trauma (PAT) has evolved greatly over the last decades: ranging from exploratory laparotomy to diagnostic laparoscopy and non-operative approach.

Materials and methods: This study covered 541 consecutive patients with PAT hospitalized in Emergency Hospital. The following approaches were used: 2006–2007 exploratory laparotomy (EL); 2008–2009 diagnostic laparoscopy (DL); 2010–2011 "selective conservatism" (SC).

Results: 207 laparotomies were performed, average rate of non-therapeutic interventions – 32.4 %. Over time the rate of therapeutic laparotomy increased from 50.5 % in EL group; 69.1 % – DL group; to 94.4 % – SC group. There was 0.92 % missed injury. In the SC group 7.3 % asymptomatic patients needed subsequent delayed laparotomy, up to 10 hours after admission, no mortality or morbidity related to failure of the approach. For patients who underwent therapeutic or non-therapeutic laparotomy the length of stay did not vary significantly regardless of the applied protocol. When non-therapeutic laparotomy was avoided by using laparoscopy or selective non-operative approach the hospital stay was significantly reduced: 4.89 ± 0.56 and 2.74 ± 0.22 days respectively ($p < 0.01$). The shortest length of stay was noted in SC group ($p < 0.001$).

Conclusion: We recommend differentiated approach instead of exploratory laparotomy in penetrating abdominal trauma and "selective conservative" rather than diagnostic laparoscopy. Selective non-operative management in penetrating abdominal trauma is safe, decreases the rate of non-therapeutic laparotomy and minimizes the hospital stay.

Disclosure: No significant relationships.

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DUODENAL INJURIES: A SURGICAL CHALLENGE

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Introduction: Duodenal injury although uncommon poses a formidable challenge to the Trauma surgeon and failure to recognize or manage it properly may have devastating results. A pre-op diagnosis of isolated duodenal injury or when following blunt trauma can be very difficult and there is no single method of repair that completely eliminates the possibility of duodenal suture line dehiscence.

Materials and methods: A 21-year-old male was admitted for Bull trampling with Isolated severe duodenal laceration. We did a pyloric exclusion, anterior GJ, JJ, Roux-en-Y DJ, & FJ. He developed biliary leak following suture line dehiscence, then burst abdomen and died of septic shock after about 40 days. A 27-year-old male was admitted for Fall from height with Isolated duodenal injury (D2-D3 junction). Primary closure with a live omental patch, pyloric exclusion, anterior GJ & FJ was done. He developed biliary leak following suture line dehiscence and then a bilio-pancreatic entero-cutaneous fistula, which was managed conservatively. A 20-year-old male was admitted for Fall from Tree with multiple skeletal injuries, including a duodenal rent (D2-D3 junction). We did a primary closure, tube duodenostomy, temporary gastrostomy & FJ. Post-op recovery was good.

Results: Of the three patients: one succumbed, another developed a fistula but was treated conservatively, while the other was uneventfully treated.

Conclusion: Duodenal injury is associated with high mortality and morbidity. The diagnosis requires a high index of suspicion. Vigorous hemodynamic resuscitation and early exploratory laparotomy is necessary. Although the rent may be closed primarily or by sophisticated techniques, duodenal diversion of gastro-bilio-pancreatic secretions may be mandatory.

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Disclosure: No significant relationships.

P353

EVALUATION OF PREHOSPITAL RESUSCITATIVE THORACOTOMY IN JAPANESE DOCTOR DELIVERY SYSTEM

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Introduction: In this decade, as Japanese prehospital care has been developed with doctor delivery system, including "Doctor-Helicopter" and "Rapid response Car", it is possible to deliver aggressive prehospital resuscitation to severe trauma patients by well-trained medical staffs. Our prehospital strategy for traumatic impending cardiac arrest includes the resuscitative thoracotomy (RT) to maintain cerebral and coronary perfusion and to control hemorrhage. We evaluate our 3 years' experience to evaluate validity of our indication of prehospital RT and outcome.

Materials and methods: This is a retrospective study of trauma patients who underwent RT in prehospital settings (under 16 years old were excluded). We assessed prehospital Recover of Self Circulation (ROSC) rate, total ROSC rate, 24-hour survival rate, and 30-day survival rate of the group.

Results: Forty seven eligible patients performed prehospital RT during this period. After thoracotomy, aortic clamping was carried out in 45 patients, pericardiotomy in 5 patients, hilar clamping in 2 patients. Of all 47 patients, prehospital ROSC rate was 31.9 % (15/47), total ROSC rate was 46.8 % (22/47), 24-hour survival rate was 12.7 % (6/47), and 30-day survival rate was 8.5 % (4/47). ECG waveforms when the medical team in contact are asystole in 23 patients (Group A), and non-asystole (PEA or Vf) in 24 patients (Group B). Group B is significantly higher prehospital ROSC rate ($P = 0.001$), 24 hour survival ($P = 0.01$), and 30 day survival ($P = 0.04$).

Conclusion: Our absolute indication of prehospital RT is impending cardiac arrest, with allowing any over-triages for early decision making, and good result might be led by this strategy for saving severe trauma patients.

Disclosure: No significant relationships.

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HIGH ISS SCORE, HIGH GRADE SPLEEN INJURY AND ASSOCIATED LIVER, LONG BONE AND PELVIC TRAUMA ARE THE MAIN RISK FACTORS INDICATIVE FOR OPERATIVE MANAGEMENT.

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Introduction: Age 40 years and above, Injury Severity Score (ISS) 25 and greater, grade III or higher grade splenic injury are defined as prognostic factors for the failure of NOM.[1] The aim of study was detection of the main risk factors significant for failure of NOM in patients with spleen injury.

Materials and methods: Retrospective and prospective inclusion of 125 patients with blunt splenic injuries treated in our institution during period from 2011 till 2014.

Results: Traumatic spleen injuries were diagnosed in 40 females and 85 males, median age 36 years (IQR 49–26). First group consisted of 73 patients with ISS greater than 26 points, median ISS 39 points (IQR 49–31). Majority, 43 patients, suffered road traffic accidents (RTA). In the second group patients had ISS lower than 25 points, median ISS was 19 points (IQR 25–17). Laparotomy and splenectomy was performed in 42 patients from the first group and 28 patients from the second group, $p = \dots$. Strong association was observed between high ISS score and combined liver injury, long bone and pelvic fracture median ISS score in those patients 40–41

Conclusion: The main risk factors indicative for operative management in patients with spleen injury are high ISS, combined, liver, long bone and pelvic trauma and high grade spleen injury.

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Disclosure: No significant relationships.

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IS IMMUNOPROPHYLAXIS NECESSARY? SPLENIC FUNCTION AFTER ANGIOEMBOLIZATION FOR SPLENIC TRAUMA IN CHILDREN AND ADULTS: A SYSTEMATIC REVIEW.

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Introduction: Splenic artery embolization (SAE) is becoming the standard of care for traumatic splenic injury. Theoretically the immunological function of the spleen may be preserved, but this has not yet been proven. A parameter for measuring the remaining splenic function must therefore be determined to choose any vaccinations and/or antibiotic prophylaxis to prevent an overwhelming post-splenectomy infection (OPSI). (1–3)

Materials and methods: A systematic review of the literature was performed by searching the Embase and Medline databases. Articles were eligible if they described at least two trauma patients and the subject is splenic function, not procedure and/or success rate of SAE. Two reviewers independently assessed the eligibility and the quality of the articles and performed the data extraction.

Results: Ten studies were included, nine with adult patients and one focusing on children. All studies used different parameters to assess splenic function. None of them reported a OPSI after splenic embolization. Nine studies found a preserved splenic function after SAE, in both adults and children.

Conclusion: All studies on the long term effects of SAE indicate a preserved splenic function. However, there is still no parameter or test available which can demonstrate that. Since the introduction of splenic embolization after blunt abdominal trauma the occurrence of OPSI was a great concern. Therefore patients were given vaccine's and a two year antibiotic prophylaxis. Multiple studies demonstrate a preserved splenic function after embolization. The question remains whether giving the prophylactic treatment is still necessary?

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Disclosure: No significant relationships.

P356

LAPAROSCOPIC APPROACH IN ABDOMINAL TRAUMA: REVIEW OF 16 CASES

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Introduction: Over the past few years, several studies were done the on using laparoscopic approach in abdominal trauma patients for diagnostic or therapeutic purposes, which have been proven to be reliable and effective. Laparoscopic approach can reduce delayed diagnosis of bowel perforation in abdominal trauma patients who has unclear indication for laparotomy, and also reduce the length of hospitalization by avoiding unnecessary open laparotomy. We report 16 abdominal trauma patients treated in with laparoscopic approach in Dankook University hospital.

Materials and methods: We reviewed sixteen patients who visited Dankook University hospital emergency department, from 2009 to 2013 who were hospitalized with abdominal trauma and received laparoscopic exam. We limited the selection to patients who had stable vital sign and were not indicated for open laparotomy.

Results: Out of the 16 patients 6 were blunt injury and 10 were penetrating injury. Five patients were accompanied by injuries in sites other than the abdomen. Intra-abdominal organ injury was found in 12 patients during laparoscopic exam. 7 cases could be finish by laparoscopic surgery. Five cases were converted to open laparotomy. Mini-laparotomy was performed in 2 cases due to penetrating injury on stomach who needed confirmation perforation of posterior wall of the stomach. Three patients underwent small bowel resection and anastomosis due to severe small bowel injury. One patient had post-op complication. There was no complication by missed injury.

Conclusion: In trauma patients, laparoscopic approach is a stable and efficient way of diagnosis and treatment in optional situations.

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Disclosure: No significant relationships.

P357

LAPAROSCOPIC SPLENORRAPHY INCREASES SPLENIC SALVAGE FOR HIGH GRADE SPLENIC INJURIES

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Introduction: To evaluate if laparoscopic splenorrhaphy can increase the splenic salvage rate for patients with high grades blunt splenic trauma.

Materials and methods: We retrospectively reviewed the medical records of hemodynamically stable patients with blunt splenic trauma in our hospital where interventional radiologists can not be available in a 7–24 basis. Patients admitted from Jan 1, 2006 to Dec 31, 2009 (before the adoption of laparoscopic splenorrhaphy for patients with blunt splenic trauma) were categorized as group A. Patients admitted from Jan 1, 2010 to Dec 31, 2013, when laparoscopic splenorrhaphy was included in the algorithm for these patients, were categorized as group B.

Results: There were 131 patients in group A, and 125 patients in Group B. There were no significant differences in demographic

characteristics, injury severity score (ISS), percentage of high grade injuries, percentage of TAE, rate of failed non-operative management (NOM), and success rate of NOM for low grades of injuries between the groups (all, $P > .05$). The percentage of high grade of splenic injuries (AAST $\geq III$) was 60.6 % in group A and 58.2 % in group B. The splenic salvage rate for patients in group A was significantly lower than in group B (50.4 % vs. 89.7 %, $p < 0.01$). The splenic salvage rate for patients with high grade splenic injuries in group A was also significantly lower than in group B (79.2 % vs. 33.3 %, $p < 0.01$).

Conclusion: Laparoscopic splenorrhaphy is feasible as an alternative method for patients with high grade splenic injuries. It increases the splenic salvage when an interventional radiologist not available.

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Disclosure: No significant relationships.

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LAPAROSCOPY AND NONOPERATIVE MANAGEMENT OF BLUNT SPLENIC INJURIES IN POLYTRAUMA PATIENTS

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Introduction: The role of laparoscopy as a diagnostic method in nonoperative management (NOM) of blunt abdominal injuries is controversial. The aim was to analyse of the laparoscopy role in doubtful clinical situations with suspect visceral injuries and as argument of NOM in unconscious polytrauma patients.

Materials and methods: 50 polytrauma patients with blunt splenic injuries(SI); M:F/2:1, median age 39.97 ± 20.35 years; ISS = 26.65 ± 1.67 ; RTS = 7.55 ± 0.11 ; TRISS-10,23 ± 2,39. Majority had: ISS > 25–34(68 %) ($p < 0.01$), and 11(22 %)-GCS $\leq 12p$. Hemoperitoneum was found by ultrasonography (100 %), grade of SI by CT (90 %), laparoscopy was performed in 14(28 %).

Results: Severity of SI (AAST): gr.I-6 (12 %), gr.II-21 (42 %), gr.III-21 (42 %), gr.IV-2 (4 %). 11 (22 %) had SBP ≤ 80 mmHg and SI gr.II (7) and III (5) combined with pelvic fractures and hemothorax, stabilized by volemic resuscitation, ISS = 37.8 ± 2.59 , RTS = 6.45 ± 0.174 . 17 (34 %) were unconscious: 11 (22 %)-GCS $\leq 12p$ and 6 (12 %) with GCS = 13p and alcoolemia > 0.7 %, with highest predicted death rate TRISS = 44.3 ± 9.1 %, ISS = 42.4 ± 2.4 . Laparoscopy was indicated: doubtful peritoneal signs – 3(6 %), confirmation of NOM success in patients with GCS $\leq 12p$ -7 (14.3 %) and control of CT data of hemoperitoneum exceeding 500 ml and dropping Hb. Laparoscopy showed jejunum (n = 1) and mesentery (n = 1) injury, both operated; liver cirrhosis with ascites and minor SI (n = 2). Missed hollow organ injuries rate was 7.1 % (n = 1), induced hemodynamic instability in one case in which laparotomy revealed SI with spontaneous hemostasis, but in 35.3 % (n = 12) avoided the risks of nontherapeutic laparotomy in polytrauma patients with ISS > 25, GCS $\leq 13p$.

Conclusion: Diagnostic laparoscopy is appropriate in NOM and is necessary in doubtful clinical situations and for confirmation of NOM success in unconscious patients with poor prognosis, thus avoiding the risks of nontherapeutic laparotomy and eventual forensic misinterpretations.

Disclosure: No significant relationships.

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LIVER ABSCESS CAUSED BY KLEBSIELLA

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Introduction: The hepatic abscess is a rare pathology, but the incidence increases with age.

Materials and methods: We present a case of an hepatic abscess caused by Klebsiella bacteria in a diabetic patient treated with surgery after failure of medical treatment.

Results: A 64-year-old woman with sepsis and unstable type 2 diabetes mellitus was immediately hospitalized. Upon admission to the hospital, she presented with somnolent tachycardia (114 heart rate), polypnea, blood pressure at 90/60 mmHg, and a temperature of 39 °C. The patient had a blood sugar level of 400 mg/dl, leukocytosis (21,200 mm³), a hemoglobin level of 8.5 g/dl, hyperbilirubinemia, and a moderate increase in CRP. The plain chest radiograph showed right pleural liquid. Ultrasonography and a CT-scan of the abdomen found a lesion in the right lobe of the liver, suggesting a hepatic abscess. Initial treatment was done with empiric antibiotic therapy (Ceftriaxone, Gentamicin, Metronidazole) and insulin therapy. Cytology of pleural fluids found the following: 85 % neutrophils, 10 % lymphocytes, 5 % mesothelial cells, and CRP at 8.8 mg/L. The patient underwent simple needle aspiration with sonographic guidance. Bacterial cultures taken during percutaneous hepatic abscess drainage detected klebsiella oxytoca which was sensitive to Cefotaxime, Ceftriaxone and Gentamicin. This procedure, performed every three days, was unsuccessful after three attempts. Given the unsuccessful treatment, the abscess was drained surgically. The patient was discharged uneventfully after a 40-day stay in the hospital.

Conclusion: Liver abscess is a rare disease, and it is often associated with a poor prognosis. The prognosis depends on fast diagnosis and appropriate treatment.

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Disclosure: No significant relationships.

P360

MANAGEMENT OF SPLEENIC TRAUMA FOLLOWING BLUNT ABDOMINAL INJURIES

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Introduction: Trauma is a major cause of morbidity and mortality; in the developed world, road traffic accidents are one of the leading causes. Up to 45 % of patients with blunt abdominal trauma will

have a splenic injury, which may require urgent operative management, angiembolisation, or non-operative management. The management of splenic injuries has evolved over the past decades with the realisation of the importance of the spleen in immunological defence and a better understanding of the role of non-operative management of splenic injuries. Such management has been aided by better diagnostic and by advances in interventional radiology.

Materials and methods: Retrospective audit conducted at AKUH from January 2008 to December 2013. 54 patients included in study who had blunt abdominal trauma.

Results: Out of 54 patients, there were 10 females. The mean age was 31 years. 41 out of 54 patients were successfully managed conservatively.

Conclusion: Nonoperative management of blunt splenic injuries is now the treatment modality of choice in hemodynamically stable patients, irrespective of the grade of injury. Nonoperative management of blunt splenic injuries should only be considered in an environment that provides capabilities for monitoring and serial clinical evaluations and has an operating room available for urgent laparotomy. Patients presenting with hemodynamic instability and peritonitis still warrant emergent operative intervention. Intravenous contrast-enhanced CT scan is the diagnostic modality of choice for evaluating blunt splenic injuries. Repeated imaging should be guided by a patient's clinical status. Adjunctive therapies like angiography with embolization remain important adjuncts to nonoperative management of splenic injuries.

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Disclosure: No significant relationships.

P361

MESH REPAIR AFTER TRAUMATIC ABDOMINAL WALL HERNIA – SERIES OF CASES

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Introduction: A traumatic abdominal wall hernia is a rare injury that may follow various types of blunt trauma. Different patterns of abdominal wall disruption can occur due to the different types of force involved. A surgical repair is not always easy to perform, and therefore close attention must be paid to factors as size and site of the defect, any associated intraabdominal injuries in order to achieve the best surgical repair.

Materials and methods: In 81 % of patients, the mesh was placed in heavily contaminated wounds; extensive fasciitis was present in 43,5 % of patients and 39,2 % had intra-abdominal abscesses. No patients eviscerated, despite these multiple procedures.

Polypropylene mesh was highly effective in restoring abdominal wall continuity. The acute replacement of full-thickness abdominal wall has been facilitated by polypropylene mesh, allowing debridement of nonviable tissue and restoration of abdominal wall integrity without tension.

Results: Mesh repair offers an advantage in preventing recurrence in the presence of large defects, but strict criteria in their use must be followed, as the presence of hollow viscus injuries is an absolute contraindication to the use of mesh. To achieve both the aims of intraabdominal injury evaluation and adequate exposure for hernia repair, laparoscopy can be used. The use of laparoscopy in the trauma setting has previously been evaluated as a safe method for assessing patients with both blunt and penetrating abdominal trauma.

Conclusion: Although the severity of abdominal injury is the most important factor for surgical repair, combining different wall reconstructions techniques in same case may be the key for success.

Disclosure: No significant relationships.

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NON-OPERATIVE MANAGEMENT IN BLUNT HEPATIC TRAUMA IN PATIENTS WITH HIGH RISK FOR FAILURE

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Introduction: One of the most common injuries after abdominal blunt trauma are hepatic injuries. Nearly 80 per cent of patients are successfully treated without laparotomy due to CT scan, rapid ultrasound and interventional radiology availability.

Materials and methods: Retrospective study of high-grade liver trauma cases admitted in a level I trauma center, in the last two years, focused on the results of non-operative management in patients with high grade injuries.

Results: During the study period 38 patients presented with blunt liver trauma, 12 of them grade I and II, 11 grade III, 12 grade IV and 3 patients V grade. 12 patients (31 %) required laparotomy, 8 of them during the initial 24 h. From the IV grade group (12 patients), 1 required in the first 24 h angioembolization for medium hemoperitoneum. There were 3 hepatic related deaths among this patients. The rest 25 patients was treated conservatively. In 3 cases with IV grade hepatic injuries, the non-operative treatment failed and after more than one week required surgery (2 biliomas and 1 hepatic-related hemorrhage).

Conclusion: Non-operative management of high-grade liver injuries may be successfully indicated to carefully selected hemodynamically-stable patients but just in ICU conditions, when ultrasound, angiography and operating room are available for urgent interventions.

Disclosure: No significant relationships.

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PENETRATING ABDOMINAL TRAUMA: CASE REPORTS ON THE ROLE OF LAPAROSCOPY

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Introduction: Abdominal trauma poses both diagnostic and therapeutic challenges. In the era of minimally invasive approach, laparoscopy may be useful in assessing the peritoneal penetration, organ perforation and in decreasing the use of non-therapeutic laparotomy.

Materials and methods: We report four cases of penetrating abdominal trauma approached by laparoscopy in one year (September 2013–September 2014), in a district non-trauma dedicated hospital.

Results: Four male patients, all hemodynamically stable, were admitted for stab wound injuries in the anterior abdominal wall. Intraoperatively, all of them showed at least a lesion of the parietal peritoneum, and only one was diagnosed with organ injury. Conversion to laparotomy was performed in two patients: one because of stab path penetrating through peritoneal adhesions from previous surgery and another one due to hemoperitoneum caused by liver laceration. There were no missed injuries related to the diagnostic laparoscopy. Patients that undergone laparoscopy were discharged home at post-operative day 3, and those submitted to laparotomy at day 7. At present day all patients are asymptomatic without complications due to the injury or to the surgical procedure.

Conclusion: Laparoscopy, in hemodynamically stable patients was a valuable tool in penetrating abdominal trauma approach, avoiding the dangerous and risky delay in diagnosis and allowing timely treatment.

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Disclosure: No significant relationships.

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PERITONEAL LAVAGE FOR BLUNT HEPATIC TRAUMA : TOWARDS A SYSTEMATIC LAPAROSCOPIC APPROACH ?

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Introduction: Non-operative management (NOM) is the gold-standard for blunt hepatic trauma in hemodynamically stable patients.

However, NOM is associated with an increasing number of complications requiring delayed surgery, especially for severe liver injury. Objective : The goal of this study was to review and analyze our experience about laparoscopic peritoneal lavage in blunt hepatic trauma initially managed by NOM.

Materials and methods: This is a retrospective and monocentric study, performed at Universitary Hospital of Nice, France, including patients with blunt hepatic trauma from january 2005 to august 2014. We retrieved demographic, laboratory, radiologic, intraoperative data, as well as the outcome from the patients' medical records Two groups were analyzed :

- « peritoneal lavage group » : patients with a laparoscopic peritoneal lavage for blunt hepatic trauma initially managed by NOM
- « control group » for all patients presenting a blunt hepatic injury totally managed by NOM

Results: Chart review identified 134 patients: 11 patients in the « peritoneal lavage group » and 123 for « control group ». There was no significant difference in age and gender between the 2 groups. The length of stay at hospital was superior for « peritoneal lavage group » : 28.4 days vs 16.1 in control group (p-value < 0.001), but the severity of liver injury was higher in the « peritoneal lavage group » : 3.8 vs 2.7 AAST classification (p-value = 0.05). From our experience, laparoscopic peritoneal lavage for blunt hepatic trauma leaded to a decreasing consumption of pain killers and biliary complications

Conclusion: Association of abdominal pain, biological inflammatory syndrome and increasing free intra-peritoneal fluid on CT-scan has to lead to a laparoscopic peritoneal lavage with hepatic drainage

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Disclosure: No significant relationships.

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RELIABILITY OF NON OPERATIVE MANAGEMENT IN RENAL TRAUMA: A METANALYSIS

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Introduction: The non-operative management (NOM) has become the gold standard for renal trauma, thanks to innovation in the field of imaging and interventional radiology. The aim of the NOM is to save renal function and allow for a short and long-term better quality of life for trauma patients. The use of the NOM is now a well established practice for the injuries of I, II and III grade while there are still many controversies about its use in IV and V grade trauma.

Our aim was to evaluate the reliability of NOM in terms of mortality, morbidity and length of stay in all trauma patients and in selected groups such as pediatric, blunt and penetrating trauma patients.

Materials and methods: We conducted a PubMed search from 2000 to 2013 to identify English-language studies that reported NOM and operative treatment (OM) results, without restrictions on age, type or grade of renal trauma. We followed the criteria of the “Preferred Reporting Items for Systematic Reviews and Meta-analyzes” statement. We selected works with a minimum of 10 patients that reported at least information on mortality and morbidity of NOM vs OM.

Results: 49 retrospective cohort studies (26009 patients) were included. Statistical analysis showed better results of NOM for all lowest degrees of renal trauma, all pediatric trauma, and all penetrating trauma. In contrast, OM showed better results in terms of morbidity in blunt trauma.

Conclusion: NOM is the treatment of choice for all pediatric and penetrating renal trauma and for I, II and III grade of blunt trauma.

Disclosure: No significant relationships.

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SIGMOID SINUS VENOUS THROMBOSIS AFTER A MINOR HEAD INJURY

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Introduction: We present the case of a 4-year-old boy who presented to the emergency department (ED) after a minor head injury.

Materials and methods: Case Report : A 4-year-old boy presented to our ED after a fall from approximately 0.5 m and having sustained an injury to his occiput. On his arrival in the ED he was fully conscious with HR 111, BP 73/30, oxygen saturation of 99 %. He had no specific complaints. A decision was made re-evaluate after 4 hours. However, after one hour, he was noted to be complaining of a headache and his mother noticed he was not as active as he had been on arrival in ED His BP was noted to be 150/106. He underwent CT scanning and paediatric review.

Results: Blood tests were within normal limits. A CT scan demonstrated the presence of venous thrombosis at the origin of the right sigmoid sinus. The child was transferred to a Paediatric Neurology Department.

Conclusion: In the literature, clinical descriptions of sigmoid sinus thrombosis in children following head injury are rarely published and usually describe late presentation, not immediately after the traumatic event. In our case the symptoms occurred within an hour of presentation to the ED.

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Disclosure: No significant relationships.

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SMALL BOWEL AND COLONIC INJURIES: A SINGLE CENTER EXPERIENCE

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Introduction: Hollow viscus injuries can complicate both blunt and penetrating abdominal trauma and surgery represents the safer way to control abdominal contamination and infectious risk.

Materials and methods: We analysed the data on demographics, clinical presentation, management and complication of 31 patients (10-year period).

Results: There were 31 patients (4F; 27 M) with hollow viscous injuries: 4 shotgun trauma (G1), 10 knife-wound trauma (G2) and 17 blunt abdominal trauma (G3). In G1 all patients had multiple bowel perforations (large and small bowel in 2 and only small bowel in 2). In G2 four patients had a single small bowel lesion and 1 patient had multiple small bowel lesions. Single colonic injuries were found in 4 patients and multiple colonic and small bowel injuries were detected in 1 patient. Only minor extra-abdominal injuries were reported in this group. In G3 group intestinal injuries were mostly associated with other major abdominal and extra-abdominal injuries with just 2 cases treated only for hollow viscous injuries. Isolated small bowel perforation occurred in 7 cases and isolated colonic perforation occurred in 3. In the other 7 cases both small and large bowel were involved. The overall mortality was 9.6 % (4 patients; G1 25 %, G2 0 %, G3 17 %).

Conclusion: Even if clinical findings can be ambiguous, early recognition of bowel injuries is mandatory to avoid infectious related mortality and morbidity in every abdominal trauma.

Disclosure: No significant relationships.

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SURGICAL MANAGEMENT OF COMPLEX LIVER TRAUMA-OUR EXPERIENCE

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Introduction: Despite the fact that treatment of liver injury has dramatically evolved, severe exsanguinating liver trauma in polytraumatic patients still have a significant morbidity and mortality. Complex exsanguinating liver trauma still have a significant morbidity and mortality.

Materials and methods: This retrospective study included 70 hemodynamic unstable trauma patients with severe (AAST grade III–V) blunt liver trauma who underwent emergency surgery. We analyzed the results of the surgical approach.

Results: On arrival hypotension occurred in 88.04 % patients, mean age of patients was 49.26 ± 10.80 years and 71.9 % were male. There were 34.2 % AAST grade III liver trauma, 51.2 % AAST grade IV liver trauma, and 14.6 % AAST grade V liver trauma. Primary repair were: simple hepatorrhaphy (15.8 %), resectional debridement (14.6 %), direct control of bleeding vessels within the liver/selective hepatic artery ligation (12.2 %); hepatectomy (8.5 %). Perihepatic packing performed in 48.8 %. Complications related to the liver

occurred in 24.4 %. The overall morbidity was 21.9 %. Non-survivors had a significantly higher AAST grade ($p = 0.0001$), higher AST level ($p = 0.01$), lower Hgb level ($p = 0.0001$), associated brain injury ($p = 0.001$), perioperative complications ($p = 0.001$) and higher blood transfusion score ($p = 0.001$). The most common causes of mortality was uncontrolled bleeding. In “late period” mortality was caused by septic complications.

Conclusion: Patients with high-grade liver trauma who arrive in hemorrhage shock and associated severe injury should be managed operatively. Mortality from liver trauma is high for patients with higher AAST grade of injury, associated brain injury and massive transfusion score. It is important that the trauma surgeon be familiar with the surgical techniques to manage severe liver trauma.

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TEN YEARS' EXPERIENCE OF BLUNT SPLENIC INJURY AND FACTORS FOR TREATMENT PREDICTION

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Introduction: Nonoperative management (NOM) for blunt splenic injury is now commonly practiced. The purpose of this study is to review of experience of treatment for blunt splenic injury and identify prognostic factors for failure of NOM.

Materials and methods: This study was a retrospective review with blunt splenic injury between Jan. 2004 and Dec. 2013. All patients underwent contrast enhanced computed tomography. Total 247 patients were admitted, and we excluded below 15 year old patients.

Results: Total 207 patients were included. Mean age was 41.5 years, and male were 165 (79.7 %). High grade injury (grade III, IV, V) consisted of 107 patients (51.7 %), and 9 patients were treated with angioembolization. There were differences in systolic blood pressure, initial hemoglobin, platelet count, aPTT, lactate, transfusion of RBC and FFP. The mortality of NOM (3.1 %) was lower than operative group (14.9 %). Multivariate analysis showed that the spleen injury grading (high grade), level of aPTT and a transfusion of packed RBC were significantly related to operative management.

Conclusion: NOM for blunt splenic injury seems to be safe even in the high grade splenic injury. Injury grading scale and a transfusion of packed RBC were related with a treatment prediction.

Further prospective studies are needed to draw a definitive conclusion.

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THE INCIDENCE OF INTRAABDOMINAL INJURIES IN CLOSED ABDOMINAL TRAUMA. A RETROSPECTIVE STUDY.

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Introduction: Blunt Abdominal traumas (BAT) includes direct blows, crushing injuries, blast and deceleration forces. Anybody can be damaged intra abdominal without direct harm to their surface in such trauma. We say that traditional lectures all penetrates abdominal traumas should be explored, while blunt injuries could be observed, as in the cases of intestinal injury diagnosis and treatment was very late in the BAT¹.

Materials and methods: The study is retrospective and was performed within the time period December 2011 through December 2013. In our study included 257 patients who were present in UHT in Tirana, Albania. After the usual epidemiological data analysis of the data was done in numerical and percentage value divided into three groups according to the mechanism of injury, not forgotten the use of formulas for calculating the gravity of the injury.

Results: RESULTS The affected age from trauma was 14–60 years old (71 %); > 60yj (19 %); 0–14yj (10 %), M (83 %) & F (17 %). The mechanism of damage had distribution MVA -164 (63 %), FfH (fall from height) 58 (23 %) and HsT (Hit with strong tools) - 35 (14 %)....

Conclusion: The most important principle in the management of BAT is knowledge of principles primary, secondary and tertiary evaluations... from all physicians involved in the management of trauma. The challenge in the future will be the improvement of diagnostic techniques in trauma,

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TRAUMA IN THE YEMEN: AN ELECTIVE EXPERIENCE.

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Introduction: First founded in 1985, the Al-thawra Modern General Hospital is the largest referral trauma center in the republic of yemen{1}. Made up of approximately 900 beds, services from the majority of surgical specialities are provided including general/vascular/orthopaedic/neurosurgery and maxillofacial surgery. The aim of this elective was to gain a better idea of the case load seen, the operative management used and the current situation of trauma management in the yemen.

Materials and methods: I completed an observership from the 19th June–23rd July 2014 at the general and maxillofacial department. I would carry out 3–4 twenty-four shifts per week with the on-call team, attending trauma calls and theatre.

Results: During the six week period I witnessed a total of 78 procedures (52 of which were general surgery related and 26 related to oral and maxillofacial surgery). Amongst these cases roughly 35 % (27) of cases where secondary to trauma. Amongst the trauma cases 33 % (9) of cases where secondary to gun shot injuries and 19 % (5) of cases where related to stab injuries. The remainder of the trauma seen was secondary to road traffic accidents and violence.

Conclusion: In a country where the average ratio of arms to man is 6 to 1, trauma is frequently seen in the Yemen and makes a substantial amount of the workload seen by the general and maxillofacial surgeons{2}. However there appears to be no set guidelines in the management using the full ATLS guidelines or the principles behind damage control surgery leading to higher rates of mortality.

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TRAUMATIC DIAPHRAGMATIC RUPTURES: ONE CENTER EXPERIENCE

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Introduction: Traumatic diaphragmatic ruptures (TDR) present significant diagnostic challenge and are potentially fatal. TDR are uncommon, majority being induced by blunt abdominal trauma or by abdominal, thoracic or thoraco-abdominal wounds.

Materials and methods: During 2012–2014 19 (16 male and 3 female) patients with TDR were included. Etiology, injury site and size, ISS, RTS, TRISS scores, treatment method and results were analyzed. M:F

ratio was 5.33:1, mean age 30.05 ± 10.36 (95 % CI: 25.06–35.04) years. **Results:** Blunt trauma was in 7(36.84 %), wounds – in 12(63.16 %) cases. The left diaphragm was injured in 12(63.16 %), the right – in 7(36.84 %) cases. The injury size was 7.5 ± 6.1 (95 % CI: 4.55–10.44) cm. Left-sided injury size was 6.41 ± 5.39 cm (95 % CI: 2.98–9.84), right-sided injury size was 5.5 ± 6.69 cm (95 % CI: 0.68–11.69) ($p = 0.52$). The mean ISS and RTS were 22.53 ± 12.32 (95 % CI: 16.59–28.46) and 7.342 ± 1.053 (95 % CI: 6.834–7.849) respectively. In 13(68.42 %) cases the diagnosis was established < 12 h; in 1(5.26 %) 13–24 h and in 5(26.32 %) > 24 h after admission. TDR was diagnosed preoperatively in 9(47.36 %) cases by thoraco-abdominal X-Ray and CT. In all cases the lesions were repaired using permanent sutures: by laparotomy ($n = 15$), right-sided thoracotomy ($n = 1$), laparoscopically ($n = 1$), laparotomy + right-sided thoracotomy ($n = 1$) and by laprotomy + left-sided thoracotomy ($n = 1$). Predicted mortality rate (TRISS) was 9.9 ± 20.92 % (95 % CI: 0.17–19.99). Postoperative death rate was 5.26 % ($n = 1$).

Conclusion: Up to date TDR represent a challenging diagnosis and require a high index of suspicion. Right sided injuries are more commonly missed compared to the left sided ones. Surgery remains the standard of care for TDR and both diaphragmatic domes must be inspected during laparotomy.

Disclosure: No significant relationships.

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TRAUMATIC RUPTURED SOLITARY SPLENIC HYDATID CYST. A CASE REPORT.

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Introduction: Hydatid cysts are caused by the tape worm, *Echinococcus Granulosus*. They are endemic in cattle-rearing areas particularly in the Middle East. We report a case of traumatic hydatid splenic cystic rupture.

Materials and methods: A 39 year old previously healthy man presented to the emergency department (ED) after sustaining a motor vehicle collision, 30 min prior to presentation. In the ED he had a GCS of 15 and he was hemodynamically stable. However, he was complaining of left upper quadrant and flank pain in addition to abdominal distention. A computed tomography (CT) scan, revealed 10.5 x 10 x 11 cm cystic lesion in the spleen with internal heterogeneity. Shortly after the CT, the patient started to have hypotension that responded to fluid resuscitation. Next, a laparotomy was performed and it revealed large hemoperitoneum and a ruptured splenic cyst with a structure resembling hydatid cysts membranes. The peritoneal cavity was irrigated with Cetrimide. Thorough exploration of the abdomen revealed no other pathology.

Results: Post operatively, the pathology of the spleen was consistent with hydatid disease. The patient was started on albendazole 400 mg twice daily.

Conclusion: Traumatic rupture of hydatid cyst of the spleen is a rare event, however; we should list it in the differential which will guide us to the management with imperative reflection on the medical course of the patient.

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