Eur J Trauma Emerg Surg (2014) 40 (Suppl 1):S1–S231
DOI 10.1007/s00068-014-0398-3

Abstracts

15th European Congress of Trauma and Emergency Surgery
and 2nd World Trauma Congress

May 25–27, 2014
Frankfurt, Germany

Congress President

Prof. Dr. Ingo Marzi

Frankfurt, Germany

European Journal of Trauma and Emergency Surgery
Official Publication of the European Society for Trauma and Emergency Surgery

Abstracts for the 15th European Congress of Trauma and Emergency Surgery
2nd World Trauma Congress
May 25–27, 2014 Frankfurt, Germany

Organized by
European Society for Trauma & Emergency Surgery
World Coalition for Trauma Care
German Trauma Society

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Dear Colleagues,

It is my honor and a privilege to welcome you to the 15th European Congress of Trauma and Emergency Surgery (ECTES) in Frankfurt, Germany, which incorporates the 2nd World Trauma Congress.

"Innovation in Trauma Care" is the motto of this European and World Wide Meeting 2014.

Besides the network of the 30 national ESTES member societies, all 31 Societies of the World Coalition for Trauma Care and many of the European and German Partner Societies in Trauma and Emergency Care have accepted the invitation to this meeting. All these societies have a strong interest and play specific roles in the surgical care of patients suffering from trauma and acute surgical emergencies, or following catastrophes.

The broad collaboration and the continued work of the ESTES board and its specific sections has resulted in a very dedicated and up-to-date scientific program for this international setting. Participants from more than 75 countries will be expected. From the submissions received from all over the world, 353 abstracts have been accepted for oral presentation as well as 342 abstracts as poster presentations. In addition, 232 international, well-known speakers will contribute as key-note speakers and lecturers. All over, we will have 44 instructional lectures sessions and guest symposia, 35 free paper sessions and 29 poster sessions.

The scientific program is designed for surgeons and related disciplines working in the various settings. It addresses in particular the following topics:

- Trauma Care: prehospital and in-hospital management and new diagnostic tools, surgical techniques, bleeding control, decision making and clinical studies;
- Emergency Surgery: primary surgery, optimized surgical procedures, infection management;
- Disaster and Military Surgery: Experiences from recent events, systematic preparation for austere surgery.

Furthermore, we will organize several pre-congress courses, such as the ATLS, DSTC, ETC, MUSEC and the Polytrauma Course.

This 15th European Congress of Trauma and Emergency Surgery is organized by the European Society for Trauma and Emergency Surgery (ESTES) in close cooperation with the German Trauma Society (DGU), the largest institutional member society of ESTES. In addition, the newly formed World Coalition for Trauma Care (WCTC) has honored our meeting by including their bi-annual meeting in this European Congress. Already during the preparation of this congress, the collaboration of the world wide acting trauma societies resulted in various common interests.

I am very grateful to my colleagues from the National and International Societies for their support in the preparation of the meeting. Beyond that, I would like to thank the local organizers, the international scientific committee, the PCO "Mondial Congress and Events" and "Intercongress" for their professional and effective organization. Lastly, I would like to thank the city of Frankfurt, the University of Frankfurt and my colleagues for the continued support during the preparation of this event.

Frankfurt is the most international city in Germany, the largest financial center on the continent, the historical city of coronations and the city of Goethe. In brief, the smallest metropolis in the world has a lot to discover at close hand, with interesting offers for extensive tours of the city, cultural enjoyment and attractive shopping trips waiting for you besides the scientific congress.

I am very proud to welcome you to Frankfurt!

Prof. Dr. Ingo Marzi
Congress President

Oral Presentations

SURGICAL CRITICAL CARE

O001

USE OF ACS-TQIP TO ANALYZE THE CAUSE OF UNPLANNED EXTUBATION IN TRAUMA PATIENTS

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Introduction: The unplanned removal of an endotracheal tube is a life-threatening incident. Critically ill trauma patients at an ACS-designated level II trauma center were evaluated for variables leading to unplanned extubation (UE). Data provided by the American College of Surgeons Trauma Quality Improvement Program (TQIP) was analyzed for reasons for UE.
Materials and methods: A retrospective evaluation of trauma patients who experienced UE in a surgical critical care setting during a 12-month period was conducted. UE was identified as an unintended, premature removal of an endotracheal tube secondary to dislodgement due to activity, provision of patient care, or self-extubation by the patient.
Results: A total of 20 cases of UE occurred among 17 patients in 144 ventilator days—(4.3 UEs/100 ventilator days). 19 (95 %) had no change to the ventilator settings; 15 (75 %) were restrained at the time of extubation; 13 (65 %) were perceived to have adequate analgesia; 12 (60 %) had no sedation administered and 11 (55 %) had no analgesia administered within 4 h of UE. Interestingly, 12 patients (60 %) did not require reintubation.
Conclusion: Though most patients were perceived to have adequate analgesia and sedation by providers, a majority had not had an analgesic or sedative administered within 4 h preceding UE. We concluded that the currently utilized pain assessment tool may be less accurate in intubated patients. A new pain assessment scale was utilized based on the findings of this study which is currently in use. A larger prospective study analyzing factors leading to UE in the entire ICU is ongoing.
References: da Silva, Fonseca.
Disclosure: No significant relationships.

O002

ACCURACY OF NON-INVASIVE HAEMOGLOBIN MEASUREMENT BY SPECTROPHOTOMETRY (SPHB) IN TRAUMA PATIENTS IN THE SURGICAL INTENSIVE CARE UNIT (SICU)

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Introduction: Haemoglobin concentration is one of the parameters upon which urgent clinical decisions are made in critically-ill trauma patients. We aimed to determine whether non-invasive haemoglobin measurement by spectrophotometry (SpHb) could provide clinically acceptable accuracy in critically-ill trauma patients compared to haemoglobin measurement via arterial blood sampling ($_{lab}$Hb).
Materials and methods: We conducted a prospective, blinded, observational study over a 1 year period. All trauma-activated patients admitted directly to SICU from the Emergency Department were included in the study. Patients were monitored with standard monitors and a radial artery catheter. The SpHb probe from the Radical-7^{TM} Pulse CO-Oximeter (Masimo Corporation, Irvine, CA, USA) was placed on the ring finger of the same upper limb of the sited radial artery cannula. Time-matched SpHb and perfusion index (PI) measurements were recorded for each $_{lab}$Hb measurement obtained. The primary measurement was the difference between SpHb and $_{lab}$Hb at each paired measurement, expressed as mean ± SD g/dl.
Results: 212 SpHb and $_{lab}$Hb measurements were obtained. SpHb significantly correlated with $_{lab}$Hb ($r = 0.639$, $p < 0.01$). When SpHb was compared with $_{lab}$Hb, the bias was -0.59 ± 2.03 g/dL. There was no significant correlation between the SpHb or the difference between SpHb and $_{lab}$Hb and the PI.
Conclusion: SpHb correlated with $_{lab}$Hb, with a slight underestimation in trauma patients in the intensive care setting. However, at this time, we recommend that decisions regarding blood transfusions should still be guided by the $_{lab}$Hb level.
Reference:
1. Frasca D, et al. Accuracy of a continuous noninvasive hemoglobin monitor in intensive care unit patients. Crit Care Med. 2011;39(10): 2277–82.
Disclosure: No significant relationships.

O003

CURRENT AWARENESS OF ABDOMINAL COMPARTMENT SYNDROME: INTERIM RESULTS OF THE WORLD SOCIETY OF ABDOMINAL COMPARTMENT SYNDROME AMERICAS SURVEY

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Introduction: IAH and ACS are a life threatening condition that may affect many critically ill patients. Little is known about the awareness of IAH and ACS and its management in the Americas.
Materials and methods: A questionnaire was created by the WSACS and emailed electronically to independent physicians, Medical Universities and recognized Associations in South, Central, North America.
Results: 168 replies were received from 13 different countries in the Americas in a month. In a population of predominantly physicians (93 %) from different specialties most respondents (94 %) indicated that they were familiar with IAH/ACS concepts. Only 31 % know about the recommended guidelines for bladder instillation volume and are still confused about the interval of measurements. Many clinicians didn't know what defines a normal IAP (32 %) and 58 % didn't know when to start measuring IAP. In septic patients 32.3 % indicated to screen for increased IAP, while this reached up to 76 % in trauma patients. About 54 % of respondents are aware of the existence of the consensus definitions for IAH/ACS [1].
Conclusion: Physicians from the Americas are answered to be aware of and to be familiar with the concepts of IAH and ACS. However, approximately 68.5 % don't know how to measure IAP correctly, especially with regard to the correct bladder instillation volume. Almost 50 % of the respondents were unaware of the existence of updated guidelines on this important syndrome.

Reference:
1. Kirkpatrick AW, Roberts DJ, De Waele J, et al. Intra-abdominal hypertension and the abdominal compartment syndrome: updated consensus definitions and clinical practice guidelines from the WSACS. Intensive Care Med. 2013.
Disclosure: No significant relationships.

O004

EFFECT OF EARLY FEEDING AFTER EMERGENCY SURGERY IN PATIENTS WITH GASTROINTESTINAL PERFORATION

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Introduction: The aim of this study is to assess the efficacy of early postoperative feeding after emergency surgery in patients with gastrointestinal perforation.
Materials and methods: The medical records of 521 patients admitted between Jan. 2006 and Dec. 2012 were evaluated retrospectively. Patients were divided into early EN (EEN, n = 71) group and late EN (LEN, n = 450) group. EEN was defined when feeding started within 48 h postoperatively. Morbidity, mortality, length of hospital and ICU (intensive care unit) stay were compared in two groups.
Results: Two hundred eleven patients admitted to the ICU. The APACHE II scores were not significantly different between two groups (EEN 18 vs. LEN 18, $p = 0.790$). EEN group had lower mortality (2.8 vs. 10.7 %, $p = 0.048$), morbidity (38.0 vs. 52.2 %, $p = 0.030$), length of hospital stay (18.0 vs. 23.0 days, $p = 0.001$), and length of ICU stay (2.0 vs. 2.0–7.3 days, $p < 0.001$). Although infectious complications and non-infectious complications were not significantly different among two groups, newly developed sepsis (1.4 vs. 7.8 %, $p = 0.046$) and pulmonary complications (22.5 vs. 35.3 %, $p = 0.042$) were significantly lower in EEN group.
Conclusion: Early postoperative feeding is associated with reduced mortality, and shows beneficial effects such as fewer complications, shorter length of hospital stay, and length of ICU stay compared with late EN in patients undergoing emergency gastrointestinal surgery with bowel perforation.
References:
1. Lee HS. Early feeding is feasible after emergency gastrointestinal surgery. YMJ. 2013 (accepted).
2. Kaur N. Early enteral feeding by nasogastric tubes in patients with perforation peritonitis. World J Surg. 2005:1023–27.
Disclosure: No significant relationships.

O005

DO NOT TIGHT SO HARD: INTRA-ABDOMINAL PRESSURE AS A PREDICTOR OF ACUTE KIDNEY INJURY POSTOPERATIVELY TO ABDOMINAL SURGERY

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Introduction: Patients undergoing abdominal surgeries may have increased intra-abdominal pressure (IAP) what could be explained by intra-operatively administration of large amounts of fluids, causing tissue edema, an increase in capillary permeability and visceral edema. The purpose of this study was to determine if IAP could predict acute kidney injury (AKI) postoperatively to abdominal surgeries, and its cutoff value so far.
Materials and methods: Prospective observational study conducted from January/2010 to March/2011 in the Intensive Care Units (ICUs) of the University Hospital of Botucatu Medical School. Consecutive patients undergoing abdominal surgery were included in the study. Initial evaluation at admission to ICU, was performed to obtain demographic, clinical, surgical and therapeutic data. Evaluation of IAP was obtained by the intravesical method, four times per day, and renal function was evaluated during the patient's stay in the ICU until discharge, death or occurrence of AKI.
Results: 60 patients were evaluated, 16 developed intra-abdominal hypertension, 45 developed an abnormal IAP (>7 mmHg) and 26 developed AKI. The first IAP at the time of admission to the ICU was able to predict the occurrence of AKI (area under the ROC curve was 0.669; $p = 0.029$) with the best cutoff point (by Youden index method) $\geq$7.68 mmHg, sensitivity of 87 %, specificity of 46 % at this point. The serial assessment of this parameter did not added prognostic value to initial evaluation.
Conclusion: Intra-abdominal hypertension was frequent during ICU stay postoperatively to abdominal surgeries, and it predicted the occurrence of AKI. Serial assessments of IAP did not provided better discriminatory power than initial evaluation.
Reference:
1. Brochard L, et al. Am J Respir Crit Care Med. 2010;181:1128–55.
Disclosure: No significant relationships.

O006

ACUTE CORTICOSTEROID INSUFFICIENCY IN POLYTRAUMA PATIENTS WITH COMBINED NEUROTRAUMA

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Introduction: Corticosteroid insufficiency in critical illness is a clinical issue with severe consequences like hypotension, shock and electrolyte disorders. Although chronic secondary hypopituitarism following neurotrauma is well examined, little is known about the corticosteroid levels in the first hours after trauma. This study focuses on total and free cortisol levels shortly after poly- and neurotrauma.
Materials and methods: In this prospective study, polytrauma patients presenting with an Injury Severity Score equal or higher than 16 were enrolled. Serum blood samples were collected at time of admission, after 12 and after 24 h. Total cortisol level was measured using a chemiluminescent assay, Corticosteroid-binding globulin with radioimmunoassay technique. Free cortisol was determined with Coolens equation.
Results: In 49 polytrauma patients total cortisol levels 12 h after trauma were significantly ($p = 0.044$) lower in those subjects with neurotrauma (14.8 μg/dl ± 1.7 SEM) compared to those without neurotrauma (22.1 μg/dl ± 3.6 SEM). Hierarchical multiple regression analysis confirmed the influence of neurotrauma on total and unbound cortisol levels also when including confounders to the regression model.

Conclusion: In the last years cortisol administration with therapeutic doses after neurotrauma has been abandoned. This study shows that some neurotrauma patients might not reach physiological stress levels of corticosteroids compared to polytrauma patients without neurotrauma. It indicates a need for further investigation in corticosteroid hormone metabolism in the very acute clinical period after poly- and neurotrauma.
Reference:
1. Schneider HJ, et al. Hypothalamopituitary dysfunction following traumatic brain injury and aneurysmal subarachnoid hemorrhage: a systematic review. JAMA. 2007;298:1429–38.
Disclosure: No significant relationships.

O007

IS EARLY TRACHEOSTOMY AFTER VENTRAL APPROACH TO CERVICAL SPINE ELEVATE THE WOUND INFECTION RISK?

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Introduction: Patients suffering from cervical spine injuries and paralysis suffer depending on severity grade often from respiratory insufficiency. In case of necessary mechanical ventilation a tracheostomy may be indicated. If additional an operative care by ventral approach to cervical spine is necessary, an elevated wound infection risk seems to be taken into consideration. On the contrary an early tracheostomy may prevent aspiration and pneumonia. This retrospective study should show wound infection risk in dependence of time to tracheostomy.
Materials and methods: We included patients of our Level I spine center from 2008 to 2011 that received an cervical spine operation and an additional percutaneous dilatation tracheostomy. We were processed the biometric data, documented pneumonia and wound infections, paraclinic infection markers and infection-related revisions. Data were collected retrospectively by use of a patient-data-management-system and operation-protocols. Additional we excluded external revisions by a phone reassessment.
Results: 35 patients became included. Mean age was 64.5 years, 12/35 were female, mean BMI was 27.4, Mean time to operation was 100 h. In 28/35 cases neurological deficit was caused traumatically. Mean hospital stay was 32 days, in mean 28 days at ICU. N = 3 patients were tracheostomated preoperatively or on the operation day, n = 9 1–5 days postoperatively, n = 15 6–9 days postoperatively, n = 8 at day 10 of later. We saw only one wound infection that needed to be revised operatively in a patient that got his tracheostomy 9 days postoperatively.
Conclusion: An early tracheostomy after ventral approach to the cervical spine is not elevating the wound infection risk.
Disclosure: No significant relationships.

O008

EXTRACORPOREAL LUNG SUPPORT AND HIGH FREQUENCY OSCILLATION VENTILATION IN SEVERE INJURED PATIENTS

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Introduction: We present the results of the trauma-related- ARDS treatment using pumpless extracorporeal lung assist (pECLA), high frequency oscillation ventilation (HFOV) and veno-venous extracorporeal membrane oxygenation (v.v. ECMO).
Materials and methods: Prospective study with data from January 1, 2008 to June 30, 2013 at the Level 1 Trauma Center of the University Hospital Bergmannsheil in Bochum, Germany. 47 patients (5 female, mean age 47 ± 15.8 years, mean ISS 34 ± 11.8) with major trauma and acute lung injury fulfilled criteria for cannulation with extracorporeal lung support.
Results: 15 patients received pECLA, 9 patients HFOV, 31 patients were cannulated for v.v. ECMO. Average run time of v.v. ECMO was 8 ± 6.9 days, of pECLA 3 ± 4.9 days. Mean length of stay in the ICU was 26 ± 15.9 days, hospital length of stay 49 ± 36.1 days. 43 (70.8 %) patients have been weaned from extracorporeal lung support, 28 (60.8 %) patients were discharged from the ICU and 27 (58.7 %) from the hospital. As complications occurred acute renal failure (40 %), oxygenator clotting (12 %), DIC (4.3 %) and cranial bleeding (4.3 %).
Conclusion: ECMO support ensures the lung protection. Further intensive care therapy is based on reduction of the sedation, early integration of the spontaneous breathing and simultaneously weaning from mechanical ventilation and from the extracorporeal device. Early use of extracorporeal lung support devices before MOF runs at an advanced stage is decisive to the success of therapy. This will result in reduced catecholamine and reversibility of acute renal failure. That might reduce the mortality rate associated with posttraumatic MOF.
Reference:
1. Cordell-Smith et al. Traumatic lung injury treated by ECMO. Injury. 2006.
Disclosure: No significant relationships.

O009

POSTOPERATIVE PULMONARY COMPLICATIONS (PPC) PREVALENCE IN A SURGICAL ABDOMINAL POPULATION

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Introduction: Our study aims to evaluate in an abdominal surgical population the prevalence of PPC and to investigate the effect of protective lung ventilation on PPC rate in surgical procedures (first outcome); in addition, the suitability of ARISCAT score for laparoscopic technique was investigated (secondary outcome).
Materials and methods: After local ethical committee approval and patient consent, we enrolled 409 patients undergoing abdominal surgery. To stratify postoperative pulmonary complications utilized ARISCAT score and assigned 0 point (like peripheral incision) to LPS surgery. Follow-up for PPC lasted till the 30th postoperative day or day of discharge.
Results: Frequency of PPC was higher in urgent (33 %) than in elective surgery (7 %) (p = 0.0001), and in open (1.9 %) versus laparoscopic (6 %) approach (p = 0.0006). Logistic regression showed that ARISCAT (p = 0.004), age (p = 0.01) and urgent surgery (p = 0.000) were predictive factors for PPC. For prediction of PPC, a cut-off point of 23 for ARISCAT was identified (with a sensibility 95 % and a specificity of 29 %).
Conclusion: The following conclusions can be drawn from this study: (1) Patients undergoing open urgent surgery were exposed to a higher

risk of PPC compared to laparoscopic procedures. (2) ARISCAT score fits well with the prevalence of PPC in surgical patients undergoing laparoscopic approach; therefore, this score may be usefully adopted to stratify PPC risk in laparoscopic approach.

References:
1. Canet J. Curr Opin Anesthesiol. 2013;26:107–15.
2. Canet J. Anesthesiology. 2013;6:1338–50.
3. G. de Abreua M. Curr Opin Anesthesiol. 2013;26:105–6.

Disclosure: No significant relationships.

O010

USE OF DOUBLE LUMEN CANNULA FOR VENO-VENOUS ECMO IN TRAUMA PATIENTS

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Introduction: The aim of this case series is to present the use of double lumen cannula in trauma patients with posttraumatic acute respiratory distress syndrome (ARDS).

Materials and methods: Prospective study with data from January 1, 2008 to June 30, 2013. 47 patients (mean ISS 34 ± 11.8) with major trauma and acute lung injury fulfilled criteria for cannulation with extracorporeal lung support. A double lumen cannula (Avalon®, Maquet, Hechingen, Germany) was inserted in 8 cases, performed under fluoroscopy.

Results: Mean age was 45 years. Mean ISS was 31 (20–48). V.v ECMO therapy was started 3 days post- trauma. The duration of the ICU stay was on average 21 days. The mean ECMO run time was 7 days (6–18), and the hospital stay was in mean of 60 days. All the patients survived. There was a single complication as thrombosis around and inside the Avalon® cannula. Surgical removal of the cannula was necessary. Five patients developed ventilator associated pneumonia, and one patient has had self -limiting bleeding from the urethra.

Conclusion: The use of double lumen cannula for v.v ECMO therapy in trauma patients is a feasible treatment option. It allows fully mobilization of the awake patient, more patient comfort and the earlier mobilization and physiotherapy and spontaneous breathing and rapid weaning. However, the double-lumen cannula is not heparin-coated, so heparin dosages have to be PTT- controlled.

Reference:
1. Ried et al. Extracorporeal lung support in trauma patients with severe chest injury and acute lung failure: a 10-year institutional experience. Crit Care. 2013;17:110.

Disclosure: No significant relationships.

O011

FULMINANT CLOSTRIDIUM DIFFICILE COLITIS: PROSPECTIVE DEVELOPMENT OF A RISK SCORING SYSTEM

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Introduction: No system exists to rapidly identify patients at risk of developing fulminant *Clostridium difficile* colitis (fCDC) and possibly in need of surgical intervention. Our aim was to design a simple and accurate risk scoring system (RSS) for daily clinical practice.

Materials and methods: We prospectively enrolled all patients diagnosed with a *C. difficile* infection and compared patients with and without fCDC. An expert panel, combined with data derived from prior studies, identified four risk factors and a multivariable logistic regression model was performed to determine their effect in predicting fCDC. The RSS was created based on the predictive power of each factor and calibration, discrimination, and test characteristics were subsequently determined.

Results: 746 patients diagnosed with *C. difficile* infection were enrolled between November 2010 and October 2012. Based on the log (odds ratio) of each risk factor, age >70 years was assigned 2 points, white blood cells ≥20,000/μL or ≤2.000/μL 1 point, cardiorespiratory failure 7 points, and diffuse abdominal tenderness on physical exam 6 points. Using this system, the discriminatory value of the RSS (c-statistic) was 0.98 [95 % confidence interval (CI) 0.96–1].The Hosmer and Lemeshow goodness-of-fit test showed a p value of 0.78 and the Brier score was 0.019. A value of 6 points was determined to be the threshold for reliably dividing low-risk (<6) from high-risk (≥6) patients.

Conclusion: The RSS is a valid and reliable tool to identify at the bedside patients who are at risk of developing fCDC. External validation is needed before widespread implementation.

Disclosure: No significant relationships.

O012

VITAMIN D STATUS AND SEVERITY OF CLOSTRIDIUM DIFFICILE INFECTIONS IN HOSPITALIZED ADULTS

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Introduction: *Clostridium difficile* is the most common cause of nosocomial diarrhea, affecting up to 10 % of hospitalized patients. Preliminary studies suggest an association between vitamin D status and *Clostridium difficile* infections (CDIs). Our goal was to investigate whether serum 25-hydroxyvitamin D [25(OH)D] levels are associated with CDI severity.

Materials and methods: We prospectively enrolled patients diagnosed with CDI and divided them into two severity groups: group A (positive toxin A/B enzyme immunoassay only) and group B (positive toxin A/B enzyme immunoassay plus abdominal CT consistent with colitis). Serum 25(OH)D levels [D_3, D_2, and total 25(OH)D] were measured on all patients after diagnosis of CDI. We performed multivariable logistic regression analysis to examine the association between 25(OH)D levels and CDI severity, while adjusting for age, Deyo–Charlson Comorbidity Index, recent hospitalization, and vitamin D supplementation.

Results: 100 patients were enrolled between July 2011 and February 2013. The mean (SD) cohort age and Deyo–Charlson comorbidity index was 62 (19) years and 4 (3), respectively; 54 % of patients were male. Mean serum total 25(OH)D level was 22 (10) ng/ml; 43 % of patients had 25(OH)D <20 ng/mL. Mean 25(OH)D_3 level was

significantly higher in group A (n = 71) than in group B (n = 29): 21 (1) ng/mL versus 15 (2) ng/mL, respectively (P = 0.005). Multivariable logistic regression showed that $25(OH)D_3$ levels were associated with CDI severity (aOR 0.92; 95 % CI 0.87–0.98).
Conclusion: We found a significant inverse association between $25(OH)D_3$ levels and CDI severity. Further studies are needed to determine whether vitamin D supplementation can improve outcomes in patients with CDI.
Disclosure: No significant relationships.

TREATMENT OF HUMERUS FRACTURES

O013

EFFECT OF CHRONIC HEAVY SMOKING ON PROXIMAL HUMERUS FRACTURES HEALING

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Introduction: We analysed the effect of chronic heavy smoking on closed proximal humerus fracture and overall outcomes.
Materials and methods: Over a 5-Year period, 1752 patients were treated with proximal humerus fractures in our institution. Chronic heavy smoking was defined as daily smoking of greater than 20 cigarettes per day for over 20 years. 118 met the inclusion criteria. An age and sex matched control group were randomly selected for comparison purposes.
Results: For the chronic heavy smokers group, 14 patients required surgical fixation. The rest were treated conservatively. For the control group, 10 patients required surgery and the rest were treated conservatively. For the conservatively treated cohort, chronic heavy smokers were more likely to suffer from delayed fracture healing [mean 11 weeks (range 10–15)] when compared to the control group [mean 9 weeks (range 7–10)] (p = 0.004). Other significant differences were identified when comparing soft tissue healing (p = 0.021) and postoperative pain (at 4 weeks) (p = 0.08). For the surgically treated cohort, chronic heavy smokers showed a statistically significant delay in fracture healing [mean 14 weeks (range 12–19)] when compared the control group (p < 0.001). Further analysis revealed a significant correlation between chronic smoking and postoperative delayed wound healing (p = 0.005), duration of postoperative pain (p < 0.001) and surgical site infections (p = 0.002).
Conclusion: Chronic heavy smokers with proximal humerus fractures are likely to suffer from delayed union when compared to non-smokers. Patients with this injury requiring surgical fixation were reported to suffer from poor wound healing, postoperative pain and deep surgical infection.
Reference:
1. Patel et al. Bone Joint Res. 2013;2(6):102–11.
Disclosure: No significant relationships.

O014

DIAPHYSEAL HUMERAL FRACTURES: FAILURE ANALYSIS OF A SINGLE CENTRE SERIES

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Introduction: Humeral shaft fractures account for 1–3 % of all fractures in adults. Modern concepts of internal fixation of long bone shaft fractures advocate stabilisation techniques with no harm to the fracture zone. Plate and screw fixation has always been the more common surgical treatment of humeral shaft fractures. However, intramedullary nailing of the humerus has gained popularity over the last two decades. The purpose of this study was to retrospectively evaluate our results regarding infection and non union rates after intramedullary nailing of humeral shaft fractures.
Materials and methods: Between January 2000 and January 2013, 246 patients with a total of 246 humeral fractures were treated with intramedullary nailing. Analysis was performed to determine deep infection and non union rates.
Results: In total, 125 consecutive patients with 125 humeral shaft fractures were included in the analysis. Of these, 14 were polytrauma patients. One patient (0.8 %) developed a deep infection. Non-union occurred in 6 patients (4.8 %). Five patients (4 %) needed revision surgery within 3 months of the primary treatment due to technical failure.
Conclusion: This retrospective analysis revealed an infection rate of 0.8 % and a non union rate of 4.8 % after intramedullary nailing of humeral shaft fractures. Important is that the general complication rate is low compared with the literature. We believe that good patient selection and nailing technique are primordial for excellent outcomes.
Reference:
1. Liu GD, et al. Meta-analysis of the outcomes of intramedullary nailing and plate fixation of humeral shaft fractures. Int J Surg. 2013.
Disclosure: No significant relationships.

O015

RADIAL NERVE PALSY IN HUMERAL SHAFT FRACTURES WITH INTERNAL FIXATION: ANALYSIS OF MANAGEMENT AND OUTCOME

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Introduction: The incidence of radial nerve injury after humeral shaft fractures is 12 % representing the most common peripheral nerve injury associated with long bone fractures. The purpose of this study was to analyze our current policy related to the outcome.
Materials and methods: We retrospectively analyzed the data of patients with surgically treated humeral shaft fracture from 01/2003 until 02/2013. Analysis included fracture type, soft tissue injury, type of fixation, management and outcome of radial nerve palsy.
Results: 151 humeral shaft fractures were fixed (89 plates, 62 nails). 20 (13 %) showed a primary radial palsy (11 plates, 9 nails). 5 were open fractures. Primary nerve exploration was performed in 9 cases. Mean follow up was 14 months. 8 patients showed a complete, 4 a partial nerve recovery. 2 of them underwent a revision procedure. 9 patients were lost to follow up.
In 9 cases a postoperative palsy occurred (7 plates, 1 nail, 1 ex fix). 5 patients, in which the nerve was not exposed during initial operation, underwent revision surgery with exploration. In 4 cases with former exposure of the nerve during initial surgery, no revision was performed. Mean follow up was 11 months. 5 patients showed a complete, 2 a partial recovery. 2 patients were lost to follow up.
Conclusion: Our study showed a rate of 13 % posttraumatic radial nerve palsy after humeral shaft fractures. The risk of secondary palsy after surgery is high and mainly seen after plate fixation. In these cases we recommend immediate nerve exploration when not performed during initial operation.
Reference:
1. Shao YC, et al. JBJS. 2005.
Disclosure: No significant relationships.

O016

PROXIMAL HUMERAL FRACTURES: NON-OPERATIVE TREATMENT VERSUS INTRAMEDULLARY NAILING IN 2-,3- AND 4-PART FRACTURES

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Introduction: This study compares non-operative (NOT) with operative treatment (OT) of patients suffering from humeral head fractures in dependence upon the severity of the fracture.
Materials and methods: Two series of patients (NOT n = 167, OT n = 117) were matched according to age, gender and fracture type. 41 pairs were built. Surgery was performed using antegrade nailing with the Targon PH nail. Radiographic and clinical follow up were executed on average after >4 years.
Results: CSs were 73.3 vs. 70.7, 78.4 vs. 74.7 and 62.6 vs. 68.6 in 2-, 3- and 4-part fractures comparing NOT vs. OT. The only significant difference was found in 3-part fractures with 33.4 in the NOT group vs. 28.4 in the OT group. There was a tendency toward better ADL in 4-part fractures when treated with nailing (26 vs. 23.3). The complication rate was higher in the OT group. Displacement rates were 14.6 % after surgery vs. 50 % in the NOT group.
Conclusion: Intramedullary nailing is not superior to non-operative treatment. In 2-, 3- and 4-part fractures functional results were similar. Anatomical fracture healing is not predictive for good shoulder function.
Reference:
1. Sanders et al. Locking plate versus nonsurgical treatment for proximal humeral fractures: better midterm outcome with nonsurgical treatment. J Shoulder Elbow Surg. 2011;20(7):1118–24.
Disclosure: No significant relationships.

O017

RESULTS OF THE FOUR-PART FRACTURE DISLOCATIONS OF THE PROXIMAL HUMERUS (NEER VI) TREATED WITH A LOCKING PLATE

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Introduction: Four-part fracture dislocations (FPFD) comprise up to 3 % of all proximal humerus fractures. The controversy regarding treatment stems from the fact that small case series do not allow a standard protocol to be worked out.
Materials and methods: This retrospective case series includes 35 patients with 36 (FPFD). There were 21 anterior and 15 posterior dislocations. 24 (67 %) patients were less than 60 years old. In 16 (44 %) patients sustained high-energy trauma. 3 cases initially presented with a pl. brachialis injury. The average time to surgery was 7 days (2–45). The following features were assessed—Hertel's I and II signs, the presence of a calcar spike, head split or depression and metaphyseal defect. Patients were graded according to injury severity—15 (42 %) very severe, 11 (31 %)—severe, 10 (27 %) of moderate severity. Intra-operative reduction was judged as anatomical in 8 (22 %) cases, good in 11 (31 %), acceptable in 9 (25 %) and inadequate in 8 (22 %) patients.
Results: According to CS: 8 (22 %) excellent, 7 (19 %) good, 9 (25 %) fair and 12 (34 %) poor. The complications were detected: partial AVN—8 (22 %), complete AVN—6 (17 %), non-union 4 (11 %), screw cut-out 15 (42 %), malrotation 6 (17 %), shoulder impingement—6 (17 %), ectopic ossification—1 (3 %) case. Overall, 25 (69 %) additional surgical procedures were needed.
Conclusion: ORIF of FPFD with LCP has shown a high complication rate—29 %. In this series, the prevalence of fair and poor functional results—up to 59 %.
Reference:
1. Soliman OA, Koptan WM. Four-part fracture dislocations of the proximal humerus in young adults: results of fixation. Injury. 2013;44(4):442–7.
Disclosure: No significant relationships.

O018

PROSTHESIS OR ANGULAR-STABLE OSTEOSYNTHESIS IN ELDERLY PATIENTS WITH INTRAARTICULAR FRACTURES OF THE DISTAL HUMERUS?

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Introduction: This study aims to evaluate the functional outcome and complication rate after total elbow arthroplasty (TEA) compared with angular-stable osteosynthesis (ORIF) of intraarticular distal humerus fractures (AO type C1–3) in patients older than 60 years.
Materials and methods: In a period from 01/06 until 01/09 eight patients with intraarticular fractures of the distal humerus were treated by total elbow arthroplasty. Mean age in this group was 73 years. In the same period 15 patients with a mean age of 73 years were treated with an anatomically precontoured and angular-stable double-plate osteosynthesis. The functional result was evaluated using the Mayo Elbow Performance Score (MEPS) and by clinical examination. Complications in the treatment course were recorded.
Results: Mean MEPS in the TEA group was found to be 95 points (95–95, SD 0). All patients were rated as excellent. In the ORIF group mean MEPS was 87 points (75–100, SD 8.3). There were four excellent and seven good results. Concerning range of motion extension/flexion in the TEA group was 82° (55–100, SD 16) compared with 95° (70–130, SD 18) in the ORIF group. In both group's pro- and supination was nearly not compromised (TEA 155° vs. ORIF 166°). One complication (12.5 %) occurred in the TEA group. In the ORIF group overall complication rate was found to be 33 %.
Conclusion: Both total elbow arthroplasty and angular-stable osteosynthesis of intraarticular distal humerus fractures in patients of advanced age yields in good clinical results. Results demonstrated in this study indicate that TEA should be considered as a useful alternative in elderly patients.
Disclosure: No significant relationships.

O019

IS CONSERVATIVE TREATMENT OF HUMERAL SHAFT FRACTURE STILL RELEVANT IN 2014

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Introduction: Is conservative treatment of humeral shaft fracture still relevant, given the numerous means of osteosynthesis available?
Materials and methods: 27 patients were included in a 1-year study: 19 female, 8 male; mean age, 60.8 years. All were assessed clinically and radiologically at 6 months' to 1 year's follow-up. In Emergency, patients were immobilized in a U splint. A check-up was performed at day 8. The U splint was maintained for about 1 month, then replaced by a semi-rigid resin Sarmiento cast. The elbow was mobilized as quickly as possible. Immobilization was completed by a Berenhail orthopedic jersey. A radiological and clinical check-up was performed every 3 weeks. At 2 months or as soon as the callus appeared, the jersey was replaced by a lighter Polysling sling allowing elbow and shoulder mobilization (pendular motion etc., but strictly avoiding external rotation).
Results: In 70 % of cases, the superior third of the humerus was fractured, in 14 % the mid-third and in 11 % the inferior third. Fusion was achieved in a mean 4 months (range 2.5–5 months). One patient received plate osteosynthesis at 5 months de to delayed fusion and an other on keeps its pseudarthrosis. 80 % of patients were satisfied;. There were no complications other than some early skin irritation that rapidly resolved.
Conclusion: This method seems to us a method of choice, particularly for comminuted and mid-third fractures in elderly patients. Complications other than non-fusion are few.
Reference:
1. Sarmiento A, et al. Functional fracture bracing. J Am Acad Orthop Surg. 1999.
Disclosure: No significant relationships.

O020

DECISION-MAKING IN SEVERELY DISPLACED FRACTURES OF THE PROXIMAL HUMERUS—FRACTURE OR SURGEON BASED?

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Introduction: Commonly cited indications for replacement of the humeral head are true Neer 'head-splitting' fractures, multi-part fractures with delayed presentation and fractures in which the head is deemed to be nonviable. However, decision-making is not only influenced by the type of fracture, but also by patient- and probably by surgeon-related factors.
Materials and methods: A total of 217 surgeons evaluated 10 case vignettes on patients with 3 and 4-part fractures of the proximal humerus. We provided radiographs, patient age, sex, trauma mechanism, activity level, and physical status. Observers were asked to (1) choose open reduction and internal fixation or hemiarthroplasty and (2) to briefly describe the factors that lead to their decision. We assessed interobserver reliability using the Fleiss generalized kappa and analyzed factors that influenced decision-making according to treatment choice.
Results: Reconstruction was the preferred treatment in the majority of cases. The overall multirater agreement was fair ($k = 0.30$) with a 75 % proportion of agreement. When asked to describe the factors that influenced decision-making, surgeons favoring reconstruction described patient-based factors in 52 %, fracture morphology in 51 %, surgeon factors in 42 %, and bone quality in 11 %. In contrast, fracture morphology was the most common factor (67 %) described by surgeons considering replacement.
Conclusion: Reconstruction is the treatment of choice even in complex fractures of the proximal humerus. Decision-making is not only influenced by the type of fracture, but also by patient- and surgeon-related factors.
Reference:
1. Robinson CM, Page RS, Hill RM, et al. Primary hemiarthroplasty for treatment of proximal humeral fractures. J Bone Joint Surg Am. 2003;85-A:1215–23.
Disclosure: No significant relationships.

O021

THE ASSOCIATION BETWEEN BODY MASS INDEX AND THE SEVERITY OF PROXIMAL HUMERUS FRACTURES: EFFECT ON FRACTURE UNION AND SOFT TISSUE HEALING

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Introduction: We investigated the relationship between body mass index (BMI) and proximal humerus fracture in postmenopausal females.
Materials and methods: Over a 5-year period, 1,752 patients were treated with proximal humerus fractures. The inclusion criteria included females >45 years of age with good health status and no balance or mental health issues, not diabetic nor suffer from neuromuscular weakness, not requiring a walking aid and no history of falls or previous fractures. 822 patients met the inclusion criteria. Patients were classified according to their BMI into 4 categories. Fractures were classified as per the Neer classification. 82 patients underwent surgical fixation and the rest were treated conservatively. All patients were followed up for a minimum period of 24 months.
Results: Overweight and obese patients were more likely to sustain 4-part proximal humerus fracture with >1 cm displacement when compared to normal weight ($p < 0.001$) and underweight ($p < 0.001$) patients. The surgical fixation group (15 3-part and 67 4-part fracture) has an increase delay in fracture healing (mean 14 weeks) when compared the conservatively managed group (150 3-part and 102 4-part fracture), ($p < 0.021$). Further analysis of the surgical cohort, revealed a significant correlation when it comes to postoperative delayed wound healing ($p = 0.002$), duration of postoperative pain ($p = 0.002$) and surgical site infections ($p = 0.005$), when compared to the conservatively managed (Neer classification-matched) group.
Conclusion: The current evidence linking BMI and proximal humerus fracture in postmenopausal females confirms that the severity of the fracture is increased in overweight and obese patients.
Reference:
1. Prieto-Alhambra et al. J Bone Miner Res. 2012;27(2):294–300.
Disclosure: No significant relationships.

O022

A COMPARISON OF INTERSCALENE BLOCK ANAESTHESIA AND GENERAL ANAESTHESIA IN PATIENTS WITH PROXIMAL HUMERUS FRACTURE

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Introduction: A proximal humerus fracture is a common injury of the shoulder. The aim of this study is to compare the effects of two anaesthetic methods in patients with proximal humerus fracture in development of postoperative pain.
Materials and methods: 50 patients were included in this prospective, randomized study. They were randomized into two groups, ISBA group and GA group. Patients in ISBA group were anesthetized using interscalene block technique; whilst patients in GA group were anesthetized according to general anaesthesia protocol. The VAS score was assessed every 2 h at rest and in motion. We measured time necessary to prepare anaesthesia in both groups, duration of operation, hemodynamic and respiratory stability, loss of blood during operation, use of analgesics postoperatively and patient satisfaction.
Results: There was no statistically significant difference between groups regarding demographic characteristics and ASA status. ISBA group had statistically lower VAS score as well as lower analgesics use ($P < 0.05$). There were no statistically significant differences in intraoperative complications, although more hypotension was recorded in GA group. The loss of blood was higher in ISBA group, but this result bears no statistical significance. The time necessary to perform anaesthesia was significantly longer in ISBA group ($P < 0.05$). There is a statistically significant difference regarding patient satisfaction, to the advantage of ISBA ($P < 0.05$).
Conclusion: ISBA is a better method of anaesthesia than GA in patients with proximal humerus fracture, it leads to better pain relief, lesser use of analgesics, without significant complications.
Reference:
1. Fredrickson MJ. Postoperative analgesia for shoulder surgery: a critical appraisal and review of techniques. Anaesthesia. 2010;65:608–24.
Disclosure: No significant relationships.

O023

CEMENT AUGMENTATION OF A PROXIMAL HUMERUS PLATE FOR OSTEOPOROTIC FRACTURE. NUMERICAL ANALYSIS OF A COMPLEX PROBLEM

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Introduction: Treatment of fragility fractures at the proximal humerus remains a major challenge in trauma surgery with high implant failure rates [1]. The idea arose to augment the screws of a proximal humerus plate with bone cement. Finite-Element-Analysis was used to assess which combination of augmented screws carries the highest potential to decrease the risk of mechanical failure.
Materials and methods: The FE-model employs high-resolution CT image-data of an osteoporotic proximal humerus. An unstable 3-part fracture was virtually stabilized with a PHILOS-plate (DePuySynthes Inc.). 0.5-ml bone cement clouds were virtually placed around the tips of six proximal screws. Physiological loading was mimicked by rotator-cuff tendon forces and joint reactions from inverse dynamic calculations (AnyBody^{TM}). Custom-made algorithms were used to interlink several software packages from pre- to post-processing to enable efficient simulation of in total 64 possible cement configurations (6 proximal screws with and without cement). The model was validated by mechanical testing.
Results: With all six proximal screws augmented, a maximum strain reduction of 33 % was achieved compared to the non-augmented case. However, there were augmentation patterns with three augmented screws, which yielded a comparable reduction in strain of 29 % (range 29–8.2 %). According to the model, the 4-screw patterns offer strain reductions between 31 and 15 % and the 5-screw patterns between 32 and 25 %.
Conclusion: The results indicate a superior anchorage of the PHILOS-plate system in osteoporotic bone with a minimum amount of correctly injected bone cement. However, the fewer screws are augmented, the more the actual location of the cement appears to matter.
Reference
1. Solberg BD, et al. Locked plating of 3-and 4-part proximal humerus fractures in older patients: the effect of initial fracture pattern on outcome. J Orthop Trauma. 2009;23:113–9.
Disclosure: No significant relationships.

O024

DISTAL BICEPS TENDON RUPTURE—IS SURGICAL INTERVENTION REALLY ALWAYS NECESSARY?

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Introduction: Rupture oft the distal biceps tendon is a rare injury but leads to a considerable loss of strength. Deficit of 40 % of supination and more than 50 % in flexion is reported in literature. Therefore surgical refixation is the method of choice. However, some patients undergo conservative treatment. The purpose of this study was to assess the results of non-operative treatment according to objective muscle strength testing and evaluation of subjective satisfaction.
Materials and methods: In 10 years 206 patients suffered distal biceps tendon rupture. Clinical examination and MRI confirmed diagnosis. Most of these patients (85.4 %) underwent surgical intervention. In 30 Patients conservative treatment (cast-fixation following physiotherapy) has to be initiated due to several causes. Patients underwent clinical assessment using a modified Mayo elbow performing score. Measurement of supination and flexion strength was performed by isometric strength test.VAS was applied for subjective satisfaction.
Results: 24 of the 30 patients (80 %) underwent follow-up examination. Mean time between trauma and check-up was 80 months (18–138 months).Loss of supination strength was 27.2 %, compared to the other side. Loss of flexion strength was 24–15 % depending of the forearm position.VAS was 8.6. The modified Mayo elbow performing score was 81.05 (90 max).
Conclusion: In literature severe loss of strength is reported after distal biceps tendon rupture. Loss of supination and flexion strength is evident but much less than reported so far. Moreover subjective satisfaction is high. Comparing the data of remaining strength loss after surgical repair including the risks of postoperative nerve lesions we must reconsider surgical repair as the only recommended treatment.
References:
1. J Bone Joint Surg Am. 1985;67(3):418–21.
2. J Bone Joint Surg Am. 1985;67(3):414–7.
Disclosure: No significant relationships.

NEURO- AND SPINE TRAUMA

O025

PROSPECTIVE EVALUATION OF PENETRATING INJURY OF THE NEUROCRANIUM

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Introduction: Management of penetrating neurocranial injury (PNCI) is mainly derived from retrospective (military) data in which gunshot is the predominant mechanism. In this prospective cohort study treatment of civilian PNCI was analyzed for factors related to outcome.
Materials and methods: 1,059 consecutive patients with possible PNCI were screened between March and July 2013. In 52 patients radiographic investigations revealed PNCI. Patients injured 48 h prior, non PNCI death and non-survivable PNCI at presentation were excluded.
Results: Mean age (98 % male) was 24. Predominant entering sides: parietal (40 %) and frontal (20 %) part of the skull. Most PNCI (73 %) was by LET (knife, axe, screwdriver, panga) versus 27 % HET (gunshot). Mechanism did not influence overall survival (89 %). All operated patients survived (n = 16). CTA findings indicative for surgical versus non-surgical treatment were: object in situ (38 vs. 10 %), trans ventricular injury (19 vs 0 %), hematoma (94 vs 62 %), edema (81 vs 35 %), midline shift (75 vs 10 %), Marshall score (MS) >2 (96 vs 79 %), lateralization (38 vs 3 %), acidosis (63 vs 10 %) and brain matter oozing (60 vs 4 %).Predictors of mortality versus survival: GCS <8 with intubation (80 vs 2 %), multilobular injury (100 vs 29 %), edema (80 vs 25 %), midline shift (80 vs 25 %) and MS >2 (100 vs 79 %).
Conclusion: Patients with intubation for a low GCS and CTA with multilobular injury, midline shift and MS >2, have a poor outcome. Patients with similar CTA and lateralization, brain oozing, and acidosis but no need for intubation benefit from surgery compared to conservative treatment.
References: See pubmed.
Disclosure: No significant relationships.

O026

THE EFFECT OF EARLY CHEMOPROPHYLAXIS ON DEEP VENOUS THROMBOSIS AND INFERIOR VENA CAVA FILTER RATES IN HEAD INJURED PATIENTS

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Introduction: Trauma Brain Injury (TBI) patients are at risk of developing Deep Venous Thrombosis (DVT). Recent studies have demonstrated the safety of early commencement of Low Molecular Weight Heparin (LMWH) in the presence of stable CT scans. We evaluated our practice of instituting earlier chemoprophylaxis in TBI patients on the rate of DVT and prophylactic Inferior Vena Cava filters (IVCFs) placement.
Materials and methods: All TBI patients admitted to a US Level I trauma center between 7/2009 and 06/2013 were identified. Over the first 24-month period (PRE-LMWH), DVT prophylaxis was not commenced early in TBI patients and prophylactic IVCFs were placed in patients who developed DVT or were deemed to be at risk.At the beginning of the second 24-month period, a policy of early initiation of LMWH in TBI was started. The total number of DVTs and IVC filters placed was noted. Comparisons were made using Chi square testing.
Results: In the PRE-LMWH period there were 2,278 TBI patients and 1,865 in the subsequent period (LMWH).There were 135 DVTs (5.9 %) in the PRE-LMWH period and 100 (5.4 %) in the LMWH period ($p = 0.68$). Lower extremity DVTs accounted for 3.6 % of DVTs in the PRE-LMWH period and 3.9 % in the LMWH timeframe ($p = 0.46$) A total of 83 IVCFs were placed in TBI patients in the PRE-LMWH period (3.6 %) vs. 10 in the LMWH period (0.5 %, $p < 0.0001$)
Conclusion: At our Level I Trauma center, early utilization of LMWH in TBI patients was not associated with a reduction in DVT, however was accompanied by a marked reduction in prophylactic IVC filter insertions. Further research on methods to further reduce DVTs in high-risk trauma populations is needed.
Disclosure: No significant relationships.

O027

SELF-REPORTED OUTCOMES AFTER HEAD INJURY—ASSAULT AS A RED FLAG FOR ADVERSE OUTCOMES

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Introduction: Traumatic brain injury (TBI) due to intentional assault is a pervasive and emotionally traumatic event that could represent a compounding factor leading to a poorer outcome. We investigated whether self-reported outcomes differ between intentional and unintentional TBI patients.
Materials and methods: We retrospectively reviewed 70 TBI patients of various mechanisms/severity. They had been assessed with Rivermead post-concussion symptoms questionnaire [1] and Quality-of-Life after Brain Injury (QOLIBRI) questionnaire [2] at follow-up. Patient's responses to each element in the questionnaires were quantified by a scale of 0–4. Sectional and overall scores for both questionnaires were calculated. Comparisons were made between cases of assault and other aetiologies.
Results: Of 70 patients reviewed 14 sustained TBI from an assault; the remainder sustained TBI due to other causes. The severity ranged from mild to severe. Neither a significant effect of severity on Rivermead or QOLIBRI scores was found, nor a significant difference in the distribution of severity between assaulted and non-assaulted cases. The assault group reported higher overall scores in the Rivermead questionnaire than the non-assault group ($p = 0.029$). Sectional scores of both questionnaires were also significantly higher in the assaulted patients (Rivermead RPQ-3, RPQ-13 and QOLIBRI Part-2).
Conclusion: Self-reported outcomes are independent of TBI severity. Assaulted patients tend to develop more severe post-concussion symptoms and be more bothered by their physical and emotional problems. This information is useful in arranging earlier and targeted follow-up and support.
References:
1. Eyres S, Carey A, Gilworth G, et al. Clin Rehabil. 2005;19:878–87.
2. von Steinbüchel N, Wilson L, Gibbons H, et al. J Neurotrauma. 2010;27:1167–85.
Disclosure: No significant relationships.

O028

THE DAILY PRACTICE OF IMMOBILIZING FRACTURES OF THE THORACOLUMBAR SPINE

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Introduction: Although the incidence of a Thoracolumbar Spine Fracture (TLSF) after blunt trauma is low, the impact on (pre) hospital workload is substantial. This is due to extensive immobilizing measures during transport of a trauma patient suspected for a TLSF. The evidence to support spinal immobilization however is weak and spinal immobilization can have negative side effects [1]. A more selective immobilization protocol could therefore greatly reduce workload and improve outcome. As first step in developing an evidence-based immobilizing protocol we evaluated the daily practice of spinal immobilization of patients with a TLSF.
Materials and methods: All patients diagnosed with a TLSF within a seven-and-a-half year period at the Emergency Department of a Dutch level-II trauma-center were included in the study group. Outcome parameters were spinal immobilizing measures, neurologic deficit and adverse events.
Results: A total of 312 patients (median age 60.2 years) were identified (46 % male). Pre-hospital immobilization was absent in 52 % although all patients were initially suspected for a TLSF. No serious adverse events following pre-hospital spinal immobilization were encountered.
Twenty-six patients (8.4 %) suffered neurological symptoms of which ten patients (3.2 %) did not receive pre-hospital immobilization.
Conclusion: This study shows that more than half of the patients with a fracture of the thoracolumbar spine did not receive pre-hospital immobilization even though sometimes neurological symptoms were present. This alarming outcome warrants further analysis of the criteria for spinal immobilization and their implementation. We postulate that a more selective immobilization protocol is achievable.
Reference:
1. Kwan et al. 2001.
Disclosure: No significant relationships.

O029

PRE-HOSPITAL IMMOBILIZATION OF THE CERVICAL SPINE IN THE ALERT PATIENT WHO WERE AMBULATORY ON SCENE AFTER BLUNT TRAUMA: A RETROSPECTIVE ANALYSIS

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Introduction: Prehospital spinal immobilization is advocated in all patients suspected for cervical spine injury (CSI). Unnecessary application however is time consuming, expensive, potentially harmful and associated with increased workload [1, 2]. Validated spinal clearing criteria are promising tools in pre-hospital setting and to determine eligibility for spinal immobilization. This study assesses the need for immobilization in patients who were ambulatory on scene post-trauma.
Materials and methods: All patients who were ambulatory on scene post-trauma and suspected for CSI at the Emergency Department (ED) of a level II trauma-centre within a two-and-a-half year period were included. Primary outcome measures were fracture of the Cervical spine and neurologic deficit. The NEXUS criteria were used to analyse CSI suspicion in-hospital.
Results: A total of 728 patients were included of which 491 (67 %) did meet one of the NEXUS-criteria and therefore suspected for CSI. Within this group 19 patients (4 %) suffered neurologic deficit and 9 (2 %) had a fracture of the cervical spine. Pre-hospital immobilization was applied in 56 %. Forty-two patients (9 %) received secondary spinal immobilization at the ED, all without CSI.
There were no fractures or cases of neurologic deficit within the NEXUS-negative group of which 64 % received pre-hospital immobilization.
Conclusion: Patients who were ambulatory on scene post-trauma and did not meet one of the NEXUS-criteria were without CSI. In these patients spinal immobilization could be omitted in pre-hospital tract or at the ED. This outcome could have implications for current pre-hospital care and should be evaluated in a prospective setting.
References:
1. Kwan et al. 2001.
2. Hauswald et al. 2002.
Disclosure: No significant relationships.

O030

THE ANTERIOR TRANSARTICULAR C1–2 STABILISATION IN ATLANTO-AXIAL INSTABILITIES OF GERIATRIC PATIENTS- BENEFIT AND PROBLEMS

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Introduction: The posterior transarticular screw fixation C1–2 is a demanding procedure to treat atlanto-axial instabilities. It holds risks to injure the A. vertebralis as well as neurological structures. Furthermore the posterior approach of the upper part of the cervical spine requires a traumatic preparation of the soft tissue. The anterior transarticular C1–2 fusion is less traumatic and offers the same strength of the stabilisation.
Materials and methods: Since the beginning of 2007 over 56 Patients multimorbid patients with atlanto-axial instabilities of different entities were treated via the anterior transarticular fusion, were regular examined radiologically and the procedure critically judged.
Results: ATS was performed in 56 patients (32f, 16m; 82.15 years (62–101)). The average operation-time took 64.5 min. One revision had to be done because of p.o. bleeding. 2 patients were in need of a prolongated ventilation, Ø 6.7 days p.o. the patient were emissed from hospital. The radiological control showed 97 (86.6 %) of the transarticular screws in correct position, 8 (7.1 %) were too long, 3 of those showed loosening, 2 of them had to be revised. 3 screws (2.7 %) were too ventral, 4 (3.6 %) to medial, no revision was needed.
Conclusion: The ATS is a gentle and stable procedure for atlanto-axial instabilities. Especially in the geriatric patient this short intervention can bring a quick relief of pain and good stability.
Reference:
1. Josten C. Cervical spine. In: Buhren V, Josten C (eds) Surgery of the injured spine. Berlin: Springer; 2013. P. 1135–79.
Disclosure: No significant relationships.

O031

LOOSENING RATE AND LOSS OF CORRECTION IN MULTISEGMENTAL POSTERIOR STABILIZATION WITH OR WITHOUT PMMA-AUGMENTATION OF PEDICLE SCREWS IN VERTEBRAL FRACTURES OF THE AGING SPINE

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Introduction: Within the last two decades the use of polymethylmethacrylate (PMMA) in the treatment of osteoporotic vertebral fractures has been established and augmentation of pedicle screws found widespread use. Several studies showed improved pullout strength of augmented screws in osteoporotic bone. We analyzed our elderly patients concerning secondary loss of correction and loosening of the pedicle screws respectively.
Materials and methods: We analyzed 24 patients concerning loosening and secondary loss of correction after multisegmental posterior instrumentation. No additional anterior stabilization was used. Loss of correction was determined by bisegmental cobb angle and kyphosis angle of the fractured vertebra using routine CT-scans and X-ray. Furthermore we analyzed clear zones around pedicle screws as a sign of loosening.
Results: In 15 patients with 117 PMMA-augmented pedicle screws, we saw signs of loosening in 4.3 % of screws, whereas in 9 patients with 86 uncemented screws, loosening rate was 62.8 %. PMMA-augmented pedicle screws showed a significantly lower loosening rate. Loss of correction was minimal despite poor bone quality in our patients. There was significantly less loss of correction in patients with augmented pedicle screws ($1.1° \pm 0.8°$) as compared to patients without augmentation ($5° \pm 3.8°$).
Conclusion: PMMA-augmented pedicle screws are superior to conventional instrumentation concerning loosening rates and loss of correction in spinal fractures of the elderly. Multisegmental posterior instrumentation is safe and reliable without additional anterior stabilisation of the fractured segment itself in these patients.
Reference:
1. Amendola et al. Fenestrated pedicle screws for cement-augmented purchase in patients with bone softening: a review of 21 cases. J Orthop Traumatol. 2011.
Disclosure: No significant relationships.

O032

COMPARISON OF OPEN VS. MIS REDUCTION CAPABILITIES IN SPINAL FRACTURES USING THE NEW PERCUTANEOUS SCHANZ-SCREW BASED INTERNAL FIXATOR

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Introduction: The new generation of the original Schanz-screw based Internal Fixator allows direct lordotic reduction by the lever of transpedicular screws through MIS access. In order to directly compare the predecessor model (open access) with the new percutaneous fixator, we clinically evaluated the reduction capabilities and the periop. data of pat. with stabilized spinal fractures in our institution.
Materials and methods: Prospective analysis of 2 groups of consecutive pat. with thoracolumbar fractures, selected by the method of surgery (posterior fixation alone w. or w/o cement augmentation) in 2012 and 2013. Group "open" $N = 25$ and group "MIS" $N = 22$ with similar age/gender distribution. Evaluation of radiologic parameters as Cobb angle deformity correction and spinal canal clearance, as well as the clinical values duration of surgery and blood loss. Furthermore, assessment of complications, pain and hospital stay. Statistics by software analysis (*t* test; significance level $p < 0.05$)
Results: Kyphosis correction similar in "open" and "MIS" with Cobb angle 8° (± 6) and 9° (±5.6) respectively. Spinal canal clearance in both groups 10–11 (±7) % decompression. Duration of surgery similar in "open" and "MIS", significant difference of blood loss (open: 234 ml (±46), MIS: 57 ml (±8); $p < 0.05$). No major complications except 1 pat. needing screw revision (asymptomatic, MIS). No relevant differences found concerning postop. pain management or duration of hospital stay.
Conclusion: The reduction of the operation invasivity of "MIS" was expressed by the significantly decreased blood loss. No relevant differences exist in the amount of fracture reduction using the classic (open) or MIS Internal Fixator in percutaneous access.
Disclosure: No significant relationships.

O033

CLINICAL CLEARANCE OF THE CERVICAL SPINE IN CHILDREN WITH BLUNT TRAUMA—RESULTS IN A LEVEL-II TRAUMA CENTER

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Introduction: Although children with potential cervical spine injury (CSI) are presented in daily practice, criteria for clinical clearance of the pediatric cervical spine are lacking, especially in younger children.
Materials and methods: All patients presented to the ED of a Dutch level-II trauma center after blunt trauma and with in-hospital suspicion for blunt CSI were registered in a database within a 2.5-year period. Blunt trauma patients younger than 18 years with radiographic C-spine imaging were identified. Patient characteristics, trauma mechanism and Injury Severity Score (ISS) are described. Retrospectively, the NEXUS criteria were analysed in all patients. The measured outcome was CSI.
Results: In total, 223 children with blunt cervical spine trauma and radiographic C-spine imaging were included in this study. Mean age 11 years (range 0–17 years), mean ISS 6.39 (range 1–41). In 154 children (69.1 %) ≥1 NEXUS criteria were positive. Based on conventional radiographic imaging, none of these 223 children were diagnosed with CSI. In 35 children additional cervical spine CT imaging were performed, including 1 child (0.4 %) with atlanto-axial subluxation type II and 34 children without signs of CSI.
Conclusion: CSI is very uncommon in children. However, in daily practice many children (30.9 %) are exposed to radiographic C-spine imaging, without meeting up to regular used NEXUS criteria in adults. Due to lack of evidence of criteria for clinical clearance of the pediatric cervical spine, daily practice seems challenging.
Reference:
1. Ehrlich PF, et al. Canadian C-spine rule and the NEXUS criteria for C-spine radiography in young trauma patients. J Pediatr Surg. 2009;44(5):987–91.
Disclosure: No significant relationships.

O034

PREHOSPITAL IMMOBILIZATION IN SUSPECTED CERVICAL SPINE FRACTURES

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Introduction: 1–2 patients with potential Cervical Spine Injury (CSI) are presented to an ED each day. Missed cervical spine injuries can lead to severe morbidity and mortality. Therefore, prehospital immobilization of the spine is recommended in all these patients. However, unnecessary spinal immobilization can cause severe side effects, is time consuming and associated with an increased workload.
Materials and methods: All patients presented to the ED of a Dutch level II trauma centre after blunt trauma and with in-hospital suspicion for blunt CSI were registered in a database within in a two-and-a-half year period. We assessed the number of cervical spine fractures/injuries and neurological deficit. Retrospectively, the NEXUS criteria were analysed in all patients.
Results: In total, 1,318 patients with suspected blunt CSI were included in this study. Prehospital immobilization was performed in 986 patients. 22 patients (2.2 %) in this group had a C-spine fracture. 306 patients (31 %) who were prehospitally immobilized did not meet one of the NEXUS criteria at the time of presentation in the ED. 332 patients (25 %) were not prehospital immobilized .6 patients had a C-spine fracture. At time of presentation in the ED, 240 patients who were not immobilized did meet one of the NEXUS criteria.
Conclusion:

- This study showed that 21 % of the patients with a C-spine fracture where not prehospitally immobilized.
- 30 % of the patients suspected for injury of the C-spine had a negative NEXUS score.

Reference:
1. Kwan I, Bunn F, Roberts I. Spinal immobilisation for trauma patients. Cochrane Database Syst Rev. 2001(2):CD002803.
Disclosure: No significant relationships.

TRAUMA SCORES AND MODELING

O035

NOVEL SCORING MODEL USING A 3-DIMENSIONAL APPROACH FOR THE ASSESSMENT OF THE QUALITY OF NATIONAL TRAUMA SYSTEMS

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Introduction: There are several proposed quality indicators to assess the quality of trauma care; however, the evidence to support these indicators is neither strong nor applicable at the national levels.
Materials and methods: We aimed to develop a novel, simplified scoring model for assessing the quality of national trauma systems and to evaluate the impact of the number and quality of registry-based publications in a given country on the delivered trauma care. Therefore, we reviewed the literature, registry-based publications and different national quality indictors over the last 15 years.
Results: Based on the available date we developed a 3×3 model [3T (technology, transportation, and trauma system), 3H (human, health, and hospital status), and 3E (election, education, and economy status)]. Using these variables of the 3×3 model, we identified three indicators and three pillars per each variable. We observed that the number and quality of registry-based publications reflect the maturation of trauma system and quality of the delivered trauma care. In comparison to the western countries, there are few publications from the developing countries along with an inadequate trauma care.
Conclusion: Trauma Registry is a fundamental component of the trauma system that measures the impact of injury and quality of care delivered by the trauma system. A simplified, informative and reproducible scoring model of the quality of national trauma system is needed. This will assist policy makers in creating appropriate strategies for optimal trauma care.
Reference:
1. Arts DG, et al. Defining and improving data quality in medical registries: a literature review, case study, and generic framework. JAMA. 2002;9:600–11.
Disclosure: No significant relationships.

O036

A QUALITY INDICATOR TO BENCHMARK ACUTE CARE LENGTH OF STAY FOR TRAUMA ADMISSIONS

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Introduction: Injury is second only to cardiovascular disease in terms of resource use [1] but no quality indicator (QI) is currently available to evaluate trauma care in terms of length of stay (LOS). Our objective was to derive and internally validate a QI for acute care LOS following admission for injury.
Materials and methods: The study is based on a Canadian integrated trauma system (2005–2010; 57 trauma centers, $n = 57{,}524$). Data were abstracted from the trauma registry linked to the hospital discharge database. Risk factors were identified by expert consensus and selected for model derivation using bootstrap resampling [2]. QI validity was evaluated in terms of inter-hospital discrimination, construct validity, and forecasting.
Results: The risk adjustment model includes age, injury mechanism, maximum Abbreviated Injury Scale score for each body region injured, the Glasgow Coma Score, the Elixhauser comorbidity index, the number of admissions in the 12 months prior to injury, and transfer status. The QI discriminates well across trauma centers (coefficient of variation = 0.02, 95 % CI 0.011–0.028) and is correlated with QI on processes of care ($r = -0.32$), complications ($r = 0.66$), unplanned readmissions ($r = 0.38$), and mortality ($r = 0.35$).
Conclusion: We propose a trauma QI based on risk-adjusted LOS that can be implemented with routinely collected data. This QI can be used to target interventions to reduce LOS, which will lead to more efficient resource use and may improve patient outcomes following injury.

References:
1. The economic burden of injury in Canada. http://www.smartrisk.ca/index.php/burden.
2. Krumholz HM, Brindis RG, Brush JE, et al. Standards for statistical models: Circulation. 2006;113(3):456–62.
Disclosure: No significant relationships.

O037

VALIDATION OF THE REVISED INJURY SEVERITY SCORE IN PATIENTS WITH TRAUMATIC BRAIN INJURY

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Introduction: Traumatic brain injury (TBI) is the main cause of death in trauma [1]. Thus, it is crucial that the performance of the adjustment models used in trauma benchmarking is valid for these patients [2, 3]. Accordingly, a validation study of the RISC score for predicting outcome in TBI was conducted.
Materials and methods: Patients entered into the TraumaRegister DGU® and the trauma registry of Helsinki University Hospital in 2006–2011 were used for internal and external validation. Patients were categorized as: severe and mild TBI (sTBI, mTBI). The sTBI group was further divided into isolated and polytrauma. The RISC score performance was evaluated by assessing its Area Under the Curve (AUC), Hosmer–Lemeshow GoF (H–L) and Brier score.
Results: For 15,306 and 1,274 patients included for the internal and external analyses unadjusted mortality was 19 respectively 16 %. Internal validation showed good performance for sTBI (AUC 0.89, 95 % CI 0.88-0.90; H–L 362.0, Brier 0.117) and mTBI (AUC 0.92, 95 % CI 0.89–0.95; H–L 43.2, Brier 43.2), no major differences between the sub-groups. External validation revealed good performance for sTBI (AUC 0.84, 95 % CI 0.81–0.87; H–L 33.8, Brier 0.135) and mTBI (AUC 0.93, 95 % CI 0.88–0.98; H–L 5.5, Brier 0.016). However, sub-group analysis revealed poorer performance for isolated compared to polytrauma sTBI (ΔAUC 0.13)
Conclusion: The RISC is a valid tool for TBI benchmarking. However, limitations for patients with isolated sTBI were noted.
References:
1. Patel HC, et al. Lancet. 2005;366:1538–44.
2. Hemmila MR, et al. J Trauma. 2010;68:253–62.
3. MacKenzie EJ, et al. N Engl J Med. 2006;354:366–78.
Disclosure: No significant relationships.

O038

VOLUME DOES MATTER

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Introduction: The volume-outcome relationship in complex and specialized health care and its application to quality improvement is addressed in many studies [1–3]. In trauma care, only a few studies have demonstrated an association between increased patient volume or per-surgeon experience and improved outcomes [4, 5].
In this study, we evaluate the volume-outcome relationship in trauma by analyzing and comparing performances in high and low volume trauma centers.
Materials and methods: International multicenter prospective trauma registry based study, performed in: University Medical Center Utrecht (UMCU), Utrecht, the Netherlands; Harborview Medical Center (HMC), Seattle, USA; John Hunter Hospital (JHH), Newcastle, Australia
Inclusion: patients ≥18 years, admitted in 2012, registered in the institutional trauma registry.
Statistical analyses: TRISS methodology and propensity score adjusted multivariable logistic regression analysis.
Results: Annually admission UMCU = 1,300, JHH = 4,500, HMC = 6,000. Patients included in this study: UMCU = 955, JHH = 1,146, HMC = 4,049. Penetrating trauma: UMCU = 6.9 %, JHH = 5.2 %, HMC = 13.4 %. Mean ISS: UMCU = 11.7, JHH = 13.5, HMC = 13.4. Number and proportion of patients ISS >15: UMCU = 300, 32 %, JHH = 412, 36 %, HMC = 1375, 34 %. Unadjusted mortality was significantly higher at UMCU; UMCU = 6.5 %, JHH = 3.5 %, HMC = 4.8 %. Adjusted odds of death at JHH = 0.577 (p = 0.044) and HMC = 0.578 (p = 0.001) compared to UMCU. Adjusted odds of death for patients ISS >15 at JHH = 0.609 (p = 0.077) and HMC = 0.541 (p = 0.001) compared to UMCU.
TRISS analysis: UMCU: Ws = 0.787, Z = 1.31, M = 0.87; JHH: Ws = 3.583, Z = 6.7, M = 0.89; HMC: Ws = 3.902, Z = 14.6 M = 0.84.
Conclusion: The results of this international multicenter study demonstrate that the overall odds of survival is significantly higher for patients treated in a high-volume trauma center than for patients treated in a low-volume trauma center.
References:
1. Luft. N Engl J Med. 1979;301:1364–9.
2. Birkmeyer. N Engl J Med. 2002;346:1128–37.
3. Finks. N Engl J Med. 2011;364:2128–37.
4. Konvolinka. Am J Surg. 1995;170:333–40.
5. Nathens. JAMA. 2001;285:1164–71.
Disclosure: No significant relationships.

O039

DONABEDIAN'S STRUCTURE-PROCESS-OUTCOME QUALITY OF CARE MODEL: VALIDATION IN AN INTEGRATED TRAUMA SYSTEM

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Introduction: Donabedian's healthcare quality model [1] has been widely adopted by the trauma community but has not yet been validated in a trauma system. We aimed to assess the performance of an integrated trauma system in terms of structure, process and outcome and evaluate the correlation between quality domains.

Materials and methods: Quality of care was evaluated for patients with major trauma treated in a Canadian provincial trauma system (2005–2010; 57 centers, 11,183 patients). Structural performance was measured according to American College of Surgeons accreditation criteria. Process performance was assessed by average conformity to 15 process QIs. Outcome performance was measured using risk-adjusted rates of mortality, complications, and readmission. Correlation between QI was assessed with Pearson's correlation coefficients.
Results: Statistically significant correlations were observed between structure and process QIs ($r = 0.29$), and process and outcome QIs ($r = -0.22$ for mortality, $r = -0.48$ for complications, and $r = -0.30$ for readmission). Weaker correlations were observed between structure and outcome QIs ($r = -0.19$ for mortality, $r = -0.29$ for complications). Strong significant positive correlations were observed between outcome QIs ($r = 0.69$ for mortality-readmission; $r = 0.67$ for complications-readmission; $r = 0.87$ for mortality-complications).
Conclusion: Significant correlations between quality domains observed in this study suggest that Donabedian's model is a valid model for evaluating trauma care. It suggests that trauma centers that perform well in terms of structure also tend to perform well in terms of clinical processes, which in turn has a favourable impact on patient outcomes.
Reference:
1. Donabedian A. An introduction to quality assurance in health care. Oxford: Oxford University Press; 2003.
Disclosure: No significant relationships.

O040

ONE STOP ORTHOPAEDIC CLINIC: INNOVATIVE VALUE-ADDED MUSCULOSKELETAL RADIOLOGY IN THE NEW MODEL OF PATIENT CARE CYCLE

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Introduction: In the current era of 'New Look NHS', radiology faces a number of challenges to evolve in order to provide better patient care and reduce waiting lists. The purpose of this exhibit is to illustrate the importance of creating value-added radiology services such as One Stop Orthopaedic Clinic and areas to work toward creating better team working in the future.
Materials and methods: Objectives: In order to provide integrated Orthopaedic and Imaging care to the patient like a one stop care. Methods: We have started instant orthopaedic ultrasound for the patients in Orthopaedic and fracture clinic. We concentrate on how to ensure fast and better imaging service throughout the patient care cycle. The patient care cycle starts by them being seen by the Orthopaedic surgeons and referred to the radiologists, who have a clinic room equipped with ultrasound machine and work station. We also provide guided injection at the same time, if needed.
Results: There are significant time saving and financial gains to the patient and the trust by this service, which have been proven by our initial audit. The patient satisfaction has also improved drastically as they are getting better and quick service.
Conclusion: The future of how we practice radiology and manage our patients in the clinic is changing. It is essential to know and understand the changes and how we can provide value in the emerging healthcare models to continue to provide high-quality care to our patients.
Reference:
1. http://www.orthopaedicunit.org.uk/orthopaedic-imaging. (Last Accessed 27 Oct 2013).
Disclosure: No significant relationships.

O041

OUTCOMES FROM A MAJOR TRAUMA CENTRE—THE IMPORTANCE OF MECHANISM OF INJURY

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Introduction: UK Trauma care has evolved over the last few years to a hub and spoke design of Major Trauma Centres (MTC) with full capabilities and Trauma Units TU with limited capabilities. Pre-hospital staff use a decision tool to determine which patients are transported immediately to the MTC and which can be managed in the TU's The system is not nationalised and different tools are in use in the different regions. That used in London includes mechanism of injury but this is not the case in other centres [1, 2]. We investigated whether mechanism of injury was a factor in outcome of shocked major trauma patients.
Materials and methods: The records of all patients registered on the TARN (Trauma Audit and Research Network) database presenting in shock as a result of major trauma between 01/04/2012 and 31/12/2012 were reviewed.
Results: 59 patients were identified. Mortality amongst those presenting shocked was low, crude survival was 81 %. Excluding those who arrived in cardiac arrest systolic BP did not appear to have an influence on survival. Injury Severity Score did not appear to correlate with survival in those who arrived with a recordable cardiac output Mechanism of injury was the single largest determinant of outcome in all-comers. Asphyxiation and falls from a height >2 m were associated with the worst outcome. Survival being 0 and 62 % survival respectively.
Conclusion: Mechanism of injury should be included in tools used by pre-hospital personnel in decisions about transfer directly to a Major Trauma Centre.
References:
1. http://www.londontraumaoffice.nhs.uk/silo/files/s3triage-tool-t-parr.pdf
2. TEMPO Trauma East Manual of Procedures and Operations
Disclosure: No significant relationships.

O042

GROUND-LEVEL FALLS IN JAPAN

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Introduction: For the geriatric population, Ground-Level Falls (GLF) can be a cause of multi-system trauma and thought to be associated with the mortality. However, there are no data of GLF for geriatric patients which account for a third of the population in Japan. The purpose of this study was to evaluate the association with injury dominant region and the in-hospital mortality in geriatric GLF victims.

Materials and methods: This study used the data sets of the Japan Trauma Data Bank (JTDB) 2004–2013 for 12,101 patients more than 65 year old who have an Injury Severity Score of 9 and over with GLF. This cohort were divided into three groups for analysis. The brain injury dominant group (BG; n = 3,154) was defined as the patient who had a higher Abbreviated Injury Score (AIS) in head region than that of other body regions. The trunkal injury dominant group (TG; n = 2,248) and the extremity injury dominant group (EG; n = 6,699) were also defined as the same way.
Results: The mean age with a 95 % confidence interval (BG vs. TG vs. EG) was 79.1 (78.9–79.4) vs. 78.8 (78.5–79.2) vs. 83.6 (83.4–83.8) ($p < 0.001$). The male ratio was 0.591 vs. 0.482 vs. 0.189. The mean ISS was 17.4 (17.2–17.7) vs. 10.3 (10.0–10.7) vs. 9.1 (9.1–9.1) ($p < 0.001$). The crude survival rate was 0.844 (0.831–0.857) vs. 0.968 (0.960–0.975) vs. 0.976 (0.972–1.000) ($p < 0.001$).
Conclusion: Grand-level fall in the geriatric population result in more severe if they accompanied with the head injury.
Reference:
1. Spaniolas K, et al. Ground level falls are associated with significant mortality in elderly patients. J Trauma. 2010;69(4):821–5.
Disclosure: No significant relationships.

O043

PATIENT EVALUATION OF OUTPATIENT VENOUS THROMBOEMBOLISM PROPHYLAXIS SERVICE FOLLOWING LOWER LIMB INJURIES

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Introduction: This paper reports patients' satisfaction following introduction of a new service to provide outpatient venous thromboembolism (VTE) prophylaxis for patients with lower limb injuries requiring immobilization.
Materials and methods: Patient satisfaction was assessed using an anonymised 50-question patient satisfaction survey that was handed out to patients during their outpatient appointment over a 6-month period. A five point grading system was used (Scale 1–5) (1 = poor, 5 = excellent). The survey was validated using Cronbach's alpha reliability coefficient (>0.9 in all domains).
Results: 100 respondents completed the survey. 98 respondents comprising 54 females and 43 males (average age = 43 years). 67 were new patients following VTE prophylaxis service provision while 22 had had more than two visits prior to survey. A good average score was obtained in all aspects of the survey. Patients were most satisfied with our staff (4.62). Good scores were also noted for VTE medication administration counselling (4.53), clinical communication (4.47) and the VTE prophylaxis consultation (4.49). The least satisfied aspects were the appointments process itself (4.26) and our facility (4.21). 90 % of the patients recommended the service.
Conclusion: Our results show that overall patient satisfaction is high with recently implemented outpatient VTE prophylaxis service in our hospital. There is room for improvement in our service. Larger studies comparing individual referral departments in our trust will provide further data about discrepancies, if any, within the trust.
Reference:
1. Nokes TJC, Keenan J. Thromboprophylaxis in patients with lower limb immobilisation—review of current status. Blackwell Publishing Ltd, Br J Haematol. 2009;146:361–8.
Disclosure: No significant relationships.

O044

THE POTENTIAL IMPACT OF IMPLEMENTING THE CANADIAN CT HEAD RULE AT AN URBAN TRAUMA CENTER

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Introduction: Computed tomography (CT) of the head is obtained for a majority of patients with suspected head injuries in U.S. emergency departments, with approximately 7.8 million head CTs performed annually. Routine use of head CT results in increased medical costs, exposure to radiation, and utilization of limited resources. The Canadian CT Head Rule (CCHR) is a clinical decision tool that has been validated in prospective studies and implemented internationally, but its incorporation into practice patterns among US physicians has been limited.
Materials and methods: Our goal was to determine the potential impact of implementing the CCHR at an urban trauma center, in terms of the number of potentially avoidable scans, savings associated with eliminating unindicated scans, reduction of radiation exposure, and significant head injuries that would have been missed. We reviewed 2,457 patients entered into the trauma registry at Riverside Methodist Hospital between January 1, 2012 and December 31, 2012.
Results: Fifteen-hundred ninety-five patients underwent head CT; 330 met CCHR criteria to forego head CT. An additional 440 patients had no loss of consciousness (LOC), but were scanned nonetheless. No injuries requiring neurosurgical intervention would have been missed using the CCHR.
Conclusion: Applying the CCHR irrespective of LOC, we could potentially avoid 764 head CTs per year, reduce our use of head CT by 47.9 %, and save $641,760 USD in costs.
References:
1. StielI IG, et al. The Canadian CT head rule. Lancet. 2001;357:1391–6.
2. Eagles D, et al. International use of the Canadian CT head rule. Acad Emerg Med. 2008;15(12):1256–61.
Disclosure: No significant relationships.

O045

DESCRIPTION OF OLDER TRAUMA PATIENTS IN THE SOUTHERN COUNTY OF THE NETHERLANDS

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Introduction: The ageing population presents serious issues for trauma care. In the last decade, the number of older patients admitted for trauma has been sharply increased. Therefore, the epidemiology of elderly hospitalized trauma patients in the county Brabant (covering about 15 % of the Netherlands) has been established.
Materials and methods: All trauma patients over the age of 65, who were hospitalized in Brabant between 2008 and 2011 and recorded in the national trauma registry, were included in this observational cohort study. Age, gender, injury (AIS code), injury severity score (ISS), duration of hospitalization, destination after discharge and the mortality rate were extracted from the trauma registry.

Results: The elderly (14,962) had more risk to be hospitalized after an accident. They (40 %) counted for 62 % of the 634 beds, yearly occupied by trauma patients. The mean in hospital stay was 10 days (SD 10) and increased with age. Nine percent of the patients were only very slightly injured (ISS 1–3). A quarter had an ISS 4–8 (50 % injury of extremities, 20 % concussion). Most patients (66 %) had an ISS 9–15 (63 % hip fractures). About 4 % of the patients were severely injured (ISS >15). Most of them had a cerebral injury (58 %) or thoracic injury. Hospital mortality rate was 5 % and increased with age. Duration of hospitalization and mortality did not always increase with higher ISS.
Conclusion: Health care should be prepared on a growing number of especially very old trauma patients with a hip fracture and slightly injured patients with comorbidity.
Reference:
1. National data registry database of the Netherlands
Disclosure: No significant relationships.

O046

QUALITY OF CRITICAL CLINICAL DATA COMMUNICATION DURING PATIENT TRANSFER TO A LEVEL I TRAUMA CENTRE IN BRITISH COLUMBIA, CANADA

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Introduction: British Columbia, Canada, has 4.5 million people and one Adult Level I Trauma Centre (L1TC). Annually, 200–300 major trauma cases require transfer to L1TC for definitive care. There is no standardized process/mandatory documentation for patient transfers. Lack of standardized handover process is linked to adverse events. Objective: To characterize communication of critical clinical data during inter-hospital transfer of major trauma patients in BC.
Materials and methods: A retrospective audit of the BC Trauma Registry and patient charts was conducted for major trauma patients (ISS $\geq$16) transferred to L1TC from April 2011–March 2012. Communication of critical clinical data (ATLS variables, adjuncts, transfer summary) was assessed objectively via audit of BCTR and patient charts. Quality of documented clinical data was assessed subjectively via chart audit.
Results: 243 major trauma patients required transfer to L1TC. Documentation of critical clinical data was sub-optimal. Scene Paramedic form arrived with 43 % of patient charts. Primary Survey data ("ABCDs") were present in 74–83 % of transfers from BCTR audit; proportions were slightly higher from chart audit. Quality assessment revealed adequate documentation of C-Spine status in 47 % of charts. Adjuncts (CXR, ECG) were adequately documented in 19–32 % of charts. One-third of charts contained a transfer summary from the referring clinician; one-fifth were of adequate quality. Identifying necessary clinical information required assessment of $\leq$5 areas of the transferred chart.
Conclusion: The current process for transfer of major trauma patients in BC is sub-optimal, inefficient and high risk for adverse events. A standardized transfer protocol may improve quality of care.
Reference:
1. Lingard et al. Arch Surg. 2008;143:12–7.
Disclosure: No significant relationships.

O047

VENOUS THROMBOSIS FOLLOWING FRACTURES BELOW THE KNEE: A NATIONWIDE DANISH COHORT STUDY

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Introduction: The aim of this study was to investigate the incidence of deep venous thrombosis (DVT) and pulmonary embolism (PE) in patients undergoing fracture surgery below the knee, and to identify specific risk factors associated with DVT/PE. These patients are not routinely recommended post-surgery antithrombotic prophylaxis.
Materials and methods: Using individual linkage of nationwide registries, we included all Danish patients undergoing fracture surgery below the knee, 1999–2011. Patients were followed 180 days from discharge. Event rates of DVT/PE were calculated and significant risk factors were identified using multivariate Cox regression analyses.
Results: We included 57,619 patients, from these 594 (1.0 %) had DVT/PE that demanded hospitalization within 180 days. The incidence rate was around 4 events per 100 person-years the first weeks after discharge, stabilized below one event per 100 person-years between 13–14 weeks after discharge. Oral anticonceptiva [hazard ratio (HR) 5.23, 95 % CI 3.35–8.18], previous DVT (HR 6.27, 95 % CI 4.18–9.40), previous PE (HR 5.45, 95 % CI 3.05–9.74), coagulopathy (HR 2.47, 95 % CI 1.07–5.72, and periphery artery disease (HR 2.34, 95 % CI 1.20–4.56) were the risk factors associated with the highest risk of postoperative DVT/PE. Also, increasing age, increasing body mass index, cancer, and treatment with nonsteroidal anti-inflammatory drugs were associated with a significantly increased risk of DVT/PE.
Conclusion: The overall risk of DVT/PE was low following fracture surgery below the knee, however the risk was markedly increased in the presence of a number of risk factors. This study suggests, that specific groups of patients undergoing fracture surgery below the knee might be candidates for post-surgery antithrombotic treatment.
Disclosure: No significant relationships.

O048

PRE-INJURY FUNCTIONAL STATUS OF TRAUMA PATIENTS—A COMPARISON WITH THE GENERAL DUTCH POPULATION

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Introduction: Normative data of the general Dutch population have been established for both the Short Musculoskeletal Function Assessment (SMFA-NL) and the EQ-5D questionnaire. However, it is unknown whether pre-injury scores of trauma patients are comparable to the general Dutch population. Hence, aim of this study was to assess differences in pre-injury SMFA-NL and EQ-5D scores of trauma patients and the general Dutch population.
Materials and methods: 1,007 patients who visited the emergency department of the University Medical Center of Groningen (The Netherlands) have received the SMFA-NL and EQ-5D. Patients were asked to retrospectively report their physical functioning during the week before their injury. *T* tests were used to assess differences between the pre-injury scores on the SMFA-NL and EQ-5D of the trauma patients and the general population, for both males and females and different age groups (18–24, 25–34, 45–54, 55–64 years).
Results: 432 patients (251 men and 181 women) responded (response rate 43 %). Overall, pre-injury scores on the SMFA-NL and EQ-5D of trauma patients were significantly higher compared to the general population, irrespective of gender and age, except for the *upper extremity dysfunction* subscale of the SMFA-NL.
Conclusion: Pre-injury SMFA-NL and EQ-5D scores were higher for trauma patients, indicating that trauma patients had a better physical functioning before their injury compared to the general population. These findings suggest that the trauma patient population is a specific subsample of the general population. This should be kept in mind when norm data are used for assessing the effectiveness of treatment of trauma patients.
Reference:
1. Reininga IH, et al. Injury. 2012;43(6):726–33.
Disclosure: No significant relationships.

O049

THE BIGGER THEY ARE THE HARDER THEY FALL: CORRELATIONS BETWEEN OBESITY AND TRAUMA PATIENTS OF A LEVEL 1 TRAUMA CENTER IN SOUTH BRASIL

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Introduction: Obesity is an important public health issue, playing a role as a truly global epidemic. Besides that, trauma accounts for a large number of deaths worldwide every year. To correlate mechanisms and injury in a Level 1 trauma center and obesity this study was conducted.
Materials and methods: Prospective, observational study, including trauma patients from July to August. The excluding criteria were patients whose weight was not possible to measure upon admission. To evaluate obesity we used the following parameters: weight, height, body mass index (BMI), waist circumference (WC), hip circumference (HC) and waist-hip ratio (WHR). Statistical analysis was performed using the Chi square for discrete, and the Students' *t* test for continuous variables.
Results: 1197 trauma patients were included in the study. 61.6 % were men, mean age: 30.7 years-old. Mean weight: 60.8 kg, mean BMI: 22.9 kg/m^2, mean WHR: 0.9. The most common mechanisms of injury (90 %) were falls from the high, shock to objects and strain/dislocations. 456 patients were in the normal weight range(38.1 %), 382 patients (31.9 %) were over weighted (22.7 % overweight and 9.2 % obese). There was a prevalence of overweight/obesity in females. Overweight patients suffered more strains/dislocations than the others. Knee sprain were more frequent in patients with overweight than in those with BMI <25 kg/m^2 ($p < 0.05$). Being overweight did not increase the risk of fracture amongst victims of falls of the high ($p > 0.05$).
Conclusion: Obesity is a public health problem in the region of Curitiba, correlated to more trauma patients than world's average. The association with traumatic injuries reinforces the need for actions to prevent obesity.
Reference:
1. Neville AL, et al. Arch Surg. 2004;139:983–7.
Disclosure: No significant relationships.

O050

USING THE AMERICAN COLLEGE OF SURGEONS TRAUMA QUALITY IMPROVEMENT PROGRAM (ACS-TQIP) TO DETERMINE 30-DAY COMPLICATION AND HOSPITAL READMISSION RATE

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Introduction: The trauma population represents a unique subgroup of surgery patients. They present many challenges in management. We noticed that the incidence of complications and readmissions among trauma patients treated at Saint Francis Hospital (SFH) was low. This lead us to investigate if the rate was falsely low because trauma patients were not returning for follow-up care to SFH. We apply the National Surgical Quality Improvement Program (NSQIP) 30-day follow-up standard to the Trauma Quality Improvement Program (TQIP) database to determine the real complication and readmission rate.
Materials and methods: Patients treated at SFH during a 6 month period are administered a questionnaire by telephone and mail. Information regarding complications and readmissions within 30 days of discharge from the hospital are obtained.
Results: The study is ongoing.
Conclusion: This paper seeks to utilize the established Quality Assessment and Improvement tool utilized by the NSQIP database and apply it to the new and evolving TQIP database to assess the quality of care provided and identify areas of improvement. This is the first study of its kind using the TQIP database. If the study shows a significant disparity between the observed and expected rates of complications, it will lend validity to the incorporation of a quality assessment tool into the TQIP database. We could recommend incorporating the NSQIP-like post-discharge feedback questionnaire into the national TQIP database. The utilization of the NSQIP post-discharge feedback questionnaire has shown significant benefit. This could lead to significant improvement in the quality of care provided to trauma patients.
Reference:
1. http://www.acstqip.org.
Disclosure: No significant relationships.

FEMUR FRACTURE TREATMENT I

O051

NOVEL IMAGE INTENSIFIER BASED NAVIGATION SYSTEM FOR ACCURATE LAG SCREW POSITIONING—COMPARISON OF. NAVIGATED TAD MEASUREMENT VS. A CONVENTION MATCHED COHORT

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Introduction: The aim of this study was to evaluate, if the use of an assistive positioning system, a novel concept in computer assisted surgery, would be beneficial to optimize and therefore reduce the Tip-Apex-Distance as the strongest predictor for cut-out occurrence.
Materials and methods: For hip screw positioning of a Gamma3 nail in the evaluation group the so called Adaptive Positioning Technology (ADAPT, Stryker Osteosynthesis) was used, in the matched control group a conventional technique was used. Otherwise there was no difference in the standards of care and rehabilitation scheme. In this study, all cases utilized a Ziehm image intensifier. The study was approved by the local ERB. Data was collected anonymised.
Results: The average TAD using ADAPT showed significant improvement ($p = 0.0001$) and was 17.1 mm (range 8.4–33.8 mm) compared with 23.3 mm in the reference group (range from 8.4–37.7 mm). Especially in the lateral plane, positioning of the lag-screw and therefore reduction of the TAD was improved. Comparing the operating time with or without using the ADAPT-technology showed no significant statistic difference
Conclusion: The present study could demonstrate that with a new camera-free navigation system a higher rate of central positions of the lag screw with significantly smaller TAD values compared to the conventional technique can be achieved.
Reference:
1. Goffin JM, Jenkins PJ, Ramaesh R, Pankaj P, Simpson AH. What is the relevance of the TAD as a predictor of lag screw cut-out? PLoS ONE. 2013;8(8):e71195.
Disclosure: No significant relationships.

O052

DAMAGE CONTROL FOR TREATING POLYTRAUMA PATIENTS WITH FEMORAL FRACTURES

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Introduction: Although everybody agrees about the significant benefit of early stabilization upon the outcome of the fracture, debates about the type of surgery for femoral fractures in polytrauma (Early Total Care or Damage Control surgery) continue.
Materials and methods: This retrospective study evaluates 64 polytrauma patients with femoral fractures, treated between 1.06.2008–1.06.2012, 26 by intramedullary nailing (IMN), 38 by DCOS, concerning: hospital stay, rate of MSOF, of ARDS and local complications (wound infections, pin track infections, implant failure, non-unions).
Results: Hospital stay was significantly influenced by the life-threatening injuries and their outcome and not by the type of osteosynthesis; the rates of ARDS and MSOF as well were less for the DCOS group than the ETC group, although the traumatic scores of the patients within the DCOS group were considerably higher. Sequential method did not increase the rates of local complications (due to initial external fixation)
Conclusion: Femoral fractures treatment in polytrauma patients is challenging, since both the fracture and its' treatment have a significant influence upon these patients. This study revealed that DCOS represents a valuable choice for femoral fractures in polytrauma patients, due to its' significantly lower impact upon the fragile balance of the polytrauma patient.
Reference:
1. Pape HC, et al. Changes in the management of femoral shaft fractures in polytrauma patients: from early total care to damage control orthopedic surgery. J Trauma. 2002;53:452–61.
Disclosure: No significant relationships.

O053

SINGLE INJURY HIP FRACTURE AT A LEVEL I AND LEVEL II TRAUMA CENTER: AN ANALYSIS OF QUALITY MEASURES

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Introduction: After implementing regionalization of trauma care, a rapidly increasing number of severely injured patients is treated at our level-I trauma center. Therefore resources for specialized trauma care are mainly used for severely injured patients, maximizing capacity of available acute care facilities. As a consequence, this leaves less resources for the optimal treatment of patients with a single injury. Therefore these patients are increasingly referred to other levels of trauma centers within the trauma system. Quality measures are set in hip-fracture care to improve quality and outcomes of care This includes: number of surgeries within the first day after admission, and reoperation within 60 days (complication of initial surgery). The aim of this study is to analyze difference in epidemiology of hip-fractures in a level-I and level-II trauma center and compare outcome defined by quality measures.
Materials and methods: Patients with a femoral neck or intertrochanteric fracture admitted from 2008–2012 were included. Data concerning age, ASA-classification, trauma mechanism, surgery type, operation date, admission duration, cause of delay and complications were retrieved.
Results: A total of 238 and 1873 patients were admitted at a level-I and level-II trauma center respectively. Patients were operated within one admission day in 80.9 %(I) and 98.5 % (II). 11.7 % (I) and 4.7 % (II) patients underwent a re-operation.
Conclusion: At the level-II trauma center only 1.5 % of patients is operated after second admission day. Because delay in operative treatment is associated with worse outcome, referring single injury hip-fractures from a level-I to a level-II trauma center is justified.
Reference:
1. Sund. Qual Saf Health Care.2005;14(5)371–7.
Disclosure: No significant relationships.

O054

CUTTING OUT IN TROCHANTERIC FRACTURES CAN BE AVOIDED BY I BEAM PROFILE OF THE FEMUR NECK COMPONENT (GN/GLIDING NAIL)

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Introduction: Due to increased osteoporosis the implant bone interface stability gains increasing importance in the osteosynthesis of trochanteric fractures. For the PFN rates of 10 %, for the Gamma nail 5–8 %, for the DHs 2–19 % and the new PFNA of 5 % are reported. The increased surface, a sure rotation stability and the highest moment of resistence is given by a I beam profile (Mr = width × height^2/6)
Materials and methods: In experimental tests in sawbones and pair corpse femora alternating load test we could show that the risk of cut out of the I beam plate is reduced by 50 % compared to the single Gamma screw and 755 to the PFN double screw. 501 consecutive patients of one trauma center with trochanteric fractures treated between 1996–2001 were all stabilised with a GN. Al patients where allowed immediate full weight bearing. Reexamination was performed at minimally 6 months. 23 surgeons were performing the operations
Results: In no case cut out occurred, migration of the blade occurred in 3 (0.6 %), total implant related revision rate was 2.5 %. Haematomas occurred in 2.5 % but general complication as urinary infection, pneumonia, cardial, neurologic or thrombosis occurred in 28.5 %. Hospital mortality was 3.9 % and was highly dependent from the complication rate. The 3 month mortality was 14.3 %
Conclusion: The I beam profile of the GN neck component improves the stability of the osteosynthesis avoiding cut out and allowing in all fractures primary full weight bearing due to the higher surface of the plate, rotation stability and to the bone impaction around the blade by impaction.
Reference:
1. W. Friedl Experimentelle Untersuchungen zur Optimierung der Belastungsstabilität von Implan- taten für proximale Femurfrakturen: intra-versus extramedulläre Lage des Kraftträgers und Untersuchung zur Minimierung des Ausbruchsrisikos des Schenkelhals-Kraftträgers. Der Chirurg. 2001;72:1344–52.
Disclosure: I am author of the GN but no more financial relation to the distributor/producer.

O055

MINIMALLY INVASIVE LCP FIXATION OF DISTAL FEMUR FRACTURES (TYPE A AND C)

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Introduction: The aim of this study is to analyze the rate of bone healing after MIO with LCP of distal femur fractures and to define which cases are suitable for primary bone grafting.
Materials and methods: For the period of 8 years 59 fractures have been treated. There were 31 women and 28 men with mean age 49 years. According AO classification there were: Type A1–10, Type A2–14, Type A3–6, Type C1–9, Type C2–9 and Type C3–11. Closed fractures were 41 and open were 18 (Type I-11, Type II-3, Type III-4). MIO with LCP has been used in 53 patients and ORIF for the rest.
Results: 45 fractures healed averagely for 6.5 months. There were 11 delayed unions (4 open, 7 closed fractures) 2 infected nonunions and one amputation. Bone grafts were used in a second procedure in 10 cases from which 8 closed fractures. The cases were Type A3-1, Type C2-2, Type C3-5 all with massive bone defects due to comminution and impaction.
Conclusion: One of the advantages of minimally invasive LCP fixation of the distal femoral fractures even in shattered fractures is to avoid primary bone grafting. However there are some fractures with problematic bone healing due to bone defects that required primary bone grafting regardless of using MIO with LCP.
Reference:
1. Kregor PJ, et al. Treatment of distal femur fractures using the less invasive stabilization system: surgical experience and early clinical results in 103 fractures. J Orthop Trauma. 2004;18(8)509–20.
Disclosure: No significant relationships.

O056

INITIAL EXPERIENCES AND RESULTS WITH A DYNAMIC LOCKING PLATE FOR THE TREATMENT OF INTRACAPSULAR HIP FRACTURES

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Introduction: The intracapsular hip fracture remains a challenging fracture with non-union and AVN rates of 30 and 20 %. A newly developed dynamic locking plate combines the advantages of angular stable plate systems, the dynamic hip screw and multiple cancellous screws. In a retrospective study we present our initial experiences and results with this implant in 63 patients.
Materials and methods: Between January 2009 and December 2013 63 patients (mean age 56.5 years) with intracapsular hip fractures were treated by closed reduction and internal fixation with the new dynamic locking plate. Fracture healing was evaluated by means of conventional X-rays. Clinical outcome was examined by means of the Harris Hip Score (HHS).
Results: Complete X-ray data were available for 51 patients; complete X-ray and clinical data were available in 36 patients. Non-union occurred in two patients, one patient developed secondary dislocation and one patient developed AVN. The mean HHS was 92/100 points in 36 patients. The results of the HHS were rated excellent or good in 72.3 %, fair in 2.8 % and bad in 25 %. Displaced fractures, older age, a long interval between trauma and operation and a long operation time were negative predictors for clinical outcome.
Conclusion: Our initial experiences and results suggest, that this new implant is suitable for the treatment of intracapsular hip fractures and leads to reduced complications in comparison to currently used implants.
Reference:
1. Parker MJ, Stedtfeld HW. Internal fixation of intracapsular hip fractures with a dynamic locking plate: initial experience and results for 83 patients treated with a new implant. Injury. 2010;41(4):348–51.
Disclosure: No significant relationships.

O057

CT EVALUATION IN FEMORAL TROCHANTERIC FRACTURES—RELATION TO CLINICAL RESULTS

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Introduction: In this study, the relationship between fracture classification of femoral trochanteric fracture by 3D-CT and clinical results was investigated.
Materials and methods: 53 cases (male 15, female 38, average age 81.6) treated with PFNA-II were investigated. Fracture was classified to 2 part, 3 part (5 subgroups), and 4 part with combination of 4 fragments in CT; Head (H), Greater trochanter (G), Lesser trochanter (L), and Shaft (S). 5 subgroups of 3 part fracture were (1) H + G (small fragment) + L-S, (2) H + G (big fragment) + L-S, (3) H + G-L (large fragment of greater trochanter including lesser trochanter) + S, (4) H + G (whole) + S, and (5) H + L + G-S. Sliding length of blade and the status of fracture union were evaluated.
Results: Numbers of each group were 2 part: 13, 3 part (1): 6, 3 part (2): 11, 3 part (3): 13, 3 part (4): 2, 3 part (5) :5, 4 part: 3. There were 17 cases which sliding length of blade over 5 mm; 2 cases in 2 part, 1 case in 3 part (1), 7 cases in 3 part (3), 2 cases in 3 part (4), 3 cases in 3 part (5) and 2 cases in 4 part. One case in 3 part (3) was non union and 2 cases in each 3 part (4) and 4 part were delayed union.
Conclusion: 3 part (3), (4), (5) and 4 part fracture were considered as unstable in this study.
Disclosure: No significant relationships.

O058

CROSSING ANGLE AS A PREDICTOR OF INTERNAL FIXATION FAILURE FOR A TYPE A OF PROXIMAL FEMUR FRACTURE

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Introduction: Failure of nail fixation (cutout effect) of a type A of proximal femur fractures has been reported to be as high as 2–4 %. Accurate placement of the neck screws, as well as a good fracture reduction are essential for successful treatment. Till now their has not been devised a simple per-operative measurement predicting nail fixation failure.
Objective: To evaluate if the crossing angle (CA) is useful as a predictor of nail fixation failure for a type A proximal femur fracture.
Materials and methods: A retrospective study of 206 patients, with type A of proximal femur fracture, who were treated in University Hospital Brno from January 2011–October 2012 with Targon PFT Nail. The sum of angular deviation of nail neck screws from the axis of the femur neck in anteroposterior and lateral views (CA) was calculated in each patient. CA was compared between patients with cutout of the screw (group 1; $n = 13$) and those, who were successfully treated (group 2; $n = 193$). The difference between these two groups was tested by Man Whitney U test and the Fisher exact test.
Results: The average CA was 8° (0°–22°) for group 2 compared with 31° (18°–37°) for group 1 ($p < 0.001$). None of the 166 patients with CA <16° lead to cut-out's ($p < 0.001$) and there was statistical relationship between increasing CA and the rate of cutout ($p < 0.001$).
Conclusion: If the proposed position of guide pin results in CA >16° we recommend reconsideration of the reduction or redirection of the guide pin or to change angle of the nail.
Reference:
1. Morihara T.
Disclosure: No significant relationships.

O059

LATERAL CORTICAL NOTCHING—A SIMPLE TREATMENT PROCEDURE FOR CERTAIN TYPES OF NONUNIONS AFTER PROXIMAL FEMORAL NAILING

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Introduction: Proximal femoral nailing is a common procedure for fixation of intertrochanteric and reversed fractures. Delayed union and nonunion are rare complications, however they are difficult to manage [1]. In a clinical study we evaluated biomechanical reasons for these problems and suggest a simple but effective solution.
Materials and methods: In eight nonunion cases and delayed union cases observed between 1998 and 2011 after proximal femoral nailing proximal femoral fracture the procedure of lateral cortical notching (LCN) was performed. We report on the follow-up of these patients and developed a biomechanical model explaining the principles of nonunion formation and treatment in these specific situations.
Results: Mean age was 73.3 years. The interval between initial operation and intervention ranged between 4.3 and 15.0 months (mean 8.4 months). In three cases implant breakage occurred. Bone healing was observed in all cases after LCN.
Conclusion: We can show that specific inter- and reversed fractures develop a characteristic kind of nonunion at the level of the lesser trochanter. This painful condition includes the risk of implant failure due to material fatigue. Dynamization may be blocked by the cortex of the distal fragment directly supporting the prominent lag screw or its sleeve. LCN, which means removal of this supporting cortex, is an elegant method of making distal conventional dynamization effective and allowing for bone healing.
Reference:
1. Hesse B, Gaechter A. Complications following the treatment of trochanteric fractures with the gamma nail. Arch Orthop Trauma Surg. 2004;124:692–8.
Disclosure: Both authors received grants from BBraun Aesculap within the past 5 years for consulting activities.

O060

LAG SCREWS SLIDING INITIATION IN MITKOVIC TYPE SELFDYNAMYSIBLE INTERNAL FIXATOR (SIF) FOR PROXIMAL FEMUR

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Introduction: Different kinds of implants for surgical treatment of trochanteric fractures are in today's routine use. Dynamic trochanteric fractures implants allow fracture fragments to be compressed. Dynamisation in axis of femoral neck can be realized if the axial force overcome friction force between lag screws and the wall of implant body canals. The aim of this study was experimental analysis of forces that initiate sliding of lag screws in Mitkovic Selfdynamysible Internal Fixator (SIF).
Materials and methods: An angle block was attached for SIF with lag screws oriented in vertical position. The transversal load of 5 kg was connected to lag screws. A dynamometer was in contact with tips of lag screws and it was used to measure pressing force during the movement of angle block.
Results: Regression coefficients were $a1 = 4.052$, $b1 = 0.623$ for SIF with 2 sliding screws with diameter of 7 mm and $a2 = 4.534$, $b2 = 0.422$ for SIF with 1 screw with diameter of 10 mm. Coefficients of determination were: $r1 = 0.470$ and $r2 = 0.123$.
Conclusion: Dynamisation of SIF lag screws can be realised in each body weight (50–130 kg). Higher values of body weight give higher possibility for dynamisation occurence. Early bearing of operated leg has significant role in sliding initiation of SIF lag screws.
Reference:
1. Loch DA, Kyle RF, Bechtold JE, et al. Forces required to initiate sliding in second-generation intramedullary nails. J Bone Joint Surg. 1998;80:1626–31.
Disclosure: No significant relationships.

O061

EVALUATION OF PRE-OPERATIVE TRACTION IN 347 PATIENTS WITH TROCHANTERIC FRACTURES TREATED WITH A GAMMA3 NAIL

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Introduction: Historically, pre-operative treatment of pain in patients with hip fractures used traction applied to the injured limb. In addition, so far there is no evidence that skin traction facilitates the surgical procedure, Rationale of this study was to evaluate if skin traction has an impact on the postoperative result and complication rate. Patient population in this study is derived from the international prospective Gamma3 Follow up study.
Materials and methods: The Gamma3 Study is an international prospective clinical follow-up evaluation. The presented data of 347 patients was collected in April 2011. Data are derived from 5 centres.
Results: There was no detectable statistical difference regarding the parameters pain, device related complications, medical complications or mobility at 4 months (all $p > 0.05$). Regarding total surgery time, subjects with pre-operative traction had highly significant lower total surgery times ($p < 0.001$), the same applied for the skin-to-skin time ($p < 0.001$).
Conclusion: In our prospective trial there appears to be no benefit of traction for pain, complications or outcome. From the evidence available, the routine use of traction prior to surgery for a hip fracture does not appear to have any benefit apart from procedure time.
Reference:
1. Resch S, Bjarnetoft B, Thorngren KG. Preoperative skin traction or pillow nursing in hip fractures: a prospective, randomized study in 123 patients. Disabil Rehabil. 2005;27(18–19):1191–5.
Disclosure: No significant relationships.

PREHOSPITAL TRAUMA CARE

O062

OUTCOME OF AIR AND GROUND TRANSPORT OF MAJOR TRAUMA PATIENTS TO A TERTIARY CARE HOSPITAL IN THAILAND

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Introduction: The number of medical transport in Thailand increases, especially air transport for major trauma, since it was proven to associate with better outcome. This study compared outcome of air and ground transport of major trauma patients transferred to single tertiary care hospital.
Materials and methods: 124 major trauma patients (Injury Severity Score >15) transferred to Bangkok Hospital Medical Center in 1 year period, since January 2012 to January 2013, were retrospectively reviewed. Injury Severity Score (ISS) and mortality were compared between modes of transport. Transport team configuration was also analyzed.
Results: There were 20 air transports and 104 ground ambulance cases. The median ISS of ground transport group was 21, percentage of severe trauma (ISS >25) was 31.73 %. Air transport group had higher median ISS, 24 and higher percentage of severe trauma, 70 %. Mortality was 6.73 % in ground transport and 20 % in air transport. Median ISS of fatality in air transport and ground transport were 35 and 26 respectively. Ground transports with doctor in escort team had lower mortality.
Conclusion: Air transport in Thailand is usually spared for severe trauma. Higher ISS in air transport group directly relates to higher mortality. Ground transport for major trauma is an accepted option. Doctor in transport team associated with lower mortality.
Reference:
1. Galvagno SM, et al. Association between helicopter vs ground emergency medical services and survival for adults with major trauma. JAMA. 2012;307(15):1602–10.
Disclosure: No significant relationships.

O063

CIVILIAN FIELD EXPERIENCE WITH A CHITOSAN-BASED HAEMOSTATIC DRESSING

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Introduction: Bleeding remains a leading cause of death in trauma patients, both in civilian and military settings. Military experience in Vietnam, Iraq and Afghanistan has led to the introduction of the Combat Application Tourniquet (CAT-T®) to treat severe bleeding from the extremities and haemostatic dressings for severe bleeding from extremities, head, neck and torso, in accordance with the c-ABCD protocol. Several new haemostatic dressings have been introduced to stop massive non-compressible bleeding [1]. We describe our experience using the new haemostatic dressing based on chitosan (Hemcon Chitogauze).
Materials and methods: We have implemented Hemcon Chitogauze, pre-hospital, during our work on Lifeliner 3 (One of the four Dutch trauma helicopters, stationed at Volkel Airbase, falling within the Regional Emergency Healthcare Network, and the Radboud University Medical Center of Nijmegen). Indications were massive bleeding that could not be controlled with an "ordinary" compressive bandage.
Results: During the study period 2009–2013, 24 patients were successfully treated with Hemcon Chitogauze. All bleedings could be

stopped (75 %) or controlled (25 %). At available follow up of 85.7 % of the patients, no side effects were noted.
Conclusion: We conclude that chitosan-based haemostatic dressings are a safe and useful tool in stopping or controlling external blood loss in our series of prehospital patients. In our group of 24 patients we found no significant side effects or wound healing problems during the short follow up. Future clinical studies should be conducted to identify the ideal haemostatic dressing.
Reference:
1. Tan ECTH, Bleeker CP. Field experience with a chitosan-based haemostatic dressing. Med Core Int. 2011;3/4:6–10.
Disclosure: The first 10 Hemcon Chitogauze used were free of charge and donated by Hemcon.

O064

PRE-HOSPITAL TRAUMA CARE CAN IMPROVE OR WORSE SURVIVAL IN TRAUMA PATIENTS?

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Introduction: To assess effects of pre-hospital tracheal intubation (TI) and pre-hospital placement of intravenous lines (IV) on hospital mortality in severely injured trauma patients.
Materials and methods: In this case control study, we selected directly ambulance-transferred subjects to hospitals from data ($N = 123{,}462$) of the Japan Trauma Databank after imputing missing values using multiple imputation. Subjects with cardiac arrest at the scene were excluded. Propensity scores which were estimated from age, gender, onset year, trauma mechanism, the Injury Severity Score, pre-hospital vital signs, the Abbreviated Injury Scale and pre-existing comorbidities for TI or IV extracted matched pair of TI or IV, respectively. Risk of cardiac arrest on arrival at the emergency department, needs for cardiopulmonary resuscitation and in-hospital death were assessed in intergroup comparison after propensity score matching.
Results: A total of 4191 subjects were selected each for TI and the matched control. Subjects with TI had greater risk of cardiac arrest on arrival (OR 1.18, 95 % CI 1.09–1.29, $P < 0.001$), needed more cardiopulmonary resuscitation (OR 1.22, 95 % CI 1.12–1.33, $P < 0.001$) and had higher mortality (OR 1.37, 95 % CI 1.25–1.51, $P < 0.001$). A total of 2529 subjects each were selected for IV and the matched control. Subjects with IV had similar risk of cardiac arrest on arrival (OR 1.03, 95 % CI 0.91–1.17, $P = 0.604$), needed more cardiopulmonary resuscitation (OR 1.20, 95 % CI 1.06–1.37, $P = 0.005$) and had a trend of higher mortality (OR 1.12, 95 % CI 1.00–1.25, $P < 0.051$).
Conclusion: Pre-hospital tracheal intubation might worsen survival of severely injured trauma patients. Hypothesis driven prospective study is needed to establish safer pre-hospital trauma care.
Reference:
1. Hasegawa K. JAMA. 2013.
Disclosure: No significant relationships.

O065

TOURNIQUETS AS FIRST AID FOR HAEMORRHAGE—THE LAYMAN TIES HIMSELF UP IN KNOTS!

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Introduction: Tourniquet use in first aid has been the centre of much controversy, and is no longer recommended as routine immediate management for severe bleeding. This study aims to evaluate the current perception on tourniquet use amongst members of the public in Malta.
Materials and methods: Volunteers, recruited according to a probability quota sample, submitted to a structured interview detailing demographics, training and knowledge relevant to immediate care for severe bleeding and tourniquet use. Individual Chi squared tests were performed to relate knowledge to expected influences.
Results: 500 participants (47 % male) were interviewed, of whom 34 % ($n = 169$) had previously received formal training in first aid. Overall, 43 % of those interviewed identified tourniquet application as the first attempt to control blood loss, 34 % said they would use tourniquets as a last resort after all other methods had failed, whilst 23 % insisted that they believed there to be no role for tourniquets in the first aid for major haemorrhage. Those formally trained in first aid performed better ($p < 0.001$), being less likely to apply a tourniquet as initial management (30 vs 49 %) and being similarly more prone using it as a last resort (40 vs 21 %) or not at all (30 vs 20 %).
Conclusion: Much of the general population remains unaware of the current recommendations with regards to tourniquet use in first aid. First aid training is associated with an improved trend of knowledge, however, remains limited in scope and clarity.
Reference:
1. International first aid and resuscitation guidelines. International Federation of Red Cross and Red Crescent Societies; 2011.
Disclosure: No significant relationships.

O066

USING A MOBILE APP TO HELP EMERGENCY MEDICAL SERVICE IDENTIFYING AND CONTACTING THE NEAREST SPECIALTY HOSPITAL

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Introduction: The selection of an adequate specialized hospital for patients with traumatic injury, stroke or chest pain is crucial. Changes in hospital infrastructure, i.e. merger of hospitals or diversification or specialization of emergency departments especially in rural areas, require efficient communication structures for optimal and fast patient disposition by emergency services.
Materials and methods: Within a project (MA-RIKA) funded by the European Union and the North Rhine-Westphalian Ministry of Health, Emancipation, Care and Aging (MGEPA), we developed a mobile application for emergency medical services (EMS). EMS receive a smartphone application showing their GPS-position on-site of emergency and the distances to surrounding specialized medical centers. Now EMS personnel can choose the optimal clinic regarding assessment, distance and level of care and opening hours. The EMS dispatcher always has access to the data base and has to confirm the on-site EMS choice. The smartphone application enables EMS to set up a direct voice communication line to the clinic department headed for.
Results: Using the application EMS on-site and the emergency physician at the nearest specialized hospital can exchange detailed information about the indication, optimize pre-hospital therapy by

medical consultation directly on the phone and define the needed settings inside the emergency room before arrival. A first user trial is going to start in January 2014.
Conclusion: While the application is currently tested and evaluated, hospitals and EMS already have expressed great interest. The application and the first results of the first evaluation phase can be presented at the conference.
Reference:
1. http://www.egesundheit.nrw.de/content/projekte_im_ueberblick/altersgerechte_versorgungsmodelle_produkte_und_dienstleistungen/index_ger.html.
Disclosure: No significant relationships.

O067

A FIELD DELIVERY SYSTEM FOR FROZEN PLASMA

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Introduction: Trauma-induced coagulopathy (TIC), a preventable cause of death, has been shown to be present at the scene in severely injured trauma patients [1]; thus, presumptive plasma administration should improve outcomes. To implement field administration of plasma, each ambulance must be equipped to thaw plasma. Our purpose is to develop a mobile system to thaw and administer frozen plasma rapidly in ground ambulances.
Materials and methods: After comparison to a FDA-approved microwave thawing device, we employed Plasmatherm (Barkey, Leopoldshoehe, Germany), which thaws plasma in a contained water system. The ambulance electrical system supplies 12 V direct current (VDC) power, but Plasmatherm requires 110 V alternating current (VAC) and utilizes up to 1,600 W. Thus, a 2,000 W, 110 VAC power inverter, converting DC input power to AC output power, was required. All equipment was rated for mobile use and compact to fit in an ambulance.
Results: Using a large surface area bag (Fenwal, Lake Zurich, Illinois; product code: 4R2422), our time to thaw plasma was under 4 min. Plasmatherm drew nearly all the current from the ambulance's electrical system, leaving the ambulance unable to function for clinical purposes. We developed an independent system to power the device up to 36 h using a 300 Ampere-hour (A-h), 12VDC lithium ion battery. A 100 A, 14.6 VDC charger recharges the battery via a 110 VAC shore power connection.
Conclusion: A mobile system to thaw frozen plasma rapidly in the ambulance will allow for severely injured trauma patients to receive plasma earlier post-injury, potentially attenuating trauma-induced coagulopathy and improving survival.
Reference:
1. Floccard. Injury. 2012.
Disclosure: No significant relationships.

O068

BYSTANDER FIRST AID IN TRAUMA

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Introduction: Bystanders first aid and basic life support in out-of-hospital cardiac arrest have received considerable attention, and resulted in improved survival [1]. Bystanders' action in trauma has received far less attention, but can also improve survival [2].
Materials and methods: We conduct a prospective 18-month study in two mixed urban–rural Norwegian counties. The personnel on the first arriving ambulance to trauma calls assess and document all first aid done by bystanders in a standard form.
Results: (Preliminary): 244 trauma calls are included so far, with bystanders present in 97 %. Securing open airways was done correctly in 86 % of the 42 patients in need of this first aid measure. Bleeding control was provided correctly for 79 % of 55, and, prevention of hypothermia for 61 % of 156 patients where these measures were indicated. 34 % of the first aiders studied had some training in first aid, 5 % had no training, while 61 % was not registered. Bystanders with first aid training gave better first aid than those where no training was registered ($p < 0.05$).
Conclusion: A majority of trauma patients studied receive correct prehospital first aid. There is a clear need for improvement, particularly for prevention of hypothermia. Previous first aid training seems to improve the quality of first aid. Effect on survival needs to be investigated.
References:
1. Sunde. Improving the local chain-of-survival to improve survival after out-of-hospital cardiac arrest; 2013.
2. Husum et al. Rural prehospital trauma systems improve trauma outcome in low-income countries; 2003.
Disclosure: No significant relationships.

O069

IMPACT OF HELICOPTER EMERGENCY MEDICAL SERVICE IN TRAUMATIZED PATIENTS: WHICH PATIENT BENEFITS MOST?

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Introduction: Helicopter emergency medical service (HEMS) is established in prehospital trauma care of traumatized patients. Improved rescue times and increased covered area are discussed as specific advantages of HEMS. To date, clear references regarding benefits of HEMS are still discussed.
Materials and methods: Traumatized patients (ISS $\geq$9) primarily treated by HEMS or ground emergency medical service (GEMS) between 2002 and 2012 were analyzed using the Trauma Registry of the German Trauma Society. A multivariate regression analysis was used to reveal the survival benefit between different trauma populations.
Results: 52.281 traumatized patients were included. 68.8 % (35,974) were rescued by GEMS and 31.2 % (16,307) by HEMS. According to

the logistic regression model, HEMS rescue resulted in an overall survival benefit compared to GEMS (OR 0.81, CI-95 0.75–0.87, $p < 0.001$). With respect to demographic aspects, patients aged 55–64 years treated by HEMS revealed the highest survival benefit (OR 0.62) while children did not profit (OR 1.1). Focusing the trauma mechanism HEMS rescue influenced "low falls" mostly (OR 0.68) while the outcome in traffic injuries was comparable (car 0.93, motorcycle 0.94, bicycle 1.08). Patients sustaining severe traumatic brain injuries (TBI) did not profit considerably by HEMS (TBI OR 0.83, no TBI 0.78). With respect to the injury severity, minor trauma (ISS 9–15) was impacted by HEMS rescue more likely (OR 0.66) than severe multiple trauma (ISS $\geq$34, OR 0.90).
Conclusion: In summary, middle aged patients, low energy trauma, and minor injury severity had the most survival benefit when rescued by HEMS.
Reference:
1. Galvagno SM, et al. Cochrane Database Syst Rev. 2013. doi: 10.1002/14651858.
Disclosure: No significant relationships.

BONE AND TISSUE HEALING AFTER ORTHOPEDIC TRAUMA

O070

PHOTODYNAMIC BONE STABILIZATION—NEW HORIZON IN FRACTURE TREATMENT

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Introduction: The IlluminOss-Photodynamic-Bone-Stabilization-System is a novel, minimally-invasive method for intramedullary bone stabilization. The system consists of a thin wall PET-balloon mounted on a 3 mm diameter flexible catheter, a "cure-on-demand" photodynamic fluid monomer and a light-source. In the procedure, the balloon-catheter is inserted through a small pathway in the bone. Fixation is achieved by infusing the liquid monomer into the balloon-catheter spanning the fracture site. Upon activation of the light (436 nm wavelength) the monomer is polymerized into a hard polymer within 400–600 s. The polymer conforms tightly to the contours of the intramedullary canal, providing immediate stabilization with longitudinal strength and rotational stability. Extensive studies have shown the biocompatibility of the system.
Materials and methods: Between 01/2010–10/2013 76 patients were operated with the implant. 14 metacarpal-fractures, 19 forearm-fractures, 43 humeral fractures and 4 distal fibula-fractures were treated (10 pathological, 5 delayed unions/implant failure). Most had poor bone quality (osteoporosis/malignancy). 5 patients had prior surgery.
Results: From 76 patients with mean age of 77.35 years (15–100) 52 had follow up. 98 % of the fractures showed consolidation. DASH-Score: 24.5, the Constant-Score 68.3. We saw 4 complications (1 temporary radial-nerve-palsy, 2 implant-failures, 1 fistula without bacterial contamination). 3 implants had to get removed.
Conclusion: The system is characterized by a simple minimal-invasive-procedure, rotational stability, high reduction-force, early onset of mobilization of the fractured limb, and increasing of stability while using additional locking screws and/or additional plate fixation, which is especially convincing in poor-bone-quality-fractures.
Reference:
1. Wegmann K, et al. Biomechanical-evaluation-of-the-primary-stability-of-pedicle-screws-after-augmentation-with-an-innovative-bone-stabilizing-system. Arch Orthop Trauma Surg. doi: 10.1007/s00402-013-1842-2.
Disclosure: Consultancy with IlluminOss.

O071

AUTOLOGOUS BONE GRAFTING WITH THE REAMER-IRRIGATOR-ASPIRATOR (RIA) SYSTEM: A COMPARISON OF BONE HEALING RATE TO ILIAC CREST BONE GRAFTING

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Introduction: Bone defects and non-unions still pose a challenge to today's trauma surgeon. The reamer-irrigator-aspirator (RIA) has been established as an alternative to the iliac crest for harvesting large quantities of autologous bone with decreased donor site morbidity [1]. Purpose of this study was to compare healing rates of bone grafts obtained from the iliac crest or using the RIA.
Materials and methods: We performed a retrospective analysis of follow up data after bone grafting surgery on 58 Patients. 35 Patients received bone grafting using the RIA, for fracture (10), pseudarthrosis (19) or other entities (6). 23 Patients received autologous bone grafting from the iliac crest, for fracture (11), pseudarthrosis (10) or other entities (2). A two-sided Fisher's exact test was used for statistical evaluation, p-value <0.05 indicates statistical significance.
Results: Patients who received bone grafting using the RIA system presented a higher rate of secondary diseases such as diabetes, renal failure or autoimmune diseases, and in some cases had already received bone grafting from the iliac crest without consolidation, we saw no significant difference in bone healing rate both in the RIA group (80 %) and the iliac crest group (87 %, $p = 0.725$). No major complications (pulmonary embolism, shaft perforation or fracture) were observed in the RIA group.
Conclusion: The RIA system provides a safe alternative to harvest large quantities of autologous bone with a similar bone healing rate compared to conventional iliac crest bone grafting, even if used as a last resort after previous failure of conventional bone grafting.
Reference:
1. Cox et al. Reamer-irrigator-aspirator indications and clinical results: a systematic review. Int Orthop. 2011.
Disclosure: No significant relationships.

O072

ALTERATION OF MASQUELET'S INDUCED MEMBRANE CHARACTERISTICS BY DIFFERENT KINDS OF BONE CEMENT IN A CRITICAL SIZE DEFECT MODEL OF THE RAT FEMUR

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Introduction: The Masquelet technique for the treatment of large bone defects consists of a 2-stage procedure. In the first stage, a cement spacer is inserted into the defect and a membrane forms that encapsulates the spacer. This comparative study was undertaken to elucidate the effect of different bone cements on the development of this induced membrane.
Materials and methods: 72 male SD rats received a femoral 10 mm critical size defect which was filled with Palacos (P), Copal Gentamycin + Vancomycin (V), Copal + Gentamycin + Clindamycin (GC) or Copal Spacem (CS). The induced membranes were analysed histologically at 2, 4 and 6 weeks (wks). The study was approved by the animal care committee, $p < 0.05$ is significant.
Results: Membrane thickness increased significantly from 2 to 6 wks (553–774 μm) in group P whereas membrane thickness decreased significantly in groups GC (682–329 μm) and CS (916–371 μm). Significantly increased membrane thickness in group P and V versus group GC at 6 weeks was observed. The fraction of elastic fibres was significantly increased in groups GC (71, 80 %) and CS (82, 81 %) at 2 and 4 wks versus groups P (56, 57 %) and V (63, 69 %).
Conclusion: We demonstrated that the induced membrane's thickness and the proportion of elastic fibres were influenced by the type of cement and the kind of supplemental antibiotics. If those alterations of the induced membrane have an effect on the bone healing response, must be proved in further studies.
Reference:
1. Giannoudis et al. Injury. 2011;42.
Disclosure: This experimental study was funded in part by Hereaus Medical GmbH, Wehrheim, Germany.

O073

AUTOLOGOUS GROWTH PLATE CHONDROCYTE IMPLANTATION TO CARTILAGE LESIONS OF SYNOVIAL JOINTS

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Introduction: Following Brittberg's experimental chondrocyte implantation case in 1987 dozens of new generation techniques have been developed. A special one was an object of our experimental finding according to animal rabbit model in which growth plate is a donor place. 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: In an animal model of rabbit we performed investigation including harvesting phase, multiply in vitro phase and implanting scaffolds in place of the cartilage defect. After that post mortal morphological examination, histological and immunohistochemical preparations were conducted to obtain objective results.
Results: In study we found good results of cartilagous healing in ten cases covering both marginal part and bottom of lesions revealing in histological examination hyaline like tissue. It was demonstrated in ICRS classification as well as Ki-67 and S-100 immunohistochemical staining. In two cases we discovered fibrocartilagous mix type of healing tissue.
Conclusion: Growth plate is useful and good quality donor place for chondrocytes proliferation procedure forming after ACI reconstruction hyaline like healing tissue.
Reference:
1. Olin A, Creasman C, Shapiro F. Free physeal transplantation in the rabbit. An experimental approach to focal lesions. J Bone Joint Surg Am. 1984;66:7–20.
Disclosure: No significant relationships.

O074

DIFFERENTIATION OF OSTEOPROGENITOR CELLS IS AFFECTED BY TRAUMA-HEMORRHAGE

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Introduction: In multiple trauma patients an increased incidence of delayed healing and non-union has been observed. The exact mechanisms underlying this delayed fracture healing are still not fully understood.
Materials and methods: 40 male C57BL/6N-mice underwent standardized midline laparotomy and pressure-controlled hemorrhage (TH) or implantation of catheters without blood loss (sham procedure). Animals were sacrificed 24 or 72 h later. Osteoprogenitor cells derived from bone marrow were differentiated into osteoblasts and osteoclasts. Osteoblast mineralization and osteoclast numbers were determined, as well as gene expression of Alpl, Bglap, Opg, Rankl, Rank, Ctsk and Nfatc1. Furthermore, plasma Opg, Rankl and TRAP were measured.
Results: Mineralisation capacity of osteoblasts was unchanged after TH, but Alpl gene expression at 72 h was decreased compared to sham. Osteoclast number at 24 h was significantly decreased after TH compared to sham. Furthermore, gene expression of Ctsk and Nfatc1 were increased in group TH 72 h compared to group TH 24 h. Plasma Opg concentration was elevated and Rankl concentrations were declined in TH groups compared to sham groups after 24 h and 72 h.
Conclusion: TH results in a diminished osteoclast number after 24 h, whereas differentiation of osteoblasts seems to be unaffected. The reduction of osteoclast number seems to be mediated through the Rankl-Opg-signalling pathway. However, further studies in models including a fractured extremity are needed to identify the relevance of the Rankl-Opg-pathway in delayed fracture healing after TH and to focus on possible therapeutic interventions.
Reference:
1. Neunaber C, Yesilkaya P, Pütz C, Krettek C, Hildebrand F. Differentiation of osteoprogenitor cells is affected by trauma-haemorrhage. Injury. 2014 (in press).
Disclosure: No significant relationships.

O075

A TWO-STEP APPROACH TO GENERATE VASCULAR STRUCTURES FOR TISSUE ENGINEERING

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Introduction: Vascularization of engineered tissues still remains a challenging issue. Different approaches like biofabrication of artificial scaffolds, inclusion of different angiogenic growth factors, as well as their time- and space-controlled degradation have been investigated. Here, we

employ a two-step approach using "cell-made" microvascular structures which can then be integrated in a "man-made" larger vessel network
Materials and methods: To generate microvessels endothelial cells and mesenchymal stem cells were seeded on fibrin scaffolds and analyzed for their ability to form mature structures using immunofluorescence and immunohistochemistry. Perfusion was tested by subcutaneous implantation of the fibrin clot in a nude mouse model. Decellularized placenta vessels are used to connect microvessels to larger vascular structures.
Results: Endothelial cells from different sources (umbilical vein and blood, peripheral blood) in combination with mesenchymal stem cells display vascular tube formation in vitro as well as in vivo, as evidenced by staining for CD31 and other vascular endothelial markers. Importantly, these microvessels can be perfused and are stably integrated into the host tissue.
Conclusion: "Man-made" strategies are now followed up in order to connect these microvascular structures to larger vessels. This two-step approach should ensure oxygen and nutrient supply even in larger tissues and thus represents a novel strategy for vascularization of engineered tissues.
Reference:
1. Holnthoner W, Hohenegger K, Husa AM, Muehleder S, Meinl A, Peterbauer-Scherb A, Redl H. Adipose-derived stem cells induce vascular tube formation of outgrowth endothelial cells in a fibrin matrix. doi: 10.1002/term.1620.
Disclosure: No significant relationships.

O076

AUTOGENOUS CULTURED GROWTH PLATE CHONDROCYTES TRANSPLANTATION IN TREATMENT OF PHYSEAL INJURY IN RABBITS

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Introduction: Excision of a portion of the medial aspect of the proximal tibial physis led constantly to formation of a bone bridge, growth arrest and angular deformity. The aim of this experimental study on New Zealand's white rabbits was to investigate the transplantation of autogenous growth plate cells to treat the injured growth plate. They were assessed in terms of measurements of radiographic tibial varus and histological characteristics.
Materials and methods: An experimental model of plate growth medial partial resection of tibia at 14 New Zealand white rabbits was created. During this surgical procedure the plate growth cells were collected and than they were cultured. While the second surgery was being performed the autologous cultured growth plate cells were grafted at the right tibia, whereas the left tibia was used as a control group.
Results: Histological examinations showed that grafted right tibia presented regular shape of the plate growth with hypertrophic maturation, chondrocyte columniation and enchondral calcification. Radiographic study shows that the average tibial deformity at the left angle was 20.29° and in the right one it was at the level of 7.21°.
Conclusion: This study has demonstrated that grafting of an autogenous cultured growth plate cells into a defect of the medial aspect of the proximal tibial physis can prevent bone bridge formation, growth arrest and the development of varus deformity.
Reference:
1. Tobita M, Ochi M, Uchio Y, Mori R, Iwasa J. Treatment of growth plate injury with autogenous chondrocytes: a study in rabbits. Acta Orthop Scand. 2002;73(3):352–8.
Disclosure: No significant relationships.

O077

RECONSTRUCTION OF LONG BONE DEFECTS WITH A PERIOSTEAL FLAP AND ANALYSIS OF THE INDUCED BONE HEALING IN RATS

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Introduction: The concept of the periosteal flap taken from the medial femoral condyle to reconstruct long bone defects is an operation technique with which even the most complex defects can be healed. The aim of our study was to induce bone healing by a periosteal flap in a small animal model and to remove these after 4 and 8 weeks analogous to humans.
Materials and methods: A periosteal flap is harvested with its vessel supply from the medial femoral condyle. The femur is stabilised ventrally by a locking plate and a critical size defect of 7 mm is established. The prepared periosteal flap is flipped into the defect from the medial side. Afterwards the defect is either left vacant, is additionally filled with beta-TCP or with beta-TCP enriched with MSC/EPC or BMC. In one group the vessel supply is ligated. In total 5 groups consist of 20 rats each.
Results: We could see an increase in new bone formation and vascularisation from group 1 (periosteal flap) to group 5 (periosteal flap + BMC), except for group 3 (vessels ligated). Bone stiffness increased significantly in group 4 and 5 in comparison to group 1–3, which were not enriched with stem cells.
Conclusion: New bone formation can be stimulated to a maximum by a vascularised periosteal flap enriched with MSC/EPC and BMC, so that long bone defects can be healed without the use of autologeous cancellous bone.
Reference:
1. Doi K, Sakai K. Vascularized periosteal bone graft from the supracondylar region of the femur. Microsurgery. 1994.
Disclosure: No significant relationships.

SPORT TRAUMATOLOGY

O078

INCIDENCE OF RECREATIONAL ALPINE SKIING AND SNOWBOARDING INJURIES; 6 YEARS EXPERIENCE IN THE LARGEST SKI RESORT IN FINLAND

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Introduction: Skiing and snowboarding are popular winter activities in Finland. Skiing has for years had a reputation for skiers being afflicted by frequent knee injuries and lower leg fractures and snowboarders suffer often from upper extremity injuries. The aim of the present study was to provide the accurate information on incidences of skiing and snowboarding injuries in Finland.

Materials and methods: A retrospective cohort study of all injured people at Levi ski area during the 2006–2012 winter seasons. Levi Ski Resort has Ski Data®—system, which records automatically every ski lift run taking place. The Ski resort emergency system register data of all the injured persons they meet. The present retrospective study was based on this registered data.
Results: The average injury incidence was 0.98 injuries per 10,000 lift runs. The anatomical pattern of injuries for both skiing and snowboarding was similar to that of other countries. Skiers' knee injuries constituted nearly one-third of all cases and Snowboarders sustained more injuries to the upper limb and axial areas. The injury rate in this study is less than in previous studies done in USA, continental Europe, but similar to other Nordic studies.
Conclusion: Skiing and Snowboarding are related to a relatively high risk of injury, and the most common ski injuries affect the knee and the most common snowboarding injuries affect the upper extremity, especially wrist. A continuous and systematic review of injuries is needed to monitor the effects of changes made in terms of safety.
Reference:
1. Johnson. Update on injury trends in alpine skiing.
Disclosure: No significant relationships.

INJURIES DURING ARMED CONFLICTS

O079

PENETRATING BALLISTIC AND KNIFE TRAUMA AT A UK MAJOR TRAUMA CENTRE: INCIDENCE, RECIDIVISM, OUTCOMES AND CREATION OF A TRAUMA MAP

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Introduction: The evolution of centralized trauma care started in the UK from 2012. Currently no UK data for trauma recidivism has been reported, which is defined as repeat admissions as a violent trauma victim. American studies have identified up to 50 % recidivist rates in low socioeconomic areas. This study evaluated the presentation and clinical outcome of penetrating ballistic and knife trauma at University Hospital Aintree, Liverpool, over 5 years.
Materials and methods: A retrospective observational study was conducted of all patients who presented to UHA with ballistic or knife injury between 2009 and 2013. Clinical and demographic data, including registered addresses of patients, were collected. Geographical demographic data were plotted to construct a sphere of influence map and compared to existing geographical data on quantified indices of social deprivation.
Results: 490 patients with penetrative gun or knife injury were identified. Overall mortality rate was 0.40 % and recidivist rate of 0.61 %. White British males aged mid-20 s were the most frequent victims. Distinct geographical postcode areas L20, L11 and L9 provided the highest number of victims, with a significant correlation to areas of high levels of social deprivation. The monthly time trend of incidence changed from a peak and trough distribution before 2010, to a constant monthly average by 2013.
Conclusion: Mortality and recidivism rates were lower than American reports. Specific demographic and geographical data relating to penetrative injury were identified. This information can be used to create targeted community based primary preventions programs to reduce crime rates.
Disclosure: No significant relationships.

O080

SEVERE BOMB BLAST INJURY OF THE LOWER LIMB: AN INTERDISCIPLINARY APPROACH IS THE KEY FACTOR FOR SUCCESSFUL SALVAGE OF THE EXTREMITY

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Introduction: History: Due to a car bomb 23 people were killed and 97 injured. Our patient suffered severe injuries to the lower extremities.
Materials and methods: Injury pattern: Extensive injuries to the left leg with severe soft tissue injuries and comminuted open fractures of the distal femur, the proximal tibia and fibula, the mid-foot, and injuries to the anterior and posterior tibial artery.
Results: Primary treatment (Alexandria): Debridement of all soft tissue injuries was followed by primary wound closure. The fractures were treated by external fixation and k-wires. The posterior tibial artery was reconstructed using an autologous graft from the saphenous vein. Secondary treatment (Munich—3 weeks later): All initially closed wounds showed extensive necrosis and infection with drug-resistant bacteria. The posterior tibial artery was not perfused. We first performed debridement of all wounds with subsequent VAC-therapy and antibiotics. Thereafter, the anterior tibial artery was reconstructed. After wound closure was accomplished by skin grafting and a musculus rectus abdominis flap we performed an osteosynthesis of the distal femur using a locking plate. The tibial fracture was treated by external fixation and the fractures to the foot by partial bone resection and modification of the k-wires. Nine months after the injury the patient was able to ambulate without crutches.
Conclusion: Severe soft tissue injuries and open fractures due to blast injuries should not primarily be closed. The graduated therapeutic regime in coordination with the trauma-, foot-, vascular- and plastic surgeon, microbiologist and pain therapist enabled us to save the limb.
Disclosure: No significant relationships.

O081

MULTIPLE BLAST EXTREMITY INJURIES IN AFGHANISTAN: DEFINITIVE MANAGEMENT OF LOCAL CASUALTIES IN A COMBAT SUPPORT HOSPITAL

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Introduction: The objective of this report is to analyze the definitive management and injury patterns of local casualties with multiple blast extremity injuries in a Combat Support Hospital (CSH) in Afghanistan.
Materials and methods: An observational prospective study was performed in Afghan casualties treated in the Kabul Internal Airport CSH from July 2012 to January 2013. Inclusion criteria were a minimum of two extremities injured and an Injury Severity Score (ISS) superior to 8. Two groups were considered for analysis: group A including patients with amputations, and group LS including patients with limb salvage procedures.
Results: Nineteen patients were included with a mean age of 23.7 ± 12 years. They totalized 57 extremity injuries. There were 6

patients in the group A and 13 patients in the group LS, with a mean number of injuries of 3.5 and 2.8 respectively. The median ISS was significantly higher in the group A. The number of débridement, skin grafting and flap coverage was significantly higher in the group A, whereas external or internal bone fixations were predominant in the group LS. The blood product utilization and the overall time of surgery were significantly higher in the group A.
Conclusion: Reconstruction of multiple blast extremity injuries may be achieved in a field hospital, despite limited resources and operational compulsions. This activity requires the utilization of significant supplies and major investment from the medical personnel deployed.
Reference:
1. Fleming M, et al. Dismounted complex blast injuries: patterns of injuries and resource utilization associated with the multiple extremity amputee. J Surg Adv. 2012;21:32–7.
Disclosure: No significant relationships.

O082

MINIMIZING MISSED WAR-RELATED INJURIES

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Introduction: Aim: To study the biomechanism and causes of delayed diagnosis of missed war injuries treated during the Second Gulf War so as to highlight lessons learned.
Materials and methods: War-related injured patients who had missed injuries and were treated at Mubarak Al-Kabeer Teaching Hospital from August 1990 to September 1991 were retrieved for the War Trauma Registry. Studied variables included age, gender, anatomical site of missed injury, mechanism of missed injuries, causes for missing the injury, and clinical outcome.
Results: 12/1,100 patients (3.3 %) having a mean (SD) age of 23.1 (9) years had missed injuries. Eleven were males and five were civilians. Triage missed injuries included: blast lung injuries, spinal cord injuries, peripheral vascular injuries and bowel injuries and those were significantly more for a non experienced surgeon ($p < 0.01$, Fisher's exact test). These were mainly were due to lack of appreciation of the mechanism of injury and its severity. All missed intra-abdominal injuries were retroperitoneal (pancreas, colon or ureter). The median (range) hospital stay was 27 (1–70) days. Two patients died (17 %).
Conclusion: The most experienced surgeon should perform the triage. Understanding the biomechanics of ballistic wounds will help to early diagnose war-related injuries. It is essential to find the inlet and exit of the ballistic wounds and to map the missile injuries. Missed intra-operative injuries occur mainly in the retroperitoneal structures.
Reference:
1. Behbehani A, Abu Zidan F, Hasaniya N, Merei J. War injuries in the Gulf war: experience of a teaching hospital in Kuwait. Ann R Coll Surg Engl. 1994;76:407–11.
Disclosure: No significant relationships.

O083

LESSONS LEARNED FROM DUTCH DEPLOYED SURGEONS AND ANESTHESIOLOGISTS TO AFGHANISTAN: 2006–2010

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Introduction: Care for battle casualties demands special skills from surgeons and anesthesiologists. The experiences of Dutch military surgeons and anesthesiologists that were deployed to Afghanistan between February 2006–November 2010 could be useful to improve pre-deployment training and preparation of military medical specialists.
Materials and methods: Using a digital questionnaire all Dutch surgeons and anesthesiologists that were deployed to South Afghanistan between February 2006–November 2010 were asked about their experiences and observations.
Results: Knowledge of maxillofacial, ophthalmic, neurological, urological, gynecological and vascular surgery scored below average. Most (35/40) participants reported high levels of preparedness prior to their deployment. All (40/40) surgeons and anesthesiologists described a positive influence of their deployment on their professional skills and 33/40 described a positive effect on their personal development. Influence on their social support network was reported negative by 11/40 participants, 24/40 reported a neutral and 5/40 a positive effect.
Conclusion: There is currently no standardized pre-deployment training program to prepare Dutch surgeons and anesthesiologists for war surgery. A standardized North Atlantic Treaty Organization wide course could be a solution in the future. Secondly the high mental and psychological impact on the deployed surgeons and anesthesiologists warrants further assessment.
References:
1. Kearney. Preparedness of orthopaedic surgeons for modern battlefield surgery. Mil Med. 2012.
2. Tyler. Combat readiness for the modern military surgeon: data from a decade of combat operations. J Trauma. 2012.
Disclosure: No significant relationships.

O084

LANDMINE INJURIES IN THE GOLAN HEIGHTS

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Introduction: The Golan Heights contains the majority of Israel's landmines, but landmine injuries in this area have never been quantitatively reported in the trauma literature. Although landmines are considered important for border defense, they pose considerable danger to unintended targets such as residents conducting farming and herding activities and recreational visitors.
Materials and methods: Data from the nonprofit organization Golan for Development on landmine injuries that occurred between 1967 and 2001 were included in the analysis. We then determined the percent of pediatric patients, the number of deaths, number of amputations, and the injury pattern (upper extremity vs lower extremity).
Results: The Golan for Development recorded 67 cases of landmine injuries during the study period. At the time of injury, 46 (61 %) were under 18 years of age. Among survivors, facial and upper extremity

injuries were present in 74 %, while lower extremity injuries were present in 42 %. 43 % of the survivors underwent limb or finger amputation. Out of the 67 records, there were 16 deaths (24 %). Of the patients who died, 50 % were in the pediatric age group.
Conclusion: In our study, an unusually high fraction of pediatric cases (61 %) and the high rate of upper extremity injuries (74 %) suggests that children may be at risk for actively tampering with the explosive devices, rather than stepping on them inadvertently. Additional studies are indicated to assess the quality of life of the survivors, and how well the rehabilitation needs of the injured population are being met.
Reference:
1. ICBL. Landmine and cluster munition monitor: country report on Israel; 2012.
Disclosure: No significant relationships.

O085

COMBAT LIVER TRAUMA: OUTCOMES OF END TO END CARE

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Introduction: We aimed to assess the outcomes of liver injuries sustained by British servicemen in combat in the last 10 years.
Materials and methods: We searched the Joint Theatre Trauma Registry from 2002 to 2012 for all patients with liver injuries. Non-combat injuries were excluded. Information was collated on injury mechanism, grade of liver injury, other injuries sustained, procedures performed and outcomes.
Results: 149 patients were included. Mechanisms of injury were blast (77 %) and gunshot wound (23 %). The median Injury Severity Score was 75 (range 9–75). Only 36 patients survived to reach deployed medical facilities. Of these, seven died prior to repatriation. Of 29 patients evacuated back to the UK, four died in hospital within 30 days. The remainder survived. Laparotomy in deployed facilities was performed in 23 survivors and 15 (65 %) underwent liver packing. Of the 23 laparotomies, 14 (62 %) had only grade 2 liver injuries, but all 14 had other indications for laparotomy. In the UK, the 15 packed patients returned to theatre for re-look and removal of packs. Only four patients (27 %) required further liver procedures. Of the four patients that died in the UK, two died of brain injuries, one died after a liver transplant and one died of multi-organ failure.
Conclusion: Liver injuries sustained in combat are associated with a high mortality rate. Most fatalities occur at the scene of injury. Packing is often the only required liver intervention and is therefore an essential skill for deployed surgeons. Most late deaths are not as a result of the liver injury directly.
Disclosure: No significant relationships.

O086

PEDIATRIC WAR INJURIES IN A FRENCH MILITARY COMBAT SUPPORT HOSPITAL IN AFGHANISTAN: A REVIEW OF 81 CASES BETWEEN JULY 2009 AND MARCH 2012

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Introduction: The NATO Hospital KAIA, provides medical support to NATO forces in the Kabul area. Medical assistance to populations is another mission that includes support for child war victims. The objective of this study was to analyze characteristics of war pediatric victims.
Materials and methods: A monocentric observational study on all children (<15 years) trauma linked to war acts was conducted. We analyzed mechanisms, topography, severity scores, surgical care and resuscitation.
Results: On this study period, 217 children were operated with 81 war trauma. 67 % of these injuries were caused by explosions. The mean ISS score and PTS were 16 and 6. 49 % of children were admitted to the ICU with a mean PRISM of 7.5. 33 % of al children were transfused. The mortality rate was 4 % (2 hemorrhagic shock and 1 cerebral wound). The average number of locations lesion was 2.2 per child: 72 % of child had a members lesions, 42 % in cephalic region (34 children) 21 % in abdomen and 17 % in thorax.
Conclusion: War surgery represents over one-third of pediatric's activity. Causes of death are those conventionally found in adults war surgery's series [1]. The lack of protection (helmet, vest bullet) in children explains the importance of cephalic and trunk lesions. Wartime pediatric injuries are most likely to be the result of penetrating fragment injuries from explosion explaining frequency of multiple injuries, soft tissues injuries and amputations.
Reference:
1. Holcomb JB, McMullin NR, et al. Causes of death in U.S. Special Operations Forces in the global war on terrorism: 2001–2004. Ann Surg. 2007.
Disclosure: No significant relationships.

RESEARCH IN SURGICAL EDUCATION

O087

SELF-EFFICACY OF SURGEONS AND ANESTHESIOLOGIST AFTER A TRAUMA SURGERY COURSE

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Introduction: Each year an international master class on trauma care is organized, with a surgical and an in-house developed anesthetic version: the Definitive Surgical Trauma Care (DSTC®) and the Definitive Anesthetic Trauma Care (DATC). Little is known about the effects of such course on professional development. We studied the impact of the course on self-efficacy by using a self-reported questionnaire
Materials and methods: Participants were asked to fill in anonymously a questionnaire regarding six general skills and 22 (DSTC®) or 18 (DATC) specific skills before (pre), at the end (post) and 3 months after the course (follow-up). Each item was weighed on a 1–5 Likert scale with 1 = completely incompetent and 5 = fully competent. For each questionnaire the total mean scores for the general and specific skills were calculated.
Results: Response rate was 96 % for the pre-questionnaire, 70 % for the post questionnaire and 43 % at follow-up for the DSTC® group and respectively 94, 88 and 50 % for the DATC group. In the DSTC® group, medians of total mean scores concerning self-efficacy increased significantly from pre- 3.50 (general skills) and 2.91

(specific skills) to post 4.00 (p = 0.001) and 3.93 (p = 0.000). The DATC group also increased significantly from pre- 3.33 (general) and 3.33 (specific) to post 4.00 (p = 0.006) and 3.75 (p = 0.002). For both groups scores remained stable at follow-up.
Conclusion: Self-efficacy in trauma care competency increases significantly after attending the DSTC® and DATC course and remains at a high level 3 months after the course.
Reference:
1. http://www.dstc-datc.nl.
Disclosure: No significant relationships.

O088

PERFORMANCE IMPROVEMENT PROGRAM ON MRI IN SPINAL TRAUMA

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Introduction: Performance improvement (PI) programs have not been fully explored with surgeons who manage fractures and related musculoskeletal injuries. This educational research aimed to deliver an effective PI program to orthopedic trauma surgeons, neurosurgeons, and radiologists to improve communication and the use of MRI in spinal trauma.
Materials and methods: A 3-step PI process was defined and implemented over a 6-month period in one hospital department: (1) opportunities for improvement were identified by applying a 10-item quality checklist to 25 cases, (2) a focused educational intervention was delivered to address identified gaps, and (3) a set of 25 post-education cases was compared.
Results: 24 cases collected prior to the educational intervention showed several areas for potential improvement. In only 4 out of 24 cases a specific trauma mechanism or a possible inflammatory or malignant illness were mentioned by the surgeon, where such information may lead to a change of MRI sequence planning. In 23 cases the radiologist did not believe that the communication led to a change of plan, although sequences other than usual were carried out. In 4 cases the radiologist did not believe that the indication was appropriate though the MRI was carried out. The educational intervention outlined the data and suggested actions.
Conclusion: There are specific aspects that may be improved concerning communication between the surgeon and the radiologist. Our post-educational intervention data will demonstrate if improvements were achieved after 6 months.
Reference:
1. Martin C, Rüetschi U, Cunningham M. Design and implementation of performance improvement programs for orthopedic trauma surgeons. AMEE Conference; 2013.
Disclosure: The educational research reported in this study has been supported by the AO Foundation through an educational grant from Siemens.

O089

AWARENESS OF COMPARTMENT SYNDROME AMONG WARD AND JUNIOR MEDICAL STAFF

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Introduction: Compartment Syndrome (CS) is a condition with severe consequences if not recognised and treated rapidly. Orthopaedic nursing and junior medical staff will be the first to assess patients with CS. We aimed to assess the level of CS knowledge among these staff and identify any potential learning needs.
Materials and methods: Anonymised questionnaires were distributed amongst junior medical staff and nursing staff on orthopaedic wards. Questions related to causes, recognition and initial management of CS.
Results: 56 questionnaires were completed by18 staff nurses, 11 healthcare assistants and 27 junior doctors. 43 % had previously encountered a patient with CS, 57 % were aware of it but had not seen it in a clinical setting. 88 % correctly identified fractures as being a major cause of CS however only 34 % recognised the risk in the post-operative period. The symptoms of CS were well understood with 86 % correctly identifying the four cardinal symptoms and all of these stated that disproportionate pain was the most sensitive. Only 45 % of respondents actually stated they would be confident in managing a patient with CS.
Conclusion: Reassuringly, there is good awareness of the potential for CS in fracture patients. Staff also know which symptoms ought to alert them, and that senior orthopaedic review is urgently required. However, only 34 % recognised that post-operative patients were also at risk, and over half stated that they were NOT confident managing patients with CS. There is a training need in order to improve the knowledge regarding certain details of the syndrome, and improve confidence it its management.
Reference:
1. J Bone Joint Surg Br. 1996;78:195–98.
Disclosure: No significant relationships.

O090

ACHIEVING A BETTER TRAUMA CARE: IMPLEMENTATION OF VIDEO FEEDBACK ON INITIAL TRAUMA MANAGEMENT

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Introduction: Initial management for the patients with severe polytrauma is chaotic. Feedback to the trauma team is necessary to have clear judgment during the resuscitation. However, it is given verbally without objective assessment, and often ends up being unsatisfactory. A constructive feedback is the essential part of the education on trauma care, especially in the country with small numbers of severe cases. We have started to record the scenes of resuscitation for trauma patients, and used it to facilitate a BETTER feedback to achieve a BETTER quality of care since April 2013. We have conducted a questionnaire survey to evaluate whether the video feedback is more educational.
Materials and methods: This questionnaire was designed to get feedback from our trauma team. It included 13 questions concerning the implementation of the video feedback and quality improvement of trauma care. The participants were 13 emergency physicians including trauma surgeons, 36 nurses, and 5 radiology technologists. All questionnaires were completed and retrieved for analysis.
Results: Thirty-one (57 %) of the participants knew about the implementation of the video feedback, 38 (70 %) of whom attended the conferences using it and mostly found them educational. Nine (69 %) of the emergency physicians and 11 (31 %) of the nurses have become more confident about their trauma management. Forty-eight (89 %) of the participants have become more aware of "Teamwork".

Conclusion: The addition of video feedback to the conferences has the potential educational value to improve the quality of trauma care; however, notification of this implementation would be required.
Reference:
1. Br J Surg. 2012;99(Suppl 6):32.
Disclosure: No significant relationships.

O091

EVALUATING THE EDUCATIONAL EFFECT OF A SERIES OF LIVE PEDIATRIC TRAUMA WEBINARS

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Introduction: The AOTrauma Pediatrics Education Taskforce is implementing a competency-based curriculum, making online learning one key priority, a need further confirmed by data from a recent global needs analysis. The taskforce developed a series of live webinars, the first three of which ran 2012–2013. This study evaluates if this educational format is effective in improving surgeon performance and patient care.
Materials and methods: AOTrauma delivered three webinars and implemented an 11-question online survey eliciting responses on content relevance to daily practice and likelihood of changes in clinical practice as a result of participation. Participant demographics were recorded as well as overall satisfaction.
Results: 676 clinicians attended the webinars (range 145–286) from 68 countries and 222 participants completed the survey. 89 % reported the webinar content to be of quite to high relevance, 75 % of the respondents reported they were likely or very likely to make changes in their clinical practice as a result of participating in the educational event. On average, 62 % of respondents stated that they learned something new and plan to use it in their practice.
Conclusion: The results show very high relevance scores and a high percentage of intention to change. Live webinars are a valuable component to be included in a continuing professional development curriculum portfolio that can result in intended changes in practice.
Reference:
1. Cunningham M, Brink P. Global needs analysis in orthopedic trauma for practicing surgeons: the European perspective. Eur J Trauma Emerg Surg. 2013;39(Suppl 1):S1–S162.
Disclosure: No significant relationships.

O092

CHECKLIST: USING A MODEL OF FORMATIVE AND SUMMATIVE ASSESSMENT IN LABORATORY OF SKILLS AND SIMULATION

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Introduction: The challenge of medical schools lies in offer to the student a basic grounding, complete and integrated, based on the qualities of cognitive, psychomotor and affective professional to be formed. In this context, the assessment is presented as a fundamental tool to be discussed and optimized for its features, formative and summative. We present in this paper the implementation of a new evaluation model for the Laboratory of Skills and Simulation (LSS), based on the use of structured checklists.
Materials and methods: The method used in LSS is a formative and summative assessment, composed of the checklist, followed by feedback. The activity is performed in a single station in LSS with an examiner and two students in a double period of 40 min. Each student performs a different checklist and can use another student or laboratory mannequins for its realization, depending on the procedure. Upon completion of the evaluation, the monitors and teachers discuss the errors and provide students with the opportunity to correct their mistakes.
Results: This model has been very positive, because it is characterized by being homogeneous, objective, enabling the student to develop a sequential reasoning, leading to greater understanding and fixing the content.
Conclusion: The implementation of the new evaluation method was useful, having great impact on the further training of students, showing that it is a valuable tool for teaching and learning and should be a greater part of the teaching strategies of medical courses.
Reference:
1. Pezzi L, Pessanha-Neto S. O Laboratório de Habilidades NA Formação Médica. Cadernos ABEM. 2008;4:16–22.
Disclosure: No significant relationships.

O093

THE TRAUMA SURGERY EDUCATION AND QUALITY PATIENT SAFETY PROGRAMS. JOINT EFFORTS ACHIEVE SUSTAINED IMPROVEMENT IN CLINICAL OUTCOMES FOR THE INJURED PATIENTS IN QATAR

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Introduction: Trauma is the leading cause of death in Qatar. Trauma centers are associated with improved patients outcomes through robust continuing medical education and performance improvement programs. Aim: This study will describe the effect of implementation of a Trauma and Critical Care Fellowship Program with an established trauma performance improvement program in a trauma center by reducing hospital mortality for the injured patients in Qatar.
Materials and methods: A retrospective analysis of data from the trauma registry was conducted for the years 2010–2012. Comparisons of process and outcome measures were done and the number of physicians undergoing advanced training in our program were computed and compared during the study period.
Results: There was a 40 % reduction in hospital trauma mortality rate from year 1 to 2 of the study period, from 5 to 3 %. The sustained mortality reduction persisted into year 3 of the study. A 30 % reduction of length of stay for our severely injured patients was also observed.

Conclusion: The implementation of an advanced post-graduate training program in trauma and critical care medicine in conjunction with a robust trauma performance improvement program resulted in reduced rates of trauma mortality in the second year and this effect was sustained in its third year.

References:

1. http://www.leapfroggroup.org/for_hospitals/leapfrog_hospital_survery_copy/leapfrog_safety_practices/icu_physician_staffing?tid=105941.
2. MacKenzie EJ, Rivara FP, Jurkovich GJ, Nathens AB, Frey KP, et al. A National evaluation of the effect of trauma-center care on mortality. NEJM. 2006;354:366–78.

Disclosure: No significant relationships.

O094

MULTIDIMENSIONAL APPROACH TO TEACHING ANATOMY: DO GENDER AND LEARNING STYLE MATTER?

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Introduction: The exponential growth of image-based diagnostic and minimally invasive interventions requires a detailed three-dimensional anatomical knowledge and increases the demand towards the undergraduate anatomical curriculum. Personal learning style as well as gender characteristics might affect outcome and success of teaching methods.

Materials and methods: We randomly assigned second year medical students (164 women, 78 men, mean age 22.8) to three groups. All students attended the compulsory dissection cadaver course. The ultrasound group (MSUS, n = 84) received additional peer-teaching training by specially-trained 5th year medical students in musculoskeletal ultrasound introducing standard scan planes (2 units, 75 min each, shoulder and knee joint). The arthroscopy group (ASC, n = 70) received training by experienced board-certified Orthopaedic Trauma surgeons at a simulator combined with video tutorials (2 units, 75 min each, shoulder and knee joint). The control group received no additional training. Learning outcomes were tested using a 15 item multiple-choice questionnaire (MCQ) and a 2-station objective structured clinical examination (OSCE). We determined students' personal learning styles according to Kolb using an online questionnaire.

Results: Male students scored higher than their female counterparts regardless of subgroup. Female medical students in the ASC group achieved significantly higher results in the final exam ($p < 0.001$). With respect to learning styles, accommodators in the ASC group scored higher in the final exams (n.s.). Assimilators demonstrated significantly less knowledge ($p = 0.03$).

Conclusion: Personalized, targeted and gender based training approaches need to be developed to counterbalance gender and learning style differences.

Reference:

1. Beermann J, et al. Three-dimensional visualisation improves understanding of surgical liver anatomy. Med Educ. 2010;44(9):936–40.

Disclosure: No significant relationships.

BLEEDING AND INTERVENTIONAL STRATEGIES

O095

PREPERITONEAL PELVIC PACKING FOR TREATMENT OF SEVERE PELVIC TRAUMA: INITIAL EXPERIENCE

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Introduction: Preperitoneal Pelvic Packing (PPP) represents a valid tool in the treatment of hemodynamically unstable pelvic trauma, even in multi-trauma patients. We present our initial experience after the introduction of this salvage maneuver.

Materials and methods: From 9/2011 to 4/2013 11 patients underwent PPP. Indications for PPP as a first procedure was represented by pelvic fracture (any) and hemodynamic instability, (systolic blood pressure (SBP) under 90 mmHg or need for ongoing resuscitation). Patients were treated according with ATLS® guidelines and basic diagnostic tool in the Shock Room were chest and pelvic Xray and Focused Assessment Sonography for Trauma (FAST). Laparotomy and thoracotomy were performed if indicated. We use both pelvic binder and external fixation for mechanical instability.

Results: Mean age was 45.8 (SD 17.2), initial SBP was 88 (SD 13), heart rate (HR) 116 (SD 32). A severe hemodynamic status was represented by a mean pH of 7.18 (SD 0.12), with a BE of −10 (SD 6). Haemoglobin was not accurate because of a mean of 10.4 (SD 1.9). Time from arrival in the Emergency Department (ED) to intervention was 60 min (SD 41). Transfusion rate was 16.1 for packed red blood cell (SD 9.2), 8.6 for Fresh Frozen Plasma (FFP) and 1.7 for platelets (SD 1.1). Mortality was 45.5 % but none for pelvic bleeding.

Conclusion: PPP is a valid salvage maneuver to control pelvic bleeding even in severely injured patients, together with pelvic stabilization.

References:

1. Cullinane DC, et al. J Trauma. 2011;71(6):1850–68.
2. Burlew CC, et al. J Am Coll Surg. 2011;212(4):628–35.

Disclosure: No significant relationships.

O096

COMBINATION OF TRANSCATHETER ANGIOGRAPHIC EMBOLIZATION AND SURGERY FOR PATIENTS WITH MULTIPLE SEVERE TRAUMA

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Introduction: Transcatheter arterial embolization (TAE) has been performed more frequently for patients with trauma because of its minimal invasiveness and convenience. The resuscitation room in our trauma center affords the opportunity to perform TAE using mobile digital subtraction angiographic (DSA) equipment in the emergency department (ED). However, patients with multiple severe trauma are

occasionally untreatable by TAE alone. The combination of TAE and surgery is challenging particularly in emergency situations. The aim of our study was to confirm the benefit of TAE preceding surgery, and the prognostic factors in patients with multiple severe trauma who underwent TAE and surgery.
Materials and methods: From April 1999 to September 2012, we retrospectively reviewed multiple severe trauma patients who underwent TAE and surgery at two affiliate hospitals. We performed TAE or angiography suite surgery in the ED.
Results: The injury locations were the pelvis, abdominal solid organs, head, lung, bowel, kidney, aorta, and heart. Of these 37 patients, 25 patients underwent TAE preceding surgery. The mortality rate was 56.8 %. On univariate analysis, the prognostic factors were low pH, interval time, head injury, ISS, and TAE preceding surgery.
Conclusion: From the results of this retrospective study, we showed that TAE preceding surgery for patients with multiple severe trauma might improve their mortalities. The independent prognostic factors were low pH, long interval time, and head injury.
Reference:
1. J Trauma. 2004;57(2):271–6 (discussion 276–7).
Disclosure: No significant relationships.

O097

SUCCESSFUL BLEEDING CONTROL THROUGH TRANSARTERIAL EMBOLIZATION IN POLYTRAUMA-PATIENTS WITH PELVIC RING FRACTURE

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Introduction: It is estimated that hemorrhage in unstable pelvic ring injuries is caused by arterial bleeding in approximately 10–20 %. Besides emergent pelvic stabilization, angiographic embolization is an established treatment option. We analyzed time to intervention and success rates of transarterial embolization in multiple injured patients with hemorrhage from pelvic ring fractures.
Materials and methods: At our level I trauma center we retrospectively analyzed from 01/2011 to 12/2012 all patients undergoing transarterial embolization after multi injury trauma. Data were collected throughout the German trauma registry. We included all patients with injury severity score (ISS) >16.
Results: 354 patients with ISS >16 were admitted to our hospital from 2011 to 2012. 12 out of 77 patients with pelvic fracture (15.6 %) underwent angiographic embolization. All bleedings were verified during polytrauma-CT-scan. Mean ISS was 49.9 (20–75), mean GCS 7.7 (3–15). 11 out of 12 patients (91.7 %) were hemodynamically unstable. Transarterial embolization started within 40–90 min after admission in 6 patients. 4 patients had to be stabilized hemodynamically, angiography initiated after 90–150 min. two patients were treated after 6 h interventionally. In 75 % of the patients transarterial embolization was directly successful with amelioration of the cardiovascular-system. 2 patients needed operative treatment. Altogether 4 out of 12 patients died. No adverse effects of transarterial embolization were seen.
Conclusion: In order to perform statistically relevant analysis more data are needed. Nevertheless success rate of transarterial embolization amounts to 75 %. Therefore we recommend an immediate embolization after verified arterial bleeding besides emergent pelvic stabilization.
Disclosure: No significant relationships.

O098

POST-EMBOLIZATION COMPUTED TOMOGRAPHIC SCANS PROVIDE BENEFITS IN THE MANAGEMENT OF HEMODYNAMICALLY UNSTABLE PATIENTS WITH CONCOMITANT PELVIC FRACTURES

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Introduction: Transcatheter arterial embolization (TAE) is necessary in the management of hemodynamically unstable patients with concomitant pelvic fractures. Given the critical conditions of such patients, TAE is at times performed only according to the results of a primary evaluation without computed tomographic (CT) imaging. Therefore, the evaluation of associated intra-abdominal injuries (IAIs) might be insufficient. We attempted to determine a feasible protocol for post-TAE observation.
Materials and methods: This study focused on patients who received TAE to achieve hemostasis of retroperitoneal hemorrhage and who did not undergo CT imaging due to their unstable hemodynamics. We compared the characteristics of patients with and without associated IAIs requiring post-TAE laparotomy and analyzed the effects of the timing of post-TAE CT imaging on patients with IAIs requiring surgery.
Results: All of patients underwent primary TAE without pre-procedure CT imaging, 36.6 % of them (15/41) required post-TAE laparotomy due to further deterioration. Comparisons between the two patient groups revealed no significant differences in the rate of endotracheal intubation (80.0 vs. 65.4 %, $p = 0.480$), loss of consciousness (66.7 vs. 73.1 %, $p = 0.730$) or abdominal symptoms (20.0 vs. 23.1 %, $p = 1.000$). Furthermore, analysis of patients by the timing of their operations revealed that patients who underwent surgery more than 24 h after TAE had significantly larger blood transfusion requirements, longer ICU lengths of stay (LOS) and longer hospital LOS.
Conclusion: In the management of hemodynamically unstable patients with concomitant pelvic fractures, greater attention should be paid to associated IAIs. Early CT imaging is encouraged after the patient's hemodynamic status is stabilized with TAE.
References:
1. Blackmore CC, et al. J Trauma. 2006;61:346–52.
2. Gansslen A, et al. Curr Opin Crit Care. 2003;9:515–23.
3. Advanced Trauma Life Support.
4. Fang JF, et al. J Trauma. 1999;47:515–20.
Disclosure: No significant relationships.

O099

A MORE INTENSIVE PHYSIOTHERAPY PROGRAM IMPROVES PHYSICAL FUNCTION FOR TRAUMA PATIENTS

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Introduction: Modern trauma systems have reduced mortality, but disability persists and largely relates to mobility and function. Physiotherapy is integral to modern trauma care. Treatment is primarily concerned with the remediation of impairments and disabilities and the promotion of mobility, function and quality of life. However, little published literature exists regarding physiotherapy for trauma patients.
Materials and methods: We conducted a randomised controlled trial at the Alfred Hospital, Melbourne, Australia. The primary aim was to investigate the effects of more intensive physiotherapy (IP) on trauma patient physical function compared to usual physiotherapy care (UC), as measured by the modified Iowa Level of Assistance Score (mILOA). Secondary outcomes included hospital length of stay (LOS), discharge destination and patient satisfaction.
Results: The mILOA score was significantly better in the IP group than UC group at day 3 ($p = 0.02$) and day 5 ($p = 0.04$) of hospital admission. Participants in the IP group were also more satisfied with the amount of physiotherapy received ($p = 0.01$). For those in the IP group who required rehabilitation, they had a median 6.5 day reduction in rehabilitation LOS and a 10.3 day reduction in total LOS.
Conclusion: This study showed that a more intensive physiotherapy program for trauma patients resulted in improved physical function at days 3 and 5 of hospital admission. The reduced LOS for those patients requiring rehabilitation is clinically and financially significant. Future studies are needed to identify whether this intervention can reduce acute hospital LOS or result in better long term functional recovery and quality of life.
References: To be provided on request.
Disclosure: No significant relationships.

O100

TRANSARTERIAL EMBOLIZATION MAY BE AN ALTERNATIVE TO OPEN SURGERY IN LOW SEVERITY ABDOMINAL TRAUMA CASES: A REPORT FROM JAPAN TRAUMA DATA BANK

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Introduction: Several articles from Japan reported that transarterial embolization (TAE) is an alternative to open surgery for the hemostasis of abdominal organs, but those were based on single-center experience and the indication of trauma TAE for abdominal injuries was unestablished. To assess a benefit of trauma TAE, we analyzed Japan Trauma Databank (JTDB), a multicenter, nationwide, and prospectively recruited trauma cases.
Materials and methods: Of 123,462 records from JTDB (2004–2012), we extracted isolated abdominal trauma cases of the Abbreviated Injury Scale (AIS) 3–5 whose open surgery or TAE had begun within 3 h of arrival at hospital. Patients with any trauma with AIS >3 elsewhere or cardiac arrest on arrival was excluded. Data defects were completed by multiple imputation method. Subjects with TAE and subjects with laparotomy were matched by the propensity score based on the characteristics of patients at the arrival at hospital. Primary outcome on intergroup comparison was in-hospital mortality.
Results: A total of 923 cases were included; 177 and 746 cases underwent TAE and laparotomy, respectively. Median predicted mortality based on the Trauma Injury Severity Score in subjects with TAE or laparotomy was similar (4.2 vs. 3.9 %, $P = 1.000$). In-hospital mortality of subjects undergone TAE was significantly lower than propensity-score-matched subjects undergone laparotomy (1.5 versus 8.0 %, $P = 0.023$).
Conclusion: Limited number of trauma patient, whose injury is limited to abdomen, hemostasis was required, and has lower severity, might benefit from TAE. Further randomized study is warranted in these trauma patients.
Reference:
1. Hagiwara A, et al. AJR Am J Roentgenol. 1996;167:159–66.
Disclosure: No significant relationships.

O101

HEMODYNAMICALLY UNSTABLE PELVIC TRAUMA IN MULTI-TRAUMA PATIENTS: FIVE YEARS EXPERIENCE

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Introduction: Hemodynamically unstable pelvic trauma in multi-trauma patients represents a great challenge even in most experienced Trauma centers. We present our experience after the introduction of the Trauma Team (TT) and Preperitoneal Pelvic Packing (PPP).
Materials and methods: From 1/2007 to 4/2013 32 patients with a pelvic trauma and hemodynamic instability, (systolic blood pressure (SBP) under 90 mmHg or need for ongoing resuscitation), were treated in our Center. In 4/2011 a TT was established and in 9/2011 we started to use PPP as a salvage maneuver to control pelvic bleeding. We consider patients from 1/2007 to 8/2011 (23 patients, control group) and from 9/2011 to 4/2013 (9 patients, study group). All patients underwent a surgical or radiological maneuver on the same day of admission.
Results: Mean age was not different between the groups (55 years vs 45.2, $p = 0.19$), as well as initial SBP (96 mmHg vs 93) while was different for heart rate (HR) (97 vs 119, $p = 0.04$) perhaps reflecting a more serious instability. Time from arrival in the Emergency Department (ED) to intervention was better for the study group (205 min vs 102, $p = 0.10$) even if not statistically significant. Mortality was 58.3 % for the control group and 22.2 % for the study group, not significant ($p = 0.065$)
Conclusion: TT and PPP introduction changed our approach in hemodynamically unstable multi-trauma patients, with a better trend in terms of mortality. We need further study to confirm these first favorable data.
References:
1. Cullinane DC, et al. J Trauma. 2011;71(6):1850–68.
2. Burlew CC, et al. J Am Coll Surg. 2011;212(4):628–35.
Disclosure: No significant relationships.

INJURIES OF THE LOWER LEG

O102

THE RETROGRADE TIBIAL NAIL

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Introduction: Operative treatment of distal tibial fractures demands a stable fixation while minimizing the irritation to the soft tissues by the surgical approach and implants. Antegrade intramedullary nailing has become an alternative to plate osteosynthesis for the treatment of distal metaphyseal fractures. While retrograde intramedullary nailing is a standard procedure in other long bone fractures it is currently not an option in tibial fractures. The Retrograde Tibial Nail (RTN) is a prototype intramedullary under development by our group since 2008. In this study a first biomechanical evaluation and anatomical implantations were conducted in comparison to antegrade tibial nailing.
Materials and methods: Implantation studies with the RTN were conducted in human cadaveric lower leg specimen in different extraarticular and simple intraarticular distal tibial fractures. The biomechanical evaluation compared the RTN against antegrade nailing (Expert Tibial Nail, Synthes®). Seven biomechanical composite tibiae were treated with either osteosynthesis techniques both with double proximal and triple distal interlocking in an AO/OTA 43-A3 type fracture model. The stiffness of the implant-bone constructs was measured under low and high axial compression, torsional load and load to failure tests.
Results: Results show a comparable stability during axial loading for the two implant types with slightly higher stability in the RTN group. Rotational stability was statistically superior ($p < 0.05$) for the RTN.
Conclusion: The experimental RTN combines a minimally invasive surgical approach with the ability of a secure fracture fixation and is therefore a promising new concept for the treatment of distal tibial fractures.
Reference:
1. Newman SD, et al. Distal metadiaphyseal tibial fractures. Injury. 2011;42:975–84.
Disclosure: No significant relationships.

O103

RESULTS OF THE SEQUENTIAL TREATMENT WITH EXTERNAL FIXATION AND INTRAMEDULLARY NAILING WITHOUT FREE INTERVAL OF SEVERE OPEN FRACTURES OF THE LOWER LIMBS

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Introduction: Sequential treatment of an open fracture remains a frequently used method and remains controversial, both in their indications as in times of change in the method of fixation and in its results. The aim of the study is to identify the results obtained using homogeneous criteria in the management of these patients and define a protocol on handling.
Materials and methods: We retrospectively reviewed patients who presented with Gustilo open fracture IIIa, IIIb or IIIc and were treated with sequential treatment. We identified 33 patients, 26 men and 7 women, the mean age was 35.5 years. Up to 85 % had associated injuries and their average ISS was 23.3. Tibial fractures accounted for 66 % of cases and femoral fractures for 24.2 %.
Results: In all patients external fixator was implanted the day of admission and the average time it took the external fixator was 13 days. The change to nailing was performed without free interval between the two methods. In 45 % of cases required the plastic surgeon's performance. We identified 7 cases of infection, only 1 of which required more surgery and debridement washing. Only two patients required reoperation for nonunion.
Conclusion: Following a sequential treatment protocol for severe open fractures is an excellent choice and deliver optimal results in a set of serious injury.
References:
1. Dougherty PJ. JAAOS. 2006.
2. Schemitsch EH. JBJS Am. 2012.
3. Yokoyama K. Injury. 2006.
4. Tornetta P III. Bull Hosp Joint Dis. 1995.
Disclosure: No significant relationships.

O104

INHALED AND ORAL CORTICOSTEROIDS IN CHRONIC LUNG DISEASE PATIENTS WITH ANKLE FRACTURES: EFFECT ON FRACTURE AND WOUND HEALING

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Introduction: We aimed through our retrospective comparative analysis to assess the effect of inhaled and oral corticosteroids on ankle fracture healing in chronic lung disease patients.
Materials and methods: Out of 2,436 patients, 88 patients met the inclusion criteria (closed ankle fracture, surgical fixation, and known to have asthma or COPD, being treated with corticosteroids). 21 patients were asthmatic and the rest suffered from COPD. Oral corticosteroids were used by 12 patients, 6 of which suffered from COPD. While, the rest of the cohort ($n = 76$) used corticosteroids inhalers. An age and sex matched control group was randomly identified for comparison purposes. Primary outcome factors studied were time to fracture union and wound healing. All patients were followed up for a minimum period of 24 months.
Results: There was significant difference in time to fracture union between the oral corticosteroid group (mean 14 weeks) when compared to both inhaled corticosteroids group (mean 10 weeks) and control group (mean 9 weeks). Inhaled corticosteroids, regardless of the dose, were not associated with delayed union or non-union as well as delayed nor poor wound healing. Asthmatic and COPD patients on oral corticosteroids suffered from delayed union when compared to both inhaled corticosteroids patients ($p < 0.001$) and the control group ($p < 0.001$).
Conclusion: Inhaled corticosteroids could not be linked to any adverse event affecting fracture union and wound healing. Oral corticosteroids were associated with an increased time to fracture union, poor wound healing, postoperative pain (registered at 4 weeks) and surgical site infection.
Reference:
1. Vestergaard P, Rejnmark L, Mosekilde L. Chest. 2007;132(5):1599–607.
Disclosure: No significant relationships.

O105

TEMPORARY ARTHRODESIS FOR ISOLATED LIGAMENTOUS LISFRANC INJURIES: A RETROSPECTIVE ANALYSIS OF 46 PATIENTS

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Introduction: For isolated ligamentous injuries a better outcome has been published for primary definitive arthrodesis as opposed to temporary arthrodesis with screw removal after 3 months. The purpose of this study is to investigate the clinical and radiographic outcome of open anatomic reduction and temporary tarsometatarsal joint arthrodesis in isolated ligamentous Lisfranc injuries.
Materials and methods: This is a retrospective study of 46 patients who underwent temporary tarsometatarsal joint arthrodesis in isolated ligamentous Lisfranc injuries between May 1998 and October 2012. Patients were followed for an average of 82 months (13–138 months). Evaluation included clinical examination, radiographic evaluation, the visual analog pain scale, and the American Foot and Ankle Society midfoot (AOFAS), FFI, and SF36 scores.
Results: 46 patients (16 females, 30 males) with an average age of 42.3 years old (range 18–82 years.) were included in the study. Anatomic reduction was obtained in 44 patients. At final follow-up, the average VAS was 1.4 points. 31 patients were very satisfied, 8 were satisfied and 2 were dissatisfied with the results. Five patients (11 %) had grade 1 arthrosis and 2 patients (4.3 %) showed grade 2 arthrosis. Two patients required conversion to arthrodesis. The functional results of AOFAS, FFI, and SF36 scores are pending but will be available at the ECTES meeting.
Conclusion: The superiority of a primary definitive arthrodesis for isolated ligamentous Lisfranc injuries was not confirmed in this study. Open anatomic reduction and temporary tarsometatarsal joint arthrodesis in isolated ligamentous Lisfranc injuries has promising medium term outcome that compares well to the primary definitive arthrodesis.
Disclosure: No significant relationships.

O106

FUNCTIONAL OUTCOME IN PATIENTS WITH A WOUND INFECTION FOLLOWING CALCANEAL FRACTURE SURGERY

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Introduction: High rates of wound infections (WI's) are reported following surgery of calcaneal fractures. This leads to additional treatment, prolonged hospital stay, increase in costs and burden for patients. The primary aim was to evaluate the effect of postoperative WI's on functional outcome. Secondary aims were health-related QOL and patient satisfaction.
Materials and methods: All adult patients available for follow-up between 2000–2011 with ORIF through an ELA were retrospectively included and sent questionnaires. Functional outcome was measured by the FFI (best score 0) and the AOFAS (best score 100) hindfoot score. The EQ-5D was used for QOL and a VAS (best score 10) for patients satisfaction.
Results: Of 135 consecutive patients, 94 returned the questionnaire (response rate 70 %). The median FFI was 12 points (IQR 3–33) and AOFAS 79 points (IQR 61–90). The FFI and AOFAS were respectively 17 and 9 points higher in favor of patients without ($n = 69$) a postoperative WI compared to patients with ($n = 25$) a WI. These differences were not statistically significantly different. However, an estimated minimal clinical important difference of 10 points for the FFI indicates a clinically relevant difference. In addition, the average VAS was 9 points in the group without a WI which was 2.3 points higher than patients with a WI ($p = 0.01$).
Conclusion: Patients with a postoperative WI report clinically relevant worse functional outcome compared to patients who do not suffer from a WI. Overall satisfaction is significantly lower in patients with a WI, reflecting the burden caused by a wound complication.
Reference:
1. De Groot R, Frima AJ, Schepers T, Roerdink WH. Complications following the extended lateral approach for calcaneal fractures do not influence mid- to long-term outcome. Injury. 2013.
Disclosure: No significant relationships.

O107

HEALTH RELATED QUALITY OF LIFE IN TRAUMA PATIENTS WHO SUSTAINED A CALCANEAL FRACTURE: A RETROSPECTIVE COHORT STUDY

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Introduction: Calcaneal fractures are known for causing significant long-term disability. Prior studies have selection bias, high loss to follow-up, or short follow-up times.
Materials and methods: Retrospective cohort study. Patients who sustained a calcaneal fracture and were admitted to a trauma level I hospital between 2000 and 2010. Outcomes: EQ-6D, satisfaction with range of wearable shoes, and occupational status. No exclusion criteria were pre-determined. A questionnaire was distributed by mail, which consisted of EQ-6D and additional questions. All patients were followed up by a phone call.
Results: 125 patients with 151 calcaneal fractures have been identified, 9 patients died, 4 patients were not able to truthfully fill in the questionnaire. 112 patients are available for filling in the questionnaire of which 83 % did. The mean team till follow-up was 86 months. 86 % of the study sample have an EQ-5D index score lower than the normative Dutch population. All the domains of the EQ-6D are affected. In these domains the study sample scores 2 to 4 times more frequent problems than the normative Dutch population. At time of follow-up 82 % report no or light limitations in wearable range of shoes and 85 % was not incapacitated for work.
Conclusion: Trauma patients who endured a calcaneal fracture have a lower health related quality of life in comparison to the normative Dutch population. In all the domains of the EQ-6D they report more frequent problems in comparison to the normative Dutch population. The majority experience only minor limitations in wearable range of shoes and are able to work.
Disclosure: No significant relationships.

O108

ANKLE FRACTURE SURGERY; A TIME FOR CHANGE

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Introduction: The timing of surgery for unstable ankle factures is critical to avoid soft tissue complication which can lead to failure of fixation [1]. Trauma surgeons are familiar with a swollen, oedematous ankle where closure of skin becomes a challenge and weak purchase of screws in soft bone leading to prolonged immobilization. The interstitial tissue swelling and soft bone are result of inflammatory phase of tissue and bone healing Early surgery where the inflammation is not advanced and swelling is due to oedema and displacement can avoid these potential complications [2, 3].
Materials and methods: A 2 year review of 253 displace and unstable ankle fractures treated operatively. Patients were divided into two groups (1) surgery within 24 h of fracture (2) delayed surgery group (were sent home in plaster and brought back for surgery) The two groups were compared for time of fracture to surgical fixation, intraoperative complications, hospital length of stay, cost of surgery to hospital, wound complications, time to final discharge and patient satisfaction. Delay treatment group was further looked for length of time period of delay, need for hospitalization preoperatively, patient and additional procedures.
Results: Multiregression analysis, Mann–Whitney for significance and correlation coefficient for comparison showed the length of hospital stay, the cost of surgery to hospital, complications, discharge time to physiotherapy were significantly better in early group .
Conclusion: Early operative fixation before inflammatory process causes interstitial tissue oedema and bone softening, results in better out come [4, 5], less cost of treatment and better satisfaction rates [6, 7].
Disclosure: No significant relationships.

O109

EVALUATING THE FUNCTIONAL OUTCOME OF ANKLE FRACTURES USING GAIT ANALYSIS

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Introduction: Evaluation of results of fracture treatment is made using subjective and objective criteria, most commonly used being the X-rays. However, the functional outcome is not always consistent with imaging; what matters is the functional result and the social and professional reintegration. The authors use a different evaluation method, gait analysis.
Materials and methods: The authors used platform gait analysis used in the project "A Web-based e-Training Platform for Extended Investigation in Human Motion Orthopedics" (Leonardo-da-Vinci-Transfer of Innovation), evaluating 25 patients with ankle fractures: 10 patients with bimalleolar fractures, 11 patients with equivalent bimalleolar fractures, 4 patients with trimalleolar fractures. They were clinical and imaging in accordance with the criteria in force, but it was added gait analysis.
Results: Comparing results based on evaluation of clinical data, imaging, and gait analysis, in the studied group a discrepancy between the speed of passive and active mobilization of the ankle and the speed of recovery for the gait symmetry was discovered in 18 % of the patients
Conclusion: Since the goal of treating any traumatic injury is social and professional reinsertion of the patients, the authors believe that gait analysis may be a more reliablecriterium to evaluate the progress of treatment, compared to pure imaging criteria.

Reference:
1. Stauffer RN, Chao EY, Brostrom E. Force and motion analysis of the normal, diseased, and prosthetic ankle joint. Clin Orthop Relat Res. 1977;127:189–96.
Disclosure: No significant relationships.

BLUNT ABDOMINAL TRAUMA: SPLEEN AND LAPAROSCOPY

O110

PREDICTIVE FACTORS OF NOM FAILURE IN BLUNT SPLENIC TRAUMA

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Introduction: Although the nonoperative management (NOM) of blunt splenic injuries (BSI) has become the gold standard, a splenectomy is still required in 10–15 % of cases. The aim of this study was to identify the predictive factors of NOM failure with a protocol based on a systematic use of splenic artery embolization (SAE) for post-traumatic vascular lesions.
Materials and methods: From 2003 to 2011, 107 patients presented a blunt splenic trauma with no hemodynamic instability, for which they were treated by NOM in the University Hospital of Pellegrin, Bordeaux. All the data regarding the demographic characteristics, the trauma and the management were retrospectively obtained
Results: The study included 93 (87 %) men with a median age of 26.The main cause of trauma was a traffic accident ($n = 74$, 69 %).Twenty-six (24 %) patients had a total of 30 vascular lesions (on the initial or follow-up CT), including 21 (70 %) blushes, 8 (27 %) pseudoaneurysms, and 1 (4 %) arterio-venous fistula. Among the 34 SAE performed, 18 were distal, 9 proximal and 7 combined, with a global success rate of 91.2 %. Seven (20 %) major complications occured after SAE. Seventeen (15.8 %) patients required surgery, defined as NOM failure. The only independent predictive factor of NOM failure identified by a multivariate analysis was a high AAST grade of BSI (OR 78.8 (4.05–34.52), $p = 0.004$).
Conclusion: This study confirm the high success of NOM for blunt splenic trauma. The only independent predictive factor of NOM was a high AAST grade. The presence of pseudoaneurysms, blushes or arterio-venous fistula does not seem to impair the success rate of NOM, this may be due to their systematic embolization.
Disclosure: No significant relationships.

O111

TRAUMATIC PERFORATION OF HOLLOW VISCUS IN PATIENTS WITH BLUNT HEPATIC AND SPLENIC INJURIES: AN ANALYSIS OF A NATIONAL TRAUMA REGISTRY DATABASE

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Introduction: Non-operative management has become the standard approach for treating stable patients sustaining blunt hepatic or splenic injuries. In an era of liberate use of CT, the rate of negative laparotomies has decreased, probably at the expense of a rise in the incidence of missed HVI. The aim of this study was to assess the incidence of concomitant HVI in blunt trauma patients diagnosed with hepatic and/or splenic injuries, and to evaluate whether a correlation exists between this incidence and the severity of hepatic or splenic injuries.
Materials and methods: A retrospective cohort study involving blunt trauma patients with splenic and/or liver injuries, between the years 1998 and 2012 registered in a National Trauma Registry.
Results: Of the 57,130 patients with torso injuries, 2,335 (4 %) sustained hepatic without splenic injuries (H group), 3,127 (5.4 %) had splenic without hepatic injuries (S group), and 564 (1 %) had both hepatic and splenic injuries (H + S group). The incidence of HVI among victims with neither splenic nor hepatic injuries was 1.5 %, compared to the S (3.1 %), H (3.1 %), and H + S (6.7| %) groups. In the S group, but not in the H group, there was a correlation between the severity of the solid organ injury and the incidence of HVI.
Conclusion: The presence of blunt splenic and/or hepatic injuries predicts a higher incidence of HVI, especially if combined. The incidence of HVI is correlated to the severity of splenic, but not hepatic, injury.
Reference:
1. Fang JF, Chen RJ, Lin BC, et al. Small bowel perforation: is urgent surgery necessary? J Trauma. 1999;47:515–20.
Disclosure: No significant relationships.

O112

NONOPERATIVE MANAGEMENT OF SPLENIC TRAUMA. IMPROVEMENT AFTER EMERGENCY DEPARTMENT CREATION. TEN-YEAR EXPERIENCE OF A SINGLE CENTER

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Introduction: The growing knowledge about spleen function and OPSI has led Non Operative Management to become the gold standard treatment for splenic injuries of every AAST grade. To guarantee safety, Non Operatively Managed patients should be observed in an intensive or sub-intensive care setting for close monitorization. Moreover lab, radiology and operatory room should be rapidly and always available.
Materials and methods: All patients (141 pts) with blunt abdominal trauma and spleen injuries treated at "Policlinico Umberto I" from 1 January 2003 to 15 July 2012 were reviewed. Patients observed were then divided into two groups: G1 (74 pts) included patients managed from 2003 to the end of 2007 and G2 (67 pts) included those treated from 2008 to 2012.
Results: A significant, progressive increase in NOM rate was found in our analysis. NOM patients were 13 (18 %) and 42 (63 %) respectively in G1 and G2. NOM rate increasing has been possible in a new different organization of emergency surgery care, the Emergency Department, in which several and selected surgical teams have been integrated into one working group providing trauma patients management with all emergency facilities and skills joined in a centralized area. NOM failures were 4 (30 %) in G1 and 2 (3 %) in G2. No significant differences were found in mortality rates (0.8 vs 1.1 %).
Conclusion: An integrated emergency department setting, the availability of a close patients monitorization and a trauma experienced surgical team allow surgeons to safely chose a non aggressive treatment, based only on haemodynamic parameters. Increase of non operative management had guaranteed more patients to be managed in the best way suggested by literature to avoid long term morbidity without significant change in mortality.
Reference:
1. Cirocchi R, et al. Is non-operative management safe and effective for all splenic blunt trauma? A systematic review. Crit Care. 2013;17:R185 (Epub ahead of print).
Disclosure: No significant relationships.

O113

MANAGEMENT OF SPLENIC BLUNT TRAUMA ACCORDING TO FACILITY LEVEL: A STATE-WIDE STUDY FROM QUEBEC TRAUMA REGISTRY

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Introduction: Nonoperative management can be achieved in the majority of splenic blunt trauma. However, previous studies have noticed a high variability use of surgery. This study evaluated the influence of facility level and interfacility transfer on splenic trauma management.
Materials and methods: A retrospective study was performed from the Quebec Trauma Registry between 2006 and 2011, including all adult patients (aged 16 and over) with a blunt splenic trauma. Multivariate models involving age, Injury Severity Score (ISS), and splenic injury grade were used to analyze mortality, use of surgery and embolization.
Results: There were 1596 patients identified in 70 different facilities. The management was initiated in nearby hospital (Quebec level 1 or 2) in 67 % (n = 1,074) and in specialized trauma center (Quebec regional level 2 or level 3) in 33 % (n = 522) of cases. Among patients initially managed in nearby hospital, 31 % (n = 333) were transferred to specialized trauma center. Factors independently associated with a transfer were ISS and splenic injury grade. There was no significantly difference in adjusted mortality according to level facility. However, patients transferred and directly admitted in a specialized center had a lower adjusted rate of surgery [respectively OR = 0.3 (0.2–0.5) and OR = 0.3 (0.4–0.8)] and a higher rate of embolization [respectively OR = 2.8 (1–7.8) and OR 4 (1.7–9.8)] than patients remained in nearby hospital.
Conclusion: Differences in management of blunt spleen trauma have been highlighted according to level of facility. Direct admission or transfer to a specialized trauma center is associated with a lower rate of surgery and higher rate of embolization.
Reference:
1: Zarzaur BL, Croce MA, Fabian TC. Variation in the use of urgent splenectomy after blunt splenic injury in adults. J Trauma. 2011;71(5):1333–9.
Disclosure: No significant relationships.

O114

VOLUMETRIC GRADING OF SPLENIC INJURY-COMPARISON WITH ANATOMIC INJURY SCALING OF AAST

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Introduction: The most frequent injured organ in blunt abdominal trauma is the spleen. The AAST injury scaling is the best anatomical classification however it is an intraoperative grading and doesn't allow an exact preoperative grading. Also the CT-grading is not an ideal tool for it and grading is essential in decision making for the further treatment. To measure the volume of the injured area by using a CT may describe more accurately the extend of the injury. The study aims to identify the accuracy of volumetric computer tomography (VCT) in grading the splenic injury and to compare with the CT-injury scaling according the AAST.
Materials and methods: The data of 139 patients between 2005 and 2009 were prospectively collected. The extend of the splenic injury was measured using the standard injury scaling score comparing with volumetric grading.
Results: The most frequent splenic injury was the grade I (N = 23, 32.86 %), VCT mean M = 232 cm^3, hematoma M 2 cm^3 ($\leq$10 % like in AAST); grade II (N = 16; 22.86 %), VCT M = 289.6 cm^3, hematoma M = 46 cm^3; grade III (N = 21; 30 %), VCT M = 370.89 cm^3, hematoma M = 86 cm^3; grade IV N = 11; 15.71 %, VCT M = 208 cm^3, hematoma 66 cm^3 and grade V N = 2 (2>86 %). In 9 patient the reason of failure for NOM was higher injury grade (>60 %).
Conclusion: The results suggest that volumetric grading of splenic injury may be a good independent supplement for AAST classification as a predictor for the successful non-operative management.
Reference:
1. Stassen NA, Bhullar I, et al. Selective nonoperative management of blunt splenic injury: an EAST practice management guideline. J Trauma Acute Care Surg. 2012;73(5 Suppl 4).
Disclosure: No significant relationships.

O115

OBSERVATION VERSUS EMBOLIZATION IN PATIENTS WITH BLUNT SPLENIC INJURY AFTER TRAUMA: A PROPENSITY SCORE ANALYSIS

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Introduction: Non-operative management (NOM) is the standard of care in hemodynamically stable patients with blunt splenic injury after trauma. Splenic artery embolization (SAE) is reported to increase the observation success rate. Studies demonstrating improved splenic salvage rates with SAE have primarily compared SAE with historical controls. The aim of this study was to investigate whether SAE improves success rate to observation alone in contemporaneous patients.
Materials and methods: Adult patients, admitted to five Level 1 Trauma Centres between January 2009 and December 2012 and selected for NOM, were included. Successful treatment was defined as splenic salvage and no need for a splenic re-intervention. We calculated propensity scores, expressing the probability of undergoing SAE, using multivariable logistic regression and created five strata based on the quintiles of the propensity distribution. A weighted relative risk (RR) was calculated across strata to express the chances of success with SAE.
Results: 206 patients were included. Treatment was successful in 180 patients; 132 (89 %) of the patients treated with observation and 48 (84 %) treated with SAE. The weighted RR for success with SAE was 1.23 (0.97–1.54); for complications the weighted RR was 0.71 (0.41–1.22). The mean number of transfused blood products was 9.1 (SD 17.2) in the SAE group versus 4.4 (SD 9.9) in the observation group.
Conclusion: There was a small, but consistent advantage of embolization over observation alone with regard to successful treatment and all-cause complications in patients with blunt splenic injury after trauma. This difference was, however, not statistically significant.
References:
1. Bhangu et al. Injury. 2011.
2. Harbrecht et al. JoT. 2007.
Disclosure: No significant relationships.

O116

SELECTIVE NONOPERATIVE MANAGEMENT FOR BLUNT SPLENIC INJURY IN POLYTRAUMA PATIENTS

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Introduction: Selective nonoperative management (NOM) has become the treatment of choice in patients with blunt splenic injury (BSI). In our institution all hemodynamically stable polytrauma patients, without concomitant hollow organ injuries, are selected for NOM. We evaluated the outcome of selective NOM for BSI in polytrauma patients.
Materials and methods: All adult polytrauma patients (ISS >16) admitted over a 12-year period with BSI were selected from our prospectively gathered trauma database. Patients were categorized by the type of treatment they received. Group I consisted of patients treated by NOM and group two of operatively treated patients. We compared complications, length of stay, ICU-stay, failure of NOM and mortality.
Results: Ninety-Three patients were included, with a median ISS of 29 (IQR 25–38). Fifty-Three patients underwent emergency laparotomy and 40 patients were selected for NOM.
Patients treated by operative management (OM) had significantly worse hemodynamics, higher grades of splenic injury and ISS in comparison to patients initially selected for NOM.
Length of stay did not significantly differ between groups and was 16 (IQR 9–26) in the NOM group and 18 (5–41) in the OM group. There were no significant differences encountered in the number of

complications and duration of ICU-stay between groups. Failure of NOM occurred in 10 patients. Mortality was only seen in the OM group (n = 10).
Conclusion: Selective nonoperative management for adult polytrauma patients with BSI is not associated with increased morbidity, nor mortality. Moreover, the strive for preservation of splenic function in all hemodynamically stable polytrauma patients, without concurrent hollow organ injury is safe.
Disclosure: No significant relationships.

O117

IMPACT OF LOW- MOLECULAR- HEPARIN ON THE OUTCOME OF NON-OPERATIVE MANAGEMENT IN SPLENIC INJURY

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Introduction: Low-molecular-weight heparins (LMWH) are effective in preventing thromboembolic complications, but the dosis and timing of administration in trauma patients is controversial because of the unknown risk for bleeding. The aim of the study is to identify if and when LMWH has negative influence on outcome of non operative management (NOM) in splenic injuries.
Materials and methods: A review of prospectively collected data of 139 patients with blunt spleen injuries over a period of 5 years was conducted. Demographic data, time administration and dosis of LMWH and surgical outcomes were prospectively collected. Computer tomography volumetry was used as a follow-up monitor NOM success.
Results: 90 (64.75 %) patients were treated with NOM while 49 (35.25 %) were operated (OT). 36 (43.75 %) of NOM did not receive any LMWH, 15 (18.75 %) received LMWH early (within the first 24 h), 31 (37.80 %) late (after 48 h). There was no case of pulmonary embolism-deep venous thrombosis in the group with late admission or without LMWH. 9 cases were converted from NOM to OT because of late bleeding, in 3 patient the grade of splenic injury was IV (33.33 %).
Conclusion: This study suggests that the use of LMWH in patients with blunt splenic trauma treated non operatively could be associated with a certain risk of failure when LMWH is administrated immediately after trauma and high doses of LMWH should only be given in carefully selected patients with high risk of thrombosis.
Reference:
1. Eberle BM, Schnüriger B, et al. Thromboembolic prophylaxis with low-molecular-weight heparin in patients with blunt solid abdominal organ injuries undergoing nonoperative management: current practice and outcomes. J Trauma. 2011;70(1):141–6.
Disclosure: No significant relationships.

O118

BLUNT ABDOMINAL TRAUMA AND THEIR MANAGEMENT, 2 YEARS EXPERIENCE

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Introduction: Blunt abdominal trauma (BAT) is a leading cause of morbidity and mortality among all age groups. Identification of serious intra-abdominal pathology is often challenging; many injuries may not manifest during the initial assessment and treatment period.
Materials and methods: The study is in units center performed within the time period December 2010 to December 2012. In our study included 255 patients who were presented in UHT, NTC in Tirana, Albania.
Results: ***Analysis of data:*** To see the relationship between two variables the correlation coefficient was used to Kendal's tau. The data were presented through tables and charts of different types. Was considered significant p values <0.05 (or 5 %).
Through the coefficient of correlation of Kendal's seen that there is a difference statistically significant between the mode of transport and the state of patient in admission ($r = 0199$, $n = 254$, $p = 0.001$), type of trauma and tactic of treatment ($r = 0301$, $n = 254$, $p < 0.001$), ISS and complications ($r = 0254$, $n = 254$, $p < 0.001$), ISS and form of treatment ($r = 0318$, $n = 254$, $p < 0.001$).
Conclusions: The results of trauma treatment has a close relation; type of trauma (mechanism of trauma), the methods of transport, time of presentation to hospital, state of TP in admission; performance examinations; gravity of injuries(ISS).
Keywords: Blunt abdominal trauma · Intra-abdominal injury
Reference:
1. Weißbuch Schwerverletzten-Versorgung (de) Deutsche Gesellschaft für Unfallchirurgie (Hrsg.) (September 2006). Abgerufen am; 2010.
Disclosure: No significant relationships.

O119

IS LAPAROSCOPY STILL RECOMMENDED IN ABDOMINAL TRAUMA?

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Introduction: Laparoscopy is accepted for penetrating abdominal trauma (PAT), but when it comes to blunt abdominal trauma (BAT) its use becomes controversial.
Materials and methods: Our paper assesses retrospectively the use of diagnostic laparoscopy (DL) and therapeutic laparoscopy (TL) in abdominal trauma during 2006-2012.
Results: DL was performed on 42 hemodynamically stable patients. There were 17 PAT and 25 BAT. The main indications for laparoscopy were: peritoneal violation for patients with PAT, suspicion of hollow viscus injury, active bleeding with solid organ injuries and diaphragmatic injuries for patients with BAT. Prior to surgery, 11 out of 41 abdominal ultrasounds and 3 out of 17 CT scans were false negatives. 15/17 stab wounds were actually penetrating injuries, 9 with organ lesions, and TL was possible for 5 patients. Patients with BAT had 9 hollow viscus perforations, 3 mesenteric lesions, 9 solid organ lesions and 2 diaphragmatic lesions. Conversion was necessary for 7 patients. 7 TLs and 6 assisted TLs (5 enteroraphies and 1 enterectomy) were possible. There were no omitted lesions. There were 4 complications and 2 deaths, unrelated to laparoscopy. The average hospital stay in the surgical ward was of 6.26 ± 7.3 days for laparoscopic patients and of 7.3 ± 8.3 for those with conversion. Laparotomy was avoided for 28/42 patients.
Conclusion: In selected PAT cases, but also in selected BAT cases with unclear clinical and imaging diagnosis, laparoscopy is a useful diagnostic tool, with therapeutic potential, which reduces the need for laparotomy and the hospital stay.

Reference:
1. Nicolau A. Is laparoscopy still needed in blunt abdominal trauma? Chirurgia. 2011;106:59.
Disclosure: No significant relationships.

O120

THE USE OF LAPAROSCOPY IN JAPANESE TRAUMA PATIENTS WITH ABDOMINAL INJURY

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Introduction: Open laparotomy (OL) is a standard procedure to definitely evaluate intra-abdominal injuries, which carries approximately 20 % morbidity [1]. However, benefit of laparoscopic surgery (LS) in trauma care is still uncertain [2–3]. Aim of this study was to compare the usefulness of LS and OL in patients with abdominal trauma.
Materials and methods: The data source was JTDB from 2004 to 2012. After imputing missing values in important variables using multiple imputation, descriptive statistic showed background characteristic of subjects. We selected subjects who underwent LS and age-, gender-, admission vital signs-, Abbreviated Injury Scale (AIS)-, the Injury Severity Score (ISS)-, and indication for surgery-matched OL using propensity score matching. Intergroup comparison showed the differences in hospital length of stay (LOS) and mortality.
Results: Of a total of 123,462 subjects in JTDB, 3814 and 56 underwent OL and LS, respectively. Demographic characteristics of LS subjects were as follows; Age 40 (29–61) years, male 57 %, penetrating injury 38 %, systolic blood pressure 126 (114–137) mmHg, and ISS 14 (7–18) [median (IQR) for numeric variable or % for categorical variable]. Subjects underwent diagnostic and therapeutic LS were 50 and 27 %, respectively. Therapeutic LS was successfully performed in bowel, bladder and diaphragm injuries. In contrast, 15 % of LS subjects converted to OL due to bleeding from solid organ or vascular injuries. There were no significant difference between LS and matched OL in LOS [8 (4–17) vs 11 (5–20); $p = 0.321$] or mortality (0.0 vs 6.1 %; $p = 0.224$).
Conclusion: Selective use of LS in hemodynamically stable trauma patients may be comparable to OL.
References:
1. Shih HC. World J Surg. 1999;23:265–70.
2. O'Malley E. World J Surg. 2013;37:113–22.
3. Leppäniemi A. J Trauma. 2003;55:636–45.
Disclosure: No significant relationships.

O121

LAPAROSCOPY DECREASES THE LAPAROTOMY RATE FOR PATIENTS WITH BLUNT HOLLOW VISCUS PERFORATION AND MESENTERIC INJURIES

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Introduction: This study was to evaluate if laparoscopy can decrease the laparotomy rate for patients with hollow viscus and mesenteric injuries caused by blunt trauma.
Materials and methods: We retrospectively reviewed hemodynamically stable patients who were suspected with hollow viscus and mesenteric injuries after blunt abdominal trauma. Patients admitted from Jan 1, 2006 to Dec 31, 2008 (prior to the adoption of laparoscopy for patients with blunt splenic trauma) were categorized as group A. Patients admitted from Jan 1, 2010 to Dec 31, 2012, when laparoscopy was included in the algorithm for these patients, were categorized as group B.
Results: There were 35 patients in group A, and 50 patients in Group B. There were no significant differences in demographic characteristics, injury severity score (ISS), percentage of intra-abdominal free air, and operation time between the groups (all, $p > 0.05$). The percentage of hollow viscus injury was 42.9 % in group A and 48.0 % in group B. The laparotomy rate for patients in group A was significantly higher than in group B (100.0 vs. 4.0 %, $p < 0.001$). The hospital stay in group A was significantly longer than in group B (21.3 ± 11.9 vs. 11.7 ± 5.8 days, $p < 0.001$). The complicated rate in group A was higher than in group B (28.5 vs. 14.0 %, $p < 0.05$).
Conclusion: Laparoscopy can decrease the laparotomy rate for patients with blunt hollow viscus perforation and mesenteric injuries. It also provide patients the advantages of minimally invasive surgery in terms of shorter hospital stay and lesser complications.
References: Laparoscopy.
Disclosure: No significant relationships.

O122

INCIDENCE AND MORTALITY OF ACUTE CARE SURGERY: A FRENCH NATIONWIDE STUDY

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Introduction: Acute care surgery corresponds to frequent and potentially serious diseases. However, little information is available on the public health issue it represents. We therefore conducted a French national study evaluating the incidence and mortality of emergency surgical general interventions, as well as factors associated with mortality.
Materials and methods: Data were obtained from the national hospital discharge data base ("Programme de Medicalisation du Systeme d'Information") for the year 2011. The selection criteria were: age >18 years, surgery for diseases within the realm of general surgery (established from a list), hospitalization after emergency department admission.
Results: The search identified 85,235 patients operated in 496 facilities (public general hospital 66 %, university hospital 17 %, private hospital 17 %), representing 17 % of all general surgery procedures admissions. The mean number of patient operated per facility was (range 1–766). The frequent diagnoses were: acute appendicitis (33.2 %), acute cholecystitis (21.4 %), occlusion (10.5 %), and hernia (10.5 %). The average hospital stay was 8.9 days. The overall 90 days hospital mortality rate was 3.6 % with a regional variation ranging from 2 to 5.3 %. Mortality factors were age, the presence of co- morbidity, and mechanism of the disease.
Conclusion: Acute care surgery represent an important part of the overall activity in general surgery in France. Most of the procedures are performed in nearby public hospital. The mortality analysis will allows us to target management improvement.
Reference:
1. Symons NR, Moorthy K, Almoudaris AM, Bottle A, Aylin P, Vincent CA, Faiz OD. Mortality in high-risk emergency general surgical admissions. Br J Surg. 2013;100(10):1318–25.
Disclosure: No significant relationships.

O123

THE MANAGEMENT OF TRAUMA PATIENTS IN THE EMERGENCY DEPARTMENT OF A UNIVERSITY HOSPITAL IN GREECE. IS THERE ANY ROOM FOR IMPROVEMENT?

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Introduction: Trauma is the most common cause of death during the first four decades of life. Proper management in the first golden hour is crucial. The aim of this perspective study is to validate the provided health care by Surgeons and Surgical Residents in the Emergency Department (ED) of a University Hospital in Greece.
Materials and methods: During a 14-month period (27 days/24-h shift), 589 patients with traumatic injuries were admitted to the ED. According to a specific protocol, data about patient's accident, pre-hospital management, transfer, management during and after his admission to ED and outcome, were collected.
Results: 67 % of patients were admitted to the ED with blunt injuries, 25 % with penetrating trauma and 8 % with burns. 42 % of injuries were due to falls and 32 % due to road accidents, whereas 67 % of these patients did not take any safety measures. 91 patients were transferred to the ED by ambulance; most of them after a road accident. 415 patients were initially managed by a surgical resident trained in Advanced Trauma Life Support (ATLS), without always the administration of ATLS principles. There was no significant difference in patients' outcome between trained and not trained in ATLS. 85 trauma patients were admitted to the 5th Surgical Department, 8 patients needed operation and 2 of them died.
Conclusion: There is room for improvement for the prehospital and hospital trauma patient care with emphasis to the organization of ED and further training of the personnel.
References:
1. ATLS manual—ACS.
2. PHTLS manual—NAEMT.
3. ETR manual—Medication.
Disclosure: No significant relationships.

SYSTEMIC AND LOCAL INFLAMMATORY MECHANISMS AFTER TRAUMA

O124

DOSE DEPENDENT EFFECTS OF PPAR BETA/DELTA AGONISTS ON SYSTEMIC INFLAMMATION AFTER HEMORRHAGIC SHOCK

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Introduction: Protective effects of GW0742 (agonist of PPAR beta/delta) in sepsis have been described in prior studies. In this analysis we studied the dose dependent effects of GW0742 on sterile inflammation after hemorrhagic shock (HS).
Materials and methods: Male C57/BL6 mice 6–10 weeks and weighing 20–25 g were used in this study. Mice were subjected to pressure controlled HS (mean arterial pressure of 35 ± 5 mmHg for 90 min). Following groups were analyzed: Group HS (HS alone), Group DOSE 1 (injection of 0.03 mg/kg/BW of GW0742) and Group DOSE 2 (injection of 0.3 mg/kg/BW of GW0742). End point of the study was 6 h. Systemic cytokine levels (IL-6, -1b, TNF-alpha, KC, MCP-1, GMCSF) and neutrophil infiltration to the lung were studied.
Results: Higher dose (DOSE 2) treatment with GW0742 has showed pronounced pro-inflammatory response, while the injection of low dose GW0742 (DOSE 1) decreased the inflammation (IL-6: HS 297.7 ± 134 pg/ml; DOSE 1 122.5 ± 26.1 pg/ml: DOSE 2 738.4 ± 87.9 pg/ml; $p < 0.05$). MPO activity with in the lung and liver was comparable in all treatment groups. Mean amount of neutrophils within lung histology was reduced in both DOSE 1 and DOSE 2 in comparison with numbers in untreated animals (HS).
Conclusion: We identified dose dependent effects of PPAR beta/delta agonists on systemic inflammation. These effects have not been described so far.
Disclosure: No significant relationships.

O125

IMMEDIATE SUPPRESSION OF TNF-α RELEASE CAPACITY AFTER HEMORRHAGE AND RESUSCITATION

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Introduction: We aimed to evaluate the influence of hemorrhagic shock1 (HS) upon (a) the overall TNF-α secretion capacity of the host compared to its release from circulating leukocytes in peripheral circulation, and (b) the endotoxin-binding capacity (LBC).
Materials and methods: In vivo: rats (8/group) subjected to HS (MAP of 30–35 mmHg for 90 min followed by resuscitation over 50 min) were challenged with Lipopolysaccharide (LPS 1 μg/kg iv.) at the end of resuscitation (HSR–LPS group) or 24 h later (HSR–LPS24 group). Control animals were injected with LPS only (LPS group). Plasma TNF-α was measured at 90 min after the LPS challenge.
Ex vivo: whole blood (WB) was obtained either from healthy controls (CON) or from HS rats at the end of resuscitation (HSR = 140 min) and at 24 h post-shock (HSR24). WB was incubated with LPS (100 ng/mL) for 2 h at 37 °C. TNF-α concentration and LBC was determined.
Results: In vivo: Compared to LPS group, HS followed by LPS challenge resulted in suppression of plasma TNF-α in HSR–LPS and HSR–LPS24 (1,835 ± 478, 273 ± 77, 498 ± 200 pg/mL, respectively).
Ex vivo: Compared to CON the LPS-induced TNF-α release capacity of circulating leukocytes was strongly declined both at the end of resuscitation (HSR) and 24 h (HSR24). The LBC in WB was similar between CON and HSR and only moderately enhanced in HSR24 (57 ± 6, 56 ± 6, 71 ± 5 %, respectively).
Conclusion: Our data suggest that the overall inflammatory response capacity is decreased immediately after HS/resuscitation, persisting up to 24 h, and independent of LBC.
Reference:
1. Bahrami et al. Am J Physiol. 1997;272(5 Pt 2):H2219–26.
Disclosure: No significant relationships.

O126

PORCINE TRAUMA MODEL OF CHEST, ABDOMINAL AND EXTREMITY TRAUMA WITH HEMORRHAGIC SHOCK: TRAUMA SEVERITY AS THE MAJOR CRITERION

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Introduction: An adequate trauma severity with a lethality that closely mimics the clinical situation has been identified as a major criterion of a porcine trauma model to provide a high level of clinical relevance. In contrast to previously established models we aimed to establish a clinically relevant, long-term model (>48 h) and therefore compared models with different trauma severities.
Materials and methods: Combined trauma consists of tibial fracture, lung contusion and liver lazeration for all groups. In group I (n = 15 animals) hemorrhagic shock by withdrawing 45 % of calculated total blood volume was induced, whereas in group II (n = 10 animals) 50 % were withdrawn. MAP was aimed <30 (group I) resp. <25 (group II). After 90 resp. 120 min animals were resuscitated by application of a plenty of four times the hemorrhage-volume using crystalloid infusion.
Results: In both groups the combined traumatic insult led to severe signs of hemorrhagic shock with significantly higher lactate levels in group II. The incidence of reanimation after trauma induction was significantly higher in group II (40 vs. 26.7 %). Mortality however, was comparable between both groups (10 % vs. 13.3 %).
Conclusion: A long-term, combined trauma porcine model has been established, which is reproducible and clinically relevant. Mortality rates are comparable to the clinical situation after multiple trauma. The high incidence of reanimation after trauma induction indicates that a significant aggravation of trauma severity will not be tolerated in porcine long-term models.
Reference:
1. A combined trauma model of chest and abdominal trauma with hemorrhagic shock-description of a new porcine model. Shock. 2012.
Disclosure: No significant relationships.

O127

FIRST LONG TIME PORCINE POLYTRAUMA INVESTIGATION COMBINING LUNG, LIVER AND LOWER LIMB TRAUMATIZATION WITH SEVERE HEMORRHAGE

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Introduction: Multiorganic failure following multiple organ injury constitutes a severe problem in treatment of polytrauma patients. To date, appropriate animal models of multiple injuries include neither the whole entity of injuries nor an observation period >24 h. We aimed to develop a reproducible porcine model of multiple organ injury allowing long-time investigation.
Materials and methods: Approval of Regional Ethics Committee was obtained. Standardized polytrauma was induced in 30 pigs including lung contusion, liver laceration, tibial fracture and controlled hemorrhage with either loss of 45 % blood volume or until mean arterial pressure (MAP) <30 mmHg. After 90 min, blood loss was substituted by fourfold volume of crystalloid infusion. Intensive care treatment during an observational period of 47 h was followed by euthanasia. Ten non-traumatised pigs served as controls.
Results: In intervention group, mortality was 5 %, five pigs underwent CPR (12.5 %). Clinical suspicion of pneumothorax required a chest tube in ten pigs. We achieved a mean of 44.8 % hemorrhage and mean minimal MAP of 29.7 mm/hg. Heart rate was clearly elevated during trauma period, reaching a mean HR >180 bpm within the first 90 min. Trauma group showed to be anuric at this period, use of catecholamines was significantly elevated compared to sham group.
Conclusion: Given results confirm the severity of multiple organ injury in our model with a mortality comparable to human polytrauma. We can present a highly reproducible, clinically relevant porcine model of multi-system injury enabling first time long time observation and thorough investigation of single organ parameters.
Reference:
1. Hildebrand et al. Combined hemorrhage/trauma models in pigs—current state and future perspectives. Shock. 2013.
Disclosure: No significant relationships.

O128

THE MODULATION OF THE IMMUNE RESPONSE BY THERAPEUTIC HYPOTHERMIA IN A PORCINE MULTIPLE TRAUMA MODEL

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Introduction: After multiple trauma, an excessive immune response (SIRS) is triggered, which potentially harms the organism. miRNAs may play a crucial role in SIRS since these molecules only recently have been shown to be involved in numerous inflammatory processes, such as regulating the investigated Toll-like receptor signaling [1]. Therapeutic hypothermia is a promising approach in attenuating SIRS [2].
Materials and methods: In a porcine multiple trauma model consisting of a fracture of the tibia, blunt chest injury, liver laceration, and hemorrhagic shock, test animals were randomly assigned to a normothermia control group and a hypothermia group (N = 5). mRNA and miRNA from bone of the tibia fracture site and the unaffected opposite tibia was isolated, transcribed and real-time PCR was performed. Furthermore, ELISA was performed.
Results: Hypothermia attenuated the increase of TGF-β1 in blood plasma and down regulated TGF-β1 gene expression in bone after

multiple trauma. After 48 h, miRNA-146a, miRNA-155 and miRNA-223 expression in bone was significantly lower in normothermia animals compared to the hypothermia group. Interestingly, gene expression analysis of bone revealed a significantly higher expression of TLR1 and IRAK4 under hypothermic conditions.
Conclusion: In this porcine multiple injury model, the expression of miRNAs regulating signaling pathways of the innate immune system and corresponding molecules of the Toll-like receptor signaling showed differential patterns in therapeutic hypothermia. The understanding of the effects of hypothermia on the differential expression of miRNAs is crucial for the understanding of its therapeutic potential.
References:
1. Tsitsiou E, Lindsay MA. Curr Opin Pharmacol. 2009.
2. Hildebrand F, et al. Cytokine. 2005.
Disclosure: No significant relationships.

O129

MOLECULAR MECHANISMS UNDERLYING INTRINSIC APOPTOSIS RESISTANCE IN NEUTROPHILS (PMN) FROM POLYTRAUMATIZED PATIENTS

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Introduction: After multiply injury PMN lifespan is extended due to an impaired intrinsic apoptosis pathway, which correlates with the increased expression of antiapoptotic Mcl-1 protein. We investigated the molecular mechanisms underlying these processes.
Materials and methods: 37 polytraumatized patients and 35 healthy volunteers were enrolled in this prospective study. Patient's blood was collected at day 1 of admission to trauma center, PMN were isolated using discontinuous Percoll density gradient. Mitochondrial membrane depolarization was determined by JC-1 dye and flow cytometry. Apoptosis was assessed by propidium iodide staining and flow cytometry. The Mcl-1 mRNA and protein expression were analysed by qRT-PCR and immunoblotting. The Mcl-1 interactions were studied by co-immunoprecipitation. The localization of proapoptotic proteins was analysed by the subcellular fractionation, immunoblotting and immunofluorescence. Mcl-1 knock down was caused by RNAi.
Results: The intrinsic apoptosis resistance and stabilization of Mcl-1 protein seen in PMN from multiply injured patients correlate with increased heterodimerization of Mcl-1 with the proapoptotic proteins Bax, Bid, Bad and Bik, reduced cleavage and reduced mitochondrial translocation of Bax and Bid, maintenance of mitochondrial membrane potential and inhibition of cytochrome *c* release. Mcl-1 knockdown in patient's PMN could partially overcome the intrinsic apoptosis resistance.
Conclusion: Mcl-1 plays an essential role in the regulation of intrinsic apoptosis resistance in PMN after polytrauma and may represent a potential target molecule to reduce PMN hyperactivation and persisting inflammation after multiply injury.
Reference:
1. Paunel-Görgülü et al. Mcl-1-mediated impairment of the intrinsic apoptosis pathway in circulating neutrophils from critically ill patients can be overcome by Fas stimulation. J Immunol. 2009;183.
Disclosure: No significant relationships.

O130

LEUKOCYTE KINETICS AFTER MAJOR TRAUMA

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Introduction: The systemic response after major trauma is characterized by altered leukocyte mobilization and leukocyte phenotypes. However, this inflammatory response of multi-trauma patients is not uniform. Some patients acquire secondary inflammatory tissue damage, e.g. MODS and ARDS, while others develop immune-paralysis with a higher risk at infectious complications. Earlier research from our group suggest that leukocytosis during the first days and 10–12 days after multi-trauma result in better fracture healing, compared to those with normal leukocyte-count. But, it is yet unknown what the effect of the kinetics and altered subpopulations of leukocytes is. Therefore, we investigated the leukocyte kinetics and the occurrence of different subpopulations after multi-trauma.
Materials and methods: Multi trauma patients with an ISS $\geq$18 and at least a femur or pelvic fracture were included. Blood was drawn at different time points after trauma and, with the use of flowcytometry, leukocyte phenotypes were analyzed.
Results: Leukocyte kinetics showed a similar pattern in all patients: direct after trauma there was a leukocytosis, which normalizes in the first week. However, in the second week the leukocyte-count increases again. This leukocytosis was uneventful in all patients, so there were no signs of secondary inflammatory complications. Flowcytometry-analysis of the leukocytes showed that the circulating neutrophil granulocytes do not consist of a homogenous population, but there are three to five different subpopulations of neutrophils varying over time.
Conclusion: Leukocyte kinetics can help us predict and even prevent secondary inflammatory complications after major trauma. Especially the occurrence of neutrophil subpopulations over time is an important lead for further research.
References: Preliminary results.
Disclosure: No significant relationships.

O131

HOMOLOGY IN SYSTEMIC NEUTROPHIL RESPONSE INDUCED BY A POLYTRAUMA MODEL IN PIGS AND BY HUMAN TRAUMA

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Introduction: Trauma results in the activation of the innate immune system. The initial immune response is for an important part mediated by neutrophils (PMNs). Excessive activation of neutrophils is a key factor in the development of severe complications as ARDS and

MODS. Recent studies identified three different phenotypes of neutrophils in the presence of human systemic inflammation. These subsets can be identified by flowcytometric analysis of the expression of two receptors: CD16 (FcyRIII) and CD62L (L-selectin). These subsets showed specific morphologic characteristics and functionality. The aim of this study was to determine the existence of different PMN subsets in a polytrauma model in pigs.
Materials and methods: A total of twelve pigs will be subjected to a standardized polytrauma model. Blood samples will be taken at baseline, prior to trauma, and after 1, 2, 3 and 4 h. The cellular immune response will be determined by absolute neutrophil numbers in blood and the humoral response will be analyzed by IL-6/IL-1beta/IL-10/TNF-a in plasma. To investigate the existence of different subsets of PMNs in trauma induced inflammation in pigs, we will analyze the receptor expression of CD16, CD62L, CD32, CD11b on PMNs by flowcytometry.
Results: This study will be performed in November. A pilot study with ischemia–reperfusion injury showed the existence of three different subsets of PMNs (identified by receptor expression of CD16 and CD62L).
Conclusion: If the results are in line with our pilot study we identified different subsets of neutrophils in the peripheral blood of polytraumatized pigs. This is an important similarity to the human immune response to trauma.
Disclosure: No significant relationships.

O132

MICROPARTICLES ARE DRIVERS OF THE HOST RESPONSE IN SEVERELY INJURED TRAUMA PATIENTS

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Introduction: Severe trauma affects the host response, inducing an immunosuppressive state, which is associated with increased susceptibility to nosocomial infections. The mechanism of this immune response is unknown. The aim of the present study is to investigate the role of microparticles on host response following severe traumatic injury.
Materials and methods: Prospective monocenter study performed at an academic level-1 trauma center. Ten Trauma patients admitted to the emergency department (ED) in May–June 2013 with an age $\geq$18 years and an ISS $\geq$16 were included, as well as ten healthy controls. Whole blood was stimulated ex vivo with 1 ng/μl lipopolysaccharide (LPS) and incubated for 24 h at 37 °C with plasma from patients and controls either containing microparticles or depleted from microparticles. Cytokine levels were measured by ELISA in supernatant.
Results: Plasma from trauma patients taken upon arrival at the ED showed a blunted host response upon LPS stimulation, with decreased levels of IL-6, IL-10 and TNF-α compared to controls ($P < 0.001$). Microparticle-depleted plasma resulted in a further decrease in the production of all cytokines in trauma patients. Plasma of trauma patients containing microparticles resulted in increased production of IL-6 and TNF-α levels compared to plasma depleted from microparticles ($P = 0.047$ and 0.002 resp.). Also in controls, plasma containing microparticles had increased IL-6 levels compared to microparticle-depleted plasma ($P = 0.028$), however TNF-α remained unchanged.
Conclusion: Trauma patients have a blunted host response on arrival at the hospital. Microparticles are drivers of the host response in severely injured trauma patients.
Reference:
1. Tschoeke SK, Ertel W. Immunoparalysis after multiple trauma. Injury. 2007;38:1346–57.
Disclosure: No significant relationships.

O133

ATTENUATED BACTERIAL KILLING BY A SUBPOPULATION OF NEUTROPHILS AS A POSSIBLE CAUSE OF POST-TRAUMATIC SEPSIS

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Introduction: Inflammation following severe trauma can lead to the compensatory anti-inflammatory response syndrome (CARS). Sepsis is a common complication during this state of immune paralysis thereby accounting for a major cause of morbidity and mortality. During CARS multiple subsets of neutrophils are found in the peripheral circulation. To study the bactericidal capacity of these subsets we developed an experimental model in which neutrophils kill GFP-expressing *Staphylococcus aureus* in 3d-fibrin gels. For successful eradication of bacteria in this tissue-like environment neutrophils require appropriate chemotaxis, migration, phagocytosis, degranulation and generation of ROS.
Materials and methods: Blood was obtained after injection of LPS to 12 healthy volunteers. This endotoxemia model is characterized by neutrophil mobilization patterns comparable to those found during CARS. After cell sorting using flowcytometry, fibrin gels were formed containing neutrophils and GFP expressing *S. aureus*. Fluorescence intensity was a read out for active containment of bacterial proliferation. The time to mid-logarithmic (TMO) bacterial growth was used as primary outcome. Furthermore phagocytosis and chemotaxis were quantified individually.
Results: $CD16^{dim}/CD62L^{bright}$ (banded) neutrophils blocked bacterial proliferation for at least 1,200 min (SEM 0). $CD16^{bright}/CD62L^{dim}$ (hypersegmented) neutrophils very poorly contained bacterial outgrowth (TMO 540, SEM 80 min). $CD16^{bright}/CD62L^{bright}$ (mature) neutrophils exhibited an intermediate phenotype (TMO 970, SEM 110). No differences were found in chemotaxis and phagocytosis.
Conclusion: Hypersegmented neutrophils possess strongly reduced bactericidal capacities as compared to mature and banded neutrophils. We propose the appearance of these cells during CARS as a possible cause of the occurrence of sepsis. Furthermore, deficient killing by hypersegmented neutrophils and both normal phagocytosis and chemotaxis might have important consequences for dissemination of infection.
Reference:
1. Pillay et al. (2010)
Disclosure: No significant relationships.

O134

THE EFFECTS OF HYPOXIA ON SYSTEMIC MARKERS OF INFLAMMATION IN NORMAL HEALTHY VOLUNTEERS

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Introduction: The systemic inflammatory response syndrome (SIRS) in trauma is primarily a sterile process, triggered by molecules called alarmins. Alarmins are released in response to physiological stressors including hypoxia, acidosis and tissue damage. The relative contribution of each to the overall SIRS burden is unknown and difficult to isolate in clinical trials. We aimed to evaluate the degree of SIRS activation provided by hypoxia by measuring serum levels of a known alarmin (HMGB-1) and a marker of binding to one of its receptors (sRAGE) in uninjured, hypoxic volunteers.
Materials and methods: Subjects ($n = 14$) underwent a 3 h exposure to normobaric hypoxia (PaO_2 86.7 % and FiO_2 ~11.4 %). Oxygen saturations (SpO_2) and serum levels of HMGB-1 and sRAGE were measured at intervals during hypoxia and compared to baseline levels taken immediately prior to hypoxic exposure and 1 h after return to normoxia. Changes in SpO_2 and serum levels over time were analysed using the Wilcoxon signed rank test, with a p-value of <0.05 being significant.
Results: Median SpO_2 levels fell by 19 % ($p = 0.001$) and median serum levels of sRAGE fell by 13 % during hypoxia ($p = 0.02$). Within 1 h of returning to normoxia, both had returned to baseline. HMGB-1 levels did not change significantly over time (n/s).
Conclusion: The protocol succeeded in producing significant hypoxia in all subjects. This degree of hypoxia induced a significant fall in serum sRAGE that promptly returned to normal on return to normoxia. No significant change was seen in HMGB-1 levels.
Disclosure: No significant relationships.

O135

MODEL OF POST-TRAUMATIC LUNG INJURY IN MICE

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Introduction: Long bone fractures are known to be associated with systemic fat liberation stimulating the development of acute lung injury. Lung failure is known to trigger the development of multiple organ failure. In this study we have developed an acute lung injury model useful for pathophysiological analysis and treatment studies.
Materials and methods: Two standardized models in mice (male C57/BL6) were used: hemorrhagic shock (HS) and oleic acid (OA) were combined. Oleic acid was diluted in serum and intravenously injected prior to the induction of pressure controlled HS (35 ± 5 mmHg). The Endpoint of the experiment was 6 h. Systemic inflammation was measured by IL-6, IL-10 and KC levels in serum. Pulmonary dysfunction was evaluated by arterial oxygenation (pO_2), Horovitz-Quotient and histological analysis.
Results: Due to pronounced respiratory dysfunction, the mortality rate reached up to 50 %. Our acute lung injury model was associated with elevated pro-inflammatory. Systemic IL-6 levels: ALI 744.8 ± 234 pg/ml vs. Controls 297.7 ± 330 pg/ml; $p = 0.024$. Moreover, we measured reduced systemic oxygenation (pO2 88.9 ± 20 mmHg) and decreased Horowitz quotient (423 ± 99). Increased migration of nucleated cells and hemorrhagic areas within the lung were registered.
Conclusion: Our acute lung injury model was associated with pronounced pro-inflammatory response. However the Horowitz Index did not reached the expected values. Therefore, more severe impairments of oxygenation and reduction of the Horowitz quotient are required to reach the criteria of ALI. Further, long-term studies with ventilated animals are needed.
Disclosure: No significant relationships.

ABDOMINAL EMERGENCIES

O136

LAPAROSCOPIC SURGICAL TREATMENT OF EMERGING DISEASES OF THE COLON

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Introduction: There are a limited number of studies describing the role of minimally invasive colectomy for urgent or emergent conditions of the large bowel. We hypothesize that laparoscopic colectomy in urgent and emergent setting can be performed safely in select settings.
Materials and methods: A cohort of patients treated at a single institution from 2006 to 2012 was identified from a prospective database. Patients who underwent open or minimally invasive surgery (MIS colectomy for urgent and emergent conditions were included.
Results: A total of 272 (laparoscopic 42, open 230) patients underwent urgent or emergent colectomy on surgical unit during the 6-year time period. Choice between open an laparoscopic procedure was made on surgeon laparoscopic skill, ASA grade and presence large bowel distension. Toxic colitis were more often selected for open procedure. Patients with colon perforation or large bowel obstruction were often selected for MIS surgery. The MIS group had a lower body mass index (BMI), lower American Society of Anesthesiologists fitness grade and was more likely to have been immunosuppressed. There was no difference in patient morbidity between the open and MIS groups. The MIS group had a longer median operative time and fewer cases of prolonged hospitalization.
Conclusion: We conclude that minimally invasive colectomy by experienced surgeons appears to be safe and effective for appropriately selected patients with emergent and urgent conditions of the large bowel.
Reference:
1. Odermatt M, Miskovic D, et al. Term outcomes after laparoscopic versus open emergency resection for colon cancer: an observational propensity score-matched study. World J Surg. 2013;37(10):2458–67.
Disclosure: No significant relationships.

O137

THEORETICAL OPERATIVE STRATEGIES FOR BOERHAAVE SYNDROME

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Introduction: Spontaneous esophageal perforation or Boerhaave syndrome is an uncommon and life-threatening surgical emergency. The pathophysiology is a barogenic esophageal rupture due to a sudden increase in the intraluminal pressure. As a standard procedure, we obtained the following theoretical surgical strategies for Boerhaave syndrome. (1) Primary closure of esophageal rupture. (2) Pleural exploration for mediastinal lavage for controlling the most fatal complication of mediastinitis. (3) Tube thoracotomy for drainage. (4) De-compressive gastrostomy to prevent the postoperative leakage. The purpose of the study was to report the effectiveness of our surgical procedures for this fatal condition.
Materials and methods: Retrospective chart review was conducted between 2003 and 2012.
Results: Four cases were referred to our department from 2003 to 2012. All of them were males and presented within 6 h from the symptom onset. The means of age (range) was 52 (30–67). There was no hospital mortality. The Mean hospital stay (range) was 28 days (9–65). The major complication, the spontaneous extraction of gastrostomy, in succession to the postoperative delirium was taken place in one case. The re-laparotomy was performed for this case on the postoperative day 4 and the 68 days hospital stay was required for the surgical site infection
Conclusion: These surgical strategies might lead to a good prognosis for patients with this rare but critical condition.
Reference:
1. Sutcliffe RP, J Forshaw MJ, Datta G, et al. Surgical management of Boerhaave's syndrome in a tertiary oesophagogastric centre. Ann R Coll Surg Engl. 2009;91(5):374–80.
Disclosure: No significant relationships.

O138

THE ROLE OF SERIAL SERUM LACTACIDOSIS MEASUREMENTS IN ACUTE MESENTERIC ISCHEMIA TO PREDICT THE EXTENT OF ISCHEMIC BOWEL AND OUTCOME OF PATIENTS

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Introduction: Diagnosis of acute mesenteric ischemia (AMI) remains a major clinical challenge. This study opted to correlate repeated preoperative serum lactate and pH measurements with length of bowel necrosis and to identify risk factors for mortality in patients suffering AMI.
Materials and methods: Retrospective study of patients with AMI from 01/01/2006 to 31/12/2012. Numbers are reported as mean ± standard deviation. Fisher exact and the Mann–Whitney *U* test were applied.
Results: 91 patients with AMI were identified. All patients underwent laparotomy. In-hospital mortality was 42.9 % (n = 39). Mean age and length of bowel necrosis was 66.9 ± 15.8 years and 94.1 ± 104.0 cm, respectively. 209 preoperative lactate measurements were available for analysis (2.3 ± 1.1 values per patient). The highest lactate value within 24 h before surgery correlated moderately with the length of bowel necrosis ($R^2 = 0.257$, $p = 0.058$). In the period ≤6 h prior surgery the lactate level was significantly higher (4.97 ± 4.21 vs. 3.24 ± 3.05, $p = 0.006$) and the pH significantly lower (7.28 ± 0.12 vs. 7.37 ± 0.08, $p = 0.001$) compared to the values >6 h before surgery. 34 patients had at least two lactate measurements within 24 h before surgery. Thereof, 17 (50.0 %) had increasing, and 17 (50.0 %) decreasing preoperative lactate levels. Forward logistic regression revealed length of necrotic bowel and the highest lactate value within 24 h before surgery as independent risk factors for mortality ($R^2 = 0.329$).
Conclusion: Multiple variables impact lactic acidosis in patients suffering AMI. Although mean lactacidosis worsened over time, the diagnostic value of serial lactate and pH-measurements is limited in individual patients due to a high variability of repeated values. Length of necrotic bowel and lactate values are independent risk factors for mortality.
Disclosure: No significant relationships.

O139

LAPAROSCOPIC LESSER OMENTUM PATCH; A NOVEL EMERGENCY SURGERY TECHNIQUE MANAGING PERFORATED PEPTIC ULCERS

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Introduction: It has been a long time since Roscoe Graham in 1938 started his technique. The traditional technique was suitable for the open surgical access but not for the laparoscopic one. Appreciation of the laparoscopic anatomy and pathology postulate a different procedure evolution. The greater omentum is mostly found affected by the process of chemical peritonitis in addition to bacterial peritonitis as well. The lesser omentum offers a more readily potent tissue flap that is both anatomically and surgically optimistic to the laparoscopic technique. High lightening the anatomical, pathological and technical aspects of the new concept constitute solid rational behind the study.
Materials and methods: This is a preliminary clinical prospective series study describing a new surgical technique for repair of perforated peptic ulcer. Between February and July 2012, seven adult male patients were recruited for the study, with no selection criteria. All patients underwent laparoscopic perforated ulcer repair using the new technique. The procedure was achieved by the author in all cases as described later. Follow up of such cases ranged between 6 and 12 months.
Results: All patients were operated by laparoscopy with no conversion to open. Patients data and results are scheduled in tables. No postoperative complication nor recurrence of perforation were recorded.
Conclusion: Laparoscopic gastroduodenal wrap utilizing the lesser omentum is a novel technique based on solid concepts. This primary study applying the technique is very encouraging and need more evaluation on a wider clinical scale. Critic is invited.
References: References (11)
Disclosure: No significant relationships.

O140

CAN WE USE CONTRAST ENHANCED CT INSTEAD OF DIFFUSION WEIGHTED MR IN PATIENTS WITH ACUTE BILIER PANCREATITIS?

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Introduction: The aim of this study is to compare contrast-enhanced CT and diffusion weighted MR (DWI) for clinical correlation in patients with acute biliary pancreatitis.
Materials and methods: 37 Patients with acute biliary pancreatitis and DWI-weighted MRI and MRCP taken in order to explain elevation in cholestasis enzyme and bilirubin levels and within 8 h after this MRI undergoing contrast-enhanced CT imaging included in this study. These patients demographic datas, severity of pancreatitis, pancreatic apparent diffusion coefficient (ADC) and CT severty index compared.
Results: Median age is 55, 16 (22–90), 14 patients were male and 23 patients were female, medium Ranson valuation was 1, 10 (0–4), median hospitalization duration is 15.62, 17 patient were evaluated as mild acute pancreatitis, 12 were moderately severe and 8 were severe based on revision of the Atlanta classification. Mild pancreatitis median Balthazar score was 0.7, moderately severe: 3, 16 severe: 5, 37. There is no significant difference between elevated CRP levels and necrosis and clinical severity. There is no significant difference between Baltazar score, ADC score, Revision Atlanta score. If we compare necrosis ADC score and Pancreatitis ADC score, there is significant diffrence between them (p 0.000).
Conclusion: We can say DWI MR is better than contrast-enhanced CT in acute pancreatitis because of no radiation, no contrast which aggregate pancreatitis and cannot use in renal failure. But we have randomised prospective studies for definitive diagnosis .
Disclosure: No significant relationships.

O140A

EMERGENCY STOMA: EXPERIENCE OF A DISTRICT HOSPITAL

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Introduction: In spite of the improvement of healthcare, namely in screening and consequently early diagnosis of colorectal cancer, stoma formation in an emergent setting remains a frequent procedure of the general surgeon.
Materials and methods: Retrospective study of patients submitted to an emergent stoma formation at hospital admission, operated from January 2008 and December 2012.
Results: In the studied period, there were 167 emergent stomas formed at hospital admission, corresponding to 50 % of stoma formation in all contexts. The most common diagnosis was colorectal cancer (52 %), being diverticulitis the most common benign cause (13 %). In 85 % of the patients a colostomy was performed, and in the remaining 15 % an ileostomy. Thirty-day morbidity was high (42 %) although in most cases it relates to medical causes (51 %), being the re-laparotomy rate 12 %. The global reconstruction rate was 27 %; nevertheless, if we exclude patients whose stoma was formally definitive and patients deceased in the 60 postoperative days, the reconstruction rate rises to 55 %.
Conclusion: Stoma formation in an emergent setting remains a common task of the general surgeon and is associated with significant morbi-mortality. Temporary stomas are in effect definitive in a significant number of cases and this reality must be in the surgeon's mind.
Reference:
1. Zhao XD, Cai BB, et al. Palliative treatment for incurable malignant colorectal obstructions: a meta-analysis. World J Gastroenterol. 2013;19(33):5565–74.
Disclosure: No significant relationships.

O141

RISK PREDICTION OF MORTALITY IN PERFORATED PEPTIC ULCER

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Introduction: Mortality rates in perforated peptic ulcer (PPU) are high. Several factors and clinical scores are associated with poor outcome in PPU, but few have been thoroughly evaluated by proper statistical methods or direct comparison in same cohorts. The aim of this study was to evaluate factors and scores to predict mortality in PPU.
Materials and methods: Patients surgically treated for perforated peptic ulcer between 2001 and 2010 in Stavanger were included. Outcome was 30 day mortality. Univariate and multiple regression were done and receiver operating characteristics curve analysis (ROC) for factors and scoring systems.
Results: A total of 172 patients (52 % women) with a median age of 68 years were included. Sixteen % died within 30 days. The PULP score achieved an Odds Ratio (OR) of 18.63 (95 % confidence interval (CI) 4.16–79.62) and a sensitivity of 92.9 and the ASA score an OR of 11.61 (95 % CI 3.82–35.41) and a sensitivity of 85.7 for mortality prediction. Both performed an area under the curve (AUC) of 0.79. The Boey score achieved an OR of 5.02 (95 % CI 2.13–11.83), a sensitivity of 64.3 and an AUC of 0.75. Hypoalbuminemia (<37 g/L) achieved an OR of 8.73 (95 % CI 3.13–24.39), a sensitivity of 82.1 and an AUC of 0.78.
Conclusion: Hypoalbuminemia predicted mortality with similar accuracy as the ASA score and the PULP score, while the Boey score was less accurate.
Reference:
1. Thorsen K, Søreide JA, Søreide K. Scoring systems for outcome prediction in patients with perforated peptic ulcer. Scand J Trauma Resusc Emerg Med. 2013;21:25.
Disclosure: No significant relationships.

O142

THE TREATMENT OF ACUTE CALCOLOUS COLECYSTIS: THE ANALYSIS OF PRELIMINARY RESULTS OF A SHARED MODEL OF TREATMENT AND THE NEED TO CONSTRUCT AN INSTITUTIONAL EVIDENCE BASED PATHWAY

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Introduction: Acute Calculous Cholecystitis (ACC) can been approached by antibiotic or by surgery; the treatment largely varied during the time and among Institutions.
Materials and methods: A retrospective analysis of patient discharged home with a diagnosis of ACC was undertaken from January 2008 to April 2013. Data were divided in two period groups: the first (199 patients) before and the second (303 patients) after May 2010 when we moved from a doctor individualized approach to a unique shared model of treatment.
Results: The population study was 502; in the first group the cholecystectomy was performed in 48 patients (24.1 %), the conversion rate was 1 %, no reoperation, mean time to operation was 79 h, hospital stay 8.27 days, and readmission 42.1 % of patients (18 patients (21 %) from the ED and 11 (61 %) requiring surgery). In the second group the cholecystectomy was performed in 174 patients (57.4 %) the conversion rate was 10.4 % and to operation was 94 h; reoperation for 2 patients (0.7 %), hospitalization was 8.8 days, 14 % of readmission (18 patients (41 %) from ED and 6 (33 %) requiring surgery). After this results we developed an Institutional clinical pathway that will be presented.
Conclusion: Our results shows that after improving a shared way for ACC the rate of operation increased, reducing the readmission rate and unplanned operation. No difference in terms of reoperation was observed. The development of Institutional Pathway should be considered as a worth instrumentation to solve some decision making doubts and conflicting evaluation of treatment opportunities in ACC.
Reference:
1. TG13. J Hepatobiliary Pancreat Sci. 2013;20:89–96.
Disclosure: No significant relationships.

O143

EMERGENCY CHOLECYSTECTOMY; AN ECONOMIC EVALUATION OF PRACTICE AT AN EMERGENCY GENERAL SURGERY UNIT

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Introduction: The clinical and economic debate as to how to best manage patients presenting acutely with gallstones disease continues.
Materials and methods: A retrospective study was conducted of all patients admitted with acute biliary symptoms, who underwent cholecystectomy between 2008 and 2011. Costing data were calculated for each patient on an individual basis, including all theatre consumables, drugs and calculated cost for length of stay. A decision tree analysis economic model was created, using input data derived from the clinical study as well as the individual patient level costs. Categorical data were analysed using the Chi squared test.
Results: 101 patients had an emergency laparoscopic cholecystectomy (eLC) and 310 patients had a delayed cholecystectomy (dLC). Median cumulative length of stay for the eLC group was 6 days, and 7 for the dLC group ($p > 0.05$). 30 % of patients waiting for a dLC were readmitted with a median stay of 3 days. 11 % of the eLC group had an open conversion compared to 8 % in the dLC group ($p > 0.05$), and there were no bile duct injuries in either group. Complications rate were similar. The baseline cost was equivalent for both pathways. After complications and readmission costs were calculated and inputted into the decision tree analysis, this difference decreased to a cost of around 240 euros more expensive for the dLC pathway.
Conclusion: Early cholecystectomy on the index admission appears to have similar outcomes to a delayed procedure, cumulative length of stay was shorter, and eLC had a lower unit cost per patient than the dLC pathway.
Disclosure: No significant relationships.

O144

EARLY CHOLECYSTECTOMY FOR ACUTE CHOLECYSTITIS: BREAKING DOWN THE BARRIER OF THE GOLDEN 72-H LIMIT

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Introduction: Nowadays early laparoscopic cholecystectomy is the treatment of choice for acute cholecystitis (AC), but the optimal surgical timing is controversial. The aim of this study was to verify the outcome of AC patients according to different timing of cholecystectomy.
Materials and methods: Patients undergoing cholecystectomy for AC during 6 years were divided into two groups: initial admission cholecystectomy (IAC) and delayed cholecystectomy (DC, after at least 4 weeks). A subgroup of patients undergoing immediate cholecystectomy (IC, within 72 h of symptom onset) was further analyzed.
Results: 316 consecutive patients were recruited. IAC group included 262 patients (82.9 %) and DC group 54 patients (17.1 %). In DC group, 37 % of the patients were re-evaluated for recurrent pain or cholecystitis and 25.9 % required re-hospitalization while waiting surgery. Conversion rate, operation length and overall complications were not different in the two groups. In DC group the total hospitalization's length was longer and the histological diagnosis found out 10 cases (18.5 %) of AC and 5 case (9.3 %) of gangrenous AC. In IC group, conversion rate, operation length and postoperative morbidity were similar to that of IAC group.
Conclusion: The golden 72 h period should not represent a rigid limit to perform LC for AC, provided that surgery is carried out during the initial hospital admission. Delayed surgery should be restricted to selected cases, considering the high rate of recurrence and need of hospital re-admission; moreover in 27.8 % of cases a severe histological diagnosis was remarkably found.
Reference:
1. Strasberg SM. Clinical practice. Acute calculous cholecystitis. N Engl J Med. 2008;358(26):2804–11.
Disclosure: No significant relationships.

O145

CLIP AND DROP: CLEAR CUT CONTROL IN NON-TRAUMA SURGERY

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Introduction: The principles of damage control surgery may be applied to non-trauma critical patients in lethal triad. The clip and drop technique, permits sepsis control and a quick transfer to the ICU. This approach favors a delayed primary anastomosis avoiding exceeding enterectomies and unnecessary stomas.
Materials and methods: Between 2010–2013 three women and one man with a median age of 66.5 years were submitted to the clip and drop technique. Three owing to small bowel infarction, secondary to adhesive bands and vascular insufficiency, and one resulting from a gastric perforation. All of these were in lethal triad and had multiple organ dysfunctions. Gangrenous bowel was resected and a subtotal gastrectomy performed using staplers "abandoning" the closed stumps. The abdomen was closed in two situations and two were left open. All were revisited up to 48 h and in three cases a manual anastomosis was performed between days 2–5. One case required further resection for ischemic bowel allowing for a successful anastomosis on day 8.
Results: All patients suffered minor morbidity and the median hospital discharge was day 17 (one exception required intestinal rehabilitation).
Conclusion: Our initial experience with this technique in non-trauma cases has shown patient benefit, minimizing the need for high output stomas that complicate nutritional status and abdominal reconstruction.
Reference:
1. Pang KK, Chao NS, Wong BP, et al. The clip and drop back technique in the management of multifocal necrotizing enterocolitis: a single centre experience. Eur J Pediatr Surg. 2012;22(1):85–90.
Disclosure: No significant relationships.

WHO, THE CARE OF THE INJURED: THE PROBLEMS

O146

CHARACTERISTICS AND SURVIVAL TIME OF POLYTRAUMA FATALITIES IN ROAD TRAFFIC ACCIDENTS: AN AUTOPSY STUDY

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Introduction: Many studies have analyzed the characteristics and reasons of mortality of polytraumatized patients who reached the clinic [1]. Yet, the preclinical situation needs to be analyzed further as these patients often die before all injuries are diagnosed.
Materials and methods: Approximately 300 polytrauma patients deceased in 2004 and 2005 due to road traffic accidents in southern Bavaria with an ISS $\geq$16 were included into this study. All injuries were coded in AIS system. Time, place and exact cause of death proven by an autopsy, medical measures and demographic parameters were recorded.
Results: Mean age of the victims was (47 years $\pm$ 23). $\sim$60 % of the patients died on scene, $\sim$37 % died in a hospital. $\sim$47 % of the victims were car drivers or passengers, $\sim$28 % pedestrians, followed by cyclists/motor-cyclists (11 % each). Patients who died within the first hour were more often male ($\sim$70 %) whereas patients who survived longer had an equal distribution of sexes. Patients who died on scene were younger on average ($\sim$43 years) than patients who died in hospital ($\sim$51 years). $\sim$70 % of the patients who died on scene had the accident in a rural area whereas this was the case for $\sim$45 % of the patients who survived longer.
Conclusion: The majority of the patients in this study died on scene. Many young patients died on scene. To prevent these casualties more attention should be paid to traffic safety.
Reference:
1. Pfeifer R, Tarkin IS, Rocos B, Pape HC. Patterns of mortality and causes of death in polytrauma patients–has anything changed? Injury. 2009;40(9):907–11.
Disclosure: No significant relationships.

O147

PATTERN OF MORTALITY IN SEVERELY INJURED PATIENTS: AN AUTOPSY STUDY

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Introduction: INTRODUCTION: Trunkey et al. described in his hallmark publication a trimodal distribution of mortality 30 years ago. Improvements in pre-clinical and clinical treatment and advances in passive and active car safety are reasons which led to reduced mortality rates within the last decades. The main aim of the present study is the analysis of the mortality pattern in patients died on scene or clinic due to severe trauma. Moreover, causes of death were proved by an autopsy.
Materials and methods: Patients deceased in the year 2004 and 2005 due to a traffic injury within Southern Bavaria were subjected to an autopsy. All injuries were recorded according to the AIS classification. Moreover, the timepoint of death, the exact cause of death proven by an autopsy and demographic parameters were studied.
Results: Approximately 300 patients were included into this study. Mean age (47 years $\pm$ 23), male (67.3 %), around 40 % of the victims showed an ISS of 75, around 13 % had an ISS between 16–26. The head was the most frequent body region which was most severely injured ($\sim$44 %), followed by thorax ($\sim$26 %) and in approximately 10 % head and thorax were equally highly traumatized and showed the same AIS level. The trimodal distribution described by Trunkey et al. could not be observed.
Conclusion: The majority of severely injured trauma patients died directly on scene or prior to admission into the hospital. More attention should gain preventable caused of death in this patient group. Moreover, prevention of trauma is of immense importance to reduce the mortality.
Disclosure: No significant relationships.

O148

FATAL COMBINATIONS OF INJURY IN POLYTRAUMA PATIENTS AFTER ROAD TRAFFIC ACCIDENTS

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Introduction: Injury pattern of polytrauma fatalities are still scarcely analysed [1]. As most of the patients do not reach the hospital because of dying on scene or before and during transport, respectively, specific injuries are often not diagnosed.
Materials and methods: In an autopsy study performed at LMU Institute for Legal Medicine around 300 patients from road traffic accidents with the coincidence of serious injuries in at least two body regions and an ISS $\geq$16 were analysed towards which body regions are affected and how severe these are injured. Injuries were coded according to AIS 2008.
Results: Most of the traffic accident fatalities not reaching hospital died immediately on scene. Head and thorax, either as leading body region or both equally severe injured, are the body regions where around 75 % of the patients show their most severe injury. These body regions in combination with other regions like abdomen, lower extremities, or neck account for another $\sim$12 % of fatal combinations. The relation of severity of injury and the affected body regions with gender, age, participation in traffic, survival time and cause of death will be presented.
Conclusion: To decrease mortality rates after severe injury detailed knowledge on injury pattern is needed. Pattern with a chance of survival should be a focus for intensified medical interventions.
Reference:
1. Pfeifer R, Tarkin IS, Rocos B, Pape HC. Patterns of mortality and causes of death in polytrauma patients—has anything changed? Injury. 2009;40(9):907–11.
Disclosure: No significant relationships.

O149

ROLLOVER CAR CRASHES WITH EJECTION: A DEADLY COMBINATION: A REPORT FROM QATAR

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Introduction: Morbidity and mortality associated with rollover car crashes (ROCs) are serious public safety concerns worldwide.
Materials and methods: All patients involved in ROCs admitted to a Level I trauma center in Doha, Qatar, between January 2011 and December 2012 were divided in Group I (ROC with ejection), and Group II (ROC without ejection). Demographics, clinical presentation, type of injuries, position in the vehicle, protective devices used, complications, and mortality were analyzed.
Results: 719 patients were involved in ROCs. 89.6 % were males, and 41 % of them were Qatari nationals. There were 232 in Group I, and 482 patients in Group II. The mean age of patients in Group I was lower than in Group II (24.3 ± 10.3 vs. 29 ± 12.2; $p = 0.001$). Among Qatari nationals the majority were in Group I (54.8 vs. 34.3 %; $P = 0.001$). Patients in Group I had higher ISS (20 ± 12 vs. 12 ± 9; $P = 0.001$) and sustained more head (53.6 vs. 26.8 %; $P = 0.001$), chest (52.3 vs. 36.7 %; $P = 0.001$) and abdominal (25.7 vs. 16.6 %; $P = 0.003$) injuries than patients in Group II. The mortality rate was significantly higher in Group I vs. Group II (25 vs. 7 %; $P = 0.001$). In addition, patients in Group I required higher ICU admission rate (50 vs. 22.3 %; $P = 0.001$). Patients in Group I had a 5-fold increased risk for age-adjusted mortality (OR 5.43; 95 % CI 3.11–9.49, $P = 0.001$).
Conclusion: ROCs with ejection is associated with higher rate of morbidity and mortality compared to ROCs without ejection. These findings highlight the need for research-based injury prevention initiatives in the country.
Reference:
1. http://www.nrd.nhtsa.dot.gov/Pubs/809438.pdf. Accessed 16 Oct 2013.
Disclosure: No significant relationships.

O150

ALCOHOL SCREENING OF TRAUMA PATIENTS IN QATAR

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Introduction: Alcohol Screening and Brief Intervention (ASBI) for trauma patient is a standard component of Level I Trauma Centers but there has been no report on this type of intervention in the Middle East.
Materials and methods: Alcohol screening results for all Level and Level II trauma activations between 1 February and 31 July 2013 were prospectively collected from a level I trauma center registry. The results were analyzed as to mechanism of injury, gender and activation level.
Results: During the study period, there were 770 trauma activations, 638 (82.9 %) underwent blood alcohol concentration (BAC) testing. Of those tested, 10.5 % were positive. The mechanisms of injury with the highest incidence of BAC (+) results were sports injuries (100 %), bicycle injuries (25 %), assault (23.5 %), pedestrian injuries (23 %) and motor vehicle crashes (12.2 %). Level II trauma activations, females and those suffering from occupational injuries, falls or falling objects, were less likely to be BAC (+).
Conclusion: An ASBI program can be implemented in a culturally diverse environment in the Arabian Gulf with results that show a lower prevalence of alcohol use than reports from other settings.
Reference:
1. Alcohol screening and brief intervention (SBI) for trauma patients: COT quick guide. American College of Surgeons Committee on Trauma.
Disclosure: No significant relationships.

O151

CHILD OCCUPANTS IN MOTOR VEHICLE CRASHES IN QATAR: PREDICTORS OF SURVIVAL

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Introduction: Motor vehicle crashes (MVC's) are the leading cause of death in Qatar. Children are a sub-population at a high risk for death from an MVC in Qatar. There is a need to better describe the risk factors and characteristics of child fatalities from MVC's in Qatar and utilize the results to guide road safety programs and policies and direct future research efforts.
Materials and methods: A retrospective analysis of data on pediatric (0–18 years) victims of MVC's from the Hamad Medical Corporation trauma registry, from 1 January 2010 to 31 December, 2012, was conducted.
Results: 241 child MVC victim records were identified, 15 were fatalities. Fatalities were more significantly older (14.95 years) and had a higher Injury Severity Score (31.57). The following factors were found to be protective characteristics for child occupants in an MVC in Qatar: being a front or back passenger and involvement in a

head on collision. Child passenger restraint use was low (1.2 %) and it was not shown to be significantly protective for MVC mortality.
Conclusion: In a population of child occupants involved in MVC's in Qatar, conventional protective and harmful factors were not shown to be readily applicable. A further prospective analysis of characteristics of MVC's in Qatar is needed. This should be conducted by a dedicated team that will incorporate more local and indigenous crash and patient factors.
Reference:
1. Road safety in the Eastern Mediterranean Region: facts from the Global Status Report on Road Safety 2013. Violence and Injury Prevention and Disabilities WHO Regional Office for Eastern Mediterranean. Cairo.
Disclosure: No significant relationships.

O152

BICYCLE ACCIDENTS IN BIG CITIES, AN INCREASING DANGER?

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Introduction: The amount of severe bicycle accidents increased in the last decades. The broad introduction of helmet for bicycles and separate cycle paths are still a matter of current political discussions in Germany and other European countries. The aim of this study was to analyze the epidemiology, the severity of injuries due to bicycle accidents, the trauma mechanism in a german metropol region.
Materials and methods: All patients who underwent a trauma with ISS >9 between 2011 and 2012 after bicycle accident and who were admitted to our hospital through our shockroom with consecutive interdisciplinary treatment according to the ATLS® algorithm were included to our study. The data acquisition was retrospectively.
Results: 39 patients (19 male, 20 female) were admitted to our hospital between 2011 and 2012 wit an ISS >9 through our shockroom after bicycle accident. The average age was 47 years (±26.4 years, from 17 to 87 years). The average ISS of these patients was 24.7 (±13.8, range 10–66). The most severe injury of the patients was trauma brain injury in 49 % (n = 19) of cases, followed with 18 % (n = 7) by injuries of the spine. Only one patient in our collective had a helmet. 79.5 % of all bicycle accidents were between March and July.
Conclusion: This study shows the severe traumatic injuries after bicycle accidents, whereas the traumatic brain injury dominates. A helmet was wearen only in one case. The increasing danger with severe accidents even in urban areas with dramatic injuries at the head shows the need of regulative intervention and implementation of helmets by law.
Reference:
1. ATLS. American College of Surgeons
Disclosure: No significant relationships.

O153

HOW MUCH IS IT TO RIDE ON TWO WHEELS? THE FINANCIAL BURDEN OF MOTORCYCLE ACCIDENTS IN HOSPITAL EXPENSES: DATA FROM A LEVEL 1 TRAUMA CENTER IN SOUTH BRAZIL

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Introduction: Trauma is amongst the hugest healthcare problems worldwide due to its impact in potentially productive years lost and especially in direct costs involved to its in-hospital treatment. In Brazil, there is a mandatory insurance for personal injuries caused by land motor-vehicles (DPVAT) that covers hospital costs of a maximum of 1,200 dollars (USD). The Unified Health System covers the expenses that overtake that amount. In order to assess the epidemiological expenses involved with traffic injuries in a southern Brazilian city this study was conduct.
Materials and methods: Retrospective observational transversal study, including all motorcycles' traffic injured patients brought to Hospital in the first week of May. Excluding criteria: patients not covered by DPVAT insurance. Financial information from Hospital's accounting department database. Statistical analysis was performed using the Chi square for discrete, and the Students' *t* test for continuous variables.
Results: 101 patients met the including criteria. 58 patients (57.4 %) victims of motorcycle falls (MCF) and 43 patients (42.6 %) victims of motorcycle crashes(MCC). Mean age 26.5 y-o (±8.7). 85.1 %men. MeanISS 2.85, meanRTS 7.79. Of the MCCs patients, 72.1 %victims of motorcycleVScar, 9.3 % motorcycleVSwall, 7 % motorcycleVSbicycle, 7 % motorcycleVSmotorcycle, 5 % motorcycleVStruck. The highest amounts of money were employed in motorcycleVSbicycle. Of the total of expenses (29,200USD, mean 289.1 USD per patient), 18,600USD were due to MCCs and 10,575USD to MCF (p = 0.0049). 90 patients (89.1 %) were using helmets, mean treatment cost: 279USD per patient. Victims without helmet mean expenses: 395USD per patient (p = 0.4383). 90.5 %were drivers-mean cost: 329USD per patient—9.5 %were passengers—mean cost: 116USD per patient (p = 0.5639). 7 patients had alcoholic breath—mean cost 436USD—and 94 did not have—mean cost 281USD (p = 0.3967).
Conclusion: MCCs had a bigger financial burden in hospital expenses compared with MCFs. Helmet use reflects in low costs with treatment. Alcohol is related to higher costs. Prevention shall be stimulated.
Reference:
1. Sikand M, et al. Injury. 2005;36(6):733–7.
Disclosure: No significant relationships.

O154

TRAUMA DEATHS IN SOUTHERN THAILAND

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Introduction: Trauma is one of the major health problems in Thailand. However, in Thailand, the systems to enumerate data are limited. The purpose of this study is to review the characteristics of adult trauma deaths in Songklanagarind Hospital where is a university hospital and a Level 1 trauma center in Southern Thailand
Materials and methods: The study is a descriptive and retrospective review from the hospital trauma registry and medical records of all trauma deaths between 2009 and 2012. Demographic data, mechanism of injuries, length of stay prior to death and the cause of death were collected and analyzed
Results: Among of the 5,902 trauma patients admitted to the hospital, 391 patients died (6.62 %). The average ISS was 28. The most common mechanism leading to death was MCC (44 %) followed by MVC (14 %) and fall (11 %). Nineteen percent of all deaths arrested upon arrival.

Sixty five percent died in the first 48 h. The overall majority of cases died from head injury (31 %), followed by exsanguination (23 %), and multiple trauma (8 %). Exsanguination was the most common cause of death in the first 48 h (30 %). Sepsis and multi-organ dysfunction were major causes of death after the first 48 h (29 %).
Conclusion: Road traffic injury was the most common mechanism that contributed to trauma death in southern Thailand. Additional public policies are needed to encourage injury prevention. One-fifth of trauma deaths occurred before the patients arrived at the hospital, future improvement of pre-hospital care should be warranted
Reference:
1. Bavonratanavech S. Trauma care systems in Thailand. Injury. 2003;34(9):720–1.
Disclosure: No significant relationships.

O155

TRAUMA SYSTEM EVALUATION IN ALBANIA USING AMERICAN COLLEGE OF SURGEONS BASIC CRITERIA

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Introduction: Albania lacks a trauma system although it has a trauma center. This is similar to other developing countries around the world that have a designated trauma hospital, but do not have organized trauma system in place. In the developing world, no accepted standard assessment tool exists to evaluate trauma services.
Materials and methods: To evaluate the trauma system of Albania (July 1, 2012 through December 31, 2012), we used the basic trauma criteria of the American College of Surgeons/Committee on Trauma (ACS/COT) as assessment tools, grouping 22 criteria into 4 key components. We conducted a series of semi-structured interviews, unstructured interviews, focus groups, and a structured workshop at the National Trauma Center (NTC) in Tirana (the capital), the Regional Hospital Durrës in Durrës (the 2nd-largest city in Albania), and the emergency center of the city of Tirana.
Results: Albania has a dedicated NTC with seven other regional hospitals that provide some trauma care, but trauma services are in need of major reforms in order to meet basic requirements for a trauma system. Of the 22 criteria, Albania fulfilled 2: it has a dedicated hospital with a trauma team and a plan in place for disaster management.
Conclusion: The basic trauma requirements of ACS/COT can be used as assessment tools, and the evaluation process per se can serve as an educational tool as well. Further studies are required in other developing countries to validate this study.
Reference:
1. Resources for optimal trauma care of the injured patient: 2006. Chicago, American College of Surgeons; 2006.
Disclosure: No significant relationships.

O156

INTRODUCTION OF A TAILORED TRAUMA CHECK-LIST IN A RURAL AFRICAN HOSPITAL: IMPLEMENTATION PROCESS AND PRELIMINARY RESULTS

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Introduction: Trauma cases are dramatically rising in rural African hospitals [1]. We report about a cooperative effort for developing a tailored trauma check-list in a bush Hospital in Bénin.
Materials and methods: A finalized health mission was planned (August-October 2012) at Tanguieta Hospital (Bénin). Team included two surgeons with previous experiences in Tanguieta (MZ, RC), the Chief of Surgery (AB), the Hospital Director (FP), 2 surgical Residents (CA, SA). After understanding the current management of trauma patients in Tanguieta (MZ), a modified TEAM Course Lecture was administered (MZ, CA, SA), including some real cases observed. An essential check-list for initial trauma management was drawn, containing a few epidemiological data (mechanism, age, delay of presentation), an essential list of ABCDE needs with critical decisions listed beside (to be checked immediately) and limited outcome data (mainly based on mortality). A draft was prepared (MZ, CA, SA), revised on-site (RC, CA, SA, EG), refined by e-mail exchanges. After the initial assessment (AB, CA, EG), the check-list was definitely employed since September 2013. An historical group of patients was retrospectively recorded for future outcomes comparison.
Results: Different releases of the sheet are presented, showing the step by step methodology, which only allowed to get team motivation. Measurable results (mortality rate, time to definitive treatment) and organizational improvements will be analyzed every 3 months.
Conclusion: Empowering health staff is essential before introducing new paradigms for trauma management. Tailoring education and tools to the specific institutional "real life" (logistics, resources, skills) revealed a key factor for quality improvement in LIC without an established Trauma System project.
Reference:
1. http://www.who.int/violence_injury_prevention/road_safety_status/2013/en/index.html.
Disclosure: No significant relationships.

O157

CHILDREN SAFETY DEVICES IN BRAZIL: WHY DO PEOPLE DON'T USE THEM AFTER SANCTION OF THE LAW?

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Introduction: Child safety car devices significantly reduce injuries and death risk in children. A survey conducted in Brazil in 2009 revealed that only 36.1 % of children were safely transported. In 2010, a Brazilian law was implemented, obligating the use of safety devices. The aim of this study is to evaluate the use of such devices after the sanction of the law and the eventual reasons for non compliance.
Materials and methods: A significant sample of Brazilian population aged 18 years or more answered a survey between August, 2012. The study was conducted in two phases. The first aimed to raise the proportion and profile of the target population, while the second investigated the car safety seat use habits for children.
Results: 622 interviews. Children's transporters are young males (57 %), living in a metropolitan area in the South region, concerned about safety and law supervision, with greater education level and income than non transporters (31 %) who are male with lack of

information, living in a non metropolitan area of the Northeast region, that would be motivated to use the device by effective law control or that of an accident

Conclusion: We observed that education, income, age, gender and region influence the use or non use of the safety seats in Brazil. Surveillance is the first reason for using the device, followed by the threat of an accident.

Reference:

1. Durbin DR, Elliott MR, Winston FK. Belt-positioning booster seats and reduction in risk of injury among children in vehicle crashes. JAMA. 2003;289(21):2835–40.

Disclosure: No significant relationships.

NEW ASPECTS IN EDUCATIONAL RESEARCH

O158

BLS TO LAIC PEOPLE: SCOUT GROUPS IN RIO DE JANEIRO, BRAZIL

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Introduction: The cardiovascular diseases represent an important cause of death. To increase survival, the ideal is to have a proper succession of steps that follow a sequence of priorities, as set out in the "chain of survival", described by the American Heart Association (AHA). However, it's necessary to train nonprofessional people in Basic Life Support (BLS), considering they are the first people who deal with sudden cardiac arrest. This report describes the experience of teaching BLS to nonprofessional people.

Materials and methods: This is a descriptive and quantitative/qualitative approach. A survey was conducted in an educational activity organized by the Center for Teaching and Research in Emergency (NEPUr/UFF), with Scouts Boys of Rio de Janeiro. The evaluation was conducted through a questionnaire describing the procedures to be taken in a cardiac arrest from electrical shock. The analysis of the results was made by simple statistics.

Results: It was found that scout boys who never took courses in BLS obtained 54.34 % accuracy; the teams that have made at least one course in BLS were 61.94 % correct and staff who took the course with NEPUr-UFF had 91.66 % correct.

Conclusion: Scout Boys not trained in CPR and who had taken courses with other university groups had similar performance, while teams who have been trained by the University were better than the other group. We conclude that the quality in training should be valued and encouraged in nonprofessional groups.

Reference:

1. Pergola AM, Araujo IEM. O leigo em situação de emergência. Rev esc enferm USP 42(4), São Paulo; 2008.

Disclosure: No significant relationships.

O159

BOOTCAMP: FIRST IMPRESSIONS OF A LONGITUDINAL GENDER BASED SURGICAL AND CLINICAL SKILLS TRAINING

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Introduction: Sex parity of medical students has increased to the degree that approximately 50 % of medical students are women. Orthopaedic and Trauma surgery however, has not managed to catch up and women are still grosslyunder-represented. This prospective investigation aims to analyze the influence of a longitudinal gender based musculoskeletal skills course on interest in orthopaedic and trauma surgery and increase of application rates by female medical students.

Materials and methods: We offer an elective, longitudinal modular skills course for third to fifth year medical students. Module 1 aims at teaching basic surgical and communication skills, including principles of local and regional anaesthesia, fracture fixation, as well as communication skills training using standardized patients. Performance of the targeted surgical and communication skills is tested using an objective, structured assessment of technical skills examination at the end of the course. Students' attitudes and perceptions are assessed using online questionnaires with multiple choice and open questions.

Results: A total of 25 fourth year medical students (16 females, 9 males) participated in the first round. All students rated the course as highly effective in terms of knowledge and skills acquisition. Especially female participants reported a marked increase in interest in Orthopaedic Trauma Surgery and less concerns regarding discrimination and gender-related issues.

Conclusion: Positive evaluation results encourage us to pursue the approach of early exposure to surgical and clinical skills. However, effectiveness will have to be proven by assessment of career development and application rates of participants.

Reference:

1. Brotherton SE, Rockey PH, Etzel SI. US graduate medical education. 2003–2004. JAMA. 2004;292(9):1032–7.

Disclosure: No significant relationships.

O160

COMBINED DSTC AND DATC COURSE, 5 YEARS OF EXPERIENCE

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Introduction: For the fifth time this year we organize a combined international master class on trauma care. We offer not only a surgical version (the Definitive Surgical Trauma Care (DSTC®)) but also an evolved anesthetic version, based on the same principles; the Definitive Anesthetic Trauma Care Course (DATC).

Materials and methods: Both courses are being organized under auspices of the Dutch Trauma Society in close cooperation with the Advanced Life Support Group Netherlands. Both courses are integrated and for more than 75 % combined. The DSATC course follows the well-known DSTC® format, with anesthesiologists joining in on

the general lectures. Also we introduced the "fire side discussion" format, working groups for intense three surgeons versus three anesthesiologists pre planned case scenarios discussions, supervised by a DSTC® and DATC faculty member. Surgeons and anesthesiologists join in the practical sessions on the cadaver laboratory and the animal laboratory. In the latter we have implemented the team concept, in which surgeons, anesthesiologist, scrub-nurses are working together, applying Crew Resource Management principles.

Results: The complete course, including all practical sessions and fireside discussions has been highly evaluated each year. Since 2013 intensivists are also participating in our course format, making this course the best and broadest trauma course ever.

Conclusion: For all military medical specialists (surgeons, anesthesiologist, intensivist) and since 2012 for all traumasurgeons in the Netherlands the course is mandatory. We hope that in the near future this course will be the mandatory course for all medical specialists dealing with trauma

Reference:

1. Information on our website http://www.dstc-datc.nl

Disclosure: No significant relationships.

O161

THE RISING OF A NATIONAL PROGRAMA ON INJURY PREVENTION ON YOUTH IN BRAZIL

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Introduction: Despite of trauma casualties increased in the last years, Brazil still has few programs on injury prevention. The P.A.R.T.Y. (Prevent Alcohol and Risk-related Trauma in Youth) Program was created in 1985 by Sunnybrook's RBC First Office for Injury Prevention. As the Canadian program has a comproved impact, this study aims to show a way to have a resembling Brazilian program.

Materials and methods: We've opened the first officer in Brazil on 2008, and another on 2010. On 2013 a partnership between Brazilian Trauma Society (SBAIT) and Sunnybrook has been firmed and P.A.R.T.Y. Brazil was founded.

Results: Since national program has been started, we created another two offices, one located in a different state. Next step is to establish more four offices until the middle of 2014, including other states that aren't reached yet. Our main care is grow with quality, so anyone who's interested on create a officer, must follow some steps: visit a existent office and achieve partnerships like city hall and prehospitalar rescue. In spite of government has shown interest on P.A.R.T.Y., we still don't have a formal support. We've done until today 146 programs, reaching 6160 students between 16 and 18 years old.

Conclusion: The national prevention program creation is a first step on the injury reduction on Brazil. We've seen, by a lot of examples, how this initiatives can perform changes in long term.

Reference:

1. Banfield JM et al. Effectiveness of the P.A.R.T.Y. (Prevent Alcohol and Risk-related Trauma in Youth) program in preventing traumatic injuries: a 10-year analysis. J Trauma. 2011;70(3):732–5.

Disclosure: No significant relationships.

O162

A TEAM-BASED-LEARNING APPROACH FOR TEACHING COMPLEX PRACTICAL SKILLS: BOON OR BANE?

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Introduction: Purported benefits of team-based-learning are enhancement of quality of student learning and encouragement of problem solving and interpersonal skills. However, it remains unclear whether team-based-learning is effective in teaching complex practical skills.

Materials and methods: We randomly assigned participants (second and third year medical students, 74 women, 44 men) to three groups. The peer-teaching group (PT, $n = 35$) received training by specially-trained 5th year medical students in musculoskeletal ultrasound introducing standard scan planes (2 units, 2 h each, shoulder joint). The doctor group (DR, $n = 39$) received training by experienced board-certified Orthopaedic Trauma surgeons. The TBL group ($n = 44$) received the course material (excerpts from standard literature) for self-study 10 days before the training started (pre-reading phase). In groups of seven students, participants discussed the acquired knowledge and trained standard planes on their fellow team mates. The theoretical learning outcomes were tested using a 9 item multiple-choice questionnaire (MCQ, theoretical and image-based items) and a 1-station objective structured clinical examination (OSCE).

Results: MCQ results concerning theoretical items were significantly higher in the TBL group compared with the other groups ($p = 0.003$). Image-based questions and OSCE results showed no significant difference between groups.

Conclusion: Team-based-learning enhances the quality of student learning and increases theoretical knowledge. With respect to complex practical skills such as musculoskeletal ultrasound, TBL is equally effective as established teaching strategies.

Reference:

1. Vasan NS, DeFouw DO, Compton S. Team-based learning in anatomy: an efficient, effective, and economical strategy. Anat Sci Educ. 2011;4:333–9.

Disclosure: No significant relationships.

O163

USE OF TELEMEDICINE FOR TEACHING PATIENT SAFETY

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Introduction: The patient safety movement has been gaining attention for more than a decade. To broaden the dissemination of this knowledge, the proposal is to spread it through telemedicine. The study aims to evaluate the patient safety care profile in a hospital and validate the telemedicine use as a useful tool for spreading knowledge on health and thereby educating in patient safety.
Materials and methods: An online SurveyMonkey questionnaire was applied after the course, with 12 one-hour classes, in person or via videoconference.
Results: The questionnaire was answered by 191 people, from 32 cities. Most participants were nurses (57.9 %) and 44.3 % of the participants considered safety in their workplace acceptable. Most participants (77.7 %) believed that in their respective work areas something is being done to improve patient safety. More than 65 % stated that patient safety may be being sacrificed to get more work done. Approximately 87 % do not attribute to chance the absence of more serious errors but to the initiatives already taken. When considering the relationship with the institution, 54 % believed that the hospital considers patient safety as a priority. However, only 44.5 % said that the hospital administration seems to be interested in the patient safety before an adverse event happens. All remote participants approved the course model.
Conclusion: The patient safety culture is something new in Brazil and needs more discussion both in the academic and health services. Telemedicine lectures are a useful tool for spreading the concepts.
Reference:
1. Marttos AC, et al. Enhancing trauma education worldwide through telemedicine. World J Emerg Surg. 2012;7(Suppl 1):S
Disclosure: No significant relationships.

O164

FROM ACCIDENT TO OR: A MULTIDISCIPLINARY VR BASED TRAINING COURSE

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Introduction: To ameliorate the team performance in polytrauma treatment we saw the need of a training course involving the prehospital and intrahospital trauma team. The 2 day course offers lectures and skill stations on the first day to impart knowledge of the principles in trauma treatment. On day two three scenarios using a human patient simulator have been trained regarding prehospital treatment, transportation, interface in the ambulance and innerhospital treatment.
Materials and methods: In August 2012 and 2013 until now two courses have been held. 16 people were trained. We used a Human Patient Simulator from CAE Healthcare, scenarios are programmed the day before, the underlying computermodel is physiologic. Pre-Hospital Team performance, Transportation, transfer and innerhospital performance are filmed and debriefed.
Results: We did an course evaluation with an average of 1.8 satisfaction. Moreover we could identify two major procedural failings in each training course and some communication problems. All the problems could be solved through the training course.
Conclusion: The training of the whole team involved in trauma care is an important modification of trauma training. The benefits are the testing of real procedures prehospital, innerhospital and during transfer involving all the real team members. During our two courses we could identify two procedural failures and communication problems during transfer.
References:
1. Rolfe JM, Staple KJ. Flight simulation. Cambridge: Cambridge University Press; 1986.
2. Wong AK. Full scale computer simulators in anesthesia training and evaluation. Can J Anaesth. 2004;51(5):455–64.
Disclosure: Relationships: I am adjunct faculty for CAE Healthcare. No conflicts of interest, no sponsoring.

O165

SURVIVING TRAUMATIC PHYSICAL INJURY: A SYSTEMATIC SYNTHESIS OF CURRENT KNOWLEDGE

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Introduction: Much of the trauma research produced globally is focused on performance indicators and outcome measures [1] with medium to long-term outcomes research focussed on the measurement of physical functioning [2]. Our aim was to investigate the current state of knowledge on the experience of surviving life-threatening injury and the implications for practice.
Materials and methods: The synthesis was informed by systematic literature review strategies, focusing on interpretive data. A description of the experience of individuals who survived life-threatening injury was sought by reviewing 13 studies on the phenomena. Findings were analysed using NVivo software and synthesised to illicit meaning.
Results: The significant number (n = 273) of participant experiences afforded strength and rigour to findings. These showed (1) injury is seen as chasm between what is known in life, to what becomes an unknown future; (2) memory and cognition play an important role in comprehending the event; (3) there is an overwhelming need to reconstruct injury events as a way to create meaning; and (4) family play a pertinent role throughout, providing an anchor to the injured person's previous life and 'self', and their subsequent new reality, reaffirming that life has a course and 'self' has purpose.
Conclusion: Trauma centres must be cognisant of the injured person's need to maintain a continuous sense of self, if the changes associated with injury are to be integrated into a renewed sense of identity. Education is required to provide practical strategies to assist clinicians to develop appropriate and relevant patient goals and expectations.
References:
1. Evans et al. 2009.
2. Livingstone et al. 2009.
Disclosure: No significant relationships.

O166

MEASURING ILLNESS BELIEFS IN PATIENTS WITH INJURIES OF THE LOWER EXTREMITIES: VALIDITY AND REPRODUCIBILITY OF THE DUTCH VERSION OF THE SOMATIC PRE-OCCUPATION AND COPING QUESTIONNAIRE (SPOC-NL)

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Introduction: The Somatic Pre-Occupation and Coping (SPOC) questionnaire was developed to capture illness beliefs and coping toward recovery of physical function and return to work after surgical treatment of tibial shaft fractures [1]. Aim of this study was to translate the SPOC into Dutch (SPOC-NL) and to evaluate the construct validity and reproducibility of the SPOC-NL in patients with injuries to the lower extremities.
Materials and methods: Patients surgically treated for injuries to the lower extremities (N = 106) filled in the SPOC-NL, SF-36 and SMFA-NL questionnaires. Self-reported current work status and work ability were also assessed. To determine construct validity, 16 hypotheses regarding correlations between SPOC-NL and SF-36, SMFA-NL, work status and work ability were defined. To assess reproducibility, 56 patients completed the SPOC-NL after 2 weeks. ICCs and G coefficients were calculated.
Results: Construct validity of the SPOC-NL was good, as 75 % of the predefined hypotheses were confirmed. High ICCs (0.72–0.91) and G coefficients (0.86–0.94) were found, indicating good reproducibility. Participants who had a paid job had significantly higher scores on the SPOC-NL, except for the subscale *Coping* ($p = 0.06$), compared to patients who were on sick leave or received disability benefits. Participants with high work ability had also significantly higher scores than participants with low work ability.
Conclusion: The SPOC-NL is a valid and reproducible measure for the assessment of illness beliefs and coping toward recovery from injuries to the lower extremities. Moreover, a strong association was found between scores on the SPOC-NL, work status and work ability.
Reference:
1. Busse JW, et al. J Orthop Trauma. 2012;26(6):370–8.
Disclosure: No significant relationships.

O167

IMPROVED OUTCOMES WITH A PROCEDURAL CHECK LIST FOR PLEURAL DECOMPRESSION AND DRAINAGE IN TRAUMA

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Introduction: Inter Costal Catheter (ICC) insertion is the standard pleural decompression and drainage technique for blunt and penetrating traumatic injury. Potentially high complication rates are associated with the procedure, with the literature quoting up to 30 % in some cases. Empyema in particular is a serious complication. Risk adverse industries such as the airline industry and military services regularly employ checklists to standardise performance and decrease human errors. The use of checklists in medical practice is exemplified by introduction of the WHO Surgical Safety checklist, which involves 'both changes in systems and changes in behaviour of individual surgical teams' to reduce rates of errors.
Materials and methods: The Alfred Hospital in Melbourne, Australia is an Adult Level 1 Trauma Centre servicing over 7,000 trauma admissions annually. In August 2009 The Alfred Trauma Service introduced an evidence-based checklist system for the insertion of ICCs, combined with standardised formal training for resident medical staff, in an attempt to minimise the incidence of ICC related empyema [1].
Results: Between January 2003 and July 2009 the incidence of empyema was 1.44 % (29 in 2009 insertions). This decreased to 0.57 % between August 2009 and December 2011 (6 in 1,060 insertions) when the measures described above were introduced [$p = 0.0314$ Fischer 2 tailed].
Conclusion: Quality control checklists, such as the ICC checklist, are a functional means to reduce complication rates during trauma resuscitation.
Reference:
1. Fitzgerald M, Mackenzie CF, Marasco S, Hoyle R, Kossmann T. Pleural decompression and drainage during trauma reception and resuscitation. Injury. 2008;39:9–20.
Disclosure: No significant relationships.

MILITARY SURGERY ORGANISATION

O168

TRAUMATEAM CZECH REPUBLIC: EU CIVIL PROTECTION MODEX FALCK EXAMINATION

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Introduction: The Czech Traumateam is a specialized medical unit, with its equipment and arrangement as module Nr. 7—Advanced Medical Post.
Materials and methods: The common purpose of the Civil Protection Mechanism EC is to provide support in case of emergency. The main aim of the Mechanism is the prevention of disasters, decrease in results, detection and timely warning and the minimalisation of response time needed to react to the case of emergency. The commitment of the Mechanism is to gain a grasp of emergency teams for the assistance intervention, performance of training plan for emergency teams and for experts. The civil protection EC holds and financially patronizes courses and trainings. The Czech Traumateam took part in the MODEX Falck exercise in Denmark from the 25th January to the 29th January 2013 representing as the CZERT CZ.
Results: The MODEX Falck exercise took place in Tinglev, Denmark. The theme of the exercise was an earthquake. The Czech Traumateam (CZERT CZ) was composed of 9 doctors, 14 nurses and 11 rescuers from the Prague fire rescue unit. The exercise took 43 h. During this period, 227 patients were treated by the unit CZERT CZ. Among these, 89 patients were seriously injured and 18 patients died. The exercise has thoroughly proved the functioning of the Czech Traumateam when engaged in extraordinary conditions.
Conclusion: The exercise has affirmed the alert of the Czech Traumateam to participate on foreign humanitarian missions.
Reference:
1. Commision decision of 20 December 2007 amending Decision 2004/277/EC, Euratom as regards rules for the implementation of Council Decision 2007/779/EC, Euratom establishing a Comunity civil protection mechanism (2008/73/EC, Euratom).
Disclosure: No significant relationships.

O169

IMPLEMENTING THE NEW NATO MEDIC CURRICULUM IN THE DANISH ARMED FORCES HEALTH SERVICES EDUCATIONAL PROGRAM

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Introduction: In a world of ever changing tactical situation it has been a vision within the NATO medical community to create a common curriculum for a MEDIC education. Such an common education, as described in Nato AMedP-22, would facilitate the international cooperation as seen in the IFOR/ISAF campaign, and thus ensure an unbroken chain of medical help from point of injury to Echelon 4.
Materials and methods: Based on the AMedP-22 we developed a core curriculum plan consisting of a series of lectures, practical skill training, simulation and larger medically based exercises. We added in oral presentation of 5–10 min duration for each participant and written assignments for each participant. Both courses ended in a written and a combined oral/practical exam.
Results: A total of 120 personnel has been undergone this basic Junior Medic training, 120 h. A total of 32 personnel has successfully completed the MEDIC training of 445 h and has been rewarded the MEDIC qualification.
Conclusion: Recognizing the fact that the core Junior Medic and Medic course participant may have a more practical than academic approach to learning, with a quite large proportion with reading disabilities we have successfully implemented an extensive array of simulations and exercise to ensure the course participants meets the demands of the patients in need of urgent medical care.
Reference:
1. McManus JG, et al. Combat trauma training for current casualty care. J Trauma. 2007;62(6 Suppl):S13.
Disclosure: No significant relationships.

O170

HOSPITAL DISASTER PLAN: EFFICACY OF SIMULATION AS TRAINING TOOL FOR HOSPITAL STAFF MEMBERS

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Introduction: Recently San Raffaele Hospital set up a plan to for response to both internal and external major incidents. A one day-course was organized for the hospital staff members involved in the response to different threats.
Materials and methods: 109 professionals were enrolled in four editions of the course: 36 doctors, 60 nurses, 13 employees. In the first part of the day the trainees were introduced to the details of the hospital disaster plan, principles of triage in disaster medicine and damage control surgery. In the second part, they performed a full scale simulation exercise with participation of all delegates in the position they would have in real disaster situation. The drill was performed on the base of MACSIM system. The patients have real injuries that have to be treated by the trainees within a certain time, in order to avoid mortality or complications. The outcome is analyzed in terms of avoidable deaths related to Injury Severity Score. To assess the efficacy of the training in improving the trainees' knowledge of the hospital plan and their skills in disaster medicine, we asked them to answer 15 questions at the beginning and at the end of the course.
Results: All the participants increased their knowledge of the topics under training.
Conclusion: These data show that training based on MACSIM system is a good method the improve hospital staff's knowledge of the hospital disaster plan.
Reference:
1. Lennquist-Montan K, et al. Comparative study of physiological and anatomical triage in major incidents using a new simulation model. Am J Disaster Med. 2011;6:289–98.
Disclosure: No significant relationships.

O171

ROADMAP OF A FRENCH COMBAT SURGEON: ABOUT THREE INTENSIVE WEEKS WITH THE 6TH FORWARD SURGICAL TEAM, SUPPORTING THE WAR IN MALI IN 2013

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Introduction: On January 2012, several insurgent groups (MNLA) began fighting a campaign against the Malian government for independence for northern Mali. The MNLA were initially backed by the Islamist group, but because of their divergences, they began fighting against Ansar Dine and other Islamist groups (MUJAO, AQMI). The government of Mali asked for foreign military help to re-take the north. On 11 January 2013, the French military began operations against the Islamists (SERVAL). Forces from other African Union states were deployed shortly after (FAMA, MINUSMA).
Materials and methods: The 6th forward surgical team (FST) operates in a mobile hospital facility consisting of five tents with intensive care and operative room. The facility's equipment is suitable for the management of adults. An X-ray, an ultrasound and a laboratory are available. The surgical team is made up of 12 people. The mission was to provide a surgical support to the French army, the FAMA and the MINUSMA.
Results: The authors report the mission of the 6th FST deployed in Gao (Mali), from august to December 2013, and focused on three intensive weeks in October. They report the daily surgical activity with the management of patients, victim of war trauma (thoracic and vascular traumas, abdominal wounds, brain penetrating injuries, burns and open fractures of the limb), and mass casualties following a suicide bomber. The development of the medical aid to the civil population is detailed too.
Conclusion: The couple orthopedic/digestive surgeons is the cornerstone of the FST. A a wide range of skills and expertise are essential.
Disclosure: No significant relationships.

O172

INCIDENCE AND EPIDEMIOLOGY OF CASUALTIES TREATED AT THE DUTCH ROLE 2 ENHANCED MEDICAL TREATMENT FACILITY AT MULTI NATIONAL BASE TARIN KOWT, AFGHANISTAN IN THE PERIOD 2006–2010

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Introduction: To improve care for the injured service member, we have analyzed battle casualty patterns and mechanisms. This study is the first documented report of wounding patterns and mechanisms of battle casualties treated at the Dutch role 2 Enhanced Medical Treatment Facility at Multi National Base Tarin Kowt, Uruzgan, Afghanistan.
Materials and methods: Participants were selected from the trauma registry at the Dutch role 2 Enhanced Medical Treatment Facility, where they fitted the criteria battle casualty and disease non battle injury between August 2006 and August 2010.
Results: The trauma registry query resulted in 2,736 casualties, of which 60 % (1,635/2,736) were classified as disease non-battle casualties and 40 % (1,101/2,736) as battle casualties. The battle casualties sustained 1,617 combat wounds, resulting in 1.6 wounds per battle casualty, these injuries predominately were caused by explosions (55 %) and gunshots (35 %). The wounding pattern was as follows: head and neck (21 %), thorax (13 %), abdomen (14 %), upper extremity (20 %) and lower extremity (33 %).
Conclusion: The wounding patterns seen at the Dutch role 2 Enhanced Medical Treatment Facility at Multi National Base Tarin Kowt resemble the patterns as recorded by other coalition partners. The wounding patterns differ with previous conflicts: a greater proportion of head and neck wounds, and a lower proportion of truncal wounds.
Reference:
1. Ramasamy. A review of casualties during the Iraqi insurgency 2006—a British field hospital experience. Injury. 2009.
Disclosure: No significant relationships.

O173

INTERFACE OF HOSPITAL COMMAND CENTER AND PREHOSPITAL COMMAND STRUCTURES. LESSONS LEARNED FROM A HOSPITAL EVACUATION SZENARIO IN GERMANY

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Introduction: Concerning the "Chain of survival" the last box is the hospital itself. What happens, if the hospital is affected by a mass casualty? This presentation tries to enlighten the special communication problems between the different organisation structures in the innerclinical and the prehospital command systems.
Materials and methods: Every german hospital is enforced with disaster plans for external an internal mass casualties scenarios. Every hospital tries to manage his problems by itself. The command structures are hierarchial. A central command center is established and leads every aspect of the scenario. The prehospital command structure uses several structures for the medical services, the fire brigade and the civil protection services. Analysing a real fire in a communal german hospital and a great civil protection exercise concerning evacuation, triage and dislocation of 100 affected patients, the problems in solving the problems are shown.
Results: Hospital command center uses different terms and techniques in solving the tactical and medical needs as a prehospital command structure do. The mail problems occurs in non medical triage, documentation and dislocation of many affected patients. Following the evaluation of the fire in the hospital and the following exercise a new communication regime was development. The exercise shows the effectiveness of the new structures concerning a common language and similar leading structures in mass casualties.
Conclusion: The new command structures are simple and safe. The results from a great exercise are satisfactory
Reference:
1. http://www.bgu.murnau.de.
Disclosure: No significant relationships.

O174

CARING FOR CASUALTIES FROM A COUNTRY DURING CIVIL WAR

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Introduction: Zefat is 320 bed hospital, on Lebanonese and Syrian boarders. The ongoing civil war in Syria, causes many casualties. In February our government permitted six wounded Syrians, to cross border, enter Israel and receive treatment in our hospital, thinking it is singular request. We now know that day was the beginning of ongoing operation that until today 86 Syrian casualties received care in our hospital, no knows when this will end.
Materials and methods: This presentation will elaborate ethical, and treatment challenges faced when caring for casualties of civil war, from country always regarded as the enemy and the casualties been educated that we are their adversary. Wounded arrive after initial minimal treatment, sometimes left in open fields or hospitals without providers. We admit them in stages of neglect without knowledge of mechanisms of injury. We are civilians caring for civilians, without politics, without taking military orders, treating wounded without knowledge of their families, not knowing if they will be allowed ever to see their loved ones again.
Results: Data and narratives 86 wounded Syrians will be analyzed and discussed, case studies will be presented. We receive severely wounded children, arriving on foot without family.
Conclusion: In war, health providers are promoters of healing and peace. Today the Syrian rehabilitated are our friends. I hope that this influences peace between nations better than politicians.
Reference:
1. MacQueen G, McCutcheon R, Santa-Barbara J. The use of health initiatives as peace initiatives. Peace Change. 1997;22(2):175–97.
Disclosure: No significant relationships.

O175

NURSES ROLE IN MASS CASUALTY EVENTS

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Introduction: Early preparations are mandatory to increase the probability of survival of casualties of Mass casualty event (MCE), and to decrease the potential devastating impact on society. Well prepared physicians, and nurses from all areas of the hospital, should develop emergency guidelines and regulations. Adequate preparedness of the medical teams will decrease the chaos associated with Mass casualty event, and increase patient survival and social durability
Materials and methods: As a result of years of our experience in functioning in MCE this talk discusses hospital nurse management in preparation and caring for casualties of MCE. This presentation will describe how nurses can take leadership in preparing ER, ICU OR and surgical teams as well as non-medical staff and volunteers to take essential roles during MCE. Surge capacity, communication issues,

family challenges, identifying the casualties, dealing with the media, emotional hardiness, and preparation for resilience will all be discussed. Challenges which we overcame and learned from our mistakes will be presented. Organizational tips and clinical cases will be offered.
Results: Sharing vital information that we have collected over 10 years dealing with MCE is essential for other trauma and surgical teams to know in order to save lives. We hope that the data we will share during this presentation will benefit medical providers participating in this conference.
Conclusion: Our experiences in caring for the casualties during MCE are likely to influence how well prepared you are for the next event in your hospital.
Reference:
1. Shapira S, Shemer J, Oren M. Hospital management of a bioterror event. IMAJ. 2002;4:493–4.
Disclosure: No significant relationships.

SOFT TISSUE INJURIES

O176

ANALYSIS OF THE COMPARTMENT SYNDROME OF THE THIGH IN 83 CONSECUTIVE CASES

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Introduction: Although the compartment syndrome of the thigh (CST) rarely occurs, it is known as an emergency situation and requires immediate intervention. Despite the fact that CST is often identified as severe injury, there are merely studies with a handful number of cases to be found in literature [1].The purpose of this study was to analyse 83 prospectively collected cases presented to the department for Trauma Surgery, Medical University of Vienna.
Materials and methods: Since 1995 the senior author has collected data of 83 consecutive patients being treated at the Department of Trauma-Surgery, Medical University of Vienna. Additional information was added from the patients' charts. Statistical analysis was done with Microsoft-Excel® and SPSS®.
Results: Average age 41.8a (11a–87a). Men were more affected than women (74/9). 57 had an isolated CST, 26 showed additional injuries. 2 patients suffered from a bilateral CST. Manifest CST was diagnosed in 71 patients. 69 patients underwent surgical intervention (single lateral incision). In most cases if detectable the hematoma was found in the lateral vastus. 54 fasciotomy-wounds were closed, either by skin suture alone or by fascial and skin suture. 10 patients died, only 1 due to CST. Contrary to our expectations most of the 14 non-surgical treated showed good results, whereby only 2 had a manifest CST.
Conclusion: The lateral single incision is sufficient. Still in selected cases a conservative treatment under observation is possible. Surgical interventions showed best results when performed early and using gradual wound reduction and suture of fascia and skin.
Reference:
1. Ojike et al. Injury. 2010.
Disclosure: No significant relationships.

O177

EFFECT OF NEGATIVE PRESSURE WOUND THERAPY ON INFECTION COMPLICATIONS OF GRADE III OPEN FRACTURES

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Introduction: Grade-III open fractures (OF) are serious injuries that frequently have infection complications. Primary application of negative pressure wound therapy (NPWT) to soft tissue injury in combination with antibiotic and surgical treatment could reduce the number of infectious complications.
Objective: To compare results between treatments of soft tissue injury of grade-III open fractures with NPWT and primary closure or covering with polyurethane COM in combination with continual wound lavage (CWL).
Materials and methods: Retrospective study of 39 patients with 41 grade-III OF, were treated in University Hospital Brno from 2007 to 2012. Patients were divided into two groups, those treated in standard surgical procedure and soft tissue injury was treated with primary closure or covered with polyurethane COM, in combination with CWL (group 1; $n = 21$). And those treated in the same surgical procedure, where soft tissue injury was covered with NPWT (group 2; $n = 20$). Main outcome measurements: infection and recurrent infection rate, osteomyelitis rate, time to negative bacteriological swab. Results were tested by Mann–Whitney U test and Fisher exact test.
Results: Total infection rate was 36.6 % ($n = 15$). In group 1 there were four deep (20 %) and seven superficial (35 %) infections, five recurrent infections (25 %) and two osteomyelitis (10 %). Whereas in group 2 there were one deep (4.8 %) and three superficial (14.3 %) infections, nobody developed recurrent infection ($p = 0.021$) and osteomyelitis. The time to receive a negative bacteriological swab in group 1 was 22 days and in group 2 was 12 days ($p < 0.001$).
Conclusion: NPWT reduce duration of bacterial contamination and the risk of recurrent infection in patients with grade-III OF.
Reference:
1. Stannard JP
Disclosure: No significant relationships.

O178

EFFECTS OF NEGATIVE PRESSURE WOUND THERAPY ON LOWER LEG FASCIOTOMY WOUND CLOSURE

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Introduction: Fasciotomy wounds can be a difficult reconstructive challenge that may prolong length of hospital stay. Skin grafting can lead to morbidity and scarring at both the donor and the fasciotomy site. Primary closure results in a better functional and aesthetic outcome with less morbidity for the patient.
Objective: To evaluate lower leg fasciotomy wound closure outcomes while comparing treatment with polyurethane COM and negative pressure wound therapy (NPWT).
Materials and methods: A retrospective study of 32 patients who underwent lower leg fasciotomy due to injury treatment from 2007 to 2012 at Department of Trauma Surgery, University Hospital Brno. Of these fasciotomy wounds 19 received NPWT in combination with dynamic elastic ligature, and 13 were treated with polyurethane COM. Fasciotomy wounds were closed either with a primary suture or in the case of persisting oedema and skin retraction the defect was covered with split thickness skin graft.
Results: There was statistically significant higher rate of primary closure using the NPWT versus traditional polyurethane COM

dressing ($p = 0.020$). The time to definitive wound closure or skin grafting was shorter and number of dressing changes was lower in the NPWT group ($p = 0.043$).
Conclusion: NPWT combined with elastic dynamic ligature offers many advantages for fasciotomy wound closing in comparison with traditional techniques. Higher rate of primary wound closures and shorter time for definitive wound treatment will decrease hospitalization time, allow earlier rehabilitation and lead to increased patient satisfaction.
Reference:
1. R. Fowler et al. Assisted closure of fasciotomy wounds
Disclosure: No significant relationships.

O179

THE PREVENTION OF WOUND INFECTION IN HIGH RISK ABDOMINAL WOUND CLOSURES BY NEGATIVE PRESSURE WOUND THERAPY (NPWT)

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Introduction: The purpose of this study is to evaluate the effect of NPWT on closed surgical incisions in high risk patients vs. closed conventional treatment. Wound infections continue to be an issue in abdominal surgery and negative pressure application may have promise in decreasing wound complication.
Materials and methods: A retrospective review of prospectively collected data in patients with high-risk abdominal wounds was undertaken. Comorbidities, infectious risk factors, wound classification and outcomes were evaluated. The primary outcome was wound infection rate. Secondary outcomes included device safety and overall surgical-site complication rate.
A total of 40 pts participated to the study. NPWT was applied to surgical incision using a commercial kit (15 pts) (Prevena®—KCI) or a home made (10 pts) dressing system using conventional foam kit of KCI. The two groups were compared to conventional wound dry dressing.
Results: 25 pts at high for infection rate underwent to one stage reconstruction of the abdominal wall by biological prosthesis. They were divided in two groups—conventional dressing (15 pts) and home made NPWT (10 pts).In NPWT group infection rate was 1/10 pts (10 %) and in conventional dressing infection rate was 6/15 pts (40 %)
Prevena group included 15 pts: infection rate was 1/15 (7 %). The comparable historical control wound complication rate was 20 %, and χ^2 analysis showed a statistically significant decrease in the infection rate with negative-pressure wound therapy ($P < 0.05$).
Conclusion: NPWT is highly effective to reduce infection rate in high risk abdominal wound closures despite the system used.
Reference:
1. Rosen MJ, et al. Ann Surg. 2013;257:991.
Disclosure: No significant relationships.

O180

RISK FACTOR ANALYSIS IN 280 CASES OF NEGATIVE-PRESSURE WOUND THERAPY

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Introduction: Prolonged duration of negative-pressure wound therapy (NPWT) is associated with increased bacterial growth. It was the aim of this study to evaluate potential risk factors for the duration from first application of NPWT to secondary wound closure and to identify factors that increase the rate of hospital-readmission.
Materials and methods: In a retrospective cohort study, 261 patients (46 ± 19 years, 70 female) who underwent 280 treatments with NPWT were analyzed. Patient specific and demographic characteristics and the presence of several risk factors were documented. The duration from first application of NPWT to secondary wound closure, the number of interventions, the duration of hospital stay, and the incidence of readmissions due to complications of the wound treated by NPWT were recorded and a risk factor analysis was performed.
Results: The median number of NPWT procedures was 2.0 ± 2.0, the duration of NPWT was 6.0 ± 14.7 days and the length of hospital stay was 16.0 ± 27.9 days. Presence of an open fracture ($p = 0.002$) and increased age ($p = 0.004$) were identified as independent risk factors for a prolonged duration of NPWT. Patients who smoked ($p = 0.001$) or patients with alcohol/drug abuse ($p = 0.015$) were more likely to return to hospital (smoking: 18/58 cases; alcohol/drug abuse: 7/19 cases). No such association was seen for diabetes, PVD, immunosuppressive medication, immunodeficiency, trauma, infection, and open fracture.
Conclusion: Patient age and presence of an open fracture are predictors of a prolonged duration from first application of NPWT to secondary wound closure. These results should be taken into account for the calculation of average costs and anticipated hospital stay.
Reference:
1. Streubel. J Am Acad Orthop Surg. 2012;20:564–74.
Disclosure: No significant relationships.

O181

TOPICAL SILVER AGENTS IN TREATMENT OF PARTIAL THICKNESS BURN WOUNDS IN CHILDREN: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction: Silver containing dressings and topicals are widely used in the treatment of partial thickness burns in pediatric patients. However, the available evidence is largely based on studies involving adult patients despite the important differences between the pediatric skin and adult skin. The objective of this study is to compare the effectiveness of silver containing dressings and topicals with non-silver treatments in partial thickness burns in pediatric patients.
Materials and methods: A systematic review and meta-analysis of all RCTs comparing silver versus non-silver treatment in pediatric patients aged 0–18 years with partial thickness burns in the acute stage was performed. Primary outcomes were wound healing and grafting. Secondary outcomes were infection or colonization, number of dressing changes, pain, length of hospital stay (LOS), cost-effectiveness and scar formation.
Results: Seven RCTs were included involving 473 participants. All the RCTs compared silver sulfadiazine (SSD) with various non-silver treatments: Mepithel®, Biobrane®, TransCyste®, Collagenase ointment with Polymixin and Amniotica Membrane. Wound healing time with use of SSD was significantly longer compared with non-silver treatment [mean difference 3.43, 95 % confidence interval (CI) 2.07–4.78], but no difference in the incidence of wound infection [odds ratio (OR) 1.41, 95 % CI 0.81–2.47] or grafting [OR 1.14, 95 %

CI 0.49–2.68] were found. No robust comparisons could be made regarding secondary outcomes due to missing data or use of incomparable effect measures between studies.
Conclusion: Our systematic review and meta-analysis implies that there is no evidence that SSD promotes wound healing, prevent wound infection or results in lesser grafting in pediatric patients with partial thickness burns when compared to non-silver treatments.
Disclosure: No significant relationships.

O182

MISSING DATA IN PRECLINICAL CARE OF SEVERELY BURNED PATIENTS

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Introduction: Only a small fraction of trauma patients suffers from burn injuries resulting in low evidence and insecurity in preclinical treatment of severe burned patients. Nevertheless early appropriate treatment of the burn injured patients presumably effects mortality and outcome of burn disease, but documentation of preclinical care providers may raise significant concerns.
Materials and methods: Retrospective assessment of emergency service protocols of 300 severely burned patients was performed. Included patients presented thermal injuries with an affected total body surface area (TBSA) over 10 %. Analysis was performed with regard to completeness of protocols focussing on aspects of preclinical burn treatment.
Results: Analyses showed only partial documentation of vital parameters and clinical assessments during preclinical care of burned patients. Affected TBSA was estimated in 72 %, blood pressure in 77 % and pulse oximetry in 48 % of cases. Capnometry was documented in 17 % and ECG in 54 % of protocols. Glasgow coma scale was determined in 75 %, NACA-score in 60 % of patients. No protocol showed documentation of body temperature.
Conclusion: Results of the present study reveal a lack of assessment of information in preclinical care of thermal injured patients. A more consistent preclinical documentation is necessary to review the influence of first clinical treatment on mortality and outcome. This research is inevitable to develop a standardized evidence-based preclinical treatment of burned patients. Completeness of medical service documentation with focus on requirements of burn patients is a first essential step for optimal care.
References:
1. Allison K. The UK pre-hospital management of burn patients: current practice and the need for a standard approach. Burns. 2002;28(2):135–42.
Disclosure: No significant relationships.

O183

PREHOSPITAL TREATMENT OF SEVERELY BURNED PATIENTS: 79 % ARRIVE WITH HYPOTHERMIA AT THE CENTRE

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Introduction: Research has shown that there is no adequate initial treatment for burned patients in prehospital setting. Insecurity arises by reason of absence of consensus guidelines, especially concerning the airway management, cooling, temperature monitoring, intravenous fluid replacement, dressings, assessment of burn size and severity. The objective of this study is to compare regional standards to existing recommendations for the prehospital care of burned patients.
Materials and methods: A retrospective analysis of 300 patients with a total-body-surface-area (TBSA) of $\geq$15 % was performed. We evaluated data from the preclinical service protocols and medical records to correlate treatment and outcome.
Results: A total of 300 patients showed a mortality of 20 %. The average TBSA was 29 %. 40 patients (13 %) suffered from accompanying injuries. Hypothermia at admission (temperature $\leq$36 °C) was present in 79 %. Patients with a temperature of 34.6°–35.9° had a TBSA of 35 % and patients with a body temperature $\leq$34.5° C showed even a TBSA of 47 %. Mortality was higher (27 %) in patients with a body temperature $\leq$34.5 °C. In cases of hypothermia, the average length of stay was 41 days compared to 31 days without hypothermia.
Conclusion: It becomes apparent that there is insufficient prehospital treatment and an absence of quality of supply. Hypothermia was shown to correlate with length of stay and mortality. Therefore, there is a need to enunciate guidelines to prevent hypothermia and to optimize the preclinical treatment in all above listed topics.
References:
1. Singer et al. 2010.
2. Hirche et al. 2011.
Disclosure: No significant relationships.

O184

MULTI-TRAUMA BURNS INJURIES IN VICTORIA: A 10 YEAR REVIEW

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Introduction: Multitrauma burn patients are uncommon, and constitute a multifaceted clinical challenge.
Materials and methods: Data was extracted for patients with severe burn injury from the Victorian State Trauma Registry (VSTR) for the period July 2001 to June 2011. A severe burn injury was considered to be a total burn surface area (TBSA) $\geq$20 %. These patients were categorized into two groups: multitrauma burn or isolated burn only.
Results: Over the 10-year period, there were 342 cases of severe burn injury, 175 had sustained significant injuries other than the burn. Over 90 % of the multitrauma cases had associated serious chest injuries. Additionally, 80 % of multitrauma cases were the result of fire, flames or smoke compared to 65.3 % of isolated cases. A higher

proportion of multi-trauma patients were admitted to ICU (89 vs. 63 %) and the median (IQR) length of stay in ICU was 14 (5–27) days for multi-trauma patients compared to 11 (2–19) days for isolated cases. The median (IQR) hospital length of stay was 33.3 (16.8–64.1) days for multi-trauma patients compared to 30.7 (12.8–50.7) days for isolated cases

Conclusion: Multi-trauma injury adds complexity to the management of severe burns. Multi-trauma burn cases are more resource intensive, with more ICU admissions, and longer ICU and hospital length of stay. This presentation will profile and compare the frequency, demographics and outcomes of patients with severe multi trauma burn injury and major isolated burn injury within the VSTR.

Reference:

1. Rosenkranz KM, Sheridan R. Management of the burned trauma patient: balancing conflicting priorities. Burns. 2002;28:665–9.

Disclosure: No significant relationships.

O185

PRIMARY CLINICAL MANAGEMENT OF BURN INJURED PATIENTS IN GERMANY, AUSTRIA AND SWITZERLAND

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Introduction: Clinical management of multiply injured patients is characterized by systematic assessment and treatment due to concise guidelines like ATLS©. Although the complexity of major burn injuries and consecutive burn disease necessitate an equally high degree of expertise, standardized approaches to burned patients are lacking and there is little evidence in clinical care of burn victims.

Materials and methods: A questionnaire was sent to 21 burn trauma centres in Germany, Austria and Switzerland. It surveys structural and statistical data, indication for admission, frame conditions concerning the burn trauma room and its staffing and leading. Furthermore the use of standard-operating-procedures (SOPs) and quality management is evaluated.

Results: 19 questionnaires were returned. Indication for admission varied as well as personnel structure and attendance of a consultant surgeon (54 %). Burn trauma rooms are managed either by plastic surgeons (75 %), trauma surgeons (8 %) or anaesthesiologists (8 %). In one centre the team leader is easily identifiable, 23 % perform a team-time-out and 38 % are able to call an ethical conference. Over 90 % provide SOPs and 60 % indicate the use of ATLS. 85 % have an in-house burn register with different variables.

Conclusion: The survey shows heterogeneous clinical care of burned patients. A standardized infrastructure and a consistent approach to the patient are lacking. Further investigation is needed to review the existing SOPs and the clinical treatment. Although most centres register their burn trauma cases more detailed documentation is needed to provide more reliable data to develop evidence-based guidelines for primary clinical care of burn victims.

Reference:

1. Kasten KR, Makley AT, Kagan RJ. Update on the critical care management of severe burns. J Intensive Care Med. 2011;26(4):223–36.

Disclosure: No significant relationships.

O186

THREE-DIMENSIONAL IMAGING: A NOVEL, RELIABLE, AND VALID TECHNIQUE FOR MEASURING TOTAL BODY SURFACE AREA IN BURNS

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Introduction: An accurate estimation of the Total Body Surface Area (TBSA) is an essential component of burn wound management. However, the reliability and validity of traditional methods are highly dependent on the experience of the clinician. Therefore, there is a need for an accurate technique for calculating TBSA. 3D imaging may be a potential technique to objectively measure the surface area of burns. This study investigated the reliability and validity of 3D imaging for measuring TBSA.

Materials and methods: 58 burn wounds on 48 patients were assessed with the Artec MHT™ 3D Scanner to evaluate the reliability of the measurement procedure. To test the validity, three stickers of standardized sizes were applied on 20 healthy volunteers, resulting in 60 areas, which were subsequently assessed. Scanning, post-processing and surface area measuring was performed by two independent clinicians.

Results: 3D imaging showed an excellent inter-observer reliability with an ICC of 0.99 and coefficient of variation (CV) 6.1 %. Difference between two measurements of two observers were plotted in a Bland–Altman plot and limits of agreement were calculated at $0 \pm 0.17 \times$ *mean surface area.* The validity analysis has shown a high ICC of 0.99 and a small Standard Error of Measurement (SEM) and CV in the forearm (SEM 118 mm^2, CV 1.52 %), followed by the sternum (SEM 28 mm^2, CV 1.08 %) and the thigh (SEM 51 mm^2, CV 0.33 %).

Conclusion: 3D imaging using the Artec MHT® 3D Scanner, is a reliable and valid instrument for measuring the burn wound percentage of TBSA.

Disclosure: No significant relationships.

ACHIEVEMENT AND ADVANCES OF ATLS

O187

APPLICATION OF CERVICAL COLLARS: AN ANALYSIS OF PRACTICAL SKILLS OF PREHOSPITAL CARE PROVIDERS AND EMERGENCY PHYSICIANS

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Introduction: Correct application of a cervical collar is essential to achieve the optimal immobilization of the cervical spine [1]. Thus, the objective of the present study was to analyze the practical skills of prehospital care providers and emergency physicans using a cervical collar.

Materials and methods: Prehospital care providers and emergency physicians were asked to immobilize the cervical spine of a life-support dummy with a common cervical collar. The procedure was evaluated and documented on a checklist. Furthermore, a standardized questionnaire was given to all subjects.
Results: Totally, 104 subjects took part in the study (prehospital care providers: 75 %, emergency physicians: 13 %). Mean work-experience in emergency medical care was 12.3 ± 9.1 years. 84 % of the subjects declared to feel safe with the application of cervical collars. Data analysis showed an accurate application of the cervical collar in 11 % of all procedures. Failure was detected in 89 % of the procedures; particularly: incorrect transfer of the measured size at the dummy site to the cervical collar (66 %), incorrect locking of the cervical collar (49 %) and incorrect measurement of the size at dummy site (35 %).
Conclusion: In summary the study reveals deficiencies concerning the application of a cervical collar to immobilize cervical spine among prehospital care providers and emergency physicians. Since correct application of a cervical collar is essential to achieve the optimal immobilization [1], quality of education and training concerning the prehospital procedure of cervical collars' application should be discussed.
Reference:
1. Bell et al. Spine J. 2009;9:225.
Disclosure: No significant relationships.

ADAPTION OF SURGICAL PROCEDURES IN MILITARY CONFLICTS

O188

DELAYED VASCULAR TRAUMA REPAIR IN WAR SURGERY

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Introduction: Vascular trauma demands urgent intervention. The Syrian civilian war has engendered an exceptional delay in medical attention for the wounded. Survivors present 24–72 h after injury with hemorrhagic shock, systemic dysfunction, chronic malnutrition, infected wounds, and with critical limb injury, ischemia and infection.
Materials and methods: During 2013, 200 war casualties were treated in our facility. 11 had vascular involvement and needed invasive interventions. All injuries were penetrating, either combined with orthopedic injuries or multi-vascular with systemic involvement. Fifteen vessel repairs were performed (9 arterial—3 lower limbs, 5 upper limbs; 4 venous—2 lower limb with venous/synthetic bypass/patch; 2 endovascular A-V-Fistula closures). Combined orthopedic-vascular injuries were treated primarily with bone alignment (external fixation) followed by vascular repair due to the long-standing ischemia.
Results: All patients survived. There was one amputation due to severe sepsis, disruption an infected bypass graft, tissue necrosis and neurological deficit. One bypass became infected with need for extra-anatomic re-bypass. All patients were discharged toward further rehabilitation with viable limbs, well-nourished and with no residual sepsis.
Conclusion: Prolonged evacuation of war casualties warrants a different treatment regime: viable, though critically ischemic injured limbs, can be salvaged with meticulous multidisciplinary treatment (surgery and critical cares). The treatment should be focused on restoring blood perfusion and outflow, mandatory wide fasciotomies, bone alignment, repeated scheduled debridement of soft tissue, early antibiotics and high calorie diet is all the key to success.
Reference:
1. A two-year experience of treating vascular trauma in the extremities in a military hospital. J Pak Med Assoc. 2013;63(3):327–30.
Disclosure: No significant relationships.

O189

SAVING LIMBS IN WAR

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Introduction: From February to September 2013, 107 Syrian civil war casualties were transferred to Ziv Hospital, a small district hospital in northern Israel. 62 patients (58 %) sustained a limb injury. Surgical teams familiar with conflict injury provided treatment in our high level care setting, which afforded staged surgery towards limb salvage and rehabilitation—services not typically available in a field hospital. We present our experience of limb salvage surgery, external fixation, and skin grafting for these patients.
Materials and methods: The Ziv Hospital trauma registry was reviewed, and details of injuries and treatments compiled.
Results: Limb salvage treatment comprises aggressive debridement, repeated as often as necessary; excision of infected, damaged bone; exploration and preservation of intact neurovascular structures; limb realignment with external fixation; vacuum assisted closure; and split thickness grafting for coverage of skin defects. Of 62 patients with a limb injury, 40 patients (65 %) had at least one open fracture. 30 of those with open fractures (75 %) were treated by external fixation of the damaged limb. All patients received debridement of their wounds, most of which were then managed with VAC therapy. 19 patients (31 %) received a skin graft. 2 patients underwent initial shortening of the fractured limb, with planned limb lengthening. Patients presenting earlier in the year had more advanced sepsis due to delayed evacuation and transfer.
Conclusion: Initial outcomes after surgery were impressive. However, staged care after discharge back to a conflict zone raises questions about follow up, wound care, physiotherapy and further treatment.
Reference:
1. Lerner A. Eur J Orthop Surg Traumatol. 2010;20:381–388.
Disclosure: No significant relationships.

O190

HOT AIR BALLOON CRASHES: IS THERE A COMMON DENOMINATOR: SINGLE CENTER EXPERIENCE IN COMPARISON WITH OTHER MAJOR EVENTS

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Introduction: There has been a rise in the frequency of major hot air balloon crashes reported in the last decade. Our center addressed one of those incidents in the year 2012. With scarce literature available, we decided to compare our experience to other similar events, trying to identify any common variables.

Materials and methods: A thorough retrospective analysis of the Ljubljana Marshes Hot Air Balloon crash (august 23, 2012) was performed to begin with. Subsequently a comparison to all other major hot air balloon crashes was made based on professional and general literature. Special consideration was given to data concerning and conditioning hospital mobilisation, mortality and triage.
Results: High mortality rates, moderate hospital mobilisation and difficulties in triage seem to be the leading facts predominant in a hot air balloon crash. Unusually, the Ljubljana Marshes Hot Air Balloon crash stands out of this average, revealing that mechanism of accident, regional disaster preparedness and full hospital mobilisation could maximise survival rates in hot air balloon crashes.
Conclusion: Hot Air Balloon Crashes are typically multiple casualty incidents of a lower grade as far as number of injured is concerned, but high mortality rates disclose a necessity for improvement. There is too little data at this point to give solid conclusions, but an integrated system of prehospital care supported by a Level 1 Trauma center seems to be the solution in Hot Air Balloon Crashes with a favorable mechanism of accident.
Reference:
1. Hot Air Balloon Crash, Mass Casualty Incident, disaster medicine, triage, hospital mobilisation, mortality.
Disclosure: No significant relationships.

O191

DECOMPRESSIVE CRANIECTOMY: DIFFERENT TIMEPOINTS FOR CIVILIAN AND MILITARY HEAD INJURY?

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Introduction: Decompressive craniectomy after head injury is controversially discussed, although some clinical effects for subgroups are recognized. Beside the indication itself and the extent of decompression the adequate timepoint is a matter of concern. Under optimum conditions a strategy of staged procedures is possible, but in the military theater often a primary decompressive craniectomy is performed. Whether staged or primary decompression is advisable remains to be determined.
Materials and methods: Comparison of a published series of craniectomies performed in the theater and a group of craniectomies after civilian head injury.
Results: Mortality rate after primary craniectomy is lower than after staged decompression. Results after military head injury are better than after civilian trauma. But the mortality does not depend on the chosen surgical strategy. The main prognostic factors are clinical condition and the morphological (radiological) extent of the injury.
Conclusion: Staged procedures for a finding-related decompression after severe head injury is useful if optimum infrastructural circumstances are available. Under military conditions these optimum circumstances sometimes are absent. A primary decompression in the military theater can therefore be necessary and advisable.
References:
1. Huang. Thirty-day mortality in traumatically brain-injured patients undergoing decompressive craniectomy. J Neurosurg. 2013.
2. Yuan. Comparative study of decompressive craniectomy in traumatic brain injury with or without mass lesion. Br J Neurosurg. 2013.
Disclosure: No significant relationships.

O192

SOFT TISSUE COVERAGE OF COMBAT-RELATED EXTREMITY INJURIES: USE OF PEDICLE FLAPS ON THE BATTLEFIELD

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Introduction: Definitive management of extremity injuries including soft tissue coverage can be challenging in battlefield medical treatment facilities due to limited available resources and operational compulsions. The purpose of this study is to explore if such reconstructive surgery can be performed in a Combat Support Hospital (CSH).
Materials and methods: A clinical study was performed in the KaIA (Kabul International Airport) CSH from July 2012 to January 2013.
Results: During this period 23 local patients treated for coverage of combat-related extremity injuries were included. Half of them were injured by improvised explosive devices. They totalized 28 extremity injuries including 18 Blast Trauma (BT) and 10 Non Blast Trauma (NBT). Prior to reconstruction, an average of 3 débridements per injury was performed and negative pressure therapy was applied on 11 injuries, without significant difference between BT and NBT groups. An overall of 35 extremity pedicled flaps was performed. There were 26 fasciocutaneous flaps, 8 muscle flaps, and one composite flap. Patients were reviewed with a mean follow-up of 59 days. Soft tissue coverage was achieved in all patients with complete wound healing. Five patients had postoperative complications including two deep infections, one partial flap necrosis and two flap failures, without difference according to injury mechanism.
Conclusion: This study demonstrate that pedicle flap transfers provide simple and safety coverage in this particular context whatever the injury mechanism.
Reference:
1. Tintle SM, Gwinn DE, Andersen RC, Kumar AR. Soft tissue coverage of combat wounds. J Surg Orthop Adv. 2010;19:29–34.
Disclosure: No significant relationships.

O193

IMPROVED SURVIVAL IN UK COMBAT CASUALTIES FROM IRAQ AND AFGHANISTAN: 2003–2012

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Introduction: The aim of this study was to examine the temporal changes of injury patterns by body region and survival in UK military casualties following a decade of conflict in Iraq and Afghanistan.
Materials and methods: The UK Military Joint Theatre Trauma Registry was searched for all UK Military casualties sustained in Iraq and Afghanistan between 1 Jan 2003 and 31 Dec 2012. The New Injury Severity Score (NISS) based on anatomic measurements of injury was used to stratify injury burden. Trauma Injury Severity Score (TRISS), combining ISS with physiological variables, was used to determine predicted probability of survival against the observed survival outcomes.

Results: There were 2,792 casualties sustaining 14,069 injuries over the study period. 70 % of casualties from hostile action were injured by explosive munitions. Other than in the invasion of Iraq in 2003, the ratio of explosive to gunshot wounds remained approximately 3:1. The extremities were the most commonly injured body region, involved in 43 % of all injuries. The NISS associated with a 50 % chance of survival rose each year from 38 in 2003 to 62 in 2012. The odds ratio of surviving with a TRISS predicted probability of survival of 50 %, increased by a factor of 1.349 (95 % CI 1.265–1.442) per year.
Conclusion: A consistent improvement in survival over the 10-year period is demonstrated. Traditional metrics for measuring improvement in military trauma care performance have reached a ceiling. We recommend that new more complex measures of performance are required.
Disclosure: No significant relationships.

O194

INFECTED SHOTGUN FRACTURES OF LONG BONES. TEN YEARS EXPERIENCE WITH APPLICATION OF ILIZAROV METHOD

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Introduction: The purpose of our study is the filling of our experience in treatment of infected shotgun fractures with the Ilizarov method.
Materials and methods: From January 2005 to December 2011, 21 shotgun fractures complicated with infection and bone defect were treated with Ilizarov fixator. All patients were male, with an average age of 47.2 years. There were 6 femoral and 15 tibial fractures. All the fractures were type C3 (AO), and open type III (Gustillo). The mean bone defect was 6.2 cm (range 2–16 cm). The acute shortening was used in 15 patients and acute docking in 6 patients. In 6 patients monofocal method was performed while in 15 patients bifocal method was used. Secondary intramedullary nailing was performed in 6 patients with delayed union at the docking site.
Results: Average follow-up period was 4 years. Complete bony union and eradication of infection was achieved in all patients. The mean external fixation time was 294.5 days (range 92–570 days). Residual angular deformity of more than 8° occurred in three cases. Ankle joint stiffness remained in six patients with periarticular injuries but full weight bearing ability was spared.
Conclusion: The Ilizarov method seems to be the treatment of choice in infected shotgun fractures, with potential of simultaneous restoration of a broad spectrum of accomplished orthopaedic pathology.
Reference:
1. Bartlett CS, Helfet DH, Hausman MR, et al. Ballistics and gun shut wounds: effects on musculoskeletal tissues. J Am Acad Orthop Surg. 2000;8:21–36.
Disclosure: No significant relationships.

O194A

MASS SHOOTING IN KIEV: A LESSON LEARNED FROM OSLO

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Introduction: Following ESTES session "What went wrong" in 2012 we tried to prepare our institution for mass casualties management. During a year numerous trainings were performed with hospital stuff, basics in multiple trauma management were refreshed for every prehospital medical team. Since 1.12.13 Kiev clinical hospital # 17 was alerted 4 times due to mass clashes of protesters with riot police as a main multiple trauma center. 18–20.02.14 unsuccessful dispersal of protesters with firearms on the main place in Kyiv has led up to 100 death and hundreds injuries.
Materials and methods: A retrospective description of mass casualty management in a trauma center is reported. Special attention is paid to alarming medical stuff, triage tricks, workout and surgical management of numerous gunshot injured admitted simultaneously. Unexpected benefits of prehospital stage management and volunteers' recruitment are discussed as well.
Results: 136 pts were admitted 18.02.14 since 11.00 till 23.00 due to blast, gunshot, stab, blunt injuries, 66 of them required hospitalization. 23 "major" surgeries performed, 4 patients died. All patients treated on outpatient basis have had at least superficial wounds requiring surgical exploration. 52 pts were admitted 20.02.14. 29 of them have gunshot wounds. Among them, 20 pts with penetrating torso wounds arrived since 9.30 till 12.00. 17 major surgeries were performed. 3 patients died. There were neither preoperative delay nor reducing surgery volume caused by simultaneous admission. Extensive engagement of volunteers help for any paramedic tasks allowed us to release trauma-related stuff.
Conclusion: Catastrophes happen in trauma care. Preparing for a "last war" is much better than doing nothing. "Unnecessary" workout could be avoided. Medical and civil volunteer's recruitment is crucial.
Disclosure: No significant relationships.

FEMUR FRACTURE TREATMENT II

O195

DYNAMISATIONS IN THE AXIS OF THE NECK AND IN THE LONG AXIS OF THE FEMUR ARE BOTH IMPORTANT IN THE SURGICAL TREATMENT OF PERTROCHANTERIC FRACTURES

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Introduction: The aim of this study is to show evidence that pertrochanteric fractures needs double dynamisation: in the axis of femoral neck and in the long axis of the femur.
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: Spontaneous double dynamisation was observed in 2 patients (6.7 %) with axial dynamisation of 2 and 5 mm.

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.

Reference:

1. Mitkovic M, Milenkovic S, Micic I, Mladenovic D, Mitkovic M. Results of the femur fractures treated with the new selfdynamisable internal fixator (SIF). Eur J Trauma Emerg Surg. 2012;38(2):191–200.

Disclosure: No significant relationships.

O196

RETROGRADE FEMORAL NAILS FOR INTERCONDYLAR FEMORAL FRACTURES

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Introduction: Intercondylar femoral fractures require much effort to anatomically reduce the articular surface and to obtain stable fixation to allow knee movements until fracture healing. Open reduction and plate fixation is usually done. MIPO is becoming popular, particularly with locked plates. However, some authors reported the successful use of supranails in intercondylar femoral fractures.

Materials and methods: Ten patients with intercondylar femoral fractures AO Type C2 were treated by fixation using a retrograde femoral nail after fixing the condyles with a cannulated screw.

Results: All fractures united, including one delayed union that required a bone graft without change of fixation. Mean time to clinical union was 3.8 months. Mean time to radiological union was 5.4 months. According to the modified HSS knee score the mean level of pain was 31.5. Eight patients had a knee ROM >90°. Two patients had extension lag of 10°. Three patients had minor residual valgus, one had minor residual varus. The mean modified HSS score was 82.6

Conclusion: Retrograde femoral interlocking nails could effectively fix intercondylar femoral fractures until union occurs.

References:

1. Ehlinger M, Ducrot G, Adam P, Bonnomet F. Orthop Traumatol Surg Res. 2013;99:353–60.
2. Garnavos C, Lygdas P, Lasanianos NG. Injury. 2012;43:1170–5.

Disclosure: No significant relationships.

O197

FIXATOR-ASSISTED INTERNAL FIXATION IN PERIPROSTHETIC FRACTURES OF THE FEMUR

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Introduction: Restoration of proper length and alignment in periprosthetic femoral fractures, nonunions and deformations can be problematic. Options of fixator-assisted technique in different periprosthetic fracture patterns have not yet been defined. Aim of our study was to develop fixator-assisted internal fixation techniques in different types of femoral periprosthetic fractures.

Materials and methods: Fixator-assisted internal fixation was used in the treatment of 40 femoral periprosthetic fractures: Vancouver B1—13 cases (5 cemented), Vancouver B2—8 (1 cemented), B3—12 (3 cemented), C—7 (4 cemented). Mostly locked intramedullary nails with connection to the stem were used for definitive stabilization (38/40). Interprosthetic fractures (2/40) were treated with locked plates.

Results: Frame application allowed to restore length and alignment of the segment in all 20 cases of stable stems (B1 and C). In loose stems (B2 and B3) not only fixation (8/20) was performed but also reduction of displaced stems (12/20) and correction of pre-existed deformity (3/20) and acute femoral lengthening up to 3 cm (5/20). Three frame types were defined depending on two factors: injury type according to Vancouver classification, and position of the stem tip inside or outside medullary canal.

Conclusion: Fixator-assisted internal fixation provides easy control of length and alignment including reduction of displaced 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.

O198

LESSER TROCHANTER AVULSION IN A PROXIMAL FEMUR FRACTURE: DOES IT AFFECT HIP FLEXION STRENGTH?

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Introduction: In proximal femur fractures, avulsion of lesser trochanter resulting from a pull of the iliopsoas is tough to not influence the clinical outcome but there is no evidence to support this statement [1]. Aim of this study was to evaluate whether or not consolidation of the lesser trochanter in a displaced position after intramedullary fixation influences hip flexion strength.

Materials and methods: The sample size for the study was determined by a priori analysis. Patients with a consolidated proximal femur fracture with or without lesser trochanter avulsion were enrolled in group A and group B, respectively. Patients' range of motion, modified Harris Hip Score (mHHS), and flexion strength with the hip in a neutral position, at 90° of flexion, and in "figure four" position were evaluated for the injured and healthy side. Vertical displacement of the lesser trochanter was measured.

Results: Groups A and B showed no significant differences in age, follow-up, range of motion and mean mHHS. Average strength differences between the two sides were significantly different between the two groups for the neutral position ($p = 0.034$), at 90 degrees of hip flexion ($p = 0.008$), and in a "figure four" position ($p = 0.034$). Significant correlations between vertical displacement of the lesser trochanter and decreases in the strength of affected side were found only at 90° of hip flexion.

Conclusion: Our results show that lesser trochanter avulsion may result in decreased hip flexion strength. Lesser trochanter displacement is inversely correlated with flexion strength.

Reference:
1. Norcross P. Movement of the lesser trochanter in pertrochanteric fracture. Postgrad Med J. 1966;42:16–9.

Disclosure: No significant relationships.

O199

AT THIS MOMENT IT IS NOT POSSIBLE TO PREDICT WHICH FEMORAL FRACTURES WILL NEED DYNAMISATION DURING THE TREATMENT USING INTERNAL FIXATION

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Introduction: Today, we still can not predict which patient will need dynamisation. According to the literature 15–25 % internally fixed long bones need dynamisation. Some protocols include routine removal of distal locking screws 2 months after primary operation in order to provide axial dynamisation, exposing so at list 75 % of patients to unnecessary intervention. The aim of this study is to indentify patients where dynamisation is needed.

Materials and methods: In this study we show results of using of new selfdynamisable method and device, SIF (known as "Intelligent implant") which automatically becomes dynamic when healing process delays. It is suitable to detect where dynamisation is needed. We analyzed series of 871 fractures.

Results: Spontaneous axial dynamisation was observed in seventy-one patient (23.8 %), 5 mm on average (2–12 mm). The average operative time was 44 min (23–119), average fluoroscopy time was 12 s (6–92) while average blood loss of 90 milliliters (60–250 mm) when minimally invasive technique used. None of the patients developed complications during the intraoperative period. Healing time was 3.9 months (3–9). Healing was achieved in 99.1 %. Superficial infection developed after seven fixations (0.9 %) while deep infection developed in 4 patients (0.5 %). The screw breaking occurred 6–18 weeks after 19 fixations (2.6 %). Cut out phenomenon happened in 24 cases.

Conclusion: SIF is one suitable method in searching for the predictive sign of fractures need axial dynamisation.

Reference:
1. Mitkovic MM, et al. Results of the femur fractures treated with the new selfdynamisable internal fixator (SIF). Eur J Trauma Emerg Surg. 2012;38:191–200.

Disclosure: The author Milorad Mitkovic, has at this moment agreement with Traffix, producer of SIF, on temporary assignment to the use of patent.

O200

LOCKED NAILING WITH STEM LENGTHENING IN PERIPROSTHETIC FEMORAL FRACTURES

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Introduction: Current treatment of fractures around hip implants has focused on locked plating in case of well-fixed stem and good bone stock. If the stem is loose surgical management includes revision arthroplasty with a long stem with or without osteosynthesis and grafting. It results with high complication rate. Aim of our study was to design a technique of less invasive fixation in periprosthetic fractures of the femoral shaft to provide primary stability of the stem and the femur.

Materials and methods: We designed and used a modification of an industrial solid titanium (Ti6Al4V) femoral locked nail. Its design reproduces femoral bow and provides tight fit of the distal part of the femoral stem. 38 patients were treated in 2007–2013 with the technique. There were 13/38 Vancouver B1 (5 cemented), 8/38 B2 fractures (1 cemented), 12/38 B3 (3 cemented) and 5 cases of Vancouver C (2 cemented). 9/38 patients had failures after previous surgical treatement.

Results: Unassisted walking occurred at 2 months in 31/38 patients, and at 3 months in 35/38. 27/38 patients were available for follow-up in 1 year—all fractures healed, two of them after secondary procedures. Major complications (4/38) include two cases of deep infection, and two cases of stem breakage at the level of junction.

Conclusion: The technique can be an effective solution in acute periprosthetic femoral fracures of any type as well as in problematic cases of posttraumatic nonunions and malunions near femoral stems.

Disclosure: No significant relationships.

O201

OUTCOME IN PATIENTS UNDERGOING A LATERAL, TRANSGLUTEAL APPROACH VERSUS ANTERIOR MINIMAL INVASIVE SURGERY IN HIP HEMIARTHROPLASTY FOR FEMORAL NECK FRACTURES: A PROSPECTIVE CLINICAL TRIAL

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Introduction: Fractures of the femoral neck are frequent and new techniques and implants with the aim of a low morbidity and short rehabilitation are needed. We decided to switch our surgical technique from a lateral transgluteal approach to an anterior minimal invasive surgery in hip-hemiarthroplasty. Our intention was, that with this muscle sparing technique, patients will recover fast and with less pain and consecutively will be able to mobilise earlier with faster return in their prehospital living.

Materials and methods: In a prospective clinical study the data of patients with a femoral fracture undergoing a hip hemiarthroplasty were collected in two consecutive groups. The first dataset before switching our technique collected at the time when we implanted a hemiprosthesis through a lateral, transgluteal approach. The second dataset was collected after the switch to the anterior minimal invasive surgery through an approach in the interval between the tensor fasciae latae and the Sartorius muscle. Included were patients older than 65 years.

Results: 149 patients with LTA and 127 with AMIS were included. The preliminary data show a significant benefit for patients where we had used the AMIS with significantly less pain in these patients, a lower reduction of the Barthel-Index and a shorter hospital stay than in the group with the LTA.
Conclusion: The anterior minimal invasive surgery has shown to be safe procedure for the treatment of displaced femoral neck fractures by a hemiarthroplasty and has obvious benefits for the patients.
References:
1. Morris AH et al. JBJS Am. 2002;84:670–74.
Disclosure: No significant relationships.

POLYTRAUMA OUTCOME

O202

MEDICAL RELEVANT INCIDENTAL FINDINGS AFTER POLYTRAUMA-CT SCAN—IS THE RADIATION EXPOSURE JUSTIFIED?

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Introduction: Whole-body CT scans for polytrauma patients with multiple trauma represent an established first diagnostic tool which allows to find out with high specificity and sensitivity all relevant injuries. However there are still serious concerns about the indiscriminate use of CT scans with an increase of radiation exposure. The decision for a CT scan is fallen by the trauma mechanism and clinical examination. However non-trauma-associated additional findings are commonly depicted based on these CT examinations especially in the elderly. The aim of this study was to evaluate the number and quality of these additional findings in consecutive patients with multiple trauma.
Materials and methods: Between 01/2011 and 12/2012 532 patients were scanned according to our dedicated multiple trauma protocol. The CT scans was analyzed by the radiologists and trauma surgeon with respect to non-trauma-associated findings. Lesions were assessed according to their clinical relevance (highly relevant, moderately relevant, not relevant).
Results: The average age was 50 years (range 17–92). 377 (71 %) of the patients were male, 155 female (29 %). 231 patients (50.3 %) had additional non-trauma-associated findings.
Conclusion: Whole-body CT scans of polytrauma patients randomized by a trauma show a considerable number of non-trauma-associated additional findings. In about 6 % of cases, these findings are clinically relevant because immidiate attention and diagnostic workup or treatment in the short term is needed. Some of them are life-threatening. The results of these analyses emphasize the diagnostic value of CT examinations and a more moderate use of CT scans in even minor injuries in the elderly population.
References:
1. Josten 2012.
Disclosure: No significant relationships.

O203

INJURY SEVERITY SCORE CALCULATION IN MAJOR TRAUMA PATIENTS—REQUIREMENTS AND PITFALLS IN RADIOLOGICAL MSCT REPORT

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Introduction: The Injury Severity Score is a well-established anatomical scoring system for polytraumatized patients. However, any inaccuracy in AIS scoring directly increases the ISS impreciseness. Using MSCT scan report, ISS calculation can be associated with certain pitfalls. This study evaluates interpretation variations depending on MSCT reports and suggests possible requirements needed to reliably determine the ISS.
Materials and methods: We calculated the ISS of 81 polytraumatized patients based on MSCT report. If an injury could not be attributed to a precise AIS cipher, the minimal and maximal ISS was calculated. Real ISS included all conducted investigations, intraoperative findings and final medical reports. The differences in ISSmin, ISSmax and ISSreal were evaluated using the Kruksal-Wallis-Test ($p < 0.05$) and demonstrated in a linear regression analysis.
Results: Mean ISSmin was 24.0 (±0.7 SEM), mean ISSreal was 38.6 (±1.3 SEM), mean ISSmax was 48.3 (±1.4 SEM). All means were significantly different compared to one another ($p < 0.001$). The difference between possible and real ISS showed a distinctive variation. Mean deviation was 9.7 (±0.9 SEM) points downward and 14.5 (±1.1 SEM) points upward. The difference between deviation to ISSmin and ISSmax was highly significant ($p < 0.001$).
Conclusion: Objectification of injury severity in polytraumatized patients using the ISS is an internationally common method in clinical and scientific settings. The MSCT report has to meet district criteria and has to be written in acquaintance to the AIS scale if intended to be used for correct ISS calculation.
References:
1. Baker SP et al. The Injury Severity Score: a method for describing patients with multiple injuries and evaluating emergency care. J Trauma. 1974.
Disclosure: No significant relationships.

O204

IS CT SCAN THE TUNNEL OF DEATH IN MOST SEVERELY INJURED TRAUMA VICTIMS?

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Introduction: Importance of CT scan in early trauma care was expanding to date, even the situation of trauma resuscitation (Huber-Wagner, Lancet 2009). Nevertheless undergoing CT scan prior to surgery in unstable patient with severe trunkal trauma was traditionally conflicting, and the aim of the study was to investigate the conflict based on data from the Japan Trauma Data Bank.
Materials and methods: After imputing missing values of important variables of JTDB. We included subjects underwent emergency thoracotomy or laparotomy in 3 h from arrival at emergency department and underwent CT scan. We compared subjects underwent prior surgery or prior CT scan after propensity score matching with more than 140 background characteristics variables available on arrival at the emergency department.
Results: Predicted mortality by the Trauma Injury Severity Score was high and similar in subjects with CT preceding and surgery preceding (40.8 vs. 40.5 %, $P = 0.846$), respectively. Rate of in-hospital death

also did not differ between subjects with CT preceding and surgery preceding after propensity matching (N = 170 versus 170, 36.9 vs. 33.5 % P = 0.592)
Conclusion: Modern technology CT scan apparently benefit most of trauma subjects, however, CT scan prior to surgery in most severely injured trauma subjects whose predicted mortality was as high as 40 % did not benefit.
References:
1. JATEC Lancet. 2009; 373:1455–1461.
2. J Trauma Manage Outcome. 2010;4:4.
3. J Trauma. 2002;52:420–425.
Disclosure: No significant relationships.

O205

TRIMODAL PATTERN OF DEATHS AFTER TRAUMA: REVISITED

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Introduction: Injury mortality was classically described with a trimodal distribution. The purpose of this study was to determine the applicability of this classical model in a contemporary trauma system.
Materials and methods: Prospectively collected databases of all trauma patients in the Songklanagarind Hospital, a Level I trauma center in Thailand, between January, 2009 to December, 2012 were reviewed. The times from injury to death were analyzed according to mechanism of injury and body area (head, chest, abdomen, extremities) with critical trauma (abbreviated injury score [AIS] $\geq$4).
Results: There were 5,902 patients admitted after trauma; of these patients 391 (6.6 %) died. The mean age was 40 years and the mean Injury Severity Score was 28. The predominant mechanisms of injury were motor cycle crashes (44 %), and motor vehicle crashes (14 %). The most commonly injured body area with critical trauma was the head (36 %), followed by chest (22 %), and abdomen (16 %). Overall there was only one predominant peak of deaths occurred within the first hour after arrival at the hospital (29 %) with a gradual decrease thereafter. Only 13 % of deaths were late (>1 week).
Conclusion: Only one distinct peak was observed. This may reflect the improvement in post-injury care. Understanding of the time of distribution of deaths might be helpful in allocating resources and focusing efforts for better outcomes.
References: Demetriades D, Kimbrell B, Salim A, et al. Trauma deaths in a mature urban trauma system: is "trimodal" distribution a valid concept? J Am Coll Surg. 2005;201:343–8.
Disclosure: No significant relationships.

O206

EMERGENCY TRAUMA SCORE AS A PREDICTOR OF MORTALITY IN CLINICAL PRACTICE

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Introduction: Multiple trauma scores are used to assess patients injury severity. Scoring systems are used for clinical research but their use in clinical practice has remained limited. In a search for a practical and easy to use trauma score a relatively new Emergency Trauma Score (EMTRAS) for predicting mortality was tested at our level I trauma center.
Materials and methods: A retrospective analysis of all patients (334) who were admitted as resuscitation events during a period of 1 year at our Institution was performed. EMTRAS was calculated according to patient age, prehospital GCS, prothrombin time and base excess. Each parameter was subdivided into four classes and scored from 0 to 3 points. All scores were summed and EMTRAS, ranging from 0 to 12 was obtained. Additionally the Injury severity score was calculated and compared to EMTRAS.
Results: The mortality risk increased exponentially with increasing EMTRAS reaching a mortality of 50 and 100 % with an EMTRAS of 6 and 11 respectively. EMTRAS correlated with the Injury severity score. Results of our series of patients showed that EMTRAS is a good predictor of mortality in trauma patients.
Conclusion: EMTRAS is easy to calculate in clinical practice and is a good predictor of mortality. All parameters of the score are routinely obtained from trauma patients who are admitted to our institution as resuscitation events allowing the calculation of the EMTRAS within first 5 min of the resuscitation while the patient is in the resuscitation bay.
References: Raum MR et al. Emergency trauma score: Crit Care Med. 2009;37(6):1972–7.
Disclosure: No significant relationships.

O207

PREVENTABLE OR POTENTIALLY PREVENTABLE TRAUMA DEATHS: A CHALLENGE FOR TRAUMA CARE SYSTEM

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Introduction: Safety monitoring and error reduction is essential to the future of trauma care. The purpose of this study was to analyze the preventable and potentially preventable deaths occurring at a Level I trauma center in Thailand.
Materials and methods: All trauma deaths during a 4-year period (2009–2012) were analyzed. The deaths were reviewed at a weekly Morbidity and Mortality Conference. Errors in care were classified into nonpreventable, potentially preventable, and preventable deaths. Trauma mortality forms included type of injury, injury severity, probability of survival with Trauma and Injury Severity Score methodology, preventability (nonpreventable, potentially preventable, and preventable deaths), and classification of errors.
Results: There were 5,902 trauma admissions, including 391 (6.6 %) trauma deaths. The average patient age was 40 years, mean injury severity score 28. Of all deaths, 20 (5.1 %) were classified as preventable or potentially preventable deaths (0.3 % of admissions). The most common cause of deaths was bleeding (55 %) followed by multiple organ dysfunction syndrome (25 %) and head trauma (10 %). The deaths peaked at the first 24 h (45 %). Only one patient (5 %) died after 7 days.
Conclusion: Preventable or potentially preventable deaths do occur at a Level I trauma center. Bleeding is the leading cause of preventable

deaths. Method in achieving hemorrhage control are vital. Review of every death to identify preventable error is essential for initiating changes that may prevent these deaths in the future.

References:
1. Hoyt D, Coimbra R, Potenza B. Trauma systems, triage, and transport. In: Feliciano D, Mattox K, Moore E, editors. Trauma. 6th ed. McGraw-Hill; 2008: 57–82.

Disclosure: No significant relationships.

O208

CHOICE OF INJURY SCORING SYSTEM TO PREDICT MORTALITY AT AN URBAN TRAUMA CENTER IN MUMBAI, INDIA

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Introduction: In India, 11 % of deaths and 13 % of DALYs lost are due to injury. Accurate assessment of injury severity is crucial for clinical practice, research and quality improvement. Information necessary for widely accepted scoring systems is often unavailable in low- and middle-income countries. This study compares Injury Severity Score (ISS) and Revised Trauma Score (RTS) to "MGAP," a simple physiological scoring system developed and validated in France.

Materials and methods: Information on patients with life- or limb-threatening injuries presenting to Lokmanya Tilak Municipal General Hospital in Mumbai, India in 2010–2011 was collected. "MGAP" scores were calculated using mechanism, Glasgow Coma Score, age, and arterial pressure. Logistic regression models correlated overall in-hospital mortality with ISS, RTS and "MGAP".

Results: Of the 1117 patients analyzed, 88 % were male, with mean age 31 years (SD 17). Road traffic injuries (32 %) and falls (24 %) were the most common causes of injuries. In-hospital mortality rate was 34 %. Incomplete data prevented calculation of ISS in 76 %, RTS in 65 % and "MGAP" in 12 % of patients. RTS and "MGAP" significantly correlated with mortality (area under ROC curve 0.85, $p < 0.001$ for each), while ISS did not (area under ROC curve 0.50, $p = 0.78$). Correlation between RTS and MGAP was 0.87.

Conclusion: The reality of clinical practice at a LMIC trauma center makes accurate data collection challenging. "MGAP," a simplified, physiological scoring system performs well in this context and should be considered when exhaustive data collection is not feasible.

References:
1. O'Reilly et al. Injury. 2013;6(44):713–21.
2. Sartorius et al. Crit Care Med. 2010;38(3):831–7.

Disclosure: No significant relationships.

O209

AGGRESSIVE OPERATIVE TREATMENT OF ISOLATED BLUNT TRAUMATIC BRAIN INJURY IN THE ELDERLY LEADS TO FAVOURABLE OUTCOME

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Introduction: Objective: To investigate the age-dependent outcome of patients suffering from severe isolated traumatic brain injury (TBI) with regard to operative and non-operative treatment.

Materials and methods: Retrospective observational study of data collected prospectively in the Trauma Registry of the German Trauma Society. Patients: Anonymous datasets of 8,629 patients with isolated severe blunt TBI ($AIS_{Head} \geq 3$, $AIS_{Body} \leq 1$, 2002–2011). Age groups: 1–17, 18–59, 60–69, 70–79 and ≥80 years.

Results: Cranial fractures (44.8 %) and subdural hematomas (42.6 %) were the most common TBIs. Independent from the type of TBI the share of patients with operative treatment declined with rising age. Subgroup analysis of patients with critical TBI ($AIS_{Head} = 5$) revealed SMRs of 0.81 (95 % CI 0.75–0.87) in case of operative treatment ($n = 1{,}201$) and 1.13 (95 % CI 1.09–1.18) in case of non-operative treatment ($n = 1{,}096$). All age groups >60 years showed significantly reduced SMRs in case of operative treatment. Across all age groups the share of patients with low/moderate disability according to the GOS (4 or 5 points) was higher in case of operative treatment.

Conclusion: Results of this retrospective observational study have to be interpreted cautiously. However, good outcome after TBI with severe space occupying hemorrhage is more frequent in patients with operative treatment across all age groups. Age alone should not be the reason for limited care or denial of operative intervention.

References:
1. De Bonis P et al.: Decompressive craniectomy for elderly patients with traumatic brain injury: it's probably not worth the while. J Neurotrauma. 2011.

Disclosure: No significant relationships.

O210

TRAUMA REGISTRIES—CREATING THEM FROM PRE-EXISTING ADMINISTRATIVE DATABASES

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Introduction: Trauma registries (TR) are a fundamental tool of mature trauma systems. They are used in developed countries to measure the effectiveness of trauma quality improvement (TQI). Low- and Middle Income Countries (LMIC) have not developed TRs on a large scale. Financial barriers and a lack of digital and human infrastructure are obstacles to creating TRs in LMICs. Some LMIC hospitals have created financial databases to record pay-for-service information. Innovative methods to adapt financial databases into TRs could advance TQIs in LMICs. We report how we adapted a financial database to measure the effectiveness of a TQI.

Materials and methods: A TQI standardizing generally accepted interventions in initial resuscitation of patients at a trauma center in Neiva, Colombia was implemented in September 2011. To measure the effectiveness, we wished to investigate the incidence of standardized interventions in the emergency department (ED) before and after TQI implementation. We used restructuring techniques to create a database that permitted analysis. To confirm accuracy, a chart

review was conducted for a subset of patients by two independent researchers.
Results: The restructured database allowed for analysis of many ED interventions and length of hospital stay (LOS). Chart review confirmed database fidelity. The analysis demonstrated the general success of the TQI by increased interventions and decreased LOS. It also demonstrated some interventions that did not increase, implying where future TQI efforts should be directed at the institution.
Conclusion: Adapting financial databases into TRs is a potentially cheap and effective way to measure TQI effectiveness in LMIC hospitals.
References:
1. Hashmi et al. Trauma. 2013;75(1):60–8.
Disclosure: No significant relationships.

O211

TRAUMA REGISTRY COMPARISON: SURVIVAL OF UNCONSCIOUS TRAUMA PATIENTS IN SOUTHERN FINLAND AND GERMANY

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Introduction: Trauma registry data from Helsinki University Hospital (TR-THEL) has been compared before with data from German level one trauma centers participating in TraumaRegister DGU® (TR-DGU) (1). Survival of severely injured patients was comparable between Helsinki University Hospital and German hospitals, but the results were poorer in the subgroup of patients with primary GCS 3–8 treated in Helsinki (Southern Finland). Those patients were also intubated on scene less often in Southern Finland. The aim of the present study was to track the subgroup of unconscious patients treated in Helsinki whose survival is worse. The hypothesis was that not intubating the patients with GCS 3–8 on scene in Southern Finland worsens the survival.
Materials and methods: We compared the data from TR-THEL and TR-DGU from 1.1.2006 until 31.12.2011. Inclusion criteria were primary GCS 3–8, age $\geq$16 and ISS $\geq$16. Transferred patients and patients with penetrating trauma without head injury were excluded. Subgrouping was done according to injury pattern, pre-hospital intubation, transportation method, age, isolated head and polytrauma.
Results: Severely injured patients with penetrating trauma to head and intubated patients under 60 years with isolated blunt head injury treated in Helsinki had worse survival when compared to German hospitals (standardized mortality ratio 2.35 vs. 1.06 and 0.99 vs. 0.90). The differences were not statistically significant.
Conclusion: The difference in intubation rate of unconscious patients between Southern Finland and Germany did not affect survival.
References:
1. Brinck T, Handolin L, Lefering R. Trauma Registry Comparison: Six years'results in trauma care in Southern Finland and Germany. in press.
Disclosure: No significant relationships.

O212

THE CLINICAL AND ECONOMIC BENEFITS OF THE CENTRALIZATION AND CREATION OF AN EMERGENCY GENERAL SURGERY UNIT IN THE UK

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Introduction: General surgical emergency admissions are the largest group of all surgical admissions to UK hospitals and account for a mortality of up to 40 % with a cost to the NHS of over 88 million euros. The creation of a centralized specialist emergency general surgery unit (EGSU) at University Hospital Aintree between 2008 and 2009 was designed to improve such outcomes.
Materials and methods: A retrospective observational study was conducted of all patients who attended the surgical unit as emergencies between 2006 and 2012 inclusively. Primary outcomes measures were overall mortality and length of stay. Secondary analysis was conducted of all emergency laparotomies conducted between these dates. Statistical analysis compared categorical data by the Chi squared test.
Results: Admissions to the EGSU ranged between 4500 and 5088 patients per year (2006–2012). Overall mortality of all patients admitted fell from 2.3 % in 2006 to 1.3 % in 2012 ($p = 0.002$). Length of stay per patient reduced from a median of 4.3 days in 2006 to 3.3 days in 2012, leading to a reduction of 5088 bed days saved, equating to cost saving of around 1.36 million Euros.
483 patients underwent emergency laparotomy in 2007 and 419 in 2011. 30 days mortality fell from 20.2 to 15 % in 2011 ($p = 0.04$). 2 years survival of patients who had a laparotomy in 2007 was 65 %, and this increased to 71 % for patients from 2011 ($p = 0.07$).
Conclusion: The centralization of emergency general surgery in a high volume unit improved overall and operative mortality, with a considerable cost saving to the hospital.
Disclosure: No significant relationships.

NEW DIAGNOSTIC PROCEDURES IN TRAUMA

O213

NOVEL SCORING SYSTEM FOR PREDICTION OF EARLY TRAUMA COAGULOPATHY: TRAUMATIC COAGULOPATHY PREDICTIONS SCORE (TCP SCORE)

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Introduction: The aggressive administration of FFP has been recommended for the improvement of trauma coagulopathy [1], and its survival benefit seems to be related to early administration of these blood products. However, no method for the prediction of traumatic cougulopathy at the point of a patient's arrival has been established. The aim of this study was the creation of a novel scoring system to rapidly predict early trauma coagulopathy.

Materials and methods: We reviewed available data of 394 trauma patients admitted to our center from Jan. 2008 to Mar. 2012. Early trauma coagulopathy was defined as 150 mg/dl or less of fibrinogen and 1.50 or more of PT-INR within 6 h from injury, although transfusion and crystalloid infusion was provider dependent. We identified predictors by means of multivariate logistic regression analysis. Each predictor was converted into a simple score based on each coefficient. The TCP Score was defined as the total of component scores. The predictive value was then validated, using trauma patients admitted from Apr. 2012 to Mar. 2013. The accuracy was tested by AUC.
Results: Five predictors were identified: systolic blood pressure, FAST, severity of pelvic fracture, lactate level, and GCS. The maximum TCP Score was 29 points. The validated results with 201 enrolled patients have revealed that the AUC was 0.901.
Conclusion: The calculation of the TCP Score is simple. Therefore, this TCP scoring system will lead to the speedy and accurate characterization of early trauma coagulopathy without any additional cost and human resources.
References:
1. Holcomb JB et al. JAMA Surg. 2013;148:127–136.
Disclosure: No significant relationships.

O214

"ISOLATED" GREATER TROCHANTERIC FRACTURES—ARE THEY REALLY?

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Introduction: Hip fractures are common in the elderly population and appropriate early diagnosis and management is critical in treating the patients and avoiding complications. Avulsion fractures of greater trochanter may be caused by direct injury or indirectly due to forced activity of abductors of the thigh. Radiographs are used in the initial assessment of these fractures. Isolated greater trochanter fractures are usually treated conservatively.
Materials and methods: MRI is highly sensitive in identifying occult fractures. MRI is increasingly requested by Orthopaedic Surgeons to identify additional components that will alter the management of the fractures. Many of the seemingly isolated fractures have significant additional findings that need surgical management. We looked at all the MRI pelvis performed for isolated trochanteric fractures in our institution during the 12 months in 2012.
Results: Less than 5 % of the fractures were isolated. Most of the isolated fractures had subtrochanteric and intertrochanteric extensions. Fractures also extended into the subcapital neck of femur. We describe and discuss the various additional fractures associated with seemingly isolated avulsion fracture of greater trochanter.
Conclusion: MRI is highly sensitive in identifying various additional components of the seemingly "isolated" Greater Trochanteric Fractures leading to appropriate surgical and non-surgical management.
References:
1. Incomplete intertrochanteric fractures: imaging features and clinical management. Radiology 1999;211:237–240.
2. Fractures of the greater trochanter: intertrochanteric extension shown by MRI. Skeletal Radiol 2000;29:572–576.
Disclosure: No significant relationships.

O215

WHO NEEDS AN EXPERT? A TOOL FOR OPTIMAL TRIAGE OF GENERAL SURGICAL PATIENTS IN THE EMERGENCY DEPARTMENT

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Introduction: The notion that 10,000 h practice of a skill are required to become expert has recently been popularised. Whilst not tested in medicine this equates to the length of a typical UK training program. Concerns have been raised about the increase in workload and difficulty in recruitment within UK emergency departments. The solution by some departments has been to use non-expert staff to "fast-track" patients to in-patient specialities. The training for these staff will by necessity fall well short of 10000 h practice of the skill of physical examination. Inappropriate or wrongly placed admissions cause major disruption and we therefore sought to create a tool to more accurately allow fast-tracking of these patients.
Materials and methods: All patients presenting as "abdominal pain" for the last quarter of 2012 in a UK teaching hospital were reviewed. Potentially useful parameters were identified. A tool was created and then modelled on the same data to determine the potential impact on admissions.
Results: Readmission rates were low suggesting placement by the "expert" clinicians of the ED was largely accurate. "Walk-in" (vs. Ambulance arrival), age(<25) and normal bloods often resulted in the patient being sent home from ED. Chronic conditions and age(>75) resulted in more patients being sent to Internal Medicine. The tool generated would have resulted in only an additional 1.3 patients/day were it applied.
Conclusion: This tool does not give a diagnosis, rather it allows non-experts to identify patients that can be sent straight to in-patient specialities for further assessment.
References:
1. Anders Ericsson. The making of an expert. Harvard Business Review 2007.
Disclosure: No significant relationships.

O216

IMPLEMENTATION OF THE NEXUS CRITERIA IN A GENERAL HOSPITAL IN THE NETHERLANDS: A RETROSPECTIVE ANALYSIS

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Introduction: In 2009 Dutch guidelines on traumatic cervical fractures have been published which recommended to use the NEXUS criteria. When all criteria are negative a patient can be 'cleared', otherwise CT is recommended. This study provides an overview of daily practice during a period of two and a half years after implementation.
Materials and methods: All adult patients who underwent radiographic evaluation of the cervical spine at the ED Department of a level II trauma-centre between January 2010 and June 2012 were included in a database. The patients were retrospectively evaluated for NEXUS criteria, radiographic procedures, and clinical outcome.

Results: In total 1173 patients (median age 46 years, 43 % female) were identified. In high risk patients (n = 798) the use of X-ray decreased from 51.6 % (n = 64) in the first half year to 36.9 % (n = 59) in the last 6 months. The use of CT as a single diagnostic procedure was 4.0 % (n = 5) compared to 5.0 % (n = 8), whereas CT combined with radiography increased from 44.4 % (n = 55) to 58.1 % (n = 93). In low-risk patients (n = 375) X-ray use, CT, and CT combined with X-ray changed from 68.4 % (n = 26) to 40.0 % (n = 33), 7.9 % (n = 3) to 17.1 % (n = 14), and 23.7 (n = 9) to 42.7 (n = 35), respectively.
Conclusion: Although new guidelines recommend the use of CT in high risk patients, 37 % solely undergo X-ray evaluation. Moreover, unnecessary use of X-ray and CT in low-risk patients is still prevalent.
References:
1. Plumb JO, Morris CG. Clinical review: Spinal imaging for the adult obtunded blunt trauma patient: update from 2004. Intensive Care Med. 2012;38(5):752–71.
Disclosure: No significant relationships.

O217

PREDICTORS OF A POSITIVE SUBXIPHOID PERICARDIAL WINDOW IN PATIENTS WITH PENETRATING INJURIES TO THE PRECORDIAL REGION

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Introduction: Subxiphoid pericardial window (SPW) remains a diagnostic tool for patients at risk of occult cardiac injuries. However, how to select patients that could benefit from this procedure remains unclear. Our goal was to identify clinical predictors of positive SPW in patients with penetrating precordial injuries.
Materials and methods: Prospective data collection of 183 patients who underwent SPW for the exclusion of cardiac injuries during 2002–2004 at a level I trauma center in Cali, Colombia. Patient's demographics, clinical characteristics, and injury information were obtained. Independent predictors of positive SPW were assessed using stepwise logistic regressions.
Results: There were 41 positive SPW (22.4 %). Univariable analyses demonstrated that stab-wounds (OR 2.48, 95 %CI 1.17–5.25), signs of cardiac tamponade (OR 8.52, 95 %CI 3.92–18.4), or transient hemodynamic instability (OR 3.21, 95 %CI 1.51–6.79) were associated with increased odds of positive SPW. Conversely, systolic blood pressure (0.98, 95 %CI 0.96–0.99) and multiple precordial injuries (OR 0.06, 95 %CI 0.01–0.51) were associated with decreased odds of positive SPW. In stepwise multivariable analyses, cardiac tamponade (OR 6.37, 95 %CI 2.78–14.6), and multiple precordial injuries (OR 0.07, 95 %CI 0.01–0.61) were independent predictors of positive SPW.
Conclusion: Emphasis on early recognition of cardiac tamponade could be the most important factor for the identification of occult cardiac injuries. Systolic blood pressure was not found as a strong predictor of positive SPW. Patients with multiple injuries to the precordial region who reached the hospital may not benefit from a SPW. However, high level of awareness is important because the incidence of occult cardiac injuries is not negligible.
References:
1. Br J Surg. 2013;100:1454–1458.
Disclosure: No significant relationships.

O218

INITIAL LACTATE LEVELS IN PATIENTS WITH ISOLATED PENETRATING EXTREMITY TRAUMA

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Introduction: Elevated initial lactate levels have been associated with severe injury in trauma patients (1), but some patients with no evidence of shock also present with elevated levels. We hypothesized that in stable patients with isolated penetrating extremity trauma, the initial lactate level does not predict need for intervention.
Materials and methods: A 5-year retrospective review of our institutional database review was performed. Hemodynamically stable patients (HR < 101, SBP > 90) with isolated penetrating extremity trauma were included. Primary outcome measurements were need for intervention (operation, angioembolization, or transfusion) or evidence of bleeding (presenting Hg <7 g/dL, or Hg decrease by >2 g/dL/24 h). Patients were divided into 3 groups: initial lactate level Normal (N; ≤2.2 mEq/l), Elevated (E > 2.2 mEq/l), and Not Sent (NS). Chi squared or Kruskal–Wallis tests were used to compare variables.
Results: 649 patients were identified. 132 patients had initial lactate levels sent (N: n = 43, 7 %), (E: n = 89, 14 %) and 517 patients did not (n = 517, 80 %). There were no differences in baseline variables between groups. When checked, lactate was elevated in 89 (67 %) of patients. Median lactate levels were 1.6 (IQR 1.2–1.9) mEq/dL vs. 3.8 (IQR 2.8–5.2) in the N and E groups, but rates of intervention or bleeding were not different between groups (37 % E vs. 37 %, N p = 0.98).
Conclusion: Elevated initial lactate does not predict the need for intervention in stable patients with isolated penetrating extremity trauma. Clinical judgment, rather than laboratory studies, should remain the gold standard for evaluating and managing these patients.
References:
1. Paladino, Letal. Utility of base deficit and arteriallactate in differentiating major from minorinjury in traumapatients withnormal vitalsigns. Resuscitation 2008;77(3):363–368.
Disclosure: No significant relationships.

O219

POST-MORTEM RADIOLOGY VERSUS CLASSICAL AUTOPSY IN TRAUMA VICTIMS—A SYSTEMATIC REVIEW OF INJURIES PER BODY REGION

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Introduction: Post-mortem radiology or virtual autopsy is a rapidly advancing field of post-mortem investigation in trauma victims. In this review we investigate whether post-mortem radiology can complement or replace classical autopsy 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 radiology had been compared to classical autopsy in trauma victims. Studies were included when two or more trauma victims had been investigated.

Results: Thirty studies were included, with a total number of 860 trauma victims. Post-mortem CT scanning (PM-CT) was performed in 26 studies, post-mortem MRI scanning (PM-MRI) in 6 studies and conventional radiography in 3 studies.
The results show that severe (AIS 3+) injuries were demonstrated accurately in post-mortem CT and MRI. Injuries that were the primary cause of death were seldomly missed (sensitivity CT 83–100 %, MRI 97.5 %).
Overall, PM-CT is more sensitive than classical autopsy and PM-MRI in showing skeletal fractures and PM-MRI is more sensitive than autopsy and PM-CT for the detection of most organ and soft tissue injuries.
Conclusion: This systematic review demonstrates that modern post-mortem radiology techniques can accurately detect skeletal and other large injuries. For a detailed detection of organ injuries, current techniques are currently insufficient. In traumatic fatalities where classical autopsy cannot be performed, PM-CT and PM-MRI are good alternatives to demonstrate the primary and significant secondary causes of death.
References:
1. Christe et al. Abdominal trauma—sensitivity and specificity of… J Trauma. 2009.
Disclosure: No significant relationships.

O220

DIAGNOSTIC DILEMMA OF DIAGNOSING OCCULT SCAPHOID FRACTURES: A DEBATE ON BEST IMAGING MODALITY WITH CURRENT REVIEW OF LITERATURE

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Introduction: Suspected scaphoid fractures with no radiographic evidence of a fracture are termed 'occult' or 'clinical scaphoid fracture'. Scaphoid fractures constitute 71 % of carpal bone fractures and are associated with severe complications such as non-union, avascular necrosis and osteoarthritis.
Materials and methods: Accurate and early diagnosis is required to confirm or exclude scaphoid fracture avoiding undertreatment or overtreatment. The current literature seems to imply that MRI is more sensitive and specific than CT at detecting occult scaphoid fractures but there is insufficient evidence. We reviewed the available literature to compare the diagnostic performances of bone scintigraphy, MRI, and CT. MR can detect a trabecular fracture line associated with perifocal bone edema on STIR images. CT is cheap, quick and easily available.
Results: A recent systematic review and meta-analysis looked at twenty-six available studies. Specificity of bone scan was worse than that of MRI ($p = 0.001$) and CT ($p = 0.001$). One study suggested that MR is inferior to CT in depicting cortical involvement ($p = 0.03$) but better in trabecular fractures. Nonunion rate varies between 5–12 % and the rate of AVN about 35 %.
Conclusion: MRI is highly accurate for confirming and excluding the diagnosis and can be the first choice investigations. More RCT's or paired design studies are needed to compare CT with MRI or bone scintigraphy. Literature research is littered with varying agreement on the 'gold standard' with lack of any agreed consensus.
References:
1. Diagnostic accuracy of imaging modalities for suspected scaphoid fractures: Meta-analysis combined with latent class analysis J Bone Joint Surg Br. 2012.
Disclosure: No significant relationships.

EXPERIMENTAL TRAUMA RESEARCH

O221

REGENERATING THE ANTERIOR CRUCIATE LIGAMENT USING A SILK-FIBER BASED SCAFFOLD DEVICE

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Introduction: The regeneration of tendon/ligament tissue relies on scaffold devices that guarantee mechanical stability, while providing the optimal environment for tissue regrowth. We have developed a novel, silk-fiber based degradable scaffold device for anterior cruciate ligament (ACL) regeneration. Here, we present the first results of an in vivo large animal study.
Materials and methods: Raw bombyx mori silk was manufactured in a wire rope design allowing cell seeding and tissue growth. The cytotoxic immune-eliciting sericin was removed by a degumming process. Biomechanical testing was performed to compare the scaffold with the natural ACL. Using a bioreactor system, we tested the regenerative capability, in terms of cell adhesion and tissue growth under mimicking the natural biochemical and mechanical conditions. An in vivo, large animal (sheep) study was conducted to test the structure under true biological conditions. Micro-CT, MRI and histological work-up was performed 6 and 12 months after implantation.
Results: We were able to manufacture a scaffold matching the mechanical properties of the native ACL. The bioreactor testing revealed tissue growth, eventually developing into typical ligamentous tissue, depending on applied stimulation time. The in vivo experiments revealed the formation of new ligament tissue in parallel with the degradation of the silk-based scaffold device.
Conclusion: With the novel scaffold design, we were able to mimic the mechanical properties of the ACL, providing stable joint conditions during the regeneration process. Histologically, a considerable reduction of scaffold fibers, already after 6 months was visible. Long-term follow up is needed to see if the scaffold will be completely replaced by the regenerated ACL.
Disclosure: No significant relationships.

O222

THE INFLUENCE OF NEGATIVE PRESSURE WOUND THERAPY WITH AND WITHOUT INSTILLATION TECHNIQUE ON NEOANGIOGENESIS IN WOULD HEALING: A SWINE STUDY AND FIRST RESULTS IN HUMAN WOUND HEALING WITH OSTEOMYELITIS

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Introduction: For evaluating the influence of negative pressure wound therapy (NPWT) on local neoangiogenesis an experimental animal study with open wounds and a prospective observational study in humans with infected wounds was performed.
Materials and methods: The influence of negative pressure settings (100–300 mm Hg) on neoangionesis was examined in 3 large swine's (70 kg) with six deep wounds (10 × 15 cm) per pig with PU and PVA foams during a period of 7 days. PU/PVA foam was used in 4 wounds with 2 controlwounds (hydrocolloid dressing). Foams changes and biopsies of the trapezial—and latissimus dorsi muscle were undertaken on day 0, 3, 5 and 7. Furthermore a prospective follow up study was performed in two humans with osteomyelitis treated with NPWT with instillation technique. All animal and human biopsies were examined with CD31 staining for neoangiogenesis. Biopsies of the instillation technique were compared to regular human NWPT.
Results: Significant formation of new vessels could be observed in the animal study, related to negative pressure settings (300 > 100 mm Hg) with reduction of wound volume. Instillation technique seems favourable supporting new vessel formation compared to standard NWPT. In animals after 7 days a statistical significant rise (long term effect) at base line level perfusion in wounds measured by laser Doppler technique could be observed ($p < 0.0001$).
Conclusion: NPWT can support neoangionesis in wounds. Higher negative pressure settings up to 300 mm Hg compared to normally recommended 125 mm Hg setting seems to be favourable in enhancing new vascular structures.
References:
1. Timmers MS: Ann Plast Surg 2005;55(6):665–671.
Disclosure: No significant relationships.

O223

MEASUREMENT OF SERUM LACTATE ACCURATELY PREDICTS MORTALITY IN PATIENTS WITH PELVIC FRACTURE

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Introduction: Optimal method in predicting fatal pelvic fractures still remains uncertain. The study objective is to investigate diagnostic value of serum lactate level as an indicators for prognosis of patients with pelvic fracture.
Materials and methods: We included consecutive patients who hospitalized in the two study hospitals. Subjects with cardiac arrest on arrival were excluded. Ordinal logistic regression analysis tested correlation between predictive indicators and in-hospital death in patients with pelvic fracture. Receiver operating characteristic (ROC) analysis compared sensitivity and specificity at an optimal cut-off value and area under curve (AUC) for lactate and systolic blood pressure.
Results: A total of 210 consecutive subjects with pelvic fracture were enrolled. On ordinal logistic regression analysis, lactate [odds ratio (OR) 1.7, 95 % confidence interval (CI) 1.3–2.1, $P < 0.001$) was independent factor associated with the risk of in-hospital death in patients with pelvic fracture. Sensitivity, specificity, positive predictive value, negative predictive value and cut-off value were 0.92, 0.86, 0.45, 0.99, 6.4. ROC analysis demonstrated higher accuracy of lactate in comparison to systolic blood pressure (AUC of 0.924 vs. 0.803, $P = 0.01$).
Conclusion: Lactate was the accurately predictive indicator for prognosis of the pelvic fracture patients. Further multicenter cohort is needed to verify the care for pelvic trauma fracture.
References:
1. Tohmas M. Scalea, Deborab M. Stein, Robert V. O'Toole. Pelvic Fractures. Trauma. 2008;759–785.
Disclosure: No significant relationships.

O224

CYTOTOXICITY EVALUATION OF THE SOLUTIONS CHLORHEXIDINE CONCENTRATIONS FROM 2.5 % TO 5 % AND THE INDICATION OF SURGICAL PROPHYLAXIS

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Introduction: The objective of this study was to evaluate in vitro cytotoxic effects of aqueous chlorhexidine digluconate at concentrations of 2.5–5 %.
Materials and methods: We applied the test of cytotoxicity in cell culture monolayers using cell lines Hep-2 by a spectrophotometer. Concentrations compared to the samples analyzed by the method of analysis of variance, the result showed that the significance level of 5 % for differences between treatments.
Results: It was found that samples with concentrations of 2.5, 3 and 3.5 % behaved as non-cytotoxic. In turn, the concentration of 4, 4.5 and 5 % measured values of respectively 21.3, 32.7 and 67 %, thus representing the amount of cells were removed from the colony.
Conclusion: The data say the concentration of chlorhexidine becomes cytotoxic from about 3.5 %. The data for a positive control with sodium hypochlorite (HS) and 5 % provided the percentage of 100 % of cells discarded. This is found that the 5 % HS is more cytotoxic than any of the concentrations tested. Knowledge of different concentrations and properties allows the digluconato de clorexidina dentists and other professionals use this substance in the specific indication.
References:
1. Harrison JW. Irrigation of the root canal system. Dent Clin North Am. 1984; 28:797–808.
2. H Masters JRW. Animal cell culture. 3rd edition. Oxford University Press; 2000.
Disclosure: No significant relationships.

O225

LOW LEVEL LIGHT BY LED PROMOTES HEALING PROCESSES IN A SKIN FLAP MODEL IN RATS

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Introduction: Most studies of low level light therapy have been performed in red or infrared range. We showed the significant impact of blue light to release nitric oxide from nitrosyl complexes. Here we aimed to compare the effects of red and blue light from LED on wound healing in a skin flap model.
Materials and methods: A skin flap supported by either left or right inferior epigastric neurovascular bundle was illuminated post-OP and on five consecutive days for 10 min with light-emitting diodes (LED) at either 470 nm or 630 nm with 50 mW/cm^2. On day 7 size of necrotic area, flap perfusion, histologic and immunohistochemical parameters were analysed.
Results: In both light treated groups wound healing was enhanced, necrotic areas were significantly smaller and flap shrinkage less pronounced compared to controls. Immunohistochemical analyses revealed profound effects of light on neoangiogenesis. In both light treated groups blood vessel count in the perimuscular layer of the skin was twice higher. In the subepidermal layer blue light doubled and red light tripled the amount of blood vessels. Consistently, tissue perfusion was twice higher in both light treated groups as determined by Laser Doppler Imaging.
Conclusion: Our data suggest that red and blue light can enhance wound healing processes. By improving angiogenesis and tissue perfusion, light treatment can help to attenuate pathophysiological complications like ischemia-induced necrosis. LLLT would provide an easily applicable and cost-effective treatment for skin wounds.
References:
1. Adamskaya N. et al. Injury. 2011; 42(9):917–21.
Disclosure: No significant relationships.

O226

IRON-MEDIATED INJURY OF MITOCHONDRIA IS ATTENUATED BY NITRITE

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Introduction: Nitrite protects various organs from ischemia–reperfusion injury, in particular ameliorates mitochondrial dysfunction. The mechanism of protection is still unclear. We aimed to investigate whether beneficial effects of nitrite are due to its interaction with free iron (Fe), a promoter of oxidative stress upon hypoxia.
Materials and methods: Rat liver mitochondria were subjected to 15 min of hypoxia (H) and reoxygenation (R) each, with and without exogenous free iron. Respiratory activity of mitochondria, Fe complexes with nitric oxide (Fe–NO), reactive oxygen species (ROS), and lipid peroxidation products (TBARS) were determined by respirometry, electron paramagnetic resonance spectroscopy and colorimetric assays.
Results: H&R induced mitochondrial damage resulting in decreased respiration rates. Mitochondrial damage occurred predominantly during R phase, accompanied by elevated ROS and TBARS levels. Exogenous Fe aggravated these changes in concentration-dependent manner. Cytochrome c restored respiration with succinate but not with glutamate, suggesting two sites of damage, namely outer mitochondrial membrane and complex I. Nitrite protected mitochondrial respiration and reduced TBARS levels but not ROS levels. This protective effect was accompanied by the formation of chemically inactive Fe–NO complexes. A iron chelator (Desferal) protected mitochondria similar to nitrite manner.
Conclusion: Our data suggest that Fe directly, without intermediate ROS formation, induces damage to outer mitochondrial membrane via activation of lipid peroxidation. Nitrite is reduced during hypoxia to NO, which scavenges free iron to form inactive NO-Fe complexes and thus, preventing damage to outer mitochondrial membrane and cytochrome c release. Mechanism(s) of complex I protection by nitrite is still unclear.
References:
1. Weidinger A. et al. Front Physiol. 2013;4:138.
Disclosure: No significant relationships.

O227

TOWARDS SPLENIC MODELING IN TRAUMA: MECHANICAL BEHAVIOUR OF HUMAN SPLEEN IN COMPRESSION EXPERIMENTAL TESTS

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Introduction: Simulating organs' behaviour during accident, we have to perform bio-faithful experimental tests. To our knowledge, there is none conducted on fresh human spleen. We compared biomechanical properties of fresh and cadavers human spleens.
Materials and methods: We performed compression tests on a group of n = 11 fresh spleens (group FS) to a group of n = 3 human cadavers' spleens embalmed (group ES). Fresh tissues came from organs donors, with French Biomedicine Agency agreement. A hydraulic cylinder was connected to a 15kN tri-axis sensor. We applied a speed rate compression of 80 mm/min, until 60 % of splenic thickness.
Results: We compared strength–elongation curves between groups. The median force for which occured the splenic first rupture during test, is 176 N (FS group) versus 166 N (ES group). The median of compression rate to this first rupture, is 38 % (FS group) versus 49 % (ES group). Splenic tissue components in FS group seemed more resistant to compression stress. Force during compression tends to be higher in FS group, at equal compression rate.
Conclusion: Differences in results between fresh and embalmed spleens, are consistent with literature, and will be strengthened by larger effective. Highlighting the need to use fresh tissue to be more bio-faithful, an investigation is in progress to characterise spleen behaviour in compression for a wide range of speed rate. Extracted datas will be used to splenic numerical modeling for traumatology field.
References:
1. B. Tay, In-Vivo Mechanical Behavior of Intra-abdominal Organs, IEEE Transac. Biomed Engin. 2006. J. Rosen, Biomechanical Properties of Abdominal Organs In Vivo and Postmortem Under Compression Loads, J Biomech. Engin. 2008.
Disclosure: No significant relationships.

O228

IMPACT OF FOCAL BRAIN COOLING ON AQUAPORIN-4 LEVEL IN MOUSE MODEL OF POSTTRAUMATIC DECOMPRESSIVE CRANIECTOMY

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Introduction: Both hypothermia and decompressive craniectomy have been considered as potential treatment for traumatic brain injury. In series of previous experiments we presented ameliorated brain edema formation and improved short-term neurological outcome in animals subjected to focal brain cooling. Since development of brain edema seems to be regulated via function of water channel proteins e.g. aquaporins, our current goal was to prove, whether selective brain hypothermia added to craniectomy impacts expression of aquaporin-4 (AQP-4) after brain trauma.
Materials and methods: Male CD-1 mice were randomly assigned into the following groups (n = 5 each): sham, decompressive craniectomy (DC), closed head injury (CHI), CHI followed by craniectomy (CHI + DC) and CHI and DC followed by focal hypothermia (CHI + DC + H). After 24 h the animals were sacrificed for biochemical analysis. The brain homogenates were processed for ELISA biochemical analysis and level of Aquaporin-4 (AQP4) water channel protein has been estimated. One-way ANOVA was used for statistical analysis.
Results: Biochemical analysis presented increased level of AQP4 in brains of the animals subjected to trauma and craniectomy (CHI + DC 47.9 ± 11.2 pg/ml, $p < 0.05$) but not to trauma, craniectomy and hypothermia (CHI + DC + H 45.3 ± 12.5 pg/ml, ns) compared with sham animals (sham 38 ± 9.3 pg/ml).
Conclusion: The protective effect of selective brain cooling, previously described by our group may be mediated via changes in content of water channel proteins and, consecutively, via impact on brain edema formation. The results will be discussed in context of current literature on function of AQP-4 in posttraumatic edema formation.
References:
1. Szczygielski J. et al. European Journal of Anesthesiology Suppl. 2012.
2. Szczygielski J. et al. Acta Neurochir Suppl. 2010.
Disclosure: No significant relationships.

ELBOW AND FOREARM FRACTURES

O229

MANAGEMENT OF COMMINUTED OLECRANON AND PROXIMAL ULNA FRACTURES USING AN ANATOMICAL, PRECONTOURED PLATE

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Introduction: Fixation of comminuted olecranon and proximal ulna fractures is challenging, the goal being stable construct affording union and early movement.
Materials and methods: Between 2004–07, low-profile, precontoured plates were used in 17 patients (10 isolated olecranon fractures, 7 with associated ipsilateral humerus fractures). Functional outcomes were measured and reviewed at 7 years: range of movement (ROM), disabilities of arm, shoulder and hand (DASH) and Mayo Elbow Performance Score (MEPS).
Results: Mean follow-up was 12.2 months (3–33). All united by 3 months. Mean ROM for both groups was 19.3°–130.7° flexion, 71.8° pronation and 72.1° supination. DASH was 16.9 and MEPS was 89.3. Comparing groups showed no significant difference in supination or pronation; all other outcome measurements showed statistical significance in favour of isolated, comminuted fractures. Extension 8.5° versus 35.0° ($p < 0.005$), flexion 140.5 versus 117.5 ($p < 0.05$), DASH 6.9 versus 34.7 ($p = 0.0007$) and MEPS 96.7 (excellent) versus 78.3 (good) ($p < 0.05$). There were no infections or failure of metalwork. We contacted 10/16 at mean follow-up of 6.34 years. Mean DASH and MEPS showed no statistical difference from earlier scores. Four had discomfort around the plate, three had plates removed and one converted to total elbow replacement.
Conclusion: This is a safe, reliable method of fixation giving excellent results when treating isolated comminuted olecranon and proximal ulna fractures, with good results with associated ipsilateral injuries in the short and long-term.
References:
1. Simpson et al. Contoured LC–DC plating of the proximal ulna. Injury 1996;27(6):411–7.
2. Newmana et al. Olecranon fractures. Injury. 2009;40:575–581.
Disclosure: No significant relationships.

O230

FLOATING ELBOW: OUR EXPERIENCE

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Introduction: Floating elbow is a rare injury of upper extremity in association with high energy trauma. There are few series published on the subject, many of which consists of a small number of patients. The objective of this study is to present our experience regarding this type of injuries.
Materials and methods: From 2004–2012, 22 patients were diagnosed with floating elbow in our hospital. We have performed a retrospective data collection about epidemiology, treatment methods and complications of our cohort of patients. Functional outcomes have been evaluated with the Mayo Elbow Performance Score.
Results: We obtained 19 males and 3 females, all of them trauma patients. The average age was 36 years; in 18 cases the injury affected the left arm. 10 patients had an open fracture of humerus or forearm, 5 of them associated with palsy of the radial nerve, 1 patient presented a catastrophic member. We carried out an emergency surgery in 12 patients; 7 patients needed two or more surgeries. The most frequent complication was nerve palsy followed by radioulnar synostosis. The average follow-up was 17.5 months. Patients with intra-articular extension had poorer results in MEPS than those without it (73 vs. 63.5); this difference was statistically significant ($p = 0.018$).
Conclusion: Factors such as complications or fracture patterns can influence in the recovery of patients with floating elbow. In our study we observed that patients with intra-articular extension had poorer functional results than patients without it.
References:
1. Stanitski CL, Micheli LJ. Simultaneus ipsilateral fractures of the arm and forearm in children. Clin Orthop Relat Res. 1980;153:218–22.
Disclosure: No significant relationships.

O231

FIVE-YEAR RESULTS OF TOTAL ELBOW ARTHROPLASTY AS TREATMENT OF COMPLEX INJURIES OF THE ELBOW IN ELDERLY PATIENTS

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Introduction: The use of an elbow prosthesis as a possible treatment option in cases of severe injuries of the elbow was proposed over the last years but there is very little published data of long-term results.
Materials and methods: Since March 2005 we implanted 29 Coonrad-Morrey prostheses. 10 patients had complex type AO-C3 fractures and received primary implantation. 19 patients received a secondary implantation due to trauma sequelae. The mean follow up was 57 months. The functional outcome was measured using the "Mayo Elbow Performance Score". We had 19 female and 10 male patients with a mean age of 68 years.
Results: All patients achieved very good results with a mean of 97 points after 1 year vs. 94 after 5 years. The mean extension/flexion was 92° vs. 101°, pronation/supination 144° vs. 153°. Flexion deformity 19° vs. 15°, mean maximum flexion 112° vs. 115°. We had three partial-ruptures of the triceps tendon, two needed operative treatment, two temporary lesions of the ulnar nerve with complete recovery and two revisions due to postoperative hematoma. Two patients had revision surgery due to an infection. One infection was treated with antibiotics only. We recorded no radiographic loosening or mechanical problems.
Conclusion: The good functional 5-year results show that total elbow arthroplasty is a reasonable treatment option for complex acute and chronic injuries of the elbow in elderly patients.
References:
1. Becker, L. et al. Z Orthop Unfall 2011;149(5):554–9.
2. Kodde, IF et al. J Hand Surg Am 2013;38(7):1377–82.
3. Mahehwari, R et al. Ann R Coll Surg Engl 2012;94(3):189–92.
Disclosure: No significant relationships.

O232

NO DIFFERENCE IN COMPLICATIONS, FUNCTIONAL AND RADIOGRAPHIC OUTCOMES BETWEEN DORSAL OR VOLAR PLATE FIXATION OF THE DISTAL RADIUS

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Introduction: Internal fixation with plates is a reliable fixation technique in the treatment of distal radius fractures and malunions after corrective osteotomy. In clinical practice, volar plate fixation is preferred because of the association between dorsal plate fixation and higher complication rates. However, the complications might be less frequent in the newer dorsal plates with lower profile. Therefore, the purpose of this study was to evaluate complications between dorsal and volar plate fixation.
Materials and methods: A total of 156 patients with acute distal radius fractures (N = 113) or malunions (N = 43) were included in this retrospective study with at least 2 years of follow up. 92 of these patients were treated with dorsal plate fixation and 64 patients with volar plate fixation. Complications were obtained from medical records. The patients completed the DASH and the PRWE questionnaires. Grip and pinch strength, range of motion and radiographic parameters were also evaluated.
Results: The risk for complications was 27.2 % in the dorsal group and 23.4 % in the volar group ($P > 0.05$). Most complications were minor and described as soft tissue/wound problems. Palmar flexion was significantly better in patients with acute distal radius fractures treated with volar plate fixation. Radial deviation was significantly better in patients with malunions treated with dorsal plate fixation. No significance differences were observed in the other outcome measurements.
Conclusion: No preference for plate fixation technique could be made according to these study results.
References:
1. Wei J. Complications following dorsal versus volar plate fixation of distal radius fracture: a meta-analysis. The Journal of international medical research. 2013;41(2):265–75.
Disclosure: Financial support was provided by Synthes Netherlands.

O233

PATIENT REPORTED OUTCOME MEASURES FOLLOWING INTERNAL FIXATION OF DISTAL RADIUS FRACTURES

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Introduction: The management of distal radius fractures using pre-contoured anatomic plating systems is common-place in the UK.
Materials and methods: We performed a review of all distal radius fractures treated at our institution using the Aptus Distal Radius Plating System (Medartis AG, Basel. Switzerland). Over a 6 years period, 93 patients were treated. We collected demographic data including: age, sex, side affected. All fractures were classified using the Frykman system. The number of distal screw rows was recorded (single or double). Two PROMs, patient related wrist evaluation (PRWE) and Quick DASH, were sent to patients.
Results: 5/93 patients were excluded; 2 died, 2 underwent corrective osteotomy (malunions), and 1 was a shaft fracture.
Mean age was 54.61 years (range 15–88). 65 % were female.
51/88 patients returned PROMs (58 %).
Mean follow-up was 2.35 years (range 0.8–5.08). Overall mean QDASH score was 32.12 and mean PRWE was 33.82. Breakdown of Frykman subtypes (means shown): Type 1 (n = 4): QDASH 65.91; PRWE 65 2 (n = 7): QDASH 20.45; PRWE 30.63 3 (n = 3): QDASH 2.27; PRWE 3.5 4 (n = 2): QDASH 31.82; PRWE 41 5 (n = 5): QDASH 35.23; PRWE 40.88 6 (n = 18): QDASH 33.84; PRWE 34.56 7 (n = 13): QDASH 25.65; PRWE 27.57 8 (n = 29): QDASH 33.33; PRWE 35.13 Volar Barton Type (n = 6): QDASH 16.67; PRWE 12.83.
Conclusion: We show that anatomical plating of distal radius fractures gives satisfactory PROMS for function and pain, even with severe intra-articular fractures. We recommend the continued use of this plating system.
References:
1. Arora et al. Aspects of Current Management of Distal Radius Fractures in the Elderly Individuals. 2011. Geriatric Orthopaedic Surgery.
Disclosure: No significant relationships.

O234

SURGERY VERSUS CAST IMMOBILIZATION FOR DISTAL RADIUS FRACTURES IN ELDERLY PATIENTS

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Introduction: The best treatment strategy for displaced distal radial fractures in elderly patients with poor bone quality is still controversial.
Materials and methods: In this retrospective trial we analyzed the functional results and health related quality of life (HRQoL) following closed reduction and cast immobilization versus surgical treatment with volar locking plate fixation of displaced distal radius fractures in elderly patients older than 65 years 12 months after the intervention.
73 patients were included in the study (36 cast; 37 plate fixation). The primary outcome was the DASH score 1 year after the intervention. Also the SF-36 physical component score and the EuroQol 5D (EQ-5D) questionnaire, wrist range of motion (ROM) and radiographic parameters were evaluated after 3 and 12 months after randomization.
Results: One year after the intervention the DASH score was not significantly different between both treatment group (17 p. cast vs. 12 p. surgical, $p > 0.05$). Also the SF-36-PCS-score (46.5 p vs. 48.8 p, $p > 0.05$) and the EQ-5D-score (0.87 vs. 0.85, $p > 0.05$) showed similar results. Wrist range of motion showed comparable results for both groups ($p > 0.05$) after 12 months. Anatomic restoration of the distal radius showed significant better results for the surgical group (palmar tilt: surgical 2.5° vs. 13.3° cast). Patients in both groups nearly returned to their preinjury activity level regardless of the treatment received.
Conclusion: In elderly patients with displaced distal radius fractures, surgical fixation was not superior to cast immobilization in health-related quality of life and functional outcomes 1 year after the intervention.
References:
1. Egol JBJS 2010.
Disclosure: No significant relationships.

O235

FUNCTIONAL OUTCOME ASSESSMENT OF PATIENTS WHO HAVE UNDERGONE OPEN REDUCTION INTERNAL FIXATION (ORIF) FOR DISTAL RADIUS FRACTURES OVER A 20 MONTH PERIOD—A SINGLE CENTRE STUDY

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Introduction: Distal radius fracture is a frequently occurring fracture especially in the elderly population (>65). We assess the functional outcome in patients who have undergone ORIF for distal radius fracture over a 20 month period.
Materials and methods: The trauma lists between September 2010 and December 2012 were assessed to compile a database of all patients undergoing ORIF for Distal Radius Fracture. 'Disability of arm, shoulder and hand' (DASH) and patient-rated wrist evaluation (PRWE) were sent to patients identified from the database. Both of these functional outcome assessment questionnaires are validated.
Results: A total of 176 patients were identified and sent questionnaires. 74 questionnaires were returned, giving a response rate of 42 %. Mean DASH score 16.5 Mean PRWE score 21.8 Pearson Correlation Co-efficient of DASH vs. PRWE = 0.808
Conclusion: Response rate of 42 % is acceptable for this type of study. A mean DASH score of 16.5 suggests good functional outcome post fixation, control studies using DASH have provided normative values of 10-13 therefore our results are suggestive that ORIF has provided good functional outcome. (i) PRWE does not have similar control studies however in similar studies mean PRWE at 1 year was given at 13.5 ± 17. (ii) Therefore again our mean PRWE of 21.8 fits within this bracket suggesting reasonable outcome. The correlation co-efficient of our DASH vs. PRWE scores of 0.808 is highly significant supporting the reliability of the two questionnaires.
References:
1. Hunsaker et al.; Normative values from the General Population. JBJS. 2002; 208–215.
2. J. MacDermid; The Patient-Rated Wrist Evaluation (PRWE) User Manual. 2011
Disclosure: No significant relationships.

O236

THE USE OF BONE GRAFTS IS UNNECESSARY IN THE TREATMENT OF MALUNITED DISTAL RADIUS FRACTURES

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Introduction: Open wedge osteotomy with bone grafting and plate fixation is the standard procedure for the correction of malunited distal radius fractures. Bone grafts are used to fill the bone defect with the idea that they provide increased structural stability and bone formation. With adequate plate fixation, the need for structural bone graft can be questioned. Therefore, the purpose of this study is to assess bone healing and secondary dislocation in the treatment of malunited distal radius fractures without the use of bone graft.
Materials and methods: Since 1993 113 patients were treated with open wedge osteotomy and plate fixation without bone grafting in our hospital. Indications for corrective osteotomy were decreased range of motion and/or pain. Preoperative radiographs were compared to the postoperative radiographs. A part of the patients completed the DASH and PRWE questionnaires. Range of motion, grip and pinch strength were also evaluated in these patients.
Results: One delayed union (6 months) and one non-union occurred in the 113 malunions. None of the patients showed significant secondary displacement. The average wedge was 21.4°. The mean DASH score was 18.3 and the mean PRWE score was 26.5. The mean range of motion was 81.4 % compared to the contralateral side.
Conclusion: Our study shows that bone grafts are not required for bone healing and preventing secondary displacement after open wedge osteotomy and plate fixation of the distal radius.
References:
1. Wieland AWJ, Brink PRG. Open wedge osteotomy for malunited extraarticular distal radius fractures with plate osteosynthesis without bone grafting. Eur J Trauma. 2005;31:148–53.
Disclosure: No significant relationships.

O237

DETERMINANTS OF DISABILITY AFTER PIP SPRAINS OR DISLOCATIONS

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Introduction: Patients with sprains or dislocations of the PIP joint often present weeks after injury, unsettled by persistent swelling, pain, and stiffness. The hypothesis of this study was that there is no correlation between disability and pain self-efficacy at the initial presentation.
Materials and methods: A total of 82 patients (54 men and 28 women) were enrolled in this prospective study. Finger motion was measured and the patients completed measures of upper limb specific disability (the QuickDASH, the shortened version of the Disabilities of the Arm Shoulder and Hand questionnaire), symptoms of depression (the PHQ-9, Patient Health Questionnaire-9), effective coping strategies in response to pain (PSEQ, the pain self-efficacy questionnaire), and an ordinal pain scale at enrollment. 68 patients repeated the questionnaires by phone an average of 9 days later.
Results: Patients were enrolled a mean of 48 days after injury. Patients with dislocations had significantly less pain and less motion. The final multivariable model accounting for greater disability included lower self-efficacy, greater symptoms of depression, and sex (women have more disability). Lower self-efficacy was also the strongest predictor of pain intensity and finger stiffness. Disability, pain intensity, and self-efficacy all improved significantly by the time of the phone follow-up.
Conclusion: Effective coping strategies such as self-efficacy facilitate recovery (less disability, pain, and stiffness) after PIP joint sprain/dislocation. The rapid post-visit improvement in disability, symptoms, and self-efficacy might relate to empathy, reassurance, and training—a hypothesis that merits additional study.
Disclosure: No significant relationships.

O238

MINIMALLY INVASIVE SCREW FIXATION OF MALLET FRACTURES USING A SPECIAL TARGET FORCEPS

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Introduction: Mallet Fractures over 30 % of the joint surface left untreated bear a high risk for osteoarthritis and functionally unacceptable results. Many different treatment options exist. Complication rates of surgical treatments go as high as 53 percent, whereas non-surgical treatment has complication rates between 5 and 47 percent. Focus of this study was the analysis of the treatment process and results of Mallet fractures treated with the target forceps and defining advantages and pitfalls of this method.
Materials and methods: Retrospective analysis of 21 patients. Minimally invasive approach using a prototype target forceps. (Fracture reduction, drilling and screw placement all through one special forceps branch) Analysis of 1 year postOP ROM, pain level, radiological reduction.
Results: ROM: Range 20°–75° (Ø 4°); no extension deficit >10° Radiological reduction: 19 of 21 anatomic, no step 2 of 19 no more than 2 mm step Crawfords criteria: 14 excellent; 6 good; 1 fair complications: 2, due to unrecognized multifragmented fractures (conversion to other fixation) Complication rate 9.5 %.
Conclusion: With the target forceps small fragments can be reduced, drilled and fixed through a single forceps branch, minimizing soft tissue complications. In our patients no nail/soft tissue complications were seen. Furthermore the stable screw fixation allows for an early mobilisation and return to work. In every mallet fracture with an indication for surgical intervention the primary goal should be a stable osteosynthesis, early mobilisation and as limited a procedure as possible. All these principles can be realized with the target forceps.
References:
1. Jupiter, 1987 Kronlage/Faust 2004 Nichajev, 1985 Stern/Kastrup 1988 Theivendran 2007.
Disclosure: No significant relationships.

O239

INTRAMEDULLARY OSTEOSYNTHESIS WITH THE XS-NAIL IN ULNA SHORTENING OSTEOTOMY

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Introduction: Ulna longer than radius con appear posttraumatic or as preexisting condition. It leads to impingement of discus ulnaris and secondary to wrist problems. For shortening osteotomy of the ulna oblique resection and plate and compression screw osteosyntheses are usually used. Instability, osteotomy pseudarthrosis and soft tissue problems due to thin soft tissue coverage are common problems.
Materials and methods: In a series of 18 patients ulna shortening was performed with a intramedullary locked angle stable compression nail system between 2002 and 2010. The XS nail has a 4.5 mm diameter and is locked proximal and distal to the osteotomy with 2.0 or 2.4 mm threaded wires. A compression screw inserted in the nail allows compression of the osteotomy performed at a 90° angle to the ulna shaft direction. The intramedullary locked nail gives higher stability and the compression a circumferencial bone compression of the osteotomy.
Results: In no case pseudarthrosis or implant failure occurred. In three patients with too long threaded wires however soft tissue irritation occurred. In 10 patients finally the nail was removed
Conclusion: The XS nail is a safe and stable method for ulna shortening osteotomy. Special attention must be given to the correct length of the threaded wires.
References:
1. Gehr J, Friedl W. Intramedullary Locking Compression Nail for the treatement of Olecranon Fractures Oper Orthop Traumatol. 2006; 199–213.
Disclosure: No significant relationships.

SOCIO-ECONOMIC ASPECTS AFTER TRAUMA

O240

TELETRAUMA IN ALBANIA—SEEKING SOLUTIONS FOR A CHALLENGING NATIONAL TRAUMA SYSTEM

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Introduction: Trauma remains a major problem in Albania. Only during 2008–2013, 1,742 persons died from Motor Vehicles Crashes (MVC). Due to the lack of communication, very frequently, an injured person in any of the 11 regions of the country appear at the University Trauma Hospital (UTH) without notice. We set up telemedicine program to improve communication and care in 6 out of the 11 regions of the country, with travelling time by ambulance from 30 min to over 4 h.
Materials and methods: Telemedicine centers have videoconferencing (VC) equipment and teleconsultations units (TC) and peripherals. Following the deployment of VC and TC equipment, we trained doctors and nurses on the use of the equipment. The first teleconsultations between Korca regional hospital and UTH started September 2013.
Results: Between September and October 2013, 6 patients were treated through telemedicine (4 neurosurgery, 1 orthopedic and vascular case and 1 polytrauma patient requiring multispecialty approach by neurosurgeon, ophthalmologist, ENT and orthopedic surgeon). Of six patients, four were managed in the local hospital, avoiding unnecessary expensive transfers and two patients were transferred non-emergently to UTH for further treatment and/or diagnostic work up. Both referring and receiving physicians were satisfied with the process. There were no technical difficulties. Radiologic studies were reviewed using locally created software.
Conclusion: Teletrauma as part of the telemedicine network in Albania has potential to greatly improve communications and reduce unnecessary expensive transfers to the Level I trauma center.
References:
1. Latifi R et al. Scan Jour Surg. 2007;96:281–289.
Disclosure: No significant relationships.

O241

SOCIOECONOMIC TRENDS OF TRAUMA: AN ANALYSIS OF EMERGENCY WARD PATIENTS IN YAOUNDé, CAMEROON

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Introduction: Injury is a significant and growing cause of morbidity and mortality in sub-Saharan Africa, but the underlying social and economic factors are not well-understood.
Materials and methods: A total of 2,855 trauma patients visiting the emergency ward at the largest trauma hospital in Yaoundé, Cameroon were surveyed regarding demographic and socioeconomic background, nature and severity of injuries, outcomes, and hospital costs. Asset-based wealth scores were constructed for patients, corresponding to a socioeconomic index developed from the urban Cameroon Demographic and Health Survey. Linear and logarithmic regression and analysis of variance were used to evaluate the effects of wealth on the nature and severity of trauma, resulting treatments and outcomes, and associated costs.
Results: Patients aged 1–89 presented primarily with road traffic injuries (59.8 %) and injuries from personal violence (23.4 %). On average, individuals visiting this hospital were wealthier than the broader urban Cameroonian population; no patients were from the least wealthy quartile. Wealth status was not associated with injury mechanism. Lower wealth was significantly associated with more severe injury as measured by the Kampala Trauma Score, Injury Severity Score, and Glasgow Coma Score, after controlling for mechanism. Admission, death, and treatment were not associated with wealth status, after accounting for trauma severity. More severe trauma scores were associated with higher costs ($p = 0.005$).
Conclusion: Although socioeconomic status was not associated with nature of injury, treatment, or outcomes, poorer patients presented with more severe injuries. The least wealthy quartile in the urban Cameroonian population was not represented in the sample, reflecting a possible socioeconomic disparity in access to care.
Disclosure: No significant relationships.

O242

SEASONAL DISTRIBUTION OF CLINICAL CODING

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Introduction: Recording DRGs and diagnoses allows to show their distribution in the course of the year. Thus cumulative seasonal occurrence of diseases can be detected.
Materials and methods: From 2004 to 2011 we recorded 50,522 main diagnoses and DRGs at the clinic for trauma surgery (Level 1 Trauma Center). Injuries with the same localisation and treatment were subsumed. Additionally, we recorded the case mix (CM), case mix index (CMI) and number of cases (NoC) treated monthly.
Results: The most frequent injuries were the concussion, followed by spinal fractures and fractures of the proximal femur. Mean monthly CM was 380 ($\pm$51.7), mean CMI was 1.45 ($\pm$0.15) and mean NoC was 263 ($\pm$26). CMI was significantly season dependent ($p = 0.04$). Within the DRGs I21Z (excision and removal of osteosynthesis and treatment of the forearm) and I47B (implantation or revision of a THR) are significantly season dependent ($p = 0.04$). Main diagnosis S42.21 (proximal fracture of the humerus: head) and S52.51 (distal extension fracture of the radius) occur most frequently in winter ($p = 0.008$, $p = 0.036$). Within the subsumed diagnoses fractures of the upper ankle joint occur significantly more often in the winter months than in other seasons ($p = 0.01$).
Conclusion: Many factors influence the distribution of diagnoses and DRGs of hospitals. It has to be verified, if logistic conclusions of our results can lead to more efficiency in a hospital. The underlying analysis is applicable for every hospital and provides a valid controlling tool.

References:
1. Fetter RB, JL et al. 1985. DRGs: how they evolved and are changing the way hospitals are managed. Pathologist. 17–21.
Disclosure: No significant relationships.

P0243

This abstract has been withdrawn.

O244

QUALITY OF LIFE, SOCIETAL PARTICIPATION AND FATIGUE IN POLYTRAUMA PATIENTS ADMITTED TO TWO DUTCH LEVEL I TRAUMA CENTERS

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Introduction: This study analyzed Health Related Quality of Life (HRQoL) in polytrauma patients 1–2 years after hospital discharge.
Materials and methods: A total of 282 adult polytrauma (ISS $\geq$ 16) patients admitted to the Leiden University Medical Center (Leiden) or the Medical Centre Haaglanden (Den Haag) from July 2011 to July 2012 received a questionnaire. HRQoL was measured using the Physical Component (PCS) and Mental Component (MCS) scores of the Short Form 36 (SF-36). Societal participation was measured using the Utrecht Scale for Evaluation of Rehabilitation-Participation (USER-P) and fatigue using the Multidimensional Fatigue Inventory (MFI-20).
Results: 118 questionnaires were analyzed (response rate 42 %). Respondent and non-respondents were comparable with respect to age, sex, and injury-pattern and severity. Respondents' mean age was 58.4 years (SD 8.9). Average ISS was 21.2 (SD 7.3). Extremity injury, advancing age, single marital state, and extensive hospitalization were associated with reduced physical functioning ($p < 0.05$). Isolated head injury and low-educational level were associated with reduced mental functioning ($p < 0.05$). Patients with reduced physical and/or mental functioning also reported less societal participation ($p < 0.001$) and greater fatigue ($p < 0.001$).
Conclusion: Up to 2 years after hospital discharge poly-trauma patients report a reduced HRQoL, reduced societal participation and suffer from greater fatigue. Extremity injury and isolated head injury result in reduced PCS and MCS scores. These results can help identify patients at risk and thus improve their recovery during medical treatment and rehabilitation.
References:
1. Peden M, McGee K, Krug, E. Injury: A Leading Cause of the Global Burden of Disease 2000, Geneva: World Health Organisation. 2002.
Disclosure: No significant relationships.

O245

A SYSTEMATIC REVIEW ASSESSING THE IMPACT OF THE INTRODUCTION OF DEDICATED EMERGENCY SURGICAL SERVICES

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Introduction: Acute care surgery (ACS) is a newly introduced model of care that combines a triad of: emergency general surgery (EGS), trauma and critical care. It has been widely adopted across the USA for the management of surgical emergencies. Surgeons in the UK face difficulty in trying to deliver good emergency surgical outcomes whilst balancing emergency and elective commitments in an era of financial cutbacks. Introduction of the ACS model may allow these factors to be overcome.
Materials and methods: A systematic review was performed following PRISMA recommendations. Studies assessing different models of care and institutional factors affecting the delivery of EGS were included.
Results: 23 studies, encompassing 372,988 patients were included. Thirteen studies compared two models of care and nine studies described a single model. In studies comparing ACS to traditional care models outcome including: mortality, complications, time to review/theatre and cost effectiveness were improved in ACS. The elements included in ACS models varied but included: Consultants were commonly cleared from elective commitments whilst oncall, were present onsite during office hours and took calls from home out of-hours. Referrals were made to specialist ACS centers with primary surgical assessments taking place on surgical admissions units rather than in the emergency department. 24-h access to dedicated emergency theatres was also described.
Conclusion: ACS provides improved clinical and financial outcomes in EGS as well as improved training opportunities for juniors. However there remains no consensus on the elements that constitute an ideal ACS model and how it can be implemented into UK practice.
References:
1. www.rcseng.ac.uk/publications/docs/emergency-surgery-standards-for-unscheduled-care Accessed online 3/2/2013.
Disclosure: No significant relationships.

O246

THE CAUSE AND ECONOMIC BURDEN OF EMERGENCY READMISSIONS TO AN EMERGENCY GENERAL SURGERY UNIT

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Introduction: Readmission to hospital contributes to the financial and capacity burden that emergency departments are faced with. The aims of this study were to identify reasons for and quantify the burden of, emergency general surgical readmissions. Reasons for readmission were to be identified and methods instilled to reduce emergency readmissions.
Materials and methods: A retrospective observational cohort study was carried out of all patients readmitted between March 2012 and March 2013 to an Emergency General Surgery Unit. This included identification of initial and readmission diagnosis, medications given on first and second admission and investigations or procedures carried out on readmission. Data was entered and analysed in a database, and recommendations made for change of practice.
Results: 7,400 patients were admitted via EGSU, of which 5,088 were general surgical. 493 of 7,400 were readmissions (6.7 %); 51 % (n = 254) were general surgical emergency admissions. 100 patients

(39 %) were readmitted due to pain, 20 % of which were solely due to inadequate analgesia from first admission. Mean time to readmission was 9.5 days, mean age of patients was 48 (range 21–80, 54 %female, 46 %male). These patients had a combined total length of stay of 101 days (median = 2), with a cost implication to the trust of £22,725, exclusive of readmission financial penalty and investigation cost.

Conclusion: The importance of adequate analgesia and patient education has been raised. Prescribing adequate analgesia and patient education could reduce 39 % of emergency surgical admissions; equating to a cost saving of at least £22,725, and appropriate deployment of resources within an acute, emergency general surgery department.

Disclosure: No significant relationships.

O247

EVALUATION OF THE ALVARADO SCORE IN PATIENTS WHO UNDERWENT SURGERY FOR ACUTE APPENDICITIS

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Introduction: Acute appendicitis (AA) is one of the most frequent diagnoses in Emergency Departments. Although very common, making the diagnoses still poses quite a challenge to physicians around the world, and various diagnostic tools have been developed to help with that decision, such as Alvardo Score. These tools could even help lowering the costs of health care in some areas.

Materials and methods: Retrospective analysis of AA confirmed by histological findings, and differential diagnoses based on intraoperative or histological observations. We calculated the Alvarado Score for each patient, sensitivity, specificity and positive predictive value (PPV), and the ROC curve for every cutoff point.

Results: 115 patients were included. Seventy (60.9 %) were male, mean age was 34.7 ± 16.4 years. AA was confirmed in 101 patients (89 %), but only 85 had intraoperative descriptions of the inflammatory phase of the appendix, being 50 (58.9 %) complicated or perforated. The best cutoff point was a score $\geq$6, yielding a sensitivity of 75 %, specificity of 50 % and positive predictive value of 90.3 % and an area under the ROC curve of 0.630. Nevertheless, 25 patients were false negative.

Conclusion: Our study showed high PPV using a cutoff point of 6, which showed the best results in our population. This could be associated with the high prevalence of complicated cases and the higher age at presentation. Still, caution should be taken regarding false negative results in our population.

References:

1. Alvarado AA. Practical Score for the Early Diagnosis of Acute Appendicitis. Annals of Emergency Medicine. 1986;15:5.

Disclosure: No significant relationships.

O248

THE DIFFICULTIES OF DIAGNOSIS AND MANAGEMENT OF ACUTE APPENDICITIS IN A RURAL AREA HOSPITAL

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Introduction: Appendectomy is a well established surgical procedure used in the management of acute appendicitis. In the era of technology, the diagnosis and management of disease are much more easier than the former times. But in rural areas, it is still sometimes a challenging issue.

Materials and methods: From November 2012 to November 2013, totaly 96 consecutive adult patients who were diagnosed as acute appendicitis in Bitlis State Hospital analyzed retrospectively. Patients age, sex, pre-hospital delay, the distance to the hospital, physical examination findings, radiological findings, operative findings, pre/postoperative complications and length of hospital stay were evaluated.

Results: Of the 96 patients, 72 were male and 24 were female (M/F 3:1). The median age was 26 (15–58 years). Median pre-hospital delay was two and a half days. Among 96 patients, ultrasound or computed tomography imaging was applied to 66 patients. Operative findings were 8 % normal appendix, 74 % acute appendicitis, %20 perforated appendicitis, 7 % abscess and 1 % terminal ileitis. Mean post-operative length of hospital stay was two and a half days.

Conclusion: Although diagnosis and management of acute appendicitis is more easier in recent times, it is sometimes a big challenge in rural areas of our country. Patients late reference to hospital may relatively causes increased rates of perforation and abscess. Therefore we, as surgeons working in these rural areas, should be more aware during the diagnosis and management of acute appendicitis.

References:

1. Chavda SK, Hassan S, Magoha GA. Appendicitis at Kenyatta National Hospital, Nairobi. East Afr Med J. 2005;82(10): 526–30.

Disclosure: No significant relationships.

O249

SIGNIFICANCE OF C-REACTIVE PROTEIN IN DIAGNOSIS OF APPENDICITIS COMPLICATIONS

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Introduction: Early diagnosis of inflammatory appendicitis and surgical treatment are of great importance for the complications occurrence.

Materials and methods: 117 patients were processed with inflammation of the appendix, clinically and patohistologically confirmed diagnosis at Surgery Clinic, CHC., Pristina-Gracanica

Results: From a total of 117 surgically treated patients for inflammation of the appendix, 57 (48.7 %) were without complications and 60 (51.3 %) with complications (gangrene, perforation and abscess). There were 59 (50.4 %) males and 58 females (49.6 %) patients. Patients were mostly between 25 and 40 years old. Univariate analysis showed following results: age ($p < 0.001$), increased white blood cell count (p, 0.005) and C-reactive protein ($p < 0.001$) showed statistical significance in the diagnosis of

inflammatory appendicitis complications. C-reactive protein values ranged from 7 to 74 mg/dl.
Conclusion: The study shows that the value of C-reactive protein greater than 8 mg/dL may be predictor of complications of appendicitis inflammation, especially in children and elderly patients
References:
1. Sekulić S. Appendicitis-disease of appendix. Dijam M press. Novi sad. 2002.
2. Amalesh T, Shanker M, Shamker R. CRP in acute appendicitis is it a necessary investiganation? Int J Surg 2004;2(2):88–9.
Disclosure: No significant relationships.

O250

CLOSURE OF OPEN ABDOMEN IN THE SAME ADMISSION BY USING COMPONENT SEPARATION TECHNIQUE

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Introduction: Achieving fascial closure in patients with open abdomen (OA) can be challenging. Component separation technique is usually used 6–12 months after discharge to obtain closure (1). Its use in the same admission is not well studied. We present our experience on using component separation in the same admission (CSSA).
Materials and methods: Retrospective chart review included 28 general surgery patients with an OA at a level 1 trauma center between January 2010 and March 2013. Charts were reviewed to identify closure status and in hospital course. A Cox regression model was used to identify predictors of survival ($p < 0.05$).
Results: Patients' median age was 28 years with 22 (78.5 %) being males. Closure was achieved on 14 (50 %) patients, of whom 6 (42.8 %) were closed by CSSA. Patients that were closed stayed fewer days on the ventilator (3.6 vs. 11; p0.013) while there was no significant difference in hospital as well as the intensive care unit length of stays (24 VS. 16; p0.48) and (11.5 VS. 13; p0.57), respectively. Independent predictors of survival were APACHE II score (HR 0.92; 95 %CI 0.85–0.99), number of trials for closure (NOC) (HR 0.53; 95 %CI 0.33–0.85) and first day fluid balance (HR 0.53; 95 %CI 0.34–0.85).
Conclusion: Our data has demonstrated an association between NOC and survival. Using CSSA is a good alternative when standard fascial closure is unattainable to obtain closure as early as possible. Further investigation is needed to determine the long-term results of using this technique.
References:
1. Ramirez, et al."Components separation" method for closure of abdominal-wall defects: an anatomic and clinical study. Plast Reconstr Surg. 1990;86(3):519–26.
Disclosure: No significant relationships.

TIBIAL INJURIES

O251

ARE OBESITY AND GENDER SPECIFIC RISK FACTORS FOR COMPLICATIONS AFTER INTRAMEDULLARY NAILING OF TIBIAL SHAFT FRACTURES?

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Introduction: The effect of obesity on patients treated for long-bone fractures of the lower extremity is largely unknown. Gender is a risk factor which has not yet been well described in the current literature. Understanding these risk factors could lead to strategies in prevention of these complications. This study aims to evaluate obesity and gender as risk factors affecting infection and delayed fracture healing of tibial shaft fractures treated with intramedullary nailing.
Materials and methods: Between January 2000 and January 2012, 507 patients with 513 tibial fractures met the inclusion criteria. Of these, 27 patients were lost in follow-up ($n = 16$) or had died ($n = 11$). Fifty-two (10.8 %) patients had a body mass index more than 30 kg/m^2. This was defined as obesity.
Results: In total 480 consecutive patients with 486 fractures were included. Twenty-one patients developed infections of which 7 (1.4 %) where deep infections. Delayed fracture healing occurred in 105 fractures (21.6 %). Multivariable statistical regression analysis revealed male gender as a risk factor for delayed fracture healing. Obesity did not reach statistical significance as an independent risk factor for complications.
Conclusion: This study shows that obesity is not an independent risk factor for complications. Although deep infection was correlated with obesity on univariate analysis which suggests that obesity has an effect on deep infection but the relationship is complex and confounded by different factors. Further analysis revealed a correlation between male gender and an increased risk for delayed fracture healing.
References:
1. Duan X, et al. Intramedullary nailing for tibial shaft fractures. Cochrane Database 2012.
Disclosure: No significant relationships.

O252

EVIDENCE SUPPORTING CAUSAL ROLE OF INTRAOPERATIVE DAMAGE IN GENESIS OF ANTERIOR KNEE PAIN AFTER TIBIAL NAILING

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Introduction: Anterior knee pain (AKP) is a common complication following tibial nailing with incidence reaching up to 86 %. We have compared conclusions of earlier studies regarding etiology and evaluated presumed causal factors on our cohort. Results were analyzed in the light of recent anatomical and physiological findings.
Materials and methods: A group of 60 patients with 62 tibial shaft fractures was formed. Mean follow-up was 38.9 months, ranging

from 12 to 84. Nailings were performed using medial paratendinous approach with knee flexed over 100 degrees. During entry point preparation no excision of infrapatellar fat was allowed and haemostasis kept at the lowest level. Soft tissue was protected using tissue protector.
Results: Incidence of anterior knee pain was 35 % (in 16 % classified as moderate). None of the patients reported severe or constant pain. Mean group Lysholm knee score was 88.6 ± 12.6. No statistical evidence supporting role of commonly presumed causal factors was identified.
Conclusion: Though we agree with multifactorial aetiology of anterior knee pain, significance of some earlier presumed causal factors appears to be overestimated. Recent studies point out nociceptive potential of Hoffa fat pad and probability of lesions of intraarticular knee structures during nail insertion. We find respecting posterior movement of menisci and Hoffa's pad in knee flexion over 100 degrees, together with atraumatic handling of infrapatellar fat, responsible for reduced incidence and severity of AKP in our patients.
References:
1. Jankovic A, Korac Z, Bozic NB, Stedul I. Influence of knee flexion and atraumatic mobilisation of infrapatellar fat pad on incidence and severity of anterior knee pain after tibial nailing. Injury. 2013;44:S33–9.
Disclosure: No significant relationships.

O253

EXTERNAL SKELETAL FIXATION AS TEMPORARY AND DEFINITIVE METHOD IN COMPLEX PROXIMAL AND DISTAL TIBIAL FRACTURES TREATMENT

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Introduction: Bridging external fixation leads to joint stiffness and cartilage damage. It is presented one simple method of transforming bridging to dynamic frame providing so normal joint motion in the treatment of complex intraarticular fractures.
Materials and methods: As a clinical material we used series of 83 proximal and distal tibial fractures treated with highly mobile dynamic external fixation device. Intraoperatively it is applied bridging construction and 2–4 weeks later it is transformed to dynamic construction in out patient clinic. The external fixation system we used provides these possibilities without additional components regardless of pins position. Special joint axis rotation finder was used.
Results: Average time of healing was 3.5 months (2.5–4.5). End functional results when external fixation used as definitive method in intraarticular fractures were: very good 20 %, good 58 %, fair 18 %, and poor 4 %. The best results have been obtained after transforming of rigid to dynamic bridging frame. Comparison of results of using of external fixation only and external and then internal fixation we didn't find important statistical difference in end results.
Conclusion: It can be concluded that using of dynamic highly mobile external fixation device accurately adjustable in three dimensions intraoperatively and postoperatively, in the treatment of distal and proximal tibial fractures leads to the same satisfactory result as used by external and then internal or by internal fixation only.
References:
1. Mitkovic MB, Bumbasirevic MZ, Lesic A, Golubovic Z. Dynamic external fixation of comminuted intra-articular fractures of the distal tibia (type C pilon fractures). Acta Orthop Belg. 2002;68(5):508–14.
Disclosure: No significant relationships.

O254

COMPARISON OF MINIMALLY INVASIVE PLATE VERSUS INTRAMEDULLARY NAIL FIXATION IN THE TREATMENT OF DISTAL TIBIAL METAPHYSEAL FRACTURES

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Introduction: We aimed to compare the clinical results of cases treated with minimally invasive plate osteosynthesis (MIPO) or intramedullary nailing for distal tibial metaphyseal fractures without extending the ankle joint.
Materials and methods: A retrospective evaluation was made of a total of 35 patients who underwent surgery for distal tibial metaphyseal fracture. Treatment was made by locked anatomic tibial plate with MIPO technique on 17 patients (Group 1) and by closed intramedullary nailing on 18 patients (Group 2). All the fractures were closed and AO 43 A. The cases were evaluated clinically, radiographically and functionally with the American Foot and Ankle Score (AFAS). The mean follow-up period was 11 months (6–17).
Results: The mean duration of surgery was 94.5 min (59–139) in Group 1 and 82.6 min (59–145) in Group 2. The mean union time was determined as 15.4 weeks (11–20) in Group 1 and as 17.4 weeks (12–22) in Group 2. The mean AFAS score was 79.4 (47–90) in Group 1 and 80.8 (65–90) in Group 2. Complications were determined as implant irritation in 2 patients in Group 1 and pain in the anterior knee in three patients in Group 2.
Conclusion: The clinical and functional results of both methods determined to be similar. The mean operation time with intramedullary nailing was shorter and the mean time to union with MIPO was shorter.
References:
1. Vallier HA, Cureton BA, Patterson BM. Randomized, prospective comparison of plate versus intramedullary nail fixation for distal tibia shaft fractures. J Orthop Trauma. 2011;25:736–741.
Disclosure: No significant relationships.

O255

SUPRAPATELLAIR NAILING FOR TIBIAL FRACTURES. NEW TOY WAITING FOR NEW PROBLEMS?

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Introduction: Classically tibial nailing gives i40 % anterior knee pain. Especially within those who need to kneel down for professional or religious reasons, will pose a serious quality problem.
Materials and methods: Since 2010 we included 26 cases of tibial fractures treated by a tibial nail using the suprapatellar approach. 11 nails were brought in without the special ancillary, the rest with the special designed guiding jig. 12 fractures belonging to the proximal tibia (defined according to Hein) three fractures were open of which

one was the result of a shot gun injury. All the nails were followed up until healing. Evaluation used ST 36 short form and LEFS score.
Results: Only the case after shot gun injury became infected. No exchange of implanted was needed, this healed after serial débridements and bone grafting. SF36 average: 89 physical score, 90 mental score LEFS score average; 66/80 Arthroscopic control immediately after nailing showed some fraying of the distal part of the trochlea femoris. MRI 2 months after nailing could not show any signs of osteochondral contusion of the patellofemoral joint. We found difficulties in nearly all cases to introduce the protection sleeve without force passing the patellofemoral joint.
Conclusion: Suprapatellar approach seems to be a save alternative of infrapatellar nailing. Introducing the protection sleeve at the beginning of the procedure is not straight forward. All patients could kneel down after surgery without anterior knee pain.
References:
1. Jakma T, Reynders P. Acta Orthopaedica Belgica. 2012; Suprapatellar nailing of proximal tibial fractures.
Disclosure: No significant relationships.

O256

INTRAMEDULLARY NAILING VS. PLATE OSTEOSYNTHESIS IN TIBIA FRACTURES TREATMENT

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Introduction: In modern traumatology very important is choice of the method for bone fragments fixation, able to provide optimal biomechanical and biological conditions for fractures union. Tibia fractures in Ukraine are on the second place among the long bones' fractures and reach 36 % of cases.
Materials and methods: We analyzed the treatment results of 219 cases of tibia bone diaphyseal fractures, among them 103 have been treated with IM nailing, other 116 with bone plates. Patients of the groups have been standardized pursuant to severity of injuries, sex and age. Treatment was performed according to the developed algorithm for use of IM nailing, based on: fracture type (AO), concomitant fibula fracture, severe concomitant injuries, presence of systemic osteoporosis. Depending thereon we used static or dynamic locking of a nail, with or without intramedullary channel drilling. In case of concomitant fubila fracture—performed osteosynthesis thereof. In cases of unstable tibia fractures and osteoporosis we fixed fibula bone both in middle and lower third.
Results: The both groups' results of treatment we studied for the period from 12 month to 2 years. Use of IM nailing increased the positive results of tibia bone fracture treatment in 27.4 % and decreased unsatisfactory results in 4.3 % compared to plate osteosynthesis.
Conclusion: Use of IM nailing for tibia bone fracture treatment ensures the proper conditions for optimal healing of tibia bone fractures and could be chosen as the method in case of shin closed fractures.
Disclosure: No significant relationships.

O257

THE ROLE OF BIPLANAR DISTAL LOCKING IN INTRAMEDULLARY NAILING OF TIBIAL SHAFT FRACTURES

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Introduction: *The ideal number and configuration of di*stal interlocking screws of tibial fractures remains controversial *(1).*This study was planned to test if biplanar distal locking has any superiority in fracture union time than the uniplanar one.
Materials and methods: A retrospective study was conducted in 39 consecutive patients, who were nailed for tibial diaphyseal fracture between 2009 July and 2013 February. Radiographs were imported from the PACS system. Group 1 comprised 17 patients had monoplanar distal interlocking and Group 2 comprised. Two groups were compared due to fracture union time by assessing all follow up radiographs of the patients by two authors. Patients were also evaluated for; age, fracture localization, open/closed nailing, surgery time and residual fracture gap. Reliability between authors was tested with the correlation index between the groups. Variety of the groups was evaluated with Mann–Whitney *U* test.
Results: In Group 1 median union time was 14.73 weeks and the screw-fracture distance was 7.5 cm. In Group 2 median union time was 10.5 weeks (6–17) and the screw–fracture distance was 4.6 cm. Group 2 had a significantly shorter union time than Group 1 ($p = 0.036$). When only screw-fracture distance with 6 or less fractures were evaluated; Group 1 and Group 2 had a median union time of 14 weeks and 10.5 weeks ($p = 0.1$), respectively.
Conclusion: In this study, multiplanar distal interlocking procedure had a significantly shorter union time. Biplanar interlocking procedure allows a faster fracture union by a more stable fixation construct.
References:
1. Fan CY, et al. Interlocking nails for displaced metaphyseal fractures of the distal tibia. Injury. 2005;36(5):669–74.
Disclosure: No significant relationships.

O258

DO WE NEED RETROPATELLAR APPROACH TO NAIL PROXIMAL THIRD TIBIA FRACTURES?

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Introduction: Fractures of the proximal third of the tibia are difficult to nail using conventional techniques. Typical problems are valgus malalignment, antecurvation and posterior shift of the distal fragment. Methods of avoiding these pitfalls have been suggested, including semi-extended knee, retropatellar approach, provisional plating. Use of the fixator-assisted technique seems to be underestimated. Aim of our study was to refine the technique of closed interlocking nailing in fractures of the proximal tibia introducing fixator-assisted technique.

Materials and methods: 97 closed interlocking nailings were performed in 91 patients in 55/97 proximal tibia fractures (20 open) and 42/97 nonunions after different treatment modalities. All surgeries were performed using a flat radiolucent table in full knee flexion in all but one case of pre-existed knee stiffness in extension. Reduction was obtained and maintained by a distractor consisted of two half-rings connected with three telescopic rods. Spatial control over the proximal fragment was gained by two K-wires inserted in coronal plane. Transmedullary (poller) K-wires were used for additional control of nail passage.
Results: Healing was reached in all cases, in 8/97 secondary procedures were necessary in open and/or high energy injuries with low healing potential. Malunions which required surgical correction occurred in 2/97 cases and were caused by loss of fixation with conventional type nails with only two proximal locking screws.
Conclusion: The simple and reproducible fixator-assisted technique provides low invasive nail insertion in knee flexion. It renders unnecessary retropatellar approach, semi-extended position, extended incision, use of reduction clamps or provisional buttress plating.
Disclosure: No significant relationships.

O259

TREATMENT OF THE COMPLEX PROXIMAL TIBIAL PLATEAU FRACTURES ACCORDING TO THE TRI-COLUMN CONCEPT—INITIAL EXPERIENCE

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Introduction: Routine CT scanning of proximal tibial fractures has led to improved understanding of bicondylar fractures and brought in a change in treatment strategies.
Materials and methods: This study covers 23 patients—12 females treated over a period of 3 years. The shortest follow-up was 12 months. 12 (52 %) were caused by high-energy trauma. The fracture line and depression of the postero-medial (PM) or postero-lateral (PL) aspect or both of the condyles were found. These fracture patterns defy the commonly used classification schemes. According to 3 column concept (M + L+P/PM + PL/) the patient spread was: M + L+PM + PL in 9 (40 %); M + L+PM in 2(7 %); M + PM + PL in 9 (40 %) and L + PL + PM in 3 (13 %). According to CT 3D personality of the fractures was: PM: splitting 17 (74 %); comminution 6 (26 %); depression 4 (17 %) cases and PL: splitting i2 (7 %); comminution 14 (61 %); depression 16 (70 %). A posterior approach was utilized in all cases for fracture fixation, combined with an antero-lateral when needed. Seven fractures were fixed by distal antero-lateral tibial plate, buttress plating was done in the remaining 16 cases. ABG of postero-lateral defects was performed. No patient was diagnosed with vascular or neurological deficit after surgery.
Results: All fractures healing. The functional results according to Lysholm knee score as: excellent in 10(43 %), very good in 5(35 %), and fair in 5(22 %) patients respectively.
Conclusion: The tri-column concept has been recently supported by routine usage of CT with 3D reconstruction. Fractures of the posterior column are challenging injuries and a new algorithm of planning and fixation is needed.
References:
1. Luo CF et al. Three-column fixation for complex tibial plateau fractures. JOT. 2010;24:683–692.
Disclosure: No significant relationships.

O260

INTRAMEDULLARY NAILING OF TIBIAL FRACTURES USING A SUPRAPATELLAR APPROACH—FIRST EXPERIENCE

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Introduction: Intramedullary nailing of tibial fractures is widely used technique. Antegrade nailing through the infrapatellar approach is associated with several specific problems. The anterior knee pain, making kneeling impossible, is present in up to 80 % of patients. Reduction of the fractures of proximal third of tibia is difficult from infrapatellar approach due to nail insertion outside of the long axis of the bone. Suprapatellar approach should eliminate the above mentioned problems.
Materials and methods: Suprapatellar approach was used in 17 patients with tibial fracture since January 2013. Four fractures were located in proximal third of tibia; the remaining 13 fractures were located in middle or distal third. The mean follow-up was 6 months. The wound complications, presence of anterior knee pain, range of knee motion, quality of fracture reduction was evaluated.
Results: In one patient we observed skin irritation by the head of the locking screw. No other wound problems appeared. Full range of knee motion was noted in all patients. Moreover, we did not observe any anterior knee pain, not even during kneeling. Acceptable fracture reduction was achieved in all patients with proximal metaphyseal tibial fractures.
Conclusion: Our first results with intramedullary nailing of the tibia using suprapatellar approach are promising. This approach eliminates two major problems of conventional infrapatellar nailing procedure: anterior knee pain and difficult reduction of the fractures of proximal third of tibia.
References:
1. Jakma T et al. Insertion of intramedullary nails from the suprapatellar pouch for proximal tibial shaft fractures. Acta Orthop. Belg., 2011, 77, 834–837.
Disclosure: No significant relationships.

O261

HIGH RATE OF COMPLICATIONS AFTER LCP FIXATION OF THE DISTAL TIBIA FRACTURES TYPE A

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Introduction: To analyse the complications after LCP fixation of the distal tibia fractures Type A.
Materials and methods: From 2005 to 2012 years have been operated 59 patients (38 women and 21 men, average age 46) with Type 43 A distal tibia fractures. The average follow up was 24 months. All fractures have been operated with minimally invasive LCP fixation. The fractures are as follows Type 43 A1–16, Type 43 A2–22 and Type 43 A3–21. The soft tissue status has been evaluated (Tscherne classification): Type C1–28, Type C2–16 and Type C3–7. According Gustilo & Anderson classification there were Type I–5, Type II–3. Ex

Fix stabilisation has been applied in 45 patients. Definitive fixation was applied averagely on day 8. In 21 cases fractures of the fibula have not been stabilised.
Results: All cases have been analysed for the reasons for valgus and varus malalignment, neurological complications, bone healing and functional recovery of the ankle joint. There have been 31 complications observed—infections 7 cases, non-union, delayed union and failure of fixation—6, malunion—10, n.peroneus superficialis dysfunction—4 and 3 cases with serious ankle joint stiffness.
Conclusion: Knowledge of biomechanics of LCP fixation in distal tibia fractures Type A and experience with operative technique is of paramount importance for better results but further research is needed.
References:
1. Hasenboehler E et al. LCP with minimally invasive plate osteosynthesis in diaphyseal and disital tibial fracture: a retrospective study of 32 patients. Injury 2007;38(3):365–70.
Disclosure: No significant relationships.

O262

DIAPHYSEAL TIBIAL FRACTURES: RISK FACTORS FOR DEEP INFECTION AND PROLONGED FRACTURE HEALING AFTER INTRAMEDULLARY NAILING

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Introduction: Despite advances in management, tibial shaft fractures remain vulnerable to complications which often require secondary surgery. Identification of risk factors could lead to strategies in prevention of these complications. The purpose of this study was to evaluate factors affecting infection and delayed fracture healing of tibial shaft fractures treated with intramedullary nailing.
Materials and methods: Between January 2000 and January 2012, 507 patients with a total of 513 tibial fractures met the inclusion criteria. Of these, 27 patients were lost in follow-up (n = 16) or had died (n = 11). Analysis was performed to determine predictors of deep infection and delayed fracture healing.
Results: In total, 480 consecutive patients with 486 tibial shaft fractures were included in the analysis. Multivariable statistical regression analysis revealed polytrauma as an individual risk factor for non-union. No specific risk factors could be identified for delayed union. Male gender, Gustilo type and polytrauma are different risk factors for delayed fracture healing in general. External fixation was statistically associated with deep infection.
Conclusion: This retrospective analysis revealed risk factors for deep infection and nonunion in patients who underwent intramedullary nailing for tibial shaft fractures. Patients with primary external fixation are at risk for deep infection. Polytrauma is an individual risk factor for non-union. Male gender, Gustilo type and polytrauma seem to be different risk factors for delayed fracture healing in general. We should consider the possibility that the nature of complications after tibial shaft nailing is multifactorial.
References:
1. Duan X, et al. Intramedullary nailing for tibial shaft fractures. Cochrane Database 2012.
Disclosure: No significant relationships.

THORACIC TRAUMA

O263

THE UNSTABLE THORACIC—CAGE INJURY: STERNAL FRACTURE AND CONCOMITANT FRACTURE OF THE THORACIC SPINE

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Introduction: The purpose of this work is to investigate if the sternal fracture is frequently associated with an unstable fracture of the thoracic spine and if it can be regarded as indicator for unstable thoracic cage injuries.
Materials and methods: By analysis of CT-scans the combined injury pattern of a sternal fracture and a concomitant spinal fracture could be observed in 206 patients. The sternal fracture was associated with a cervical-, a thoracic- or a lumbar spine fracture in 81, 130 or 82 cases. The control group consisted of polytraumatized patients younger than 50 years with thoracic spine fracture and without sternal fracture.
Results: A type B or C fracture was found in 51.5 % of all injured patients in the study group. In the control group one third of the casualties had a type B or C fracture. This proves that in case of a concomitant sternal fracture, the number of type B or C thoracic spine fractures is significantly higher. In the cases where the fracture of the thoracic spine and the sternum were located in the same segmental height, 20 out of 35 fractures were classified as type C fractures. Consequently, a significant increased number of rotational unstable fractures could be proven in corresponding fracture locations.
Conclusion: The sternal fracture is an indicator for an type B or C fracture of the thoracic spine. In the cases where the sternal and the thoracic spine fracture are located in the same segment, a highly unstable type C fracture can be expected.
Disclosure: No significant relationships.

O264

PENETRATING CARDIAC TRAUMA: DOES THORACOTOMY NEED ALWAYS TO BE INDICATED?

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Introduction: The classic treatment for penetrating injuries of the heart is surgery. Advances in diagnostic and minimally invasive surgery have changed this behavior in selected cases. This study aims to analyze the cases of minor cardiac injuries submitted to surgery at a university hospital and the possibility of a less invasive approach.
Materials and methods: A descriptive study using trauma registry of 96 patients undergoing surgical treatment for repair of cardiac injury. Were identified lesions grade I—II (AAST-OIS) and patients classified into two groups: (A) non-therapeutic thoracotomy (14 cases) and (B) lesions treated without thoracotomy (3 cases).

Results: In the 17 cases evaluated the predominant mechanism of injury was from firearms (11 cases, 64.7 %). These patients had hemodynamic stability on admission RTS average 7.6 ± 0.5. Patients in group A had surgery due to positive pericardial window in 71.4 % of cases, positive echocardiography in one case (7.1 %) and positive computed tomography in 3 cases (21.4 %). The mean hospital length of stay of these patients was 9.58 days. Patients in Group B were treated with VAT and pericardial window/drainage, and had less morbidity compared to group A.
Conclusion: The rate of non-therapeutic thoracotomy can be reduced significantly in services with well-established protocol for investigation. Larger samples are needed to confirm this hypothesis.
References:
1. Pereira BM et al. Penetrating cardiac trauma: 20-y experience from a university teaching hospital. J Surg Res. 2013;183(2):792–7.
Disclosure: No significant relationships.

O265

ROLE OF TUBE THORACOSTOMY FOR TRAUMATIC OCCULT HEMOTHORAX IN ADULTS, A SYSTEMATIC REVIEW

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Introduction: There is no clear guidance reported in the literature regarding management of occult hemothorax (OH) in adults with blunt trauma. The objective of this systematic review is to identify what is the occurrence of OH and what are the prognostic factors to predict success of conservative management.
Materials and methods: MEDLINE, Embase and the Cochrane Library databases were searched. All studies addressing occurrence of OH and outcome of conservative management in blunt thoracic trauma were included. Methodological quality was assessed and extracted data were analyzed with narrative synthesis. Main medical textbooks and professional associations guidelines were also reviewed.
Results: A total 1,222 of articles and abstracts were screened, of which, only four observational studies fulfilled the inclusion criteria. No randomized controlled trials were found. Occurrence of occult hemothorax varies between 21.5 to 30 % of adults with blunt thoracic trauma. Evidence exist that occult hemothorax less than 1.5 cm can be observed safely. High Injury Scoring Scales and the need for mechanical ventilation are inconsistently prognostic factors of failure of observation.
Conclusion: Giving the very few articles and moderate quality of evidence, only weak conclusion can be drawn. The size seems to be the most predictive factor of failure of conservative management. OH less than 1.5 cm could probably be observed safely in blunt trauma patients who present in a level 1 trauma centre. The prognostic factors identified to predict failure should be confirmed in future prospective cohort studies.
References:
1. Am J Surg. 1994;168:688–92.
2. Am J Surg. 2006;192:722–6.
3. Am J Surg. 2005;190:841–4.
4. Am J Surg. 2011;201:766–9.
Disclosure: No significant relationships.

O266

SITES FOR NEEDLE DECOMPRESSION OF TENSION PNEUMOTHORAX: LET THERE BE LIGHT

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Introduction: Needle decompression for tension pneumothorax is recommended in the second intercostal space (ICS) at the midclavicular line (MCL) as the standard of care. Recent literatures proposed the procedure had better be done in the fifth ICS at the midaxillary line (MAL). The purpose of this study was to compare the utility of needle thoracostomy in these two positions.
Materials and methods: All adult trauma patients admitted to the Songklanagarind Hospital, a trauma center in Thailand, from 2011 to 2013 were identified. One hundred thirty-two patients were chosen on the basis of a priori power analysis. Chest wall thickness on computed tomography (CT) at the second ICS in the MCL was compared with the fifth ICS in the MAL.
Results: The mean difference in chest wall thickness between the fifth ICS at the MAL and the second ICS at the MCL was 9.3 mm ($p < 0.001$) in which the chest wall thickness at the second ICS in the MCL was thinner. The percentage of patients with chest wall thickness greater than the standard 5-cm decompression needle was only 6 % at the second ICS in the MCL but 32 % at the fifth ICS in the MAL.
Conclusion: Contrary to recent literatures, needle decompression would be expected to fail in only 6 % of cases at the second ICS in the MCL. The standard recommendation for the location of needle decompression is ensured.
References:
1. Inaba K, Ives C, McClure K, et al. Radiologic evaluation of alternative sites for needle decompression of tension pneumothorax. Arch Surg 2012;147:813–8.
Disclosure: No significant relationships.

O267

AN INNOVATIVE THERAPEUTIC MODULE FOR MANAGEMENT OF PNEUMOTHORAX; VERESS NEEDLE THORACOSTOMY, AIR CONTROL SYSTEM AND INDUCED HYDROTHORAX; PROVED SUPERIOR TO THE TRADITIONAL MODALITY

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Introduction: The dilemma of thoracostomy whether open, closed or minimal access is still going on. Relying on multiple published researches; here by the suggested innovative module for diagnosis confirmation, easy, fast and safe thoracostomy access, improved air drainage and superior over all outcome.
Materials and methods: This is a case series experimental study in the field of management of pneumothorax. A complete drainage system set is standardized. Once diagnosis is assured, Veress

thoracostomy is introduced and confirmation of air on water system attached to the needle is achieved. The connected system is replacing air expelled with one type of two fluid solutions tested. The differential transthoracic pressures are recorded in all cases. The progress of cases and observations were documented.
Results: The technique of closed thoracostomy is proved safe and efficient. The induced hydrothorax showed fastened diminution of pneumothorax and accelerated pulmonary expansion is demonstrated. The duration of drainage was remarkably short. No differences were noted between both groups of fluid types. No recurrence on the short term was seen. All the standards needed for application on medical practice are documented.
Conclusion: Here in this study multiple therapeutic factors have been introduced in the same time. Collecting different areas of research, adjusted to work together forming a unique module to activate pleural dynamics and enhance pulmonary tissue healing. The follow up was of short duration. The author suggested an innovative modality for management of pneumothorax that needs to prove itself on a wide scale controlled studies.
References:
1. References (6).
Disclosure: No significant relationships.

O268

SURGICAL FIXATION OF LEFT POSTERIOR RIB FRACTURES TO AVOID CATASTROPHIC DIRECT AORTIC PUNCTURE

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Introduction: Although rare is direct aortic puncture (DAP) by fractured ribs in blunt trauma, it is catastrophic. Only few paper has referred to the indications of surgical fixation.
Materials and methods: We present 8 cases of left posterior rib fractures (lp-RF) which may cause DAP.
Results: Case 1: A sharp edge of the lp-RF verging on the descending aorta on primary CT penetrated the aorta 2 weeks later. MRI and intravascular ultrasonography were advantageous in diagnosis. Direct suture with a side clamp was successfully done. Case 2: Sudden severe shock developed 5 days after injury with over 1 L of blood drained via the chest tubes inserted on admission. A desperate attempt of TAE thankfully succeeded. At thoracotomy, 2 holes on the aorta were sutured, though only one of them was assessed on preoperative CT. Case 3: lp-RF with the distance of 7 mm to the aorta on primary CT remained unchanged on follow-up CTs. After 2-week rest on bed, the patient was found in state of cardiac arrest in the toilet on the 14th day. Emergency thoracotomy uncovered DAP but the patient died. Subsequent 5 cases were treated by prophylactic surgical fixation and discharged without complications.
Conclusion: It is vital to consider that the lp-RF near the spine is a high risk for penetrating into the aorta, particularly if the rib is fractured into displaced fragments like a 'seesaw'; and the CT guarantees the location of the rib fracture only at the moment of being scanned. Considering the risk-to-benefit ratio, prophylactic surgical fixation yields the best outcome.
References:
1. Ann Vasc Surg. 2012;26:574
Disclosure: No significant relationships.

O269

NUMBER OF RIB FRACTURES IN ELDERLY (≥60 YEARS) PATIENTS WITH SEVERE (THORACIC AIS > 2) CHEST INJURY: DOES IT MATTER?

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Introduction: The effect of the number of rib fractures on the clinical outcome is controversial. Some reports have found the number of broken ribs to correlate to outcome, and others have not. Our hypothesis was that the number of rib fractures in elderly patients with severe chest injury correlates to clinical outcome.
Materials and methods: This is a retrospective study over 5 years period in a single level 1 trauma center. We included all patients with thoracic AIS >2 and age ≥60 years. We excluded patients with thoracic spine fracture as their only thoracic injury and patients whom were dead on arrival. Data was collected on the prehospital and in-hospital treatment.
Results: During the study period 119 patients were included. The average age was 70.9 years and 70 % were males. Length of ICU stay was 5.6 ± 6.9 days and 47 patients were intubated and the length on mechanical ventilation was 2.7 days. The average ISS was 22 ± 12 and 30 day mortality was 8.4 %. The number of rib fractures (as a continuous parameter) did not correlate to mortality, length of CPAP treatment, days ventilated or ICU LOS. When comparing patients with 1–4 rib fractures (n = 50) to those with over 4 rib fractures (n = 59) we did not found any association to mortality, ICU stay or days ventilated.
Conclusion: Our results suggest that in elderly patients (≥60 years) with serious thoracic injury (AIS > 2) the number of rib fractures does not associate with outcome.
Disclosure: No significant relationships.

O270

STABILIZING FLAIL CHEST INJURIES THROUGH MINIMIZED APPROACHES TO THE KEY POINTS OF INSTABILITY USING ALEXIS® RETRACTOR

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Introduction: Stabilizing techniques of flail chest injuries usually need 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[1].
Severe morbidity due to these invasive approaches needs to be considered. This study discusses possibilities for minimized approaches to the shown regions.
Materials and methods: 17 Patients were stabilized by locked plate osteosynthesis (MatrixRib®) between may 2012 and october 2013 and prospectively followed up. Flail chest injuries were: anterolateral (8):

median approach, bilateral (2): median and bilateral approach; lateral (3): lateral approach; posterolateral (2): posterior and lateral approach; posterior flail (2): posterior approach. Each approach was 6–8 cm using Alexis® retractor

Results: One minimized approach offers sufficient access to 4 ribs posterior and laterally and 4 pair of ribs anterior in all cases. There was no need to divide latissimus dorsi.muscle. Trapezius und rhomboid muscles were only limited divided, subcutaneus dissection of serratus and abdominis muscles was necessary.

Follow up showed sufficient consolidation. Complications: pneumothorax (2) and seroma (2).

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

References:

1. [1]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 a consultant agreement with Synthes CMF. No funds were received in connection to the presented study. The coauthors are not involved in any conflict of interest.

O271

BLUNT CERVICAL ARTERY INJURY IN THE POLYTRAUMA PATIENT

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Introduction: Cervical artery injury is considered a rare entity in high-energy trauma, associated with devastating complications including permanent neurologic impairment related to cortical blindness, stroke, brain stem ischemia, and even fatal outcome. The carotid/vertebral artery are prone to injury due to their unique anatomic exposure. We analyzed their epidemiology, associated complications and concomitant spine/head injuries in order to facilitate early detection and prevent neurologic sequelae.

Materials and methods: The German Trauma Registry was used for retrospective data analysis from 59,496 trauma victims (01.01.2002–31.12.2012). Patients (ISS $\geq$ 16) with cervical artery injury were divided into the groups: CAI (carotid artery injury) and VAI (vertebral artery injury). The degree of vascular injury was characterized according AIS-values. Data of demographic, injury, therapy and outcome characteristics (e.g. thombo-embolic events/stroke/mortality) were collected and analyzed using SPSS.

Results: A total of 479 individuals with cervical artery injury were identified, including 267CAI and 212VAI. CAIs were subdivided into 159 dissections, 49 major ruptures (blood loss $\geq$ 20 %), 59 bilateral injuries. VAIs were subdivided into 95 dissections, 38 major ruptures, 68 thrombotic occlusions and 11 bilateral injuries. The risk for complications and stroke did increase with vascular injury severity. However, our results also demonstrate that 32.8 % of all individuals with cervical artery injury had no associated head injury and even 52.8 % had no cervical spine injury.

Conclusion: Immediate identification and treatment of vascular injuries is crucial for optimal management. Predicting patients at risk for cervical vascular injuries remains difficult, especially since many patients have no concomitant head or spine injury.

References

1. Anderson et al. JAAOS. 2010.
2. Lebl et al. Spine. 2013.
3. Parikh et al. J Am Coll Surg. 1997.

Disclosure: No significant relationships.

O272

A TAILORED PROTOCOL IN THE MANAGEMENT OF PENETRATING NECK INJURIES

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Introduction: We assessed the efficiency of a tailored protocol in penetrating neck injuries (PNI) based on physical examination and multidetector computerized tomography (MDCT). Also to shed light on the role of endovascular techniques in the treatment.

Materials and methods: This is a prospective study of PNI in the period from June 2008 to June 2013. Injuries not breaching the platysma, blunt injuries and posterior injuries were excluded. Patients were resuscitated using Advanced Trauma Life Support (ATLS), and a tailored protocol followed at our hospital

Results: Study included 80 males and 5 female, mean age of 27, the mode of trauma was 43 stabs, 24 shotguns, 12 bullets, and 6 motor car accidents. Presentations included 20 unstable, 21 with hard signs, 22 with soft signs and 22 asymptomatic. Investigations used were 51 MDCT, 25 duplex, 7 angiographies, 13 esophograms, and 3 larygeobronchoscopy. 31 cases managed conservatively, and 54 operatively. There were 49 vascular injuries. 22 repaired surgically, 3 by endovascular intervention, and 24 ligated. 14 aerodigestive injuries 11 repaired directly and 3 by tracheostomies. The mean hospital stay was 5 days. There was 2 missed nerve injury and 2 related mortalities.

Conclusion: (1) Zones classification is helpful but may be deceiving in slanting stabs and bullets injuries. (2) The boom of MDCT and endovascular techniques have changed the algorithms of management. (3) Following a tailored protocol improves the outcome of PNI

References:

1. Inaba K, etal. J Trauma Acute Care Surg. 2012.
2. Shiroff AM, etal. Am Surg. 2013.

Disclosure: No significant relationships.

DIAGNOSTIC TOOLS—ROLE OF CT AND ULTRASOUND

O273

THE DEGREE OF ACCURACY OF COMPUTED TOMOGRAPHY IN IDENTIFYING ABDOMINAL ORGAN INJURIES IN BLUNT TRAUMA PATIENTS WHO UNDERWENT EMERGENCY LAPAROTOMY

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Introduction: Computed tomography (CT) Scan is a radiological imaging techniques used as the primary diagnostic tool, in trauma, for identifying injuries. The objective was to estimate the degree of accuracy of pre-operative CT scan, in detecting and identifying the severity of abdominal injuries following blunt trauma and underwent emergency laparotomy.
Materials and methods: This is a retrospective study; conducted at King Abdulaziz Medical City. Comprised of a chart review, which included trauma patients whom sustained blunt abdominal trauma, and presented to the Emergency Department (ER) between January 2009–June 2012, who underwent preoperative abdominal CT scan, and followed by emergency laparotomy. The exclusion criteria included; patients who did not have abdominal CT prior to surgery. Demographic data was collected; as well as the Glasgow Coma Score (GCS), CT scan and intraoperative findings, the elapsed time between presentation to the ER until CT scan was completed.
Results: CT scan had the highest accuracy for detecting injuries to the diaphragm (93.9 %) and the lowest degree of accuracy in identifying the extent (grade) of injuries to the spleen (63.6 %), and the liver (78.8 %). The degree of accuracy of CT scan images in detecting injuries to the mesentery, bowel and kidney was 84.85 %; while detecting injuries of the pancreas was 81.8 % respectively.
Conclusion: CT scan is an accurate diagnostic tool in blunt abdominal injuries involving the diaphragm, mesentery, bowel, kidney and pancreas; but limited in detecting extent of injuries to spleen and liver.
References:
1. Davis JW, et al. Complications in evaluating abdominal trauma: diagnostic peritoneal lavage versus computerized axial tomography. J Trauma. 1990;30:1506–1509.
Disclosure: No significant relationships.

O274

IVR-CT SYSTEM IN THE EMERGENCY ROOM IMPROVE THE SURVIVAL IN THE PATIENTS WITH SEVERER 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 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 2013 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 38 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 (42 %) compared with group C (68 %) 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 create the beneficial effects on survival in severe trauma patients at high risk of death.
References:
1. First clinical experience with IVR-CT system in the emergency room: positive impact on trauma workflow.
Disclosure: No significant relationships.

O275

DETERMINATION OF RELIABILITY FOR CT-SCAN RELATED SCORING TECHNIQUES IN DIAGNOSING DRUJ INSTABILITY AFTER CONSERVATIVELY TREATED DISTAL RADIUS FRACTURES

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Introduction: Although common, diagnosing distal radio-ulnar joint (DRUJ) instability remains a challenge. DRUJ instability can be identified on CT-scans using different methods, without data on reliability. The aim of this study was to determine the reliability for methods to diagnose DRUJ instability after conservatively treated distal radius fractures using a CT-scan.
Materials and methods: Forty-six patients (eight males), treated non-operatively for a unilateral distal radius fracture were included. Of both wrists, clinical DRUJ stability was tested and a CT-scan was made. Ninety-two scans were evaluated once by two and twice by one observer, using radio ulnar line method, subluxation method, epicenter method and radio ulnar ratio. Inter- and intra-observer agreement was measured and predictive values with clinical tests as gold standard.
Results: Mean follow-up was 4.2 years. Eight patients tested positive for dynamic and 19 for static DRUJ instability. Best inter- and intra-observer agreement was found for the epicenter method and the radio ulnar line method respectively. Best positive predictive values for static and dynamic DRUJ instability were 100 % using the radio ulnar ratio and 67 % for radio ulnar line method, respectively. The best negative predictive value for static and dynamic DRUJ instability were 60 % with the radio ulnar line method and radio ulnar ratio and 87 % with the epicenter method respectively.
Conclusion: The epicenter method seems most reliable to assess DRUJ instability. The radio ulnar ratio seems most useful to diagnose DRUJ instability. Considering the inter- and intra-observer agreement, CT-scan should be used with caution for diagnosing DRUJ instability.
References:
1. Park et al. JBJS-Am. 2008;90:145–53.
Disclosure: No significant relationships.

O276

USE OF A MILITARY CT SCAN TECHNIQUE IN IMAGING THE POLYTRAUMA PATIENT

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Introduction: Imaging polytrauma patients traditionally acquires CT contrast enhanced images during the arterial phase (25 s) and porto-venous phase (60 s). This multiphase approach has limitations in the acute setting, due to time consuming acquisition of thousands of images and higher radiation doses. The biphasic technique, adopted by military in the battlefield permits both porto-venous and arterial enhancement simultaneously. Our study investigated polytrauma imaging using biphasic military versus traditional multiphase protocols.
Materials and methods: Trauma patients (n = 50) with an ISS >15 (mean age 39 years) undergoing full body scans were selected between March–May 2013. The provisional report duration, CT dose length product (DLP) and mean attenuation (HU) were compared between patients receiving biphasic versus multiphase techniques.
Results: The average DLP of the biphasic technique (959 mGycm) was less than half of cases using non-biphasic techniques (1,967 mGycm). The mean attenuation values from the biphasic protocol were more uniform across different regions of interest (Aortic arch 305 HU, Pulmonary artery 237 HU). The biphasic tool produced proportionately higher IVC enhancement values (191 vs. 118 HU). However, average time to report findings using the biphasic protocol was 71 min versus 60 min for non-biphasic scans. This could be explained by greater proportion of senior grades favouring traditional techniques compared to junior radiologists (38 vs. 24 %).
Conclusion: Biphasic military trauma scans produce better arterial and venous enhancement with lower patient radiation doses. We did not find using the more rapid biphasic tool led to any proportionate reduction in reporting time.
References:
1. Standards of practice and guidance for trauma radiology. RCR, 2011. http://bjr.birjournals.org/content/early/2012/07/17/bjr.33335273.full.pdf.
Disclosure: No significant relationships.

O277

IS ULTRASOUND AN ESSENTIAL TOOL FOR PLACING CENTRAL VENOUS LINES?

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Introduction: A recent report published by the American Society of Anesthesiologists task force on central venous access suggests the routine use of a real time ultrasound for obtaining a central venous line. This led us to test the hypothesis whether ultrasound is really an essential tool for placing a central venous catheter.
Materials and methods: A retrospective review of a prospectively collected database was performed for the period January 2002 to June 2013. Five hundred fifty patients underwent long-term Central Venous Catheter placement. All procedures were performed by experienced (>50 placements) surgeons utilizing standard techniques.
Results: Males corresponded to 51.3 % (n = 282) of the total population. The most frequent cannulated vein was the subclavian vein (n = 451/82 %). The right subclavian vein (RSV) was the first choice for catheterization (n = 410/74.5 %). 83.5 % (n = 459) of the punctures were successful on the first attempt. Complications included arterial puncture (n = 36/6.5 %), hematoma (n = 16/2.9 %) and pneumothorax (n = 4/0.7 %). Ultrasound was only used in selective high-risk cases (7.3 %).
Conclusion: The data suggests that with proper skill and experience, ultrasound is not an essential tool for placing CVCs, although it may be helpful in specific difficult cases.
References:
1. Theodoro D, Bausano B, Lewis L, Evanoff B, Kollef M. A descriptive comparison of us-guided cvc of the internal jugular vein to landmark-based sv cannulation. Acad Med. 2010;17(4):416–22.
Disclosure: No significant relationships.

O278

CONTRAST-ENHANCED ULTRASOUND FOR THE NON-INVASIVE EARLY DIAGNOSIS OF ACUTE COMPARTMENT SYNDROME—DEVELOPMENT OF A METHOD BASED ON PERFUSION KINETICS

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Introduction: Compartment syndrome of a limb is a severe and dynamic condition. Compromised microcirculation is always the initial focus of attention. A compartment syndrome is difficult to diagnose reliably and safely, a true gold standard does not exist.
Materials and methods: The usefulness of modern contrast-enhanced ultrasound for the early non-invasive diagnosis of acute compartment syndrome was assessed in a group of subjects by using the validated models (Wiemann et al., Wiger et al.).
Results: Visual inspection alone allowed us to identify a clear delay in the arrival of the contrast agent and thus to assess the situation and detect an impending deterioration in perfusion. The newly defined parameter (dTTA) provided objective evidence of an initial impairment of perfusion that occurs early in a compartment syndrome. We calculated a median dTTA of 10.89 s (6.81–16.29 s) at rest. When intracompartmental pressure increased, perfusion impairment led to a considerable increase in dTTA (median of +26.22 s [model of Wiemann et al.]; median of +24.17 s [model by Wiger et al.]).
Conclusion: With the quantifiable perfusion parameters of CEUS compromised microcirculation at the onset of compartment syndrome can be detected in real-time. The method presented in this study thus proved to be a useful tool in the early non-invasive diagnosis of compartment syndrome. Further studies are required to assess the reliability and validity of this new technique, the suitability and the benefits of this method, however, may already be expected.
References:
1. Ulmer 2002.
2. Shadgan et al. 2010.
3. Wiemann et al. 2006.
4. Wiger et al. 2000.
Disclosure: No significant relationships.

O279

EMERGING USE OF ULTRASOUND AND MRI IN PERIPHERAL NERVE INJURIES AND DISORDERS

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Introduction: The diagnostic work up of patients with peripheral nerve involvement currently depends largely on clinical and

electrophysiological investigations. MRI and Ultrasound have not been widely used so far as a diagnostic tool in the PNS except for detection of nerve compressing mass lesions. In addition to ruling out underlying mass lesions, Ultrasound and MRI allow the radiologist to directly visualize nerves and associated soft-tissue abnormalities.
Materials and methods: We use Ultrasound and MRI for diagnosis of peripheral nerve injury or neuropathy in our institution. Ultrasound and MRI have been especially useful in detecting focal intrinsic and extrinsic nerve lesions and may reveal treatable conditions even in the absence of significant electrophysiological alterations. These approaches provide general information on the distribution and classification of nerve lesions-for example, axonal versus demyelinate.
Results: In this presentation, optimal Ultrasound and MRI techniques for the evaluation of nerve disorders will be summarized. Additionally, the spectrum of imaging findings in peripheral nerve disorders will be displayed using case examples. We also have a One Stop Clinic Model for a quick ultrasound in Orthopaedic OPD and fracture clinics.
Conclusion: The radiologist plays a crucial role in the evaluation of peripheral nerve disorders. Understanding the best Ultrasound and MRI techniques to evaluate these disorders and the spectrum of imaging findings in peripheral nerve disorders adds to patient care.
References:
1. Jung et al. Usefulness of Ultrasound for Detecting Suspected Peripheral Nerve Lesions in Diagnosis of Peripheral Neuropathy. J Korean Neurosurg Soc. 2013; 53(2): 132–135.
Disclosure: No significant relationships.

O280

FOCUSED ASSESSMENT SONOGRAPHY FOR TRAUMA (FAST) TRAINING: A SYSTEMATIC REVIEW

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Introduction: Aim: To systematically review different methods for training FAST for Trauma, course design, and requirements for hospital credentialing.
Materials and methods: We searched Medline/Pubmed, Embase, Cochrane database and manual search of selected papers. All papers and abstracts written in English that studied training and education of FAST were included. Papers were critically evaluated looking into training methods and models of FAST, their advantages and disadvantages, number and type of training hours, practice exams in the course, and finally number of cases advised to achieve hospital credentialing.
Results: 52 studies were critically analyzed. The theoretical part of the courses lasted over a median (range) of 4 (1–16) hours, n = 35 studies, while the practical part over a median (range) of 4 (1–32) hours, n = 34 studies. The participants performed a median (range) of 10 (3–20) FAST exams during the courses, n = 13 studies. The most common used model was the normal human model (65 %) followed by peritoneal dialysis patients (27 %). The least used models were animal (4 %) and cadaveric models (2 %). Each of these models had their advantages and disadvantages. The median (range) FAST exams needed for credentialing was 50 (10–200) exams, n = 19 studies.
Conclusion: Different models used in FAST training are complimentary. FAST courses are recommended to be at least for 2 days (16 h). The first day should include 4 h of theory and 4 h of training on normal human models. The second day should enforce learning using animal models, case scenarios including video clips, or simulators.
References:
1. Leandro G (2005) Meta-analysis in medical research. BMJ books.
Disclosure: No significant relationships.

ADVANCES IN BIOMECHANICAL RESEARCH

O281

MICROCIRCULATION OF THE HEALTHY HINDFOOT. A PROBAND-STUDY FROM THE PERSPECTIVE OF THE SURGICAL APPROACH

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Introduction: Despite the establishment of minimally invasive techniques and possibilities of conservative treatment, surgical treatment using the extended lateral approach represents the gold standard treating intraarticular calcaneal fractures. The intact dermal microcirculation is essential for wound healing without complications. The aim of this study was to detect microcirculatory parameters of the soft tissue in a healthy volunteer collective to identify the optimal approach and factors predicting microcirculation.
Materials and methods: 125 study participants (age 30.7 years, m/f 76/49, BMI 22.3 kg/m^2, RR 124/79 mmHg, smoker/non-smoker 32/93) were included in the study and underwent analysis of the soft tissue microperfusion of the right hindfoot in supine position using the O2C (oxygen to see, laser-doppler/ultrafast laser spectroscopy, LEA-Medzintechnik GmbH, Gießen, Germany). Using a standardized measurement plan 10 measurement-points were laterally and medially recorded in a penetration depth of 2 mm and 8 mm each, analysing the bloodflow and the capillary venous O2-saturation in the blood vessels up to 100 μm.
Results: When comparing the medial approaches the McReynolds approach was found to have significantly higher values (SO_2 and Flow, $p < 0.001$) in both 2 mm and 8 mm depth, whereas the descending sustentaculum approach had the lowest values ($p < 0.001$). On lateral hindfoot the extended lateral approach showed significantly higher SO2 values (2 and 8 mm) compared to the Palmer approach showing the lowest values ($p < 0.001$). Focussing on the bloodflow the Palmer approach however provided the highest values ($p < 0.001$).
Conclusion: Soft tissue measurements of the hindfoot microcirculation show significant regional differences. Clear factors influencing the microcirculation could not be detected.
Disclosure: No significant relationships.

O282

DOES A LARGE LATERAL TALAR PROCESS EXCISION INFLUENCE ANKLE AND HINDFOOT STABILITY? A BIOMECHANICAL STUDY IN A HUMAN CADAVERIC MODEL

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Introduction: Talar injuries can be described as central or peripherical. Lateral talar process fragment excision may be followed by hindfoot instability and altered biomechanics. There is controversy regarding the ideal fragment size for internal fixation versus excision and a concern that excision of a large fragment may lead to significant instability. The aim of this biomechanical study was to assess the effect of a simulated large lateral talar process excision on ankle and subtalar joint stability.
Materials and methods: Seven fresh-frozen human cadaveric lower legs with preserved epidermal, subcutaneous, plantar soft tissue, ligaments and capsules were subjected to 5 cm^3 and 10 cm^3 lateral talar process fragment excision each. A custom made seesaw rig was designed to simulate inversion/eversion stress loading and allow for radiographic analysis. Each specimen was investigated in pre-excision, 5 cm^3 and 10 cm^3 excision state and anteroposterior radiographs were taken to assess tibiotalar and subtalar joint tilt.The data were analyzed to calculate the angular change from neutral hindfoot alignment to 10 kg forced inversion/eversion.
Results: In comparison to the pre-excision state,no significantly different mediolateral angular change was observed in the subtalar joint after 5 cm^3 and 10 cm^3 lateral talar process fragment excision in inversion (pre-excision $10.88 \pm 3.41^\circ$(mean ± SD); 5 cm^3 excision $11.85 \pm 4.26^\circ$; 10 cm^3 excision $11.43 \pm 6.90^\circ$), $p = 0.29$ and eversion (pre-excision $3.33 \pm 3.88^\circ$; 5 cm^3 excision $3.72 \pm 4.37^\circ$; 10 cm^3 excision $3.80 \pm 2.84^\circ$), $p = 0.62$. With respect to the ankle joint, 10 cm^3 fragment excision produced significantly bigger talar inversion tilt $5.30 \pm 2.04^\circ$ compared to $2.32 \pm 1.40^\circ$ in pre-excision state, $p = 0.04$.
Conclusion: Whereas excision of 5 cm^3 and 10 cm^3 lateral talar process fragment did not produce significant instability in the subtalar joint, the latter resulted in significantly bigger talar tilt in the ankle joint.
References:
1. Langer P et al. Foot Ankle Int. 2007;28:78–83.
Disclosure: No significant relationships.

O283

FEMORAL NECK FRACTURES CAN BE FIXED BETTER WITH CANNULATED SCREWS APPLYING THE NOVEL TECHNIQUE FOR BIPLANE DOUBLE-SUPPORTED SCREW FIXATION. A BIOMECHANICAL STUDY

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Introduction: Osteosynthesis of femoral neck fractures with cannulated screws is related to poor results with 20–46 % incidence.With its innovative concept the technique for biplane double-supported screw fixation (BDSF) offers opportunity for better stability buttressing two out of three medially diverging cannulated screws on the inferior cortex. In addition to its medial cortex support the distal screw touches the posterior neck cortex as well.The aim of this study is to evaluate the fixation strength provided with BDSF in comparison to the conventional fixation (CFIX) with three parallel cannulated screws.
Materials and methods: Eight fresh-frozen (FRZ) and six embalmed (EMB) pairs human femora with simulated AO/OTA 31-B2.2 fracture were assigned to four groups and fixed with three 7.3 mm cannulated screws applying either CFIX or BDSF: CFIX-FRZ, BDSF-FRZ, CFIX-EMB, BDSF-EMB. Non-destructive quasi-static tests were performed in AP bending followed by axial non-destructive quasi-static, cyclic (1 Hz/100–1,000 N/1,000 cycles) and destructive quasi-static tests run in 10° flexion and 7°/16° lateral FRZ/EMB specimen inclination. AP bending and axial stiffness, cyclic interfragmentary displacement along the diaphyseal axis and failure load were evaluated.
Results: AP bending stiffness was similar in all groups: CFIX-FRZ: 39.6 ± 2.8Nm/° (mean ± SEM); BDSF-FRZ 41.0 ± 2.4Nm/°; CFIX-EMB 39.4 ± 3.4Nm/°; BDSF-EMB 42.0 ± 3.0Nm/°. Axial stiffness was significantly higher for BDSF in comparison to CFIX at 7° inclination (CFIX-FRZ 0.53 ± 0.06kN/mm; BDSF-FRZ 0.93 ± 0.10kN/mm), $p = 0.02$ and comparable at 16° inclination (CFIX-EMB 0.85 ± 0.09kN/mm; BDSF-EMB 0.82 ± 0.05kN/mm). Interfragmentary displacement during the cyclic test remained lower for BDSF compared to CFIX. Failure load (CFIX-FRZ 2.68 ± 0.31kN; BDSF-FRZ 3.31 ± 0.36kN; CFIX-EMB 2.83 ± 0.66kN; BDSF-EMB 3.02 ± 0.68kN) was higher for BDSF than CFIX.
Conclusion: Stability of femoral neck fractures fixed with BDSF is substantially increased due to better cortical support of the cannulated screws.
References:
1. Rogmark and Johnell (2006) Acta Orthop. 77(3):359.
2. Gjertsen et al. (2010) JBJS/Am. 92:619.
3. Filipov (2011) Eur J Orthop Surg Traumatol. 21:539.
Disclosure: No significant relationships.

O284

IS LOCKED LATERAL PLATING BIOMECHANICALLY SUPERIOR TO CONVENTIONAL PLATE FIXATION IN THE PROXIMAL PHALANX?

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Introduction: Phalanx fractures require appropriate surgical stabilization to allow early mobilization. Conventional dorsal plating is considered to be biomechanically superior compared to lateral plating but may interfere with the extensor mechanism of the phalanx. The biomechanical drawbacks of the lateral approach might be overcome with the use of locked plate constructs. The current biomechanical study investigated stability of dorsal versus lateral plating for treatment of phalangeal fractures.
Materials and methods: Twenty-four fresh frozen human proximal phalanges were equally distributed into four groups ($n = 6$) for plating with dorsal and lateral non-locking, lateral locking bicortical and lateral locking unicortical fracture fixation. Instrumentation was done under anatomical reduction of an osteotomy created at a distance of 11 mm from the proximal bone end. Biomechanical testing was performed with three non-destructive quasistatic loading protocols to determine axial, dorsovolar and mediolateral stiffness followed by a destructive cyclic cantilever bending test.
Results: Mean axial and mediolateral stiffness was significantly higher in the lateral locking plate constructs compared to the non-locking implant ($p = 0.033$ and $p = 0.007$ respectively). No significant differences were found in dorsovolar bending stiffness and plastic construct deformation between the groups. The specimens in

all study groups failed with a cut-out as predominant mode of failure without significant differences in the number of cycles to failure.
Conclusion: Lateral locking plate osteosynthesis in the proximal phalanx proved biomechanically at least as good fixation stability as dorsal non-locking plating and can be considered as a valid alternative since it is less disruptive to the extensor mechanism.
References:
1. Quellette EA et al. Clin Orthop 2004;418:213–218.
Disclosure: No significant relationships.

O285

ROTATIONALLY STABLE SCREW-ANCHOR WITH TROCHANTERIC STABILIZATION PLATE (ROSA/TSP) VERSUS PROXIMAL FEMORAL NAIL ANTIROTATION (PFNA) IN UNSTABLE TROCHANTERIC FEMUR FRACTURES: A BIOMECHANICAL EVALUATION

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Introduction: Blade plate fixation has shown advantages compared to sliding hip screw with regard to rotational stability and cut-out resistance in trochanteric fractures. The rotationally stable screw-anchor plate system (RoSA) is unique in employing a novel screw-blade combination. This investigation tested the hypothesis whether RoSA with a locked trochanteric stabilization plate (TSP) is advantageous over the proximal femoral nail antirotation (PFNA) with regard to stiffness, failure load, displacement and migration in unstable trochanteric femur fractures (AO/OTA 31A2.2).
Materials and methods: Ten femur pairs (mean age 85 years, 71–96 years) received implants of either the RoSA/TSP (Koenigsee Implants, Allendorf, Germany) or PFNA (Synthes, Umkirch, Germany). Beginning with 300 N and under consecutive 300 N load-increase steps (500 cycles, 0.5 Hz) the femurs were cycled until failure. Specimens were evaluated for fragment displacement in both frontal and rotational planes, as well as for migration.
Results: There was no statistically significant difference between the two implant types with regard to stiffness (RoSA/TSP vs. PFNA: 639 ± 228 N/mm versus 673 ± 255 N/mm; $P = 0.542$). The average failure load of the RoSA/TSP system was 3000 ± 787 N; whereas that for the PFNA was 3780 ± 874 N ($P = 0.059$).
Conclusion: This study showed a partial superiority of the PFNA with regard to failure load under cyclic loading when compared to the novel screw-anchor plate system (RoSA/TSP) in an unstable trochanteric fracture model. Stiffness, rotational stability, and migration behavior were comparable between intra- und extramedullary implants.
References:
1. Knobe M, et al. J Orthop Trauma 2013 ;27(6):e127–136.
Disclosure: No significant relationships.

O286

PROPHYLACTIC REINFORCEMENT OF THE POROTIC PROXIMAL FEMUR. A SYSTEMATIC APPROACH TO FIND A VALID SOLUTION

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Introduction: After an osteoporotic hip fracture, the risk of sustaining a second fracture at the contralateral hip increases significantly.[1] An invasive prophylactic reinforcement of the contralateral limb during operation of the primary fracture could be justified for high-risk patients. For designing a fixation solution, a test model was developed consisting of dynamic numerical simulations as pre-evaluation tool and of a cadaveric free-fall setup. The model was applied to a first potential fixation approach.
Materials and methods: Five pairs of human cadaveric femora were scanned with high-resolution CT. A V-shaped implant, consisting of metal and bone–cement components, was designed and implanted into one side of each bone–pair. All specimens were tested in a free-fall setting until failure. Fracturing was simulated with specimen specific Finite Element (FE) models in a dynamic, non-linear manner. The untreated bones served as training-set to define the plastic behavior of each bone–pair. Simulations of the operated side were used as test-set to evaluate the model performance.
Results: Mean prediction error of failure load was 0.97 % (range 0.44–1.61 %) for the untreated specimens and 12 % (range 1.4–25 %) for the operated specimens. The tested implant prototype showed a significantly increased energy uptake until failure ($p = 0.044$). However, the generated fracture patterns revealed higher complexity compared to the untreated bones.
Conclusion: The introduced testing approach carries high potential for systematic development of reinforcement methods to prevent geriatric hip fractures. Even though, the tested fixation approach does not offer clinically relevant performed yet, it can be used as starting point for future developments.
References:
1. Ryg et al. Hip fracture patients at risk of second hip fracture: a nationwide population-based cohort study of 169,145 cases during 1977–2001. J Bone Miner Res. 2009;24;1299–1307.
Disclosure: No significant relationships.

O287

INFLUENCE OF EARLY POSTOPERATIVE MOBILIZATION ON THE FIXATION OF CEMENTED AND NON-CEMENTED PEDICLE SCREWS: A BIOMECHANICAL HUMAN CADAVERIC STUDY

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Introduction: Biomechanical studies have shown that pedicle screw fixation can be improved by augmentation of bone cement. The goal of this study was to analyze the early postoperative biomechanical performance of pedicle screws by simulating the load of weight bearing.
Materials and methods: A total of Fifty-nine pedicle screws (27 cemented/32 non-cemented) were instrumented into thoracic and lumbar vertebra of fresh human cadavers. Quantitative computed tomography (QCT) scans were performed to evaluate bone mineral density of the donors. Pedicle screws were subsequently placed under fluoroscopic guidance and either left non-cemented or augmented by fenestrated application of bone cement. Biomechanical performance

was assessed by either directly measuring axial pullout strength (12 cemented/21 non-cemented) or by performing a cyclic loading test (frequency: 3 Hz, load range: 20–200 N, number of cycles 100,000), followed by axial pullout testing (15 cemented/11 non-cemented).
Results: The mean bone mineral density was 56.1 mg Ca-HA/ml, while the mean T-Score was −4,251. Pullout strength was significantly increased in the cement-augmented pedicle screws compared to the non-cemented screws (1,342.2 N vs. 590.9 N; $p < 0.001$). Pullout strength significantly decreased in screws that underwent cyclic loading compared to screws that solely underwent axial pullout testing. Pullout strength was still significantly increased in cement-augmented screws vs. non-cemented screws after cyclic loading (943.3 N vs. 551.2 N; $p < 0.05$).
Conclusion: Our results show that pedicle screw stability in the osteoporotic bone decreases in the in the early postoperative mobilization phase. Cement-augmented screws show significantly increased pullout strength after cyclic loading and are thus biomechanically advantageous.
References:
1. Burval SPINE Volume 32.
Disclosure: No significant relationships.

O288

OPIOID USE, PAIN INTENSITY, AND SATISFACTION WITH PAIN RELIEF AFTER FRACTURE SURGERY

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Introduction: In 2012, Medicare began to tie reimbursements to inpatient complications, unplanned readmissions, and patient satisfaction, including satisfaction with pain management. Although some may increase the use of opioids to achieve desirable outcomes, even their short-term use can result in undesirable side-effects and complications. The aim of this study was to investigate whether the amount of inpatient opioid intake during a 24-hour period after a surgical repair of a fracture(s) is associated with pain intensity and satisfaction with pain relief on that day and 2 weeks after surgery.
Materials and methods: Ninety-seven inpatients completed measures of pain intensity (numeric rating scale), satisfaction with pain relief self-efficacy when in pain, and symptoms of depression after operative fracture repair. The amount of opioid used in Oral Morphine Equivalents [OME] taken during the prior 24 h was calculated.
Results: Patients that took more opioids reported greater pain intensity ($r = 0.38$, $p < 0.001$). The best multivariable model for greater pain intensity included depression or anxiety disorder, smoking, pre-admission use of opioid medication, and greater opioid intake. In bivariable analysis dissatisfaction with pain relief correlated with lower self-efficacy and greater opioid intake, but the best multivariable model retained self-efficacy alone. There were no significant differences in satisfaction scores between the inpatient rating and the post-discharge phone evaluations.
Conclusion: Patients that take more opioids report greater pain intensity and less satisfaction with pain relief. Greater self-efficacy was the best determinant of satisfaction with pain relief. Evidence-based interventions to increase self-efficacy merit additional study for the management of post-operative pain.
Disclosure: No significant relationships.

PEDIATRIC TRAUMA

O289

RE-IMPLANTATION OF ISCHEMIC SMALL BOWEL IN A PEDIATRIC MULTIPLY-INJURED PATIENT

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Introduction: Trauma is the leading cause of mortality in the pediatric population. Following the head and extremities, the abdomen is the third most commonly injured anatomic region in children [1]. We describe a case of a multiply injured 14-year-old boy from a Palestinian refugee camp that was brought to our center after 18 h of total ischemia of small bowel.
Materials and methods: A 14-year-old boy was brought to our emergency department with a blunt abdominal injury due to a fall. Explorative laparotomy (18 h after the injury) revealed a shocking injury—total rapture of the SMA and SMV with an ischemic bowel. We actually performed a re-implantation of the bowel with reconstruction of vascular supply. After a long rehabilitation period with seven more operations including an abdominal wall skin graft he went back to Gaza. Nine months afterwards he developed a huge POVH. Despite the numerous laparotomies and an abdominal wall skin graft we decided to use the laparoscopic technique and successfully managed to repair the hernia.
Results: we will present the surgical techniques and acute care managment that were the key to the salvage of this child .
Conclusion: We conclude that even after a traumatic injury to the bowel with an ischemia of 18 h a re-implantation of the bowel can be successful. In addition, the laparoscopic technique for abdominal wall repair is feasible and safe even after abdominal wall skin graft.
References:
1. Center for Disease Control and Prevention. Scientific data, Statistics, and Surveillance; 2012, Available from: http://www.cdc.gov/datastatistics/.
Disclosure: No significant relationships.

O290

TREATMENT OF PEDIATRIC DIAPHYSEAL FEMUR FRACTURE BY TITANIUM ELASTIC NAIL: RADIOLOGICAL AND CLINICAL EVALUATION

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Introduction: Titanium elastic nail (TEN) is commonly used for treatment of diaphyseal femur fractures (DFFs) in children between ages of 4 and 14 years (1). Aim of this study was to evaluate the radiological and clinical outcomes of intramedullary fixation (IF) using TEN in treatment of DFFs in childhood.
Materials and methods: Thirty one (34 fractures) pediatric patients were enrolled in the study. There were 19 mid- and 13 proximal and 2 distal DFFs. The evaluation included standardized and leg length radiographs, and computerzied tomography (CT). Angulation was

calculated on radiographic views. Femoral anteversion measurements of lower extremities were made on CT images. Results were graded according to the Flynn criteria.
Results: Median (range) age of children was 6.5 (5–15) years. There was no coronal angulation in any femur and no sagittal angulation in 28 femur. Median value was 0 (0–15) degree for varus and 0 (0–5) degree for valgus deformity. Median values for procurvatum and recurvatum were 0 (0–10) degree. Femoral retroversion at the fractured side [19 (−11−47) degree] was observed based on the measurements of contralateral femur [22 (−19−38) degree] ($p < 0.001$). Median leg length discrepancy was 0 (−21−18) milimeter. According to the criteria by Flynn et al., the results were excellent in 20 (64.5 %), successful in nine (29 %), and poor in two fractures (6.5 %).
Conclusion: Our findings suggest that IF using TEN is an effective approach for DFFs in childhood.
References:
1. 1. Morshed, S., et al., Retention of flexible intramedullary nails following treatment of pediatric femur fractures. Arch Orthop Trauma Surg. 2007;127:509–14.
Disclosure: No significant relationships.

O291

TREATMENT OF FEMORAL SHAFT FRACTURES OF CHILDREN AGE SIX MONTHS TO FIVE YEARS IN FOUR MAJOR GERMAN PEDIATRIC SURGERY TRAUMA CENTRES

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Introduction: Femoral shaft fractures occur in around 2–3 % of all fractures in childhood. According to guidelines produced by the German Society of Pediatric Surgery, these fractures should be treated by elastic stable intramedullary nailing (ESIN-osteosynthesis) in children over 3 years of age [1]. In contrast the American Academy of Orthopaedic Surgeons recommends early spica casting or traction with delayed spica casting for children age 6 months–5 years [2]. Our objective was to investigate the day by day treatment in Germany.
Materials and methods: This study evaluates the treatment options for femoral shaft fractures in children aged 6 months–5 years in four major pediatric surgery trauma centres in Germany from 01/2004 to 12/2011 by chart review.
Results: In 225 patients (male to female 2:1) with femoral shaft fractures most frequent a fall (<1 m) was the cause of the fracture and most often a spiral fracture occurred. Below 12 months no child was treated primarily by ESIN-osteosynthesis and between 12 to 24 months only around 1/5. The others by spica casting or traction, but treatment changes from traction to ESIN-osteosynthesis were common. In children older than 36 months most fractures were treated directly by ESIN-osteosynthesis, only some needed external fixation or combined treatments.
Conclusion: Our results show the practicability of the guidelines of the German society of Pediatric surgery with ESIN-osteosynthesis being the standard treatment for children older than 3 years of age. The search for the best treatment for children between 12 to 24 months needs further evaluation.
References:
1. http://www.awmf-leitlinien.de/006-126.htm.
2. http://www.aaos.org/Research/guidelines/PDFFguideline.pdf.
Disclosure: No significant relationships.

O292

OPEN FEMORAL FRACTURES IN CHILDREN

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Introduction: Intramedullary nailing has become the treatment of choice for closed femoral shaft fractures in children and adolescents. But recently the series of patients with open femoral fractures treated using intramedullary nailing were published. The aim of this study is to evaluate the results of intramedullary nailing of open femoral fractures in children.
Materials and methods: From the 1st Jan 2001 to the 30 th Jun 2010, 179 children were treated for femoral shaft fracture in our department.20 fractures were opened in 19 patients. The mean age of patients was 12.6 years (5–16.5). Using the Gustilo-Anderson classification there were the type I in 15 patients, II in 5, IIIA-2, IIIB-1, IIIC-1. There were 7 transversal type fractures, 9 oblique, 4 comminuted fracture. The average Injury Severity Score for 19 patients was 30 (10–42). Time of surgery after trauma was 5.5 h (2–26).
Results: The mean follow up was 57 months (14–109). 17 patients bone consolidation was obtained 3 months post-op. 1 patients with deep infection presented bone consolidation 4.5 month post-op. Patient 16.5 years with open femoral fracture type II according to Gustillo presented infection with Staphylococcus aureus 19 days after procedure. Conversion from intramedullary to external fixation was used. Infection was stopped 6 weeks after trauma.
Conclusion: In children with polytrauma, multiple fractures, which necessitate intensive nursing care, intramedullary nailing of opens femoral shaft fractures (type I, II, IIIA,) should be preferred.
References:
1. Hosalkar HS. Intramedullary nailing of pediatric femoral shaft fracture. J Am Acad Orthop Surg. 2011;19(8):472–81.
Disclosure: No significant relationships.

O293

RIB FRACTURES: COMPARISON OF ASSOCIATED INJURIES BETWEEN PEDIATRIC AND ADULTS POPULATION

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Introduction: Rib fractures are considered a marker of exposure to significant traumatic energy. In children, due to high elasticity of the chest wall, higher energy levels are necessary for ribs to fracture. The purpose of this study was to analyze patterns of associated injuries in children as compared to adults all of whom presented with rib fractures.

Materials and methods: A retrospective cohort study involving blunt trauma patients with rib fractures, registered in the National Trauma Registry.
Results: Of 6995 trauma victims who were found to suffer from rib fractures, 328 were children and 6,627 were adults. Isolated rib fractures without associated injuries occurred in 19 children (5.8 %), and in 731 adults (11 %). More adults had four or more fractured ribs compared to children ($p < 0.001$). Children suffered from higher rates of associated brain injuries ($p = 0.003$), hemo/pnemothorax ($p = 0.006$), spleen and liver injury ($p < 0.001$). Mortality rate was 5 %, in both groups.
Conclusion: The incidence of associated head, thoracic and abdominal solid organ injuries in children was significantly higher than in adults suffering from rib fractures. In spite of a higher ISS and incidence of associated injuries, mortality rate was similar. Mortality of rib fracture patients was mostly affected by the presence of extrathoracic injuries.
References:
1. Ziegler DW, Agarwal NM. The morbidity and mortality of rib fractures. J Trauma 1994;37:975–9.
Disclosure: No significant relationships.

O294

COMPARISON OF TWO OUTCOME MEASURES IN ASSESSING PAEDIATRIC TRAUMA TEAM ACTIVATION APPROPRIATNESS

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Introduction: Trauma team activation (TTA) criteria are assessed based on their ability to accurately identify patients who will benefit from a trauma team response. Ideal criteria provide the best balance between over- and undertriage. This study aimed to assess the appropriateness of TTA criteria at a paediatric centre using two different outcome measures: retrospective major trauma (MT) classification as defined within our state, and the use of Emergency Department high-level resources as recently published by Falcone et al. (Falcone interventions; FI). MT may not necessarily reflect acute patient requirements, while FI focus on the acute resuscitation care that the trauma team is assembled for.
Materials and methods: Trauma registry data and patients' charts between February 2011 and June 2013 were reviewed. Over- and undertriage rates for TTA were calculated using either MT or FI as outcome measures.
Results: In total, 280 patients received TTA, 244 met MT definition and 132 received one or more FI. The rates of overtriage and undertriage for our TTA criteria were 39.6 % (95 %CI 35.9–44.4 %) and 30.7 % (95 %CI 26.4–35.4 %) when the MT definition was used as the outcome measure, and 60.1 % (95 %CI 54.8–65.3 %) and 15.4 % (95 %CI 11.9–19.7 %) when FI was used. Patients receiving TTA had an increased likelihood of requiring FI (OR 2.3; 95 %CI 1.5–3.4), while TTA was not associated with an increased likelihood of MT classification (OR 1.3; 95 %CI 0.9–1.8).
Conclusion: Assessment of TTA appropriateness based on evaluation of FI resulted in lower undertriage rates compared to MT classification. FI may be preferable in evaluating TTA.
References:
1. Falcone RA, et al. J Trauma Acute Care Surg 2012;73(2):377–84.
Disclosure: No significant relationships.

O295

ASSESSING TRAUMA MANAGEMENT RECORD USE IN A PAEDIATRIC TRAUMA CENTRE

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Introduction: In order to ensure completeness and accuracy of medical documentation, many trauma centres have introduced trauma charts. At our paediatric institution, the Trauma Management Medical Record (TMMR) is primarily designed to improve documentation in patients who receive Trauma team activation (TTA), and includes space on the reverse side for tertiary survey documentation. The purposes of this study were to assess the rate of TMMR use, the completeness of information on the TMMR, and the association between use of the TMMR in the emergency department (ED) and completion of a tertiary survey.
Materials and methods: Severely injured patients (according to statewide guidelines) and those receiving TTA over a nine-month period were identified and reviewed. A system for assessing TMMR completeness was devised and utilised.
Results: The records of 195 children were reviewed, including 107 patients who received TTA. The rate of TMMR use in TTA patients was 88.3 %, and for non-TTA severely injured patients was 38.4 %. Seven of 18 sections of the TMMR were poorly completed (documented <70 % of the time). These included documentation of non-ED unit involvement (contacts and attendances) and sections requiring a page turn. TTA increased the likelihood of TMMR use (OR 11.8; 95 %CI 5.5–25.2), which in turn increased the likelihood of tertiary survey completion (OR 20.1; 95 %CI 8.8–45.9).
Conclusion: The trauma team was mostly compliant with TMMR use and completion. Potential strategies for improving TMMR completeness are being explored, and include modifying the form layout. Wider TMMR use in trauma patients presenting to the ED may improve tertiary survey documentation following admission.
Disclosure: No significant relationships.

O296

PREVENTION OF INFECTIOUS COMPLICATIONS IN PEDIATRIC PATIENTS WITH BLUNT SPLENIC INJURY

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Introduction: Asplenic patients are at increased risk of developing an overwhelming post-splenectomy infection (OPSI)-syndrome. It is believed that adequate immunization, antimicrobial prophylaxis and appropriate education concerning risks on severe infection led to decreased occurrence of OPSI.
Materials and methods: A retrospective, single-centre study of all pediatric patients sustaining blunt splenic injury (BSI) managed at our level I trauma centre from January 1979 to March 2012 was performed. A questionnaire was sent to all included patients to determine the level of knowledge concerning infection risks, the use of antibiotics and compliance to vaccination recommendations. Furthermore, we investigated whether the implementation of new guidelines from the Dutch Health Council (in 2003) resulted in higher vaccination rates.
Results: We identified 116 children with BSI. A total of 93 completed interviews were eligible for analysis, resulting in a total response rate of 78 % and 1,116 patient years. Twenty-seven patients were splenectomized, and 66 patients were treated by a spleen preserving therapy (including nonoperative management). Two splenectomized patients were fully vaccinated. The vaccination rate of Pneumococcus, Hib and Meningococcus improved significantly after 2003. Twenty out of the 27 splenectomized patients had adequate awareness of the infection risks associated with asplenia. Antibiotic prophylaxis was given to 5/27 asplenic patients.
From the 66 patients treated without splenectomy, 7 patients with high grade splenic injuries (grade IV–V) did not undergo follow up imaging and were not vaccinated.
Conclusion: The vaccination status, awareness of asplenic patients and use of prophylactic antibiotics are suboptimal in pediatric patients treated for blunt splenic injury.
Disclosure: No significant relationships.

SHOULDER INJURIES

O297

RISK STRATIFICATION BY CLAVICULAR FRACTURE IN POLYTRAUMA PATIENTS—RESULTS OF 46.565 PATIENTS

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Introduction: The clavicle limits the upper thoracic cage and connects the body and upper extremities. Injuries in both regions are common in polytrauma patients. We hypothesize that clavicular fracture in polytrauma patients indicates the presence of further injuries of the upper extremities, head, neck and thorax.
Materials and methods: Retrospective study using patient data of the TraumaRegister DGU®. Inclusion criteria: German level I and II trauma center treatment, ISS > 16, clavicular fracture. Control group: no clavicular fracture. Scoring was based on the Abbreviated Injury Scale (AIS), Injury Severity Score (ISS) and New Injury Severity Score (NISS). Trauma mechanisms were reported. Statistical analysis was performed via SPSS; graphs were drawn using EXCEL®.
Results: 4,790 patients with clavicular fracture (C+) and 41.775 without (C−) were included; the mean ISS was 30 (C+) vs. 28 (C−), patients with clavicular fracture had a longer stay on intensive care unit (12 days vs. 10 days). Scapular and rip fractures as well as lung injuries were significantly increased in C+ patients. Ventilation time was increased in C+. Cervical spine injures were also found more often. Thoracic as well as Arm/Shoulder AIS were increased in the C+ group.
Conclusion: A clavicular fracture can be diagnosed easily and a coincidence with other injuries was found. A clavicular fracture may be used as a pointer for further thoracic and upper extremity injuries.
References:
1. S3—Guideline on Treatment of Patients with Severe and Multiple Injuries Pfeifer R, Pape HC. Missed injuries in trauma patients: A literature review. PSS 2008 TraumaRegister DGU® (www.traumaregister.de).
Disclosure: No significant relationships.

O298

MINIMAL INVASIVE PLATE OSTEOSYNTHESIS IN MIDSHAFT CLAVICULA FRACTURES

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Introduction: We treated 95 patients with clavicula fractures. 63 cases were midshaft clavicula fractures. Operations were performed in a minimal invasive plate osteosynthesis (MIPO) approach using a locking plate osteosynthesis for fractures Typ B1 and higher (AO-Classification). This study evaluates the clinical and radiographic outcome of midshaft clavicula fractures treated by MIPO.
Materials and methods: Operation was performed with the patient in a supine position on a radiolucent table. For osteosynthesis we used an anatomical shaped (s-shaped) locking plate with 8 holes. The plate was positioned lateral-superior and medial-anterior. All patients were reexamined after 1 year with radiographs and functional tests like DASH- and Constant-Score.
Results: All examined cases showed consolidation after one year except two of them who acquired revision because of cutting out of the lateral screws in the early postoperative time. All patients had a good functional outcome in DASH- and Constant Score.
Conclusion: Minimal invasive plate osteosynthesis (MIPO) of midshaft clavicula 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 patients had celoid.
References:
1. V. Kulshrestha, T. Roy, L. Audige. Operative versus nonoperative management of displaced midshaft clavicle fractures: a prospective cohort study. J Orthop Trauma. 2011;25(1).
Disclosure: No significant relationships.

O299

EARLY OUTCOMES OF AN OPERATIVE 1ST TIME SHOULDER DISLOCATOR SERVICE

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Introduction: In recent years interest has developed in early operative intervention for young 1st time traumatic shoulder dislocators involved in contact sport or physical occupations.
Materials and methods: Prospective data on the first 18 shoulder dislocators (<25 years-old) referred to our department were analysed. Demographics, time to surgery, surgical findings and Oxford Shoulder Instability Scores (OSIS) were collected.
Results: Over 28 months, 18 patients fitted referral criteria. Mean age was 19.2 years (18–26). Time from injury to initial appointment was 4.1 days (0–25), mean time from appointment to 1st-time dislocator clinic was 3.5 days (0–9). Time from initial injury to surgery was 15 days (3–44). 10/13 patients who fitted the criteria accepted surgery. 4 did not fit the criteria and 1 had acne over the operative site. 1 patient managed non-operatively re-dislocated and was subsequently stabilised. All operated patients had soft tissue Bankart lesions, 3 with Type 4 SLAP lesions. All underwent arthroscopic anterior stabilization and repair of SLAP. Mean final review was 1.4 years (0.4–2.4). Mean overall OSIS was 40.82. OSIS in the operative group was 43.4 (39–47) and 37 (17–45) in the non-operative group.
Conclusion: Early experience demonstrates a rapid assessment and time to surgery for suitable patients. All have significant labral, plus some with associated SLAP lesions, which were stabilized. Outcomes for the operative group, at this stage, appear superior to the non-operative group.
References:
1. Wen D. Current concepts in treatment of anterior shoulder dislocations. Am J Emerg Med. 1999;17:401–7.
2. Gooding et al. Management of acute traumatic primary anterior shoulder dislocation in young adults. Shoulder and Elbow. 2010,2:141–6.
Disclosure: No significant relationships.

O299A

ORIGINAL TECHNIQUE OF INTRAMEDULLARY OSTEOSYNTHESIS OF CLAVICLE MIDSHAFT FRACTURES

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Introduction: Increased frequency of clavicle midshaft fracture was observed in the recent decades. According to many authors it is related to enhanced sports activity. At the same time the expectations of young, active patients for quick recovery after clavicle fracture and unsatisfactory results of conservative treatment caused a revision of the indication for surgical treatment. As a result, indications for surgery are now wider than in the days of Neer. There are many techniques used in clavicle fracture fixation, but none of them have a significant advantage over the others. We present our own technique of intramedullary fixation of clavicle midshaft fractures using cannulated cancellous screws, we use successfully in our department for several years.
Materials and methods: This relatively simple technique consists of open fracture reduction and introduction of cannulated cancellous screw from the distal end of clavicle and does not require the use of intraoperative fluoroscopy. The screw insertion point is in the anatomical clavicle posterior curve. The photographs (artificial bone fixation and intraoperative) explain the steps of surgery.
Results: We used this method in tens of patients with good results. Bone union was achieved without shortening of the length of the clavicle and with good functional effect.
Conclusion: The presented technique may be one of the therapeutic options in the treatment of displaced fractures of the clavicle midshaft.
References:
- Robinson. J Bone Joint Surg Am. 200486:1359.
- Hill. J Bone Joint Surg Br. 1997;79:537.
- Stanley. Injury. 1988;19:162.
- Chuang. J Trauma. 2006;60:1315.
- Khalil. International Orthopaedics. 2009;33:1421.
Disclosure: No significant relationships.

O300

CT BONE DATABASE: PLATE-BONE-FITTING OF A NOVEL CLAVICULA-PLATE COMPARED TO INDIVIDUALLY BENDED RECONSTRUCTION PLATES

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Introduction: The aim was the comparison of plate-to bone fitting of manually bended reconstruction plates withi ndustrial prebended clavicle plates (VariAx, Stryker). The prebended plates were developed using an 3D CT-Bone database.
Materials and methods: Out of 334 claviculae, 8 were randomly chosen and manufactured using a Rapid Prototyping System. Three surgeons of different qualification levels performed manual bending using the usual bending tools. Plate to bone fitting was then compared to the preformed fitting of the VariAx midshaft plates on the 8 different claviculae.
Results: The median bending time per plate varied between 1:18 to 2:03 min and did not correlate with the qualification level oft he surgeons. Also the median plate fitting error was independent of the surgeons level of experience. The fitting of the manually bended plates varied between 93 to 95 % plate-bone fit, compared to 95 to 99 % for the pre-contoured plates. The difference was not significant. Both the manually bended plates and the precontoured plates showed thereby a high rate of plate fitting with a Fitting Error below 2.5 mm.
Conclusion: The development of osteosynthesis plates using 3D-anatomic database leads to a high degree of plate fitting comparable to manually bended plates even for bones with a variable structure like the clavicle. This saves time and guarantees reliable results although the precontourded plates come at a higher retail price.
References:
1. Lu YC, Untaroiu CD.: Statistical shape analysis of clavicular cortical bone with applications to the development of mean and boundary shape models. Comput Methods Programs Biomed. 2013;111(3):613–28.
Disclosure: No significant relationships.

O301

A PROSPECTIVE MRI ASSESSMENT OF THE LIGAMENTAL CONSOLIDATION AFTER ARTHROSCOPIC STABILIZATION OF THE ACUTE ACJ-SEPARATION ROCKWOOD III-V WITH DOUBLE TIGHTROPE

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Introduction: The stabilization of the ACJ separation Rockwood (R) III–V using the double-Tight-Rope (dTR) displays an innovative approach.
Materials and methods: All patients until the end of 2010 with acute ACJ separation RIII-V had been arthroscopically stabilized within 14d using dTR (2nd generation) and were prospectively included. Standardized MRI had been applied preoperative (injured side) and after 12 months (bilateral) with standardized CR. The ligamental consolidation had been separately assessed for the conoid (con) and the trapezoid.
Results: In the average 17.1 months after surgery, 25 patients (age 35.9 ± 9.1 years) without anew macrotrauma had been completely followed. Reasons for exclusion were: lost (5) and denial (4). The cc ligament consolidation occurred in 70.2 % in a double strand configuration and in 29.8 % in a wide single strand including conoid and trazpezoid. The CC thickness was significantly hypertrophic compared to the uninjured side: tra—5.3 ± 2.8 mm (control 3.8 ± 1.1 mm; $p < 0.05$), con—5.1 ± 3.0 mm (control 3.4 ± 1.4 mm; $p < 0.05$). The tra length was similar 14.3 ± 4.8 mm (control 12.8 ± 3.1 mm; n.s.), the con length significantly elongated 13.7 ± 3.5 mm (10.1.7 ± 2.9 mm; $p < 0.05$). The point of surgery (1–7 days vs. 8–14) had no influence. Younger patients (<35 years) showed significantly more hypertrophic ligament consolidations compared to older patients (>35 years). The scores documented good clinical data.
Conclusion: The anatomic dTR repair for the acute ACJ stabilization generated significantly hypertrophic ligamental conoid and trapezoid consolidations in marginally elongated conditions.
References:
1. Habermeyer P, Lichtenberg S, Magosch P. Schulterchirurgie. Vol 4. München: Elsevier; 2010.
2. Rockwood CA, Green DP. Fractures in adults, 2nd ed. Philadelphia, PA: J.B. Lippincott, 1975.
Disclosure: No significant relationships.

O302

SHORT TERM RESULTS OF PLATE FIXATION VERSUS INTRAMEDULLARY FIXATION FOR DISLOCATED MIDSHAFT CLAVICLE FRACTURES: A RANDOMIZED CONTROLLED TRIAL

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Introduction: Plate fixation and intramedullary (IM) nailing are the most commonly used operative techniques for dislocated midshaft clavicle fractures (DMCF).[1] The aim of this study was to compare both techniques for the fixation of DMCF.
Materials and methods: A multicenter randomized controlled trial was performed in four Dutch hospitals. A total of 120 patients, age 18–65, were included and treated with either plate fixation ($N = 58$) or IM nailing ($N = 62$). Shoulder function scores and complications were documented up until 1 year post-operatively.
Results: Six weeks after surgery, the mean DASH-score in the plate group was 11.4 (±11.0) and in the IM nailing group 15.1 (±13.5) ($p = 0.09$). The mean Constant-Murley score was 91.1 (±12.2) in the plate group and 84.1 (±15.9) in the IM nailing group ($p = 0.01$). At 6 weeks after surgery, 3 (6 %) patients in the plate group suffered from a wound infection and 4 (7 %) patients experienced plate irritation. A total of 18 (29 %) patients suffered from implant protrusion causing nuisance and irritation in the IM nailing group. This resulted in 1 (2 %) total implant removal and 3 (5 %) minor revisions by removing the protruding end under local anesthesia.
Conclusion: Short-term results seem to favor plate fixation over IM nailing for the operative treatment of DMCF, both in terms of functional outcome as well as complications. The long term follow-up will clarify if additions or changes to our short-term conclusions need to made in the comparison between the two techniques.
References:
1. Smekal et al. Shaft fractures of the clavicle: current concepts. Arch.Orthop.Trauma.Surg;2009:129:807–815.
Disclosure: This research was financially supported by an unrestricted research grant of the AO foundation.

POLYTRAUMA—CLINICAL STUDIES

O303

OUTCOMES AND PROTOCOLS FOR NOM OF HEPATIC AND SPLENIC INJURIES AFTER 10 YEARS OF EXPERIENCE AT CESENA TRAUMA CENTER

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Introduction: The aim of this paper is to present the experience developed since 2001 in the NOM of hepatic and splenic injuries at the trauma center of Cesena.
Materials and methods: Out of 27.832 trauma patients discharged from our Trauma Center in the years from 2001 and 2012, we reviewed 563 politrauma patients with hepatic and/or spleen injuries. All the NOM patients were monitored by CEUS. The frequency and the modalities of the monitoring have followed the indications of an internal protocol.
Results: Out of a group of 342 politrauma patients with hepatic and/or splenic injuries 299 (87.24 %) with average ISS 33 were followed with NOM. The mortality rate was of 17.51 %. Out of a second group of 174 politrauma patients we could evaluate 105 patient in the period 2009–2011 followed with NOM. The mortality rate was 0 %, NOM success rate was 91.11 % for liver and 91.67 for spleen, while angioembolizzation rate was 15 % for liver and 30 % for spleen. Splenectomy was performed in 8.33 % of patients and surgical procedures for liver injuries was performed in 8.89 %.
Conclusion: NOM for hepatic and/or spleen injuries, irrespective for the grade of injuries, patient age and presence of associated lesions, is the modality of choice in hemodinamically stable or transient responders patients and should only be considered in an environment that provides capabilities for monitoring, for urgent laparotmy and angioembolizzation.
References:
1. Nonoperative management of blunt hepatic injury: An Eastern Association for the Surgery of Trauma practice management guideline NA. Stassen, MD, et Al. J Trauma Acute Care Surg. 2012;73:288–S293.
Disclosure: No significant relationships.

O304

MORTALITY FROM TRAUMA IN ALBANIA: A RETROSPECTIVE STUDY OF 1397 PATIENTS

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Introduction: Traumatic injuries continue to be a significant public health concern in Albania, especially in young ages having devastating effect in our country. There are more 2,500 permanent disabled on wheelchair from road traffic injuries (RTI). The aim of this paper was to study epidemiology of trauma in Albania in the last few years.
Materials and methods: All admitted patient to the University Trauma Hospital (UTH) in Tirana, Albania between January 2007 and September 2013 were studied. Age, gender, mechanism of injury, and mortality of trauma were analyzed. Data were collected from UTH and from State Police Statistics.
Results: During study period 134.116 trauma patients were evaluated. 17.185 (12.8 %) were admitted (77 % male, 23 % female). 10.5 % of patients admitted were age 0–14 years, 27.1 % 15–30, 42 % 30–50 and, 20.4 % were >60 years old. The majority of injuries (38 %) were due to RTI, followed by interpersonal violence (IV) including stab wounds (37.2 %), fall from high or work related injury (20 %), and gunshot wounds (4.8 %). Overall 7937 patients (46.1 %) underwent surgery and 5500 (32 %) were admitted to ICU. The overall mortality was 8.1 % (1,397). Of these 29.6 % (414) died during transportation & operating room. The majority 69.4 % (893) died in ICU.
Conclusion: RTI and IV are the leading trauma related cause of death in Albania. Coordinated and concentrated reform from injury prevention program to rehabilitation is required.
References:
1. Boris Miska, Road trafic injuries in Albania in 2012, (Annual statistics of State Police Department, 2012).
Disclosure: No significant relationships.

O305

IMPACT OF AN URGENT RESUSCITATIVE SURGERY FOR SEVERE TORSO TRAUMA PATIENTS

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Introduction: Several surgical managements to control hemorrhage are included in the trauma resuscitation process. Although these interventions should be performed immediately, sometimes, they would be delayed due to a hospital layout or a facility design. Therefore, we verified our policy of urgent resuscitative surgery in the ED for severe torso trauma patients.
Materials and methods: This is a retrospective study of patients in which urgent surgical intervention was carried out between April 2008 and October 2013. Patients with cardiac arrest on ED admission and AIS = 6 were excluded. Demographics, Revised Trauma Score (RTS), Injury Severity Score (ISS), and probability of survival (Ps) were assessed.
Results: Of 121 cases with RTS <7.84 on ED admission in 187 eligible cases, an urgent surgery was carried out in the ED immediately after their arrival in 60 cases (ED group). Although there was no significant difference in the observed survival rate compared to the predicted survival in the total ED group (0.517 vs. 0.421, $p = 0.062$). However there was a significant difference in the subgroup of SBP of <90 mmHg with damage control surgery between an observed survival rate and a predicted survival (0.615 vs. 0.380, $p = 0.007$).
Conclusion: The present findings suggest that our policy of urgent resuscitative surgery, which is not dependent on limitations of layout and facility design, for severe torso trauma patients might improve actual survival rate compared with the predicted survival.
References:
1. Matthew M, et al. A decade of experience with a selective policy for direct to operating room trauma resuscitations. Am J Surg 2012;204:187–192.
Disclosure: No significant relationships.

O306

ACCURACY OF THE FIELD TRIAGE PROTOCOL IN SELECTING SEVERELY INJURED PATIENTS AFTER HIGH ENERGY TRAUMA

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Introduction: For optimal treatment of trauma patients it is of great importance to identify patients who are at risk for severe injuries. The Dutch field-triage-protocol for trauma patients, LPA (National Protocol Ambulance-Services), is designed to get the right patient, in the right time, to the right hospital. Purpose of this study was to determine diagnostic accuracy and compliance of this triage protocol.
Materials and methods: Triage criteria were categorized into physiological condition (P), trauma mechanism (M) and injury type (I). A retrospective analysis of all high-energy-trauma patients from 2008 to 2011 in the Central-Netherlands is performed. Diagnostic parameters (sensitivity, specificity, NPV, PPV) of the field-triage-protocol for selecting severely injured patients were calculated including rates of under-and overtriage. Undertriage was defined as the proportion of severely injured patients($ISS \geq 16$) who were transported to a level-two or three-trauma-center. Overtriage was defined as the proportion of non-severely injured patients ($ISS < 16$) who were transported to a level-one-trauma-center.
Results: Overall sensitivity and specificity of the field triage protocol was 89.1 % (95 % CI 84.4–92.6) and 60.5 % (95 % CI 57.9–63.1)respectively.The overall undertriage rate was 10.9 % (95 % CI 7.4–15.7)and the overall overtriage rate was 39.5 % (95 % CI 36.9–42.1).These rates were 16.5 and 37.7 % respectively for patients with M + I–P-.Compliance to the triage protocol for patients with M + I–P-was 78.7 %.Furthermore,compliance in patients with either a positive I+ or positive P+ was 91.2 %.

Conclusion: The overall undertriage (10.8 %)was mainly influenced by a high rate of undertriage in patients with only a positive mechanism-criterion, therefore showing low diagnostic accuracy in selecting severely injured patients. As a consequence these patients are undetected using the current triage protocol. As it has been shown that severely injured patients have better outcome in level-one-trauma-centers further optimization of this protocol aiming at lowering undertriage is therefor essential,preferably without incrementing overtriage too much.

References:
1. Resources.ACS-COT.1986;71(10):4–23.

Disclosure: No significant relationships.

O307

ASSOCIATED THORACIC INJURY IN PATIENTS WITH A CLAVICLE FRACTURE: AN ANALYSIS OF 1534 POLYTRAUMA PATIENTS

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Introduction: The main purpose of the primary survey is to ascertain life-threatening injuries. Although a chest X-ray is made in virtually all severely injured patients, many treatment dictating thoracic injuries are not diagnosed at this X-ray. The aim of this study is to compare severely injured patients with and without a clavicle fracture to investigate if a clavicle fracture can be associated with additional thoracic injury.

Materials and methods: All patients with an ISS $\geq$16, admitted from January 2007 until December 2011 are included. Patient data are derived from the Dutch National Trauma Database (DNTD) for the area Central Netherlands, which captures demographics, trauma mechanism, sustained injuries, and admission details. Additional injury patterns in patients with and without a clavicle fracture are compared.

Results: A total of 5,357 traumapatients are admitted in the studied period. 1,534 (28.6 %) patients have an ISS $\geq$16 of which 164 (10.7 %) patients have sustained a clavicle fracture. The clavicle fracture is diagnosed on chest X-ray in 87.8 % in the primary survey. ISS is higher in patients with a clavicle fracture (29.4vs.25.0; $P < 0.001$). Patients with a clavicle fracture also have a higher prevalence of thoracic injuries (77 % vs. 50 %; OR 2.7; $P < 0.001$). Specific injuries like pneumothorax, rib fractures, sternum fracture, lung contusion and thoracic spine injury are more frequently diagnosed in patients with a clavicle fracture compared to patients without a clavicle fracture.

Conclusion: The majority of the clavicle fractures can be diagnosed during primary survey. A clavicle fracture in severely injured patients should provoke awareness for additional thoracic and thoracic spine injuries.

References:
1. Aukema. Initial assessment chest X-ray. World J Radiol; 2012; 4(2):48–52.
2.Lee. Occult pneumothoraces. Injury; 2012; Dec;43(12):2105–8.
3.Trupka. Diagnosis and subsequent management. ZentralblChir; 1997;122(8):666–73.

Disclosure: No significant relationships.

O308

INCREASING NUMBER OF FRACTURED RIBS IS NOT PREDICTIVE OF THE SEVERITY OF SPLENIC INJURY FOLLOWING BLUNT TRAUMA: AN ANALYSIS OF A NATIONAL TRAUMA REGISTRY DATABASE

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Introduction: Association between rib fractures and incidence of abdominal solid organs injury is well described. The purpose of this study was to assess whether an increasing number of rib fractures predicts the severity of splenic injury in blunt trauma patients.

Materials and methods: A retrospective cohort study involving blunt trauma patients with concomitant splenic injuries and rib fractures, between the years 1998 and 2012, registered in the National Trauma Registry.

Results: Of 321,618 patients with blunt mechanism of trauma, 57,130 had torso injuries, and of these 14,651 patients sustained rib fractures, and 3,691 patients suffered from splenic injury. Concomitant splenic injury occurred in 1,326 of the patients with rib fractures (9.1 %), as compared to 2,365 patients sustaining splenic injury without rib fractures (5.6 %). The incidence of splenic injury among patients sustaining 5 or more rib fractures was significantly higher compared to patients suffering from 1 to 4 rib fractures. Patients with concomitant rib fractures had higher ISS, but similar mortality rates. Among patients with concomitant rib fractures and splenic injury, there was no relation between the number of fractured ribs and the severity of splenic injury.

Conclusion: Although the presence of rib fractures increases the probability of splenic injury in blunt torso trauma, there is no relation between the number of fractured ribs and splenic injury severity.

References:
1. Ziegler DW, Agarwal NN. The morbidity and mortality of rib fractures. J Trauma. 1994;37:975–979.

Disclosure: No significant relationships.

O309

VALUE OF INFERIOR VENA CAVA DIAMETER AS PREDICTOR OF HEMODYNAMIC DETERIORATION IN SEVERE TRAUMA PATIENTS

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Introduction: Previous reports sugestted the relationship between a flat inferior vena cava (IVC) and hemorragic shock in trauma patients. Our aim is to analyse wether or not the ratio of IVC can predict hemodynamic deterioration in trauma patients within the first 6 h after.

Materials and methods: Retrospective analyse of the trauma patients included in our Severe Trauma Registry since 2007–2012. Inclusion criteria were severe trauma patients who were hemodynamically stable at the emergency room or who arrived in shock but responded

to fluid. We recorded demographic, severity and injury information, as outcomes and hemodinamic status in the first 6 h. Ratio between transverse and anteroposterior diameters of IVC were measured at renal hilium level at the arrival CT scan.
Results: 305 patients were included. Mean IVC ratio in patients that suffered hemodynamic deterioration in the first 6 h was statistically significant higher than in patients that remain stable: 2.37 (IQ 1.73–3.44) vs. 1.87 (IQ 1.57–2.37), $p < 0.05$. RTS, ISS and NISS, blunt trauma, haemoglobine, INR and lactate levels were also statiscally related to hemodynamic deterioration.
Conclusion: In our enviroment IVC ratio measured in CT scan is significantly related to hemodynamic deterioration in first 6 h after a severe trauma. This parameter could be helpfull, with physical and imaging findings and blood test levels, in clinical decissions making as ICU admission or therapeutic intervention.
References:
1. Matsumoto, et al. Predictive value of a flat inferior vena cava on initial computed tomography for hemodynamic deterioration in patients with blunt torso trauma. J Trauma. 2010;69: 1398–402.
Disclosure: No significant relationships.

O310

ROMANIAN TRAUMA REGISTRY—THE BEGINING EXPERIENCE

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Introduction: A disease registry is a collection of uniform data describing patients that meet different inclusion criteria, in which specific medical data, demographic or other data are documented continuously and systematically, aiming to serve preset goals. Trauma is the cause of 10 % of deaths worldwide, and a trauma registry could be a way to improve the quality of trauma patient care.
Materials and methods: Submission of data obtained during 2012 via the major polytrauma romanian registry within Emergency Hospital Bucharest.
Results: The criterion for inclusion in the registry was represented by NISS (New Injury Severity Score) over 15. Exclusion criteria are first hospitalization over 24 h of the accident, patients declared dead before reaching the hospital or without vital signs in the emergency units and no response to resuscitation, asphyxiated, drowned or burned patients. During the first year of retrospective follow-up we had 85 cases of major polytrauma. The most common mechanism was the contusion lesion due to road accidents (82 cases, 87 %). Half of the cases studied were represented by interhospital transfer. In 14 cases the ambulance helicopter was needed to transport the patient to the emergency hospital.
Conclusion: Current registries help improve patient care by means of analysis of process and outcome measures, based on data gathered in the Registry, so our objective is to implement this trauma registry nationwide in as many hospitals.
References:
1. Beuran M, Negoi I, Păun S, Runcanu A, Gaspar B, Vartic M, Trauma scores: a review of the literature, Chirurgia (Bucur). 2012;107(3):291–7. Review. Romanian.
Disclosure: No significant relationships.

O311

THE RELATIONSHIP BETWEEN TIME AND ACHIEVEMENTS OF NEW TRAUMA CENTER AND TRAUMA SYSTEM BASED ON ACS/COT REQUIREMENTS: THE QATAR EXPERIENCE

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Introduction: The American College of Surgeons -Committee on Trauma (ACS/COT) has identified the basic criteria to evaluate trauma systems and trauma centers as current standards for North American trauma centers. Trauma Center in Doha (TCD), Qatar established in 2007 functions based on these criteria. The aim of this study is to review the achievements and challenges of TCD over the last 6 years in relation to time, and fulfillment of criteria of ACS/COT.
Materials and methods: To evaluate the TCD of Hamad Medical Corporation in Qatar, we used the basic trauma criteria of the ACS/COT as assessment tools, grouping 22 criteria into 4 key components. Relationship between time and fulfillment of these requirements was studied. Fulfillment of criteria was rated as "Yes" or "No".
Results: Of 22 criteria that were grouped into four categories (overall system administration and management, prehospital trauma care, definitive trauma care facility and quality care improvement), only in 6 years, Qatar has achieved 17/22 criteria. The most important achievements were in research, education and overall structure of trauma service. Main challenges are still in the first category—the overall system administration, while all the other requirements of TCD have been fulfilled of for a Level I trauma center.
Conclusion: Over the past 6 years all efforts have been directed toward creation of the trauma center in Doha based on the ACS/COT criteria. Efforts should be now directed toward establishment of a countrywide integrated trauma system.
References:
1. ACS/COT. Resources for optimal trauma care of the injured patient: 2006. Chicago, 2006.
Disclosure: No significant relationships.

O312

EVALUATING TRAUMA CENTER PERFORMANCE: 7 YEARS EXPERIENCE OF A SLOVENIAN TRAUMA CENTRE WITH TRAUMAREGISTER DGU

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Introduction: Trauma registries are the basis for programs that aim to improve the quality of treatment of injured patients. Data from the Slovenian trauma centre (GH Celje) began to be added to Trauma-Register DGU in 2006 with aim to get a valuable tool for external assessment of quality of the treatment of patients with major trauma.
Materials and methods: Cohort of patients with inclusion criteria: polytrauma with ISS >18, isolated injuries with AIS 5, multiple injuries with NISS >16 and affected vital signs was included in the study. Indicators of quality (standardized mortality, pre-hospital time,

intubation rate, time in ER, quality of data) are presented from 2006 to 2012. Because of the changes in the treatment algorithms and some structural changes two periods from the beginning (2006–07) and the end (2011–12) were compared.
Results: A total number of 376 patients were included with average age 47 years, ISS 26.4 and standardized mortality of 0.80 (observed vs. RISC predicted). Numbers of changes were made in observed period (QM based on TraumaRegister, changes in pre-hospital services, ER algorithm, ATLS, whole body CT, massive transfusion protocols, DCS). These measures led to changes in several parameters for instance pre-hospital time (77–68 min), time in ER (95–72 min), intubation rate in comatose patients (23 vs. 83 %), and quality of collected data.
Conclusion: The external quality control by the TraumaRegister-DGU enables improvements in the quality of treatment of trauma patients. This kind of control is essential for the development of a network of trauma hospitals in Slovenia.
Disclosure: No significant relationships.

O313

IMPACT OF IMPLEMENTING A TRAUMA AND ACUTE CARE SURGERY SERVICE IN A REGIONAL HOSPITAL. CUENCA-ECUADOR

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Introduction: Acute surgical emergencies and trauma care constitute a worldwide in public health challenge. Traditionally, general surgeons have assumed responsibility providing attention to these patients not necessarily in an organized and structured fashion. The aim of this report is to divulge the impact of implementing a trauma and acute care surgical service in Latin America.
Materials and methods: From November 2011 to April 2013, records from all patients admitted for surgical treatment through our regional hospital's surgical emergency room (ER) where reviewed. Based on attending surgeon availability and structural organization of care 3 periods of 6-month was reviewed for surgical diagnoses and surgical treatments. Differences in number of surgeries performed, ER length of stay prior to surgery (ERLOS-PS), hospital length of stay (HLOS), ER cost, hospitalization cost, and ER mortality. ANOVA, Bonferroni and chi^2 statistics were used to evaluate the differences between the 3 periods.
Results: In the 18-month period there were 1294 admissions with trauma and acute surgical diagnosis whom required surgery. In periods 1, 2 and 3 the number of procedures was 257, 306 and 566; ERLOS-PS was 10.67, 7 and 3.2 h; HLOS was 4, 4 and 3; ER mortality was 5.05, 4.90, and 0.7 % respectively.
Conclusion: Implementation of a trauma and acute care surgery service has a positive impact in improving care. This model of care should be replicated in similar hospitals in Latin America.
References:
1. Ann Surg. 2006;244(4):498–504.
2. JACS 2012;215(5): 715–721.
3. J Am Coll Surg. 2004;199(1):96–101.
4. J Surg. 2010; 53(2): 76–77.
5. J Trauma. 2010;68(5):1024–31.
Disclosure: No significant relationships.

TREATMENT OF ACETABULAR AND PELVIC FRACTURES

O314

PRE-OPERATIVE PLANNING IN PELVIC FRACTURES

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Introduction: Pelvic fractures represent a real challenge due to the complex anatomy of the pelvic region and the possible risks of intra- and peri-operative complications.The authors evaluate the pre-operative steps in order to improve the post-operative results and diminish the risk of complications.
Materials and methods: The authors retrospectively analyse 22 cases operated in our hospital between 01.01.2010 and 01.10.2013 for pelvic fractures concerning all the preparations for surgery, including: evaluation of the fracture and of the patient and establishing the plan, (for the patient, the team and the operation). Then, after surgery, the authors compare the post-operative outcome with the pre-op checklist. Each of the points of the initial plan is compared to the intra and post-operative real situation.
Results: Pre-op planning matched the intra and post-operative outcome in 88 % of the analysed points, from 72 % at the begining to 94 % in the last case, meaning that experience is very important in treating this injuries. The most spectacular progress was that of the team, (improvements of the training). The most important problems were the reduction of the fractures and the positioning of the screws so as not to interfere with the the articular space. The bigger the percent of matching was, the less was the duration of surgery.
Conclusion: Pre-op complex planning is essential in order to achieve maximum treatment eficacy with minimum of risk in pelvic fractures, the word "surprise" being considered undesirable for pelvic fracture surgery.
References:
1. Phlemann T; The Hannover experience in management of pelvic fractures Clin Orthop. 1994;305:69–80.
Disclosure: No significant relationships.

O315

LIMITED OPEN REDUCTION OF DISPLACED ACETABULAR FRACTURES THROUGH A MINI-PARARECTUS APPROACH

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Introduction: Minimal invasive fixation has been reported as an option for acetabular fracture treatment. Closed reduction and percutaneous lag screw fixation (PLSF) can be done in minimally displaced acetabular fractures. If there is significant displacement, open reduction is indicated. In this study, we report the use of a mini-pararectus approach to manipulate and reduce displaced acetabular fractures combined with PLSF.
Materials and methods: This report included 10 patients with displaced simple acetabular fractures. Mini-incision (3–4 cm) was made

in Hasselbach triangle between mid-inguinal point and lateral border of rectus abdominis muscle. The external abdominal oblique aponeurosis was incised. The arched fibers of internal abdominal oblique were displaced medially to expose and incise the fascia transversalis. Care was taken to avoid injury of ilioinguinal nerve, inferior epigastric vessels, and spermatic cord. A blunt long bone impactor was introduced through this small incision to manipulate and reduce the fracture under fluoroscopic control. PLSF was done in all patients.
Results: Fracture reduction was anatomical in seven patients, and imperfect in three according to Matta. Wound healing was achieved in all patients without reported complications. Fracture union was achieved without secondary displacement in all patients. According to modified *Merle d'Aubigné score,* functional outcome of all patients was good to excellent.
Conclusion: This mini-pararectus approach allows limited open reduction of displaced simple acetabular fractures, which helps inclusion of more cases for PLSF.
References:
1. Starr AJ, Jones AL, Reinert CM, Borer DS. Preliminary results and complications following limited open reduction and percutaneous screw fixation of displaced fractures of the acetabulum. Injury. 2001;32(Suppl 1):SA45–50.
Disclosure: No significant relationships.

O316

COMPARISON OF SURVIVAL AND OUTCOME AFTER CONSERVATIVELY OR SURGICALLY TREATED OSTEOPOROTIC PELVIC RING FRACTURES OF TYPE B

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Introduction: The last years showed a significant increase of osteoporotic pelvic fractures of the elderly. Reasons in addition to the increasing age and activity level could be better diagnostics and sensitization of the examiner. Nevertheless, there is no evidence for treatment stragedy. Our aim was to compare the survival and outcome of patient after conservatively and surgically treatment of pelvic ring fracture of type B in the age over 65 years.
Materials and methods: We included retrospectively 131 patients with an osteoporotic type B fracture, diagnosed in CT, that had inpatient treatment between 2006 and 2010 in our hospital. Besides data concerning the hospital stay, complications and treatment we recorded the follow up based on a questionnaire at least 2 years after trauma. Used was the SF 12, EQ 5D, pain scale and survival.
Results: The mean age of the patients was 81 ± 8 years, most were female (86 %). 80 % suffered a minor, 10 % a high energy trauma. Conservatively treated were 80 patient (group 1), 51 underwent surgery (group 2). According to AO classification 98 % showed sacral fractures. For surgery were used mostly transiliosacral screws, additional sacroplasty, lumbopelvic stabilization. Both groups showed high non surgically complication rate (8 % vs. 10 %). Additionell 16 % complications due to surgical treatment were recorded. Follow up showed non significant better EQ 5D and SF12 for group 2. Significant higher was the survival rate for group 2 after 2 years.
Conclusion: In spite of higher rate of complications in surgical treated patients we recommend surgery for a better outcome and higher survival rate.
References:
1. Bohme J. Osteoporotic fractures of the pelvis, Chirurg. 83(10):875–881.
Disclosure: No significant relationships.

O317

TRANS-SACRAL IMPLANT POSITIONING IS MORE OFTEN CRITICAL IN S1 THAN S2

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Introduction: The upper sacrum provides only limited space for trans-sacral implants. The goal of this study was to quantify the dimensions of trans-sacral corridors on level S1 and S2.
Materials and methods: We studied at 156 computed tomography (CT) scans of intact pelves from 92 European and 64 Japanese adults. Semi-automated segmentation was performed to compute surface models of the sacra. Dimensions the trans-sacral corridors were measured. A maximal diameter of <12 mm was considered as critical and <8 mm as impossible for trans-sacral implant positioning.
Results: The cranio-caudal diameter of the trans-sacral corridor S1 ranged from 0 to 21.8 mm (mean 11.6 mm, SD ±5.4), whereas in S2 the trans-sacral corridors demonstrated a cranio-caudal diameter ranging from 8.1 to 19.2 mm (mean 14.0 mm, SD ±2.4). In all sacra the antero-posterior diameter was larger than the cranio-caudal one. 52 % (81/156) of the trans-sacral corridors S1 were critical for implant positioning in their cranio-caudal diameter (<12 mm), whereas only 21 % (33/156) were critical in S2. Impossible (<8 mm) were 19 % (30/156) on level S1 and none in S2.
Conclusion: The individual sacra revealed a large variability in their diameter of trans-sacral corridors. Especially the anatomy of the sacral ala and iliac fossa influenced the cranial limit of the corridor in. In a large number of sacra there was only limited space for placing trans-sacral implants, with the cranio-caudal corridor diameter being the decisive criterion. Interestingly, on level S2 implant positioning was always possible. Its height showed a lower variability than in S1.
References:
1. Routt et al. JOT; 1996;10(3):171–7.
Disclosure: The project was partially supported by DePuy Synthes.

O318

ACETABULAR FRACTURES TREATED WITH 3.5MM OMEGA PLATE

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Introduction: The newly developed 3.5 mm Omega plate forms the base of the medial acetabular and prevents protrusion of the medial head. The authors present an original method of preoperative modeling of the plate, based on CT slices.
Materials and methods: From 2009 to October 2013 was used modified Stoppa approach for acetabular fractures in 49 cases, 24 × was used straight standard splint, 12 × 4.5 mm omega splint and 13 × 3.5 mm omega splint. 12 patients with 3.5 mm omega plate were 10 men, 2 women, one man two splints were applied, measure the age of 54 years/range 30–77. Preoperative modeling of the plate

was performed in all patients on the basis of preoperative CT scan of the pelvis. Follow up 8–22 months, on average, 13.3 months, postoperative CT was performed in all patients. Radiological results were evaluated by MATTA score. Displacement to 1 mm was considered the anatomical to 3 mm and a satisfactory than 3 mm unsatisfactory.
Results: Intra-operative complications were 2 injuries vs. Ilica externa. In the postoperative period, no inflammatory complications. X-ray evaluation by MATTY: 7 patients with dislocation to 1 mm as an excellent result, satisfactory results in 3 patients and 2 unsatisfactory result with dislocation of 3.2 and 4.2 mm.
Conclusion: A new type of plate forms a firm foothold in complicated fractures of the acetabulum.
References:
1. ŠRÁM J[1], TALLER S[1], LUKÁŠ R[1], ENDRYCH L[2"]:
- Use of the Omega plate for Stabilisation of the Acetabular Fractures: first Experience. ACTA Chir. Orthop. Traum. Čech. 2013;80:118–124.
Disclosure: Authors involved in the development of the plate in cooperation with Medin company, Czech Republic/

O319

THE VALIDATION OF ROMMENS CLASSIFICATION FOR FRAGILITY FRACTURES OF THE PELVIS

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Introduction: The purpose of this study was to validate the Rommens classification for fragility fractures of the pelvis (FFPs) and to shed light on the problems of the classification.
Materials and methods: The data of 102 patients obtained from a database at a single orthopedic trauma center were analyzed. Five patients were excluded because of lack of data. Each patient was classified based on Rommens classification for FFPs by using radiographs, computed tomography, or magnetic resonance imaging. We also studied the cases that underwent osteosynthesis procedures and those who suffered non-union. Additionally, we studied Rommens classification and the medical complications occurring in such problematic cases.
Results: Out of 97 patients, 13 were unclassifiable. Among the classifiable patients, the Rommens classification was as follows: Ia: 17, Ib: 3, IIa: 3, IIb: 24, IIc: 16, IIIa: 5, IIIb: 0, IIIc: 1, IVa: 0, IVb: 14, and IVc: 1. Five patients underwent the procedures and four were diagnosed with non-union. Among these nine patients, the Rommens classification was as follows: IIb: 1, IIc: 2, IIIa: 2, IIIc: 1, IVb: 3. Five of the nine had diabetes mellitus and three took steroids.
Conclusion: The Rommens classification reflected the severity of the condition. It was observed that complete sacral fractures were predisposed toward non-union or needed surgery. There is an examination of the scope for the revision in the future as there were quite a few unclassifiable patients.
References:
1. Pol Maria Rommens, Alexander Hofmann. Comprehensive classification of fragility fractures of the pelvic ring: Recommendations for surgical treatment. Injury. 2013;44(12): 1733–1744.
Disclosure: No significant relationships.

O320

TOTAL HIP ARTHROPLASTY FOR POSTTRAUMATIC ARTHRITIS AFTER ACETABULAR FRACTURE

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Introduction: After an acetabular fracture a total hip arthroplasty (THA) may eventually be necessary irrespective of the method of initial management. THA outcomes after acetabular fracture have yielded inferior results compared to primary nontraumatic THA. The purpose of this study was to evaluate outcomes in a consecutive series of THAs implanted after failed treatment of an acetabular fracture.
Materials and methods: 141 acetabular fractures were analized with an average follow up of 48 months, which 32 of them developed a secondary arthrosis (38 % anterior column fracture and posterior hemitransverse) in 18 months time average, requiring PTC in 20 cases. It resulted that in the 61 % of the 20 cases, the prosthesis was implanted in the first 1.5 years, ALL of them being treated initially, by internal fixation. 20 patients underwent THA for posttraumatic arthritis after acetabular fracture; 15 were treated with open reduction internal fixation, and 5 were managed conservatively.
Results: Time from fracture to THA was 97 months (1–432 months). Average follow-up was 6 years (1.0–14 years). Harris Hip score increased from 32 (3–59) to 78 points (20–100). There was one socket loosening with osteolysis, 2 cases of deep infection and 3 cases of posterior dislocations. They were required 3 acetabular revisions. Revision surgery correlated with nonanatomic restoration of the hip center ($p < .05$).
Conclusion: THA improves significantly pain, mobility and functionality. The rate of infection, dislocation, loosening and acetabular revisions are higher than the rate in non-traumatic cases.
References:
1. Martin W. Total hip arthroplasty after operative treatment of an acetabular fracture. 1998;80-A(9):1295–1305.
Disclosure: No significant relationships.

O321

TREATMENT OF SEVERE BONE DEFICIENCY IN ACETABULAR REVISION SURGERY USING A REINFORCEMENT CAGE

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Introduction: Treatment of acetabular loosening and accompanying bone defects requires that the bone stock be rebuilt, the primary stability ensured, and the hip center of rotation restored to its anatomical location.The purpose of this study was to evaluate the complications, management, and outcome of this procedure for severe acetabular bone deficiency in acetabular revision surgery.
Materials and methods: A retrospective study was performed on 37 acetabular revision cases (37 patients) performed between 2003 and

2011. The average age at revision was 67.7 years (42–86 years). Among these acetabular loosening cases, 17 cases had a type II Paprosky acetabular bone defect and 20 cases had a type III defect.
Results: The average follow-up was 5 years (2–10 years). Ninteen (51 %) cases had no complications, N4 had sciatic, 3 peroneal nerve palsies, 2 femoral nerve palsy, 2 rings that lost fixation, 1 possibly loose ring, 1 fractured flanges, 1 loose cups, 8 dislocations, and 6 deep infections. The average Postel Merle d'Aubigné (PMA) score improved from 4.9 (range 2–9) preoperatively to 10,6 (range 4–16) at follow-up ($p < 0.01$). But success was defined as a stable reconstruction with no further acetabular revision and bone graft incorporation, it was 76 %. The need for reoperation for any reason was 21 % (8 hips).
Conclusion: We recommend a cemented dual mobility cup to avoid dislocation in selected cases. We highlight the substantial limitations of current methods available for treating patients with extensive acetabular bone loss.
References:
1. Goodman MD.Complications of Ilioischial Reconstruction Rings in Revision. J Arthroplasty. 2004;19:436–46.
Disclosure: No significant relationships.

O322

PRIMARY TOTAL HIP ARTHROPLASTY FOR TREATMENT OF ACETABULAR FRACTURES IN THE ELDERLY

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Introduction: Aim—to investigate in a prospective manner outcome in the elderly population with acetabular fractures after low-energy trauma treated acutely with a total hip arthroplasty
Materials and methods: Twenty one (from 26) patients (16 males) available for follow-up with a mean age at the time of surgery 71 years. Indication for primary total hip joint endoprosthesis was instability, hip incongruence >1 cm, acetabular defects and pre-existing arthritis. Three techniques were used + autologous bone grafting -
Results: Mean operating time was 100 min, intraoperative blood loss was 1,000 mL. There were no signs of loosening of the acetabular component, all of the fractures healed. Five patients presented (Brooker II HPO. We found an excellent (57 %) or good (43 %) result for the entire group.
Conclusion: One option is to perform open reduction and internal fixation of the acetabulum and then proceed with THA in the same sitting. The results of our study regarding the Merle d'Aubigné Score seem to be comparable to those obtained after primary total hip arthroplasty in patients with arthritis or displaced femoral neck fractures in this age group. AcuteTHAy with cranial buttressing reinforcement ring, grafting of acetabular defects with autogenous corticocancellous bone permits immediate mobilization of elderly patients, quick pain relief and full weight-bearing and thus favourable results. It is a promising treatment of displaced acetabular fractures in elderly patients with osteoporotic bone.
References:
1. Beaulé PE, Mears, Velyvis. Open reduction and internal fixation versus total hip arthroplasty for the treatment of acute displaced acetabular fractures. J. Bone Jt Surg. 2002;84-A:2103–2105.
Disclosure: No significant relationships.

O323

MANAGEMENT OF ACETABULAR FRACTURES THROUGH THE PARARECTUS APPROACH: ANATOMIC REDUCTION CONFIRMED BY COMPUTED TOMOGRAPHY AND CLINICAL RESULTS AFTER TWO YEARS

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Introduction: The anatomical restoration of the acetabular joint surface in the treatment of displaced acetabular fractures has been deemed to be essential if failure of joint-preserving surgery is to be avoided.
Materials and methods: Thirty-three patients (mean age 58 years, range 16–89; 28 male) with displaced acetabular fractures involving the AC (AC n = 3; AC and anterior wall n = 1; AC and hemitransverse n = 17; both column n = 11; transverse fracture n = 1) were treated between 12/2009 and 05/2011 using the Pararectus approach. Surgical data and accuracy of reduction were assessed by computed tomography. Patients were routinely followed up at 8 weeks, 6, 12 and 24 months postoperatively. Failure was defined as the need for total hip arthroplasty. Twenty-four months postoperatively the outcome was rated according to Matta.
Results: Fracture reduction showed statistically significant decreases (mean ± SD, pre- vs. postoperative, in mm) in "step-offs": 2.8 ± 1.9 vs. 0.1 ± 0.2, $p < 0.001$ and "gaps": 12.0 ± 6.8 vs. 0.8 ± 0.9, $p < 0.001$. Accuracy of reduction was "anatomical" in 32 and "imperfect" in one. Two (8 %) from 26 available patients required a total hip arthroplasty. In patients with a preserved hip the outcome was rated as "excellent" in ten and "good" in 14 clinically or "excellent" in 21, "good" in one and "fair" in two patients radiographically.
Conclusion: In the treatment of acetabular fractures involving the anterior column the Pararectus approach allowed for anatomic restoration with minimal access morbidity and provided a promising outcome after 2 years.
References:
1. Keel MJ e al. J Bone Joint Surg Br. 2012;94(3):405–11.
Disclosure: No significant relationships.

FEMUR RECONSTRUCTION

O324

REVISION TOTAL HIP ARTHROPLASTY USING A RECONSTRUCTION CAGE DEVICE AND A CEMENTED DUAL MOBILITY CUP

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Introduction: Postoperative dislocation is the commonest complication following revision total hip arthroplasty (THA). Dual mobility cups are supposed to reduce the risk of THA instability. We questioned whether dual mobility cups or several variables, would be associated with increased rates of revision or better outcomes.
Materials and methods: At a mean follow-up of 5 years months, we analyzed a continuous series of 37 revisions using a reconstruction

device associated in 17 cases with a Polar cup dual mobility cup cemented into the cage and in 20 cases with a cemented cup. These were acetabular revisons involving major bone loss (17 cases type II Paprosky and 20 caases type III).
Results: Four hips (10 %) were revised for loosening; three of these was also infected. There were 8 dislocations, none of them having a cemented dual mobility cup, except one case.Th e average Postel Merle d'Aubigné (PMA) score improved from 4.9 (range 2–9) preoperatively to 10.6 (range 4–16) at follow-up ($p < 0,01$). We found an association between number of previous surgeries or age and radiographic loosening and revision ($p < 0.05$). We found further association between use of a cemented dual mobility cup into the cage and lower rates of dislocations and revision ($p > 0.05$).
Conclusion: Dual mobility cups provided a lower rates of dislocation in revision THA using an antiprotrusio cage, comparable to standard cups.It is especially suited to deal with high instability risk revision cases, where constrained componentsare generally recommended.
References:
1. Schneider L. Revision total hip arthroplasty using a reconstruction cage device and a cemented dual mobility cup. Ortop and Traum 2011;97:807–13.
Disclosure: No significant relationships.

O325

INTRACAPSULAR HIP FRACTURE FIXATION WITH A NEW IMPLANT—A COMPLICATION ANALYSIS OF 135 TARGON® FN CASES

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Introduction: The Targon® FN is an innovative implant for femoral neck fracture fixation: TeleScrews are attached to a locked sideplate, thus combining the principles of sliding hip screw and parallel screw fixation. We present the first larger series with this implant.
Materials and methods: Prospective documentation of all Targon® FN cases since 2006. The implant was used for all undisplaced fractures and for displaced fractures in patients of a biological age $\leq$60 years. We collected data on demographics, fracture classification, infection, hematoma, implant perforation, non-union, and operative revision procedures.
Results: In 135 cases (mean age 71 years; average operation time 60 min; average hospital stay 10 days) we found a surgical complication rate of 16.4 % (95 % CI 10.1–22.8 %), 30-day-mortality was 2.2 % (95 % CI 0–4.7 %). There were no infections, hematoma rate was 4.4 % (95 % CI 0.9–8.0 %), non-unions were seen in 2.2 % (95 % CI 0–4.7 %). Cut-out rate was 9.6 % (95 % CI 4.6–14.7). Conversion to joint replacement was necessary in 9.6 %. Complication rate of displaced fractures (Garden 3/4) was 28.9 % (CI 15.1–42.7 %), whereas in undisplaced fractures (Garden 1/2) it was 11.2 % (CI 4.5–17.9 %); this difference was significant ($p = 0.01$).
Conclusion: Our experience with the Targon® FN supports the encouraging reports [1,2]. However we found evidence that cut-out may be an underestimated problem in displaced fractures. Detailed studies examining the influence of factors such as fracture reduction and TeleScrew positioning are needed.
References:
1. Parker, Stedtfeld. Injury. 2010;41:348–51.
2. Körver et al. Injury. 2013. http://dx.doi.org/10.1016/j.injury.2013.05.002.
Disclosure: Both authors received grants from B.Braun Aesculap for consulting activities within the last 5 years.

O326

COMPLICATIONS AFTER HIP FRACTURES IN THE ELDERLY

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Introduction: Hip fractures frequently occur in older persons and strongly decrease life expectancy and independence. Surgical treatment has improved over the years, however recovery is often hindered by complications. The reported complication rate after hip surgery in these frail patients is high[1]. We investigate if strictly following an operative protocol will reduce the complication rate. Furthermore we identify risk factors for complications.
Materials and methods: Patients treated for a hip fracture in the UMCG between July 2009 and June 2013 were included. Hospitalization, treatment and recovery were prospectively registered until 6 months after surgery. All preoperative x-rays were retrospectively examined for fracture reclassification to assess if the fracture was treated according to the operative protocol, which is part of a comprehensive multidisciplinary care pathway.
Results: 481 Patients were included, of which 424 patients (88 %) were treated strictly according to the surgical protocol. The complication rate in both groups were the same (75 %). However patients treated according to the protocol had significant less complications related to the osteosynthesis (7 vs. 23 %, $p < 0.001$) and a significant lower reoperation rate (9 vs. 23 %, $p = 0.001$). Furthermore they experienced less postoperative pain needing surgical treatment (1 vs. 5 %, $p = 0.04$) and a better post-operative load bearing capacity. General risk factors for complications were ASA classification, preoperative living situation and mobility.
Conclusion: Using a strict surgical protocol is important. Complication rate after hip fracture surgery is still high, risk factors need to be identified.
References:
1. Fisher AA, Davis MW et al. Outcomes for older patients with hip fractures. J Orthop Trauma 2006;20(3):172–8.
Disclosure: The study has had a grant, from Biomet® and Trauma Centre Northern Netherlands, a special part of the University Medical Centre. These organizations however, do not have any influence on the design nor publications of the study.

O327

RECONSTRUCTIVE SURGERY OF GUNSHOT INJURES OF EXTREMITIES

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Introduction: The treatment of gunshot injuries is real challenge in reconstructive surgery. It is difficult problems because it is specific type of trauma and requires the multidisciplinary attitude [1].

Materials and methods: We have experience of the treatment of the 55 patients with combat trauma. Most patients were young people (82 %). The majority of injuries were isolated. The open fractures constituted 30 %. The gunshot injuries dominated (60 %). The majority of injuries were a traumas of leg (41.8 %) and hand (16.3 %). The first surgery was performed according to the principles of damage control orthopedic surgery. After 7–10 days we started practicing close wounds. Direct closure was performed in 25.5 %. Split thickness skin grafts were used in 21 %. In cases with large defects of soft tissue the different types of flaps were used, such as local (23.6 %), pedicle (21.8 %) and free ones (7.3 %).
Results: The average duration of the treatment of patents with the damage of soft tissue was 30 ± 6 days, with open fractures-6.5 months. The average number of operations for a patient was 9 ± 3(max—24). We got good functional results in 94.5 %. Flap success was 100 %. Partial flap loss in one pts.
Conclusion: The management of combined skeletal trauma is a complex process. The management of gunshot injuries consists of early debridement, the avoidance of soft tissue closure under tension, the stabilization of fractures, the application of free tissue transfers. The key to early bone healing is adequate debridement and definitive soft tissue coverage.
References:
1. Dan Bieler MD, Maj MC (2012). Current Strategies for the Treatment of Blast Injuries to the Extremities. http://ftp.rta.nato.int/public/PubFullText/RTO/MP\\RTO-MP-HFM-207/MP-HFM-207-08.doc.
Disclosure: No significant relationships.

O328

WOUND INFECTIONS FOLLOWING ELECTIVE IMPLANT REMOVAL FOLLOWING FRACTURE HEALING; INCIDENCE AND RISK FACTORS

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Introduction: Metal implants placed in fracture surgery are often removed because of various reasons. Implant removal (IR) is considered a clean procedure and low risk surgery. Wound infections (WI) following IR has received little attention in literature. The aim was to assess the incidence of WI following IR.
Materials and methods: All adult patients in 2 traumacenters with IR in during 6.5 years were retrospectively included. Exclusion criteria were IR because of infection or removal as part of a new procedure. Primary outcome was a WI as defined by the US Centers for Disease Control and Prevention. Antibiotic prophylaxis was not administered routinely.
Results: A total of 452 patients were included with 512 procedures. Rates of superficial and deep WI were 10 and 1.6 %. Implants were removed in the upper extremity 73 times (13 %) and 439 times (87 %) in the lower extremity. The incidence of WI were 4 (5.5 %) and 55 (12.8 %) respectively. Four hundred and three procedures were below the knee joint, with 49 WI's (12.2 %). A WI following IR was associated with a WI following initial fracture treatment ($p = 0.012$). A WI occurred more often in younger patients with a median age of 36, compared to 43 without a WI ($p = 0.004$).
Conclusion: The incidence of postoperative WI in patients with elective IR was 11.5 %. Risk factors for a WI following IR are a previous WI after the index procedure and a younger age. The results implicate that IR should not be seen as a 'clean' procedure and will be used in a prospective study on the effects of antibiotic prophylaxis prior to IR.
References:
1. Mangram AJ et al. Guideline for prevention of surgical site infection, centers for disease control and prevention (CDC) hospital infection control practices advisory committee. Am J Infect Control. 1999;27:97–132
Disclosure: No significant relationships.

O329

EFFECTS OF SURGEONS FATIGUE ON TROCHANTERIC FRACTURE OSTEOSYNTHESIS PERFORMANCE DURING A 24-HOUR SHIFT

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Introduction: There is growing support in today's literature that physician fatigue and sleep deprivation cause significant deterioration in surgeons cognitive and technical skills. Stabilizations of trochanteric fractures often requires performance in late hours when a surgeon fatigue is increased. **Objective:** To assess the correlation between surgeons fatigue and quality of trochanteric fractures osteosynthesis during 24-h shift (7 am–7 am).
Materials and methods: The records of 206 type-A proximal femur fractures treated by a Targon PFT nail from January 2011 to October 2012 were retrospectively reviewed. Demographic data, surgery start time and duration were collected. Peroperative and postoperative radiologic fracture alignment, implant positioning and osteosynthesis failures were evaluated. Surgeon fatigue was defined by surgery performance in successive 8-h periods during 24-h shift.
Results: In the Targon PFT osteosynthesis cohort, a surgery started at the middle 8-h period was related to longest operation time ($p = 0.215$), highest rate of poor fracture reduction ($p = 0.587$), poor implant positioning ($p = 0.175$) and number of osteosynthesis failure ($p = 0.532$). Surprisingly the best results were noted in osteosynthesis performed in third 8-h period. None of the results were statistically significant.
Conclusion: A surgeon fatigue doesn't have a statistically significant effect on osteosynthesis performance during the 24-h shift. Although we feel strongly about the negative effects of increasing a surgeon fatigue and overwhelming workload in the middle period. Low-stress environment during the night period probably has more positive effect on the concentration of a surgeon, than the time elapsed from shift start.
References:
1. Ch. Peskun et al.: Effect of surgeon fatigue on hip and knee arthroplasty
Disclosure: No significant relationships.

LIVER AND THORACIC TRAUMA

O330

OPERATIVE STRATEGIES FOR TRAUMATIC LIVER INJURY

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Introduction: The liver is the most commonly injured intra-abdominal organ. Numerous surgical techniques are available in the armamentarium of a surgeon to deal with these injuries. The aim of this study was to evaluate the operative strategies for the management of liver trauma in a level1 Trauma Centre.
Materials and methods: Prospective study of patients with blunt and penetrating liver injuries who required a laparotomy between 2008 till 2013.
Results: Four-hundred-twelve patients sustained liver injuries. Two-hundred-eighteen patients were managed operatively. In 120 patients the liver was not bleeding at the time of surgery and in 73 patients a drain was left behind for possible bile leaks. Thirty-one patient required temporary packing and the bleeding could be controlled with haemostatic agents (12) or sutures (19). Sixty-three (29 %) had liver injuries in which the bleeding could not be controlled by temporary packing or simple sutures and required inflow occlusion and therapeutic perihepatic packing. In four patients the hepatic artery was involved in the injury and ligated. Five patients had major juxtahepatic venous injuries and required perihepatic packing and adjuvant direct repair. Resectional debridement was performed in 3 patients, there were no formal resections performed. Morbidity directly attributed to the liver occurred in 33 patients (16 per cent). The overall mortality was 9 per cent.
Conclusion: The majority of liver injuries require no surgical intervention or can be managed by simple surgical techniques. Perihepatic packing is a life saving procedure and bridge to definitive repair for most devastating liver injuries.
References:
1. Br J Surg. 2008;87:1030–1034.
2. J Trauma. 1988;28(10):1433–8
Disclosure: No significant relationships.

O331

NON OPERATIVE TREATMENT VS OPERATIVE TREATMENT IN HEPATIC TRAUMA: A TEN-YEAR EXPERIENCE

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Introduction: The last 25 years were witnesses of notable change in hepatic trauma treatment with the choice of non operative management (NOM) in case of hemodynamic stability and absence of peritonism.
Materials and methods: We retrospectively collected and analyzed data of trauma patient with liver injury observed from 2003 to 2012. Patients were divided in two groups: G1, patients observed from 2003 to 2007 (66, 41.5 %) and G2, from 2008 to 2012 (93, 58.5 %). We used the Liver Injury Grade of the American Association for the Surgery of Trauma and the Injury Severity Score.
Results: One thousand fifty-nine patients have been treated. The number of patients/year has increased from 4 to 35 (9 times) due to changes in the regional organization of first aid for trauma patients. We used NOM for low grade trauma, mean ISS 21.3 (95.8 % in grade I, 72.9 % grade II, 52 % grade III), while operative management (OM) was predominant in major trauma, mean ISS 27 (72 % in grade IV and 55.5 % grade V). However NOM was adopted in 48 % in G1 patients and 64 % of G2 patients. Mortality and morbidity rate were 67–57 % and 6–32 % for OM and NOM, respectively ($p < 0.0001$). The length of hospitalization was 15 days for NOM and 30 days for OM ($p < 0.01$). Furthermore, a correspondence was observed between hepatic enzymes increase and liver injury grade.
Conclusion: NOM has shown to be superior to OM, not only in relation to mortality rate, but for the length of hospitalization and morbidity rate.
References:
1. Piper GL, Peitzman AB. Current management of hepatic trauma. Surg Clin N Am 2010;90:775–85.
2. Leppaniemi AK. Severe hepatic trauma: nonoperative management, definitive repair or damage control surgery? World J Surg 2011;35:2643–9.
Disclosure: No significant relationships.

O332

CONFIRMING THE SAFETY OF A SIMPLYFIED APPROACH TO SEVERE PANCREATIC AND DUODENAL INJURIES

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Introduction: The management of severe pancreatic (PI) and duodenal injuries (DI) has evolved towards simple repair, drainage and pancreatic tail resection, without diversion, decompression and very infrequently complex reconstruction. We present the experience of a major Scandinavian trauma center.
Materials and methods: Retrospective analysis of all patients with PI and DI admitted during the period 2002–2012. Patient charts and trauma registry data were reviewed.
Results: Of a total of 70 patients, 13 were children <16 years. Blunt injury dominated (73 %). Isolated PI was diagnosed in 49 patients (71 %), DI in 16 (21 %) and 5 (7 %) had combined pancreaticoduodenal injuries (PDI). 27 patients had OIS grade 3-5 PI and 6 had grade 4-5 DI. Mean ISS was 24 (4–75). Of the 9 deaths (13 %), 6 occurred within 1 h. 18/21 grade 3 PI underwent tail resection, with splenic preservation in 11 patients. Of 8 grade 4–5 PI, 6 were treated with drainage alone and two patients underwent Whipple procedures for complex PDI/CBD injuries. All 10 patients with isolated grade 3–5 DI were subject to primary repair. A total of 22 patients had complications related to the pancreaticoduodenal injuries; 18 fistulae, 3 abscesses and one post ERCP pancreatitis.
Conclusion: This study supports an operative approach to severe PI and DI. Grade 3 PI are managed with tail resection and grade 4–5 injuries with drainage unless the CBD is involved. Duodenal injuries can with few exceptions be managed by simple primary repair without decompression or diversion. Mortality is mainly due to associated injuries.
References:
1. DOI:10.1007/s00534-010-0329-6.
Disclosure: No significant relationships.

O333

CLAMSHELL INCISION VS. LEFT ANTEROLATERAL THORACOTOMY. WHICH ONE IS FASTER WHEN PERFORMING A RESUSCITATIVE THORACOTOMY? THE TORTOISE AND THE HARE REVISITED

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Introduction: According to our previous study[1], the clamshell incision (CI) offers a better exposure than the left anterolateral thoracotomy (LAT) as a resuscitative thoracotomy. Most surgeons will have to manage a heart wound only once or twice in their carreer. The patient's survival depends on how fast the surgeon can control the heart wound; however, it is unclear which of the two incisions allows for faster control. The aim of this study was to compare the time needed to access and control a standardized stab wound of the right ventricle, by non-experienced surgical trainees, by LAT or CI.
Materials and methods: 18 residents were shown a video on how to perform a LAT and a CI. They were randomly assigned to control a standardized stab wound of the right ventricle on perfused human cadavers by LAT ($n = 9$) or CI ($n = 9$). Access time (skin to maximal exposure) control time (maximal exposure until inflation of a Foley catheter inside the heart wound) and total time (the sum of access and control times) were recorded and compared (Mann–Whitney *U* test).
Results: For technical reasons (cadaver preparation), one LAT and one CI were excluded. The LAT access time was shorter than the CI access time (2.09 ± 0.9 vs. 3.17 ± 2 min; $p = 0.34$) whereas the LAT control time was longer (4.67 ± 3.68 vs. 1.81 ± 0.57 min; $p = 0.02$), resulting in a longer LAT total time (6.77 ± 4.29 vs. 4.98 ± 2.17 min; $p = 0.46$).
Conclusion: By performing a CI resuscitative thoracotomy, the time spared by rapidly controlling the heart wound exceeds the time invested in perfoming the longer incision.
References:
1. 1. WJS 2013;37(6):1277–85.
Disclosure: No significant relationships.

O334

OBLIQUE MANUBRIUM STERNI FRACTURE DUE TO SEAT BELT INJURY—A RARE ENTITY? TREATMENT OPTIONS BASED ON A LEVEL I TRAUMA CENTER EXPERIENCE

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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 [1]. Most cases described are due to motor vehicle crash either caused by direct impact to the steering wheel or by the seat belt [2].
Fractures mainly occur to the sternal body. Only rarely are cases of manubrium fractures described in literature, for example in relationship with a direkt impact to the shoulder which caused an oblique fracture near to the sternoclavicular joint [3,4].
Three patients with profoundly dislocated oblique manubrium fracture were admitted to our Level I Trauma Center in 2012 and 2013. Those patients suffered from instability of the upper sternum and the shoulder girdle.
Materials and methods: Between January 2012 and October 2013 538 trauma patients were admitted to the emergency room and recieved whole body CT-scan. They were analysed retrospectively for sternal fractures.
In cases of instability and dislocation, fracture stabilization was performed by anterior plating through an median approach using low profile titanium plates (MatrixRib®).
Results: 79 (14.7 %) patients showed sternal fracture, out of which 13 (2.4 %) patients showed a fracture of manubrium, 10 caused by seatbelt.
In 3 cases stabilization was performed. Follow up showed sufficient consolidation without complications.
Conclusion: 16.5 % of sternal fractures were localized at the Manubrium, mostly caused by seat belt.
Fractures without significant dislocation seemed to be stable and healed well under conservative treatment.
Dislocation in this region leads to unstable shoulder girdle. Anterior plating provides sufficient stabilization and allowed consolidation.
References:
1. 1 Athanassiadi K, Gerazounis M, Moustardas M, Metaxas E. Sternal fractures: retrospective analysis of 100 cases. World J Surg. 2000; 26(10):1243–1246.
2. 2 Yeh DD, Hwabejire JO, Demoya MA, Alam HB, King DR, Velmahos GC. Sternal fracture-an analysis of the National Trauma Data Bank. J Surg Res. 2013. [Epub ahead of print].
3. 3 Helal B. Fracture of the manubrium sterni. J Bone Joint Surg Br. 1964;46:602–7.
4. 4 Velutini JA, Tarazona PF. Fracture of the manubrium with posterior displacement of the clavicle and first rib. A case report. Int Orthop. 1998;22(4):269–71.
Disclosure: The first author has a consultant agreement with Synthes CMF. No funds were received in connection to the presented study. The coauthors are not involved in any conflict of interest.

O335

THERAPY OPTIONS OF COMPLEX STERNAL FRACTURES—EXPERIENCE WITH ANTERIOR LOCKED PLATE OSTEOSYNTHESIS IN A LEVEL I TRAUMA CENTER

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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 or distraction [1]. Most cases described are due to motor vehicle crash.
Fractures mainly occur to the sternal body. In cases of unstable fractures, anterior plating provides the most popular treatment although orthopedic and trauma surgeons often are reluctant to perform plate osteosynthesis to the chest wall [2].

This study proposes to discuss the possibilities of the treatment of multiple sternal fractures and the combination of sternal- and rib fractures.

Materials and methods: 13 Patients were stabilized by locked plate osteosynthesis (MatrixRib®) and depth limited drilling between May 2012 and October 2013 and prospectively followed up [3]. Injuries were localized: manubrium (3), angulus (3), corpus (8). There were 5 multiple sternal fractures and 4 concomitant rib tib dislocations. The operative approach was median. Rib tips were fixed with Polidioxanon suture or with a sternocostal plate [4].

Results: Median approach offered sufficient access to sternum and rib tips in all cases. All cases showed sufficient stabilization of the fractures and complete consolidation during the follow up.

In one case of multiple sternal fractures requiered the use of a plate of longer lengh than available. Hence we used a 30-hole plate, ordered as a custom made device.

Complications: bleeding A. mammaria (1), pneumothorax (1) and seroma (1)

Conclusion: Stabilization of sternal fractures by anterior locked plate osteosynthesis seems to be a sufficient and safe method even in complex cases.

References:

1. 1 Potaris K, Gakidis J, Mihos P, Voutsinas V, Deligeorgis A, Petsinis V. Management of sternal fractures: 239 cases. Asian Cardiovasc
2. Thorac Ann. 2002;10(2):145–149.
3. 2 Mayberry JC, Ham LB, Schipper PH, Ellis TJ, Mullins RJ. Surveyed opinion of American trauma, orthopedic, and thoracic surgeons on rib and sternal fracture repair. J Trauma. 2009;66(3):875–879.
4. 3 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. [Epub ahead of print].
5. 4 Schulz-Drost S, Syed J, Besendoerfer M, Carbon RT. Sternocostal Dislocation Following Open Correction of Pectus Excavatum-"Stairway Phenomenon": Complication Management by Means of Sternocostal Locking Titanium Plate Osteosynthesis. Thorac Cardiovasc Surg. 2013 Oct 14. [Epub ahead of print].

Disclosure: The first author has a consultant agreement with Synthes CMF.No funds were received in connection to the presented study. The coauthors are not involved in any conflict of interest.

O336

MANAGEMENT OF PATIENTS WITH ISOLATED STERNAL FRACTURES. IS CARDIAC OBSERVATION ALWAYS NECESSARY?

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Introduction: Sternal fractures are a rare entity which are often accompanied by traumatic injuries after major accidents. However, since seat-belt legislation was introduced, the amount of sternal fractures increased significantly. In spite of the increasing amount, there is still no consensus about the optimal management of these patients. The aim of this study is to analyse the cardiac complications and need of hospitalisation of patients with a sternal fracture.

Materials and methods: We analysed a retrospective cohort of 59 patients with sternal fractures, brought into the emergency room in the period from 2007 till November 2011. We evaluated the troponin level in blood samples, abnormalities on electrocardiogram and echocardiogram.

Results: In 60 % of the cases a motor vehicle accident was the cause of injury. One third of the fractures were isolated. Three patients showed irregular cardiac rhythm during primary assessment, in only one case the rhythm was persisting when controlled a second time. 87 % of the patients had a normal troponin level. In most cases troponin levels were normalized during the second measurement, 6 h later, and therefore considered irrelevant. Only three echocardiograms were performed, none showed abnormalities.

Conclusion: Cardiac complications after sternal fractures are rare. If present, they are apparent upon presentation in the emergency room. Therefore we deem observation and cardiac monitoring not necessary if abnormalities are not present upon presentation. Based on this data we developed a flowchart to clarify the management of these patients. Clarity can save time and money, due to unnecessary hospitalisations and consulting doctors.

References:

1. Cogbill et al.

Disclosure: No significant relationships.

O337

OPERATIVE AND NON OPERATIVE MANAGEMENT IN GUNSHOT ABDOMINAL INJURIES. A REVIEW OF 321 PATIENTS

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Introduction: Evidence from images studies have changed the way we manage gunshot wounds. Operative management of all gunshot's traumas carries a high rate of unwarranted interventions that could cause serious complications. Selective nonoperative management is thus being increasingly practiced.

Materials and methods: We prospectively reviewed 321 patients with abdominal gunshot injury between January 2011 and January 2013. We classified patients in two groups (A) non operative management and (B) operative management. Data collected from these patients include age, sex, ISS score, length of stay, other associate injuries, complications and mortality in both groups. We describe the principal characteristics of both groups, trying to determinate factors associated to each group.

Results: A total of 321 patients (309 men and 12 women) were admitted with diagnosis of abdominal gunshot wound, 295 patients (91.9 %) required operative management (OM). Average age of all patients were 27.6 with a median ISS of 14.2 in OM group and 4.3 in conservative management(CM) group. The injury site identified in OM group include small bowel (22 %), large bowel (18 %), diaphragm (9.7 %) among others. Almost 54 % of this group have multiple intra-abdominal lesions. None of the CM group have complications. In these patients gunshot trajectory produced lesions outside the peritoneal cavity, to muscles and bones in the lower extremity.

Conclusion: Decision for managing gunshot patient should be based on objective clinical and diagnostic findings. Site of injury and estimated bullet trajectory could be predictors of severe injury.

References:

1. Pryor JP, Reilly PM, Dabrowski GP. Nonoperative management of abdominal gunshot wounds. Ann Emerg Med. 2004;43(3):344–53.

Disclosure: No significant relationships.

O338

PROGNOSTIC FACTORS IN PATIENTS WITH PENETRATING COLON INJURIES IN 21 YEARS OF A BRAZILIAN TRAUMA CENTER

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Introduction: The penetrating colon injuries has a low mortality rate (10–20 %), but a high morbidity (15–50 %).
Materials and methods: Identify the prognostic factors involved in penetrating colon trauma. In 21 years of study, 462 patients were admitted with colon trauma into the trauma center at the Hospital of Unicamp, excluding the 92 patients with blunt trauma and 45 with penetrating abdominal trauma, with grade I lesions, totaling the 324 patients in this study.
Results: Of these patients, 90.7 % were male, with a mean age of 28.9 years. The gunshot's injuries were responsible for 82.4 % of cases. The overall morbidity was 39.8 %, with abdominal infection rate of 20.2 % (8 % of patients). The mortality rate was 13.6 %. Fistula or dehiscence of the colon anastomosis was present in 14 patients (4.3 %), 13 in the context of primary repair (72.2 % of cases). Destructive lesions of the colon and patient and a changed RTS have higher morbidity and mortality. Patients with higher intracavitary bleeding, multiple abdominal injuries or thoracic injury associated with colon also have higher morbidity. And the patients with ISS greater than or equal to 25, required a blood transfusion, which had coagulopathy and stomach lesions in association with colon have also higher mortality.
Conclusion: To reduce morbidity and mortality of penetrating colon injuries, this risk factors involved must be known.
References:
1. Hatch et al. Outcomes after colon trauma in the 21st century. 2013
2. Stone and Fabian. Management of perforating colon trauma. 1979
3. Burch et al. The injured colon. 1986
Disclosure: No significant relationships.

O339

TRAUMATIC ANORECTAL INJURIES IN ALBANIA: A PROSPECTIVE STUDY OF 68 PATIENTS

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Introduction: Traumatic anorectal injuries (TAI) are uncommon, yet carry significant morbidity and due to associated injuries, high mortality. The objective of this study is to evaluate TAI based on anatomic localization of injury, causes, clinical presentation, treatment and complications.
Materials and methods: A prospective study of all patients with TAI treated during January 2007 to October 2013 at the National Trauma Center, Trauma University Hospital in Tirana, Albania. Gender, age, mechanism of injury, surgical approach and complications were analyzed.
Results: Sixty-eight patients were treated for TAI during this study period. 75 % (51) were males, 25 % (17) females, and average age 37.2 years (9–68). 83.8 % (57)sustained penetrating trauma, (63.1 % (43) from gunshot and explosives), 16.2 % (11)sustained blunt trauma. Extraperitoneal rectal injuries occurred in 60.2 % (41), intraperitoneal rectal injuries in 19,1 %(13)and isolated anal sphincter injuries in 13.2 % (9). 25 % (17) sphincter injuries and extraperitoneal rectal injuries. 92.6 %(63) of patients were treated operatively(diverting colostomy 91.1 % (62); 86.7 % (59) Hartman procedure). Presacral drainage and distal washout performedin 38.2 % (26) and 13.2 % (9) respectively. Primary sphincteroplasty in 5.9 % (4), delayed sphincteroplasty in 4.4 % (3). Complications occurred in 58.5 % (40) which include abscesses (perianal 9 (13.2 %), intra-abdominal 2 (2.9 %), fistulae (recto-vesical 1(1.47 %, recto-vaginal 1 (1.47 %); osteomyelitis 2 (2.9 %), and incontinence 17 (25 %).Average length of hospital stay 16 days, while overall mortality was 8.8 % (6). Complications and mortality were due to associated injuries and delay in diagnosis.
Conclusion: The anorectal injuries, particularly from gunshot wounds or explosives have serious consequences and demand multidisciplinary approach. The majority of our patients underwent diversion and resection.
References:
1. McGrath et al. Rectal trauma: management based on anatomic distinctions. Am. Surg. 1998;64(12):1136–41
Disclosure: No significant relationships.

O340

ROLE OF THE PHYSICAL EXAMINATION AND NEW DIAGNOSTIC METHODS IN THE PREVENTION OF UNNECESSARY LAPAROTOMY DUE TO ABDOMINAL PENETRATING OBJECT INJURIES

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Introduction: Prevention of unnecessary laparotomy by conservative approach in cases with abdominal trauma produced by penetrating objects.
Materials and methods: From 952 penetrating injury cases administered to İstanbul Faculty of Medicine, Emergency Surgery Unit during the time interval of 1 January 2008, 30 September 2012; 147 abdominal injury (lower thoracic region, anterior abdominal wall, and back) cases are evaluated retrospectively according to the demographic data, the site of injury, additional trauma findings, hemodynamic parameters, time passed until hospital administration, diagnostic method and treatment method. The conservative approach is based on physical examination, hemogram follow-up and hemodynamic evaluation.
Results: As a result use of physical examination and/or different diagnostic methods, decreases the nontherapeutic laparotomy number and prevents negative laparotomy. Surgeons have to make a vital decision to choose right diagnostic technique in nonoperative approach of abdominal penetrating object injuries.
Conclusion: Correct evaluation and effective use of detailed physical examination and diagnostic methods decreases frequency of negative laparotomy and nontherapeutic Results: from 147, 118 cases (80 %) are followed conservatively, 14 cases are operated in early period (1–8 h) and 15 cases are operated in late period (9–48 h). 2 early operation cases and 2 late operation cases are accepted as negative laparotomy and, 1 case is accepted as nontherapeutic laparotomy. 43

cases had diagnostic laparotomy. 6 early operation and 8 late operation cases had complications. Mortality is not observed. Average hospital-stay is 5.02 days (1–33) in all cases, 4.1 (2–20) days in conservative approach and 8 days (3–33) in operated patients.
Disclosure: No significant relationships.

Posters

POLYTRAUMA I

P001

RETROSPECTIVE ANALYSIS OF THE EFFICIENCY OF THE INDICATION CRITERIA FOR TREATMENT OF POTENTIALLY SEVERELY INJURED IN A LEVEL-1-TRAUMA-CENTER (2 YEARS)

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Introduction: The prognostic effect and benefit of computed tomography (CT) in severely injured is well known (Kühne 2004, German S3-guideline), whereas the efficiency and the discriminatory power of the indication criteria are still questionable. It is arguable that the amount of time and effort and the radiation exposure is indicated in all (potentially severely injured) patients who fulfill the CT-indication criteria referred to the S3-guideline. The aim was to evaluate, if the pre-hospital indication criteria of potentially severely injured (according to the guideline mentioned above) are valid with regard to the detection of severely injured.
Materials and methods: 648 CT-Datasets were retrospectively assessed (10/2008-10/2010). Further data consisted of CT-Datasets, radiologic statements, protocol of resuscitation room and rescue mission and the patient's records. A statistical analysis was performed regarding the mechanism of the accident, the severity of the trauma (int. severity-score) and the validity of the inclusion criteria. The CT-algorithm was performed in all patients (native scan cranium, contrast-agent supported CT-scan cervical, thoracic and abdomino-pelvic-region; Siemens Somatom 16, mean scan duration 90 s.). The indication was stated in 214pat. drop >3 m, in 167pat. car-collision (speed diff. >30 km/h), in 71pat. motorcycle-accident, in 63pat. pedestrian-accident and in 130pat. "other accident".
Results: In 199pat. no trauma-cause were found in the CT-scan (47 % car-collision). Overall mortality was 8.6 %. 23 % of motorcycle drivers were severely injured (13 % in car-collision, 27 % drop >3 m, 27 % pedestrian, 30 % "other"). 200 intracranial damages, 119 spinal trauma and 89 thoracic traumas could be found.
Conclusion: The actual guideline-criteria are valid, but they seem to overtriage the car-collision-patients.
References:
1. Kühne 2004.
Disclosure: No significant relationships.

P002

MAJOR THORACOABDOMINAL TRAUMA WITH BRONCHIAL TEAR: CASE REPORT

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Introduction: Victims of polytrauma often presents with multiple visceral injuries. Major bronchial tears are quite rare in trauma victims.
Materials and methods: In October 2013 A. C: 25 y o male was referred to our institution for major trauma due to MVC. At the scene he presented Sat 80 %, PA 90/60, P130 GCS 11 large thoracic emphysema and abdominal pain. He was intubated and bilateral chest needle decompression was performed due to bilateral pneumothorax. In the Hospital bilateral chest tube were placed with major air leak on the right side that required a second chest tube Medium hemoperitoneum was found at ultrasound. After stabilisation CT scan was performed: Grade III–IV spleen injury, mild right pnx, multiple bilateral ribs fracture, right femural fracture, C1 C5 fracture with mild epidural hematoma, no major head injuries, mandibular fracture. We than performed a laparotomy and splenectomy. In the subsequent hours the patient had MRI to better understand the spinal cord injury. Due to continue air leak in the right chest we performed an endoscopy that revealed a major tear in the middle right bronchus.
Results: The petient had a right thoracotomy that showed bronchial tear and pericardial laceration. The bronchial tear was repaired by primary closure, the pericardial laceration was treated with patch closure. In the subsequent days neurosurgical and orthopaedics intervention were performed Postoperative course was uneventful.
Conclusion: Major trauma often presents with multiple injuries. Multidisciplinary approach is important. Major bronchial lesions are rare and need to be promptly diagnosed and treated.
References:
1. Committee on Trauma, American College of Surgeons (2008). ATLS: Advanced Trauma Life Support Program for Doctors (8th ed.).
Disclosure: No significant relationships.

P003

DEFINITION OF POLYTRAUMA: A CONTRIBUTION TO DISCUSSION ABOUT OBJECTIVE DEFINITION BASED ON QUANTITATIVE ESTIMATION OF MULTIPLE INJURED PATIENTS IN WARTIME

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Introduction: A Lack of validated and consensus definition of polytrauma is clearly present. This study presents the estimation of the extent of injury and its classification in wartime using Revised Trauma Score and Injury Severity Score (TRISS) compared with clinical estimation based on subjective assessment of polytrauma versus non-polytrauma patients.
Materials and methods: We analysed the data on 426 injured related to war who sustained multiple injuries and were managed at Osijek University Hospital, from September 1st 1991 to December 31st 1991. According to the initial clinical estimation of the injury extent, they were divided into polytraumatized (n = 149) and multitraumatized (n = 277) patients. Classified as monotraumatized were excluded from this study. Estimation was based on defintion: simultaneous injury of two or more body regions or anatomic systems, at least one injury being life threatening. All data were retrospectively scored by use of TRISS methodology. Descriptive statistical analysis and nonparametric analysis were used, as well as "z" statistics.

Results: Two patients classified as polytrauma had ISS <16, and one patient classified as multitrauma had ISS >16. The correlation of actual postoperative (30.7 %) and expected (40.44 %) mortality in polytraumatized group was significant ($p = 0.0016$), and in multitraumatized group (3.0 %) versus (3.04 %) not significant ($p = 0.6103$).
Conclusion: The possibility of clinical and subjective assessment of polytrauma can be useful in management of polytrauma and can be tested retrospectively by implementation of TRISS methodology respectively.
References:
1. Butcher NE, Enninghorst N, Sisak K, Balogh ZJ. The definition of polytrauma: variable interrater versus intratrater agreement—A prospective international study among trauma surgeons, J Trauma 2013;74(3):884–9.
Disclosure: No significant relationships.

P004

POLYTRAUMA—VIEW FROM EMERGENCY DEPARTMENT

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Introduction: The authors show the organisation of care of polytraumatized patients at Department of Emergency in Regional hospital of Harlovy Vary. This department is a part of new pavilion of acute care and with beginning of its function have to change concept of care of polytrauma.
Materials and methods: retrospective study of polytraumatized patients treated before working of new pavilion and comparison with patients treated in new Department of emergency.
Results: The evaluation of results shows that polytraumatized patients have benifit from new system of acute care in our hospital.
Conclusion: The greatest advantage of new Department of emergency is possibility of 24 h trauma team, CT scan, MRI, laboratory tests at one place. Data shows decrease of mortality in first 1 year of working our new pavilion.
References:
1. März J. The principles of care of polytrauma patients, Czech Trauma congress, Mikulov, 2013.
Disclosure: No significant relationships.

ORTHOPEDIC RECONSTRUCTION

P005

MANAGEMENT OF NONUNION AND GAMMA NAIL BREAKAGE WITH INTRAMEDULLARY NAILING: CASE REPORT

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Introduction: The use of intramedullary nails as treatment of trochanteric fractures has increased along with the increasing size of the elderly population. Gamma nail is a commonly used implant for the treatment of proximal femur fractures and nail breakage is a relatively rare complication.
Materials and methods: We describe a rare case of gamma nail breakage, accompanied by nonunion of the original fracture, without a new periprosthetic fracture. A 69-year-old man with a subtrochanteric femur fracture, was treated with gamma nail fixation at our hospital. At 10 months after surgery, he was referred to our institution after feeling pain in his thigh for several weeks. The pain was aggravated after a patient's fall. Radiographs revealed a hypertrophic nonunion and a breakage of the nail at the distal screw hole.
Results: The broken nail was removed and the patient underwent an orthograde intamedullary nailing of the femur. The postoperative recovery was uneventful. During the follow-up, 6 months later, the nonunion site obtained bony union and the patient was mobilized with no complications.
Conclusion: This case shows that inadequate operation such as insufficient reduction and fixation of a subtrochanteric fracture may result in nonunion and implant breakage. Replacing the nail to a longer one was effective as salvage surgery.
References:
1. Nonunion with breakage of gamma nail and subsequent fracture in the ipsilateral femur. Niikura T, Lee SY, Sakai Y, Nishida K, Kuroda R, Kurosaka M. Case Rep Med. 2013;2013:534570.
Disclosure: No significant relationships.

P006

CLINICAL OUTCOME AFTER CUBITAL TUNNEL RELEASE

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Introduction: Cubital tunnel syndrome is the second most common compression neuropathy in the upper limb. The clinical manifestations may include pain, paraesthesia and/or motor dysfunction.
Materials and methods: Data was collected between March 2004–December 2009 by case note review and a patient telephone and postal questionnaire. Exclusions criteria included (1) trauma, (2) preceding or concurrent surgery and (3) proximal pathology.
Results: 97 patients underwent the procedure. 80 patients underwent primary decompression (44 males and 36 females). 17 patients were excluded. 66 patients had unilateral decompression and 14 had staged bilateral. Average duration of symptoms prior to surgery was 13.2 months. According to the McGowan scale of severity of symptoms, 10 patients had grade I (12.5 %), 57 patients grade II (71.25 %), 7 patients grade III (8.75 %) and 6 patients (7.5 %) could not be graded due to insufficient information in the note. Complications included scar dysesthesia in 11 cases (13.7 %), wound infection in 2 (2.5 %) and 1 (1.25 %) wound dehiscence. 56 (70 %) patients completed the outcome scale measure. 83 % of patient symptoms reported to have been cured or improved, 13 % reported no improvement and 4 % reported symptom deterioration.
Conclusion: In-situ open primary cubital tunnel decompression is effective in improving symptoms. Patients should be informed that the main aim of the procedure is to stop the progression of symptoms and not to provide complete resolution.
References:
1. Bartels RH, Menovsky T, Van Overbeeke JJ, Verhagen WIM. Surgical management of ulnar nerve compression at the elbow: an

analysis of the literature. Journal of Neurosurgery. 1998;89:722–727.
Disclosure: No significant relationships.

P007

RESULTS REPLACEMENT SURGERY IN PROXIMAL HUMERUS FRACTURES

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Introduction: Arthroplasty might be considered for comminuted proximal humerus fractures. The goal of this study is to analyze the results of this arthroplasty at our hospital.
Materials and methods: Retrospectively we analyzed 27 consecutive patients with a proximal humerus fracture treated with hemiarthroplasty (n = 11) or reverse prosthesis (n = 16) in 2008–2013. Postoperatively an abduction sling was prescribed for 2–3 weeks followed by an exercise program. Results were evaluated by patient records, X-rays, ASES shoulder-assessment self-report and QuickDASH.
Results: In the hemiarthroplasty group 5 patients were analyzed (n = 4 deceased, n = 2 lost-to-follow-up). Mean follow-up was 9.4 months (4–13). No complications were seen. Mean ASES was 50.47 (30.83–68) and QuickDASH 36.77 (27.5–50). Lower ASES and higher QuickDASH were seen with hemiarthroplasty after failure of previous osteosynthesis, or with pre-existent limitations. In the reverse prosthesis group 13 patients were analyzed (n = 2 deceased, n = 1 lost-to-follow-up). Mean follow-up was 9.7 months (2–30). In 3 patients a complication occurred, infection, dislocation and periprosthetic fracture respectively. Another 2 patients were treated at the pain clinic. Mean ASES was 52.95 (8.33–90) and QuickDASH 39.2 (15.9–86.36). As with hemiarthroplasty lower ASES and higher QuickDASH were seen in patients with pre-existent limitations and once due to persistent pain.
Conclusion: Few complications and radiographically good results were seen. But there is great variation in ASES and QuickDASH. Interpretation of these results is challenging because scores are influenced by pre-existent limitations. Regarding only patients without comorbidity these scores are remarkably better. We advise to get informed by pre-fracture ASES and QuickDASH in order to obtain a better understanding of the postoperative results.
References:
1. J Should Elb Surg. 2002;11(6):587–94.
Disclosure: No significant relationships.

P008

PATIENT SATISFACTION AFTER SHOULDER ARTHROSCOPY IN OUTPATIENT SURGERY

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Introduction: Arthroscopic shoulder surgery in Switzerland is performed almost exclusively inpatient care. We are aiming with our study at determining patient satisfaction after ambulatory shoulder arthroscopy.
Materials and methods: We retrospectively identified all patients after day surgery for shoulder arthroscopy in our hospital between 2009 and 2012. General statistical data on patient age, gender, operation on the dominant or non-dominant extremity, were recorded. Afterwards, they were interviewed about the satisfaction with the ambulatory management, about perioperative pain and sleep patterns during the first night.
Results: 52 patients were identified. 39/52 patients could be reached by phone. Mean age 33 years. The mean VAS of ambulatory patients was 5.4 in the first night. 24 were able to sleep well, and 10 not at all. 18 % would have preferred in hindsight hospitalization, 82 % would repeat the surgery again outpatient. Women compared to men felt more pain but still 7/8 women would perform the operation again as planned. Patients operated on the dominant extremity felt more pain and would prefer hospital stay compared to patients operated on the non-dominant side, 22 vs 8.3 %, would prefer a hospital stay.
Conclusion: There is a high patient satisfaction with outpatient arthroscopic shoulder surgery Young patients with slightly different operation and when the non-dominant limb was affected were more satisfied with the outpatient procedure. Patient satisfaction is related to the control of pain. The progress in the regional anesthetic techniques will lead to greater satisfaction with the outpatient procedure.
References:
1. Pain after shoulder arthroscopy. Revue de Chirurgie Orthopédique et Traumatologique, May 2011
Disclosure: No significant relationships.

P009

TREATMENT OF CLAVICULAR SHAFT NON-UNION WITH MULTIDIRECTIONAL ANATOMICAL LOCKING PLATEOSTEOSYNTHESIS

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Introduction: The goal of this consecutive, retrospective clinical follow-up study is the analysis of the outcome after delayed or non-union of the clavicleshaft with a multidirectional, anatomical locking plate osteosynthesis.
Materials and methods: 13 patients were examined after locking plate osteosynthesis, with a mean follow-up of 46.7 months (range 13–88.5). The clinical and functional results were documented with the standard clinical examination of the shoulder, the Constant and DASH scores, an analogue visual scale and a patient survey.
Results: The mean age of the patients was 44.5 years (range 23–73). The clinical examination yielded a mean DASH score of 3.0 (range 0–13.3), a mean Constant score of 86 (range 40–100) and a mean VAS score of 1.5 (range 0–5). A very good clinical success occured in 12 of 13 patients (92 %). There was no case of infection, however 2 implant failures were observed and reoperated.
Conclusion: The treatment of clavicle non-union and delayed union with a multi-dimensional locking plate is a safe treatment option with very good clinical outcome and reasonable rate of complications.
References:
1. Merschin D, Dezulovic M, Fischer S et al. (2014) Treatment of clavicular shaft non-union with multidirectional anatomical locking plateosteosynthesis. In: 15th European Congress of Trauma and Emergency Surgery Frankfurt/Main.
Disclosure: No significant relationships.

P010

RISING POPULARITY OF THE REVERSE TOTAL SHOULDER ARTHROPLASTY IN THE TRAUMA SETTING; A LITERATURE REVIEW

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Introduction: The reverse total shoulder arthroplasty (RTSA) reverses the articulating surfaces of the native joint and typical shoulder hemiarthroplasty with a concave humeral head and accommodating convex glenoid. Initially used for the treatment of osteoarthritis with a failing rotator cuff, its popularity has increased in the trauma setting.
Materials and methods: We conducted a systematic literature review using the Pubmed database to investigate the indications, outcomes and complications of the RTSA in the management of the proximal humeral fracture. This is presented with a comparison to the traditional hemiarthroplasty.
Results: The RTSA has excelled in the treatment of multi-fragmented fractures, where successful healing of the tuberosities is unlikely. Many authors have used RTSA to treat mal- or non-union of the tuberosities, following failure of initial fracture management. Outcome is assessed using a variety of scoring systems, all centred around a pain-free anterior flexion. Hemiarthroplasties in patients with intact tuberosities perform better overall, but in those with disruption of these prominences the RTSA gives a more promising outcome throughout follow-up. Infection is the most commonly reported complication, with glenoid notching, reduced rotation and dislocation all occurring infrequently.
Conclusion: For appropriate fracture types the RTSA has earned a place in the arsenal of the shoulder surgeon. Results rival that of the traditional hemiarthroplasty, despite its share of complications. The authors expect wider usage of this prosthesis in the coming years in all areas of shoulder surgery.
References:
1. Three or four parts complex proximal humerus fractures: hemiarthroplasty versus reverse prosthesis: a comparative study of 40 cases. Gallinet et al. 2009
Disclosure: No significant relationships.

P011

FACTORS INFLUENCING THE ACCURACY OF ILIOSACRAL SCREW POSITIONING

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Introduction: Percutaneous iliosacral screw placement is associated with high rates of screw misplacement. The aim of this study was to identify possible parameters leading to diminished accuracy of this procedure.
Materials and methods: Retrospective single-center cohort study performed between 03/2007 and 03/2013. Included were all patients with instable pelvic injuries treated by percutaneous placed transiliosacral-screws. Excluded were patients treated with screw implantation after open reduction. Fractures were classified regarding the Tile and the Denis Classification. Analyzed parameters were demographic data, severity of injury, body-mass-index, surgeon's experience, length of operative procedure and complications. Screw placement accuracy was analyzed using postoperative CT-scans according to the study of Smith et al. The deidentified data were analyzed using SAS (Cary, North Carolina).
Results: 102 patients (53 women) with a mean age of 48.5 years fulfilled the inclusion criteria. The ISS and the NISS reflected a polytrauma population with mean values of 18.9 (ISS) respectively 22.3 (NISS). No major complications occurred. Screw placement accuracy could be evaluated for 130 screws. Overall 86.9 % (113) of all screws were placed optimal or suboptimal according to Smith et al.. Consequently 13.1 % (17) screws fulfilled radiological revision requirements. None of the analyzed factors (age, gender, BMI, type of pelvic or sacral facture, number of screws, ISS or NISS) diminished the accuracy of screw positioning in a significant amount.
Conclusion: None of our analyzed parameters alone diminished the accuracy of screw positioning in a statistical relevant amount. Therefor we conclude that accuracy of iliosacral-screw-positioning is depending of multifactorial influences.
References:
1. Smith et al. Spine 2006;31(2):234–8.
Disclosure: No significant relationships.

P012

COMBINED PELVIC AND ACETABULAR FRACTURES

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Introduction: Combined pelvic ring and acetabular fractures are uncommon and treatment is challenging due to the complexities of decision making, associated injuries and the scarce literature guidance available. Pre-operative planning and multi-disciplinary approach is crucial to avoid potentially conflicting priorities and improve outcome.
Materials and methods: Objectives: This review describes our experience with these injuries from a regional centre. **Methods:** Surgically managed patients with combined pelvic ring and acetabular fractures identified from a prospectively maintained database from 2009 to 2013 were reviewed clinico- radiologically looking at demographics, associated injuries, fracture pattern, management priority, technical aspects, outcomes and complications.
Results: We identified 18 patients (17–63 years) with male predominance (M:F = 5:1). The commonest mechanisms were fall from height or road traffic collision. 15 patients had other associated systemic injuries. All ring injuries were either Tile type b or C. 5 patients had bilateral acetabular fractures. Mean injury surgery interval was 8 days (3–15 days). 16 had single stage surgery. Sequence of fixation is discussed. There was 1 nerve injury and one deep wound infection. At follow between 2 and 31 months, 11 patients had satisfactory good result with good mobility, 3 patients had ongoing pain and stiffness, and 1 each had late infection, residual weakness, secondary arthritis and 1 was lost to follow up.
Conclusion: combined pelvic and acetabular fractures are a serious injury from high energy trauma and outcomes are poorer.
References:
1. Combined pelvic ring disruption and acetabular fracture: associated injury patterns in 40 patients. Osgood et al. J Orthop Trauma. 2013;27(5):243–7.
Disclosure: No significant relationships.

P013

HEMIARTHOPLASTY IN DISPLACED INTRACAPSULAR NECK OF FEMUR FRACTURES: COMPLIANCE TO THE CURRENT NICE GUIDELINES

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Introduction: In the recent NICE guidelines entitled "The management of hip fracture in adults: surgical procedures", criterion 4 states that "a proven femoral stem design should be used rather than Austin Moore or Thompson stems for arthroplasties [in trauma]"[1].
Materials and methods: A total of 120 patients who underwent a hemiarthoplasy procedure for displaced intracapsular neck of femur fracture at Birmingham-Heartlands Hospital in the early months of 2012 were sampled using the operative notes and theatre logbook. It was recorded which prosthesis was used for this procedure for each patient and this was subsequently confirmed on post-operative X-rays.
Results: Of the 120 patients sampled all had either an Austin-Moore or Thompson's hemiarthoplasy.
Conclusion: The majority were carried out using an Austin-Moore type prothesis (51 %), or a Thompson's Hemiarthoplasty (29 %). The third category, i.e. unknown, involves cases where the discharge letter, theatre book or post-operative x-rays fail to confirm the prosthesis type. There are a number of reasons for this:

- The guidelines are new and have taken some time to disseminate.
- Surgeons are more accustomed to the Austin-Moore and Thompson stem designs and as such will have better outcomes when using these.
- The costs of using the "approved stem designs" is significantly greater.

Using a Euro-QOL questionnaire on a sample of patients we were able to compare these patients' experiences to those who had undergone an arthoplasty with an approved femoral stem design. We found similar results to those reported in current stem designs.
References:
1. National Clinical Guideline Centre. The Management of Hip Fracture in Adults. 2011.
Disclosure: No significant relationships.

P014

INTERPROSTHETIC FEMORAL FRACTURES: COURRENT TREATMENT AND LITERATURE REVIEW

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Introduction: Interprosthetic Femoral Fractures are uncommon lesions but are often associated with a great number of complications with difficulties in surgical management. Literature review is not quite esaustive about treatment and functional outcome. Available Classification are not always useful to plain surgical treatment
Materials and methods: Our Preliminary data results from a multicentric prospective study started on January 2011 on patients presenting to the outpatient or emergency, with interprosthetic femoral fractures. 21 patients, with a mean age of 82 years, received surgical treatment. We used Vancouver modified Classification. We planned clinical and radiographic follow up at 1, 3, 6 and 12 months. We provided also a Literature Review.
Results: Fractures were fixed in alternative with Locking Compression Plates and Autologous Bone Cortical graft or with retrograde intramedullary nailing. At the longest follow up (of 12 months) we did not observe any implants failure, prosthetic mobilization, new fractures.
Conclusion: Fair treatment of interprosthetic femoral fractures depends on the need to consider femour and prosthesis components as a single unit. When planning for reduction and internal fixation is necessary to avoid sites of excessive load. When planning for implant removal both personality and lines of the fractures must be considered. Interprostetic femoral fractures rapresent a challenge also for expert surgeons; success for this kind of lesions depends both on surgical approach and bone stock preservation and respect of medullary reaming during primary replacement surgery.
References:
1. Platzer P. et al. Injury. 2010.
2. Soenen M. et al. Orthopaedics and Traumatology: Surgery and Research 2011.
3. Solarino G. et al. Injury. 2013.
Disclosure: No significant relationships.

P014A

SHORT TERM RESULT OF THR—THE COMPARISON BETWEEN ANTERIOR MIS APPROACH AND ANTEROLATERAL AND POSTERIOR APPROACHES

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Introduction: The anterior MIS approach for THR is being used more frequently. There are different approaches described in the literature as anterolateral, lateral, posterior, modifications of them and double-incision techniques. We have not found comparative studies that demonstrate statistically that anterior MIS approach is better than the others.
Materials and methods: Since 2012 we use the anterior MIS approach in THR.
A sample of 31 cases operated with anterior MIS approach was compared with two same size samples operated with anterolateral and posterior approaches using Harris and WOMAS scores. The learning curve was observed and showed an improvement in minimizing soft tissue injury. Additionally the evaluation of radiological position of implants was done depending on the used approach.
Results: The MIS anterior approach can reduce soft tissue damage, preventing hip muscles destructions. Considering the optimal cup position of 10–15° of anteversion and inclination 40–50° and optimal stem position of 15–20° of anteversion, compared with other approaches we have not observed differences in the implants position, using equipment specifically designed for this technique. The results of postoperative Harris and WOMAC score were higher in group operated with anterior MIS approach.

Conclusion: The MIS procedures are increasingly popular and have to preserve the soft tissues. We have not found the comparative studies that demonstrate statistically that MIS procedures give better results. We have observed that average time of hospitalization was shorter in the group of patients operated using anterior MIS approach.
References:
1. Hallert (2012) J Orthop Surg Res 2012;7:17.
Disclosure: No significant relationships.

P015

SURGICAL TREATMENT OF PROXIMAL HUMERAL FRACTURES USING PERI-LOC—RELATION BETWEEN POSTOPERATIVE ALIGNMNET AND REDUCTION LOSS

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Introduction: The treatment results of proximal humeral fracture treated with open reduction and internal fixation (ORIF) using PERI-LOC which is anatomical locking plate were examined.
Materials and methods: The medical records and radiographs of 28 consecutive patients of proximal humeral fracture treated with ORIF using PERI-LOC at our institution from 2011 to 2013 were analyzed. Five men and 23 women and mean age at injury was 73.0 years old. Humeral head height (HHH) was calculated as the distance between the top of the plate and the top of the humeral head, both measured perpendicular to the axis of the plate.
Results: When we classified that the medial cortex of proximal fragment was placed outside of medullary canal of distal fragment was made into extramedullary type (EM) and in anatomical position was anatomical type (AN) and inside of medullary canal was intramedullary type (IM), the loss of HHH was an average of 3.1 mm in EM type (8 cases), and was 1.7 mm in AN type (12 cases), and was 1.1 mm in IM type (8 cases).
Conclusion: As a factor which predicts a postoperative reduction loss, the spatial relationship between proximal fragment and distal fragment is useful.PERI-LOC is a useful implant for the treatment of this fracture because its distal portion is twisting ahead to reduce deltoid impingement and its posterior head sweep buttress greater tubercle.
References:
1. Gardner MJ, Weil Y, Barker JU, et al. The impoetance of medial support in locking plating of proximal humerus fractures. J Orthop Trauma. 2007;21:185–191.
Disclosure: No significant relationships.

P016

COMPARISON OF EARLY VS. DELAYED ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION WITH HAMSTRING AUTOGRAFTS

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Introduction: We compared the clinical outcomes of anterior cruciate ligament (ACL) reconstruction, performed either delayed or early—within 3 weeks post-injury.
Materials and methods: Of the 36 included patients (24 females, 12 males, mean age 21 ± 5 years) treated by ACL reconstruction with hamstring autografts and fixation with a femoral cortical flipbutton and tibial interference screw, 15 patients underwent surgery within 21 days of the causative injury (mean of 7 days post-injury), while 21 patients were scheduled for surgery at 21–90 days post-injury (63 days mean). Operative technique and postoperative rehabilitation protocol were similar for the two groups (no weight bearing for 2 weeks postoperatively, continuous passive motion started in the first postoperative day). We followed-up patients for 24 months postoperatively, recording the Tegner score and Lysholm scale and measuring anterior tibial translation (Rolimeter^{TM}) preoperatively and at 3, 6, 12 and 24 months postoperatively.
Results: The early reconstruction group had longer operative times (no statistical significance, $p = 0.2$), but showed quicker postoperative recovery, with better Tegner scale and Lysholm score values at 3 and 6 months postoperatively. We found more meniscal lesions in the delayed reconstruction group ($p = 0.03$). Anterior tibial translation measurements showed no statistically significant differences between the two groups.
Conclusion: Early ACL reconstruction seems to be a good choice in high-demand patients, offering quicker return to pre-injury level activities and might prevent meniscal injuries caused by knee instability.
References:
1. Bernstein J. Early versus delayed reconstruction of the anterior cruciate ligament: a decision analysis approach. The Journal of bone and joint surgery American volume 2011;93:e48.
Disclosure: No significant relationships.

P017

ANTERIOR AND POSTERIOR APPROACHES FOR THE TREATMENT OF TIBIAL PLATEAU FRACTURES

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Introduction: Tibial plateau fracture with posterior instability of proximal tibial fracture require anatomical reduction and fixation using the posterior approach. We investigated anterior and posterior approaches for the treatment of tibial plateau fractures.
Materials and methods: Seven patients (6 males, 1 female) were surgically treated using anterior and posterior approachs to the tibial plateau fracture with posterior instability of proximal tibial fracture. Patient mean age at the time of operation was 47 years (range 25–70 years). According to Schatzker classification, there were 1 case of type II, 3 cases of type IV, 2 cases of type V and 1 case of type VI.
Results: The mean follow-up period was 15 months (range 5–32 months). Average range of knee flexion was 136 degrees (range 120–150 months). One patient sustained deep infection and all implants were removed after 9 months form initial operation. Another patients stated they were almost satisfied with results.
Conclusion: Posterior approach for the treatment of posterior instability of proximal tibial fracture is useful and effective approach. Posterior rigid fixation of posterior aspect of proximal tibial fracture obtains a good result.

References:
1. Schattzker J, et al., The tibial plateau fracture. The Toronto experience 1968–1975. Clin Orthop Relat Res. 1979;138:94–104.
Disclosure: No significant relationships.

P018

LOCKING PLATE FIXATION IN OPEN TIBIAL SHAFT FRACTURES

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Introduction: Open tibial shaft fractures are the result of high-energy trauma. They are usually associated with extensive soft tissue loss and represent serious clinical problems. Plating of these fractures in the acute setting remains a topic of heated discussion.
Materials and methods: From April 2009 to December 2012 were treated 28 patients with open tibial shaft fractures (22M, 6 F), with 4.5 mm LCP system. The fractures were classified according to the Gustilo—Anderson system with the following results: 12 grade II, 8 grade IIIa, 7 grade IIIb, 1 grade IIIc. Average age was 35 years. The evaluation was then performed by analyzing the radiographic evolution of the processes of healing of the fracture, the quality of the reduction in the evolution of the soft tissue damage, the occurrence of local and systemic signs of infection, the AOFAS score and the need to re-surgery.
Results: All patients with fractures grade II and 5 patients grade IIIa showed an excellent functional outcome, with good evolution of healing process, and satisfactory healing of skin lesions, without signs of infection. The average AOFAS score at 3 months (for cases with sufficient follow-up) is 78.85
Conclusion: The results obtained, obviously very preliminary and partial, seem to provide encouraging data, in terms of rates of healing of fractures (in line with the literature) and few complications, especially infectious type.
References:
1. Int Orthop. 2007.
2. Arch Orthop Trauma Surg. 2008.
Disclosure: No significant relationships.

P019

ARTHROSCOPIC REDUCTION AND INTERNAL FIXATION (ARIF) OF TIBIAL PLATEAU FRACTURES

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Introduction: Arthroscopy is a support for the achievement of these goals and enables to view directly the reduction and stabilization of the articular surface without the need for a artrothomy, removal of hematoma and osteocondral debris, diagnosis and treatment of meniscal and ligament injuries.
Materials and methods: Between January 2007 and November 2011 were treated with arthroscopic reduction and internal fixation (ARIF) 22 fractures of the tibial plateau. The technique we used is that described by Caspari, wich allow all operators to achieve accurately the site of fracture with a bone tunnel and introducing a special batter All patients were clinically and radiographically evaluated according to the Rasmussen criteria. 14 patients had a type III Schatzker fracture, 6 fracture type II and 2 type I. The medium follow-up was 22 months (range 6-32 months).
Results: From a clinical point of view 16 patients achieved an excellent result and 6 good results. The clinical outcome did not show any correlation with the type of fracture, but it appears to be influenced by the presence of associated injuries
Conclusion: Arthroscopy could be an important option for treatment of tibial plateau fractures. Although in medical literature its use in every type of fracture is avocated, we reserve the ARIF technique only to type 1, 2 and 3 of Schatzker classification fracture where traditional arthrotomy requires longer time of recovery and doesn't permit the assessment of associated meniscal, ligament and condral injuries.
References:
1. Strategies Trauma Limb Reconstr. 2012 Nov; Arthroscopy. 2011 May Arthroscopy. 2006;22
Disclosure: No significant relationships.

P020

This abstract has been withdrawn.

WHO GLOBAL ALLIANCE FOR INJURED

P021

PEDESTRIAN INJURIES IN THE UNITED ARAB EMIRATES

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Introduction: We aimed to study the anatomical distribution, severity, and outcome of hospitalized trauma pedestrian patients in Al-Ain, United Arab Emirates so as to improve preventive measures.
Materials and methods: All Pedestrian trauma patients who were involved with a road traffic collision and admitted to Al-Ain Hospital for more than 24 h or who died in the hospital were included in the study. Data were prospectively collected during March 2003–October 2007.
Results: 318 patients were studied, 279 (87.7 %) were males. Median (range) age was 31 (1–75) years. UAE nationals were significantly younger than non-nationals (median (range) age of 14 (2–75) years compared with 33 (1–75) years, $p = 0.001$, Mann–Whitney U test).

The lower limb (57.2 %) was the most common injured region followed by the head (46.9 %). The median (range) ISS of patients was 5 (1–45). The median (range) total hospital stay was 11.3 (1–130) days. 30 patients died (overall mortality 9.4 %).
Conclusion: Mortality of pedestrian injured patients in the UAE is high. Severe head injury was the main cause of death. Measures to improve pedestrian safety should be adopted so as to reduce morbidity and mortality. These include educating drivers and pedestrians on road safety and enforcement of traffic safety laws.
References:
1. Eid HO, Abu-Zidan FM. Biomechanics of road traffic collision injuries: a clinician's perspective. Singapore Med J. 2007;28:693–700.
Disclosure: No significant relationships.

P022

ROAD TRAFFIC INJURY ADMISSIONS AND THE AUSTERITY MEASURES IN A DISTRICK GREEK HOSPITAL

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Introduction: Road traffic injuries represent a significant health problem which has received a considerable attention in Greek society. A national strategy has implemented rece. To evaluate road trauma accident admissions in a Greek district hospital before and after the implementation of the austerity measures in 2009.
Materials and methods: We reviewed the data of 1470 admissions (6 years period) divided into two groups (group A from 2007-2009 and group B from 2010–2012), before and after the commence of the financial crisis in 2009.
Results: There were 1470 admissions (1,150 males, 320 females), 724 patients in group A, 746 patients in group B) out of a total 8.400 (17.5 %) admissions in the Department of Surgery. 963 patients had a minor injury staying under observation. A total of 280 patients operated by our team, 110 surgical cases, 170 orthopedic cases. 65 patients diagnosed with serious internal bleeding and they followed conservative treatment. 125 patients transferred to neurosurgery and pediatric departments. There were 37 fatal cases (25 group A, 12 group B) the majority of them occurred out of the hospital. The mean hospital stay was 4.5 days.
Conclusion: There has not been significant changes in the number of patients admitted after a road accident due to implementation of austerity measures. The number of fatal cases dropped by 50 % in group B.
References:
1. Archived files of the road accidents, Police Department of Argolis.
2. Archived files—Medical Reports, The General Hospital of Nafplion.
Disclosure: No significant relationships.

P023

POLITRAUMA IN TRAIN ACCIDENTS

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Introduction: Train is the main conveyance in underdeveloped African and Eurasian countries, but also uesd in developed countried due to it's low cost, availability and comfort. The fatality rate varies between 60 per 100 mil passengers in South Africa, 150 in India, 80–100 in Sweden and 200 in United States.
Materials and methods: We retrospectively analyzed patients admitted in a level I trauma hospital from November 2011 to November 2013, due to railway accidents
Results: We present 6 cases, casualties due to train accidents, admitted in our hospital. All our patients were male, with ages between 37 and 60 years. The mean hospitalization period was 26 days, 5 patients requiring admittance in the ICU. In 2 cases the patients were automobile occupants, in 2 they were pedestrians, and in the other 2 cases detailes regarding the accident were not available. We enocuntered multiple complex fractures and nervous sistem injuries, the abdominal viscera lessions being treated conservatory. The main investigation was FAST followed by computer tomography in 4 cases. Only one death was encountered, the majority of the patients being either discharged or transferred to other healthcare units for reabilitation.
Conclusion: Although resulting in a lower number of casualties than automobile accidents, train crashes cause complex lesions that require multidisciplinary approach, a lot of resources, often prolonged stay in ICU and are likely to result in death or irreparable damage.
References:
1. 10-year evaluation of train accidents Patterns of suicide and other trespassing fatalities on state-owned railways in greater Stockholm; implications for prevention.
Disclosure: No significant relationships.

P024

PEDIATRIC ROAD TRAFFIC INJURIES IN QATAR: TRENDS AND STATISTICS FROM THE HMC TRAUMA REGISTRY [2010–2012]

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Introduction: The epidemiology of road traffic injuries [RTI's] affecting children in Qatar has not been adequately studied.
Materials and methods: A retrospective review of patient records for all pediatric [0–18 years] victims of RTI's [motor vehicle occupant [passenger or driver] [MVC], pedestrian or PED, cyclist or BIKE, motorcyclist or MCC and ATV user or ATV [driver or passenger] seen by the Trauma Center at the Hamad General Hospital, Doha, Qatar from 1 January, 2010 to 31 December, 2012 was conducted.
Results: During the study period, the HMC Trauma Center attended to 4,864 patients, 443 [9.1 %] of these patients were child MVC victims. 83 % of victims were male and 71 % were Qatari. 0.9 % of victims were <1 year, 40 % were 15–18 years. 55 % of victims were injured in MVC's, 25 % as PED, 13.5 as ATV, 4.7 % as BIKE and 1.6 % as MCC. All fatalities were MVC's, the over-all mortality rate

was 3.4 %. MVC mortality rate was 6.2 %, longest mean length of stay [10.5 days], highest ICU admission rate [35.7 %] and 56.4 % were 15-18. One in 4 [25 %] PED victims was Qatari, they had the lowest mean Injury Severity Score [9.2] and 56 % were 10 years or younger. ATV victims had the 2nd highest ICU admission rate [25 %] and 48.4 % were from 10 to 14 years old.
Conclusion: Knowledge of the age and mechanism specific patterns of RTI in children in Qatar is essential for the formulation of road safety programs for these children.
References:
1. Road safety in the EMRO: Facts from the Global Status Report on Road Safety 2013
Disclosure: No significant relationships.

P025

UNDERTREATMENT IN PREHOSPITAL CARE IN PATIENTS WITH ORTHOPAEDIC INJURIES–CASE REPORTS

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Introduction: Patients generally present initially to GP-s. They are referred secondarily for orthopaedic care and initial examination is therefore out of the control of the orthopaedic team.
Materials and methods: We present cases of initially mistreatment of patients with orthopaedic injuries.
Results: Case 1: A patient was admitted in Emergency Center with multiple injuries sustained by falling from the height. He was unconsciousness and the inappropriate imobilisation of cervical spine had been performed. Initially we done X-ray examinations and the cervical X-ray showed the dislocation of C6 vertebra. Case 2: A patient sustained multiple injuries in traffic accident as pedestrian. He was initially treated in Level I trauma center in Serbia.He transported to our hospital with external fixation of both legs because of tibia fractures, but the fasciectomie had not been done. Case 3: In this part we showed examples of inappropriate imobilisation of isolated orthopaedic injuries. This injuries usually are not life threatening, but with insufficient imoblisiation they are potential limb or life-threatening.
Conclusion: Generally, there are three main areas in orthopaedic surgery which provoke claims for clinical negligence. These relate to errors of diagnosis, errors of treatment, and errors relating to consent. Unfortunately doctors in accident and emergency departments or in the primary health system tend to be inexperienced. Continual medical education seems to be the best method to avoid such problems.
References:
1. Bouland AJ, Jenkins JL, Levy MJ. Assessing attitudes toward spinal immobilization. J Emerg Med. 2013;45(4).
Disclosure: No significant relationships.

P026

ROLE OF CENTRAL MEDICAL REGULATION IN LABOUR

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Introduction: In pregnancy complications can threaten the life of the mother/fetus with emergency situations. The serious problems are rare, and they should be detected treated early.
Identify in the literature the role of prehospital professionals during labour.
Materials and methods: Literature search in the Virtual Health Library (VHL), base data LILACS and MEDLINE, manuals of Pre-Hospital Care. Selected publications in English and Portuguese, with no time frame.
Results: We conclude that during labour, the management decision should consider the clinical characteristics of pregnant women and the estimated time for delivery. The Malina's Score (MS) is widely recommended and evaluates five criteria: number of previous pregnancies, duration of childbirth, duration of contractions, interval between them and fluid loss. This ranks the childbirth in three priority levels: score up to five; between five and seven and above seven. It's necessary to send an Advanced Life Support ambulance when at risk of imminent labor, advanced premature childbirth, severe blood loss, Severe Specific Hypertensive Disease of Pregnancy and early warning signs of detachment of the placenta. The vaginal touch facilitates the estimated time until delivery
Conclusion: The introduction and dissemination of a protocol that prioritizes pregnant women according to their needs is crucial to a better utilization of material and human resources.
References:
1. PHTLS—Atendimento Pré Hospitalar ao Traumatizado. Ed. Elsevier. 7ª Edição.
CANETTI, Marcelo; SILVEIRA, José. Manual Básico de Socorro de Emergência—CBMRJ, Ed. Atheneu, 2ª EDIÇÃO.www.saude.ba.gov.br/…/PORTARIA%20N°933%20maio%202010.pdf acessado em 10/07/11.
Disclosure: No significant relationships.

P027

This abstract has been withdrawn.

VISCERAL TRAUMA I

P028

PRIMARY REPAIR IN COLONIC LESIONS DUE TO BLUNT TRAUMA—IS IT SAFE?

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Introduction: Colonic injuries in blunt abdominal trauma due to large peritoneal contamination, associated with hemodynamic instability were classically treated with colostomy.However, primary repair should be considered.
Materials and methods: A 32 years old male patient, car crash victim, arrived to the ER conscious, hemodynamically stable, with seat-belt sign and significative abdominal pain on his left iliac fossa. FAST was negative. Thoraco-abdominal CT showed subtle signs of hollow viscera perforation. During the urgent laparotomy, it was found a complete transection of the abdominal wall muscles and an isolated total transection of the sigmoid (grade IV), with small peritoneal fecal contamination. A primary manual anastomosis was performed.The only complication was abdominal wall cellulitis.
Results: A 32 years old male patient, car crash victim, arrived to the ER conscious, hemodynamically stable, with seat-belt sign and significative abdominal pain on his left iliac fossa. FAST was

negative. Thoraco-abdominal CT showed subtle signs of hollow viscera perforation. During the urgent laparotomy, it was found a complete transection of the abdominal wall muscles and an isolated total transection of the sigmoid (grade IV), with small peritoneal fecal contamination. A primary manual anastomosis was performed. The only complication was abdominal wall cellulitis.
Conclusion: It's safe to perform a primary repair in sigmoid injuries. However, some parameters should be taken into consideration such as the experience of the surgeon, the degree of contamination, depth of the shock, associated injuries, the time passed between the injury and the repair, patient's age and the type of colon wounds.
References:
1. Cleary R.et al.Colon and rectal injuries.Dis colon Rectum.2006;49:1203–1222
Disclosure: No significant relationships.

P029

SUCCESSFUL ENDOVASCULAR TREATMENT OF TRAUMATIC MIDDLE COLIC ARTERY PSEUDOANEURYSM AFTER BLUNT ABDOMINAL TRAUMA

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Introduction: True aneurysms and pseudoaneurysms of the visceral arteries are uncommon. Visceral artery aneurysms (VAA) represent 0.1–0.2 % of all vascular aneurysms. Blunt abdominal trauma with direct mesenteric arterial injury resulting in a pseudoaneurysm is rare, with only 11 published cases so far. We present a 12th case of a traumatic mesenteric artery pseudoaneurysm after blunt abdominal trauma.
Materials and methods: A 42 years old man was brought to the emergency department after being hit in the upper abdomen by a pallet jack at work. Initial FAST performed was negative, but when repeated 8 h later, was noted to be positive. Computed tomography of the abdomen and pelvis revealed a pseudoaneurysm of the middle colic artery. He subsequently underwent embolisation of the pseudoaneurysm and was successfully managed non-operatively over his hospital stay.
Results: Treatment is usually advisable for VAAs due to their risk of rupture and the associated high mortality. Conventional treatment of VAAs has been either surgical excision or ligation of the aneurysm with or without segmental bowel resection. However, embolisation offers an effective alternative or adjunctive therapy option, especially in patients who are poor surgical candidates.
Conclusion: Embolisation offers an effective alternative to laparotomy in the management of VAAs.
References:
1. Olsen AB et al. Superior Mesenteric Artery Pseudoaneurysm after Blunt Abdominal Trauma. Ann Vasc Surg. 2013;27(5):674–8.
Disclosure: No significant relationships.

P030

GUNSHOT PENETRATED TRAUMA IN THE LOWER ANTERIOR ABDOMINAL AREA, TREATED LAPAROSCOPICALLY. DESCRIPTION OF A CASE

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Introduction: The purpose of this study was to evaluate the predictive value of diagnostic laparoscopy in a haemodinamically stable patient with penetrating abdominal gunshot wound injury.
Materials and methods: A 32 year old male patient was presented in E.D. with penetrating injury at left lower anterior abdominal wall. The patient was haemodinamyc ally stabile. Exposure and clinical examination of the patient reveale 1 cm × 1 cm key-hole wound at the left lower abdominal wall. The diagnostic studies (X-rays, Fast Abdominal U/s and Abdominal and Thorax—CT) showed the bullet in the peritoneal cavity. Intra peritoneal and retroperitoneal visceral structures were identified to be normal. After conservative treatment for the first 24 h. Diagnostic laparoscopy was planed with also therapeutical result, removal of the bullet.
Results: The patient underwent explorative laparoscopy, the bullet has been found proximal to the sigmoid colon and has been sent for vallistic examination. Operation was complited laparoscopically. Patient remains for 24 h in the surgical department and discharge Hospital in good condition of health.
Conclusion: From this case we conclude that decision for managing gun shot patients should be based on clinical and diagnostic findings. Gunshot penetrated anterior abdominal injuries in a haemodynamic stable patient without other comorbidities, can be managed laparoscopically.
References:
1. Demetriades D. Selective nonoperative managment of penetrating abdominal solid organ inguries. Ann Surg 2006; 244(4): 620–82.
2. Velmachos G. Penetrated abdominal injuries: Managment controversies. Scand J Resc. 2009:17–19.
Disclosure: No significant relationships.

P031

THE OPERATIVE MANAGEMENT OF ABDOMINAL STAB WOUND: RETROSPECTIVE SURVEY

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Introduction: Penetrating stabbing trauma are rare in Japan. Although we traditionally operated for the patients with abdominal stab wound, unnecessary exploratory laparotomy should be reduced. Laparoscopic operation and selective non-operative approach can reduce therapeutic laparotomy rate. The purpose of this study was to clarify unnecessary laparotomy and to improve our protocol for the patients with abdominal stab wound.
Materials and methods: We surveyed retrospectively 20 cases admitted with abdominal stab wound in our hospital between 2008 and 2012.
Results: We performed operation for 17 cases and observed without operation for 3 cases. Operation was performed due to unstable vital

signs, obvious injury such as peritonitis, dislocate intestine from the abdominal cavity and suspicious injury. There were major injuries (Liver 4, Pancreas 2, intestine 5, intestinal mesenteric 4, omentum 6, vessels 2) for 11 cases. However unnecessary operation was also performed for 5 cases (29.4 %). We analyzed the clinical data at admission to compare with necessary operation group and unnecessary operation and non-operative group. There were no significantly difference blood test and physical signs between groups. To decrease unnecessary laparotomy we need to modify less invasive approach such as laparoscopic operation or selective non-operative approach.

Conclusion: Our traditional operative criteria showed high ratio of unnecessary laparotomy. We must include laparoscopic operation or selective non-operative approach for penetrating patients.

References:

1. Christey GR: Practical guidlines for abdominal stab wound management. ANZ J Surg. 2007;77:610.

Disclosure: No significant relationships.

P032

PENETRATING INJURIES IN OLDER ADULTS: AN URBAN TRAUMA CENTER'S EXPERIENCE

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Introduction: Older adults ($\geq$55) make up a large proportion of trauma admissions. The majority of injuries are blunt a smaller cohort suffers penetrating injuries. Little is known of the history of penetrating wounds in the elderly. We hypothesized that older adults with penetrating injuries to the torso have worse outcomes than a younger cohort

Materials and methods: A retrospective review of patients $\geq$55 with a penetrating injury to the torso over was performed. Patients with isolated head, face, extremity or external injuries were excluded. A matched younger cohort was created. Hemodynamics, complications, length of stay and mortality were analyzed.

Results: 105 patients $\geq$55 met inclusion criteria. We compared them to 315 younger patients. Injury patters were similar. Initial heart rate was lower in the older vs. the young group, $p = 0.025$. 60 % of older patients required ICU care vs. 25 % of younger patients, $p < 0.05$. Older patients required longer ICU stays, $p = 0.0008$; and while not significant more time in the hospital (older, 17.5 ± 3.0 days vs. younger, 10.2 ± 0.8 days, p = ns). More older patients (59 %) suffered complications compared to the young group (26 %), $p = 0.005$. Mortality was 23 %in older group compared 15 % in young, although not significant.

Conclusion: Penetrating injuries to older adults are associated with higher rates of complications and longer ICU stays compared to a younger cohort with similar injury patterns. Further study is warranted to understand the physiologic response in elderly patients to improve outcomes.

References:

1. Trauma in the Older Adult: Epidemiology and Evolving Geriatric Trauma Principles. Clin Geriatr Med. 2013;29:137–150.

Disclosure: No significant relationships.

P033

DELAYED FASCIAL CLOSURE WITH INTRA-PERITONEAL ONLAY MESH IMPLANTATION AND VACUUM-ASSISTED WOUND CLOSURE IN ABDOMINAL TRAUMA PATIENTS

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Introduction: In trauma patients with open abdomen, abdominal wall reconstruction remains challenging. Here, a first case series of intraperitoneal onlay polypropylene mesh (IPOM) implantation with delayed fascial closure including vacuum-assisted wound closure (VACWC) is presented.

Materials and methods: In a retrospective study, patients with abdominal trauma between 01/01/2009 and 31/12/2013 were analysed. Patients undergoing laparotomy and IPOM implantation were identified.

Results: During the 60-months study period, 307 patients were hospitalised for abdominal trauma, 41 (13.4 %) underwent laparotomy. Thirty-nine had primary abdominal closure, 33 discharged with closed fascia without IPOM or VACWC. IPOM implantation and open fascia with VACWC was applied in 4 (9.8 %) patients. Delayed primary fascial closure with IPOM implantation was performed in 3 (7.3 %) patients. Six of these 7 patients had a blunt, one a penetrating trauma. Mean age and ISS of these 7 patients were 47 ± 11 years and 35 ± 10, respectively. Indications for laparotomies were organ lacerations, hollow viscus perforations, mesenteric bleeding and severe posttraumatic pancreatitis. On average these patients underwent 5 laparotomies (range 2–11). IPOM was performed at the second laparotomy (range 2–4) at hospital day 7 (range 1–15). Follow-up was available in 6 patients with an average of 575 days (range 25–1,659 days). Five patients had an uneventful follow-up, one developed chronic wound healing disorders needing repeated debridement. No fistula or incisional hernia occurred.

Conclusion: IPOM with or without open fascia is a valuable treatment option even in a contaminated abdominal environment or in case of unfeasible primary fascial closure and may be considered as a surgical technique to reconstruct abdominal integrity.

Disclosure: No significant relationships.

P034

This abstract has been withdrawn.

P035

APPENDICEAL MUCINOUS NEOPLASMS AND PSEUDOMYXOMA PERITONEI: ONE CENTER EXPERIENCE

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Introduction: To describe the cases of appendiceal mucinous neoplasm (AMN) and its complications treated in our unit.
Materials and methods: Retrospective review of twenty patients (12F/8 M; mean age 56.2 years) with AMN and its complications. Fourteen patients were treated initially and six were referred to our unit. The patients were divided into two groups: AMN without (n = 9) and with (n = 11) complications. Surgical procedures performed for the first group included: appendectomy (n = 9), combined with subtotal hysterectomy + bilateral adnexectomy (n = 1) and resection of small bowel (n = 1). Histopathology reported low grade mucinous neoplasm in all cases. Second group included following complications: torsion of the appendix (n = 1), mucinous cutaneous fistula (n = 2) and pseudomyxoma peritonei (PMP) (n = 8). The mean time till PMP development was 7.4 (2–14) years. Surgical procedures performed for this group included: appendectomy (n = 1), cytoreductive surgery with intra- and early postoperative hipertermic intraperitoneal chemotherapy (HIPEC and EPIC) (n = 6), right hemicolectomy + HIPEC and EPIC (n = 3), paracentesis + EPIC (n = 1). The HIPEC and EPIC (5POD) was performed with 5FU-750 mg/m2. Histopathology reported low grade mucinous neoplasm (n = 2) and high grade mucinous neoplasm (n = 9).
Results: A median follow up of 35.5 (4–157) months for the first group showed no complications. In the second group four patients died after a median of 14.5 (4–28) months postoperatively (PMP progression and intestinal obstruction (n = 2); pleural extension of PMP (n = 1) and acute cardiac event (n = 1). The rest after 48.1 (7–66) months showed no relapses.
Conclusion: AMN are rare and the histological type is an important predictor of PMP development and survival in patients with AMN. Long time follow up is mandatory in patients operated for AMN, since even low grade neoplasms may lead to PMP.
Disclosure: No significant relationships.

P036

PROPOSAL FOR PREOPERATIVE ALGORITHM TO DECREASE THE INCIDENCE OF IATROGENIC LESIONS OF THE BILIARY TRACT

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Introduction: Iatrogenic biliary duct lesions are serious injuries and have serious long-term consequences, leading to an increased morbidity and mortality, decreased quality of life of patients and increasing costs for care.
Materials and methods: Extensive efforts have been made regarding classification, diagnosis and treatment of iatrogenic lesions. There are over 15 known classification, the most recent being established by EAES in 2012. Study of risk factors and the factors favoring the occurrence of biliary lesions led to the development of an algorithm to prevent the occurrence of these lesions preoperatively. We conducted a retrospective and prospective study on a group of 2707 patients who underwent cholecystectomy in a 10 years period.
Results: Based on data obtained from the study we propose an algorithm for calculating a preoperative score, based on which to settle the new criterion for conducting further preoperative and intraoperative investigations, in order to prevent biliary lesions. Scoring tries to establish the increased risk of iatrogenic lesions, the criteria to calculate the score include patient age and gender, obesity, local/systemic inflammation, experience of the surgical team.
Conclusion: Score is a simple and handy calculated based on historical clinical and laboratory basic data. The value of this score has to be checked in time by further studies designed to examine the validity and power to prevent the occurrence of iatrogenic biliary lesions.
References:
1. 5. A. Fingerhut, et al. ATOM, the all-inclusive, nominal EAES classification of bile duct injuries during cholecystectomy, Springer Science + Business Media New York 2013, Surg Endosc
Disclosure: No significant relationships.

P037

TRAUMATIC POSTEROLATERAL ABDOMINAL WALL HERNIA CONTAINING PERFORATED COLON. INTRAPERITONEAL MESH REPAIR

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Introduction: Traumatic abdominal wall hernia management has several controversial points regarding initial or delayed treatment, use of a prosthetic mesh versus primary closure alone, etc.
Materials and methods: We report a case where a 19-year-old male obese polytrauma patient was treated at another institution after suffering a high-energy motorbike accident. Patient vitals were normal.CT-scan showed a left posterolateral abdominal wall hernia containing small bowel and left colon and AAST grade IV left kidney trauma with a patent right kidney. Emergent Angiography showed left renal artery amputaion with no active bleeding. The patient was managed conservatively and after 48 h of uneventful observation was transfered to our institution (patient's hometown reference-hospital). 24 h later the patient had a worsening ongoing left-upper-quadrant abdominal and lumbar pain and septic shock. An urgent CT-scan showed the known hernia with signs of strangulation and perforation and an ischaemic left kidney. Emergent median laparotomy was performed confirming left colon strangulation and perforation with fecal contamination inside the traumatic posterolateral hernia. Limited left colon resection and terminal colostomy was performed. Left nephrectomy was performed as the kidney was iscahemic and with evidence of ongoing superinfection. An intra-abdominal Proceed® mesh was placed covering the hernial defect from inside.
Results: The recovery was unventful without any signs of surgical infection. Hartmann's reverseal was done 5 months later succesfully. 3 years later there is no evidence of hernia recurrence.
Conclusion: Strangulated Traumatic abdominal wall hernias with perforated intestinal content may be treated succesfully with prosthetic meshes despite contamination.
References:
1. Hernia. 2005;9(4):388–91.
2. Indian J Surg. 2012;74(2):149–56.
Disclosure: No significant relationships.

P038

PENETRATED SIGMOID COLON BY AIR GUN PELLET COULD BE LIFE THREATENING: A CASE REPORT

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Introduction: Although mainly used for sport purposes, air non powder guns can cause serious life-threatening injuries. Penetrating injuries of large bowel with non powder gun pellets are extremely rare.
Materials and methods: We report an extremely rare case of a 44-year-old Caucasian woman referred to the abdominal surgery for diagnostic evaluation and eventual treatment after an accidentally occurred small wound in the lower left abdominal quadrant caused by air gun pellet.
Results: Blood and biochemical analysis were normal but CT scan revealed the presence of a foreign body–air gun pellet, in the left iliac region of the abdomen. Clinically, during the first 24 h significant changes were not noticed. Pain and local tenderness in the lower left abdominal quadrant revealed after 42 h. Laparotomy discovered a retained pellet in the wall of the sigmoid colon associated with a small leak of colonic contains around the pellet and the consecutive local peritonitis as well.
Conclusion: The hollow organs of digestive tract, although very rarely can be penetrated by air gun pellet, will not typically show all signs of acute abdomen in the early posttraumatic phase. Such injuries can lead to a pronounced infection, which may cause the septic shock if not appropriately treated.
References:
1. Christoffel KK, et al. Am J Dis Child. 1984;138:557–561.
2. Bowen DI, Magauran DM. BMJ. 1973;1:333–337.
3. Mostafa Hosseini et al. J Med Case Rep. 2012; 6:184.
Disclosure: No significant relationships.

P039

DIVERSITY OF THE DEFINITION OF HEMODYNAMIC STABILITY IN TRAUMA PATIENTS: RESULTS OF A NATIONWIDE SURVEY

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Introduction: Hemodynamic stability (HS) based on VS is thought to be the most useful criteria for successful non-operative management (NOM) of blunt spleen injury (BSI). However, a consistent definition of HS has been lacking. We wanted to evaluate the diversity of the definition of HS by nationwide survey.
Materials and methods: The questionnaire regarding the definition of hemodynamic stability (HS) was sent to surgical attending doctors working at the Department of trauma surgery between Oct 2011 and Nov 2011. Data was compared using analysis of variance, *t* test, $\chi 2$ test and logistic regression.
Results: Among 563, 459 (81.5 %) responses were analyzed. There was significant diversity to define HS on the subject of the type of blood pressure (BP), cut off value of hypotension, measuring technique of BP, duration of hypotension, whether or not using heart rate (HR) as a determinant of HS, cut off value of hypotension when the patient has comorbidity or when the patient is pediatrics. 91.5 % replied that they were confused defining HS and felt the need to have more objective determinants.
Conclusion: Many trauma doctors are using only VS to define HS. This is why there is confusion regarding how to define which patient is hemodynamically stable. More objective determinants such as base deficit or lactate can be useful adjuncts.
References:
1. Longo WE, Baker CC, McMillen MA, Modlin IM, Degutis LC, Zucker KA. Nonoperative management of adult blunt splenic trauma. Criteria for successful outcome. Ann Surg 1989;210:626–9.
Disclosure: No significant relationships.

MILITARY AND DISASTER SURGERY

P040

A TERRIBLE GUNSHOT INJURY WITH HAPPY ENDING

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Introduction: A patient with thoracoabdominal injury due to infantry rifle with high kinetic energy, referred our hospital. In initial admitted hospital, liver primary repair, right hemicolectomy, ileotransversostomy, diaphragmatic primary repair and thoracal tube drainage have been performed.
Materials and methods: The patient with necrotizing fasciitis was operated, urgently. Extensive abdominal wall debridement was done.Transvers colectomy, ileostomy, cholecystectomy and diaphragmatic debridement were performed because of necrozis. Three days later patient was reoperated because of pancreatic fistula, and was seen necrosis on the pancreatic head and we performed serosal patch and drainage for pancreas, repaired bile leakage in liver. But the bladder, pancreatic head and transvers colon were not on the bullet trace. We followed patient with Bogota bag and than performed Vacuum Assisted Closure (VAC). After controlling fistulas diaphragm was resutured to ribs. Giant abdominal defect was closed with split thickness graft.
Results: Ostomy was taken down after 9 months and 2,000 cc tissue expanders were put both side of the abdominal defect. Four months later abdominal wall was closed with dual mesh and expanded skin.
Conclusion: Many organs maybe affected even if not on bullet trace for gunshot injuries with high kinetic energy due to temporary cavitation because of blast effect. This effect damage vascular endothelium, and causes late perforation and necrosis (1). So, must be careful and meticulous for this kind of unjuries in first exploration, must perform damage control principals, early second look may perform, if necessary.
References:
1. Ozer MT,Ogunc G,Eryilmaz M at all. Organ models in wound balistics: experimental study. Ulus Travma Acil Cerrahi Derg 2007;13(1):20–27.
Disclosure: No significant relationships.

P041

SURGICAL TREATMENT OF THE WOUNDED WITH TRAUMA AND BURNS IN A LOCAL ARMED CONFLICT

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Introduction: The combination of burns and gunshot wounds diagnosed in 5–7 % of injured in local conflicts in the World.
Materials and methods: Were treated 235 patients with severe mine-blast injuries. The combination of burns and gunshot wounds were diagnosed in 93 (39.6 %) in the North Caucasus in 1994–1997, 1999–2010. Age from 19 to 48.The cause of injury in 75 (80.6 %) was undermining of explosive mines, 18 (19.4 %) hit of the projectile in military equipment. 16 (17.2 %) patients were evacuated into military field hospital for 1 h, 47 (50.5 %) for the 2 h. Head injury had 67 (72.0 %) patients, neck 7 (77.8 %), chest 16 (17.2 %), abdomen and pelvis 18(19.4 %), 67 (72.0 %) extremities. Superficial burns had 76 (81.7 %), deep 20 (21.5 %). 61 (65.6 %) patients had burns and gunshot wounds in the same area. Early total Care (ETC) was used in all cases 29 (31.2 %) from 1994 to 1997 and from 1999 to 2001, regardless of the degree of severity of the injury.
The surgical treatment was diferent from 2002 [totaly 64 (68.8 %)]: in case of absence traumatic shock ETC was used—30 (32.2 %), in case of shock surgical treatment was limited—Damage Control Surgery (DCS) was used in 34 (36.6 %) cases.
Results: Complications occurred in 51 (54.8 %) cases: 15 (51.7 %) after ETC, 36 (56.2 %) after using of the differentiated surgical treatment ($p = 0{,}856$). Overall mortality rate was 9 (9.7 %), 4 (13.8 %) after ETC and 5 (7.8 %) after the application of differentiated tactics ($p = 0.453$).
Conclusion: Using of differentiated surgical treatment (ETC + DCS) has led to increase in the number of complications and reduced mortality rate compared with a group of wounded, when was used only ETC.
Disclosure: No significant relationships.

P042

NEIGHBOURS IN WAR SURGERY: CASUALTIES OF THE SYRIAN CIVIL WAR TREATED IN ISRAEL

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Introduction: Ziv Hospital, a small district hospital in northern Israel, receives war wounded from the Syrian civil war. Since February 2013, 145 patients have been admitted, 127 male and 8 female, with an age distribution of 2–51 years old.
Materials and methods: Data was collected from the Ziv hospital trauma registry and medical notes after Helsinki ethics approval and stored in a password protected file accessed only by the authors.
Results: Complete datasets of the first 65 patients show 30 patients had multiple trauma and 34 had single compartment injury; causes include gunshot wounds (35 patients), blast injuries (22), car accidents (3) and unknown causes (6). Seventy-five operations were performed (17 laparotomies, 4 thoracotomies, 28 orthopaedic, 8 vascular repairs, 16 skin grafts, 2 maxillofacial cases and multiple debridements, relooks, changes of dressing and VAC assisted closure of wounds). Eight patients (12 %) were admitted directly to the ICU. Three patients died.
Conclusion: At least 120,000 Syrians have been killed since 2011; up to 4 times more have been injured and disabled. Though a state of war still exists between Israel and Syria, ordinary people and health professionals are not immune to the suffering of their neighbours. One hundred forty-five is a tiny figure amongst the thousands injured, but perhaps the value of caring for the relatively few still gives us hope for a better future.
References:
1. Adini B. Am J Emerg Med. 2011;29(9):965–71.
2. Rubinstein Z. Harefuah. 2010;149(7):427–32.
3. Schreiber S. Gen Hosp Psychiatry. 2004;26(5):359–66.
Disclosure: No significant relationships.

P043

TRAUMA TEAM INTERVENTION TO IMPROVE COPING AMONG FAMILIES OF VICTIMS OF TERROR ATTACKS

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Introduction: The terror attacks in our country in the past focus national attention on personal tragedies of casualties and their families. This is a time for coping with trauma and loss. This lecture's is describe the relationships between trauma coordinator and the wounded during hospital stay arrival to discharge and beyond.
Materials and methods: In literature, three circles of injury are described: First: Ones who directly exposed and injured in the attack and their families. Second: The ones "only" exposed to the attack not hurt physically. Third: Children or parents who weren't in attack were exposed by media. Near the Trauma Resuscitation Unit we find all circles. Some families with a wide net of social support, showing abundant love and support other families with narrow net of support. Some families find difficultly accepting help, others allow everyone to assist them. Some families at high risk like new immigrants, single parents, etc.
Results: The trauma teams' support intervention created solid basic trust providing feeling of control and overcome family feelings of helplessness. The means to reach this goal are: Orientation, giving clear reality map, providing information concerning wounded relatives, caring for basic physical needs, listening carefully to debriefing of event, letting them vent their thoughts and plenty of empathy.
Conclusion: This talk describes immediate trauma team intervention shown to improve long term coping among families of terror attacks.
References:
1. Stress and coping among families of patients with traumatic brain injury: a review of the literature Verhaeghe, Defloor, Grypdonck. Journal of Clinical Nursing 2005;14(8);1004–1012.
Disclosure: No significant relationships.

P044

MANAGEMENT OF MASS CASUALTIES INCIDENT IN WARTIME. HOW IS IT PERFORMED IN FRENCH FORWARD SURGICAL TEAM (NATO ROLE 2)?

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Introduction: A mass casualties incident (MCI) is defined as an event, which generates more patients at one time than locally available resources can manage using routine procedures. It requires exceptional emergency arrangements and additional or extraordinary assistance (PAHO/WHO 2001). In modern wartime, the great part of the MCI is secondary to explosions (Improvised Explosive Device, suicide bomber), and civilians are often concerned.
Materials and methods: The forward surgical team (FST) is a mobile hospital facility consisting of tents with an operative room, a wards, and one tent for triage, in case of MCI. The facility's equipment is suitable for the management of adults. An X-ray, an ultrasound and a basic laboratory are available. The surgical team is made up of 12 people: 1 anesthetist, 1 orthopedic surgeon, 1 general surgeon, and paramedics. It is usually deployed very closed to the combat area and is the first level providing surgical capacity. The initial equipment is theorically done to manage 10 casualties during 48 h in a total autonomy.
Results: The authors will expose the initial triage and evacuation criteria (NATO categorization) and the basic MASCAL plan of the French FST. The authors will illustrate the presentation with their experience in Ivory coast (Operation Licorne, 2004), Jordan (operation TAMOUR, 2013) and Mali (operation SERVAL, 2013).
Conclusion: Management of MCI requires a careful preparation and repeated trainings, especially in small structures as FST. An experienced team anesthetist/trauma surgeon is essential to perform the triage.
Disclosure: No significant relationships.

P045

EXPERIENCE OF A FRENCH MILITARY FORWARD SURGICAL TEAM DURING THE MALIAN CONFLICT

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Introduction: On January 2013, the French military launched Operation Serval, intervening in the Malian conflict. The aim of this study was to evaluate the activity of a forward surgical team deployed in Gao, Mali, to support the coalition's forces during the combats.
Materials and methods: Between January and April 2103, all the patients operated by the forward surgical team were eligible for inclusion in this study, including soldiers of the french army, soldiers from the African coalition, and civilians. The categories of injuries were: war related injuries, non hostile related traumatic emergencies, non traumatic emergencies and elective surgery. Mechanisms and types of injuries, affected organs and surgical procedures were collected.
Results: A total of 17 patients sustained a surgical procedure during this period, including 13 war related injuries (4 French, 7 Chadian and 2 Malian soldiers) and 4 non traumatic emergencies. The repartition among the war related injuries were: 38 % visceral, 38 % orthopaedic, 8 % vascular, 8 % thoracic and 8 % cranial. Among the non traumatic injuries, 100 % were infectious injuries (3 appendicitis and 1 abscess). Among the war related injuries, 60 % were life-threatening injuries requiring an emergency procedure and the early mortality rate was 8 %.
Conclusion: A wide range of skills and qualifications are required in a forward surgical team. Our study emphasizes that military surgeons have to be competent in emergency surgery, including thoracic, visceral, vascular, orthopaedic and neurosurgery. An advanced course (CA-CHIRMEX) was developed in the French Army to provide basic skills to each forward military surgeon.
Disclosure: No significant relationships.

SURGICAL CRITICAL CARE I

P046

HOURS WITHOUT VENTILATION ON VENO-VENOUS EXTRACORPORAL MEMBRANE OXYGENATION IN SEVERE TRAUMA: A CASE REPORT

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Introduction: Veno-venous ECMO is a more and more common therapy for ARDS after severe trauma, not only as a rescue therapy.
Materials and methods: We report a 32 year-old-motorcyclist hit by a tram. He was presented to the emergency room with a blunt thoracic trauma, a pelvic fracture and a severe destruction of the left lower extremity with rupture of A. and V. poplitea. Damage control surgery included external fixation of the left lower extremity after reconstruction of the left A. poplitea with autologe graft and compartment incision. When admitted to ICU, there was a major diffuse bleeding of the left leg. Progredient pneumopericardium was treated with pericardial suture via thoracotomy on ICU ward. Severe ARDS developed within hours and vvECMO was started. The patient received 30 units of PRBC within the first 48 h after trauma. On day 3 the patient developed an abdominal compartment syndrome, which was treated by laparotomy. Lung-compliance was too low for ventilation without further lung injury and ventilation was stopped for 48 h. Afterwards spontaneous breathing recovered and assisted ventilation was initiated.
Results: The patient was later discharged from hospital in good condition.
Conclusion: ECMO can be a successful treatment in severe trauma. Severe hemorrhage is not a contraindication for ECMO, heparin is not mandatory and administration of blood products and coagulation factors is possible without clotting of the oxygenator. In a case of complete loss of lung compliance under ECMO, discontinuation of ventilation is a therapeutic option.
References:
1. Cordell-Smith et al. Traumatic lung injury treated by ECMO. Injury 2006
Disclosure: No significant relationships.

P047

LOWER LIMB'S PROPHYLACTIC FASCIOTOMY: A CLINICAL CASE

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Introduction: In acute situations, fasciotomy can be done prophylactically or as early therapeutic decompression, the latter being performed as soon as the first symptoms of compartment syndrome are present.
Materials and methods: This report describes the prophylactic's fasciotomy case in a patient with a lower limb frature.
Results: Male, 31 years, healthy, was admitted in the emergency room with a work accident and a major injury of the right lower limb by a motor's boat propeller. At the admission he was a deformation of the right limb, keeping limb's sensitivity with pulseless on dorsalis pedis and posterior tibial right arteries. A radiograph of the right lower limb showed proximal femur frature.Doppler flow showed no popliteal distal pulse. Underwent closed reduction and nailing of the femur and superficial femoral popliteal bypass: popliteal vein supra-articular with reversed saphenous vein. Intraoperatively it was found extensive femoral venous injury, proceeding to its suture was also performed fasciotomies open in the medial aspect of the limb and in the postero-lateral side.Admitted to Intensive Care Unit for consumption coagulopathy, metabolic acidosis and rhabdomyolysis. In a second time of the surgery was approached the edges of the incision of the limb. Discharge from hospital on day 17.Favorable evolution after 4 months.
Conclusion: The diagnosis of compartment syndrome is essentially clinical.The Doppler is important for monitoring changes during evolution.Treatment consists of immediate decompression after fasciotomy.
References:
1. Burghardt RD et al. Traumatol. 2013 1;16(5):308–10.Compartment syndrome of thigh and lower leg with disruption of the popliteal vascular bundle after being run over by a 25-ton truck.
Disclosure: No significant relationships.

P048

AMPUTATION OF ARMS AND LEGS CAUSED BY SEPTIC SHOCK WITH DISSEMINATED INTRAVASCULAR COAGULATION (DIC) IN A PATIENT WITH NEUTROPENIA AS SECONDARY EFFECT OF OVERDOSAGE OF METAMIZOLE

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Introduction: Amputation of all extremities caused by Septic Shock with DIC in the context of overdosage of metamizole with bone marrow toxicity is a unique case in the world's literature.
Materials and methods: We present a unique case report.
Results: Case report: a 30-year-old-female was admitted to our hospital′s emergency room with treatment-refractory painful anal fissure. The patient was taken metamizole in higher dosages. Blood tests showed a severe neutropenia (40 neutrophils per microlitre) and the patient was interned in the Hematology Unit, where got worse, with hypotension, tachicardia, hypoxemia and systemic treatment refractary. In the Intensive Care Unit (ICU) was neccesary very high doses of vasoactive and inotropic amines. She was diagnosed of Septic Shock with multiple organ failure. A quick and dramatic reduction of platelet count was identified. TCscan revealed an anal abscess, which was considered the possible etiology of septic shock. DIC and high dosage of vasoconstrictors drugs prduced ischemia and necrosis of all extremities. Amputation of arms and legs were done.
Conclusion: Septic shock with DIC is a severe disease that requires an early diagnosis to avoid serious complications like ischemia and necrosis of organs and extremities, and death in the worst case. Amputation of necrosed extremities should be performed as soon as possible to avoid gangrene infection. Overdosage of metamizole can produce bone marrow toxicity and susceptibility to infections. Neutropenia, even medullary aplasia could be present in bone marrow toxicity, and is often a reversible disease.
Disclosure: No significant relationships.

P049

INITIAL AND DEFINITIVE MANAGEMENT OF THE MANIFESTATION OF A LOWER RECTAL CANCER AS FOURNIER'S GANGRENE

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Introduction: The manifestation of a lower rectal cancer as Fournier's gangrene is a inusual debut. We present two cases with this clinical findings. We also discuse the initial management, the decision to perform a colostomy and when is the best moment to make the definitive surgery.
Materials and methods: First case: 70 years old woman with a 2 month history of purulente discharge without pain. The physical examination and CT showed a Fournier's gangrene due to a perforation of a lower rectal mass. Extensive debridement and terminal colostomy by laparoscopic approach were performed. One month later, a perineal abdominal resection was made. Second case: 70 years old man with septic shock. Physical examination was a Fournier's gangrene with a lower rectal mass. Extended debridement and colostomy were performed. After this, two months later, a perineal abdominal resection was made.
Results: Discussion. The gold standard treatment for fournier's gangrene is a radical debridement together with broad spectrum parenteral antibiotics. The performance of a colostomy is controversial but it's accepted when there's extensive sphincter damage or extensive perineal debridement.
Conclusion: In those cases where a lower rectal cancer appears, colostomy performance is recommended. Laparoscopy is the ideal approach to make colostomy. It's very difficult to apply definitive surgery at the same time because the cinical conditions of the patients are normally very poor.
References:
1. Osturk. Colorectal Dis. 2011;13:1044–7.
2. Thwaini. Postgrad Med J. 2006;516–9.

3. Carr. J Clin Oncol. 2010;28:605–6.
4. Am J Gastro. 1998;657–8.
Disclosure: No significant relationships.

P050

BLOCKAGE OF THE MITRAL HEART VALVE CAUSE OF A GIANT LEFT ATRIAL MYXOMA

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Introduction: Primary cardiac tumors are rare and myxomas are the most common type of these rare tumors. Larger tumors are more likely to be associated with cardiovascular symptoms. If the tumor grows inside the heart, it can block blood flow and surgical treatment should be made early.
Materials and methods: We present a case and we made a bibliographic review.
Results: A case is presented of a 34-year-old pregnant female patient with a history of asthenia, dyspnea and cough, orthopnea, hemoptysis, thoracic pain, palpitations and reduced functional capacity 2 months before. When the patient was admitted to the Intensive Care United (ICU) presented dyspnea, incoercible cough, hypoxaemia and tachycardia. Thorax compute tomography with contrast showed a bilateral pulmonary embolism and a intracardiac mass. Inicially it was suspected a intracardiac thrombus. Transthoracic echocardiography revealed a giant mass in the left atrium which prolapsed into the left ventricle and produced severe obstruction of the mitral valve. An emergent surgery was decided and the mass (10x5.5 cm) was resected without any complications. Histolopatological study confirmed the diagnosis of myxoma.
Conclusion: Myxomas are the most common primary cardiac tumor. However, other tumors can simulate myxomas and should be considered in the differential diagnosis. Although a myxoma is not cancer, complications are common. Prompt resection is required because of the risk of complications, including sudden death.
References:
1. Up to date. Durgut K. Primary cardiac myxomas: report of 28 cases and review the literature. 2011;16(2):345–8.
Disclosure: No significant relationships.

P051

IATROGENIC BRONCHIAL PUNCTURE: RARE COMPLICATION OF TUBE THORACOSTOMY WITH SMALL BORE CATHETER

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Introduction: Various complications have been described. This is the report on the case in which a trocar-type tube was accidentally introduced into the left main bronchus.
Materials and methods: A 69-year-old male was admitted with dyspnea. The chest X-ray showed a pleural effusion. Despite the insertion of the 12 Fr trocar-type tube, the pneumothorax was not improved. The chest CT revealed that the tube was placed into the left main bronchus.
Results: After removal of tube, patient recovered uneventfully without any signs of complications from pulmonary hemorrhage and bronchial perforation.
Conclusion: Tube thoracostomy is a commonly performed procedure. However, for the patients with the history of thoracostomy, adhesions should always be a consideration and be extremely cautious.
References:
1. Can J Surg. 2007;50(6):450–8.
2. Pulm Med. 2012;2012:256878.
3. J Trauma. 2009;66(2):393–9.
4. Interact Cardiovasc Thorac Surg. 2005;4(5):473–4.
5. Ann Thorac Surg. 2013;96(4):1450–4.
Disclosure: No significant relationships.

P052

CARDIAC ARREST IN A 13-YEAR-OLD BOY DUE TO ELECTRICAL INJURY. SUCCESSFUL RESUSCITATION AND POST-RESUSCITATION CARE WITH MILD HYPOTHERMIA

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Introduction: Electrical injuries in children are rare. They occur predominantly at home following contact with low voltage electrical cords and wall outlets, causing mainly burns. Cardiac arrest due to electrical injury in children is exceedingly rare and has a high mortality. Survivors may have a devastating neurologic outcome.
Materials and methods: We report the case of a 13-year-old boy with electrical injury due to contact with an extension cord, and associated cardiac arrest.
Results: The patient was successfully resuscitated after 40 min of CPR and directly initiated on mild hypothermia (34 °C) for 24 h with an excellent recovery.
Conclusion: Hypothermia in paediatric patients, following successful cardio-pulmonary resuscitation (CPR), even though not yet a firm recommendation in the European Paediatric Life Support guidelines (2010), could be beneficial.
References:
1. Young MK, et al.: Use of cold intravenous fluid to induce hypothermia in a comatose child after cardiac arrest due to a ligtning strike : Resuscitation (2008)79, 336–338
Disclosure: No significant relationships.

SKELETAL TRAUMA FEMUR

P053

COMBINED MINIMALLY INVASIVE AND OPEN APPROACH FOR INTRAARTICULAR DISTAL FEMORAL FRACTURE

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Introduction: Fractures of the distal femur comprise 4 per cent of all femoral fractures. They occur as a result of high energy trauma[1].
Materials and methods: 56-year old patient reported to our emergency ward after motorcycle accident. He presented with Gustillo grade 3 open fracture of the distal femur. X-ray imaging showd comminutied fracture of the distal femor (AO grade 33-C2). Patient underwent immediate surgery—external fixator was placed. Ten days after the initial surgery patient underwent definitive treatment. Definitive treatment included opening knee joint and reposition of intraarticular fragments. Fragments were fixed with 4.0 mm spongious screw. Wound was closed and we proceeded with minimally invasive approach to distal femur. LCP plate was placed.
Results: Patient was hospitalized for 20 days. We immediately started with physical therapy. During hospital stay knee movements were 25/75°. One month after the patient was discharged movements were 0/90° with allowed weight bearing of up to 30 kg. Two months after surgery movements were 0/115° with weight bearing up to 40 kg. Three months after surgery full weight bearing was allowed. Range of motion was 0/120°. Patient reported no pain.
Conclusion: By combining open and minimally invasive approach we achieved excellent end result. Open method enabled ideal reduction of intraarticular fragments. Placment of LCP plate through minimally invasive approach enabled preservation of knee soft tissues. All those facts combined lead to excellent end range of knee motion.
References:
1. Kolmert L., Wulff K., Epidemiology and treatment of distal femoral fractures in adults, Acta Orthop Scand. 1982;53(6):957–62.
Disclosure: No significant relationships.

P054

IM NAILING IN FEMUR SUPRACONDYLAR FRACTURES TREATMENT

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Introduction: Reaching bone alignment at supracondylar femur fractures treatment could be difficult due to unbalanced pull of thign and calf muscles. As for plate fixation, bone's distal fragment consolidation inadequacy could result from cortical bone insufficiency. Reasons for increase in popularity of locking plates or dynamic condylar systems are: possibility to fix distal femur fracture and to mobilize knee joint early. However, soft tissues distruption and periosteal stripping during implantation may interfere with the healing process and cause slowened union or non-union. Antegrade intramedullary nailing offers more biologically-friendly fixation, decreasing soft tissues devitalization.
Materials and methods: We analyzed theoretical and biomechanical modelling of different supracondylar fractures fixation using IM nailing, LCP and DCP and studied 126 case records of distal femur fractures (AO type 33A1, 33A2, 33A3) to determine these patients' overall outcome.
Results: Femur supracondylar fractures osteosynthesis with IM nailing causes minimal changes of bone's elastic stain conditions compared to other methods. Important is the distance from fracture to knee joint, showing distal screw pressure decrease from 9.5 to 5.5 MPa. The differential approach to supracondylar fractures treatment with IM antegrade nailing was applied in 126 cases and has shown high efficiency, allowing reasonable and reliable increase in positive results.
Conclusion: Antegrade intramedullary nailing is useful for supracondylar femur fractures treatment, providing stable fixation and good distal bone fragment consolidation, allowing minimal soft tissues disruption and early joint mobilization. The rate of union is high, with a low incidence of complications.
Disclosure: No significant relationships.

P055

COMPARISON OF DYNAMIC HIP SCREW, GAMMA NAIL AND HEMIARTHROPLASTY IN THE TREATMENT OF INTERTROCHANTERIC FRACTURES OF THE FEMUR

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Introduction: We aimed to compare the effectiveness of three types of intertrochanteric fractures treatment: Dynamic Hip Screw (DHS), Gamma Nail (GN) and hip hemiarthroplasty.
Materials and methods: We included 63 patients treated between September 2008-October 2011 (38 females, 25 males, mean age 79 $\pm$ 8 years). There were 28 type A2, 22 type A1 and 13 type A3 fractures (OTA classification). 24 patients had hemiarthroplasty, 21 were treated with DHS and 18 with GN. We recorded the operation time, blood loss, the need for transfusion, wound complication and duration of hospital stay. The Harris Hip Score (HHS) was used for clinical assessment.
Results: Mean follow-up was 3 years (2–5 years), with 16 patients lost to follow-up. GN had the longest operation times, significantly different from hemiarthroplasty and DHS ($p = 0.01$, $p = 0.03$). Blood loss and transfusion were similar between the groups. All patients had a mean hospital stay of 7 days (5–11 days), with no wound complications. The HHS improved in all patients. There were 6 postoperative complications: 3 cases of hemiarthroplasty with acetabular erosion at 3 years postoperatively, 2 cases of GN degraded at 1 and 1.6 years postoperatively, and one case of femoral head necrosis in the DHS group.
Conclusion: We consider hemiartroplasty, DHS and GN to all be viable options in the treatment of intertrochanteric fractures, with good and excellent results in well selected cases.
References:
1. Karthik K, Natarajan M. Unstable trochanteric fractures in elderly osteoporotic patients: role of primary hemiarthroplasty.Orthop Surg 2012;4:89–93.
2. Khan N, et al.Intertrochanteric fracture of femur; outcome of dynamic hip screw in elderly patients.Prof Med J. 2010;17:328–33.
Disclosure: No significant relationships.

P056

SURGICAL MANAGEMENT OF SUPRACONDYLAR FEMORAL FRACTURE ABOVE TOTAL KNEE ARTHROPLASTY USING LOCKED PLATES COMBINED WITH MIPO TECHNIQUE

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Introduction: Incidence of distal femoral periprosthetic fracture following total knee arthroplasty is increasing and has been reported to range between 0.3 % and 2.5 %.
The aim of this study was to evaluate the results and complications of treating periprosthetic supracondylar femur fracture above a TKA with the locked plate.
Materials and methods: Between 2008 and 2012 in our Hospital, Level 1 Trauma Center, have operated 14 patients with supracondylar fracture above TKA. The fractures were classified using Rorabeck and Taylor classification system (Type ll fractures).
We recorded demographic data, time for fracture healing, postoperative complications, functional and radiological outcome.
Results: Average age was 74.4 years (58–82 years). All fractures healed. Average time to union was 18 weeks (12–30 weeks). There were no postoperative infection and neurovascular problems. A valgus deformity of 10^{o}–14^{o} was apparent in four cases. Return to pre-injury level of function was achieved by 12 of 14 patients.
Conclusion: The LC plate implantation using a minimally invasive technique in distal femoral periprosthetic fractures above TKA provides excellent results and union rate.
References:
1. McGraw P, Kumar A. Periprosthetic fractures of the femur after total knee arthroplasty. J Orthop Traumatol 2010;11(3):135–41.
Disclosure: No significant relationships.

P057

TREATMENT OF THE DISTAL FEMORAL TYPE 2 PHYSEAL FRACTURES WITH KIRSCHNER WIRE AND CAST PLASTER IN CHILDREN

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Introduction: Although it is rare fractures of the distal femoral type 2 physeal fractures of children, have a high incidence of physeal arrest. The aim of this study was to, at the distal femoral type 2 physeal fractures of children, treated with closed or open reduction and percutaneous fixation with Kirschner wires.
Materials and methods: Fifth teen patients with the distal femoral type 2 physeal fractures were treated by closed or open reduction and percutaneous Kirschner wiring. The average age of patients was 7.6 ± 4.9 (range 1–15), follow-up time was 45.8 ± 29.6 (range 25–74), 66 % (n = 10) were male and 8 % (n = 5) were female. Plaster cast was applied after operation all patients. Anteroposterior and lateral radiographs were used for classification and evaluation of fracture reduction.
Results: All the patients were followed up with an average of 45.8 ± 29.6 (range 25–74) months. The mean time from injury to operation was 0.5 days (range 0–3). There were 33.3 % (n = 5) physeal bar, 6.6 % (n = 1) procurvatum on femur, 6.6 % (n = 1) distal femoral valgus deformity, 20 % (n = 3) superficial pin-track infection and 6.6 % (n = 1) early closure on physeal of distal femoral.
Conclusion: Salter-Harris type 2 distal femoral physeal injuries are proposed to warn the clinician with higher complication risk. Closed or open reduction and fixation with Kirschner wire seem to be suitable for the fixation of distal femoral fractures in children.
References:
1. Growth plate fractures of the distal femur. J Pediatr Orthop.2012 2-The effect of percutaneous pin fixation in the treatment of distal femoral physeal fractures. J Bone Joint Surg Br. 2011
Disclosure: No significant relationships.

P058

LONG-TERM RESULTS OF THE PROXIMAL FEMORAL FRACTURES IN ELDERLY

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Introduction: The proximal femoral fractures are very often in elderly. The average age of this patients is raising and 90 year old lady is not rare. The operative treatment with good reduction and stability is a gold standard but what about long term results?
Materials and methods: The autor presents 3 groups of the patients treated by DHS, proximal femoral nail and THP and compared the age, gender, mechanismus and day time of the injury, timing of the operation. Time in the hospital and type of the long term postop care are important too.
Results: The relative clear results are presented. Significantly better results are dependent on early operation, early mobilisation and postop care at home with the family. Long term results after 1 year were best in women group under 80 years old and the family postop care.
Conclusion: We can recommend early operation and mobilisation of course, but postop family care is very important too.
References:
1. Roche, J.J.W., Wenn, R.T., Effect of comorbidities and postoperative complications on mortality after hip fracture in elderly people: prospective observational cohort study, BMJ. 2005;331:1374
Disclosure: No significant relationships.

P059

RESULTS OF THE APPLICATION OF A NEW METHOD OF INTERNAL FIXATION OF FEMORAL NECK FRACTURES – SELF-TAPPING ANTIROTATION CANNULATED SCREWS (SAF)

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Introduction: Femoral neck fractures are one of the most common fractures, primarily the elderly, coupled with a high degree of

morbidity and mortality.We developed a new method of fixation of femoral neck fracture,which allows stable fixation of dislocated and nondislocated femoral neck fracture.Self-tapping antirotation fixation(SAF)using two cannulated screws to initial compression fractures intraoperative and postoperative dynamic linear compression of the fracture with early full support to the patient.
Materials and methods: In the period between 2008 and 2012, 53 patients treated for femoral neck fracture in our department by SAF.All patients were followed up after surgery in a minimum period of 13 weeks.The outcome was evaluated on the basis of clinical and radiological signs of fracture healing and the Harris hip score of functional recovery of the patient.
Results: Of the total number of patients (53) treated with this method of fixation,31 of them were females and 22 males,mean age 52.7 years (28–75 years).The total incidence of nonunion of femoral neck fracture after surgery this method was 6.4 %.Shortening of the femoral neck after fixation by this method was recorded in 27 cases (average of 2.8 mm) and did not affect the functional outcome.
Conclusion: SAF method represent a reliable method of fixation of dislocated and nondislocated femoral neck fracture.This way of fixation allows the early full weight bearing patient operated limb and faster postoperative functional recovery of the fracture healing in optimal time.
References:
1. Bhandari M, Tornetta P 3rd, Hanson B, et al. Optimal internal fixation for femoral neck fractures: multiple screws or sliding hip screws? J OrthopTrauma. 2009;23:403–407.
Disclosure: No significant relationships.

P060

MINIMALLY INVASIVE APPROACH—CALCANEAL FRACTURES

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Introduction: The high risk of shortening and reduction of the hight of the calcanus is related with comminuted fractures and surgery in recommended in this case. CRIF is difficult, especially reduction of the upper subtallar joint surface. ORIF is relate with wound complication and is contraindicated in diabetes, heavy smokers etc. The authors presents approach which minimalized risk of wound complications.
Materials and methods: The 3 cases of the group of patients are demonstrated. The approach is incision 3–4 cm, below and ventrally of the external malleolus. This approach make the reduction of the upper subtalar surface possible. The next step is temporary fixation with K wires, after this we reduced length and hight of the calcanus, usually with the Schantz screw in calcaneal tuber as a joystick. After this we apply one or two cannulated screws which fixed subtalar fragments and definitive fixation of the lenght and hihgt we can make percutaneously by the K wires or screws (6,5 HCS Synthes) or new implant–calcaneal nail.
Results: We have present our first experiences with this approach and minimal fixation. All fractures was healed during 10 weeks after surgery without the wound complications. The full weight bearing was possible 3 month after procedure.
Conclusion: We can recommend this aproach for reduction of the calcanear fractures before mininvasive fixation which can be represented by nail, K wires or screws.
References:
1. Weber, M., Lehmann, O., Limited open reduction and internal fixation of displaced intraarticular fractures of the calcaneum, JBJS Br. 2008;90-B (12):1608–1616.
Disclosure: No significant relationships.

P061

CHANGES IN ANKLE AT NATURAL MODELING OF FIBULA BONE INJURIES

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Introduction: Shin bone fractures in 80 % of cases include fibula bone fractures. Although, the necessity of fibula osteosynthesisis if injured are segments 43 and 44 (AO/ASIF) is undeniable. Advisability of injuried 42nd segment osteosynthesis is under discussion [1].
Materials and methods: Using 12 fresh-frozen lower limbs examples (shin-foot) and universal examining machine TIRAtest-2151 we studied axial static and cyclic loadings influence on ankle at changes of foot's position (neutral, dorsal extension, plantar flexion, inversion, eversion) and modeled fibula injuries (osteotomy and resection of middle and lower thirds thereof), tibia bone is intact.
Results: We recovered that ankle–foot system (A-F) axial loading increase causes it's toughness augmentation, although insulated FB injuries on syndesmosis or lower level not influence reasonably the system's toughness. Foot's position changes in case of FB injuries affect A-F system's toughness unreasonably under static and cyclic loadings.
Conclusion: The modeled lower and middle third of fibula bone injuries, if distal tibiofibular syndesmosis is intact and tibia has stable fixation (fracture types 42A, B1, B2), do not cause critical decrease of ankle–foot complex load bearing capacity, and increase oftenly compression toughness of examples. To decrease the joint's surface pressure on ankle, and to increase the toughness of bone-and-fixator system in case of fracture types 42B3 and 42C, and injuries of 43rd segment, in addition to tibia bone segments stabilization, fibula bone fixation is required on the level of the middle or lower third thereof.
References:
1. Weber T. G., Harrington R. M., Henley M.B. Journal of orthopaedic trauma 1997;11(3):206–211.
Disclosure: No significant relationships.

P062

ARTHROSCOPIC ASSISTED FIXATION OF INTRAARTICULAR MEDIAL FEMORAL CONDYLE FRACTURE OF THE KNEE

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Introduction: Isolated coronal fracture of medial femoral condyle (Hoffa fracture) is extremely rare. In most cases, an arthrotomy with fragment reduction and internal fixation is performed. The case

presented here is a Hoffa fracture treated with arthroscopic-assisted reduction and percutaneous screw fixation.
Materials and methods: A thirty one-year old female was diagnosed with Hoffa fracture on the right knee, tibial fracture and humeral shaft fracture on the left side following a motor vehicle accident. Reduction and retrograde percutaneous screw fixation were performed under arthroscopic visualization through the standard portals. The tibial fracture was treated with intramedullary nailing and the humeral shaft fracture with a plate.
Results: The Hoffa fracture healed clinically and radiographically at three months postoperatively with no limitation of motion. The patient had no complaints and the functional result was excellent at the one-year follow-up.
Conclusion: Arthroscopic assisted fixation of Hoffa fracture has advantages with decreased blood loss, shortened operative time, excellent intraarticular visualization, decreased soft tissue dissection, and shortened postoperative recovery.
References:
1. Gavaskar AS, Tummala NC, Krishnamurthy M. Operative management of Hoffa fractures-a prospective review of 18 patients. Injury. 2011;42:1495–1498.
Disclosure: No significant relationships.

P063

HOFFA FRACTURE—MINIMALLY INVASIVE TREATMENT

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Introduction: Unicondylar femur fractures are extremely rare. Unicondylar coronal femur fracture was first described by Hoffa in 1904[1]. Coronal femur fractures are very difficult to diagnose using standard X-ray imaging and should always be considered with high enery knee trauma.
Materials and methods: A 59-year old patient reported to our emergency ward after falling from a bicycle and landing on his left knee. He reported pain in his left knee and loss of motion. X-rays showed no signs of fracture and patient was treated conservatively for a week. On the next follow up he still reported significant pain and knee CT was ordered showing unicondylar Hoffa fracture. The patient undervent minimally invasive surgery. We used 2 Kirschner's wires for closed reduction and temporary fragment fixation. After verifying fragment position under C-arm, two 6.5 mm spongious screws were placed.
Results: Initally knee motion was allowed up to 45° without weight bearing. The next follow up was after one month. Allowed range of motion was up to 95° with weight bearing up to 35 kg. No signs of knee instability or pain were present. Six weeks after the surgery we allowed full range of motion and physical therapy was started. After three months patient had full knee function without any pain.
Conclusion: Minimally invasive approach reduces the risk of infection and also results in lesser pain levels and more acceptable scaring. Duration of rehabilitation process was also decreased by using minmally invasive approach.
References:
1. 1. Hoffa A. Lehrbruch der Frakturen und Luxationen, 4th ed. Stuttgart: Ferdinan Enke Verlag, 904:453.
Disclosure: No significant relationships.

P064

PERCUTANEOUS TREATMENT OF ACETABULAR FRACTURES

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Introduction: Currently surgical treatment using open reduction and fixation is the gold standard for fractures of the acetabulum with more than 2 mm of displacement or fractures involving the weight bearing dome. However, open surgical treatment of acetabular fractures is not without immediate and delayed complications. In an effort to further reduce the incidence if complications, percutaneous techniques have been developed.
Materials and methods: We reviewed a consecutive series of 5 patients treated for acetabular fractures with percutaneous screw fixation (PSF) and early mobilization at our Level 1 Regional Trauma Center. Their records were reviewed including injury mechanism, weight bearing status, complications, time to radiographic union, and concomitant injuries.
Results: Five patients were identified who sustained fractures of the acetabulum and were treated with PSF. All but one patient was allowed to weight bear at least 50 pounds after surgery. No DVT, pulmonary emboli or nerve palsies were noted postoperatively. No patients required transfusions secondary to intraoperative blood loss. Six fractures in five patients went onto union without complication.
Conclusion: Displaced acetabular fracture treatment has traditionally consisted of ORIF with limited weight bearing for up to 3 months. Nondisplaced fractures were often treated with simple non weight bearing for up to 3 months. In select fracture types, percutaneous treatment options provide quick return to weight bearing while minimizing complications commonly associated with extensive open procedures.
References:
1. Starr AJ, Jones AL, Reinert CM, Borer DS. Preliminary results and complications following limited open reduction and percutaneous screw fixation of displaced fractures of the acetabulum. Injury 2001;32(Suppl 1):45–50.
Disclosure: No significant relationships.

ABDOMINAL EMERGENCIES I

P065

LAPAROSCOPIC APPENDECTOMY FROM A SINGLE SURGEON'S PERSPECTIVE: AN ENHANCED STUDY (ANALYSIS) OF 75 CASES

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Introduction: The laparoscopic approach remains viable and is increasingly becoming the procedure of choice for appendicitis (1). The current study reports the details of a single surgeon's experience to evaluate the safety and effectiveness of a laparoscopic appendectomy (LA).
Materials and methods: Patients with a diagnosis of acute appendicitis who underwent LA between April 2009 and November 2013 were included in this study. Demographic details, operative findings, and postoperative outcomes were analyzed.

Results: Seventy-five consecutive patients (41 male and 34 female) underwent LA. The median age was 26 years (range 13–74), and the median operative time was 45 min (range 20–75). In 69 (92 %) patients, a laparoscopic appendectomy was performed using the conventional method with three trocars, and a single incision was used in 5 (6.7 %) patients. The securing of the appendiceal base was performed using an intracorporeal knot in 61 (81.3 %) patients, endoloops in 10 patients (13.3 %), and polymeric clips in 3 (4 %) patients. Of the patients, 30 (40 %) had complicated appendicitis. One patient underwent a conversion to open procedure (1.3 %). The mesoappendix was divided using LigaSure in 67 (89.3 %) patients, titanium clips in 5 (6.7 %) patients, and ultrasonic energy in 2 (2.6 %) patients. As for pathologies, three patients were diagnosed with appendiceal carcinoid, appendiceal diverticulitis, and appendiceal endometriosis, respectively.
Conclusion: LA can be performed safely, even in complicated cases, after the accumulation of experience.
References:
1. Vettoretto N, Agresta F. A brief review of laparoscopic appendectomy: the issues and the evidence. Tech Coloproctol 2011;15:1–6.
Disclosure: No significant relationships.

P066

IS SINGLE ADMINISTRATION OF PREOPERATIVE ANTIBIOTICS ENOUGH AFTER SIMPLE LAPAROSCOPIC APPENDECTOMY?

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Introduction: Laparoscopic appendectomy is one of the most frequent operations worldwide, and its advantages in the cosmetic side and recovery are well known. In case of simple acute appendicitis, generally prophylactic antibiotics are chosen in accordance with clean-contaminated wound. The aim of this study is to evaluate whether single-dose of preoperative antibiotics after laparoscopic appendectomy is reasonable, compared with usage of postoperative antibiotics.
Materials and methods: From July 2013 to October 2013, fifty patients who underwent laparoscopic appendectomy without perforation or drain insertion were analyzed retrospectively. Patients were divided into group with single-dose preoperative antibiotic (SG) and group with use of pre- and post-operative antibiotics (PG).
Results: The mean age of patients was 35.1 $\pm$ 14.5 years old, and the mean duration of hospital stay was 3.0 $\pm$ 1.0 days. Total complications such as seroma, wound infection and GI symptom were occurred in 8 patients (16 %). Mean duration of hospitalization and timing of diet start in SG were significantly shorter than in PG. There was no significant difference in the rate of wound infection, seroma or GI symptom between two groups (3.2 vs 5.3 %, 3.2 vs 15.8 % and 3.2 vs 5.3 %).
Conclusion: Single-dose preoperative antibiotic is relatively acceptable in patients requiring laparoscopic appendectomy for simple appendicitis.
References:
1. Liberman MA, et al. Single-dose cefotetan or cefoxitin versus multiple-dose cefoxitin as prophylaxis in patients undergoing appendectomy for acute nonperforated appendicitis, J Am Coll Surg. 1995:180;77–80.
Disclosure: No significant relationships.

P067

APPENDICAL MASS: IS INTERVAL APPENDECTOMY NECESSARY?

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Introduction: The aim of the study was to evaluate the cases with the diagnosis of appendicular, who did not underwent interval appendectomy after ruling out other ileocecal pathologies.
Materials and methods: We retrospectively evaluated 58 patients who were treated with the diagnosis of appendicular mass between January 1st 2005 and June 1st 2010. The Diagnosis of appendicular mass was revealed by the physical examination, abdominal ultrasound and computerized tomography (CT). We analyzed, age, gender, the time passed from the onset of the symptoms until internalization to the hospital, hospital stay and investigations after the discharge.
Results: There were 33 male (56.8 %) and 25 female (43.2 %) patients. Average age was 46.6 (range 16–80). The time passed from the onset of the symptoms until internalization to the hospital was 10.5 days. Ten cases with appendicular abscess had percutaneous drainage under local anesthesia. One case was diagnosed as inflammatory bowel disease and medically treated. Average hospital stay was 6.2 days. One of the cases had recurrent appendicular infection after 24 months from diagnosis and had appendectomy.
Conclusion: Patients having successful conservative treatment under the diagnosis of appendicular mass may not need to underwent interval appendectomy after ruling out other ileocecal pathologies.
Disclosure: No significant relationships.

P068

THE USE OF ULTRASOUND IN SUSPECTED ACUTE APPENDICITIS; TO REQUEST OR TO NOT REQUEST

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Introduction: Appendicitis is common and historically is diagnosed clinically. With this comes a diagnostic inaccuracy with an approximate negative appendicectomy rate of 20 %. Modern imaging has the potential to reduce this innacuracy however some deny any benefit of imaging and suggest the cost of delay and subsequent risk of perforation.[1]
Materials and methods: Retrospective review of all patients within an NHS Foundation Trust with suspected appendicits undergoing ultrasound over a 6 month period. The impact of ultrasound on the outcomes of these patients was assessed.
Results: 168 patients with suspected appendicitis were referred for a diagnostic USS. 148 (88 %) of these patients were female and 20 (12 %) were male. 13 (7.7 %) patients had an ultrasound which reported appendicitis. 9 patients with an ultrasound report of appendicitis were taken to theatre and of these histology confirmed appendicitis in 5 (55 %). The negative appendicectomy rate for these patients was 45 %. 155 patients had an ultrasound scan which was equivicol and of these 28 were taken to theatre. Of these 28 who had an equivicol ultrasound, 8 (29 %) had appendicitis proven on histology, giving a negative appendicectomy rate of 71 %. Over a similar time period the overall negative apendicectomy rate for patients operated on for suspected appendicitis was 12 %.

Conclusion: Ultrasound does not help in patients with suspected appendicitis. Clinical acumen utilising examination, blood analysis, observation and repeat clinical assessment are as effective and less costly than the employ of radiology.

References:
1. Lee SL, Walsh AJ, Ho HS. Computed tomography and ultrasonography do not improve and may delay the diagnosis and treatment of acute appendicitis.Arch Surg. 2001;136:556–561.

Disclosure: No significant relationships.

P069

SECOND-LOOK LAPAROSCOPY IS AN ALTERNATIVE TO CONVERSION TO OPEN OPERATION IN THE DIFFICULT LAPAROSCOPIC CHOLECYSTECTOMY

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Introduction: Laparoscopic cholecystectomy is well-established as the standard-of-care for the treatment of most patients with acute cholecystitis. In patients whose laparoscopic procedure is rendered technically-difficult or unsafe by acute adhesive inflammation, and the 'critical view of safety' is obscured by dense adhesions, many surgeon convert to an open operation. In so doing, the optimum operative environment—excellent magnification, working space and illumination—is jettisoned. Add to this the risks of increased short- and long-term complications and any potential benefit from open surgery is lost. In an era where surgeons-in-training are no longer routinely-exposed to open cholecystectomy, safe alternatives to a dangerous and now-unfamiliar operation must be explored.

Materials and methods: We examined our experience in 'damage-control' laparoscopy in the presence of unsafe biliary anatomy or acute adhesive inflammation, with drain placement and the cessation of dissection. Patients were discharged home on antibiotic therapy and scheduled for an elective 'second look' laparoscopy and interval cholecystectomy, where indicated.

Results: From June 2010–September 2013, 164 laparoscopic cholecystectomies were attempted in patients with a history of acute cholecystitis. 143/164 (87.1 %) underwent uneventful laparoscopic cholecystectomy, 4/164 (2.4 %) were complicated by conversion to open cholecystectomy and 17/164 (10.3 %) were terminated as a 'damage-control' procedure. 10/17 patients (58.8 %) underwent a 'second-look laparoscopy' and cholecystectomy without complication, while the remaining 7/17 (41.2 %) were treated pharmacologically without subsequent operation.

Conclusion: Terminating the difficult laparoscopic cholecystectomy, with elective interval 'second look' laparoscopy, is a safe alternative to conversion to open cholecystectomy, minimising morbidity. Our data commend this approach as a useful strategy for the modern laparoscopic emergency surgeon.

References:
1. 1.References is missing

Disclosure: No significant relationships.

P070

ROBOTIC RIGHT COLECTOMY FOR HAEMORRHAGIC RIGHT COLON CANCER

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Introduction: Right colon cancer rarely presents as an emergency. Common symptoms are mild anemia, weight loss, changes in bowel transit or palpable abdominal mass. Patients are mostly aged with frequent co-morbidities and sometime malnutrition. Minimally invasive procedure for right colectomy have progressively increased and robotic surgery still does not have a defined role in colonic surgery, but, its indication has slowly but constantly increased. Anyway in the vast majority of cases robotic surgery is performed in a programmed setting.

Materials and methods: We present the case of a 86 years-old woman presenting for massive rectal bleeding, severe anemia (Hb 6 g/dL) and hemodynamic instability. A CT scan showed a right colon neoplasia with active bleeding; no distant metastasis were present in the liver and lungs. The patient was admitted in Intensive Care Unit for resuscitation and blood transfusion. A colonoscopy did not show any other bowel polyp, while a constant bleeding from the right colon mass was temporarily arrested with endoscopic procedures.

Results: A robotic right colectomy in a semi-urgent setting was indicated for the recurrent rectal bleeding. An ileo-colostomy was performed for the poor nutritional status of the patient. The post-operative was unremarkable with good health condition after 1 month of follow-up. The tumor was a pT3N0, no adjuvant chemotherapy was indicated.

Conclusion: Robotic surgery still not have a definite role in colo-rectal surgery, but its indication is growing constantly; usually performed for specific sub-groups of programmed patients, it may be used as well in a semi-urgent setting with good results.

Disclosure: No significant relationships.

P071

RETROSPECTIVE STUDY FOR STRATEGY OF LARGE BOWEL OBSTRUCTION BY COLON CANCER: IS PREOPERATIVE DECOMPRESSION NECESSARY?

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Introduction: Although malignant large bowel obstruction (LBO) needs urgent or emergent operation, we sometimes take time to decide the strategy, whether we do preoperative decompression (stent, long tube) or not, and which operative procedure is better.

Materials and methods: 69 patients who admitted due to malignant LBO during a 6-year period were included. We retrospectively collected data of cancer location, long-tube decompression+/−, operative procedure, and analyzed which factor is associated with complications or hospital length of stay.

Results: Of 69 cases, 23(33 %) is right-sided, 46(67 %) left-sided. Long-tube procedure was performed 33 cases; 20 by transanal, 8 by transoral, 5 both. Of 25 cases performed transanal long-tube procedure, 9(36 %) failed and 1 case resulted in death because of perforation during the procedure. 44 cases(64 %) ware performed primary resection and anastomosis(PRA), 11(16 %) resection and colostomy/ileostomy, 8(12 %) two-staged operation, 6(8 %) colostomy only. Although complications were found in 38 cases; 5 anastomotic leakage, 3 dehiscence of midline incision, 10 paralytic ileus, 2 retained abscess, 4 pulmonary disorder, 1 endoscopic

perforation, these were not associated with preoperative decompression and operative procedure. About hospital length of stay, 21.4 days in those performed preoperative decompression and 22.1 days in those without decompression, which resulted in no significant difference.

Conclusion: In malignant LBO cases, preoperative decompression or operative procedure seems not to be associated with hospital length of stay and complications. Transanal long-tube procedure has not so high success rate and should be considered about critical complication.

Reference:

1. Breitenstein S. Systematic evaluation of surgical strategies for acute malignant left-sided colonic obstruction. Br J Surg. 2007;94:1451–60.

Disclosure: No significant relationships.

P072

EMERGENCY ABDOMINAL SURGERY IN PATIENTS OVER AGE 80: STUDY OF MORTALITY PREDICTING FACTORS

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Introduction: The aim of the present study was to determine factors predicting mortality in elderly patients.

Materials and methods: Subjects were 76 patients aged 80 years and older who underwent emergency abdominal surgery. Main outcome measures included background of the patient's physical condition, morbidity and mortality, and scoring system (ASA classification, Comorbidity index and POSSUM). The outcome at 30 days postoperative and at middle term was researched. Factors affecting mortality were also evaluated by univariate and multivariate analysis.

Results: Forty-six (60.5 %) of the patients were female, with an average age of 85 years (range 80–98). The most frequent surgical indication was strangulated hernia. Mortality rate within 30 days after surgery was 32.9 % and at middle term 43.4 %. Two independent risk factors of mortality were characteristic of the elderly patients: ASA class >3 and physiologic POSSUM score ≥3. Univariate analysis showed other mortality risk factors within 1 month after operation: Comorbidity index >7, white cell count >10,000/mm^3, multiple organ dysfunction syndrome, POSSUM operative score ≥20 and medical complication. With a gap of 8 months (range 2–16), body mass index, cognitive dysfunction postoperative and institutionalization were mortality risk factors.

Conclusion: Characterization of risk indicators for mortality in the elderly undergoing emergency surgery is essential and may lead to improve practices.

Reference:

1. Fukuda N, Wada J, Niki M, Sugiyama Y, Mushiake H. Factors predicting mortality in emergency abdominal surgery in the elderly. World J Emerg Surg. 2012;7:12.

Disclosure: No significant relationships.

P073

ACUTE MESENTERIC ISCHEMIA: OPERATIVE AND LONG-TERM RESULTS IN A COMMUNITY HOSPITAL

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Introduction: Acute mesenteric ischemia is a life-threatening emergency with high mortality. Little progress has been made in the last decades in terms of early diagnosis, management and overall prognosis. Aim of this study was analyse operative and long-term results.

Materials and methods: Retrospective study covering a 5-year period (October 2008–October 2013). The relation of site of occlusion to etiology, extent of infarction, and survival following resection and revascularization is described. Included is an analysis of the technical factors and specific complications of revascularization.

Results: Surgery for acute mesenteric ischemia was performed in 24 patients (mean age 71.4 years). Diagnosis was established by CT angiography or laparotomy. Underlying disease was atrial fibrillation in 14 cases, atherosclerosis in 7 and 3 patients had a massive intestinal ischemia. Exploratory laparotomy was performed in 5 cases with 100 % mortality. Revascularization without bowel resection was performed in 6 cases with 66.6 % mortality. Resection without revascularization was performed in the remaining 13 cases with 38.5 mortality. In 3 cases, second look procedure was necessary to evaluate the viability of the intestine. Additional resection was mandatory in 2 patients. Postoperative short bowel syndromes occurred in 4 patients.

Conclusion: Acute mesenteric ischemia still carries a high morbidity and mortality rate. Early diagnosis by CT-angiography and aggressive surgical approach with a liberal indication for laparotomy are important to improve outcome in patients with acute mesenteric ischemia.

Reference:

1. Ottinger LW. The surgical management of acute occlusion of the superior mesenteric artery. Ann Surg. 1978;188(6):721–31.

Disclosure: No significant relationships.

P074

GASTROSTOMY TUBE DISLODGMENT ACUTE PANCREATITIS

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Introduction: Percutaneous gastrostomy (PEG) is the preferred root for long term feeding of patients who cannot be fed orally. The use of percutaneous gastrostomy carries a low risk of complications. Listed among life threatening complications of this procedure is obstructive pancreatitis that results from migration of the tube's balloon to the 2nd part of the duodenum. This complication is rare and only scarcely described in the English literature.

Materials and methods: We describe a case of a patient who presented with abdominal pain eventually diagnosed with acute pancreatitis. The apparent cause was the migration of the Foley catheter used as a permanent gastrostomy to the 2nd part of the duodenum, obstructing the ampulla of vater.

Results: The gastrostomy tube was pulled back and secured. The patient was given a supportive treatment and her symptoms were significantly relieved, and was discharged after uneventful recovery.

Conclusion: PEG is considered safe and effective method for providing long term enteral nutrition. Tube related complications are often managed by replacing the PEG with a Foley catheter or other balloon-tube gastrostomy as a bridging solution at the emergency

room or the patient's bed side. We review the eleven cases described in the literature, discuses the mechanism and the measurements advised to prevent this iatrogenic cause of acute pancreatitis.

References:
1. Grant MD. Gastrostomy placement and mortality among hospitalized Medicare beneficiaries. JAMA. 1998;279.
2. Shah AM. Replacement gastrostomy tube causing acute pancreatitis: case series with review of literature. JOP. 2012;13.

Disclosure: No significant relationships.

P075

COMPARATIVE ANALYSIS OF OUTCOMES IN PATIENTS WITH PANCREATITIS DUE TO ALCOHOL AND GALL BLADDER STONES: A REVIEW OF A SMALL SERIES FROM SOUTH INDIA

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Introduction: The severity of acute pancreatitis forms a continuum, and the average mortality rate approaches 2–10 %. Aim To look at the demographic profile of patients with acute pancreatitis due to gall stones and alcohol and compare the complication rate. To analyse outcome using APACHE II

Materials and methods: A prospective study done in Sri Ramachandra Medical College and Hospital from April 2011–September 2013. All patients with a diagnosis of acute pancreatitis due to alcohol (35 patients) or gall stone induced pancreatitis-20. Pancreatitis due to other causes or of unknown etiology were excluded (35 patients).

Results: Out of 90 patients that had acute pancreatitis, 55 patients constituted the study population. Males accounted for 83.6 %.The incidence of local complications was higher with a mean APACHE-II score of 9.56 (P value of 0.023). A mean APACHE-II score of 20.36 was associated with an increased risk of development of systemic complications (P value $\leq$ 0.0001). Alcohol induced pancreatitis had a mean CTSI of 5.69. Gall stones pancreatitis had a mean CTSI of 3.85. (P value of 0.028). Based on our results we found that patients with a mean APACHE-II score of 14.94 required ICU care (P value = 0.003). A higher APACHE-II score was associated with a higher risk or mortality (P value of <0.0001).

Conclusion: In patients with alcohol induced pancreatitis and gall stone induced pancreatitis, when the APACHE-II score increased then the risk of complications; local, systemic and mortality increased significantly.

Reference:
1. Lankisch PG, Blum T, Maisonneuve P, et al. Severe pancreatitis: when to be concerned? Pancreatology 2003;3:102.

Disclosure: No significant relationships.

P076

LAPAROSCOPIC VERSUS OPEN REPAIR OF PERFORATED PEPTIC ULCER

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Introduction: This study aims to compare the benefits of laparoscopic repair and those of open repair for patients with perforated peptic ulcer (PPU) who showed mild to moderate symptoms.

Materials and methods: We reviewed patients with PPU of the duodenum and pyloric antrum who underwent laparoscopic or open repair between 2007 and 2012. Patients with shock status, gastric cancer, giant perforations (diameter, >19 mm), and who underwent procedures 24 h after the onset of symptoms were excluded. Data including demographics, operative time, initiation of postoperative oral intake, duration of hospitalization, morbidity, and mortality of patients in the laparoscopic or open group (group L or group O, respectively) were collected.

Results: 55 patients who underwent laparoscopic repair and 19 patients who underwent open repair matched the criteria for this study. According to patients' demographics, no significant difference was observed between both groups except for creatinine and hemoglobin levels. Operative time in group L was significantly longer than that in group O (94 vs. 75 min). Initiation of postoperative oral intake was almost similar (3.5 vs. 4.5 days); however, duration of hospitalization in group L was significantly shorter than that in group O (8 vs. 18 days). Morbidity in group L was lower than that in group L (16 vs. 32 %), although not significant. The complications in group L included wound infection (4), intra-abdominal abscess (1) and suture site leakage (1).

Conclusion: Operative time of laparoscopic repair for PPU was longer than that of open repair; however, the duration of hospitalization shorter.

Disclosure: No significant relationships.

P077

RISK FACTORS ASSOCIATED WITH INCREASED MORTALITY IN PATIENTS WITH PERFORATED GASTRODUODENAL ULCER, 3-YEAR EXPERIENCE IN A UNIVERSITY HOSPITAL

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Introduction: Gastric and duodenal ulcers are most important and expensive amongst gastrointestinal diseases.

Materials and methods: A 3-year retrospective study was conducted in Riga East Clinical university hospital "Gailezers". Patients with a gastroduodenal peptic ulcer perforation were included and divided into 2 groups—admitted within or after 24 h form the onset of the disease.

Results: Totally 256 patients with ulcer perforations were included. The first group consisted of 210 patients with a median age of 45 years admitted within 24-h period. The second group consisted of 46 patients with a median age of 58 years admitted later than 24 h from the onset. Positive free air on X-ray confirmed diagnose in 68 % of all patients. CT scan was positive in 89.6 % and in 85.7 % in the first and second group respectively. Free fluid in the abdominal cavity by ultrasound was found in 61.5 % of patients who were admitted within 24 h and in 75 % of patients admitted later, $p = 0.129$. C-reactive protein was higher in patients who were admitted later than 24 h (45.7 mg/l), compared to earlier admitted patients (2.7 mg/l), $p = 0.001$. Formation of abscess, wound infection, MODS and sepsis were more often observed in the second group 28.3 vs. 4.8 % in the first group, $p < 0.001$. Significantly higher mortality was observed in the second group 8.4 % than 1.4 % in the first group, $p = 0.006$.

Conclusion: Patient age, the length of anamnesis more than 24 h and severe comorbidities are the main risk factors associated with the increased mortality in patients with perforated peptic ulcer.
Disclosure: No significant relationships.

P078

DECREASE AT PEPTIC ULCER PERFORATION PREVALENCE

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Introduction: At last time decrease in the tendency to the peptic ulcer perforations is reported at medical literature. We are going to examine the patients who have gone under surgery because of the peptic-ulcer perforation.
Materials and methods: Cases which are operated because of peptic ulcer perforation between 2005–2013 have been examined retrospectively.
Results: Total case count is 130 and 105(81 %) of these cases are duodenum perforation and 25(19 %) of these cases are gastric perforation. Prevalence of ulcer perforation was high between 2005–2008 but from 2009 up to day prevalence is going down significantly. For example at 2007 in 31 cases, at 2011 in 3 cases there have seen perforation. When we examine these patients medical history we see that none of them has used anti-ulcer medication before the surgery.
Conclusion: Increase of using H2-receptor antagonists-proton pump inhibitors decreased the prevalence of perforations. In our series striking point is that perforations have seen in cases which didn't use medication. All cases in our series are patients who didn't use medication before the surgery. If patients in our series has anti-ulcer treatment they shouldn't face the perforation and shouldn't go down under the surgery. Importance of protective medicine comes front at here. Society should informed about the importance of routine medical examinations of the family practitioners to prevent diseases which can be ended up with surgery. We believe that by this peptic ulcer perforations should occur more and more less.
Reference:
1. Hermansson M, Ekedahl A, Ranstam J, Zilling T. Decreasing incidence of peptic ulcer complications after the introduction of the proton pump inhibitors, a study of the Swedish population from 1974–2002. BMC Gastroenterol. 2009;9:25.
Disclosure: No significant relationships.

QUALITY IN TRAUMA CARE I

P079

DAMAGE CONTROL SURGERY AS INITIAL APPROACH TO SEVERE ABDOMINAL SEPSIS

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Introduction: The abdominal sepsis is associated to high mortality. The open abdomen technique is a surgical alternative to try to change its evolution. The open abdomen technique is currently indicated for damage control, severe intra-abdominal sepsis, abdominal compartment syndrome. Those critic patients with intra-abdominal sepsis are currently included in the application of damage control surgery.
Materials and methods: 52 year old woman transferred from another hospital due to septic shock subsequent to peritonitis originated by an intestinal perforation after an eventroplasty intervention. The following procedure is adopted: intestinal repair, cleansing of the abdominal cavity and placement of a vacuum system for temporary closure of the cavity. After 24 h. the cavity is checked and the vacuum system renewed. 5 days later the cavity is closed using a wall replacement mesh. Male aged 77 presents abdominal evisceration with secondary peritonitis due to intestinal anastomosis failure. We proceed to resect the anastomosis and to leave proximal and distal intestinal loop closed. We review in theatre after 48 h proceeding to perform a new anastomosis. We place successive vacuum systems till the wall reparation with a mesh.
Results: DISCUSSION The relaparotomy on demand, which involves performing a first process, trying to close the abdominal wall if possible, and re-explorations for future clinical evaluation, is a valid strategy to consider.
Conclusion: The open abdomen technique combined with damage control surgery can help to improve the prognosis of our patients.
References:
1. Iñaguazo. Rev Chil Cirugía 2009;61(3):294–300.
2. Expósito. Cir Ciruj 2002;70:31–5.
3. Barker. J Trauma 2000;48:201–6.
Disclosure: No significant relationships.

P080

CANDIDA INFECTION AND DISTRIBUTION OF CANDIDA SPECIES AMONG SURGICAL CRITICALLY ILL PATIENTS

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Introduction: Candida species consist of a major pathogen among critically ill patients. However, little is known about the Candida infection in patients that are admitted in surgical oncology departments. The present study aims to identify and quantify Candida species among surgically oncology patients that are complicated by systemic candidiasis.
Materials and methods: A 2-year retrospective, single-centered study was conducted in a tertiary oncology hospital. All patients that were hospitalized in the surgical oncology unit during the study period and were diagnosed with surgical infection by candida were included. Candida species from blood samples were isolated and identified.
Results: 14 cases of oncology patients were treated of surgical infection caused by Candida. 5 patients were males compared to 9 women. The most frequent isolate was *C. tropicalis*-7 cases out of 14(50 %), followed by *C. parapsilosis*-4 out of 14 (28.6 %) and *C. albicans*-3 patients (21.4 %). Comparatively, the predominant pathogen Candida among oncology patients admitted in the Intensive Care Unit was *C. parapsilosis*-36.3 %, followed by *C. albicans*-31.8 % and *C. tropicalis*-13.6 %. *Candida glabrata* and *C. krusei* were randomly identified.
Conclusion: It is worth-noticing that in the present report the most frequent pathogen of systemic candidiasis among surgical critically ill

patients was *Candida tropicalis*. According to current data *Candida albicans* is identified to be the commonest cause of fungal infection. Further evaluation of fungal surgical infections should be attempted.
References:
1. Sqanga G. Clinical aspects of invasive candidiasis in the surgical patient. Drugs 2009;69(Suppl 1):29–32.
2. Eqqiman P, Pittet D. Postoperative fungal infections. Surg Infect. 2006;7(Suppl 2);555–6.
Disclosure: No significant relationships.

P081

FACTORS ASSOCIATED WITH COLONIZATION OF BRONCHIAL SECRETIONS BY MULTIDRUG RESISTANT BACTERIA IN ICU TRAUMA PATIENTS

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Introduction: To determine factors associated with colonization of the respiratory tract by multiresistant Gram-bacteria in ICU trauma patients.
Materials and methods: We retrospectively studied all mechanically ventilated patients treated in ICU for more than 5 days during 1.01.2011–31.12.2012 and their respiratory tract was colonized by multiresistant Gram-bacteria. Data recorded were age, sex, cause for hospital admission, Injury Severity Score (ISS), length of ICU stay and outcome. T-student test, χ^2 test and Cox regression were used for statistical analysis.
Results: 181 patients (128 men and 53 women), fulfilled inclusion criteria for the study. Among them 77(42.5 %) were multiple injured and 101(57.5 %) were suffering from surgical–medical diseases. Multidrug resistant Gram-negative bacteria cultured in bronchial secretions were *Pseudomonas aeruginosa*, *Acinetobacter baumannii* and *Klebsiella pneumoniae*. Bronchial secretions' colonization by multiresistant Gram-bacteria was significantly less frequent in multiple injuries than in surgical and pathological patients ($p < 0.001$). Age, ISS score and outcome were not significantly correlated with colonization. Male gender was significantly associated with colonization by MDR bacteria (odds ratio = 2, $p = 0.004$). Also, length of ICU stay in days was strongly correlated with colonization (odds ratio = 1.02 for each subsequent day, $p < 0.017$).
Conclusion: Gender and length of ICU stay are significant factors for bronchial secretions' colonization by multiresistant Gram-bacteria. The colonization of multiple injured patients needs more study.
Reference:
1. Arvaniti, et al. The importance of colonization pressure in multi-resistant *Acinetobacter baumannii* acquisition in a Greek intensive care unit. Crit. Care. 2012;16:R102.
Disclosure: No significant relationships.

P082

LUNG ABSCESS COMPLICATING PNEUMONIA CAUSED BY MULTIDRUG RESISTANT GRAM-BACTERIA IN PATIENTS WITH SEVERE THORACIC TRAUMA

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Introduction: We describe five cases of lung abscess complicating MDR bacterial pneumonia in patients with severe thoracic trauma.
Materials and methods: Five intubated patients with severe thoracic trauma, aged 20 to 50 years, were admitted to ICU. All had multiple rib fractures, pulmonary contusions and atelectasis. Two had haemo-pneumothorax treated with chest tube placement. Ten to fifteen days after admission clinical and laboratory signs of pneumonia were appeared.
Results: MDR *Klebsiella pneumoniae* was isolated from bronchial secretions in four patients. *Acinetobacter baumannii* sensitive to carbapenem and colimycin was isolated in one patient. For the treatment of pneumonia caused by MDR klebsiella Colimycin, gentamycin and tigecycline were administered while meropenem and colimycin were used for acinetobacter. Over the next few days the patients have not improved and a week later pulmonary abscess was revealed by CT scan. Three patients underwent surgical drainage of abscesses. MDR *Klebsiella pneumoniae* was isolated from drained fluid. In one patient CT-guided drainage was performed and the cultured fluid showed Acinetobacter, Klebsiella and Candida. In one patient the abscess drained automatically during physical therapy. Three patients, died while two were improved and left the ICU.
Conclusion: Lung abscess complicating MDR bacterial pneumonia is acute and urgent situation requiring combination therapy with antibiotics and abscess' drainage.
Reference:
1. Wang J-L, et al. Changing bacteriology of adult community-acquired lung abscess in Taiwan: *Klebsiella pneumoniae* versus anaerobes. Clin Infect Dis. 2005;40:915–22.
Disclosure: No significant relationships.

P083

NECROTIZING SOFT TISSUE INFECTIONS (NSTI) IN GENERAL AND BONE SURGEON PRACTICE

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Introduction: NSTI are rare, rapidly progressive soft tissue necrosis with systemic toxicity and high mortality rate. Progressive infection and necrosis involve all layers within soft tissue compartment.
Materials and methods: Establishing an early diagnosis is greatest challenge. Combination of clinical signs, laboratory tests, radiographic imagining and high index of suspicion leads to proper diagnosis. Early, profound, aggressive and repeated surgical debridement should not be delayed. Empiric broad spectrum iv antibiotic therapy should be started as soon as possible. Septic cases require intensive supportive therapy in ICU.
Results: Excessive soft tissue debridement and even amputations leads to the enormous overall disability.
Conclusion: Despite low incidents NSTI occur often enough that surgeon can encounter at least with one such patient during surgical practice.
Disclosure: No significant relationships.

P084

FROM EMERGENCY ROOM TO VENOVENOUS EXTRACORPOREAL MEMBRANE OXYGENATION: A CASE REPORT ABOUT ECMO THERAPY AS PRIMARY CARE

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Introduction: In case of an accident with fractures forming part of a polytraumatic event, the chest injury is one of the most limiting factors for therapy. As an alternative to conventional ventilation, extracorporeal membrane oxygenation (ECMO) can be used to avoid high-pressure ventilation during acute respiratory distress syndrome.
Materials and methods: We report of an 18 year old male car driver who strayed from the road and fell 15 m in the depth by landing on the roof of his car in a backyard. The Injury Severity Score was 29 points for this pattern of injuries (haematopneumothorax left, sternum fracture, pneumothorax right, pneumomediastinum, intracerebral bleeding, scalping injury occipital, fracture of the 9th thoracic vertebral body and complete paraplegia).
Results: The patient arrived in our hospital 12 h after the accident. As the secondary survey in our trauma room started, the decision to implant an ECMO was due to the deteriorated oxygenation. The patient developed afterwards a SIRS, which was declining after 72 h and the patient started breathing spontaneously. A heparin low dose therapy was started after the initial ECMO therapy without anticoagulation. After 7 days the ECMO therapy was terminated and the patient recovered from illnesses soon.
Conclusion: The vv-ECMO therapy for patients with no opportunity for lung-protective ventilation has become a successful therapy to improve oxygenation. In our case, the vv-ECMO was necessary and performed due to a lack of anticoagulation as a result of a traumatic brain injury.
Reference:
1. Cordell-Smith, et al. Traumatic lung injury treated by ECMO. Injury. 2006.
Disclosure: No significant relationships.

P085

EVALUATING TRAUMA CARE: INCIDENCE AND RISK FACTORS ON MAJOR TRAUMA PATIENTS OF A SURGICAL MULTIDISCIPLINARY ICU IN TERTIARY TRAUMA CENTER HOSPITAL OF ATHENS GREECE

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Introduction: Trauma represents 4th cause of death in Greece, needs intensive care for a long time and is associated with increased cost, morbidity and mortality.
Materials and methods: In order to identify factors associated with outcome were retrospectively reviewed all major trauma patients admitted to our ICU during the years 2011–2012 and met the following criteria: ISS score >16, intubation and mechanical ventilation, sedation and analgesia. Clinical and demographic data, gender, age, ISS score, injury types, ICU length of stay and outcome were recorded.
Results: During years 2011–2012, 346 patients were admitted to the 1st surgical ICU, 109 met the trauma study entry criteria. 91♂(83.48 %) mean age 66 years (19/83) and 18♀(16.52 %) mean age 47 years (23/79). ISS score on admission registered was 32.59 ± 13.42. Injury types recorded: trauma brain injury n = 48(44 %), thoracic trauma n = 28(25.6 %), spinal cord injuries n = 26(23.8 %) and burning trauma n = 11 patients (10 %). All patients were intubated and mechanically ventilated; sedatives and analgesics were given as required. The total length of ICU stay was 2,061 days (1/151) with mean duration 19.26 ± 23.6 days. ICU mortality was 27.5 % while 72.5 % of patients survived. Patients who survived had significantly lower age and ISS score compared with those who died (p = 0.009 and p = 0.001 respectively). Length of ICU stay did not significantly affect mortality.
Conclusion: The outcome of multiple trauma patients requiring intensive therapy is influenced by the patients' age and the severity of injury.
Reference:
1. E.U. INJURY DATABASE (2008–2010), Gennarelli TA, et al. The Abbreviated Injury Scale 2005. Manual of Definitive Surgical Trauma Care. 2nd ed. Barrington: Association for the Advancement of Automotive Medicine; 2005.
Disclosure: No significant relationships.

P086

ALPINE SKIING INJURIES IN FINLAND: A TWO-YEAR RETROSPECTIVE STUDY BASED ON QUESTIONNAIRE AMONG SKI RACERS

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Introduction: The aim of the present study was to document and analyse the injuries of skiers participating in competitive alpine skiing in Finland.
Materials and methods: The inclusion criterion was an injury in alpine skiing resulting in a training pause longer than 1 week Athletes of all ages were included. The study period was from the start of the season of 2008–2009 to end of the season of 2009–2010
Results: There were 61 injuries (36 males with a median age of 14 years, 25 females with a median age of 14) fulfilling the inclusion criteria. Ligamentous knee injury was the most frequent and lower leg fracture the second common injury, respectively. There was a female dominance in the ACL injuries. The overall training pause was 26 weeks after the ACL injury and 17 weeks after the lower leg fracture, respectively.
Conclusion: Alpine skiing is related to a relatively high risk of injury, and the most common and most disabling injuries affect the knee and the lower leg. The increasing number of ACL injuries has to be stressed, and major actions are to be done in terms of fighting this progress. A Continuous and systematic review of injuries is the way to monitor the effects of changes made in terms of safety.
Reference:
1. Bergström K. A., Bergström A., Ekeland A. Organisation of safety measures in an Alpine World Junior Championship. Br J Sports Med. 2001;35:321–4.
Disclosure: No significant relationships.

P087

IS TRAUMA IN SWITZERLAND ANY DIFFERENT?: THE FIRST 5 YEAR REPORT FROM A SWISS TRAUMA CENTER

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Introduction: Switzerland, country with the highest health expenditure per capita, lacks data on trauma care and system planning. Recently, 12 trauma centers were designated and will be reassessed through a future national trauma registry. Lausanne University Hospital has launched the first Swiss trauma registry in 2008, containing the largest database on trauma activity nationwide.
Materials and methods: Prospective analysis of data from consecutively admitted shockroom patients from 1.1.2008 to 31.12.2012. Shockroom admission is based on physiology and mechanism of injury, assessed by prehospital physicians. Management follows a surgeon-lead multidisciplinary approach. Injury coding is performed by AAAM-certified coders.
Results: 1,599 trauma patients were admitted. Patients were predominantly males with a median age of 41.4 years and median ISS of 13. Rate of ISS >15 was 42 %. Principal mechanisms of injury were road traffic (40.4 %) and falls (34.4 %) with 91.5 % blunt trauma. Principal patterns were brain injury (64.4 %), chest (59.8 %) and extremity/pelvic girdle (52.9 %). Severe (AIS $\geq$3) orthopaedic injuries, defined as extremity and spine injuries together, accounted for 67.1 %. 29.1 % underwent immediate intervention, mainly by orthopaedics (27.3 %), neurosurgeons (26.3 %) and visceral surgeons (13.9 %). 43.8 % underwent a surgical intervention within the first 24 h and 59.1 % during their hospitalization. In-hospital mortality for patients with ISS >15 was 26.2 %.
Conclusion: This is the first five-year report on trauma in Switzerland. Trauma workload is similar to other European countries. Despite high levels of health care, mortality exceeds published rates by >50 %[1]. Regardless the importance of a multidisciplinary approach, trauma remains a surgical disease and needs dedicated surgical resources.
Reference:
1. Davenport RA. The British journal of surgery 2010;97:109–17. On behalf of the Committee for Trauma: J. Bloch, O. Borens, R.T. Daniel, A. Denys, M. Oddo, M. Pasquier, S. Schmidt, P. Schoettker, T. Zingg.
Disclosure: No significant relationships.

P088

EMERGENCY UNITS AND INFORMED CONSENT

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Introduction: The application of informed consent procedures to patients admitted emergency units is legal and ethical necessity. In emergency departments for medical/surgical application, patients often are not available to participate about their own decisions. In this situation; emergency nurses and health care professionals working in the units live more ethical dilemmas. Today most discussed ethical issues for emergency patient is the informed consent. Although there is an emergency case, these questions must be answered in the informed consent and patients and their families must be informed. Primarily in terms of the ethical and legal obligations to the emergency room, the patient, must determine whether there is an urgent need for intervention or not.
Materials and methods: The detection is important why fully conscious emergency patient reject the application: because of fear and panic of this situation or individual preferences. The adequacy of informed consent should be taken by patient relatives when the patient is unconscious. In the absence to the patient's relatives; patient's life-saving procedure, as decided by the health care professional can be applied. This is the accepted approach to the ethical and legal aspects.
Results: As a result; emergency health care professionals, have a responsibility to preserve and sustain the patient's life.
Conclusion: According the patient rights and ethical procedures should insist on receiving informed consent.
Reference:
1. Ersoy N, Şenses Ö. Informed consent in emergency medicine. Turk J Trauma Emerg Surg. 2010.
Disclosure: No significant relationships.

EDUCATION

P089

CLINICAL RESEARCH IN EMERGENCY AND CRITICAL CARE UNIT: WHY, HOW AND WHEN?

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Introduction: Research is pivotal part of evidence-based practice in emergency and critical care. It is important for integrating biomedical and public health issues for preventing injury and improving patient outcomes.
Materials and methods: To understand the need for research in emergency settings and to look for major obstacles for conducting research in emergency and critical care units. We reviewed research engines as PubMed, MEDLINE and EMBASE between January 1980 and January 2013 using key words "emergency department", "critical care", "research" and "ethics" for searching.
Results: Research within emergency care is slow or inexistent due to time and financial constraints as well as a lack of a research tradition. There are many barriers in conducting research studies in emergency situations as who, what, when and how to get patient consent. We need to establish a structured plan to assess and track decision-making capacity, develop a consent process that is matching with the study risk, consider a multistep enrollment and consent strategy, and develop an integrated approach to recruitment into studies.
Conclusion: Emergency medicine environment is highly pressurised, emotional, and overburdened. Time for research is at particular risk of interruption of immediate interventions. Ethical issues abound particularly relating to informed consent. Research in emergency is still in its earlier stage. So, there is a strong need for extensive research in emergency setting through community awareness, resource management, ethics, collaborations, capacity building and development of research interest for improvement of patient care and outcomes.
References:
1. Jansen, et al. Intensive Care Med. 2007;33:894.
2. AACN. Adv Crit Care. 18(4):352–5.
Disclosure: No significant relationships.

P090

IMPORTANCE OF "NúCLEO DE ENSINO E PESQUISA EM URGêNCIAS": NEPUR-UFF IN THE EDUCATIONAL ROLE IN URGENCY AND EMERGENCY

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Introduction: The "Núcleo de Ensino e Pesquisa em Urgência" from the "Universidade Federal Fluminense" (NEPUr-UFF) is a national reference in the educational, scientific and extension of knowledge in the areas of emergency and urgency.
Objective: Train professionals from within and outside the health issues in urgency/emergency.
Materials and methods: During 1 year, there were several educational workshops involving topics related to emergencies. At the end of the workshops were filled by students evaluation sheets about the training technique—in which we assessed: objective, connection between themes, content and practical activities—and the knowledge of the participants before and after the completion of the course, the criteria being used weak (W), regular (R), good (G), very good (VG) and excellent (E) in the questionnaires.
Results: Regarding the technical evaluation of the training—0 % W, 0 % R, 4,65 % G, 16,03 % VG, 79,32 % E.
Regarding the students' knowledge before training—10.2 % evaluated their own knowledge as (W), 29.5 % as (R), 58.3 % as (G), 2 % (VG) and 0 % as (E).
Regarding the students' knowledge after training—0 % (W), 0 % (R), 7,34 % (G), 42,58 %(VG) e 50,08 % (E).
Conclusion: From the results obtained, it is perceived excellence in teaching NEPUr-UFF, highlighting its importance in describing the course participants in the thematic area discussed to better assist victims of trauma.
Reference:
1. Troncon LEA. AVALIAÇÃO DO ESTUDANTE DE MEDICINA, Medicina, Ribeirão Preto 1996;29:429–9. outubro/dezembro 1996.
Disclosure: No significant relationships.

P091

IMPLEMENTATION OF FREE LABORATORIES OF URGENCIES BY BRAZILIAN FEDERAL UNIVERSITIES

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Introduction: The first quality care for trauma victims is crucial for a better prognosis. According to Ordinance 2048 05/11/2002 MS there is fragmentation, low utilization and inadequate curricula directed to emergencies in traditional training. Universidade Federal Fluminense (UFF) founded in 2004 the Center for Teaching and Research in Emergency (NEPUr) and, through the Pro-Rector Extension-UFF, idealized a pioneering project, the Laboratory of Emergencies. Free training goals in traumatic and non-traumatic emergencies and awareness about prevention of incidents, aiming to train 400 people/month/h class.
Materials and methods: Lectures and practical sessions lasting for 4 h. The meetings targeted audience is health professionals—group 1; undergraduate healthcare people—group 2 and several areas—group 3.
Results: 172 classes, from July 2012 to April 2013 resulted in 8,488 with an average attendance of 49.34 Attendance/class attendance and 771.63/month. Compared to group 1: 3,850 attendance in 73 classes, average 52.73 people/class, group 2: 53 2,560 attendance in classes, average 48.30 people/class and group 3: 66 lessons in attendance in 2,078, averaging 31.48 people/class.
Conclusion: There was a greater demand for courses in group 1, followed by group 2, indicating a failure in the university curriculum frameworks. We suggest setting up laboratories of urgency in national territory, in accordance with the National Policy for Emergencies.
Reference:
1. Atendimento pré-hospitalar ao traumatizado, PHTLS/NAEMT. 7th ed. Rio de Janeiro: Elsevier; 2011.
Disclosure: No significant relationships.

P092

THE ROLE OF THE UNIVERSITY IN THE PREPARATION OF SOCIETY TO DISASTER SITUATIONS

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Introduction: Medical knowledge about behavior and attendance in disaster situations is neglected within the curriculum of the courses in the area of health. In a medical perspective, we talk about disaster when the number of patients requiring care within a given period of time is greater than the human and material resources available, being necessary to seek help outside.
Objective: Describe the experiences of NEPUr-UFF in training for military and civilian operations in disaster.
Materials and methods: Qualitative-descriptive study that gathered and described data and experience gained by the members from NEPUr-UFF in the training of civilian and military people to act in situations of disasters over the past 11 years.
Results: The program "NEPUr-UFF Helping to Save Lives" trained, for free, 49,316 people in the 11-year period, representing an average of 373 people/month. During some disasters that occurred in Brazil, through field observation, it was found that soldiers and civilians were not prepared to act in major disasters. Aiming to change this reality, NEPUr-UFF offers training civilian and military so that they can act in a systematic manner in the incidents with mass casualties.
Conclusion: To intervene in the natural history of the disaster it is essential to prepare the population. The NEPUr performs a pioneer university work in this area with great expression in care in disasters.
Reference:
1. González PA, Carril FG, Espinar MHGAC. El concepto de desastre y su aplicacion em Astúrias. Rev San Hig Púb. 1994;68:573–8.
Disclosure: No significant relationships.

P093

ADVANCED DISASTER MEDICAL RESPONSE COURSE (ADMR): AN EFFECTIVE METHOD FOR LEARNING ABOUT MEDICAL DISASTER MANAGEMENT

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Introduction: ADMR course is promoted by the PanAmerican Trauma Society (SPT) and is performed in Brazil supported by the Brazilian Trauma Society (SBAIT). Lasting a total of 8 h, it has the objective to instruct healthcare professionals on how to medically respond on disasters situations. The present study aims to investigate whether the ADMR course helps increasing the knowledge on the subject.
Materials and methods: A pre and post-test were conducted, both exactly the same, with ten questions each. The analysis was based on assessments of twelve Brazilian cities where a total of 17 courses were performed between the years of 2011–2013 summarizing a number of 1,347 participants.
Results: The participants were predominantly medical students and physician. In all studied locations there was a significant increase between pretest and posttest scores, ranging from 9.64 to 51.54 % success rates. The average success rate was of 28.77 % ($\pm$1.1 for pretest and $\pm$0.7 for posttest), demonstrating knowledge improvement after taking the course.
Conclusion: The ADMR course is an effective learning tool for preparing to disasters situations.
Reference:
1. Abolghasemi H, et al. International medical response to a natural disaster: lessons learned from the Bam earthquake experience. Prehosp Disaster Med. 2006;21(3):141–7.
Disclosure: No significant relationships.

P094

ROLE OF THE CENTER FOR TEACHING AND RESEARCH IN EMERGENCIES (NEPUR-UFF) IN EDUCATION IN PREHOSPITAL CARE EDUCATION OF BRAZILIAN ARMY

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Introduction: The history of pre-hospital care (PHC) emergency merges to the history of world wars; one of its landmarks is the development of the "flying ambulances" in the eighteenth century, by the Baron Dominick Jean Larrey, chief surgeon of Napoleon Bonaparte's army.
Objectives: Prepare military people for APH activities in Brazilian Army (EB). This study exposes the objective of providing specific training for military health personal to be prepared in PHC in risky activities, in accordance to the Health Department rules.
Materials and methods: Based on the Norm-EME 129 of September 15, 2011 which deals with the implementation of PHC, it was developed by the EB-UFF NEPUr a semi-in person support course of PHC. Meetings occur weekly, with discussion of several topics. Fortnightly meetings for practice training occur. The trainees also have access to Moodle platform, with supporting texts, videos and exercises for fixation of learning.
Results: The project started with the training of 112 soldiers from EB. However, based on the quality of that work, the course was extended to all military EB working in the State of Rio de Janeiro, Brazil.
Conclusion: The trained soldiers are able to work in accident with mass casualties, and attend to major events that are going to happen in the city of Rio de Janeiro.
Reference:
1. Brasil. Ministério da Saúde. Política Nacional de Atenção às Urgências. 3rd ed. Brasília: Ministério da Saúde; 2006.
Disclosure: No significant relationships.

P095

IMPORTANCE OF EDUCATION AND TRAFFIC ACCIDENTS

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Introduction: Traffic accidents are traumatic incidents which effect our lives dramatically and could be ended mortally. Our goal is to research the relation between traffic accidents and education status.
Materials and methods: Number of accidents for each 10,000 vehicles according to provinces at 2012 in Turkey compared with the ratios of university graduates to total population. Between these 81 provinces, provinces with the highest and the lowest rate of accidents included to study.
Results: First 10 provinces with the highest accident rates named as first group and the last 10 provinces with lowest accident rates named as second group. In first group count of highest and lowest accidents are 287 and 168 and the mean is 206.3. In the second group count of highest and lowest accidents are 82 and 49 and the mean is 73.8. In first group highest and lowest ratio of university graduates to total population are 0.109 and 0.048 and mean ratio is 0.075. In second group highest and lowest ratio of university graduates to total population are 1.064 and 0.079 and mean ratio is 0.20.
Conclusion: In our study in group of highest ratio of university graduates, rate of count of traffic accidents are more less. In group of the lowest ratio of university graduates, count of traffic accidents are 2.5 times more than the former group. Education status should be heighten of the society to protect people from the trauma and even deaths which are associated to traffic accidents.
Reference:
1. Turkey statistical agency website.
Disclosure: No significant relationships.

POLYTRAUMA II

P096

FREQUENCY AND TREATMENT OF PELVIC RING FRACTURES AT THE RESUSCITATION BAY

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Introduction: Pelvic ring fractures and dislocations are caused by high energy trauma. Pelvic ring injury by itself can cause hemodynamic instability and need for immediate resuscitation and treatment. Despite the severity of pelvic ring fracture, the concomitant injuries are the ones that really threaten the patient. That is why analysis of the patients at the resuscitation bay was done.
Materials and methods: Retrospectively all the patients admitted to the resuscitation bay during 1 year period were analyzed. Focus was on the patients with pelvic fractures and dislocations. Primary treatment before admittance to the intensive care unit and definitive treatment of the pelvic fractures was noted.
Results: 334 patients were admitted to the resuscitation bay in 1 year period. In 12 % of the patients pelvic fracture was present. Only 22 % of them needed primary stabilization due to dislocation. Only two patients needed ex-fix and angioembolization. None of them needed pelvic packing. All the patients with primary stabilization, were operated later with stabilization of the anterior and posterior pelvic ring. Death occurred in 20 % of patients with pelvic ring fracture, but it was due to head, thoracic or abdominal trauma. None of the patients died directly due to pelvic trauma.
Conclusion: Pelvic trauma is predictor of dangerous hidden blunt trauma injury, but it is treatable by itself with simple and non aggressive measures.
Reference:
1. Hauschild O, et al. Mortality in patients with pelvic fractures: results from the German Pelvic Injury Register. J Trauma. 2008;64(2):449–55.
Disclosure: No significant relationships.

P097

PELVIC FRACTURE IN SEVERELY INJURED PATIENTS: IMPACT OF MASSIVE TRANSFUSION PROTOCOL IMPLEMENTATION

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Introduction: Massive transfusion protocols (MTP) have been associated with improved outcome in massively bleeding patients. Our aim was to study the possible benefit of MTP implementation on massively bleeding patients with pelvic or acetabular fracture.
Materials and methods: This is a retrospective study of 3 years before MTP implementation (pre-MTP) and 3 years after the implementation (post-MTP). We searched our trauma register for patients with pelvic or acetabular fracture.
Results: We found 172 patients in pre-MTP and 162 patients in post-MTP periods. Groups were similar regarding ISS, RTS, TRISS. Pre-MTP population was slightly younger, 39.5 ± 18.8 vs. 45.0 ± 22.2 years. After removal of patients whom were dead on arrival the mortality between pre-MTP and post-MTP were similar (4.1 vs. 3.1 %). Groups were compared regarding ICU LOS, days ventilated, hospital LOS, prehospital fluids, and fluid resuscitation in hospital. Also, a comparison of those parameters was made between the groups in a subgroups of patients with BE ≤ -5.
Conclusion: The effect of MTP on the outcome of patients with ISS >15 and pelvic or acetabular fracture is discussed.
Disclosure: No significant relationships.

P098

DAMAGE CONTROL IN PELVIC FACTURES IN POLYTRAUMA PATIENTS

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Introduction: Due to the complexity of the pelvic fractures, many therapeutic methods and implants have been described. One of them, widely used, is external fixation, especially in polytrauma patients. The authors analyze the opportunities to use Damage Control in pelvic fractures, and evaluate the results.
Materials and methods: This retrospective study evaluates 28 polytrauma patients with pelvic fractures, treated between 1.01.2009–1.01.2013, by Damage Control concerning: the type of the fractures, associated injuries, traumatic scores, hospital stay, rate of MSOF, of ARDS, mortality and local complications (wound infections, pin track infections, implant failure).
Results: Hospital stay was not significantly influenced by the type of osteosynthesis, but by the life-threatening injuries and their outcome; the rate of MSOF and that of ARDS were comparable to those described in literature, although the patients form the DCOS group had considerably higher traumatic scores. DCOS was not associated with higher rate of local complications
Conclusion: Properly indicated and executed, DCOS represents a valuable choice for pelvic fractures in polytrauma patients, due to its' significantly lower impact upon the fragile balance of the polytrauma patient.
Reference:
1. Giannoudis PV, Pape HC. Damage control orthopaedics in unstable pelvic ring injuries. Injury 2004;35(7):671–7.
Disclosure: No significant relationships.

P099

THE ROLES OF LAPAROTOMY AND TRANSCATHETER ARTERIAL EMBOLIZATION IN THE MANAGEMENT OF THE PATIENTS WITH CONCOMITANT PELVIC FRACTURE AND UNSTABLE HEMODYNAMICS

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Introduction: The management of the patients with concomitant pelvic fracture and unstable hemodynamics can be difficult. The laparotomy and transcatheter arterial embolization (TAE) are usually necessary to treat the associated intra-abdominal injuries and retroperitoneal hemorrhage. We attempted to delineate the role of these two procedures in such unstable patients.
Materials and methods: During the 60-month investigated period, patients with concomitant pelvic fracture and unstable hemodynamics were identified. Their demographic and indications of laparotomy were recorded. Patients with different clinical course were compared and analyzed.

Results: A total of 139 patients were enrolled. There were 33.9 % patients received laparotomy and 37.4 % patients received TAE. The patients received laparotomy had significantly higher percentage of positive sonographic examination (63.0 vs. 9.7 %, $p < 0.001$) than the patients did not receive laparotomy. The patients received TAE had higher percentage (46.2 vs. 11.5 %, $p < 0.001$) of unstable pelvic fracture on pelvic X-ray than the patients did not receive TAE. The patients received post-laparotomy TAE after initial laparotomy had significantly higher percentage of unstable pelvic fracture (81.8 vs. 41.2 %, $p = 0.018$) (odds ratio = 3.4) and more blood transfusion (2,356.3 ± 1,477.6 vs. 1,887.3 ± 934.9 ml, $p < 0.001$) (odds ratio = 6.7) than the patients received laparotomy only.
Conclusion: In the management of the patients with concomitant pelvic fracture and unstable hemodynamics, the hemorrhagic site and necessity of hemostasis may indicate the priority of laparotomy and TAE. The more attention should be paid in the patients with unstable pelvic fracture or more blood transfusion requirement because of their increasing risk of need for TAE after laparotomy.
References:
1. Gustavo Parreira J, et al. Injury. 2000;31:677–82.
2. Demetriades D, et al. J Am Coll Surg. 2002;195:1–10.
3. Fu CY, et al. Am J Emerg Med. 2009;27:792–6. Advanced Trauma Life Support. 9th ed.
Disclosure: No significant relationships.

P100

RELATIVE HYPOTENSION SERVES AS A MARKER OF THE REQUIREMENT OF ANGIOEMBOLIZATION IN PELVIC FRACTURE PATIENTS WITHOUT CONTRAST EXTRAVASATION ON COMPUTED TOMOGRAPHIC SCAN

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Introduction: In the management of the pelvic fracture, the contrast extravasation (CE) on computed tomography (CT) is indicative to active hemorrhage which need for angioembolization. However, in some patients without CE on CT scan, the angioembolization is still needed for hemostasis upon hemodynamic deterioration. We attempted to define the characteristics of pelvic fracture patients without CE on CT scan but requiring angioembolization.
Materials and methods: During the 60-month investigated period, we focused on pelvic fracture patients without CE on CT who then received angioembolization. The demographics, pelvis stability and the level of decreased SBP (comparison between SBP on arrival and measured lowest SBP, relative hypotension) were analyzed.
Results: In total, 7.4 % patients without CE on CT scan received angioembolization. Patients with episode of SBP less than 90 mmHg or SBP decreased over 30 mmHg had a higher rate of need for angioembolization(11.3 vs. 2.6 %, $P < 0.01$). Furthermore, these patients presented with a higher rate of unstable pelvic fracture.
Conclusion: In the management of pelvic fracture patients with relative hypotension in the emergency department, more attention should be paid to the higher probability of retroperitoneal hemorrhage, even the CT scan revealed no CE.
References:
1. Biffl WL, et al. Ann Surg. 2001;233:843–50. Advanced Trauma Life Support. 9th ed.
2. Smith W, et al. J Orthop Trauma. 2007;21:31–7.
Disclosure: No significant relationships.

P101

EPIDEMIOLOGY AND OUTCOME OF PENETRATING TRAUMA IN A WESTERN EUROPEAN URBAN REGION

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Introduction: Severe life threatening injuries in Western Europe are mostly caused by blunt trauma. However, penetrating trauma might be more common in urban regions, but their characteristics have not been fully elucidated.
Materials and methods: Retrospective analysis of patients admitted to our Universitary level I trauma center between 2008–2012 with suspicion of severe multiple injuries (Polytrauma according to the German Trauma Society).
Results: Out of 2.008 patients admitted over the 5-year time period 184 (9.2 %) suffered a penetrating trauma (mean age 39.5 ± 17.0 years [SD], mean ISS 12.4 ± 14.5 points). In 61.0 % these injuries were caused by interpersonal violence, mostly stabbing (n = 86) and gunshot wounds (n = 20). In 94 % surgical treatment was performed. 45.1 % of the patients received ICU therapy (7.1 ± 8.8 days). The mortality for interpersonal violence was 14.9 %, which is significantly higher than for the cases of accidental penetrating trauma (2.9 %, $p < 0.05$). 20.7 % of the patients developed infectious complications.
Conclusion: Specific characteristics of penetrating trauma in urban regions can be identified. Compared to nationwide data, penetrating trauma is more frequent in larger cities (9.2 versus 5) in patients entering the hospital via the shock room.
Reference:
1. Annual report of the TR-DGU 2013-11-05.
Disclosure: No significant relationships.

P102

TRAUMA AND ACUTE STRESS DISORDER

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Introduction: Nowadays the possibility of developing acute stress disorder (ASD) after a trauma well known, particularly after major trauma, but only proportions of persons exposed to traumatic events develop it. The risk factors such as personal predispositions and family psychiatric history, nature of the biological response influence vulnerability to the onset of ASD.
Materials and methods: All traumatized patients admitted to our hospital, between November 01, 2009, and November 01, 2012 were screened for the clinical symptoms of ASD. We have excluded severe traumatic brain injury and spinal cord injury from the study, assessment measures of trauma severity, the frequency of ASD and the relationship between severities of trauma with ASD.
Results: Of the 1,319 traumatized patients screened, 148 patients (11.2 %) received a diagnosis of ASD according to the ASD-scale administrations. The average was 42.6 (±12.7 SD) years (range 17 to 62 years). There were 127 men (85.8 %), 21 women 14.2 %; 75 % that reported a high school diploma and 25 % having completed college or an advanced degree. The mean ASD score was 72.6. There were 109 patients (73.6 %) founded with ASD after a motor vehicle accident and 39 patients (26.4 %) after a firearm injury. The mean Injury Severity Score was 35.8.

Conclusion: ASD that is untreated is strongly associated with the later development of posttraumatic stress disorder. There appears to be no significant correlation between ISS and ASD. The presence of ASD in traumatized patients complicates the surgical diagnosis.

Reference:

1. Forbes D, Wolfgang B, Cooper J, et al. Post-traumatic stress disorder—best practice GP guidelines. Aust Fam Physician. 2009; 38:106-11.

Disclosure: No significant relationships.

P103

GERIATRIC TRAUMA: CHARACTERISTICS OF PATIENTS OLDER THAN 90 YEARS. AN ANALYSIS FROM THE TRAUMA REGISTRY OF THE GERMAN SOCIETY FOR TRAUMA SURGERY (DGU)

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Introduction: Due to demographic change, the amount of geriatric trauma patients rises. Elderly patients reveal specifics compared to younger patients. Characteristics of patients older than 90 years with severe injuries are considered and compared to a control group.

Materials and methods: 93,000 patients from Germany, Switzerland, Austria, Belgium and the Netherlands are evaluated, including patients registered online in the trauma registry of the German Society for Trauma Surgery during 2002 and 2011, older than 18 years with an ISS of at least 9, treated on ICU primarily or transferred during 24 h. Patients older than 90 years are treated separately and compared to those between 18 and 89 years, regarding accidental circumstances, gender and mortality.

Results: 41,444 patients are included, 389 older than 90 years, 41,055 between 18 and 89 years. Most common accidents in the control group are traffic accidents, mostly car related, followed by falling higher and lower than 3 m. Most common accidents of the elderly are falls lower than 3 m. Most of the control group is male, most of the elderly female. 5.8 % of the control group and 4.2 % of the elderly commit suicide. 16.3 % of the control group and 51.2 % of the elderly decease, 8.6 % respectively 23.4 % during the first 24 h. Days on intubation, ICU or hospital decrease with increasing age, just as operations.

Conclusion: The amount of severely injured patients rises since 2002. Multimorbidity and increased mortality face surgeons and intensive care physicians with enormous challenges.

Reference:

1. Prokop, et al. Versorgung geriatrischer Patienten in der Unfallchirurgie. Chirurgische Praxis; 1996

Disclosure: No significant relationships.

P104

GERIATRIC TRAUMA: AGE-DEPENDANT DIFFERENCES IN TREATMENT PRE- AND POST-HOSPITALIZATION. AN ANALYSIS FROM THE TRAUMA REGISTRY OF THE GERMAN SOCIETY FOR TRAUMA SURGERY (DGU)

Y.M. Fülling[1], C. Fisahn[1], M. Himmerich[1], R. Lefering[2], T.A. Schildhauer[1], J. Swol[1]

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Introduction: Due to demographic change, the amount of geriatric trauma patients rises. Elderly patients reveal specifics, thus the treatment pre- and post-hospitalization of severe injured patients older than 60 years is considered and compared to a control group.

Materials and methods: 93,000 patients in centers in Germany, Switzerland, Austria, Belgium and the Netherlands are evaluated retrospectively, including patients registered online in the trauma registry of the German Society for Trauma Surgery during 2002 and 2011, older than 18 years with an ISS of at least 9, treated on ICU primarily or transferred during 24 h. Treatments of patients older than 60 years are considered separately in quinquenniums and compared to those between 18 and 59 years, regarding transport time and mode, emergency room time, sedations, intubations, resuscitations, catecholamine doses, post-hospitalization transfers and Glasgow-Outcome-Score.

Results: 41,444 patients are included, 12,372 older than 60 years. Transport time doesn't reveal significant differences, emergency room time increases with increasing age. Transport mode in 15.2 % of the elderly was a helicopter, compared to 38.4 % in the control group. Sedations, intubations, catecholamine doses and resuscitations decrease in the elderly, there is a back and forth in post-hospitalization transfers to rehab clinics or in homely environment.

Conclusion: The amount of severely injured patients rises since 2002. Multimorbidity, increased mortality and the clinical outcome face emergency physicians, surgeons, intensive care and primary care physicians with enormous challenges.

Reference:

1. Prokop, et al. Versorgung geriatrischer Patienten in der Unfallchirurgie. Chirurgische Praxis; 1996

Disclosure: No significant relationships.

P105

MATERNAL AND FETAL OUTCOME IN MOTOR-VEHICLE CRASHES: A 12 YEARS STUDY IN ONE LEVEL 2 TRAUMA CENTER

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Introduction: Trauma in pregnancy places the mother and fetus at risk. Motor-vehicle crashes are the leading cause of traumatic fetal injury mortality and the leading cause of death during pregnancy.

Materials and methods: The objective of this study was to evaluate the pregnancy outcome after motor-vehicle crashes and the factors that may predict fetal loss and adverse peripartum outcomes. A retrospective chart review was performed during the period 2001–2012. Uni- and multivariate analysis and a logistic regression models were performed using SPSS version 17.0.

Results: Delivery information was available for 102 pregnant patients but only 64 patients with severe injuries have been included in analysis. Nine percent of injured pregnant patients were positive tested for alcohol and 24 (37 %) were not using seat-belts. Patient data included mechanism of injury, driver status, seat belt use, gestational age, maternal hemodynamic parameters, Injury Severity Score (ISS), Glasgow Coma Score (GCS), diagnostic and surgical procedures performed and maternal and fetal death. Pregnant women were

drivers in 74 % of the cases and the distribution by trimesters was: first 12.5 %, second 50 % and third 37.5 %. Four patients died (6.25 %) and 16 suffered fetal death (25 %). Risk factors significantly predictive of fetal death included ejections, maternal hemodynamic instability, lack of restraints, nonviable pregnancy (<23 weeks), ISS > 9 and GCS ≤ 8.

Conclusion: Trauma during pregnancy is associated with high fetal mortality and unfavorable maternal outcomes. Close maternal and fetal monitoring is justified when ISS > 9 and hypotension is present on admission.

Reference:

1. Vivian-Taylor. Motor vehicle accidents during pregnancy. BJOG 2012;119:499–503.

Disclosure: No significant relationships.

P106

HORSE-RELATED TRAUMA DURING A NINE MONTH PERIOD IN A COHORT FROM LINKÖPING, SWEDEN

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Introduction: Horse-related injuries have historically been both common and severe. Our group has previously studied horse-related trauma in Östergötland. The main goals in this study were to describe the incidence and nature of horse related accidents in the county of Östergötland as well as provide data on healthcare consumption and usage of safety equipment.

Materials and methods: All patients presented at the emergency department at the University Hospital Linköping where recruited by the nursing staff. All patients were sent a questionnaire and the medical records of the respondents were reviewed.

Results: There were 102 patients recruited, 74 patients responded to the questionnaire, two were excluded leaving a cohort of 72 patients. The total incidence was 3.5 accidents per 1,000 h spent around horses. The children had 6.8 accidents per 1,000 h of horse riding and 3.4 accidents per 1,000 h of horse care. The adults suffered 3.8 accidents per 1,000 h of horse riding and 1.9 accidents per 1,000 h of horse care. The incidence is equal as previous.

Conclusion: The adults more frequently suffered severe injuries then the children; this may be attributable to their lower use of safety equipment. Compared to our previous study the incidence of severe injuries was lower but the adults in this study had more days of sick leave. This may be the effect of new and better safety equipment which may have changed the pattern of injury.

References:

1. Barber HM. Horse-play: survey of accidents with horses. Br Med J 1973;3(5879):532–4.
2. McAbee GN, Ciminera PF. Intracranial hematoma in experienced teenage equestrians. Pediatr Neurol. 1996;15(3):235–6.

Disclosure: No significant relationships.

P107

EQUESTRIAN INJURIES IN RURAL ENGLAND

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Introduction: With an abundance of rolling countryside the Shropshire area has a high prevalence of horse-related injury. This paper highlights the significant impact horse riding injuries can have on a hospital service through an epidemiological study at a rural district general hospital.

Materials and methods: Our study was conducted in Shropshire, UK, at a district general hospital serving a population of around 284,000. The inclusion criteria for participants was an injury sustained during equestrian activity and treated between February 2012 and February 2013. Independent variables included patient age and sex, rider experience, and the mechanism and nature of injury.

Results: So far 65 equestrian injuries have been identified. Age of rider ranged from 6 to 70 years, with 28 % being paediatric patients. Extremity injury was found to be the most common, both as fractures and soft tissue injuries (74 % of all injuries). The incidence of upper limb injury was greater than previous studies, at 69 %, with over half of these being fractures. We also saw a disproportionately high paediatric involvement. Fall from a horse was the most frequent mechanism.

Conclusion: Equestrian sport continues to be popular in the rural setting, accounting for a notable incidence of hospital admissions. Our study found a very high incidence of upper limb injury and paediatric patients. Consequently further research is needed into the relationship between experience of rider and nature of injury sustained, the use of upper limb protective gear, and safeguarding factors for children participating in equestrian sport.

References:

Twelve references to be included.

Disclosure: No significant relationships.

P108

RARE BLUNT INTRA-THORACIC INJURIES IN SEVERELY INJURED TRAUMA PATIENTS: 10 YEARS EXPERIENCE FROM A SINGLE TRAUMA CENTER

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Introduction: Rare blunt intra-thoracic injuries present a challenge to surgeons as they might encounter these injuries only few times throughout their career. The incidence and effect of rare intra-thoracic injuries on clinical outcome were analyzed in this study.

Materials and methods: Rare intra-thoracic injury was defined as incidence of <5 % in hospitalized patients with ISS > 15 and thoracic AIS > 2. We identified rare intra-thoracic injuries in a cohort of 594 patients (2003–2007) fulfilling the above mentioned criteria. We searched our hospital trauma registry for patients fulfilling the inclusion criteria (2008–2012) and identified rare intra-thoracic injuries.

Results: Data collected includes patient age, sex, MOI, ISS, rare thoracic injuries, required operations, year of injury, RTS, 30-day mortality, ICU LOS, hospital LOS, other injuries, and the cause of death. The incidence and annual changes of rare intra-thoracic injuries were calculated from all hospitalized patients with ISS > 15 and thoracic AIS > 2. The required treatment of these injuries was collected as well as the mortality of patients with rare intra-thoracic injuries and these we compared to patients without rare intra-thoracic injuries.

Conclusion: The mortality related to rare intra-thoracic injuries was also evaluated.

Disclosure: No significant relationships.

VASCULAR TRAUMA

P109

BLUNT THORACIC TRAUMA WITH INJURY TO CRITICAL AIRWAY

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Introduction: Tracheobronchial rupture by blunt trauma can result from four mechanisms: decrease of the anteroposterior diameter, rapid deceleration, sudden increase of pressure in tracheobronchial tree in closed glottis and direct tracheal hit. The right bronchus is more affected than the left and the diagnosis is made by bronchoscopy.
Materials and methods: In a 4 years period, 4 cases of tracheobronchial disruption by blunt trauma were diagnosed and treated at João XXIII Hospital.
Results: There were 3 male and one female, between 17 and 46 years old, all of them were car accident victims. They underwent tube thoracostomy and, after clinical and tomographic suspicion of main airway injury, bronchoscopy was performed. One patient presented rupture of the left bronchus, 2 patients had rupture of the right bronchus and the female patient had laceration from distal trachea through the carina until the right bronchus. Right posterolateral thoracotomy was performed in 3 cases, with closure of the defect and patch of intercostal muscle. In one patient was performed left posterolateral thoracotomy followed by bronchoplasty without muscle patch. There was one death caused by sepsis in a patient with rupture of the right bronchus. The other patients improved progressively, with total hospital stay ranged between 7 and 38 days.
Conclusion: Tracheobronchial injury is one of the most severe injuries caused by blunt trauma and requires a high index of suspicion for early diagnosis. Surgical repair is successful in most instances, especially when it is performed by an experiment surgeon in a trauma center.
Reference:
1. A.E. Balci, et al. Eur J Cardiothorac Surg. 2002;22:984–9.
Disclosure: No significant relationships.

P110

EFFICACY OF CARDIAC MRI FOR THE DIAGNOSIS OF BLUNT CARDIAC INJURY

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Introduction: Blunt cardiac injury that causes cardiac tamponade is considered an indication for urgent surgery; however, we experienced a patient in whom only pericardial drainage was performed and diagnosis of the injured area was made by cardiac MRI.
Materials and methods: The patient was a 47-year-old man admitted after a car collision with a median strip. He was unconsciousness (GCS 2.2.5) and in shock with a systolic blood pressure of 80 mmHg. FAST revealed cardiac tamponade. We performed pericardial drainage and obtained 160 ml of bloody drainage. Following drainage, the patient's circulation stabilized, and we decided to treat him conservatively. Laboratory data showed elevation of troponin T and CK-MB levels, and the ECG showed complete right bundle branch block. TEE and cardiac CT could not reveal the cause of the tamponade or the site of cardiac injury. Cardiac MRI performed on the 12th hospital day.
Results: Cardiac MRI showed high intensity in the anteroseptal area on black-blood T2-weighted images and no enhancement on delayed enhancement images. Black-blood T2-images show the presence of myocardial edema and short-term injury. (1) The area of high intensity on black-blood T2-images was not present on day 120 after injury. We could thus accurately diagnose cardiac contusion of the anteroseptal area, which would explain the initial ECG abnormality.
Conclusion: Cardiac MRI may be especially useful in the evaluation of non-operative management of blunt cardiac injury.
Reference:
1. Cury RC, et al. Cardiac magnetic resonance with T2-weighted imaging improves detection of patients with acute coronary syndrome in the emergency department. Circulation. 2008;118:837–44.
Disclosure: No significant relationships.

P111

WHICH WAY SHOULD A CHEST TUBE BE INSERTED IN PRIMARY TRAUMA CARE, POSTERIOR OR ANTERIOR?

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Introduction: The ATLS guidelines suggest that in primary trauma care the chest tube should be placed posteriorly along the inside of the chest wall. However, posterior chest tubes have a tendency to be nonfunctional drains for the evacuation of pneumothoraces. The purpose of this study was to evaluate unnecessary posterior chest tubes in primary trauma care.
Materials and methods: We reviewed the volume of hemothoraces from 61 chest drains emergently placed posteriorly in 55 blunt chest trauma patients who were consecutively admitted over a 4-year period. Massive acute hemothorax (MAH), in which the chest tube should be inserted posteriorly, was defined as more than 500 ml within 24 h of trauma admission. Demographics, interventions, and outcomes were analyzed. Logistic regression analysis was used to identify the independent predictors for the development of MAH. We also reviewed the malpositioning of 32 chest tubes in patients who subsequently underwent computed tomography (CT).
Results: The overall incidence of MAH was 20 % ($n = 12$). In regression analysis, the presence of multiple rib fractures, shock, pulmonary opacities on chest X-ray, and the need for intubation were found to be independent predictors for the development of MAH. The incidence of nonfunctional chest drains that required reinsertion or the addition of a new drainage was 25 %. CT revealed that 63 % of the chest tubes were malpositioned, a higher incidence than previously reported.
Conclusion: Chest tubes did not need to be directed posteriorly in many trauma cases. Posterior chest tubes have a high incidence of being malpositioned.
Reference:
1. ATLS. Program for doctors. 8th ed; 2008.
Disclosure: No significant relationships.

P112

THE OPERATIVE STABILIZATION OF RIP FRACTURES IN POLYTRAUMA PATIENTS: A STANDARD PROCEDURE?

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Introduction: Severe thoracic injuries are associated with significant morbidity and mortality. Flail chest injury is a potentially life threatening condition traditionally treated with invasive mechanical ventilation to splint the chest wall. Longer-term sequelae of pain, deformity, and physical restriction are well described. This study investigated the impact of operative fixation in patients with rib fracture after severe injuries.
Materials and methods: A retrospective study was performed regarding clinical outcome of operative fixation of fractured ribs in the flail segment. In-hospital data such as duration at ICU, IMC, duration invasive ventilation, duration of NIV postextubation, duration of hospital stay, in-hospital mortality, follow-up review, spirometry and CT were collected.
Results: Between 2011 and 2012 patients who were admitted to our hospital and were treated in our trauma room according to our stockroom activation criteria 354 patients had thoracic injuries and 5 (1,4 %) patients (2 female, 3 male) with flail chest were fixed operatively. The average age of the patients were 63 years (±8.6, 53 until 77 Jahre). In 4 (1.1 %) cases the ISS was >15, in one case flail chest was the result of rib series fracture after CPR during myocardial infarction. The postoperative invasive ventilation duration was in average 6.3 days (±5.4 days).
Conclusion: The operative treatment of rib fractures with flail chest remains rare. Only 1.4 % of the cases with severe thoracic injuries underwent an osteosynthesis. Operative rib fixation of flail chest is still not considered standard management. Currently, rib fixation tends to be practiced by a minority of trauma surgeons.
Reference:
1. J. Fakler. 2013.
Disclosure: No significant relationships.

P113

EARLY SURGICAL STABILIZATION OF RIB FRACTURES USING A MINIMALLY INVASIVE PROCEDURE: A PILOT STUDY

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Introduction: In spite of considerable development in surgical fracture treatment, most patients with rib fractures are still treated non-operatively, although the respiratory consequences of rib fractures may have severe impact on the prognosis after severe trauma. The purpose of the present study was to report our initial experience with early surgical stabilization using a minimal invasive procedure of open reduction and internal fixation (ORIF) of multiple rib fractures.
Materials and methods: 10 consecutive patients received in our level 1-traumacenter with one of the following: flail chest with at least two rib fractures on two adjacent ribs or four adjacent dislocated rib fractures. The basic principles were: A. No osteosynthesis of costa # 1, 2 or 3. B. Operative fixation of only dislocated ribs. In ribs with multiple fractures only one fracture was stabilized. C. Small incisions with minimal dissection of muscle tissue. All had operative stabilization using the Synthes MatrixRIB Fixation System. The operations were performed in the lateral decubitus position through a muscle saving approach.
Results: None of the patients had postoperative infections, seromas or wound problems. The average number of costae fixated was 3. Lung function at 3 month was equal to background population.
Conclusion: Rib fracture stabilization is a safe procedure that can be performed with small incisions, without transection of muscles and with low morbidity. The intraoperative impression is that operative fixation of approximately half of the fractured ribs provide sufficient stabilization for unstable chestwalls and provides a normal lung function.
Reference:
1. Multiple rib fracture, flail chest, surgical rib stabilisation, muscle saving procedure.
Disclosure: No significant relationships.

P114

CLAMSHELL THORACOTOMY FOR RESUSCITATION AND REPAIR OF LIFE-THREATENING CHEST INJURY

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Introduction: Resuscitative thoracotomy (RT) is an important skill for approaching to the thoracic cavity to control exsanguinating hemorrhage. Clamshell thoracotomy (CT) is more invasive intervention rather than RT, but is a useful technique to resuscitate and repair of chest injuries. We have an aggressive policy of trauma resuscitation using CT in the situation required RT.
Materials and methods: This is a retrospective study of patients in which urgent surgical intervention was carried out between February 2007 and October 2013. Patients with cardiac arrest on ED admission and AIS = 6 were excluded. Demographics, Revised Trauma Score (RTS), Injury Severity Score (ISS), and probability of survival (Ps) were assessed.
Results: Of 45 cases performed RT in 217 eligible cases, CT was carried out in 9 cases (eight in the ED immediately after their arrival and one in the operating room). Revised trauma score and injury severity score of them were 4.66 and 36.1, respectively. Although the predicted survival of 9 cases was 0.481, an observed survival rate of CT cases was 55.6 % (5/9; cardiac repair in three, segmental pulmonary resection in one, and chest wall packing in one).
Conclusion: The present findings suggest that our policy of CT for resuscitation and repair of life-threatening chest injury led a good result comparing with the predicted survival.
Reference:
1. Simms ER, et al. Bilateral anterior thoracotomy (Clamshell incision) is the ideal emergency thoracotomy incision: an anatomical study. World J Surg. 2013;37:1277–85.
Disclosure: No significant relationships.

P115

DELAYED DIAGNOSIS OF PULMONARY ARTERY INJURY, DUE TO BLUNT TRAUMA, WHICH MIMICKED TRAUMATIC LUNG PSEUDOCYST

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Introduction: Blunt chest trauma is associated with a variety of fatal injuries and pre-hospital mortality. However, pulmonary artery laceration due to blunt trauma is rare. This is a case report of delayed diagnosis of pulmonary artery laceration in a patient who had a fall from a cultivator.
Materials and methods: A 67-year-old female presented to the emergency department with complaints of dyspnea and chest wall pain after a fall from a cultivator. On the third day of admission, the chest X-ray revealed an abrupt aggravation of haziness and the chest CT revealed the increased size of the hematoma with active bleeding from the pulmonary artery.
Results: Deceleration injuries caused by high-speed collision or a fall from a height and deformities of the chest wall such as flail chest and multiple rib fractures are highly associated with pulmonary artery injury. However, the fall suffered by the patient in this report was not from a significant height, which was approximately 1 m, and the patient did not even present with chest deformities as mentioned previously. In case of loculated hematomas adjacent to the hilum on CT scan, the diagnosis of pulmonary artery injury should be considered.
Conclusion: Pulmonary artery injury can be present despite the absence of hemodynamic instability, massive hemothorax with continued bleeding, hemopericardium, or large mediastinal hematoma. Furthermore, if a suspected loculated hematoma or traumatic lung pseudocyst is located near the hilum, the diagnosis of pulmonary artery injury should be considered and it should be followed by close observation and treatment.
References:
1. Ann Thorac Surg. 2009;87:939–40.
2. J Trauma 2003;54:478–85.
3. J Trauma 1961;1:595–9.
4. J Trauma 1997;43:701–2.
5. J Thorac Dis. 2012;4(SI):74–8.
Disclosure: No significant relationships.

P116

SELECTIVE ANGIOEMBOLIZATION OF THE SUPERIOR GLUTEAL ARTERY AFTER A GUNSHOT WOUND

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Introduction: Development of a bleeding post-injury pseudoaneurysm following a gunshot wound to the buttock is uncommon. There are two different approaches described: open surgery and endovascular coil-embolization. We present a case of severe multiple gunshot wounds with successful embolization of the gluteal artery pseudoaneurysm.
Materials and methods: A hemodynamically stable 33 year-old male presented to our level 1 trauma center with gunshot wounds to the chest, extremities and buttock (9.0 mm Makarov pistol). Physical and X-ray examination revealed no signs of hemopneumothorax. The wounds of extremities were superficial. There was a large expanding hematoma in the area of entry wounds in the right buttock.
Results: Computed tomography confirmed a hematoma formation in the area of the gluteal arteries and revealed two bullets (close to the right acetabulum). A subsequent arteriogram revealed the pseudoaneurysm of the right superior gluteal artery (4.0 × 3.0 cm) which was embolized with coils by a trauma surgeon trained in interventional radiology using a C-arm. A repeat arteriogram showed cessation of blood flow within the pseudoaneurysm. The patient has not had any further bleeding. The bullets were removed electively. A repeat computed tomography done 4 months later demonstrated a selective occlusion of the right superior gluteal artery while other arteries remained patent.
Conclusion: This report demonstrates the modern surgical approach to gunshot injuries. Selective angioembolization should be the treatment of choice in gluteal artery injuries.
Reference:
1. Agarwal M, et al. Pseudoaneurysm of the inferior gluteal artery following polytrauma: diverse presentation of a dangerous complication: a report of two cases. J Orthop Trauma. 2003;17:70–4.
Disclosure: No significant relationships.

P117

ISOLATED BLUNT INNOMINATE ARTERY INJURY IN THE SETTING OF BOVINE ARCH ANATOMY

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Introduction: Blunt injuries to the innominate artery (IA) are rare. The postulated mechanisms include shear forces between the relatively mobile vessel and its adjacent fixed origin. Bovine arch anatomy (BAA), in which the left common carotid originates from the innominate artery is seen in only 11 % in normal population We described here a case of isolated blunt IA injury associated with BAA treated surgically.
Materials and methods: Twenty five year-old motorcycle driver was brought to our shock trauma room having involved in a road accident. The patient was stable and intubated on arrival. Physical examination revealed soft tissue laceration on the right side of his neck. Chest x ray was normal. Computed Tomography scan demonstrated a contained transection of the IA associated with BAA. No other significant associated injuries were seen.
Results: The patient was transferred to the operating theater for mid sternotomy. The disrupted segment of the IA was replaced by an interposition prosthetic graft.
Conclusion: Injury to the innominate artery is a life threatening condition and could result in a significant morbidity and mortality. Blunt IA injury is associated with substantial injury to surrounding structures. Our patient suffered only minor related injuries. The association of blunt IA injury and BAA is described. We postulated that the preexisting BAA rendered the patient's IA to profound shear forces and vulnerable to much less decelerating force. Indeed 30 % of IA injury is associated with BAA.
Reference:
1. Mauney MM. Management of innominate artery injury in the setting of bovine arch anomaly. Ann Thorac Surg. 2001;72(6):2134–6.

Disclosure: No significant relationships.

P118

SUCCESSFUL ENDOVASCULAR TREATMENT OF A ILIACO TO ILEAL 'BRICKER' CONDUIT FISTULA AFTER EVAR

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Introduction: Endovascular aneurysm repair (EVAR) is a widely accepted and available technique for excluding potentially life-threatening aneurysms. A rare complication following EVAR is a secondary fistula to a neighbouring vital structure.[1] In urology, ileal conduit urinary diversion has become a frequently used reconstruction method after radical cystectomy. Fistula formation from an ileal conduit to the common iliac artery has been described in the literature once.[2] Both types of fistula formation are life-threatening and warrant immediate treatment.
Materials and methods: We describe a patient who underwent urinary diversion as well as EVAR of his right common iliac artery. He developed a fistula between the ileal conduit and the distal rim of the EVAR, which was repaired by endovascular stenting.
Results: An endovascular approach was chosen, in which the stent graft had to be turned upside down for optimal fit. Previously, this type of switch, deployment of the graft outside of the patient and reloading it, has been described in Talent stentgrafts, with larger strut sizes. This case shows that in case of emergency, a like-wise procedure can also be performed in Endurant stent grafts.
Conclusion: We describe a patient with a fistula from an EVAR to an ileal conduit, which is an extremely rare complication. An endovascular approach was chosen, in which the stent graft was turned upside down. Obviously reloading of stentgrafts is outside the instructions for use. However, in case of emergency with life-threatening haemorrhage it is worth considering.
References:
1. Sager HB, et al. Cardiovasc Intervent Radiol. 2011;34:S60–3.
2. Hori S, Triruchelvam N. Urology. 2012;1:23–7.
Disclosure: No significant relationships.

ABDOMINAL EMERGENCIES II

P119

AS AN EMERGENCY SURGICAL INTERVENTION, IS HARTMANN SECURE?

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Introduction: Hartmann is generally preferred as an emergency operation in some cases which primary anastomosis is not reliable and in the presence of an infected abdominal cavity. In this study, we analyzed morbidity and mortality of Hartmann operation.
Materials and methods: Between January 2008 and October 2013, 80 patients, who underwent Hartmann operation at Istanbul University Istanbul Faculty of Medicine Trauma and Surgery Department was analyzed retrospectively. Demographics, duration of surgery, length of stay, surgical indication, complications and interval between Hartmann's operation and closure of colostomy (reversal of Hartmann's procedure) were recorded.
Results: Mean age was 59.5 years (range 22 to 91 years) and the average hospitalization duration was 19 days (range 1 to 176 days). 43 cases had acute mechanical intestinal obstruction, 26 cases had hollow organ perforation, 6 cases had anastomotic leakage and 5 cases were operated for other rare causes. 16 out of 29 patients, who had post operative complications need to have resurgery. The most common complication was intraabdominal infection, which requires antibiotic treatment, occured in 7 cases (8.75 %). Postoperatively 58 patients (72.5 %) was in need of intensive care. Of the latter 22 stomas were closed. Earliest stoma closure was at 94th day and latest was at 793rd day. 2 patients needed diverting ileostomy and the ileostomy was closed 3 months later. Enterocutaneous fistulae occurred in 1 patient, whose stoma was closed. Mortality of Hartmann operation was found to be 21.5 % (17 patients).
Conclusion: Hartmann procedure is a surgery, which is performed in emergency situations with higher morbidity and mortality.
Disclosure: No significant relationships.

P120

BOCHDALEK HERNIA RELAPSE AFTER LAPAROSCOPIC REPAIR

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Introduction: A *Bochdalek hernia* is a form of diaphragmatic hernia and mostly is found on the left side. The clinical manifestation of symptoms and diagnosis in adults are extremely rare and may lead to gastrointestinal or pulmonary diseases. We present a 67-year-old patient with Bochdalek hernia incarceration.
Materials and methods: Case report.
Results: On admission patient complained of upper abdominal pain, nausea and vomiting, that increased during last 3 days. The incarceration of the transverse colon and the stomach in the thoracic cavity through the large diaphragmatic hernia was found on the CT scan. The patient was prepared for emergency surgical intervention. During the laparoscopy a left-side diaphragmatic defect 10 cm in diameter was found. An intra-thoracic hernia sac contained most of the stomach, parts of the transverse and descendent colon and a part of the greater omentum. Hernia contents were released and herniooplasty with 15×15 cm prolene mesh was performed. After 2 months the patient underwent a CT scan before radical prostatectomy due to prostatic cancer, however, a relapse of the diaphragmatic hernia was not diagnosed. The patient was hospitalized the third time 3 months after the first operation due to the small bowel obstruction. The terminal ileum was pulled out of posterior mediastinum during the laparotomy, a gap in the diaphragm was sutured.
Conclusion: Laparoscopic technique is the golden standard in most directions of surgery; however, the postoperative course needs particular attention in selective categories of patients.
Disclosure: No significant relationships.

P121

INTRODUCTION OF EMERGENCY LAPAROSCOPIC SURGERY; SINGLE INSTITUTION EXPERIENCE

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Introduction: Elective laparoscopic surgery (LS) such as laparoscopic colectomy has been introduced actively in Japan. However, emergency LS is not widely accepted because of the diseases severity and surgeon's skill. Until the last year, we performed conventional open surgery (OS) for acute abdomen. While this year, we can introduce emergency LS with the relocation of endoscopic surgeon. The purpose of this study is to clarify whether we can conduct the LS in emergency setting.
Materials and methods: A retrospective review of patients admitted to our hospital and had emergency surgery between 4/1/2012 and 9/30/2013 was conducted. Acute abdominal emergency surgery was performed 201 cases in this period. Study period was divided into two groups, the year of 2013 (4/1/2013 to 9/30/2013) and that of 2012 (4/1/2012 to 3/31/2013). Of 201, 66 and 135 surgeries were performed in 2013 and 2012, respectively. The number of OS and LS was counted in acute appendicitis, bowel obstruction (BO) and upper gastrointestinal perforation (UGIP) in each year. Chi square test was conducted for statistical analysis.
Results: LS was performed in 32 (48 %) and 3 (2 %) cases in 2013 and 2012, respectively. The ratio of LS to OS was significantly increased in 2013 ($p < 0.01$). In acute appendicitis, LS ratio was significantly increased in 2013 ($p < 0.01$, 27/31 vs 3/66, respectively). In BO ($p = 0.11$, 4/23 vs 0/23) and UGIP ($p = 0.30$, 1/3 vs 0/7), there were no differences between two groups.
Conclusion: LS has conducted in emergency setting in our hospital, especially in acute appendicitis. We have started LS in BO and UGIP.
Disclosure: No significant relationships.

P122

WHEN THE ABDOMEN MASQUERADES AS THE HEART

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Introduction: Electrocardiographical ST-segment elevation can be seen in extracardiac conditions of abdominal origin misleading or delaying the diagnosis process.
Materials and methods: We describe a case-report where male, 34, complained of epigastric and low retrosternal pain. Vitals, auscultation, Chest and abdominal X-ray were normal. Electrocardiogram (ECG) showed sinus rhythm, normal axis, narrow QRS complexes and diffuse concave ST elevation. Laboratory test normal. A non-steroidal-antiinflammatory drug was given and after 4-hours observation and new negative cardiac enzymes he was discharged with ibuprofen and omeprazole with a diagnosis of Pericarditis. Six hours later he came back with severe diffuse abdominal pain and hypotension. He had an haemoconcentration, INR 2.09. Creatinine 2.8 mg/dL and RCP 54.9 mg/dL. X-ray showed pneumoperitoneum and he was taken to the Operating room.
Results: Urgent laparotomy showed diffuse purulent peritonitis and a duodenal ulcer perforation that was treated by suture and epiploplasty. Postoperative course was uneventful with rapid improvement, ECG normalization and a normal echocardiography without pericardial effusion.
Conclusion: ST-segment elevation can be seen in many conditions other than myocardial infarction such as early repolarization, left-bundle-branch block, Brugada syndrome, hyperkalemia, pericarditis, pancreatitis, duodenal ulcer, acute appendicitis, endoscopic retrograde cholangiopancreatography or even pancreatic head neoplasia. Every physician involved in emergency care should be aware that (due to unclear mechanisms) the abdomen can masquerade as the heart when looking at the ECG. This case reminds us again the importance of history taking and physical exam above other explorations.
References:
1. N Engl J Med. 2003;349:2128–35.
2. Gastroenterology 1954;27:861–4.
3. Am J Emerg Med. 2008;26:734.e1–4.
4. Can J Gastroenterol. 2003;17:539–44.
5. Am J Emerg Med. 2010;28:389.e3–5.
Disclosure: No significant relationships.

P123

PRIMARY AORTO-ENTERIC FISTULA (PAEF) CAUSED BY METASTATIC CERVICAL CANCER

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Introduction: Primary Aorto-Enteric Fistula (PAEF) is a unique and rare life threatening disease and Cancer is an extremely unusual etiology of PAEF.
Materials and methods: The purpose of this report is to present this rare case in detail and to review primary aortoenteric fistulas reported in literature.
Results: We report a case of a 48-year-old-female with infiltrating cervical cancer (IIb stage) treated 3 years ago. In the emergency room she presented nauseas, huge hematemesis and melena with syncopes, heavy epigastralgia and severe lower back pain of 3 h of evolution. She presented haemodynamic instability and a serious decrease in haemoglobin and haematocrit. CT-angiography revealed a communication between the third part of the duodenum and anterior aortic wall, hemoretroperitoneum with active bleeding and a lytic lesion in the second lumbar vertebra (L2) suspected of being metastasis. An emergent vascular surgery was undertaken with aortic prosthesis implanting. Anatomopathological diagnosis was infiltration by slightly differentiated squamous cell carcinoma from metastatic cervical cancer.
Conclusion: Primary Aorto-Enteric Fistula (PAEF) is a unique and rare cause of catastrophic gastrointestinal bleeding with an unusually high mortality rate and delayed diagnosis. Aortic abdominal aneurysms are implicated in a vast majority of cases while cancer as an etiology of PAEF is extremely rare. If the symptoms are associated with bleeding and the patient is hemodynamically stable, emergent endoscopy and an emergency ultrasound or CT scan should also be performed. If a PAEF is confirmed, emergent surgery should be undertaken to avoid rupture into the bowel or retroperitoneum.

References:
Up to day Medline database.
Disclosure: No significant relationships.

DIAGNOSTIC PROCEDURES

P124

SEVERITY ASSESSMENT OF ACUTE PANCREATITIS: APPLYING MARSHALL SCORING SYSTEM

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Introduction: Determination of the severity of acute pancreatitis (AP) is crucial in view of the implied prognosis and the appropriate treatment selection. In 2008, the revision of the Atlanta classification defined that the severity of AP, at least in the first week, is based on clinical components. For the definition of organ failure, the revised Atlanta classification suggests the Marshall scoring system.
Materials and methods: Sociodemographic, clinical, laboratory and radiological findings of 39 consecutive patients admitted to the Hospital of Sorocaba, with a diagnosis of acute pancreatitis, were collected daily, by consulting their medical records for up to 7 days for all cases. The Ranson and Marshall scoring systems were applied to all patients.
Results: The age of the participants varied from 20 to 88 years, being 17 men and 22 women. The average of the Ranson score on admission was '1.1', and within 48 h, it was '1.5'. The average of the Marshall system was '2.2' points. From among all the cases, seven patients died within 1 week. Of those who died within 7 days, all had some type of organ failure according to the Marshall Scoring System.
Conclusion: Taking into consideration the need for a method to evaluate organ failure in determining AP severity, the Marshall scoring system showed that it can be widely used as an effective method and with simplified application.
References:
1. Marshall JC, et al. Multiple organ dysfunction score. Crit Care Med. 1995;23(10):1638–52.
2. Campos T, et al. Classificação de gravidade. Rev Col Bras Cir. 2013;40(2):164–8.
Disclosure: No significant relationships.

P125

DOES MULTIDETECTOR COMPUTED TOMOGRAPHY IMPROVE THE DIAGNOSIS OF BLUNT SMALL BOWEL INJURIES?

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Introduction: The diagnosis of blunt small bowel injuries (BSBI) remains challenging in trauma room. We hypothesized that the current era of multidetector computed tomography (MDCT) has improved the accuracy and early diagnosis compared with old helicoidal computed tomography (CT).
Materials and methods: Patients with BSBI grade >I were identified in the university trauma database and CT scans were retrospectively revaluated by an experienced radiologist. Patients were grouped as pre-MDCT and pos-MDCT, according to the use of 64 slice MDCT incorporated in our service on April, 2009.
Results: Among 26 BSBI between 2005 and 2012, 16 were evaluate by CT. In the pre-MDCT period, 5 out of 13 patients (38.5 %) had abdominal CT, and after-MDCT 11 out of 13 patients (84.6 %) performed the exam. In the pre MDCT all the exams were abnormal, with findings like pneumoperitoneum (60 %), free fluid (40 %) and bowel wall enhancement (20 %). In the post-MDCT group all exams, except one (detected later by radiologist) were abnormal, and the most frequent findings were free fluid (90.9 %) and bowel wall enhancement (72.7 %), with higher sensibility. However, the rate of delayed laparotomy did not change. The mortality rate in both groups were similar (20 % in pre and 18.2 % in post-MDCT group).
Conclusion: The use of MDCT in abdominal trauma has increased the sensibility to diagnosis, but with no impact in patient outcome.
Reference:
1. Matsushima K, et al. Blunt hollow viscus and mesenteric injury: still underrecognized. World J Surg. 2013;37(4):759–65.
Disclosure: No significant relationships.

P126

MRI TO LOOK FOR OCCULT FEMORAL NECK FRACTURE: A PICTORIAL REVIEW OF MULTIPLE INCIDENTAL MIMICKING CONDITIONS, WHICH EVENTUALLY EXPLAIN PATIENT'S SYMPTOMS

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Introduction: MRI is considered gold standard to look for occult fracture neck of femur. MRI examination of the hip has become the most common musculoskeletal MRI performed in the emergency department to rule out occult hip fracture in patients presenting with acute hip pain. The purpose of this presentation is to illustrate MRI features of commonly encountered causes mimicking occult hip fracture in these patients with normal radiographs.
Materials and methods: In this presentation, we describe the MRI features of various causes of acute hip pain due to presence of bone marrow edema. These include trauma (pelvic fractures), adductor bursitis, inflammatory conditions (sacroiliitis, arthropathy), infectious (septic arthritis), tumour (osteoid osteoma, metastases), degenerative osteoarthritis, and miscellaneous causes such as transient osteoporosis, and avascular necrosis (AVN).
Results: The clinical examination is of paramount importance in clinically assessing the patient correctly but at the same time it is important for radiologists to recognize the precise MRI features to characterize the origins of various osseous and soft-tissue abnormalities mimicking femoral neck fracture.
Conclusion: A knowledge of occurrence of soft-tissue and osseous abnormalities either alone or in association with subtle fractures on MRI in the evaluation of patients with a clinical suspicion of occult femoral neck fracture is necessary for timely diagnosis and management of these lesions in the emergency department.

Reference:
1. Gill SK,* Smith J, Fox R, Chesser TJS. Investigation of occult hip fractures: the use of CT and MRI. Sci World J. 2013;2013:830319.
Disclosure: No significant relationships.

P127

SACRAL FRACTURES IN CHILDREN

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Introduction: Sacral fractures in children is a rare injury but is a challenging surgical problem. The treatment of this fracture depends of fracture type, patients' age.
Materials and methods: From 2000 to 2011, 11 children with sacral fractures were treated. 7 fractures accompanied pelvic fractures and 4 fractures was isolated. The mean age of patients—10.5 years old (3–17).There were 7 boys and 4 girls. Fractures were caused by traffic accident in 6, sport injury 2, other in 4 case. No open fractures. According to Denis three zone classification, there were 9 zone-I fracture 1 zone-II and 1 zone-III.1 patient presented bilateral sacral fracture with unilateral sacro-iliac dislocation. In our series no sacral neurological damage was showed. Fractures were accompanied in 6 head trauma (2 patients needed neurosurgical procedure for hematoma) in 4 abdominal trauma, in 2 femoral fracture. 6 sacral fractures needed surgical procedure, 4 caused by instable pelvic ring fracture and 1 because displacement sacral fracture (Denis zone-I). For stabilization cannulated screws were used in 3 patients and plates in 3.
Results: Bone consolidation was obtained in all cases 84(63–92) after fracture. In 8 patients consolidation was presented on XR, and 2 patients need CT to confirm consolidation. There is no differences with consolidation between patients treated conservatively and surgically.
1 patient (17 year-old) showed sacro-iliac pain 6 month after surgery, pain was presented after walk over 500 m. After screw ablation pain was disappeared.
Conclusion: Sacral fracture in children instable or with displacement fracture need surgical procedure.
Reference:
1. Vaccaro A, et al. Diagnosis and management of sacral spine fractures. J Bone Joint Surg Am. 2004;86:166–75.
Disclosure: No significant relationships.

P128

THE USE OF WATER SOLUBLE CONTRAST IN ADHESIONAL SMALL BOWEL OBSTRUCTION; A RETROSPECTIVE ANALYSIS

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Introduction: Gastrografin is a hyperosmolar water-soluble contrast medium regularly used as a diagnostic adjunct in radiological investigations.[1] Gastrograffin can be used in conjunction with a delayed plain abdominal radiograph to predict prognosis of adhesional small bowel obstruction (ASBO), however there is conflicting evidence as to whether it's use offers any therapeutic benefit.
Materials and methods: Retrospective review of all patients within an NHS Foundation Trust over a 14 month period admitted with ASBO. Electronic records, discharge letters and radiology were reviewed and comparisons were made of the outcomes between those who did and did not receive a gastrografin challenge.
Results: Over a 14 month period 176 patients were admitted with ASBO. The male to female ratio was equal and the average age was 68 years. 38 (22 %) of the patients were given gastrografin by the admitting team and 138 (78 %) were managed without gastrografin. Of those receiving gastrografin, 24(63 %) were successfully managed conservatively compared to 74(54 %) of those who did not receive gastrografin. The length of stay for the two groups was similar, averaging 13.9 days in those receiving gastrografin and 15.5 days in those who did not.
Conclusion: The use of gastrografin administered enterally in patients who present with ASBO can increase the likelihood that the obstruction will resolve without operative intervention. It's use is therefore advocated in all patients who present with ASBO unless there are clinical contraindications.
Reference:
1. Therapeutic value of gastrografin in adhesive small bowel obstruction after unsuccessful conservative treatment. A prospective randomized trial. Ann Surg 236(1):1–6.
Disclosure: No significant relationships.

P129

THE ROLE OF EARLY DIAGNOSE OF TRAUMATIC DIAPHRAGMATIC RUPTURE TO PREVENT MALPRACTICE

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Introduction: Traumatic diaphragmatic ruptures may be misdiagnosed, thus may cause serious problem even years after the initial presentation. The complications are more common if the rupture occurs on the left diaphragm. Sometimes the herniation of hollow organs may cause strangulation or perforation and may be life-threatening. The purpose of the present study is to share our experience regarding diaphragmatic wounds.
Materials and methods: 15 traumatic diaphragmatic ruptures treated at General Surgery Clinic of İstanbul Training and Education Hospital between 2007 and 2013 were evaluated retrospectively.
Results: Localization of the injury was on the left side of the diaphragm in 13 patients and on the right side in 2 patients. Only 1 case was diagnosed preoperatively, by plain chest X-ray. All diagnostic investigation revealed no diaphragmatic injury in 14 cases and the diagnosis made during the laparotomy or diagnostic laparoscopy. In 6 cases there was no other injury then the diaphragmatic rupture. There was no mortality.
Conclusion: Preoperative diagnosis of diaphragmatic injury due to a stab wound is difficult. Left sided injuries should diagnosed with laparoscopy or thoracoscopy. If the patients refuse the procedure, they should sign an informed consent and declare that that they rejected the procedure. Otherwise because of misdiagnosed diaphragmatic rupture, the doctors could be accused of malpractice.

References:
1. Dirican A, et al. Delici-kesici alete bağlı diyafragma yaralanmaları:18 olgunun analizi Ulusal Cerrahi Dergisi 2010; 26(2):99–102.
2. Ayşan E, Ertekin C, Aren A, Güloğlu R, Penetran Karın Travmalarına Yaklaşım Ulusal. Travma Dergisi 2001;7(2):78–81.
Disclosure: No significant relationships.

P130

COMPLEMENTARY EXAM ON THE MANAGEMENT OF TORSO TRAUMA. IS IT SAFE TO HAVE ONLY RADIOGRAPHY AND FAST?

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Introduction: Trauma is responsible for a big amount of public health expenditure. To avoid missed injuries, some use tomography as routine. But it has risks, is expensive and is unavailable in lots of hospitals. We want to show if it is safe to use radiographics and FAST as a screening method for torso injuries.
Materials and methods: It's the first result of a prospective study under execution. Between September and October 2013, we have studied 45 patients attended in Hospital João XXIII, Brazil. They were victims of blunt trauma and were submitted to a radiographic study (thorax and pelvis) and FAST (Group-A) or tomographic study (thorax/abdomen/pelvis), (Group-B), at hospitalar admission.
Results: Group-A: 38 patients, average age: 31, RTS: 7.02, GCS: 11. Nineteen patients of this group didn't show any change on their exams. Of these 19, 17 didn't have any complications and 2 had solid organ injury diagnosticated after with tomography, required because of abdominal pain. Group-B: 7 patients, average age: 34, RTS: 5.8, GCS: 8.6. All of them had injuries diagnosticated by tomographic study. Three patients had injuries that changed the management.
Conclusion: It seems hat radiography and FAST are safe to predict the patient that won't have torso complications when they are negative ($p < 0.05$). Combined with clinical exam we haven't missed any patient with major injury. Tomography diagnosis more injuries, but part of them don't change the management. Our results motivate us to continue working and we would like to receive ideas to improve it.
Reference:
1. Vugt R. J Trauma. 2011;72:553.
Disclosure: No significant relationships.

P131

IMPLEMENTATION OF PERCUTANEOUS DILATATIONAL TRACHEOSTOMY ON TRAUMA PATIENTS

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Introduction: In the past 50 years, several methods of doing percutaneous tracheostomy at the bedside have been introduced. The most popular technique today is the percutaneous dilatational tracheostomy (PDT).This technique uses serial dilators over a guide wire and is usually done at the bedside in the intensive care unit under bronchoscopic guidance. We present our experience with PDT in trauma patients, with special attention to time for the procedure, early and late complications and outcomes.
Materials and methods: Between January 2012 and September 2013, PDTs were performed in 37 trauma patients. Demographic and clinical data, procedure, ventilatory parameters, as well as perioperative and late complications were recorded prospectively for open technic (OT) and percutaneous tracheostomy.
Results: The mean severity APACHE II score at the time of admission was 17.48 (SD 6.41) in PDT patients and 16.94 (SD 5.64) in OT. Completion of the procedure consumed a mean of 5 min (PDT) vs 30.37 min (OT) ($p \leq 0.0005$). Time until tracheostomy was performed was lower in PDT (mean 2.2d) group vs OT (mean 4.3d) ($p \leq 0.0005$).The procedure caused complications in 7 (PDT) vs 7 (OT) patients ($p = 0.14$). 1 stenosis, 3 granulomas, 2 cases of wound bleeding, 1 subcutaneous emphysema. All patients were followed up for 1 to 6 months. Causes of death in 5 were unrelated to the PDT.
Conclusion: PDT is a fast, safe and simple procedure for trauma patients.
Reference:
1. Delaney A, Bagshaw SM, Nalos M. 'Percutaneous dilatational tracheostomy versus surgical tracheostomy in critically ill patients: a systematic review and meta-analysis'. Crit Care. 2006;10(2): R55.
Disclosure: No significant relationships.

P132

IMAGE EXCHANGE IN ACUTE TRAUMA CARE: CAN MULTIPLE X-RAYS ALWAYS BE AVOIDED?

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Introduction: Efficient cooperation between trauma-centres of all levels is mandatory. Several systems have been implemented that enable transfer of images between hospitals. However, additional and/or repeated imaging can not always be avoided. Our study investigated the rates and reasons for additional and repeated imaging at a Level-1 trauma centre.
Materials and methods: We did a chart review of all trauma-unit patients treated at a Level-1 trauma-centre in 2010 and 2011. Using the hospital information systems and the PACS, we compared the images from the referring hospital to the images made at the Level-1 trauma-centre and identified reasons for additional and repeated imaging.
Results: 163 patients were transferred from another hospital. A total of 100 conventional x-ray images were made in the referring hospitals, 33 % of those were repeated at the receiving hospital. Of the total 251 CT-scans from the referring hospitals, 53.8 % were repeated. The main reason for repeating imaging was insufficient or incomplete imaging (51.9 %), such as only native-CTs. Additional imaging for assessing the progress of trauma (bleeding) had to be performed in 31.8 %. The highest rate of repeated images was found in patients from lower trauma level hospitals.
Conclusion: Exchanging image data between hospitals is an important tool in trauma care. However, there is a large rate of repeated imaging. In order to avoid repeated imaging, common protocols for

trauma imaging need to be implemented and followed in cooperating hospitals.

Reference:

Juhra C, et al. Improving communication in acute trauma care. Electron Healthc. 2009;8(3).

Disclosure: No significant relationships.

NEURO- AND SPINE TRAUMA

P133

AN ASYMPTOMATIC KNIFE BLADE STAB TO THE HEAD: A CASE REPORT

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Introduction: Penetrating, non-missile, head trauma to the temporal region is frequently hazardous causing life-threatening intracranial complications (neurological deficits, vascular defects and infections). We present a case of a penetrating head injury from a knife.

Materials and methods: A young male was brought after sustaining a stab wound to the head. The wound was in the patient's left temporal region (Fig. 1). He was hemodynamically stable. Glasgow Coma Scale was 15/15 and pupils were equal and reactive to light. Extraocular movements were normal and symmetric. He did not reveal any sensorimotor dysfunction or neurologic deficit. The X-rays showed the blade noted passing through maxillar ethmoid bone with the tip of the blade positioned in the right maxillary antrum (Fig. 2). CT cerebral angiogram demonstrated no apparent arterial damage or extravasation (Fig. 3).

Results: The severity of the stab injury depends from the site, the depth, the type of object and the transorbital trajectory. The extent of the injury is often difficult to be evaluated. A thorough clinical examination and radiological evaluation (X-rays, head CT and CT angiogram) are required to evaluate the damage. The therapeutic goals are to remove the foreign body; to prevent the short- and long-term complications; and avoid any further neurological injury.

Conclusion: The point of interest in our case was that the knife blade did not damage the patient's brain or any major vessel.

References:

1. Gulati A. Penetrating knife to the frontal lobe-a case report; 2010.
2. Sweeney JM. Management of nonmissile penetrating brain injuries: description of three cases and review of the literature; 2011.

Disclosure: No significant relationships.

P134

UPPER EXTREMITY TRAUMA IN MULTIPLE TRAUMATIZED PATIENTS: IS THERE AN ADDITIONAL EFFECT OF TRAUMATIC BRAIN INJURY ON LONG-TERM OUTCOME?

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Introduction: Musculoskeletal injuries are common in patients with multiple trauma resulting in pain, functional deficits, and disability. Traumatic brain injuries (TBIs) are common in severely injured patients potentially resulting in neurological impairment and disability that would potentially add to that from the musculoskeletal injuries.

Materials and methods: We reassessed 281 patients with multiple trauma to reveal the impact of TBI after upper extremity trauma at least 10 years after trauma: 229 patients with upper extremity injuries but without TBI (Group I), 32 with concomitant upper extremity injuries and TBI (Group II), and 20 with TBI but no upper extremity injuries (Group III) were included. We evaluated the Glasgow Outcome Score (GOS), Hannover Score for Polytrauma Outcome, SF-12 (Physical Component Summary Score and Mental Component Summary Score), medical aid requirements, and vocational living circumstances.

Results: Additional TBI in multiple trauma patients led to reduced function (GOS: Group I: 4.9 ± 0.2, Group II: 4.5 ± 0.7, Group III: 4.5 ± 0.8) resulting in vocational restrictions (job change: Group I: 74 %, Group II: 91 %, Group III: 90 %). The combination of upper extremity and TBIs did not result in worse long-term scores compared with TBI alone.

Conclusion: Rehabilitation and social reintegration in multiple trauma patients with TBI requires particular emphasis to minimize disability and vocational isolation. Musculoskeletal injuries should not be neglected to ensure the maximum extremity function given the impaired cognitive functions after TBI.

Reference:

1. Dowrick AS, et al. Does the presence of an upper extremity injury affect outcomes after major trauma? J Trauma 2005;58:1175–8.

Disclosure: Industrial support was provided by Hannover Life Re-Insurance, Hannover, Germany. No direct or indirect financial support or other assets were transferred to the authors for this study. The authors state that there are no competing interests.

P135

TREATMENT STRATEGY FOR THE BLUNT CEREBROVASCULAR INJURY: IMPORTANCE AND EFFECTIVENESS OF ENDOVASCULAR TREATMENT

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Introduction: Blunt cerebrovascular injuries (BCVIs) are rare but potentially devastating events. Recent reports have suggested that BCVI occurs in approximately 1 % of all blunt trauma patients with a resultant neurologic morbidity up to 80 % and associated mortality up to 40 %. The optimal management strategy for patients with these lesions is not yet established.

Materials and methods: The study comprised 322 patients admitted from April 2011 to March 2013, with blunt trauma who met predefined screening criteria for multidetector computed tomographic angiography.Screening criteria were severe head injury, basilar skull fracture, facial fracture, cervical injury, and massive epistaxis. The incidence, prognosis and management of BCVI were evaluated retrospectively.

Results: We diagnosed 7 patients with BCVI in a total of 8 vessels. They were categorized morphologically as grades II, III, IV, and V (1, 1, 5, and 1 vessels, respectively) in the Denver grading scale and all

patients received endovascular interventions. Five patients required cervical traction with halo vest brace in the acute phase and two patients revealed massive epistaxis. The overall incidence of BCVI was 2.7 % and mortality was 14 %. The postoperative stroke was observed in one patient (14 %) suffered from grade V cervical artery injury.

Conclusion: Although it is clear that anti-coagulant therapy is the gold standard treatment for BCVI, application of endovascular techniques will be effective for preventing secondary stroke in patients who require cervical traction or in whom anti-coagulation is prohibited because of hemorrhagic complications.

Reference:

1. Bromberg WJ, et al. Blunt cerebrovascular injury practice management guidelines: the Eastern Association for the Surgery of Trauma. J Trauma. 2010;68(2):471–7.

Disclosure: No significant relationships.

P136

EMERGENCY DEPARTMENT INTERMEDIATE CARE UNIT FOR TRAUMATIC BRAIN INJURY

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Introduction: In acute medicine, the concept of intermediate care units (ImCU) promotes greater flexibility in patient triage who may require frequent monitoring of vital signs or nursing interventions, but usually do not require invasive monitoring. We afforded the opportunity to incorporate emergency department ImCU (EDImCU) for trauma patients since 2008.

Materials and methods: We reviewed the medical records of all patients with traumatic brain injury (TBI) admitted to our EDImCU and intensive care unit (ICU) between Jan 2009 and Dec 2012. Patients aged <15 years were excluded. On admission, we deferred to current admission guideline.[1]

Results: Of 518 trauma patients, 69 and 85 patients with TBI were admitted to the EDImCU and ICU with a mean age of 55 and 53 years old, respectively. Eighteen of 69 patients admitted in EDImCU had severe TBI with abbreviated injury score (AIS) $\geq$4. Three of 18 determined growing haematoma and underwent emergency craniotomy after admission, and one of 3 was died during hospitalization. The average length of stay at EDImCU was 3 ± 2 days. All of patients admitted to ICU had TBI with AIS $\geq$3 and/or with other major injuries, i.e., pelvic fracture, pneumothorax or spinal cord injury.

Conclusion: This challenge provides the utility of EDImCU for patients with TBI. The current admission guideline for EDImCU mentioned only patients with TBI. Further studies of this approach for trauma patients with or without TBI are warranted.

Reference:

1. Guidelines on admission and discharge for adult intermediate care unit. American College of Critical Care Medicine of the Society of Critical Care Medicine.

Disclosure: No significant relationships.

P137

DIAGNOSTIC APPROACH OF CEREBRAL FAT EMBOLISM IN OUR HOSPITAL

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Introduction: Cerebral fat embolism (CFE) is one of major complications in trauma victims, and the diagnosis of CFE with multiple trauma is often difficult.

Although there are some diagnostic criteria for CFE, individual diagnostic criterion items have low specificity.

We aimed to collect the cases of CFE to study the accuracy of previous diagnostic criteria based in the clinical features and laboratory examinations.

Materials and methods: We conducted a retrospective chart review. We investigated traumatic patients without head injury who admitted from January 2005 to December 2009 at Teikyo University Hospital and from April 2011 to March 2013 at Yokohama City University Medical Center.

Results: We had 5 patients with the diagnosis of CFE; 4 males and 1 female.

All patients were survival at discharge of hospital, and were met to the Tsuruta criteria which was frequently used as diagnostic criteria of CFE in our country.

In all cases, initial head CT after the onset of consciousness disturbance showed no abnormal findings. However head MRI revealed findings as spotty high signal intensity lesions on DWI and T2WI.

In diagnostic items of the Tsuruta criteria, respiratory failure, anemia and thrombocytopenia were met in all cases.

Conclusion: In the process of diagnosis of CFE, we considered that the Tsuruta criteria is available for screening of CFE, and head MRI is useful for definitive diagnosis.

Reference:

1. You JS, et al. Use of diffusion-weighted MRI in the emergency department for unconscious trauma patients with negative brain CT. Emerg Med J. 2010;27(2):131–2.

Disclosure: No significant relationships.

P138

IMPACT OF SURGICAL OPERATION ON GLASGOW COMA SCALE AND CEREBRAL STATE INDEX AND THEIR CORRELATION IN TRAUMATIC BRAIN- INJURED PATIENTS

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Introduction: Correlation between Glasgow Coma Score (GCS) and variables derived from electroencephalogram has been investigated already in the traumatic brain injury (TBI).[1] Since some TBI patients undergo surgical operation, a query maybe formed about the impact of operation on CSI, GCS and their correlation. This study was designed to answer this question.

Materials and methods: In 60 patients with mild to severe head injuries, GCS and CSI were measured once a day for the first 10 days. Of the total patients, 26 cases underwent craniotomy on the first day of hospitalization. In surgical cases, CSI and GCS were also measured before and after the surgery and were compared with those not undergoing the operation. Correlation between the two indices was compared in the operated and non-operated patients.

Results: A significant correlation was observed between GCS and CSI in the operated ($r = 0.648$) and non-operated ($r = 0.479$) patients in

the all data sets ($P < 0.001$). In patients, who had not undergone surgical operation, GCS and CSI were almost fixed, while in those who were operated, the GCS and CSI increased gradually up to day 7. However, this increase was more prominent about GCS.
Conclusion: In the TBI patients, there is a significant correlation between GCS and CSI regardless of surgery. Interestingly, we found that GCS was more consistent than CSI for the evaluation of consciousness in TBI.
Reference:
1. Jung JY, Cho CB, Min BM. Bispectral index monitoring correlates with the level of consciousness in brain injured patients. Korean J Anesthesiol. 2013;64(3):246–50.
Disclosure: No significant relationships.

P139

MIDDLE LATENCY AUDITORY EVOKED POTENTIAL INDEX MONITORING TO PREDICT BRAIN DEATH AFTER EMERGENCY CRANIOTOMY IN PATIENTS WITH SEVERE TBI

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Introduction: Traumatic brain injury (TBI) is associated with high mortality and brain death (BD) rate. Clinicians treating patients often make therapeutic decisions based on their assessment of prognosis and this is important in deciding whether or not to withdraw treatment. However, there is no satisfactory report on the monitoring of cerebral function to predict functional outcome after TBI.
Materials and methods: The middle latency auditory evoked potential index (MLAEPi) monitor (aepEX plus®, UK) is a mobile MLAEP monitor measuring the degree of cerebral function and representing it using numerical values. All patients underwent emergency craniotomy for TBI within 12 h of the damage, and MLAEPi were subsequently monitored for 14 days after craniotomy. Neurological outcome was evaluated using a cerebral performance category (CPC) score. In this study, patients with CPC score of 3–5 were entered. All patients were administered sedatives for 2 days after craniotomy.
Results: Subjects comprised 13 patients with a median age of 60 years. With regard to outcome, 7 patients had CPC of 3–4 (worse outcome), and 6 showed BD. MLAEPi was not significantly increase after craniotomy in cases of BD. MLAEPi was observed to be significantly higher after day 5 than at immediately after craniotomy in cases of worse outcome. Although MLAEPi was not differ between cases of worse outcome and BD during sedation, MLAEPi was observed to be significantly higher in cases of worse outcome than in BD after day 3.
Conclusion: MLAEPi can predict brain death at an early stage after therapeutic interventions in comatose patients due to TBI.
Disclosure: No significant relationships.

P140

TEMPORARY COVERAGE OF THE MENINGES WITH HYDROCOLLOID DRESSING IN HEAD TRAUMA

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Introduction: Our case report involves a head injury with meningeal exposure, in which we describe a technique for creating a simple and effective temporary cover allowing preparation of a final flap to repair the defect.
Materials and methods: Case report.
Results: An 8 years-old female involved in a motor vehicle accident; at arrival with hypovolemic shock grade III, Glasgow coma scale of 6, a frontal scalp with bone avulsion and partial bone and soft tissue loss with meningeal exposure; a depressed fronto-parietal fracture. The wound dimensions of 10 cm long for 8 cm wide. During surgery a partial left sphenoidal bone loss and a retro-ocular left hematoma were found, a fronto-parietal resection was performed, no rupture of the exposed meninges was found. The depressed fracture was repaired. Due to meningeal exposure a protective hydrocolloid dressing was used to cover the left frontal lobe meninges during 6 days. Posteriorly a right parieto-temporal skin flap was used to cover the defect and skin grafts were applied to cover the remaining soft tissue loss. Her progress was satisfactory without neurological sequelae. Two years from the accident the bone defect is repaired performing a cranioplasty with methylmethacrylate and final remodeling of the flap. Currently the patient is in good conditions without neurological impairment.
Conclusion: We propose the hydrocolloid dressing as a safe option for temporary occlusion of the meninges allowing planning of reconstructive surgery in severely ill patients.
Reference:
1. Jaskolka MS, Olavarria G. Reconstruction of skull defects. Atlas Oral Maxillofac Surg Clin North Am. 2010;18(2):139–49.
Disclosure: No significant relationships.

P141

POSTTRAUMATIC PNEUMOMEDIASTINUM AND PNEUMOMYELON AFTER THORACIC TRAUMA

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Introduction: Pneumomediastinum is a rare occurence in traumatological patients. Actually no report is available about a posttraumatic pneumomyelon.
Materials and methods: In this retrospective case report we want to present a case of posttraumatic pneumomediastinum and pneumomyelon. A 21 years old man that was stomped on the chest while lying on the back when he was in vacation. He seeked medical attention in this country and a computer tomography of the head, cervical spine, thoracic spine and chest was performed. In the absence of clinical symptoms he was discharged home. The patient presented to our E&R because of persistent chest pain and he was notified by the initially treating physician. The foreign radiologist recommended re-evaluation without further information.
Results: The scan showed a pneumomediastinum and a pneumomyelon without pneumothorax or neurological deficit. During hospitalisation a through re-evaluation of the patient was without pathological findings. A gastroscopy and a bronchoscopy were performed and didn't show any hollow organ injury. The bronchoscopy showed an acute bronchitis.
Conclusion: The rare condition of pneumomediastinum and pneumomyelon can occur without persistent symptoms and may resolve spontaneously. In this case it is unclear if it occurs because of the bronchitis or the trauma.

References:
1. Fangman. Brian. N Y State Dent J. 2012;78(6):25–8.
2. Hu, Melissa. Am J Otolaryngol. 2013;34(1):85–8.
3. Jennings, Scott. ANZ J Surg. 2013; no report available about posttraumatic pneumomyelon.
Disclosure: No significant relationships.

P142

PLATELET FUNCTION IN TRAUMATIC BRAIN INJURY; DOES THE TYPE OF TEST MATTER?

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Introduction: Traumatic brain injury (TBI) in patients with platelet inhibitors has risen dramatically in the U.S. Tests of platelet dysfunction to guide treatment are needed. Bleeding time is no longer offered in most U.S. hospitals. Platelet function is currently measured by an Adenosine Di-phosphate (ADP) based test or an Epinephrine (EPI) based test. The purpose of this study is to analyze the effectiveness of each methodology in directing treatment algorithms.
Materials and methods: A retrospective review of all TBI patients admitted to a level one-trauma center was performed (2009–2011). Data included age, sex, MOI, ISS, AIS, GCS, treatment with platelets, platelet function study type and result, mortality, discharge outcomes, and CT scan results on admission and first repeat CT. The study was IRB approved and analyzed using SPSS 21 software. Level of significance were appropriate were $P < 0.05$.
Results: trauma registry included 2004 patients with TBI. Data on anticoagulation and platelet function testing was available in 1,864 patients. ADP platelet function directed therapy showed no correlation between the test and the status of anti-platelet therapy. The EPI directed therapy does correlate with the anti-platelet therapy $p < 0.001$ but had a high 10 % false negative rate.
Conclusion: Evaluation of the patient with either the ADP or the EPI test does not seem to be adequate and may lead to a inappropriate treatment according to current algorithms. Our findings suggest testing such as TEG may better guide reversal in this group of patients.
Reference:
1. Armand R, Hess JR. Treating coagulopathy in trauma patients. Transfus Med Rev. 2003;17(3):223–31.
Disclosure: No significant relationships.

P143

THE "UNHAPPY TRIAD OF C1/2": A NEW FRACTURE ENTITY OF THE ATLANTOAXIAL JOINT AT THE GERIATRIC PATIENT

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Introduction: Even bagatelle trauma can cause atlantoaxial instabilities and combined injuries. In contrast to young patients in the elderly often a "cranial" odontoid fracture, then in combination with a fracture of the atlas bow with a preexisting arthrosis C1/2 is seen. The aim of this study was the description of a new fracture entity.
Materials and methods: Since 01/2007 in 15/48 prospective collected, with anterior transarticular C1/2-stabilisation (ATS) treated geriatric patients with atlantoaxial instabilities "unhappy triad of C1/2" was detected. It is termed as a combined injury of a cranial odontoid fracture (Type II Anderson/D'Alonzo), fracture of the anterior bow of the atlas (Type Gehweiler I) and a preexisting arthrosis of C1/2.
Results: 15 patients (7w, 8m), Ø 81.5 years (r.: 62–91) were treated with the ATS, no new neurological deficits were found. Intraoperative no complications were seen, 1 patients was in need of a prolongated ventilation postoperative. Ø 8.8 days postoperative the patients were discharged from hospital. In the radiological control 41/43 (95.3 %) of the transarticular screws showed correct placement. The examined patients were satisfied with the procedure and painfree.
Conclusion: Caused through the arthrosis of the atlantoaxial arthrosis with restriction of the atlantodental interval a shearing-off injury of the dens is seen, mainly at the level or below the atlas bow fracture(saving bow fracture) and therefore prevent neurological injuries. We recommend the ATS as a gentle procedure, which ensures stability and a fast pain relief.
Reference:
1. Josten C. Cervical spine. In: Buhren V, Josten C (eds) Surgery of the injured spine. Berlin: Springer; 2013. p. 135–1179.
Disclosure: No significant relationships.

P144

CLEARANCE OF THE CERVICAL SPINE IN TRAUMA PATIENTS: EXPERIENCE IN AN ASIAN HOSPITAL AND IMPLEMENTATION OF A CERVICAL SPINE CLEARANCE PROTOCOL

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Introduction: Cervical spine trauma is frequently encountered in patients with blunt trauma. The optimal strategy for evaluating the absence of cervical spine injury before removal of immobilisation collar remains debatable. We aim to evaluate the use of CT imaging alone in C-spine clearance in trauma patients.
Materials and methods: We conducted a retrospective review of 374 patients over 30 months. All trauma activated patients who underwent a CT C-spine were included in the study. Patients who did not fulfil NEXUS criteria underwent a CT C-spine. Fracture of any part of the cervical vertebrae and any subluxation was considered a positive CT C-spine for injury.
Results: Injuries of the cervical spine were detected on CT C-spine imaging in 12.3 % ($n = 46$) patients. 42 patients had both CT and MRI of the cervical spine. 55 % of patients had normal MRI scans and 19 % had soft tissue/ligamentous injuries. Ligamentous injury was missed on CT in 2 patients. Less than 2 % of patients ($n = 7$) required surgery for their cervical spine injuries and 3 of these patients were deemed to require surgical intervention as a result of the MRI findings.
Conclusion: Clinically significant cervical spine injuries was low in our study population and less than 1 % of patients require a change in management as a result of MRI C spine findings, hence we feel that CT imaging alone is sufficient to clear the C spine in patients without gross neurological deficits.
Reference:
1. Hennessy D, et al. Cervical spine clearance in obtunded blunt trauma patients: a prospective study. J Trauma. 2010;68(3):576–82.
Disclosure: No significant relationships.

P145

3D-C-ARM BASED NAVIGATION AT POSTERIOR STABILISATION OF THE CERVICAL AND THORACIC SPINE IN 545 SCREWS. PROBLEMS AND BENEFIT

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Introduction: 3D-C-arms connected with navigation systems are being used more often especially in posterior stabilisations in the cervical and thoracic spine. This study analyses our experiences with 3D-based navigation after 5 years of clinical use.
Materials and methods: A 3D-C-Arm (Vision Vario 3D, Ziehm) was connected with a navigation system (Vector vision, Brainlab) and since 10/2007 used for the posterior placement of overall 545 (92 cervical, 453 thoracic) screws at 82 Patients (20 Cervical, 62 thoracic spine).
Results: Scan-time intraoperatively took 60 s on average, data-transfer to the navigation-system another 10 s. Application-time including anti-collision-check needs approx. 6 min [5;18]. In total 83.5 % (455/545) of the screws were navigated. In addition, we experienced technical problems Altogether 9 screws (4 Cervical, 5 thoracic) were changed because of the intraoperative 3D-scan. Correct placement was seen for each screw.
Conclusion: The application of the combination of intraoperative 3D-imaging and navigation for posterior instrumentation of the cervical and the upper thoracic spine is technically feasible and reliable in clinical use. Image-quality at the cervical spine is depending on individual bone density, and possible metal artifacts. With undisturbed visibility of the vertebral body, the reliability of 3D-based navigation at the cervical spine is comparable to that of CT-based procedures. Furthermore, exposure to radiation is reduced due to the possibility of sparing pre- and postoperative CT. Because of that, costs are being decreased.
Reference:
1. Gonschorek O, Jarvers JS: [Intraoperative imaging and navigation. In: Buhren V, Josten C (eds) Surgery of the injured spine. Berlin:Springer; 2013. p. 135–1179.
Disclosure: No significant relationships.

P146

HORSE RELATED SPINE INJURIES: A REVIEW OF 50 CASES

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Introduction: Horseback riding is a sport of unbroken popularity, with its risks often underestimated. Horse related accidents frequently lead to severe spine injuries. We analyzed horse-related cases of spine injuries to show the need for preventive measures.
Materials and methods: For a retrospective analysis of hospitalized horse-related injuries between May, 2005 and October, 2012 in our database we used horse-related keywords. The identified cases were analysed for patient age and sex, accident mechanism, resulting injury, chosen treatment, and duration of the stay in hospital.
Results: We identified 52 inpatient cases. Most of the spine injuries resulted from a fall of the horseback and occured in either spring or fall. Most patients were female (87 %), on average 30.6 years old. The identified 52 patients covered a total of 87 separate spine injuries. Cervical spine was hurt in 18 %, thoracic spine in 31 %, lumbar spine in 46 %, and sacral spine in 4 %. Nine of 52 patients sustained severe spine traumata with three or more spine regions affected. 63 of 87 injuries were fractures with 53 requiring surgical treatment. On average, the duration of a stay in hospital was 11.4 days.
Conclusion: Horse-related injuries often lead to spine injuries, with more than half needing surgical treatment. With a high percentage of severe spine traumata, the risks of this popular sport must not be underestimated. Thus, a recommendation for mandatory back-protection should be discussed.
Reference:
1. Hessler C, Namislo V, et al. Spine injuries due to horse riding accidents—an analysis of 30 cases. Sportverletz Sportschaden. 2011;25(2):93–6.
Disclosure: No significant relationships.

SURGICAL CRITICAL CARE II

P147

IDIOPATHIC RETROPERITONEAL BLEEDING: A REPORT OF FIVE CASES

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Introduction: Idiopathic retroperitoneal bleeding (IRB) is a rare disease. We categorized clinical characteristics of IRB in patients treated in our hospital.
Materials and methods: We investigated present and past medical history, blood test results before bleeding, therapies used, and causative blood vessels of 5 patients with IRB treated in our ICU and ER center.
Results: The patients included 3 men and 2 women. The diagnosis was made in 1 patient after live donor liver transplant and in 1 patient with fulminant hepatitis/hepatic encephalopathy, 2 patients with renal failure, and 1 patient with post resuscitation encephalopathy. Average platelet count was 127,000/mm^3, PT(INR) was 1.36, and APTT was 32.9 s. The causative blood vessels were lumbar and superior gluteal arteries in 1 patient, lumbar arteries in 2 patients, renal artery in 1 patient, and internal iliac artery in 1 patient. We stopped the bleeding in 4 patients with arterial embolization and in 1 patient with surgical hemostasis. We instituted hemodialysis before bleeding in 4 of the patients (for anticoagulation, heparin and nafamostat mesylate were used). The patient not receiving hemodialysis bled after administration of heparin. We considered adiministration of anticoagulant drugs and hemodialysis as risk factors for IRB. We considered rupture of the blood vessels by mechanical stimulus of back pressure due to the patients' recumbent position as mechanism of bleeding.
Conclusion: Administrations of anticoagulant drugs and hemodialysis are risk factors for, IRB.
Reference:
1. Sun PL, Lee YC, Chiu KC. Retroperitoneal hemorrhage caused by enoxaparin-induced spontaneous lumbar artery bleeding and treated

by transcatheter arterial embolization: a case report. PubMed. 2009;2:9375.
Disclosure: No significant relationships.

P148

LUXATIO CORDIS- SURGICAL TREATMENT AND ECMO THERAPY

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Introduction: We are reporting about a 54 year old male Patient, who was transferred 8 days post trauma to our ICU after a motorcycle accident and initial treatment.
Materials and methods: Case report.
Results: CT scans showed instable fractures of the thoracic vertebrae, a transsection of the myelon, serial fractures of the rips bilaterally, a left sided haematothorax and femur fracture. On the trauma scene CPR was necessary. Febrile temperatures delayed the surgical treatment. Two weeks post trauma CT scans detected a pneumothorax and pneumopericardium, so a chest drain was inserted. Post interventional chest X-rays showed further dislocation of the heart to the right. A luxatio cordis was diagnosed. The patient underwent a pericardial patch plastic immediately. Postoperative high dose vasopressor therapy was needed; the slightest change of the patient's position caused a cardial decompensation. Oxygenation worsened under high pressure and high oxygenated ventilation post surgical, so that ECMO was installed 24 h post surgery. The ECMO therapy was necessary for 7 days. Afterwards the Patient presented stable vital signs. Eighteen days after ECMO therapy we were able to stabilize the spine and further on transferred the patient to a rehabilitation facility.
Conclusion: Conclusively a luxatio cordis is a treatable condition when treated fast and is lethal when not detected early.
Reference:
1. Fulda G, Rodriguez A, Turney SZ, Cowley RA. Blunt traumatic pericardial rupture. A ten year experience 1979–1989. J Cardiovasc Surg (Torino). 1990;31(4):525–30.
Disclosure: No significant relationships.

P149

AMOUNT OF BLOOD TRANSFUSIONS IN A RESTRICTIVE TRANSFUSION PROTOCOL AND SURVIVAL IN PATIENTS RECEIVING EXTRACORPOREAL MEMBRANE OXYGENATION (ECMO)

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Introduction: The Extracorporeal Life Support Organization (ELSO) recommends a hematocrit >45 %, whereas in critical care patients a restrictive transfusion protocol is recommended. We analysed a restrictive transfusion protocol (transfusion trigger haemoglobin <8 g/dl) and early outcomes in overall survival in ECMO patients.
Materials and methods: We analyzed the ELSO Registry and retrospectively our database for adults undergoing ECMO therapy from 2008 to 2012. n = 45, over 16 years of age, outcome "weaned from ECMO", "survival discharge", hemoglobin levels and number of transfused packed red blood cells (PRBC) before/after cannulation, and during ECMO support.
Results: Mean age 52 (39-65) years. 6 female patients. Veno arterial ECMO in 5 cases. Successful weaning from ECMO 27 cases (60 %). Survival discharge 22 cases (49 %). In survivors mean Hb 9.79 ± 0.7 g/dl, transfused PRBC before cannulation 3.6 (SD 3.4), during ECMO support 10,5 (SD 6.6), after decannulation 4.6 (SD 3.9). In nonsurvivors mean Hb 10.11 ± 1.02 g/dl, transfused PRBC before cannulation 4.3 (SD 4.3), during ECMO support 19.9 (SD 13.1) and after decannulation 1.3 (SD 2.1). The Wilcoxon–Mann–Whitney test showed no significance in overall survival considering the haemoglobin level and amount of PRBC transfusions.
Conclusion: Although there was a non significant tendency for non-survivors to receive higher transfusion rates during the course of ECMO support, the amount of PRBC transfusions and the haemoglobin level in a restrictive protocol had no influence on outcome in overall survival.
References:
1. Hendrickson. Noninfectious serious hazards of transfusion. 2009.
2. (ELSO)-General Guidelines for all ECLS Cases.
Disclosure: No significant relationships.

P150

THE EFFECT OF HFOV FOR CONTINUOUS ALVEOLAR HEMORRHAGE DUE TO TRAUMATIC LUNG INJURY PATIENTS

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Introduction: High frequency oscillatory ventilation (HFOV) seems ideal for lung protection to open the alveolar collapse keeping with mean airway pressure in acute respiratory distress syndrome (ARDS). Although ARDS are life threatening complication in trauma patients, there are a few reports traumatic lung injury treated with HFOV.
Materials and methods: The purpose in this study was to evaluate HFOV for traumatic lung injury patients who continued alveolar hemorrhage using conventional mechanical ventilation. We retrospectively analyzed 14 patients treated with HFOV in our hospital. We compared P/F ratio, Oxygen index (OI) at before HFOV, after 24 h and after 7 days.
Results: 13 patients were multiple trauma injury and 1 patients were return of spontaneous resuscitation after the cardio pulmonary resuscitation. Average age was 63.1 years old, SOFA score was 13.9, APACHE II Score was 23.9. Alveolar hemorrhage was subdued by HFOV. P/F ratio was significantly improved 111.5 ± 44.3, 216.7 ± 83.9, 287.6 ± 55 and OI was also significantly improved 16.2 ± 4.7, 8.64 ± 2.5, 4.16 ± 1.4 (before HFOV, after 24 h, after 7 days respectively). Some complications such as hypotension (3), pneumothorax (1), subcutaneous emphysema (3) were occurred. However these were not leading to the serious problems and the most benefit using HFOV was stopped alveolar hemorrhage.
Conclusion: Our survey indicated that HFOV was useful tool for the patients with continuous alveolar hemorrhage using conventional

ventilation. The further study is needed to elucidate the efficacy and safety using HFOV.

Reference:

1. Young D, et al. High frequency oscillation for acute respiratory distress syndrome. OSCAR Study Group. N Engl J Med. 2013;368(9):806–13.

Disclosure: No significant relationships.

P151

CLINICAL FEATURES AND ANALYSIS OF PREDICTORS OF MORTALITY IN PATIENTS WITH TRAUMATIC BRAIN INJURY (TBI) ADMITTED TO THE INTENSIVE CARE UNIT

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Introduction: The research objective was to describe patient characteristics and study the factors associated with mortality in patients with traumatic brain injury (TBI) admitted to the Intensive Care Unit (ICU) in a general hospital in Florianópolis.

Materials and methods: Data were collected from medical records for the period from 01 October 2007 to September 30, 2009 involving all individuals of both sexes with clinical diagnosis of TBI and age less than 16 years and transcribed into an instrument specially designed for this purpose and included gender, age, mechanism of injury, CT scan, initial severity by ECG, be traumatized, presence of fever, pneumonia, hypoxia, hypotension and Association of hypoxia and hypotension.

Results: Were admitted 67 TBI. Among these, (73.1 %) were aged less than or equal to 40 years (26.9 %) aged over 40 years. There was male predominance (77.6 %) patients, most patients (22.4 %) coming from the city of Palhoça. The most common cause of head injury was traffic accident (67.7 %), followed by falls (23.9 %) and assaults (4.5 %). Regarding the severity of trauma, 2 patients had no report as to the score on the Glasgow coma scale; (68.7 %) had severe TBI, (9 %) and moderate (19.4 %) had mild head injuries.

Conclusion: The initial severity by ECG, the presence of hypotension and the association of hypoxia and hypotension were a significant influence on patient outcomes.

Reference:

1. Martins ET, Linhares MN, Sousa DS, et al. Mortality in severe traumatic brain injury: a multivariate analysis of 748 Brazilian patients from Florianopolis city. J Trauma. 2009.

Disclosure: No significant relationships.

P152

INTENSIVE CARE CHALLENGES FOR SURGICAL PATIENTS WITH RENAL FAILURE: OUR EXPERIENCE

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Introduction: Dialysis dependent chronic kidney failure is a problem for every healthcare system. The prevalence of end-stage renal disease has increased in the last decades. Renal failure is associated with increased risk of cardiovascular comorbidity, increased severity of cardiovascular disease, and an adjusted all-cause mortality rate higher than the general population.

Materials and methods: In the last 2 years in our department were admitted 881 patients with renal failure and underwent different surgical procedures (parathyroidectomy, vascular access surgery, nephrectomy or peritoneal catheter insertion and other procedures).

Results: These patients presented electively or emergently for surgery related or not to renal failure. In any perioperative setting the haemodialysis dependent patient represented a significant clinical challenge, and successful management of these patients required effective cooperation and communication between nephrologist, anaesthesiologist, and surgical staff. In this paper we provide an overview of some of the key aspects of managing these patients successfully during the perioperative period.

Conclusion: For these patients, in general surgery procedures anesthesia and perioperative management should be careful prepared, with adequate perfusable solutions and drugs doses. We propose an overview of the importance of maintaining microvascular perfusion and the role of viscosity in preserving the capillary perfusion network for these patients.

Reference:

1. Renal failure, surgery, management.

Disclosure: No significant relationships.

P153

EXTRACORPOREAL LUNG SUPPORT AND HIGH FREQUENCY OSCILLATION VENTILATION IN PATIENTS WITH SPINAL CORD INJURY

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Introduction: Trauma related spinal cord injury carries potentially devastating respiratory implications. We present our results on ARDS treatment in tetra- and paraplegia patients using extracorporeal lung support (iLA, v.v. ECMO) and HFOV.

Materials and methods: In total 5 tetra- and 5 paraplegic patients (8 male, 2 female) fulfilled the criteria for treatment with extra-corporeal lung support. The outcome is analyzed included ICU and hospital length of stay, runtime of the device, weaning and survival.

Results: 2 patients received iLA, 2 patients HFOV, 6 patients were cannulated for v.v. ECMO. Average time to ECMO was (3.5 days $\pm$ 3.4). Average run time of v.v ECMO was 11.7 $\pm$ 4.2 days, of iLA 7 $\pm$ 1.4 days and of HFOV 6 days. Mean length of stay in the ICU was 25 $\pm$ 11.7 days, in hospital 50.2 $\pm$ 37.4 days. 5 (83 %) patients have been weaned from ECMO. 4 (66.7 %) patients were discharged from the ICU and hospital. 1 Patient treated with iLA has been weaned and was discharged from the ICU and hospital (50 %). Both Patients treated with HFOV died at the ICU.

Conclusion: ARDS is one of the feared complications in patients with major trauma. ECMO therapy in patients with traumatic spinal cord injury and ARDS is a feasible procedure.
Reference:
1. Cordell-Smith, et al. Traumatic lung injury treated by ECMO. Injury 2006.
Disclosure: No significant relationships.

P154

OUTCOME OF OCCULT HEMO-PNEUMOTHORAX IN TRAUMA PATIENTS WHO REQUIRED POSITIVE-PRESSURE VENTILATION

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Introduction: Occult hemo-pneumothorax (OHPT) is the presence of intrapleural blood and air visible on chest computed tomography (CT) but not on initial chest radiograph. Scarce data exist on the management and outcomes of OHPT in blunt trauma patients who are subjected to positive-pressure ventilation (PPV).
Materials and methods: To identify those patients with OHPT on mechanical ventilation or need for ventilatory support for surgical procedures and who can be safely managed without chest tube insertion. We conducted a cohort observational study. OHPT was quantified by CT measurement. Data included patients' demographics, injury mechanism and severity, chest injuries, mechanical ventilation duration and parameters. Indications for tube thoracostomy, hospital length of stay, complications and outcome were analyzed.
Results: There were 51 patients with OHPT identified on CT scan in our study including those who underwent mechanical ventilation for surgical procedures. Tube thoracostomy was successfully avoided in 37 patients (72.5 %). Indications for chest tube placement in 14(27.5 %) of patients included x-ray evidence of hemothorax progression (10), pneumothorax progression (2), respiratory compromise with oxygen desaturation (2).Thirteen patients developed pneumonia and seven patients had ARDS.
Conclusion: Occult hemo-pneumothorax can be carefully observed without tube thoracostomy in 72.5 % of patients with chest trauma who require positive pressure ventilation. Intervention can be restricted to those patients who had evidence of increase in the size of hemothorax or pneumothorax on follow-up chest radiographs or developed respiratory compromise.
References:
1. Moore, et al. Blunt traumatic occult pneumothorax: is observation safe? J Trauma. 2011;70(5).
2. Bilello JF, et al. Occult traumatic hemothorax. Am J Surg. 2005;190:841–4.
Disclosure: No significant relationships.

P155

CHEST WALL RECONSTRUCTION FOR POSTSTERNOTOMY MEDIASTINITIS AND STERNAL DEHISCENCE AFTER CARDIAC SURGERY

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Introduction: Sternal dehiscence following cardiac surgery is a rare and grave complication that is often a precursor to mediastinitis.
Materials and methods: We report a complex case of sternotomy wound dehiscence with multiple serious complications and we present an overview and management of sternal wound infection.
Results: A 80 years-old man with diabetes, coronary artery disease and severe aortic valve stenosis, was admitted to hospital for aortic valve replacement and aortocoronary bypass and then he was accepted in Intensive Care United. During the first 2 days in the ICU he presented several episodes of insufficiency left ventricular and high glycemic levels. 4 days after surgery the patient presented fever up to 39 °C and the sternal wound showed erythema and large volume drainage with sternal stability. We performed a thorax scan that release a retroesternal abscess 9 mm major diameter and mediastinal infiltration. Antibiotics treatment, surgical debridement and vacuum-assisted closure were done without clinical improvement. Latissimus dorsi and skin flaps for sternal closure were performed with complete flap necrosis and wound infection 2 days after surgery. A second surgery was necessary and omental flap was placed into mediastinal defect.
Conclusion: Mediastinitis is a grave complication after median sternotomy. There are risk factors for sternal wound infection and may be helpful for additional prophylactic measures. Diagnosis of sternal dehiscence after sternotomy is still made clinically. Muscle or omental flaps are often necessary to successful closure and reduce the incidence mediastinitis-related morbidity and mortality, but they are not free of complications.
Reference:
1. Up to Date Pubmed Journal of cardiothoracic surgery.
Disclosure: No significant relationships.

SKELETAL TRAUMA LOWER EXTREMITY

P156

THE MANAGEMENT OF COMPLEX POLYSEGMENTAL TIBIAL FRACTURES WITH THE ILIZAROV FIXATOR. TEN YEARS EXPERIENCE WITH ILIZAROV APPLICATION

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Introduction: The aim of this study is to evaluate the results of a consecutive series of patients with complex polysegmental tibial fractures treated with the Ilizarov fixator.
Materials and methods: From 2005 to 2011 eighteen patients with polysegmental diaphyseal tibia fractures (AO/OTA types C2 and C3) were treated with the ilizarov fixator. All of them were men, with the average age 38.7 years (range 17–64 years). Nine fractures were open. The Ilizarov fixator was applied after closed fracture reduction technique under calcaneal skeletal traction in all cases. In 8 patients the fixator was extended to the foot.
Results: Mean follow-up was 31.4 months (range 16–58 months). The mean external fixation time was 135.6 days (range 92–186 days). Fracture union and full weight-bearing ability on the affected limb was achieved in all cases. All the patients at the last evaluation had fully returned to daily and working activities. Residual valgus deformity 8° occurred in one case. Only seven wires (7/282), presented Grade-2 pin tract infection and were subsequently exchanged.

Conclusion: The Ilizarov fixator is a reliable option for the treatment of complex polysegmental diaphyseal tibia fractures. The technique provides a minimally invasive, biological fracture osteosynthesis, with high union and a very low complication rate.

Reference:

1. Giannoudis PV, Hinsche AF, Cohen A. Segmental tibial fractures: an assessment of procedures in 27 cases. Injury 2003;34:756–62.

Disclosure: No significant relationships.

P157

COMPARISON BETWEEN HYBRID EXTERNAL FIXATORS (HEF) VS ORIF IN THE TREATMENT OF DIFFICULT TIBIAL PLATEAU FRACTURES

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Introduction: The aim of this study is to compare the outcomes of HEF and ORIF techniques for the treatment of difficult tibial plateau fracture (Schatzker types V and VI).

Materials and methods: Between 2000–2012, 52 patients aged between 19–82 years, have been treated operatively for Schatzker V (28 patients = Group A) and Schatzker VI (24 patients = Group B) tibial plateau fractures,. 18 patients of the Group A and 5 patients of the Group B have been treated with HEF, while 10 patients of the Group A and 19 patients of the Group B with ORIF and bone grafting (DBM). Open fractures occurred in 4 patients of the Group A and 1 patient of the Group B, all of them treated with HEF.

Results: Follow up ranged from 2–12 years. Average time to union has been 5.5 (3–7) months for the ORIF group and 4.8 (3–6.5) months for the HEF group. Superficial pin tract infection has developed in 5 cases, deep infection in 1 case, delayed union in 1 case and post- traumatic arthritis in 5 cases.

Conclusion: Both techniques seem to have satisfactory and comparable results in treating these difficult tibial plateau fractures, provided the anatomic restoration of the articular surface. In cases of concomitant skin problems (lesion or excessive soft tissue oedema) HEF should be the treatment of choice.

Reference:

1. Krupp RJ, et al. Treatment of bicondylar tibia plateau fractures using locked plating vs external fixation. Orthopedics 2009;32(8).

Disclosure: No significant relationships.

P158

SEVERE OPEN IPSILATERAL NONCONTIGUOUS TIBIAL SHAFT AND PLATEAU FRACTURES TREATED BY COMBINING SUPRA-PATELLAR NAILS AND PLATES: A CASE REPORT

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Introduction: It can be challenging to treat open noncontiguous tibial shaft and plateau fractures. The traumatized soft tissue can be easily damaged by plate application and flexed knee positioning for tibial nailing can be also problematic. We report two cases successfully treated by combining supra-patellar nails and plates.

Materials and methods: Case 1 A 43 year-old female, hit by a car. Diagnosis: left tibial plateau fracture (C3) and shaft open fracture (IIIa). Operation: debridement, external fixation (EF). Negative pressure would therapy (NPWT) applied on the damaged wound. Two weeks later, firstly tibial plateau was fixed using a non-bulky plate. Supra-patellar nailing was then performed while compressing the plateau fracture using a clamp device with knee extended position. After 6 months, she was discharged without complications.

Results: Case 2 A 28 year-old male was injured in a traffic accident. Diagnosis: left tibial plateau fracture (C3) and shaft open fracture (IIIb). Operation: debridement, EF. NPWT applied on the damaged wound. Two days later, shortening of the left tibia was done to close the open wound. One week later, tibial fracture was treated same as case 1. Wound was covered by musculo-cutaneous flap. After 6 months, all fractures healed. Later, we consider extension for his left tibia.

Conclusion: Tibial plateau fractures were treated using non-bulky plates and supra-patellar nailing was performed while using a clamp device with knee extended position, which was effective for preserving damaged soft tissues.

Reference:

1. Kubiak EN, et al. Operative treatment of ipsilateral noncontiguous unicondylar tibial plateau and shaft fractures: combining plates and nails. JOT. 2008.

Disclosure: No significant relationships.

P159

OUR EXPERIENCE IN OPERATING DISTAL TIBIA FRACTURES WITH THE USE OF ORIF AND/OR EXTERNAL FIXATION (EF)

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Introduction: Distal tibia fractures include extra-articular fractures of the metaphysis and the more severe intra-articular tibial plafond or pilon fractures. The aim of this study is to present our experience in the surgical treatment of distal tibia fractures with the use of ORIF and EF.

Materials and methods: Between 2000–2012, 22 patients aged 17–88 years, have been treated operatively for distal tibia fractures. ORIF has been used in 7 cases, ORIF and Ex-Fix in 8 cases and Ex-Fix in 7 cases. 14 patients have been male and 8 female. The mechanism of injury is RTA in 15 cases and fall in 7 cases. 9 out of 22 fractures have been open.

Results: Follow up ranged from 1–12 years. Average time to union was 18 weeks (16–23) for ORIF, 21.1 weeks (16–25 weeks) for ORIF and EF and 16.4 weeks (12–22 weeks) for EF. There were 3 pin-track infections at the Ex-Fix group and 2 cases of mild post-traumatic arthritis at the ORIF group.

Conclusion: Both techniques seem to have satisfactory results in treating these difficult distal tibia fractures. Reconstruction of correct length of the fibula and articular surface of the tibia, use of cancellous autograft to fill the bone defect in the metaphysis of the tibia, and stabilization of the medial aspect of the tibia seem to be vital factors for the outcome of both techniques.

Reference:

1. Bahari S, et al. Minimally invasive percutaneous plate fixation of distal tibia fractures. Acta Orthop Belg. 2007;73:635–40.

Disclosure: No significant relationships.

P160

TIBIAL SHAFT FRACTURES TREATED USING INTRAMEDULLARY OSTEOSYNTHESIS

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Introduction: Method of intramedullary osteosynthesis, as minimally invasive surgical procedure, enables faster tibial healing, better reposition and fixations of fragments, early mobilization of attendant joints and faster rehabilitation of patients. Objectives are retrospective analysis of clinical material and representation of 8 years follow up treatment results using this method.
Materials and methods: On our clinic, from 2006 to 2013, we have treated patients with 390 tibial shaft fractures. There were 308 (79 %) closed fractures, 82 (21 %) open fractures, of which 64 were gradus I (Gustilo-Anderson) and 18 were gradus II (Gustilo-Anderson). All of nailing were performed with reaming medullar canal, while in 362 (93 %) cases proximal and distal locking screws were used and in remaining 28 (7 %) cases proximal or distal locking screw was used. In 33 cases (9 %), nail dynamization was performed afterwards to accomplish faster healing.
Results: Early perioperative complications were: two intraoperative tibial fractures, two compartment syndromes. Fracture union was recorded in 382 cases (98 %), fracture nonunion in 5 cases (1 %) and pseudoarthrosis in 3 cases (1 %). There were 2 cases of deep infection, both successfully eradicated and treated with transosseus osteosynthesis. Nail fracture was recorded in 2 cases, and locking screw fracture in 19 cases. Average healing time was 3 months.
Conclusion: Intramedullary osteosynthesis represent method of choice for tibial shaft fracture treatment because it is minimally invasive procedure, enables good reposition-fixation of fragments and faster healing.
Reference:
1. Duan X, Al-Qwbani M, Zeng Y, Zhang W, Xiang Z. Intramedullary nailing for tibial shaft fractures in adults. Cochrane Database Syst Rev. 2012;1:CD008241.
Disclosure: No significant relationships.

P161

This abstract has been withdrawn.

P162

MULTIFRAGMENTARY TIBIAL PILON FRACTURES TREATED WITH TRANSOSSEOUS OSTEOSYNTHESIS

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Introduction: Treatment of multifragmentary pilon fractures and the maximum correct surgical technique leaves some impact on the function of the ankle.
Materials and methods: In our clinic, we have treated 46 patients from 2006 to 2013. Because of the complexity of these fractures and dangers of open reduction and fixation, we opted for a closed method, transosseous osteosynthesis with the Ilizarov apparatus. On average, the patients were operated after 3 days. 38 fractures were closed and 8 open. According to Anderson-Gustilo classification, 3 cases were type I, 3 type II and 2 type III. Age structure consisted of 37 men and 9 women. The average age was 37 years.
Results: Average wearing time of the apparatus was 3.5 months. Full splicing, we had in 41 cases, extended splicing in 3 cases, and pseudoarthrosis in 2 cases. The occurrence of transient infection around the needles of the apparatus, we had in 6 cases, which were treated with antibiotics based on smear findings. We analyzed the functional results (contracture of the ankle, limping, sympathetic dystrophy, pain and immobilization). Parameters indicate that in 33 patients the result was excellent, good in 5, moderate in 5 and poor in 3.
Conclusion: Transosseous osteosynthesis in our experience proved to be significantly superior to the traditional methods of osteosynthesis (ORIF) because it reduces the risk of infection and the ability to manipulate the device to bone fragments are possible.
Reference:
1. Vidyadhara S, Rao SK. Ilizarov treatment of complex tibial pilon fractures. Int Orthop. 2006;30(2):113–7.
Disclosure: No significant relationships.

P163

This abstract has been withdrawn.

P164

INTRA-ARTICULAR PROXIMAL TIBIAL FRACTURES: ARTHROSCOPICALLY ASSISTED OSTEOSYNTHESIS

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Introduction: Intra-articular proximal tibial fractures are some of the most challenging periarticular injuries to treat. Anatomic restoration of the articular surface with rigid internal fixation, allowing immediate range of motion, is critical to a successful, functional outcome. Arthroscopic techniques possess several advantages over conventional open reduction and internal fixation performed through an arthrotomy. Usually is arthroscopically assisted osteosynthesis recommended for fractures classified B according to the AO system.
Materials and methods: In the period from 2005 to 2013, 78 patients with proximal tibial fractures were operated in our department. Fractures AO 42 B1–C3 were diagnosed by CT before operation. In all these cases we used arthroscopically assisted osteosynthesis. Minimally invasive fixation with cancellous screws was used in 11, buttress plate in 24 and LCP in 43 patients. Spongioplasty was carried out in 27 patients and 16 meniscal ruptures were repaired.
Results: 74 patients were healed without complication. Complication was in 4 cases of B type fractures: 1 failure of osteosynthesis, 1

flebotrombosis, 1 complication of wound healing and 1 delayed union.
Conclusion: Results and number of complication of arthroscopically assisted osteosynthesis of intra-articular fractures of proximal tibia classified according to the AO system B and C are comparable.
We found lower number of complication in group of C type fractures. That is why we can recommend arthroscopic techniques for treatment of B and also C type fractures.
Reference:
1. Miller MD, Cole BJ, et al. Textbook of arthroscopy. Philadelphia: Elsevier; 2004.
Disclosure: No significant relationships.

P165

OSTEOSYNTHESIS OF THE POSTERIOR EDGE OF THE TIBIA IN TREATMENT AS THE PREVENTION OF THE ANKLE POSTTRAUMATIC ARTHROSIS

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Introduction: The posterior edge of the distal tibia is an important stabilising factor of the ankle joint. This fragment in ankle fractures may play an important role in the posttraumatic joint condition and it is often neglected. The purpose of this study was to show the relevance and importance of the posterior edge of the distal tibia in the surgical treatment as the prevention of the ankle osteoarthritis and chronic tibiofibular instability.
Materials and methods: Prospective study was conducted from 2006 to 2008, with the total of 48 patients with diagnosed fracture of the posterior edge of the distal tibia. Surgical treatment with lag screws aplicated from the dorsal approach was done in 18 patients and evaluated with the Foot and Ankle Out-come Score (FAOS).
Results: FAOS assessment: 16 patients 88.9 % received more than 90 points and 2 patients (11.1 %) ranged between 80–90 points at 6 months follow-up. 17 patients 94.4 % received more than 90 points and 1 patient 5.6 % ranged between 80–90 points 1 year after the surgical treatment.
Conclusion: As the prevention of the ankle posttraumatic osteoarthritis and chronic tibiofibular instability, the restoration of the congruence of the joint surface and the stable osteosynthesis of the posterior edge of the tibia is necessary. The chronic subluxation of the fibula and talus can occur, too. All these factors contribute to osteoarthritis development which is accompanied with pain, movement limitation of the ankle joint, and the decrease of the patients quality of life.
Reference:
1. Těknědžjan Osteosyntéza hlezna, Act. Ortopedic. 2006.
Disclosure: No significant relationships.

P166

PLATE OSTEOSYNTHESIS PRIMARY FIXATION IN OPEN LOWER LIMB FRACTURE

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Introduction: Authors present a definitive primary approach with highly satisfactory results using plate osteosynthesis in tibia fixation of an open lower limb fracture to a case of a 13 year old injured with a land mower.
Materials and methods: We present a 13 year old male that sustained a complicated left lower limb and foot fracture caused by a land mower while using it. The incident happened during the morning, he was transported at 11.30 a.m. to Koprivnica regional hospital, was promptly diagnostically processed. An anesthesia and surgery team organized immediate surgery, antibiotic booster therapy was administered. At 2.30 p.m. surgery started, ended at 5.45 p.m. The main act was primary tibial plate osteosynthesis.
Results: Recovery was as expected with no secondary complications, control x-rays revealed a highly satisfactory osteosynthesis and fragment position with no primary signs of possible arthrodesis. Soft tissue healed partially "per secundam" with no primary infection. Long term follow up showed that bone recovered as expected for age and fracture type, soft tissue fully healed.
Conclusion: Primary definitive plate osteosynthesis in open fractures of extremity bones could give highly satisfactory results without or minimal complications despite fracture classification and injury nature, it is the surgeons decision based on work conditions, experience, patients general condition and above all a professional team.
References:
1. Antabak A, et al. Results of treatment of tibial fractures in children. Lijec Vjesn. 2012.
2. Grimard G, Naudie D, Laberge LC, Hamdy RC. Open fractures of the tibia in children. Clin Orthop Relat Res. 1996;332:62–70.
Disclosure: No significant relationships.

P167

CAUSES OF OPEN FRACTURES: ORTHOPAEDIC INJURIES RELATED TO HOME-MADE AGRICULTURAL VEHICLES

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Introduction: Hoeing machines, which have been made by changing outboard motors for use in agriculture and may be added to trailers, are in widespread use in Anatolia. Although the use of these vehicles, which are known as 'pat pat', is forbidden in traffic, they may be involved in traffic accidents or their use for agricultural hoeing purposes may result in accidents. This study aimed to evaluate the orthopaedic injuries related to these home-made agricultural machines.
Materials and methods: Patients hospitalised in two central hospitals in Samsun between December 2006 and October 2013 was scanned using ICD codes. Patients with head trauma, thoracic or abdominal trauma were excluded from the study.
Results: Forty-six patients (43 male, 3 female) with a mean age of 36 years (range 15–64 years) were evaluated. Open fractures were determined in 42 patients. According to the Gustilo-Anderson classification, 8 patients had Type 1, 16 patients had Type 2 and 18 patients had Type 3 open fractures. Amputation was necessary in four of the patients. The duration of hospital stay was determined as mean 17.1 days (range 1–56 days).
Conclusion: As most of the orthopaedic injuries related to home-made agricultural machines are open fractures, it is important to guard against these types of injuries. We recommend that these machines are not used in traffic and that regulations should be applied for safer use in agriculture.

Reference:
1. Lubicky JP, Feinberg JR. Fractures and amputations in children and adolescents requiring hospitalization after farm equipment injuries. J Pediatr Orthop. 2009;29:435–8.
Disclosure: No significant relationships.

P168

MUSCULOSKELETAL TRAUMA OF INTIMATE PARTNER VIOLENCE VICTIMS IN A FINNISH LEVEL I TRAUMA CENTRE

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Introduction: Intimate partner violence (IPV) refers to physical, mental or sexual abuse within an intimate relationship. According to recent studies IPV has a high prevalence in orthopaedics. We sought to identify and record the demographics of IPV patients and their trauma during a 12 month period in one of the largest Scandinavian trauma admitting hospitals.
Materials and methods: All patients who self-reported as victims of IPV during 8/2012–8/2013, were included in this prospective study. The clinical files were reviewed in detail for demographics, trauma related circumstances, musculoskeletal trauma and treatment. The Injury Severity Score (ISS) was calculated for each patient.
Results: We identified 23 patients with median age of 43 years, with female (91 %) overrepresentation. 15 were living with the abuser and in 20 cases the perpetrator was male. 12 fractures and six head injuries were recorded. The most severe injuries were a pelvic ring fracture, a bilateral subdural hematoma, an open mandibular fracture and a combined arterial, neural and tendon injury of forearm. The average ISS score was 4.3 (range 0–29) and 10 patients needed hospitalization or surgery.
Conclusion: Self-reporting IPV- victims are quite rare at a Level I trauma centre. IPV leads to significant musculoskeletal trauma and even potentially life threading injury. IPV should especially be kept in mind with young and middle aged female trauma patients with facial or upper limb injuries and multiple injuries.
References:
1. Krug, et al. World report on violence and health. Geneva:World Health Organisation; 2002.
2. Bhandari, et al. The prevalence of IPV across orthopaedic fracture clinics in Ontario. J Bone Jt Surg Am. 2011;93(2):132–41.
Disclosure: No significant relationships.

QUALITY IN TRAUMA CARE II

P169

THE USE OF EMERGENCY THEATRE OVER TWO ONE MONTH PERIODS IN 2012 AND 2013 IN ONE OF LONDON'S MAJOR TRAUMA UNITS

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Introduction: To investigate the use of the emergency theatre in one of London's busiest trauma units.
Materials and methods: Emergency theatre booking forms and theatre record sheets from December 2012 and April 2013 were collected. We calculated delays related to NCEPOD category, how appropriately the emergency theatre was used and emergency theatre use by surgical specialities.
Results: In December n = 393, in April n = 512. Patients were sorted by CEPOD category (immediate/urgent/expedited). Delay in theatre arrival was extracted. In December average wait for "immediate" patients was 4.14 h, "urgent" 8.25 h, "expedited" 3.63 h and "no category" 8.05 h. In April "immediate" was renamed "life/limb saving". Aprils' average wait for "life/limb saving" was 3.31 h, "urgent" 12.75 h, "no category" 6.42 h. Maximum time waited decreased from 51 h (December) to 31.75 h (April) for "immediate" cases. The maximum time waited in December for "urgent" was 87 h, in April it was 121.58 h. In December 106/393 cases had no booking form. In April 213/512 cases had no booking form. In December 137/301 known cases and in April 203/408 took place outside emergency theatre.
Conclusion: Understanding of CEPOD emergency forms in our centre is poor; resulting in large volumes of incomplete/missing forms. When "immediate" changed to "life/limb saving" wait reduced despite an increased number of cases. We attribute this to better understanding and triaging of patients. The increased wait for "urgent" cases we attribute to poor understanding of how to categorise patients outside "life/limb saving". To improve patient safety and waiting times the other terms should be clarified—timings may help: "urgent <12 h". The form should be redesigned to minimise incomplete forms.
Reference:
1. http://www.ncepod.org.uk/pdf/NCEPODClassification.pdf.
Disclosure: No significant relationships.

P170

STRATEGY OF DEVELOPMENT TRAUMA AND EMERGENCY SURGERY IN BOSNIA AND HERZEGOVINA

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Introduction: During the Bosnian War 1992–1995th all the strategies of organized peacetime trauma care fell apart. The concepts of war surgery and patients care in catastrophic events were applied.
Materials and methods: Sadly almost 20 years after war the proper organized facilities and algorithms of care for isolated orthopedic trauma and polytrauma are missing.
Results: Specific problem are based on the political organization and financial meters as well as problems with human resources.
Conclusion: We want to present you our efforts in reorganization health care system and aiming to applied ATLS concept.
Reference:
1. Clinical Center University Sarajevo data.
Disclosure: No significant relationships.

P171

INCIDENCE, TIME AND RISK OF MORTALITY IN INJURED PATIENTS: A SINGLE CENTER EXPERIENCE OVER A 3-YEAR PERIOD

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Introduction: Trauma ranks the third most common cause of death. It is the leading cause in the first four decades of life worldwide.
Materials and methods: To analyze incidence, time and risk of mortality in injured patients, we conducted a retrospective study of all trauma-related mortalities over a period of 3 years (2010–2012) at Hamad Level I trauma center in Qatar. Patients were categorized into three groups according to the time of post injury death [immediate, early (within the first 24 h) and late (more than 24 h)]. Data were analyzed and compared.
Results: A total of 333 trauma-related mortalities (6.5 %) were included in the study. Mortality rates were 43, 29, and 28 % within the 3 groups respectively. The majority of patients were males (95 %) with mean age of 35.8 ± 17 years. Motor vehicle crashes (43.5 %) and pedestrian injuries (28.7 %) were the most common mechanisms of injury. Head (67 %) followed by chest (45 %), and abdomen (26 %) were the frequently injured regions. Mean ISS was 33 ± 11. Blood transfusion was needed in 42 % cases. Ventilator-associated pneumonia (10 %) was the most common complication, followed by sepsis (3.3 %) and ARDS (2.1 %). Young age, injuries of chest and abdomen, and need for blood transfusion were significantly higher in patients who died early. Old age and medical comorbidities were significantly associated with late deaths when compared to early deaths.
Conclusion: The high rate of death at the scene addresses the importance of injury prevention. Young patients are more susceptible to early post-injury death
Reference:
1. Sobrino J, Shafi S. Timing and causes of death after injuries. Proc (Bayl Univ Med Cent). 2013;26:120–3.
Disclosure: No significant relationships.

P172

CLINICAL REVIEW IS ESSENTIAL TO EVALUATE 30-DAY MORTALITY AFTER TRAUMA

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Introduction: Securing high-quality mortality statistics requires systematic evaluation of all trauma deaths. We analysed patients admitted to our trauma center between 2007–2011 and who died within 30 days.
Materials and methods: Demographics, injury characteristics, dead on arrival (DOA), cause of death, and time to death of all patients were reviewed. Deaths were analyzed based on injury mechanism (penetrating, blunt trauma and low energy blunt trauma) and cause of death (traumatic brain injury (TBI), hemorrhage, organ dysfunction and other/unknown).
Results: 343 deaths were identified of 7422 admissions; 36 (11 %) were non-traumatic causes. Age was 71 years, ISS 29 and time to death 24 h (all medians). 54 patients (18 %) were DOA. Injury mechanism; 8 % penetrating trauma, 56 % blunt trauma and 36 % low energy blunt trauma (LEBT). TBI accounted for 59 %; hemorrhage 16 %, organ dysfunction 15 %, and other/unknown for 10 % of the deaths. Patients who died after LEBT were older, had lower ISS and longer time to death compared to those who died after penetrating and blunt trauma (all $P < 0.01$). Exclusion of patients DOA reduced mortality rate and median ISS and increased median age and time to death ($P < 0.05$–0.001).
Conclusion: Clinical review of all trauma deaths was essential to interpret mortality. The inclusion of patients DOA significantly increased mortality. The subgroup of deaths following low energy blunt trauma should be analysed separately to allow useful comparisons of blunt trauma as a cause of death.
References:
1. Van Haren RM. J Trauma. 2012;73:1512–6.
2. Powell DW. J Am Coll Surg. 2004;199:211–5.
3. Newgard CD. J Am Coll Surg. 2013;216:147–57.
4. Kahl JE. J Trauma 2013;75:195–201.
Disclosure: No significant relationships.

P173

ANALYSIS OF THE LOCATION OF THE MOST COMMON AGE-DEPENDENT INJURIES IN CHILDREN

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Introduction: The article presents current and most common injuries head, upper and lower limbs in children and adolescents.
Materials and methods: The study group formed all children living in Katowice, and accounted for 112 children between the ages of 2–18 years of age. The study qualified for 96 boys and 16 girls who have suffered a head injury, arm or leg.
Results: The vast majority of injuries were recorded for boys—85.7 % (in females 14.3 %). According to the preliminary analysis, the majority of injuries occurred in the place of residence—59.8 %, outside the place of residence of 40.2 %. In place of residence, or in the home of head injuries is significantly more (over 50 %) than in the yard or the street. While the smaller the amount of lower limb injuries. Number of upper limb fractures remains similar. Outside the home and the most recorded of upper limb injuries (40 %), and lower limbs, the least trauma to the head.
Conclusion: However, a detailed analysis of the type of injury and the scene of the available data shows us that the place of residence only for injuries of the lower limbs confirmed this theory.
References:
1. Rennie L, et al. The epidemiology of fractures in children. Inj Int.
2. Francis RM. Fracture risk assessment. Current.
Disclosure: No significant relationships.

P174

EPIDEMIOLOGY OF TRAUMA IN THE PROVINCE OF PAVIA: A 5 YEARS RETROSPECTIVE STUDY

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Introduction: The progressive ageing of the general population and the consequent growth in the number of old people, have determined new challenges for physicians in Orthopaedic and Traumatology departments. The province of Pavia spreads on a surface of 2,965 km^2, with a population of more than 550,000 inhabitants and about 22 % of people are over 65 years of age.
Materials and methods: This retrospective study regards the casualties admitted for fracture in hospitals in the province of Pavia between 2007 and 2011. Data collected included the year of admittance, sex and age of the patient and the type of fracture presented. All the information were then elaborated in a Microsoft Excel sheet and analyzed to identify which the most frequent fractures in the population were, if there was any correlation between sex, age and type of fracture and to estimate the frequency of these in our population.
Results: In the population we studied fractures of the lower limb are more common. In particular proximal fractures of femur occur more often in older people, expecially in females; fractures of the leg are more frequent in younger patients, being related to high energy trauma. In the upper limb, proximal humerus is more frequently affected, as well as distal forearm, in both younger and older patients.
Conclusion: In our population the most common fractures that present to the emergency rooms are those typical of the elder. Although high energy fractures occur in younger patients.
Reference:
1. Court-Brown CM, Caesar B. Epidemiology of adult fractures: a review. Injury 2006;37(8):691–7.
Disclosure: No significant relationships.

P175

INCLUSION CRITERIA FOR ANABOLIC TREATMENT OF OSTEOPOROSIS IN HIP FRACTURE IN ELDERLY PATIENTS

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Introduction: A need for bigger efficiency in fragility fractures treatment introduced the concept of the Orthogeriatrics. The hip fracture is understood to be an adverse event of the chronic geriatric condition.
Materials and methods: The short hospital stay jeopardizes the holistic approach, the process-reorganization is focused on surgical fast track treatment. The team leader nurse is needed for interdisciplinary management which runs to medical treatment parallelly.
Results: Our experience is based on the qualitative analysis(questionnaires) and quantitative scores (Barthel's index, Morse score, Masud's MIPP fall prevention program) obtained since the Orthogeriatric project in General and Teaching Hospital Celje was confirmed by the Slovenian Ministry for Health 2 years ago.
Conclusion: Holistic approach, comprehensive rehabilitation initiated at the ward, a team leader nurse with social gerontology competency are needed for safe and efficient functioning of the orthogeriatric fragility fracture department.
Reference:
1. Komadina R, Senekovič V, Veninšek G, et al. Recommendations for hip fracture management in Slovenia. Zdrav Vestn. 2012; letn. 81, št. 3, str. 183–192.
Disclosure: No significant relationships.

P176

MAXILLOFACIAL TRAUMA EXPERIENCED BY A CENTRAL LONDON HOSPITAL: A RETROSPECTIVE STUDY

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Introduction: Maxillofacial trauma is a common reason for unplanned attendance to hospital. Operative management is often necessary. Epidemiological analysis can aid in developing service provision and facilitate good patient care.
Materials and methods: This retrospective audit spanned 7 months. Data was collected on demographics, aetiology and type of injury. This was compared to current literature regarding epidemiology of maxillofacial injuries. An algorithm comprising diagnosis and management of maxillofacial trauma was developed.
Results: A total of 70 patients required operative management under general anaesthetic. 81 % of these patients were male. The mean age was 25.91 years. The most frequent cause of injury was alleged assault (49 %); mechanical fall was the second most frequent mode of injury (17 %). The most common injury was mandibular fracture (40 %). 25 % of these fractures involved the mandibular condyle and parasymphysis. 20 % of injuries were zygomatic fractures; 19 % were orbital fractures; and 10 % were lacerations. The remaining injuries consisted of nasal fractures (6 %), dentoalveolar fractures (3 %) and combined zygomatic/orbital fractures (2 %).
Conclusion: The results demonstrate findings consistent with the current literature. Understanding the epidemiology of maxillofacial injuries can aid the clinician in assessment and treatment, and can facilitate the development of preventative strategies and enable effective distribution of resources. A standardized protocol to manage these patients improves the quality of service and training of junior doctors.
References:
1. Emerg Med J. 2008;25(9):565–8.
2. Emerg Med J. 2006;23(12):927–8.
3. Br Dent J 1991;170(8):300–2.
Disclosure: No significant relationships.

BLEEDING CONTROL I

P177

RECOVERY OF FIBRINOGEN CONCENTRATE AFTER INTRAOSSEOUS APPLICATION IS EQUIVALENT TO THE INTRAVENOUS ROUTE IN A SWINE MODEL OF HAEMODILUTION

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Introduction: Fibrinogen concentrate (FC) is increasingly considered as haemostatic agent for trauma patients experiencing bleeding. In hypovolaemic patients venous access is sometimes limited, especially

in case of severe haemorrhage. We investigated in vivo whether intraosseous administration of FC results in the same systemic fibrinogen recovery as compared to intravenous administration.
Materials and methods: Twelve pigs were enrolled into this study. Following controlled blood loss (35 ml/kg) and fluid replacement with a balanced crystalloid, intraosseous (IO, n = 6) administration of FC (80 mg/kg bodyweight) in the proximal tibia was compared to intravenous (IV, n = 6) administration.
Results: All tested laboratory parameters (blood cell count, standard coagulations tests PT, PTT, Clauss plasma fibrinogen and thromboelastometry) were not different between the IO and IV group at baseline, haemodilution, and 30 min after FC administration. Calculated fibrinogen recovery based on the Clauss assay were equal in the IO and IV group, (89 ± 23 and 91 ± 22 %, respectively). Histological investigation of the tibia revealed no thrombosis or clotting in the spongiosa of the puncture site.
Conclusion: This study suggests that intraosseous administration of fibrinogen concentrate results in similar recovery of fibrinogen to intravenous administration. The intraosseous route of fibrinogen concentrate could be a valuable alternative in situations where intravenous access is not feasible or would be time consuming.
Reference:
1. Schlimp CJ, Schöchl H. The role of fibrinogen in trauma-induced coagulopathy. Hamostaseologie. 2013;34(1). [Epub ahead of print].
Disclosure: CJS and HS have received speaker honoraria and research funding from CSL Behring. CS is an employee of CSL Behring.

P178

RELIABLE AND FAST MEASUREMENT OF FIBRINOGEN LEVELS IN WHOLE BLOOD. RESULTS FROM IN VIVO AND IN VITRO EXPERIMENTAL STUDIES

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Introduction: Fibrinogen plays a key role in haemostasis in bleeding patients. Current guidelines on traumatic bleeding recommend fibrinogen supplementation once plasma fibrinogen concentration reaches specific threshold levels. However, fast measurement (<10 min time) of plasma fibrinogen values is not available yet. We investigated a way to quickly determine "plasma- equivalent" fibrinogen values adopting the Clauss assay in a steel ball coagulometer using whole blood.
Materials and methods: By adjusting the measured whole blood fibrinogen concentration with a quickly measureable hemoglobin-derived hematocrit, "plasma- equivalent" fibrinogen level can be accurately estimated within minutes. We tested in a first step the feasibility of this approach with one Clauss assay in multiple swine fresh blood samples obtained during in vivo bleeding, hemodilution and after treatment with coagulation factors. In a second step we tested two different Clauss assays in multiple human volunteers' blood samples diluted in vitro and supplemented with coagulation factors.
Results: Depending on the assays used, the coefficient of variation of whole blood measurement and regression of derived plasma fibrinogen and measured plasma fibrinogen was excellent in porcine and human blood samples, especially in the ranges of interest for traumatic or perioperative bleeding.
Conclusion: It appears reasonable to consider using quick fibrinogen measurement derived from whole blood, to guide fibrinogen supplementation. Further studies are needed to proof this concept and the turnaround times for the clinical application in emergency rooms and operation theaters.
Reference:
1. Amukele TK, Ferrell C, Chandler WL. Comparison of plasma with whole blood prothrombin time and fibrinogen on the same instrument. Am J Clin Pathol. 2010;133:550.
Disclosure: CJS and HS have received speaker honoraria and research funding from CSL Behring. CS and GH are employees of CSL Behring.

P179

ACUTE EMBOLIZATION FOR HIGH-RISK SURGICAL PATIENTS WITH HEMORRHAGE

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Introduction: Standard treatment for acute hemorrhage is surgery, but some patients are at high risk for immediate surgery. Artery embolization might be the procedure of choice in this group. We reviewed the experience of embolization in a large tertiary center population.
Materials and methods: To compare the benefits (temporary or permanent relief of symptoms) and harms (recurrence of symptoms, procedure-related morbidity) of acute embolization in the management of high-risk individuals with hemorrhage.
Results: From July 2007 to March 2012, a total of 40 patients (28 males, 12 females) with a median age of 42 years (range 1 to 83 years) presented with hemorrhage and underwent acute artery embolization. The median follow-up period was 164 weeks (range 80 to 304 weeks).
Conclusion: In experienced hands, embolization is easy to perform, with low complication and high success rates. It is the procedure of choice in patients with hemorrhage unfit for emergency surgery.
Disclosure: No significant relationships.

P180

ACUTE BLEEDING IN PATIENTS WITH TRAUMA: DEVELOPMENT OF AN INTERVENTION ALGORITHM

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Introduction: About 25 % of trauma patients on admission to the Emergency Room present coagulopathy, which contributes to a four times more risk of mortality. There is a growing evidence that early reposition of coagulation factors improves patients outcomes. With the purpose of optimizing transfusion practices, an action algorithm for trauma-related acute bleeding was developed by a group of Immuno-hemotherapy and Anesthesia specialists.
Materials and methods: Bibliographic references were obtained by searching in PubMed without date limitations and including keywords such as "*trauma"*, "*algorithm development*", "*blood management*", "*coagulation*", "*hemorrhage"*, "*transfusion*", "*goal-directed-therapy*". From the references, were included those with interest and still actual. The clinical experience of the specialists also contributed to the final consensus.
Results: After mechanical control of bleeding, hemostatic therapy should be initiated as early as possible. The rapid detection of the hemostatic state of patient is recommended to guide an early correction of missing factors. If not possible, clinical suspicion criteria of these deficits should be considered. The administration of tranexamic acid, fibrinogen concentrate and platelets among others, should follow a logic sequence, guided either by laboratory or clinical signs, allowing treatment to be tailored to patient's needs.
Conclusion: The creation of algorithms allows to simplify complex procedures, such as control of bleeding in trauma patients in a rational, structured and logic way. The use of this algorithm and its impact in hospitals will be evaluated in a near future.
References:
1. Spahn DR, et al. Crit Care. 2013.
2. Schochl H, et al. Scand J Trauma Resusc Emerg Med. 2012;20:15.
Disclosure: No significant relationships.

P181

EFFECT OF TRANEXAMIC ACID ON BLOOD TRANSFUSION IN TRAUMA PATIENTS WITH ACUTE COAGULOPATHY IS AFFECTED BY FIBRINOLYTIC ACTIVITY

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Introduction: Whereas The CRASH-2 trial revealed tranexamic acid (TXA) reduces total mortality of those injured with significant hemorrhage, it is unknown why TXA isn't work 3 h after the injury. Our aim is to clear the factors including time after injury affecting blood transfusion after indication of TXA.
Materials and methods: We examined 1,336 trauma patients transferred and admitted into Tokyo Medical and Dental University Shock Trauma and Emergency medical center from January 2009–December 2012. Adult 97 trauma patients, who met JAAM DIC diagnostic criteria within 24 h after injury, were eligible for this study. Those patients who had advanced cancer or liver cirrhosis were excluded. We examined retrospectively age, gender, ISS score, injury mechanism, initial lactate, FDP, fibrinogen, amount of transfusion, indication of TXA, and outcome of this 97 patients. We use SPSS version 21 for statistic analysis.
Results: 50 patients were administrated TXA, and 47 were not administrated TXA. Age, gender, ISS score, and mortality have no statistic difference between both groups. Amount of transfusion also has no difference between the groups, but has significant difference in such patients who showed low initial FDP value under 30 μg/ml.
Conclusion: TXA may decrease blood transfusion in patients with not hyper-fibrinolysis. Effect of TXA may depend on not time course but fibrinolysis.
References:
1. Lancet 2011;377:1096–101.
2. Lancet 2010;376:23–32.
Disclosure: No significant relationships.

P182

THE POTENTIAL USE OF NOVEL AND INNOVATIVE HEMOSTATIC DRESSINGS IN THE CURRENT TRAUMA AND EMERGENCY SURGERY

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Introduction: In recent years, many new products, which could be potentially used as a fast pre-operative or intra-operative solution for massive bleeding of inner organs and damaged visceral tissues, have been proposed. Unfortunately, in many reports there is still a lack of information relating to cytotoxicity of used solutions or real potential influence of this materials, in in vivo experimental studies.
Materials and methods: In the study we have firstly performed an systemic analysis and critical review of currently published data relating to the problematic aspects novel and innovative hemostatic dressings. In the next step we have compared collected data with results of experimental in vivo studies performed in our department. We have evaluated the biological activity and potential clinical use of two materials: carbon nanotubes and PLC dressings obtained due electrospinning.
Results: In results we have shown the data and detailed analysis of cytotoxicity and biological and potential clinical effects of two different concepts of hemostatic dressings obtained using nanotechnology techniques.
Conclusion: An important factor in the creation of modern hemostatic dressing is a modification of the materials used during their production, their chemical composition, structure or consistency. Modern dressings often exhibit faster action and can be used in a wider range, including the serious trauma within the inner organs. But we should remember that some novel and innovative types of dressing could generate some specific and negative interactions, as for example cytotoxicity, when they are used not properly.
Reference:
1. Nowacki, et al. Polim Med. 2012;42(1):35–43.
Disclosure: No significant relationships.

P183

ROCKALL SCORE COMPLEMENTED WITH PROTHROMBIN TIME IMPROVES THE ACCURACY IN PREDICTING INCREASED RISK OF RECURRENT BLEEDING AFTER ENDOSCOPIC HAEMOSTASIS

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Introduction: Rockall score is not reliable in high re-bleeding risk patients with upper non-variceal gastrointestinal bleeding (UNGIB). Recurrent bleeding risk need evaluation of additional factors. The aim of the study was assessment of Prothrombin time, completeness of endoscopic haemostasis and ulcer size as a complementary prognostic factor for Rockall score.
Materials and methods: Medical data of patients with UNGIB admitted to our institution from May 2010 till June 2013 were analysed retrospectively. All patients underwent emergency endoscopy within 24 h from admission. Rockall score, Prothrombin time, endoscopic findings, ulcer size were compared in patients with or without re-bleeding.
Results: Totally 249 patients were included, median age 59(71–49) years. Patients with re-bleeding (11.2 %) had median of 6(7–4) Rockall score points vs. 5(7–4) points without recurrent bleeding, $p = 0.117$. Only adrenaline injection resulted in 20.9 % re-bleeding rate vs. 7.0 % after combined haemostasis, $p = 0.024$. Significantly lower Prothrombin time, 55.5 % (65–41) was observed in patients with re-bleeding compared to 78 % (94–63) in patients with definitive haemostasis, $p = 0.007$. Ulcer size did not differ in both groups, $p = 0.158$. Multinomial logistic regression revealed that only Prothrombin time is an independent risk factor of re-bleeding, $p = 0.039$, with cut of value 60 % significant for increased risk of re-bleeding, $p = 0.007$. Complementation of the Rockall score with two points if Prothrombin time is <60 %, statistically significantly discriminated patients at high risk of re-bleeding.
Conclusion: Supplementation of the Rockall score with additional two points if patient had Prothrombin time is less than 60 % improves the accuracy in predicting increased risk of recurrent bleeding after endoscopic haemostasis.
Disclosure: No significant relationships.

P184

CHARACTERIZATION OF THE LATENT PROTO-HYPERFIBRINOLYTIC STATE IN SEVERE TRAUMA AND A LIMB ISCHEMIA MODEL

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Introduction: Hyperfibrinolysis in trauma is predictive of massive transfusion and hemorrhagic death. Unfortunately, an understanding of the mechanism triggering this pathology is lacking and treatment remains empiric. The concentration of tissue plasminogen activator (tPA) causing hyperfibrinolysis in controls is higher than tPA levels in trauma patients. Thus, we hypothesized that hyperfibrinolysis in trauma chiefly depends upon the loss of inhibition of tPA activity.
Materials and methods: PAI-1 levels were measured in 71 trauma patients who activated our massive transfusion protocol. These were dichotomized into detectable versus undetectable levels of PAI-1. Additionally, blood was collected from the upper extremity of healthy volunteers, before and after 25 min of pressure-induced ischemia and was titrated with tPA, from 0–100 ng/mL. Thrombelastography was used to quantify fibrinolysis.
Results: In trauma patients with detectable levels of PAI-1, median fibrinolysis was 0.0 % (IQR 0.0–0.0), whereas in patients with undetectable PAI-1, median fibrinolysis was 5.0 % (IQR 3.4–28.8 %; $p < 0.0001$). The limb ischemia model caused no baseline fibrinolysis, but increased the sensitivity to tPA, shifting the tPA titration curve to the left by approximately 25 ng/mL of tPA.
Conclusion: Ischemia alone is predisposing toward hyperfibrinolysis, but is insufficient to cause fibrinolysis on its own. Undetectably low levels of PAI-1 are necessary (but not always sufficient) to cause hyperfibrinolysis in trauma patients. Thus, a latent proto-hyperfibrinolytic state, characterized by low or absent levels of PAI-1, exists in isolated limb ischemia and in trauma. An unknown "second hit" appears necessary to trigger overt hyperfibrinolysis.
Reference:
1. Brohi K, et al. Acute traumatic coagulopathy. Ann Surg. 2007;245(5):812–8.
Disclosure: We receive research support from Haemonetics.

CMF INJURIES

P185

ELECTIVE AND EMERGENCY THEATRE LISTS FOR MAXILLOFACIAL TRAUMA IN A REGIONAL REFERRAL CENTRE: ARE WE OPERATING EFFECTIVELY?

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Introduction: Maxillofacial trauma may require urgent or deferred operative management depending on the type and severity of injury. As a regional centre receiving referrals from peripheral hospitals, providing efficient care can be challenging. Carrying out operative management during the optimal surgical window is important in ensuring a good postoperative outcome.
Materials and methods: This retrospective study spanned 7 months. Data was collected on the type of injury, aetiology, length of stay and treatment outcomes. Data was evaluated against current literature, which states mandibular fractures require surgery within 3–5 days. Other maxillofacial fractures require surgery within 2–3 weeks, following this fractures may start consolidating. Orbital fractures may be deferred for longer provided there is no neuromuscular involvement.
Results: 70 patients required surgery. 61 % underwent operation on an emergency list, 58 % of these were mandibular fractures. Surgery on emergency lists was completed within 3 days of admission. 90 % of mandibular fractures were operated on within 48 h. 39 % had an operation on an elective list, 48 % of these were zygomatic fractures. 89 % of elective surgery was completed on the day of admission. All zygomatic fractures were operated on within 3 weeks of the injury. Mean time for orbital fracture repair was 32 days post injury.
Conclusion: Successfully operating during the optimal surgical window is due to the combined use of emergency and elective theatre

lists. This enables us to optimize utilization of resources and to provide a high standard of care.

References:
1. J Craniofac Surg. 2004;15:145–50.
2. J Craniofac Surg. 2010; 21(4):1051–3.

Disclosure: No significant relationships.

P186

THE CAULIFLOWER EAR. THE PUGILIST AND THE INSANE

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Introduction: The auricular haematoma is often seen in the external ear of people commonly involved in contact sports. Failure to recognize and drain the haematoma results in infection and deformity.

Materials and methods: A 22 year old gentleman came to the outpatient from a mental asylum with complaints of a swelling on the ear. Further history was not elicitable. Examination revealed the entire ear to be red, shiny, and there was a fluctuant, warm and tender swelling evident over the pinna. A 50 year old gentleman came to the surgical consultation room, with complaints of a swelling over the left ear. The only other significant history was that he was on low dose aspirin for his coronary artery disease. Both patients recovered without any residual deformity.

Results: The cauliflower ear or haematoma auris, occurs due to a haematoma arising beneath the perichondrium of the ear. This accumulates between the auricular cartilage and the perichondrium. The haematoma often gets infected and this deprives the cartilage of vascularity and the ischaemic cartilage necroses. This shriveled deformed cartilage causes the ear to resemble a cauliflower. Commonly seen in wresters, boxers, martial arts exponents, rugby players and pugilists,

Conclusion: The important detail is the application of a post procedure compression dressing that prevents a recurrence and ensures that the contour of the ear is maintained. Thermoplastic splints, silicone splints and dental rolls are often used to prevent recurrence. The important complications that can occur include infection, recurrence, chondritis and scarring (the cauliflower ear).

Reference:
1. Giles WC, Iverson KC, King JD, Hill FC, Woody EA, Bouknight AL. Incision and drainage followed by mattress suture repair of auricular hematoma. Laryngoscope. 2007;117(12):2097–9.

Disclosure: No significant relationships.

P187

THE IMPORTANCE OF ORAL AD MAXILLOFACIAL SURGEON IN TRAUMA CENTERS

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Introduction: It is known that the facial trauma affects people of all ages and is very common in our population, and the Oral-Maxillofacial Surgeon (OMFS) is the most qualified for this service, however this is not seen in public hospitals of the State of Rio de Janeiro, Brazil.

Evidence, after curricular and professional evaluation, that the OMFS is the best suited professional to assist the victims of facial trauma

Materials and methods: It is a literature review; there were performed researches and analyzes of articles, which were selected and subsequently co-related.

Results: In Brazil, the facial trauma shows a higher prevalence in males, aged between 20 and 30 years; the major causes were car accidents and physical assaults. Among individuals at extreme ages, prevails fall from height as the main cause. Having seen the importance to the patient of the OMFS proper intervention in craniofacial procedures, it is essential to have a good academic background. In a comparative analysis of the curricula, analyzing the anatomy of the head and neck, dentistry students had on average 142 h of class, while medical students approximately 17 h.

Conclusion: Seen the importance of OMFS in the treatment of facial injuries, the Federal Council of Medicine concludes that there are interests in common about these lesions to Medicine and Dentistry, seeking adequate security result. In this way, the surgical team should include mandatorily medical doctor and OMFS, always under the medical doctor leadership.

Reference:
1. Brasil. Ministério da Saúde. Política Nacional de Atenção às Urgências. 3 ed. Brasília: Ministério da Saúde; 2006.

Disclosure: No significant relationships.

P188

COMPLICATIONS FOLLOWING SURGICAL MANAGEMENT OF MAXILLOFACIAL TRAUMA INJURIES

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Introduction: Surgical management of traumatic maxillofacial injuries aims to restore normal anatomy and function. Complications can be related to idiosyncratic and surgical factors. Complications can be categorised as cosmetic, nerve damage and impaired function. They can be minimized by early repair and appropriate follow up.

Materials and methods: This retrospective study spanned 7 months. Data was collected regarding injury, treatment and outcomes. This was compared to data within the published literature relating to complications following maxillofacial trauma injuries.

Results: A total of 70 patients required surgery. 31 % of patients experienced complications post surgery. 64 % of these complications were associated with mandibular repair. The incidence of lip paraesthesia following mandibular repair was 25 %, these patients did not require further treatment. Occlusal discrepancy was noted in 11 %, these patients were referred for occlusal adjustment. 7 % developed infection and required admission for IV antibiotics. The remaining 36 % of total complications involved diplopia following orbital repair (14 %) and cosmetic concerns following nasal and zygomatic/orbital surgery (18 %). These patients are currently under review.

Conclusion: A significant percentage of complications were managed conservatively and achieved improvement. The rate of post surgical complications demonstrates a similar trend to that reported in the

current literature. We are successfully reaching treatment goals to restore function and minimise risks.

References:
1. J Craniomaxillofac Surg. 2012;40(4):e108–11.
2. Orbit. 2002;21(1):27–33.

Disclosure: No significant relationships.

P189

MYOFUNCTIONAL TREATMENT IN THE PRE AND POST-SURGICAL OF ORTHOGNATHIC SURGERY

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Introduction: The goal of this work is the realizer of a meta-analysis of the role of the speech therapist in the treatment of orthognathic surgery in Brazil to find what therapeutic performance of election at different stages of rehabilitation.

Materials and methods: A meta-analysis of the role of the speech therapist in the treatment of orthognathic surgery in Brazil to find what therapeutic performance of election at different stages of rehabilitation.

Results: Through a meta-analysis of the role of the speech therapist in the treatment of orthognathic surgery in Brazil, it was verified that the therapeutic action of choice in various stages of rehabilitation.

Conclusion: A clinical assessment in the pre-surgical orthognathic surgery aims of an analysis of the stomatognathic system in order to meet the standards changed in order to verify the presence of para-functional habits and muscle work in stomatognathic function, with anatomical conditions, and muscular important. In the work of post-surgical becomes even more the intervention Speech, eliminating muscular and functional alterations, ensuring the successful outcome and preventing any recurrence.

Reference:
1. Campiotto AR. Fonoaudiologia. In: Souza LCM. e col. eds. Cirurgia craniomaxilofacial e ortodontia. São Paulo: Santos; 1998. p. 19–30.

Disclosure: No significant relationships.

P190

EARLY RECONSTRUCTION OF ISOLATED SOFT TISSUE DEFECT AFTER FACIAL TRAUMA

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Introduction: Few studies had been conducted into facial soft tissue. Lee et al. developed the MCFONTZL system of classifying facial laceration to improve accuracy of recording such injuries. There are different Causes of facial trauma such as sport, motor vehicle accidents, firearm, falling from height and work related injuries. The mammalian bites represent only 1 % of all visits to emergency department.

Materials and methods: This prospective study included a total of 23 patients with isolated soft tissue defects in the face, who were admitted to Tanta Emergency University Hospital in the period among July 2010 to June 2011. Full history was taken, thorough examinations including neurological examinations, laboratory investigations and imaging were done. All soft tissue defects after trauma are included using various surgical techniques while burn or associated maxillofacial fractures were excluded.

Results: The commonest age group affected was adolescence while the least was middle age. The commonest cause of trauma was motor vehicle accident and the least was firearm. The commonest site of trauma was ear while the least was eyebrow. The commonest used technique was flap and one stage operations. Ear operations were the longest operations.

Conclusion: Early reconstruction of isolated soft tissue defect of the face after trauma, either by single stage or multiple stages is highly efficient technique in achieving better cosmetic appearance.

References:
1. Lee RH, et al. The MCFONTZL classification system. Plastic Reconstr Surg. 1999;103:1150–7.
2. Lynda. Eyelid reconstruction. Soft Tissue Surgery of Craniofacial Region 2007; 3:21.

Disclosure: No significant relationships.

SKELETAL TRAUMA: UPPER EXTREMITY

P191

LIMITS OF SALVAGE IN SEVERE EXTREMITY INJURIES

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Introduction: The management of a severely injured extremity is still controversial. The questions of debate are: is the result of limb salvage only a viable appendage that functions poorly; is the injury isolated or part of polytrauma, where DCO guidelines must be followed?

Materials and methods: Between 1996–2013 37 patients were admitted, in whom primary amputation or completion of subtotal amputation was performed. 22 had polytrauma, 10 monotrauma, 5 died within 1–2 h after admission. In further 6 patients secondary amputation had to be performed. In addition to assessing the results of our patients, we reviewed the relevant medical literature.

Results: The patient's condition was decisive in opting for amputation or salvage of the severely injured limb, and not the available scoring systems. According to DCO criteria, no salvage was attempted in unstable or in extremis patients. Overall treatment time (including rehabilitation) was about 3 months in primary amputations, and between 6–12 months in secondary amputations. We refer to the metaanalysis of J.W. Busse et al., who concluded, that in limb salvage patients there was higher rate of osteomyelitis (9.4 vs 3.1 %) non-union rate 20.9 %, greater number of operations, and higher treatment costs.

Conclusion: If amputation of the severely injured limb is inevitable, it should not be regarded as failure of treatment, but rather a means of survival and rehabilitation.

References:
1. Busse JW, et al. Amputation or salvage? J Orthop Trauma. 2007;21.
2. Prasarn ML, et al. Management of the mangled extremity. Strat Traum Limb Recon. 2012;7:57–66.

Disclosure: No significant relationships.

P192

INFECTED OPEN FEMORAL FRACTURE IN POLYTRAUMA PATIENT TREATED WITH BONYPID: CASE PRESENTATION

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Introduction: Infected open fractures need complex treatment, dramatically increasing medical expenses, explaining the growing interest for efficient methods mitigating their impact upon morbidity and mortality. The authors present a clinical case reflecting a useful tool in treating infected open fractures
Materials and methods: The patient, male, 35 years old, polytrauma, was admitted 4 days after a traffic accident, with crushing injury and open femoral fracture (debridement in the initial hospital). Muscular debris, soft tissue oedema and modified haematoma raised the suspicion of infection, later confirmed by culture. Initial treatment consisted in thorough debridement, external fixation and BonyPid implantation (1 vial), followed by repeated debridements and a second vial of BonyPid implanted (after approx 4 weeks).
Results: BonyPid™ is a synthetic bone graft substitute, which is made of β tricalcium phosphate (TCP) granules that are coated with doxycycline-hyclate. This allows the BonyPid™ βTCP granules osteoconductive activity to take place also in bones that are contaminated.
The outcome was positive, the skin defect was grafted, secretion diminished and then disappeared. Sequential method was considered to be suitable for the patient, considering the aseptic outcome following BonyPid™ implantation.
Conclusion: Infected open fractures require a prolonged and complex treatment. Standard procedures (debridements, ExFix) can be enhanced by local anti-bacterial and healing-promoting agents. In this case, BonyPid™ represented a valuable asset in stimulate healing of the comminuted and contaminated open fracture.
Reference:
1. Emanuel N, et al. BonyPid™: a lipid-and-polymer-based novel local drug delivery system. Eur Cells Mater 2012;24(Suppl.1).
Disclosure: Investigator in a clinical study behalf of the Clinical Emergency Hospital using BonyPid™ as a IP.

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SURGICAL TREATMENT OF A VARIANT MONTEGGIA FRACTURE IN A CHILD; A CASE REPORT

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Introduction: A Monteggia fracture is a fracture of the proximal ulna with dislocation of the radial head. In children, a rare variant shows a plastic deformation of the ulna combined with radial head dislocation.
Materials and methods: We present a case of a 4 year old girl with a trauma of the right elbow. Although present at the first X-ray, a radial head dislocation was not recognized. After several weeks, she visited again the outpatient department. At that time, X-rays showed a radial head dislocation with a periostal reaction of the ulna. Pre-operative radiographic analysis showed a positive "bow" sign of the ulna, compared to the non-injured side. A corrective osteotomy of the proximal ulna with open reposition of the radial head was performed. Aftercare consisted of a long cast for 6 weeks.
Results: She recovered well without any functional impairment or pain.
Conclusion: Because direct treatment of these variant Monteggia fractures is associated with better outcome, recognition is of great importance. Especially the alignment of the radial head with capitellum should be thoroughly analysed. If radial head dislocation occurs without an evident fracture of the ulna, plastic deformation should be considered.
For stable reduction of the radial head, correction of ulnar deformity is obligatory. In acute lesions, treatment can be non-operatively in most cases. If treatment is delayed, open reduction of the radial head is often necessary. If reduction of the radial head remains unstable, a corrective osteotomy of the ulna should be performed.
Disclosure: No significant relationships.

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BILATERAL ANKLE FRACTURE: A CASE REPORT

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Introduction: We present the case of a 58 year-old male with type II D.M. who was brought to our emergency room after a 2 m high fall in June 2012 who reported bilateral displaced fractures of distal tibial and fibular shaft, exposed on the right (Gustillo-Anderson I), involving the articular surface (43B3).
Materials and methods: Te patient was taken immediately to the OR for a surgical debridement of the exposition site (Gustillo-Anderson type I) on the right leg and was then put under trans-calcaneal traction with Zuppinger slope. The patient was treated with bilateral osteosynthesis with locking plate (Zimmer Periarticular Locking System) by skin spearing incisions after 7 days from admittance and discharged 7 days later.
Results: Complete weight baring was allowed 3 months after surgery. Follow-up visits were planned at 4 weeks, 2, 6 and 12 months.
Conclusion: In our experience MIPO technique together with locking stability plates represent a good approach for displaced fractures of distal tibia. A good reduction can be obtained by external maneuvers. Weight bearing can be allowed in a reasonable time.
References:
1. E. Hasenboehler, et al. Injury 2007;38:365–70.
2. Olerud C, Molander H. Arch Orthop Trauma Surg. 1984;103:190–4.
3. Gupta RK, et al. Int Orthop. 2010;34:1285–90.
Disclosure: No significant relationships.

P195

HINGED EXTERNAL FIXATION VS. CROSS PINNING OF THE ELBOW FOR ACUTE AND SUBACUTE INSTABILITY

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Introduction: Elbows that are unstable after injury or reconstructive surgery are often stabilized by external fixation (either hinged or static) or cross pinning of the joint supplemented by cast immobilization. Over the years we have tended to use cross pinning more often. We therefore reviewed our experience to compare hinged elbow fixation with cross pinning of the elbow.
Materials and methods: Between 1998 and 2010, 19 patients had hinged external fixation and 10 patients (11 elbows) were treated with cross pinning and casting for subacute or acute post-traumatic elbow instability.
Results: Seven patients (37 %) that were treated with external fixation experienced seven device-related adverse events; three pin track infections, two nerve problems, one broken pin, and one pin track fracture of the ulna. Of the ten patients and eleven elbows treated with cross pinning, one patient (9 % of the elbows) had pin track inflammation that resolved with pin removal. The average Broberg and Morrey score was 84 points (range 52 to 100 points) after hinged external fixation and 90 points (range 80 to 100 points) after cross pinning.
Conclusion: Both cross pinning of the elbow and external fixation (static or hinged) can help maintain elbow alignment while ligaments and fractures heal and are particularly useful in the subacute setting. Hinged external fixation is technically difficult to apply, associated with more adverse events related to the device, and does not result in better Broberg and Morrey scores.
Reference:
1. Morrey BF. Complex instability of the elbow. J Bone Joint Surg Am. 1997;79A:460–9.
Disclosure: No significant relationships.

P196

CLOSED REDUCTION AND KIRSCHNER WIRE FIXATION IN THE TREATMENT OF INTRA-ARTICULAR FRACTURES OF THE BASE OF THE FIFTH METACARPAL

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Introduction: The aim of this study is to show the benefits of surgical treatment of intra-articular fractures of the base of the fifth metacarpal by double pinning.
Materials and methods: Nine patients' intra-articular fractures of the base of the fifth metacarpal were treated by closed reduction and percutaneous Kirschner wiring. All patients were male with a mean age of 32 years (range from 23 to 53 years). The mean time from injury to operation was 2.6 days (range from 1 to 7 days). Plaster cast was applied after operation with an average of 33.3 days (range from 30 to 45 days). The reduction of articular surface, symptom of ache and function of fifth metacarpal after operation were evaluated.
Results: None of the patients had an open fracture and concomitant pathologies. All the patients were followed up with an average of 12.8 months (range from 12 to 16 months). All fractures united. Superficial pin tract infection was observed in two patients. In 3.3 % (n = 3) patients had decreased grip power, and 65.1 % (n = 28) had radio-graphical signs of osteoarthritis.
Conclusion: Treatment of fractures of the base of the fifth metacarpal with closed reduction and percutaneous inter-fragmentary pinning, using two K-wires, has shown good functional and anatomic outcome.
Reference:
1. Galanakis I. Treatment of closed unstable metacarpal fractures using percutaneous transverse fixation with Kirschner wires. J Trauma. 2003;55(3):509–13.
Disclosure: No significant relationships.

P197

CLOSED REDUCTION AND KIRSCHNER WIRE FIXATION IN THE TREATMENT OF BENNETT'S FRACTURES OF THE BASE OF THE FIRST METACARPAL

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Introduction: Fractures to the base of the thumb metacarpal occur commonly following axial load to a partially flexed thumb. There with a variety of fractures and fracture-dislocations occur about the base of the thumb. The aim of this study was to describe the results of Bennett's fractures treated with closed reduction and percutaneous fixation with Kirschner wires.
Materials and methods: Twenty-nine patients with Bennett's were treated by closed reduction and percutaneous Kirschner wiring. There were male 26 and female 3 cases with a mean age of 31 years (range 18–67). The mean time from injury to operation was 5.3 days (range 1–10). Plaster cast was applied after operation with an average of 36 days (range 34–46). The reduction of articular surface, symptom of ache and function of thumb after operation were evaluated.
Results: All fractures were closed. All the patients were followed up with an average of 12.8 months (range from 12 to 16 months). All fractures united and the articular surfaces were reduced well. Superficial pin tract infection was observed in five patients. The grasp force decreased in all patients.
Conclusion: Closed reduction and percutaneous Kirschner wire fixation has advantage such as simply operation, precisely fixation, high potency ratio. These results suggest that this technique can be safely used in the treatment of intra-articular fractures at the base of the first metacarpal.
Reference:
1. Lutz M. Closed reduction transarticular Kirschner wire fixation versus open reduction internal fixation in the treatment of Bennett's fracture dislocation. J Hand Surg Br. 2003;28(2):142–7.
Disclosure: No significant relationships.

P198

PITFALLS FOR THE TREATMENT OF IMPALEMENT INJURIES OF THE HANDS

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Introduction: Impalement injuries are the specific open injuries having two distinct factors of stab wound and blunt trauma. There

have been only a few reports regarding this injury compared to the trunk or the lower extremity. In this study, eight cases are reported and treatment pitfalls are discussed.
Materials and methods: Between June 2002 and August 2013, eight patients with impalement injuries of the hands were treated in our institution. We retrospectively reviewed their records.
Results: The impaled objects were iron bars penetrated by mistaken operation of machines in six cases, a key penetration when the patient fell down in one case, the other was a wooden body penetration by blind fingering in the trash bag. Seven patients had the foreign bodies kept penetrated on arrival. One of them had a fracture and a tendon rupture, but no injuries of main nerves or vessels. In six cases, we added incision before the foreign bodies were removed. All wounds healed without severe infections.
Conclusion: Removing off the impalement object blindly increases the risk of a new injury and the residuals of the foreign body. In our study, there were no secondary injury and serious complications by exposing the whole route of impalement. It is very important to assess the involvement of surrounding tissues and handle under direct vision with considering complicated anatomical features of hands.
References:
1. Ketterhagen JP, Wassermann DH. Impalement injuries: the preferred approach. J Trauma. 1983;23:258–9.
2. Horowitz MD, et al. Impalement injuries. J Trauma. 1985;25:914–6.
Disclosure: No significant relationships.

P199

INFLUENCE OF MONODIRECTIONAL AND MULTIDIRECTIONAL ANGULAR STABILITY ON DEFORMATION AND CUT OUT OF PROXIMAL HUMERUS OSTEOTOMIES

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Introduction: Bone resorption and micromovements lead to instability of normal plates. Monodirectional angular stable plates have the disadvantage that the screws can often not be placed in the ideal position for the type of fracture. These problems can be avoided with a multidirectional angle stable plate system. In a experimental model we tested if the stability of multideirectional angular stable plate is reduced compared to other plate types.
Materials and methods: In experimental tests of 18 subcapital humeral defect osteotomies stabilised with nonangular stable, monodirectional angle stable and multidirectional angle stable plates we analysed the deformation and stability of the osteosynthesis under 1,000 cycles of alternating load of 200 N.
Results: The deformation was lowest in the multidirectional group. Also between cycle 10 and 1,000 the increase of deformation was with 10 % smallest in the multidirectional group as compared with 20 % in the monodirectional angle stable and 50 % in the nonangular stability plate group.
Conclusion: Our tests show that the multidirectional angle stable plate do not have a lower but higher stability and lower deformation because the stability is limited by the screw bone interface witch can be chosen better in multidirectional angular stable plates and not by the head plate interface. This improves the stable reconstruction of the fractures and a better functional aftercare especially in osteoporotic fractures.
Reference:
1. Friedl W. Winkelstabileplatte vs Verriegelungsnagelosteosynthese der Distalen Radiusfractur DGOU; 2013.
Disclosure: No significant relationships.

P200

DISTAL HUMERUS FRACTURES: CLASSIFICATION, TREATMENT

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Introduction: Fractures of elbow joint represent about 4.3 % of all fractures. Typical fractures of distal humerus affect medial and lateral pillar simultaneously. Single condylar fractures make about 5 % of distal humerus fractures. Many classifications systems were proposed. The main goal of surgical treatment is an anatomic reconstruction of trochlea and both columns.
Materials and methods: Authors presented group of 42 patients with distal humerus fractures—28 men and 14 women. Classification was based on Müller AO Classification. In three cases it was an extraarticular fracture of A2 type, in two cases it was A3 type. B1 and B2 types were represented twice; C type fractures were treated in 33 cases. The average age was 54.3 years, in the range from 38 to 86 years. In one case it was an open fracture with large bone and soft tissues defect. All patients were operated from posterior approach using ORIF technique.
Results: The soft tissue was healed at all patients per primam. Fracture consolidation on X-ray was visible after 6 months since the operation. In one case the failure of osteosynthesis has occurred due to inadequate care in sanatorium. 82 % of patients can be classified in good and excellent category of function results score (Mayo Elbow Score).
Conclusion: Open reposition and stable fixation of distal humerus fractures allows patients to return to everyday life. The early start rehabilitation is an inseparable part in the treatment of this fractures.
Reference:
1. Jupiter JB, Mehne DK. Fractures of the distal humerus. Orthopedics. 1992;15(7):825–33.
Disclosure: No significant relationships.

P201

COMPLICATION OF TREATMENT OF FRACTURE OF SHAFT OF HUMERUS

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Introduction: Humeral shaft fractures can be treated nonoperatively. Other state operative treatment is the gold standard.
Materials and methods: Following data collecting about them:
Age, sex, hospital stay, site of fracture, pattern of fracture, previous treatment, current treatment, duration between two admission,.
Results: 20 patients, their age range from 17 to 85 years with mean of 31.5 6 of them female and 14 male. Period between two admission range from 1 to 12 months with mean 4.2 months. Site of fractures

were: 12 distal, 7 middle, one proximal 12 cases treated initially conservatively, 6 of them readmitted because delay union and other 6 because loss of reduction and malalignment. 8 of these 12 treated by plating, one case treated by nail, in two cases conservative treatment continued because of medical problem, last case treated by manipulation under GA and TV guide and U-shape slab applied. 4 cases treated initially by plating, one of them complicated by blown out, other one complicated by broken plate and refracture, two cases re-admitted because of infection 4 cases treated with external fixation, all of them admitted for removal only, even though the fracture not united in two cases yet but no more management done.
Conclusion: Conservative treatment might be complicated by delay union and malalignment. Plating may lead to infection and implant failure. External fixation might be complicated by delayed union.
Reference:
1. Sarmiento Functional bracing for the treatment of fractures of the humeral diaphysis, J Bone Jt Surg. 2000;82A:478.
Disclosure: No significant relationships.

P202

NONUNION AFTER BUNDLE NAILING OF DIAPHYSEAL HUMERUS FRACTURES IN SEXAGENERIANS

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Introduction: Majority of pseudoarthroses after bundle nailing occurs in patients in their sixties. The aim of this research was to establish the cause of this complication.
Materials and methods: 156 patients underwent surgery using bundle nailing in years 2001–2010. 24 patients were sexagenerians.
Results: Non-union developed in 6 fractures (3.8 %). 5 were in the sexagenerian patient group (20.8 %). In these cases three-times was the medullary cavity incompletely filled with implants, three-times was distraction of fragments retained after surgery.
Conclusion: Elastic bundle nailing is safe and easy method of osteosynthesis of uncomplicated diaphyseal fractures of humerus. Cause of implant failure in sexagenerians lies in wrong indication due to underestimation of physical activities.
References:
1. Broadbent MR, Will E, McQueen MM. Prediction of outcome after humeral diaphyseal fracture. Injury 2010;41:571–7.
2. Hackethal KH. Die Bündel-Nagelung. Berlin-Göttingen-Heidelberg: Springer; 1961.
Disclosure: No significant relationships.

P203

BRIDGING EXTERNAL FIXATION FOR DISPLACED AND UNSTABLE DISTAL RADIAL FRACTURES: A 6 MONTH FOLLOW UP STUDY OF 26 PATIENTS

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Introduction: Surgical treatments of unstable distal radial fractures is controversial and include closed reduction and pinning, bridging or non-bridging external fixation and open reduction with plate and screw fixation. This study was undertaken to determine if external fixation could be useful for treating unstable distal radius fractures.
Materials and methods: This prospective follow-up study assessed 26 patients with unstable distal radius fractures treated with external fixation. According to the AO classification system, 10 patients had type A3 fracture, 6 patients had type C2 fracture, and 10 patients had type C3 fracture. The outcome was measured on the basis of the Disabilities of the Arm, Shoulder and Hand (DASH) score; the range of wrist motion; the rate of complications; and radiographic measurements including dorsal radial tilt, radial inclination, and ulnar variance.
Results: At the time of final follow-up (6 months minimum) the mean volar tilt was $-1.2 + 6.48°$, radial inclination was $20.5 + 3.3°$ and ulnar variance was $0.0 + 4.5$ mm. Mean wrist extension measured 53°, wrist flexion 52°, radial deviation 11°, ulnar deviation 34°, pronation 84°, and supination 81°. The mean DASH score was 11 points. Four patients developed transient neuropathy of the median nerve. Three patients developed superficial infection and underwent early removal of the fixator at 4 weeks, but there was no subsequent loss of reduction. Nineteen (74 %) of the patients had no complications.
Conclusion: The present study demonstrated that unstable distal radius fractures could be successfully treated with external fixation.
Reference:
1. Slutsky DJ. External fixation of distal radius fractures. J Hand Surg. 2007;32(10):1624–37.
Disclosure: No significant relationships.

P204

INTERPRETATION OF PRE- AND POSTOPERATIVE X-RAYS IN DISPLACED INTRA-ARTICULAR DISTAL RADIUS FRACTURES AFTER FIXATIONS USING VOLAR LOCKING PLATES ARE INSUFFICIENT IN THE MAJORITY OF CASES

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Introduction: There is an international trend towards open reduction and internal fixation of displaced intra-articular distal radius fractures using volar locking plates. We questioned whether standard X-rays meet requirements of trauma surgeons treating these fractures.
Materials and methods: We included 22 patients with an intra-articular distal radius fracture and received a volar locking plate. Three trauma surgeons and a fellowship-trained trauma surgeon characterized all X-rays on standardized criteria. First we evaluated the quality of posterior-anterior and lateral X-rays of the distal radius in the pre- and postoperative phase. Secondly we assessed the interpretability of fracture reduction and hardware placement after surgery with an additional 22 degree tilted lateral X-ray.
Results: In preoperative PA-projected x-rays standardized criteria were met in 39.8 % of all patients, postoperatively in 37.5 %. Lateral X-rays 35.2 % of the criteria were met preoperatively and 59.1 % postoperatively. In lateral X-rays interpretability of the articular surface of radiocarpal joint could be assessed in 73.9 % of the patients preoperatively. Postoperatively, fracture reduction and hardware positioning was assessable in 14.8 %. The postoperative tilted lateral X-ray improves assessment of the articular surface of the radiocarpal

joint in 77.3 % of patients compared to standard lateral X-rays due to a posteriorly shifted X-ray beam.
Conclusion: Results suggest improving wrist positioning during obtainment of lateral X-rays to better quality. Secondly, an additional 22 degrees tilted lateral X-ray will improve the interpretability on the articular surfaces and hardware positioning.
References:
1. Ballinger, Merrill's atlas of radiographic positions and radiologic procedures.
2. Lundy, Tilted lateral radiographs in the evaluation of intra-articular distal radius fractures.
Disclosure: No significant relationships.

P205

AC DISLOCATION-CRPF OR ORIF

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Introduction: we would like to present you a group of patients (50) with AC dislocation (Rockwood III–V) that was treated operatively in our hospital during 2009–2012. One group (25) was treated by CRPF-2 K wire and other group (25) was treated by ORIF-hook plate.
Materials and methods: Patients with AC dislocation Rockwood III–V were treated operatively by two method. We compered result after 1, 3 and 6 months. Complications after treatment.
Results: In this two groups we did not found differences in results after 6 months, which we compare by Constant score. But patients, who were treated by ORIF, have higher result after first month and third month. We have more complications after CRPF.
Conclusion: Both groups have excellent result after 6 month, but ORIF have better results after first and third month. ORIF is more expensive, but return to normal activity is faster and this is better for society.
Reference:
1. Stannard JP, Schmidt AH, Kregor PJ. Surgical treatment of orthopaedic trauma.
Disclosure: No significant relationships.

VISCERAL TRAUMA II

P206

DELAYTED HEPATECTOMY AFTER MAJOR LIVER TRAUMA

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Introduction: Liver is a highly vascular organ and is susceptible to injury from traumatic mechanisms. Motor vehicle collision is the most common injury mechanism.
Materials and methods: A 32-year-old male, was transferred to the E.D. of a District Hospital in condition of oligaemic shock, after a motorbike accident. Emergency laparotomy revealed a grade V major hepatic trauma. Specifically, he had rupture 15 cm length and 4 cm depth to segment VII–VIII, in proximity of the right hepatic vein, another hepatic rupture 4–5 cm length around the gallbladder and 4 l of blood in the peritoneal cavity. Massive patching of the traumatic areas, cholecystectomy and blood aspiration were performed.
Results: The patient was transferred to ICU of a Teaching Hospital where was remained for 3 months. Because of repeated abdominal infections and hepatic collections, underwent multiple surgical interventions. Five months after the accident, extensive right hepatectomy was performed.
Conclusion: Management of hepatic injury has evolved over the last two decades. Hemodynamic status, not the grade of injury, should dictate the management. Unstable patients mandate always emergency laparotomy. Direct control of bleeding vessels and damage control surgery are preferred and the most popular approach compare to anatomic resection of liver.
Reference:
1. Ahmed N, Vernick JJ. Management of liver trauma in adults. J Emerg Trauma Shock. 2011;4(1):114–9.
Disclosure: No significant relationships.

P207

SPLENECTOMY AFTER EXPLOSIVE INJURY TO STOMACH, IMPLANTATION PIECES SPLEEN IN GREAT OMENTUM, STATUS AFTER 18 YEARS

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Introduction: The boy at the age of 6 years was injured 19/05/1996. explosive grenades and the explosive sustained multiple injuries to the abdomen many metal shrapnel in the abdomen, blast injury spleen with fracture elbow.
Materials and methods: The GH Gospic cared injury abdomen, laparotomy was performed to management explosive multiple injuries to the bowel resection small intestine of TT anastomosis suturing bladder and bowel suture lacerations with splenectomy, and several pieces healthy spleen size 2 × 1 cm implanted in great omentum.
Results: At age 15, has a fully functional healthy spleen. 28th July 2011th CT of the abdomen was made in which he finds bilobulirano tissue spleen size 7.6 × 5.3 × 3.4 cm, homogeneous parenchyma, located in front of and something lower the left kidney.
Conclusion: We present a successful case in autologous spleen tissue after a 15-year-old monitoring the patient. Spleen implanted in a great omentum during growth may reach the size and the function of the normal spleen. The patient was not had serious illness, and we believe that the implantation was reasonable and meaningful to the children who need to be underwent splenectomy due to injury.
Reference:
1. Rajković Z, Kopjar M. Organization of care for the injured and…..sing experiences acquired in patriotic war. Acta Medica Croatica. 2006;60:397–9.
Disclosure: No significant relationships.

P208

USE OF SENGSTAKEN–BLACKMORE BALLOON (SBB) IN PENETRATING HEPATIC TRAUMA: A CASE REPORT

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Introduction: Trough and trough liver injuries are challenging for every surgeon. Case report: 32 year/old, male, with a gunshot wound to the right thoracoabdominal transition. Admitted on hypovolemic shock, chest tube placed on the ER with low output
Materials and methods: Sent to OR for exploratory laparotomy, which identified a transfixing injury to the liver with active bleeding plus other gastrointestinal injuries. SBB positioned into the projectile path through the liver and damage control mode surgery performed. After ICU hemodynamic/metabolic compensation patient was returned to OR and SBB cuff was deflated with persistence of active bleeding. Angioembolization of the right and left hepatic arteries were performed using Gelfoam.
Results: Five days after SBB was removed at the OR no bleeding was observed but a biliary leak. Abdominal drains were placed near by entrance and exit hepatic wounds. Patient evolved with biliary fistula with good resolution after endoscopic papillotomy.
Conclusion: Liver penetrating trauma is difficult to manage, especially in critically ill patients with coagulopathy. Alternative surgical techniques, such as SBB are possible with good control of bleeding.
Reference:
1. Fraga GP, Zago TM, Pereira BM, Calderan TRA, Silveira HJV. Use of Sengstaken-blakemore intrahepatic balloon: an alternative for liver-penetrating injuries. World J Surg. 2012;36(9):2119–24.
Disclosure: No significant relationships.

P209

DAMAGE CONTROL SURGERY IN TRAUMA PATIENTS

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Introduction: Damage control surgery/DCS/has become well established as the surgical strategy to be employed in the unstable trauma patients.
Materials and methods: A retrospective review of 71 victims undergoing emergency department thoracotomy/EDT/or damage control laparotomy/DCL/was performed. There were 17 patients with blunt/6/or penetrating/11/thoracic trauma and 54 patients with blunt abdominal trauma. The mean Injury Severity Score/ISS/was 32/28-61/.
Results: In 6 victims undergoing EDT to blunt thoracoabdominal trauma was indicated for severe intraabdominal haemorrhage/3/or for lung laceration/3/. From those 4 patients died. Penetrating heart injuries were treated in 11 patients with death in two. Overall mortality rate in EDT was 35 %. 54 patients with blunt abdominal injuries were undergoing DCL to severe intraabdominal hemorrhage from solid organs and blood vessels and or with associated contamination of peritoneal cavity from perforation of GIT. A total of 40 patients survived/74 %/and 14 died/10 within 24 h and 4 died 2–4 days after injury/. The deaths were caused by severe primary injuries resulting in failure of circulation or craniocerebral injuries.
Conclusion: DCS is the leading strategy in emergency surgery in unstable thoracic and abdominal injuries.
Reference:
1. Lee JC, Peitzman AB. Damage-control laparotomy. Curr Opin Crit Care. 2006; 12:346–50.
Disclosure: No significant relationships.

P210

BLUNT ABDOMINAL TRAUMA WITH RENAL INJURY

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Introduction: Renal trauma is rare and occurs in approximately 1–5 % of all traumas. Renal trauma can be acutely life-threatening, but nowadays, the majority of renal injuries can be managed conservatively.
Materials and methods: We are presenting a case of medical records, laboratory and radiologic findings, and a review of literature of renal injury following blunt abdominal trauma.
Results: An 18 year old boy had fallen and sustained a direct blow to the left flank. He was sent to the nearest hospital. In the radiologic investigations, they detected free intra-abdominal fluids, perirenal hematoma, and lacerations in the upper pole of the left kidney. After 14 h, the clinical status of the patient was aggravated, and he was transferred to our hospital.The physical examination revealed an ecchymosis, pain on the left abdominal flank, and abdominal distension. The patient had macroscopic hematuria, but was hemodynamically stable. The value of haematocrit was 31.3 %, creatinine was 0.8 mg %. In these circumstances, we decided to treat the patient conservatively. In the next few days, due to the decrease of the haematocrit value to 21 %, the patient was transfused with 4 units of blood and 4 units of fresh frozen plasma. The patient was discharged from the hospital after 2 weeks.
Conclusion: The majority of renal trauma can be treated conservatively. Hemodynamic stability is a precondition for non-surgical treatment. Follow-up examinations should continue until healing is documented and the laboratory findings are stabilized.
Reference:
1. Santucci RA, Fisher MB. The literature increasingly supports expectant (conservative) management of renal trauma—a systematic review. J Trauma. 2005;59:493–503.
Disclosure: No significant relationships.

P211

EXPERIENCE WITH RENAL TRAUMA AT A MAJOR TRAUMA CENTRE IN THE UK

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Introduction: Renal injury occurs in 1–5 % of all trauma cases[1]. Blunt trauma causes between 80–95 % of renal trauma, with penetrating injury a less common cause. Management of the vast majority of renal trauma is conservative. This study details the experience of renal trauma at St Mary's Hospital(SMH) in London, a Major Trauma Centre in the UK, and reports on the patterns of injury and their management.

Materials and methods: All significant trauma cases admitted to SMH over a 56 month period were collated. Significant trauma cases were defined as requiring either >72 h hospital admission, HDU or critical care admission, transfer to another specialist centre or trauma-related deaths. The electronic patient record and trauma CT scans for all such patients were reviewed.
Results: Total number of trauma cases was 1856, of which 36(1.9 %) included a renal injury. Blunt trauma accounted for 78 % of renal trauma. Majority of injuries were classified as AAST severity grade III (28 %) or grade IV (28 %). Management of the majority of renal trauma cases was conservative (89 %). Only 3 embolizations and 1 nephrectomy were performed. All patients undergoing intervention sustained their renal injury as a result of stabbing. Mortality rate for significant renal trauma was 8.3 %.
Conclusion: Rates and causes of renal trauma at SMH are in keeping with international comparisons. The overwhelming majority of cases were managed conservatively, with an intervention rate of approximately one case per year. Notably, all injury which underwent invasive management resulted from stabbing, suggesting invasive management is more likely with this mechanism of injury.
Reference:
1. Bent, et al. Clin Radiol. 2008;63:1361–71.
Disclosure: No significant relationships.

P212

ESOPHAGEAL PERFORATION SECONDARY TO BLUNT THORACIC TRAUMA: A RARE INJURY

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Introduction: Esophageal perforation is a condition with a high mortality rate. Generally is classified into iatrogenic, traumatic and spontaneous. Mechanisms of traumatic perforation include penetrating injury, ingestion of caustic fluids and blunt trauma. The latter constitutes an extremely rare entity. The outcome depends mostly on the time of diagnosis, the size of the injury and the physical status of the patient.
Materials and methods: We present a case of esophageal perforation after a low-speed motor vehicle collision. The patient complained for retrosternal pain and suffered multiple right rib fractures. Air in the paravertebral soft tissues of C7–T7 vertebrae and the epidural space of the spinal cord and nerve roots of T3–T6 vertebrae, aroused suspicions of an injury to the aerodigestive tract (Fig. 1). Contrast swallow examination arranged urgently which confirmed the perforation at the thoracic part of the esophagus (Fig. 2).The patient was managed conservatively.
Results: Esophageal perforation is a life-threatening condition and the key for a good outcome is the early diagnosis. However, the diagnosis is often delayed due to the atypical clinical presentation, and requires high clinical suspicion. Operative treatment is usually necessary in order to avoid septic complications but in selected patients, non-operative therapy, if strict criteria are met, can be applied.
Conclusion: Esophageal perforation after blunt trauma is an extremely rare injury and requires a high index of clinical suspicion. Delay in diagnosis increases the mortality but in selected cases can be managed non-operatively.
References:
1. Reyes D, et al. Conservative management of esophageal perforation. Inter J Surg Case Rep. 2013;4:550–3.
2. Strauss, et al. Distal thoracic oesophageal perforation. World J Emer Surg. 2007.
Disclosure: No significant relationships.

P213

RENAL ARTERY PSEUDOANEURYSM SECONDARY TO BLUNT TRAUMA

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Introduction: Renal pseudoaneurysm is a very rare complication secondary to blunt trauma, but it can be critical when it ruptures. We usually take second CT 7 days after injury, to seek pseudoaneurysm. In this report, we describe a renal pseudoaneurysm following blunt trauma, and managed successfully.
Materials and methods: We routinely took second CT scan for patients with solid organ injury to seek pseudoaneurysm from June 2012 to October 2013. The included patients had detectable solid organ injury on the initial imaging test. Patients with pseudoaneurysms were consulted to Radiologists and endovascular embolization was attempted.
Results: We had a case of renal pseudoaneurysm after blunt trauma. A 57-year-old female was brought to our emergency service after falling down the 10 stairs in her house. Gross hematuria was observed and continued for 3 days. The abdominal CT scan revealed retroperitoneal hematoma around left kidney and multiple sphenoidal low-density lesion in the parenchyma. She admitted and was managed non operatively. PID 7, she underwent second CT scan and it revealed an pseudoaneurysm in left renal artery. Endovascular embolization was performed with metallic coil and N-butyl-2-cyanoacrylate successfully.
Conclusion: Renal artery pseudoaneurysm is a rare complication following blunt trauma, but should be kept in mind. These patients should be carefully followed by image inspection, as pseudoaneurysms can rupture many years after their formation and could be life-threatening. With this aspect, we routinely take follow up imaging test after visceral blunt trauma.
Reference:
1. Renal artery pseudoaneurysm secondary to blunt trauma nine years earlier: Case report and review of the literature.
Disclosure: No significant relationships.

P214

CHILIADITI'S SYNDROME IS MISDIAGNOSED PEPTIC ULCUS PERFORATION

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Introduction: Chilaiditi's sign is an asymptomatic radiological finding that refers to the interposition of the colon between the liver and the diaphragm (1). Our case is presented here as he presented to

us as a syndrome with symptoms and the entire colon was not detected initially and assumed to be free air.
Materials and methods: Case report is presented.
Results: 49-years old male. He admitted to our emergency clinic with complaints of sudden abdominal pain, nausea, vomiting and abdominal tenderness in examination and air under the diaphragm on the right in direct abdominal graphy were detected. With current clinical findings, the patient was prediagnosed with peptic ulcus perforation and was interned. As he developed no abdominal rigidity and leucocitosis in laboratory follow-up, his direct abdominal graphy was repeated and as a colon segment and haustras on the right under the diaphragm were observed.
Conclusion: Chilaiditi's sign occurs in 0.1–0.25 % of the population and is asymptomatic. Main symptoms include abdominal pain, distension, nausea, vomiting, constipation (2). In our case, the presence of sudden abdominal pain, tenderness in abdominal examination, air under the diaphragm, but the failure to detect the colon haustras in the first film led to a misinterpretation of Chilaiditi's syndrome as peptic ulcer. Treatment of Chilaiditi syndrome is conservative; the symptoms are eliminated with bed rest, nasogastric decompression, soft-liquid diet, liquid replacement, and enema. Surgical intervention is rarely indicated (2).
References:
1. Plorde JJ, Raker EJ. Transverse colon volvulus and associated Chilaiditi's syndrome: case report and literature review. Am J Gastroenterol. 1996;91(12):2613–6.
2. Wong VWY, Yuk-Wah Liu S, Wai-Yan Chiu P, Kin-Hung Wong S, Kwok-Wai Ng E. Chilaiditi's syndrome: a nonemergent cause of "free gas under diaphragm". Am J Surg. 2009;198(2):e25–e26.
Disclosure: No significant relationships.

P215

AND NOW? SUPERIOR MESENTERIC VEIN INJURY. CASE REVIEW

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Introduction: The superior mesenteric vein injury is uncommon. This fact is responsible for the lack of experience between surgeons and is responsible for a lot of doubts during operating time. Patient condition and other associated injuries are keystones that help the surgeon to decide the best management.
Materials and methods: To describe a case treated in our hospital, João XXIII, Belo Horizonte, Brazil, on September, 2013. A young male has been shot at his torso and at admission was stable and aware. During exploratory laparotomy was revealed hollow viscera injury, lumbar vertebra fracture, aortic contusion and complete superior vein mesenteric (SMV) injury.
Results: As the patient has remained stable during the whole surgery, we've decided to treat the SMV. Primary suture was not possible due to the loss of substance. So, we treated the injury with a bypass, using the safena magna vein. With 5-day admission the patient was discharged, accepting everything per mouth and until today there were not complications.
Conclusion: There is lack of evidence and experience to show how is the best way to treat SMV injuries. We would like to share a successful case in order to contribute with other surgeons that could face a case like this.
References:
1. Asensio JA, et al. J Trauma. 2007;62:668–75.
2. Hugon S, et al. Ann Emerg Med. 2007;50(5):623–4.
Disclosure: No significant relationships.

P216

ACUTE THROMBOSIS OF AN ABDOMINAL AORTIC ANEURYSM FOLLOWED BY DIRECT ABDOMINAL TRAUMA: A CASE REPORT

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Introduction: We present a case of acute thrombosis of the AAA in a patients who experienced sustained abdominal compression.
Materials and methods: A 77-year-old man with complaints of sudden onset pain, paresthesia and paralysis in both lower extremities was referred to our hospital. Prior to the onset of his complaints, he had jumped through a window of his house because he had no key. He was struck in the window for 3 min with compression to his abdomen. Physical examination revealed an absence of both femoral pulses and mottled skin below the level of the umbilicus. A CT showed an 5.5-cm infrarenal AAA which was occluded with thrombus extending into the lower extremity arteries without collateral blood flow.
Results: Thrombus from the aneurysm was removed and embolectomy which retrieved mixed fresh and organized thrombi was performed in the bilateral common iliac and femoral arteries. Aorto-bifemoral bypass was done with a bifurcated Dacron graft. Both feet were pale and not perfused at the end of the procedure and we performed bilateral above-knee amputation. The postoperative course was complicated by a massive systemic reperfusion injury and the patient expired on day 2 due to multiple organ failure.
Conclusion: Thrombosis of AAA is rare, but catastrophic complications may occur. In a thrombosed AAA, direct trauma on the abdomen should be avoided to prevent the dislodgement of mural thrombi and distal embolization.
Reference:
1. Bogie R, Willigendael EM, de Booij M, Meesters B, Teijink JAW. Acute thrombosis of an abdominal aortic aneurysm: a short report. Eur J Vasc Endovasc Surg. 2008;35(5):590–2.
Disclosure: No significant relationships.

P217

CAROTID ARTERY DISSECTION AFTER ROAD TRAFFIC ACCIDENT: A DIAGNOSTIC CHALLENGE IN EMERGENCY MEDICINE—2 CASE REPORTS

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Introduction: Carotid artery dissection must be considered in patients presenting to the Emergency Department with acute neurological signs following major trauma.

Materials and methods: We present 2 case reports of traumatic carotid artery dissection where clinical assessment revealed acute neurological signs secondary to carotid dissection.
Results: (1) 46 year old male transferred by ambulance to Emergency Department(ED) post Road Trafic Accident (RTA) with acute right sided hemiparesis (power 3/5 lower and upper limbs) and dysarthria. A non-contrast CT of the brain demonstrated early signs of ischaemia in the left middle cerebral artery territory. The patient was thrombolysed and transferred to the stroke unit. A contrast CT of the brain and carotid vessels revealed a filling abnormality in the right internal carotid artery. MRI confirmed a dissection.
(2) 38 year old female transferred by ambulance post RTA from a head on collisions between two cars. Injuries included C6 fracture, right femur fracture, left tibia and fibula fracture, right ulna fracture. Initial CT of the brain was normal. In ICU she developed left hemiplegia. CT angiogram reported right internal carotid artery dissection. MRI detected left internal carotid artery dissection.
Conclusion: Carotid dissection should be considered in patients with acute neurological signs following RTA's. Although the gold standard radiological investigation of choice to diagnose Carotid or Vertebral dissection should be MRI, CT angiograms are useful to exclude acutely gross filling deficits.
References:
1. Srivastava A. Bilateral carotid artery dissection after high impact road traffic accident case report.
2. Edmundson SP. Delayed presentation of carotid artery dissection following major orthopaedic trauma resulting in dense hemiparesis.
Disclosure: No significant relationships.

QUALITY IN TRAUMA CARE III

P217A

A QUESTIONNAIRE FOR THE ASSESSMENT OF PRURITUS IN BURN PATIENTS

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Introduction: The pruritus in burns is a common symptom affecting rehabilitation and quality of life of patients. This symptom may be a feature of any inflammatory wound, a burn can be considered as in a state of chronic inflammation, triggering the mediators that are causing the pruritus.
Materials and methods: We apply a validated questionnaire of prevalence and characteristics of pruritus in patients who suffered burns and were admitted to the Central Hospital IMP Prieto of San Luis Potosi. Was tested in 20 burn patients
Results: Univariate analysis was performed where the variables that showed statistical significance were: maximum level of study, occupation, and health status. A bivariate analysis of patients with pruritus alone, according to the percentage of burn area, finding that sex, age and current medications do not present statistical significant results. We also performed bivariate analysis of patients with pruritus, according to the percentage of burn area, meeting with ANOVA output variables unbearable itching ($p \leq 0.04$), altered my sleep ($p \leq 0.01$) and limits the life ($p \leq 0.01$) were statistically significant.
Conclusion: We seek to use a validated questionnaire that had the variables needed to qualify from the general characteristics of pruritus, until the duration, number of episodes per day, quality of life, among others, so as to have a high sensitivity in order to know the characteristics pruritus.
Reference:
1. Brooks JP. Scratching the surface- Managing the itch associated with burns: a review of current knowledge. Burns. 2007;34:751–60.
2. Yosipovitc G. Itch. Lancet. 2007;361:690–963.
Disclosure: No significant relationships.

P218

THE EFFECTIVENESS OF REGIONALIZATION OF TRAUMA CARE, A SYSTEMATIC REVIEW

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Introduction: Trauma as an important health problem is one of the leading causes of death and disability in world. Several reports assessed the implementation of a structured trauma system of care, but research evidences on the effectiveness of regionalization for improvements trauma outcomes are limited.
Materials and methods: We searched bibliographic databases of Medline, EMbase, EconLit, HMIC using sensitive search terms, for interventional studies that reported trauma regionalization system as their intervention. At least two authors assessed eligibility for inclusion and the risk of biases and extracted data from the included studies. As meta-analysis was not possible, we conducted a narrative analysis as well as a 'vote-counting' analysis for important outcomes.
Results: After initial search, 64 papers were retrieved. Fifteen studies were included from the USA, Canada, Australia and The Netherlands. In spite of variation in specifications of the studies, most of them were before-after studies with high risk of biases. However reduction in mortality was showed in most of studies, only one interrupted time series study had low risk of bias and reported significant reduction in preventable deaths after implementation of trauma system.
Conclusion: A regionalized network of trauma care, is correlated with reduction in the mortality outcomes. Despite comparisons were done in several studies before and after existing trauma system, evidence of effect of regionalization is weak. It is necessary to conduct studies with robust research designs and lower risk of bias in a more diverse range of countries to assess the effectiveness of regionalization
Reference:
1. West J, et al. Impact of regionalization, the orange county experience. Arch Surg. 1983;118:740–4.
Disclosure: No significant relationships.

P219

IMPACT OF TRAUMA ACTIVATION IN THE MANAGEMENT OF MAJOR TRAUMA PATIENTS WHO UNDERWENT EXPLORATORY LAPAROTOMY: A COMPARATIVE ANALYSIS OF BEFORE AND AFTER THE TRAUMA ACTIVATION

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Introduction: The aim of this study is to evaluate the impact of trauma activation in the management of major trauma patients who underwent exploratory laparotomy.
Materials and methods: We investigated the medical records of major trauma patients who underwent exploratory laparotomy, with an Injury Severity Score (ISS) of over 15, from October 2010 to August 2013. Major trauma activation started in March 2012, and the 18 months of results from both before and after the trauma activation were analyzed by dividing the patients into an activation (AC) group and a nonactivation (NA) group.
Results: 280 patients underwent emergency exploratory laparotomy and 76 patients (27.1 %) were major trauma patients with an ISS over 15. Among them, 41 patients (53.9 %) were in the AC group. There were no significant differences in ISS, RTS, or TRISS between the two groups. The time to operation for the AC group (202.4 ± 154.7 min) was significantly shorter than for the NA group (313.4 ± 231.1 min) ($p = 0.021$). The mortality rate was 25.7 % in the NA group and 22.0 % in the AC group, but there was no statistical significance ($p = 0.702$). Also, there were no significant differences in the length of ICU stay and hospital stay ($p = 0.465$, $p = 0.871$).
Conclusion: The trauma activation decreased the time interval from ER visit to operation in major trauma patients with the early intervention of trauma team.
Reference:
1. Davis T, Dinh M, Roncal S, et al. Prospective evaluation of a two-tiered trauma activation protocol in an Australian major trauma referral hospital. Injury. 2010;41:470–4.
Disclosure: No significant relationships.

P220

MORTALITY OF THE SEVERELY INJURED PATIENT WITH DCS HASN'T IMPROVED IN JAPAN

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Introduction: Trauma mortality in Japan has greatly improved in these 10 years after Japan Advanced Trauma Evaluation and Care (JATEC) was introduced. But the mortality of the patients whose Trauma Injury Severity Score (TRISS) probability of survival was 0.5 or more hasn't showed satisfactory improvement. In this study, we investigated the yearly change of the mortality in patients who had undergone Damage Control Surgery (DCS).
Materials and methods: In this case control study, we selected subjects from the Japan Trauma Databank (JTDB) who underwent DCS. We imputed missing data with multiple imputation and excluded subjects with unknown outcome, unsurvivable injuries, and out-of-hospital cardiac arrest. After dividing the subjects into three cohorts (the early; 2004–2006, the transit; 2007–2009, the late; 2010–2012), a logistic regression analysis after adjustment for TRISS estimated relative risk of in-hospital death of the transit cohort and the late cohort in reference to the early cohort.
Results: A total of 497 out of 123462 subjects registered in JTDB matched the selection criteria. The mean TRISS probability of survival was 0.67. Relative risk of in-hospital death in the transition (OR 0.87, 95 % CI 0.50–1.51, $P = 0.627$) and the late cohort (OR 1.03, 95 % CI 0.61–1.51, $P = 0.924$) versus the early cohort were similar and non-significant.
Conclusion: By the same token, the mortality of the most severely injured patients with DCS has not improved yet. We emphasize the importance of the education in definitive trauma surgery.
Reference:
1. Hondo K. In-hospital trauma mortality has decreased in Japan possibly due to trauma education. J Am Coll Surg. 2013;217(5):850–7.
Disclosure: No significant relationships.

P221

LAPAROTOMY AFTER INTRA-AORTA BALLOON OCCLUSION (IABO) IS HAZARDOUS IN PATIENTS WITH SEVERE ABDOMINAL TRAUMA: A REPORT FROM JAPAN TRAUMA DATA BANK

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Introduction: Intra-aorta balloon occlusion (IABO) is a device for bridging therapy to definitive laparotomy in trauma patients with severe bleeding and hemorrhagic shock, however, safety and efficacy of the device remained unestablished. We compared mortality of laparotomy with or without IABO for abdominal injuries based on Japan Trauma Databank (JTDB).
Materials and methods: The data source was JTDB. After imputing missing values in important variables using multiple imputation, of subjects with complete dataset to estimate the injury severity score (ISS) and mortality, we extracted isolated severe abdominal trauma victims who treated with open surgery and/or IABO. We excluded subjects with out-of-hospital cardiac arrest. An intergroup comparison with adjustment based on propensity score matching estimated from subjects' background characteristics variables assessed a risk of mortality of IABO for following laparotomy.
Results: Of a total of 123462 subjects in JTDB from 2004 to 2012, 3,998 subjects were included; 318 underwent both laparotomy and IABO and 3,683 underwent laparotomy alone. Inhospital mortality was 63 % in patients with laparotomy and IABO and 63 % in those with laparotomy alone. After adjustment for baseline trauma severity based on propensity score matching, a use of IABO followed by laparotomy was significantly hazardous in comparison of laparotomy alone (mortality is 61 vs. 43 %. $P < 0.001$).
Conclusion: Authors concluded that use of IABO against isolated severe abdominal injury might be hazardous whose number needed to harm equal to 5.
Reference:
1. Gupta BK. The role of intra-aortic balloon occlusion in penetrating abdominal trauma. J Trauma. 1989;29(6):861–5.
Disclosure: No significant relationships.

P222

THE PROMPTNESS OF THE FIRST DOCTOR VISIT AND SURGICAL OPERATIONS FOR PATIENTS IN THE EMERGENCY DEPARTMENT OF HILLA TEACHING HOSPITAL

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Introduction: Trauma and emergency surgery are common in Iraq which is passing through hard times of war. Though the country had been struggling in all aspects of life including medical services, I always had a feeling we are doing well regarding trauma and emergency surgery. So I carried out this study.
Materials and methods: Studying 236 patients who were admitted to the emergency department of our hospital between 5/3/2011 and 4/8/2012. Males equaled females. Patients ages ranged 12–71 years studied criteria were average time required for the first visit by the intern doctor, senior house officer and specialist surgeon. Also I studied the average time required for the patient to be on the operating couch and the time required for the disposition from the emergency department.
Results: Average time required for 1st intern doctor, 1st senior house officer, 1st specialist surgeon visit was 3, 4 and 30 min respectively. Average time for patient to be on operation couch was 2 h 13 min. Average time for disposition of patients from emergency department was 1 h 15 min.
Conclusion: Compared to other countries our hospital is doing well regarding emergency surgery though there are terrorism challenges.
References:
1. Lu Y, Qin L. A situation analysis of medical resources in emergency department hospitals. Chin J Emerg Med. 2005;14:1054.
2. Widgren B, Jourak M. Medical emergency treatment system: a new protocol in primary and secondary priority in emergency medicine. J Emerg Med. 2008.
Disclosure: No significant relationships.

BLEEDING CONTROL II

P223

INTERNAL ILIAC ARTERY LIGATION (IIAL): CONTINUING EXPERIENCE ON A LIFE-SAVING SURGICAL MANEUVER

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Introduction: By extending our experience and by further evolving the method we try to emphasize on the utility and efficacy of Internal Iliac artery ligation in life threatening conditions. The method has been proven to be useful especially in units were contemporary supportive modalities are lacking.
Materials and methods: In the last 5 years our hospital has been equipped with a fully functional angio-suite, in which selective angio-embolisation is readily available. Out of a total of 27 cases, we herein present 16 new cases in the last 5 years from our previous presentation. Expanding our experience we further evolved the method by performing more distal and selective liagtions. Truncal IIAL (bilateral and unilateral) remain the majority, we have also performed branch selective (parietal and unilateral) and more distal skeletonizations. These cases include trauma and elective general surgery, urology, gynecology and orthopedic cases complicated with massive pelvic hemorrhage. IIAL was used as the only intervention or combined with packing and/or angiography and embolization.
Results: The method's applicability was 100 % and it's efficacy to achieve final hemostasis was 87 %. Long term followup revealed only one case of procedure related complications.
Conclusion: The IIAL and its modifications is a safe, applicable and highly effective method of stopping pelvic bleeding from a wide range of causes. Its utility is obvious in hospitals lacking supportive technology or as an adjunct or alternative method in others.
Reference:
1. Ioannides P, et al. Emergency Internal Iliac Artery Ligation (EIIAL) for control of massive pelvic hemorrhage. Poster presentation. 9th European Trauma Congress in Budapest; May 2008.
Disclosure: No significant relationships.

P224

A META-ANALYSIS TO DETERMINE THE EFFECT OF COAGULOPATHY ON INTRACRANIAL HAEMATOMA PROGRESSION IN PATIENTS WITH BLUNT HEAD TRAUMA

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Introduction: This Meta-analysis aimed to determine the risk of haematoma progression in adult patients with isolated blunt head trauma with coagulopathy. A comparison was made between patients with blunt head injury with evidence of coagulopathy (elevated PT or APPT) against a cohort of patients with blunt head trauma and no coagulopathy.
Materials and methods: A Medline search was performed via the Pubmed interface. The search strategy was performed using the words *head injury AND clotting (Oct 2013)*. Cohort studies of adults not children were included. Criteria used for coagulopathy were either prolonged PT or APTT. The search produced 1237 citations of which 73 abstracts were reviewed for relevance. Thirty-two full papers were reviewed of which seven papers were included. Cross referencing produced three further studies. Statistical analysis was performed using Comprehensive Meta-analysis Version 2 software.
Results: In total ten studies were identified as being suitable for the meta-analysis. Significant heterogeneity was present between the studies as demonstrated by an $I^2 = 60.568$. The Fixed Effects model was considered to be the preferred model and this produced a pooled Odds Ratio of 6.176 (95 % CI 4.727–8.069).
Conclusion: The results of this meta-analysis have demonstrated that coagulopathy is a statistically important risk factor for haematoma progression in patients blunt head trauma.
References:
1. (short references)
1. Yuan, et al. J Neurotrauma. 2012.
2. White, et al., J Trauma. 2009.
3. Allard, et al. J Trauma. 2009.
4. Yadav, et al. Neurol India. 2006.
5. Schuster, et al., Am Surg. 2005.
Disclosure: No significant relationships.

P225

FREQUENCY AND RELEVANCE OF INHERITED THROMBOPHILIA IN PROPHYLAXIS OF VENOUS THROMBOEMBOLISM IN COMBAT CASUALTIES WITH EXTREMITY WOUNDS AND AMPUTATIONS

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Introduction: The objective of this study was to define the frequency and relevance of inherited thrombophilia and associated venous thromboembolism (VTE) in wartime extremity wounds and amputations casualties.
Materials and methods: A 10-year retrospective cohort analysis performed to determine the prevalence of inherited thrombophilia for prophylaxis of VTE in casualties admitted to the Main Military Clinical Hospital of Internal Troops and the Main Hospital of the Ministry of Interior from the North Caucasus. Continuous and categorical variables were studied with the Student's t test, Fisher's exact test or χ^2 test, multivariate analysis was performed using a stepwise regression logistic model.
Results: A total of 980 records were reviewed. Four hundred twenty-six (43.5 %) had amputations, 279 (28.5 %) had long-bone fractures not requiring amputation and 275 (28 %) had tissue wounds. The observed rate of VTE in these casualties was 7.3 %. Blood tests for determination genetic risk factors of VTE found the rate of gene mutations 28.3 %. Inherited thrombophilia was detected in association with other risk factors of VTE. Casualties with lower extremity deep vein thrombosis had one or two inherited gene variations in 62 % ($P < .001$).
Conclusion: This report is the first to characterize inherited thrombophilia in combat injured with VTE. Additional study is needed to determine significant gene mutations, frequency of ultrasound screening, indications for anticoagulation prophylaxis and necessity of using vena cava filter devices for this group of patients.
Reference:
1. Kapustin SI, et al. Genetic determinants of hereditary thrombophilia in pathogenesis of venous thrombosis. Ter Arkh. 2003;75(10):78–80. Russian.
Disclosure: No significant relationships.

P226

A PRECLINICAL MODEL OF ACUTE TRAUMATIC COAGULOPATHY: WHAT HAPPENS IN THE FIRST HOUR?

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Introduction: A worsening of patient's outcome has been associated with acute traumatic coagulopathy. Understanding what happens during the first hour warrants the best care to trauma patients. In this study we examined the changes occurring during the first hour post injury in an experimental model of ATC.
Materials and methods: 12 Male Wister rats were submitted to trauma and haemorrhage to a target mean arterial blood pressure of 30 ± 5 mmHg. After 60 min blood samples were taken and analysed.
Results: After 60 min the animals presented significant rotational thromboelastrometry changes in accord with a coagulopathy trace (reduction in clot amplitude at 5 min (time 0 vs time 60 = 53 vs 49 mm, $p < 0.01$) and in maximal clot firmness (t0 vs t60 = 65 mm vs 57 mm, $p < 0.0002$). Both liver and kidney function were deranged showing risen levels of creatinine and ALT (creatinine: t0 vs t60 = 30.3 μmol/L vs 50 μmol/L, $p < 0.002$ and ALT: t0 vs t60 = 46 U/L vs 61 U/L, $p < 0.002$). As expected the hematocrit level decreased possibly due to the rapid fluid movement into the vascular space. There was a global fall in the cellular blood component affecting both white blood cells and red blood cells.
Conclusion: The organ function seems to be affected immediately after the trauma-haemorrhagic insult alongside with the coagulation impairment. This model warrants a good tool for further investigation of the identified changes and a possible association with the established coagulopathy.
Reference:
1. Brohi K, et al. Acute traumatic coagulopathy: initiated by hypoperfusion. Ann Surg. 2007; 245:812–8.
Disclosure: No significant relationships.

P227

ALPHA-ENOLASE, A GLYCOLYTIC ENZYME ELEVATED IN HEMORRHAGIC SHOCK, POTENTIATES T-PA MEDIATED FIBRINOLYSIS

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Introduction: *Alpha-e*nolase is a glycolytic enzyme present in the cytoplasm of most cells. The functions of alpha-enolase as a receptor are distinct from its well-established function in glycolysis and it's expression has been found to be dependent on the pathophysiological conditions of the cell. When present as a cell surface receptor, alpha-enolase binds circulating plasminogen and accelerates it's conversion into plasmin. In a proteomic analysis of mesenteric lymph from a rodent model of trauma and hemorrhagic shock, our group recently demonstrated a +2.4-fold increase of alpha-enolase in post-shock mesenteric lymph. Clinically significant fibrinolysis has not yet been demonstrated as a result of this interaction between alpha-enolase and plasminogen. We hypothesized that alpha-enolase would potentiate the fibrinolytic effect of tissue-plasminogen-activator(tPA) in whole blood as measured by thrombelastography.
Materials and methods: Whole-blood from ten healthy-volunteers, was collected in citrated-tubes. A paired thrombelastography(TEG) analysis was performed in whole-blood samples with tPA-alone in parallel with samples with tPA(50 ng/ml) + alpha-enolase(50 mcg/ml).The mean of TEG variables were compared by Student's *t* test (±SEM) for statistical significance.
Results: Alpha-enolase significantly increased tPA induced fibrinolysis by 22.1 % (41.4 %tPA-alone vs. 63.5 %tPA + enolase, $p = 0.02$) as measured by LY30. The TEG-variables R-time, angle, and MA were not statistically different between samples of tPA-alone and tPA + alpha-enolase. Addition of alpha-enolase to whole blood in the absence of tPA didn't result in any significant change compared to whole-blood.
Conclusion: Alpha-enolase, a glycolytic enzyme demonstrated to be elevated during hemorrhagic shock, significantly potentiates fibrinolysis. Hence, alpha-enolase may facilitate fibrinolysis in trauma. These data provide a novel insight into the complex pathophysiology of fibrinolysis and serves as a platform for further study.
Reference:
1. Peltz ED, et al. Surgery 2009;146(2):347–57.
Disclosure: No significant relationships.

P228

THE ANTICOAGULATORY EFFECTS OF DABIGATRAN IN A TRAUMA EXPERIMENTAL PIG MODEL CAN BE REVERSED WITH PROTHROMBIN COMPLEX CONCENTRATES AND A SPECIFIC ANTIDOTE (ADABI-FAB)

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Introduction: Specific reversal agents are not available in situations of life-threatening bleeding with the thrombin inhibitor dabigatran.[1] Using a porcine model of trauma, this study assessed the ability of prothrombin complex concentrate (PCC), activated PCC (aPCC), rFVIIa and a specific antidote to dabigatran (aDabi-Fab) to reverse the anticoagulant effects of dabigatran.
Materials and methods: Studies were performed in 5 pigs. Dabigatran was given orally for 3 days (30 mg/kg bid) and, on the 4th day, dabigatran was infused prior to liver injury. Blood samples were taken before, after dabigatran infusion and 60 min post-injury. Doses of PCC (30, 60 IU/kg), aPCC (30, 60 IU/kg), rVIIa (90, 180 μg/kg) and aDabi-Fab (30, 60 mg/kg) were added to blood samples ex vivo. Coagulation was assessed by thromboelastometry, PT and diluted TT.
Results: Oral dabigatran prolonged clot formation (159 ± 39 s) and PT (27 ± 9 s), but coagulopathy was more severe after achieving high dabigatran plasma levels (943 ± 147 ng/ml) and trauma (CFT: 3374 ± 625 s; PT: 167 ± 40 s). Both PCCs and aDabi-Fab, but not rFVIIa, reversed the effects of dabigatran on thromboelastometry parameters and PT. aPTT was only normalised by aDabi-Fab. Plasma concentration of dabigatran remained elevated after PCC therapy, but was not measureable after aDabi-Fab.
Conclusion: The ex vivo addition of PCCs is effective in reducing coagulopathy in a porcine model of dabigatran, while aDabi-Fab fully corrected all coagulation measures. No significant effects were observed with rFVIIa.
Reference:
1. Baglin T. Clinical use of new oral anticoagulant drugs: dabigatran and rivaroxaban. Br J Haematol. 2013;163:160–7.
Disclosure: J.vR. is an employee of Boehringer Ingelheim Pharma GmbH & Co.

P229

DELAYED ONSET OF CIRCULATORY SHOCK IN A CASE OF MULTIPLE TRAUMA

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Introduction: While there were few cases of report concerning delayed shock of trauma, we present a case of delayed shock more than 24 h after controlling blood leakage and stabilizing clinical status by conducting transcatheter arterial embolization (TAE) for pelvic fracture, which required abdominal gauze packing.
Materials and methods: A 53-year-old man was rear-ended and injured by traffic accident. On arrival at the hospital, the patient was lucid and FAST negative, but was in shock status showing systolic pressure of 91 mmHg, heart rate of 76 bpm and respiratory rate of 24 times per minute. Pelvic X-ray showed unstable fracture at primary survey, and we performed TAE to embolize left internal iliac artery, parallel with massive transfusion. One day after his entering ICU with stabled circulatory dynamics, CT revealed that the patient developed intraabdominal bleeding, which led us to conduct abdominal surgery.
Results: We observed blood spillage via small retroperitoneal incision into abdominal cavity but couldn't identify the location of the vascular rupture. Following gauze packing and another TAE, we confirmed complete arrest of bleeding. There was no bleeding at gauze removal. He was then transferred to another hospital after fracture reduction.
Conclusion: Oozing caused by retroperitoneal failure may be considered as an intraabdominal bleeding. We should notice this complication caused by pelvic fracture, even after achieving stabilized circulatory status by TAE.
Reference:
1. Wheaton DJ, Tsalamandris K: Delayed presentation of abdominal bleeding in a teenage boy after a fall. Am J Emerg Med. 2000;18:78–82.
Disclosure: No significant relationships.

P230

FATAL THROMBOEMBOLISM IN A FONDAPARINUX PROPHYLACTED OBESE PATIENT: DO WE NEED A WEIGHT ADAPTED DOSE? A CASE REPORT

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Introduction: It's evident that patients do need a prophylaxis against thromboembolism after proximal femur fractures. One possible drug for this is fondaparinux. In obese patients an adaptation in drug dose is so far not mandatory in this drug.
Materials and methods: In this retrospective case report we want to present a case of fatal thromboembolism of a 59 year old woman that slided of her chair during work and was presented with an out-rotated shortened left leg at our E&R department. We diagnosed by X-ray a pertrochanteric femur fracture (AO 31A2.1). Closed reduction and osteosynthesis by a CMN (300 mm, 130° 90 mm CMS, Zimmer) was performed. She needed a prolonged weaning in our post anaesthesia care unit caused by respiratory insufficiency. The suspected cause for this was her obesity of BMI 60.1. At this time we excluded an intracranial lesion by cCT and an lung embolism by thoracic CT-scan.
Results: Postoperatively we used Fondaparinux 5 mg sc per day as prophylaxis against thrombosis. A mobilisation to sitting position started at day 1 postoperatively. No standing was achieved. At day 14 postop. the patient was found laying dead in her bed. The result of the autopsy showed a right and left heart insufficiency as cause of the death. This was caused by a deep vein thrombosis at the left leg and multiple fresh lung embolisms of the middle and peripheral branches of the lung arteries.
Conclusion: We recommend to adapt antithrombotic prophylaxis by fondaparinux to therapeutic level in severe obese patients at day 6 postoperatively after high risk operations.
Disclosure: No significant relationships.

P231

A THROMBOELASTOMETRIC EVALUATION OF THE CHARACTERISTICS OF TRAUMA INDUCED COAGULOPATHY WITH LOWER FIBRINOGEN LEVEL: A RETROSPECTIVE STUDY

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Introduction: The purpose of this study is to assess the characteristics of trauma induced coagulopathy (TIC) with lower fibrinogen level using rotational thromboelastometry (ROTEM® delta).
Materials and methods: 17 blunt trauma patients transported to the Saga University Hospital between January and September in 2013 were enrolled in this study. Patients were divided into two groups: a lower fibrinogen group (L-group; mean fibrinogen level of 157.4 ± 32.1 mg/dL), and a normal group (N-group; 269.0 ± 33.7 mg/dL). Clinical demographics, trauma score, laboratory data, and the ROTEM findings (EXTEM, INTEM and FIBTEM) were retrospectively analyzed in each group.
Results: The characteristics of each group were similar in terms of age, gender and vital signs at admission. There was no difference in ISS, AIS, RTS and Ps. L-group showed significantly higher WBC level ($p = 0.015$), lower prothrombin activity ($p = 0.048$) and lower pH level ($p = 0.046$). No significant correlation between plasma fibrinogen level and other laboratory data was observed. In the ROTEM analysis, the significantly lower alpha angle ($p = 0.022$) and prolonged clot formation time (CFT)($p = 0.024$) of EXTEM were confirmed in the L-group than N-group. Moreover, L-group showed significantly lower FIBTEM A5-A30 (clot amplitude at 5-30 min; $p < 0.001$-$p = 0.031$) and maximum clot firmness (MCF; $p < 0.001$). No other parameters in ROTEM analysis showed statistical difference. There was no difference in the volume of transfusion, therapeutic plan and outcome.
Conclusion: The alpha angle and CFT of EXTEM and clot amplitude of FIBTEM are reliable parameters to predict the TIC with lower fibrinogen level.
Reference:
1. Schoechl H, et al. Crit Care 2011;15:R265.
Disclosure: No significant relationships.

P232

EFFECTIVENESS OF HEMOSTATIC AGENTS IN A HEPARINIZED PORCINE HEPATIC ABRASION MODEL TO REDUCE INTRAOPERATIVE BLEEDING

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Introduction: Minimizing blood loss using adjunctive hemostatic agents decreases morbidity and mortality following hepatic surgery [1]. A porcine hepatic abrasion model was used to compare effectiveness of a microporous polysaccharide hemostatic agent (MPH) and a bovine-derived gelatin and human-derived thrombin combination hemostatic agent (FS).
Materials and methods: Paired circular abrasions created in the hepatic parenchyma were treated according to a randomization scheme of either MPH (ARISTA™ AH)(1 g) or FS (FLOSEAL™)(1 mL)(40 lesions/group). Hemostatic success (Y/N), degree of bleeding score (0-5) and blood loss were assessed at 2, 5, and 10 min. Treatment effect was evaluated using success odds ratio in a binomial model of "hemostatic success" and a proportional odds model of "degree of bleeding."
Results: FS provided superior "hemostatic success" at 2 (100 vs 82.5 %), 5 (97.5 % vs 57.5 %, OR 0.04, 95 % CI 0.004–0.278), and 10 (95.0 vs 37.5 %, OR 0.03, 95 % CI 0.007–0.150) min after application relative to MPH. FS significantly reduced "degree of bleeding" at 5 (OR 0.006, 95 % CI <0.001–0.037) and 10 (OR 0.009, 95 % CI 0.001–0.051) min relative to MPH. FS reduced blood loss at 2 min (0.01 ± 0.05 vs 0.17 ± 0.55 ml/min [mean ± SD], $p = 0.067$), and significantly reduced blood loss at 5 (0.01 ± 0.08 vs 0.33 ± 0.69 mL/min, $p = 0.007$) and 10 (0.03 ± 0.1 vs 0.85 mL/min, $P = 0.001$) min.
Conclusion: A combination hemostatic agent of bovine-derived gelatin and human-derived thrombin provides superior hemostatic success, superior control of bleeding, and significantly reduces blood loss relative to a microporous polysaccharide hemostatic agent in a preclinical model of hepatic surgery.
Reference:
1. Bui LL, et al. Minimising blood loss and transfusion requirements in hepatic resection. HPB (Oxford). 2002;4(1):5–10.
Disclosure: All authors were employees of Baxter International subsidiaries at the time of this work. The study was designed using sound scientific methods, randomization and standardized lesions for impartial comparisons of test items.

P233

THE MATURATION OF A MASSIVE TRANSFUSION PROTOCOL REDUCES EARLY MORTALITIES FROM MASSIVE TRAUMATIC BLOOD LOSS: THE QATAR EXPERIENCE

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Introduction: Massive transfusion protocols [MTP] have been reported to reduce early mortality, in less than 24 h, from massive transfusion blood loss [MTBL] in Level I Trauma Centers. This study will describe the maturation of MTP and its effect on early mortality from MTBL at a trauma center in Qatar.
Materials and methods: A retrospective analysis of data from the MTP, Blood Bank and trauma registries was conducted for the years 2010–2012. Comparisons of process and outcome measures were done and the annual average component usage, ratios and early mortality [in less than 24 h] were computed and compared during the study period.
Results: There was a 65 % increase in the number of MTP activations from year 1 to 2 of the study period, from 26 to 43 annually, a 7 % increase in the last year. The percent of trauma admissions needing MTP activation had a 59 % increase in the second year and a 4 % reduction during the third year. The mean PRBC, FFP, platelet and cryoprecipitate utilized per MTP activation increased during the second year and remained stable during year 3. Early mortality rates, for MTBL patients, decreased every year of the study period, from 38.5 to 14.0 to 8.7 %.
Conclusion: The implementation of MTP for major trauma resulted in improvements in triage, component utilization and early mortality in the second year and this effect was sustained in its third year.

Reference:
1. Cotton BA, et al. Predefined massive transfusion protocols are associated with a reduction in organ failure and postinjury complications. J Trauma. 2009;66:41–8.
Disclosure: No significant relationships.

P233A

EFFICACY OF NEW CHITOSAN DRESSINGS ON ACUTE ARTERIAL HEMOSTASIS

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Introduction: Chitosan has long been material of wound dressings due to its exudates absorbency and antimicrobial property. Recently, capability of chitosan to attract negatively-charged particles, including coagulation substances in blood has arisen the attention to its potential of stanching bleeding [1]. The present study aims to investigate the efficacy of three chitosan dressings on arterial hemostasis.
Materials and methods: Twelve 37 kg-weighted pigs were equally assigned to a control group and 3 experimental groups, in which chitosan-bandage, chitosan-non-woven fiber and chitosan-bandage were used as hemostat, respectively. For each specimen, a segment of femoral artery was slashed, resulting in a 60 s bleeding. The wound was then compressed with gauze for 2 min in the control group and with hemostat dressing in the experimental groups. Specimen's arterial pressure was maintained at 65 mmHg for 180 min.
Results: Baseline blood pressure, pretreatment blood loss or fluid infusions were not significantly different among the four tested groups. Hemostasis maintained stable in experimental groups. The survival time of each experimental group was significantly longer, while the post-treatment blood loss was less in experimental groups compared to those of control group. Abnormal rise of wound temperature (>1 °C) was not found after dressing application. Computed tomography images showed scarce blood flow through vessels. Histology results indicated absence of abnormal vascular changes.
Conclusion: The 3 investigated chitosan dressings, though manufactured differently, were effective in achieving arterial hemostasis without causing significant side effects, and thus suitable for first-line emergent treatment for severe injuries.
Reference:
1. J Trauma Acute Care Surg. 2012;72(4):899.
Disclosure: The present study is performed under the cooperation with Coreleader Biotech Co., Ltd, which provides the wound dressing.

SKELETAL TRAUMA PELVIS AND HIP

P234

COMBINED PELVIC RING AND ACETABULAR DISRUPTION: EXPERIENCE OF A NEWLY ESTABLISHED POLYTRAUMA DEPARTMENT

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Introduction: Combined pelvic ring and acetabular lesions involve high-energy trauma with significant challenges regarding resuscitation and reduction and high risk for mortality and complications.
Materials and methods: Between 09.05.2007–15.10.2012, 130 patients with pelvic injuries were operated from whom 21 had combined acetabular and pelvic ring lesions with a minimum 1 year followup. Parameters assessed were: age, gender, accident cause, ISS, type of lesions, treatment techniques and outcome.
Results: There were 13 male (62 %), 8 female (38 %), mean age 38.5 years. Car accidents were the most frequent cause-67 %. 18 patients (86 %) had ISS $>$ 25 and mean ISS of 35. 3 cases had bilateral acetabular fx and 5 associated hip dislocation. We noticed 11 elementary and 13 associated acetabular fractures. Pelvic ring lesions were: SI dislocation-15, pubic rami-10, sacral fx-5 and pubic diastasys-5. We had used: skeletal traction-5 patients, ExFix-3 patients, SI screws-14 patients, ORIF for acetabular fx-12 cases and for SI joint-2 patients. 8 patients (38 %) had complications: 5 malunion and 8 surgical would complications with 3 deep infections. 6 patients (28 %) died (one with ISS 29 and the rest with ISS $>$ 40).
Conclusion: Association of pelvic ring and acetabular disruption is a severe pathological entity with a high rate of complications and mortality. Staged treatment with minimal invasive methods in emergency as part of damage control and delayed definitive fixation, especially for acetabular fx, can be the best approach.
References:
1. Osgood GM, et al. Combined pelvic ring disruption and acetabular fracture: associated injury patterns in 40 patients. JOT. 2013;27(5):243–7.
2. Tile M, et al. Fractures of the pelvis and acetabulum. 3rd ed. 2003.
Disclosure: No significant relationships.

P235

PELVIC CIRCUMFERENTIAL COMPRESSION DEVICE PROVIDES BENEFITS IN THE MANAGEMENT OF ANTERIOR-POSTERIOR COMPRESSION TYPE PELVIC FRACTURE

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Introduction: The anterior-posterior compression (APC) pelvic fracture creates a complete diastasis of the anterior pelvis, which might be associated with severe sacroiliac joint injuries and further arterial injuries. The noninvasive pelvic circumferential compression device (PCCD) can reportedly provide reduction of diastasis and a tamponade effect, which reduces hemorrhage in the management of patients with pelvic fracture. In the present study, we evaluated the feasibility and efficiency of PCCD in patients with APC type pelvic fracture.
Materials and methods: We investigated the characteristics of the patients with different types of pelvic fractures. The comparisons between the patients received the PCCD or not were performed under different type of pelvic fractures. The effectiveness of PCCD in the management of patients with pelvic fractures was delineated.

Furthermore, the evaluation of the PCCD impaction was focused on the patients with APC type of pelvic fracture.
Results: We enrolled 606 patients with pelvic fractures in the study. Generally, the patients received PCCD had significantly fewer blood transfusions, shorter intensive care unit (ICU) length of stays (LOS) and shorter hospital LOS than the patients who did not receive the PCCD. In the comparisons of subgroups (APC type and non-APC type), the patients received PCCD in both of these two groups had significant fewer blood transfusion. However, the effect of PCCD is more significant in the group of APC type (APC type: 523.1 ± 522.4 ml vs. 1745.3 ± 873.4 ml, $p < 0.001$) (non-APC type: 235.7 ± 301.2 ml vs. $644.7.3 \pm 431.2$ ml, $p = 0.041$).
Conclusion: PCCDs benefit patients with pelvic fracture, especially for the APC type. PCCDs appeared to be a feasible and safe procedure in the management of patients with pelvic fracture.
References:
1. Ghaemmaghami V, et al. Am J Surg. 2007;194:720–3.
2. Fu CY, et al. Am J Emerg Med. 2013;31:1432–6.
Disclosure: No significant relationships.

P236

SECOND NECK OF FEMUR READMISSIONS FOLLOWING AN INDEX SURGICALLY TREATED NECK OF FEMUR FRACTURE

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Introduction: Neck of femur fractures is a major health concern in elderly patients with a 1-year mortality of 14–36 %. Post-operative mortality rises with increase in associated post-operative complications. Majority of studies have reported non-surgical pathologies as the major causes of readmission. This study looks at the prevalence of readmission following a subsequent neck of femur fracture, predictors of this readmission and its impact on patient outcomes.
Materials and methods: Retrospective Review (National Hip Database (2000–2011). Continuous data summarized by median (25th/75th centiles) and categorical data by percentage. Data analysed using Stata statistical computer package
Results: 6237 patients (82 years average age, M:F: 23:231. 263 patients readmitted for second neck of femur on contralateral hip(13 months median time to readmission). 12 patients admitted within 28 days with second neck of femur fracture. Time to readmission shorter with older patients, men and ASA > 1. 50 % readmitted from residential or nursing care. Increased 1 year mortality following readmission compared to non-admitted group.
Conclusion: Subsequent readmissions secondary to another episode of femur fracture although rare (4 % in 11 years) leads to significant patient related morbidity and mortality. There is urgent need to reduce prevalence of readmissions secondary to this.
Reference:
1. Bottle A, Aylin P. Mortality associated with delay in operation after hip fracture: observational study. BMJ. 2006;332:947–50.
Disclosure: No significant relationships.

P237

EXCESSIVE TELESCOPING TREATED WITH SHORT FEMORAL NAIL IN FEMORAL TROCHANTERIC FRACTURES: HOW TO PREVENT ITS PROBLEM?

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Introduction: Excessive telescoping of the lag screw treated with short femoral nail (SFN) in femoral trochanteric fractures potentially leads to fixation failure such as cutout/cut-through, and proximal lateral thigh pain especially in Japanese old thin ladies. The aim of this study is to reveal fracture type which poses excessive telescoping and the means of prevention.
Materials and methods: We defined the excessive telescoping as over 11 mm because of Japanese small stature. 48 patients were included. There were 15 males and 33 females. The mean age was 83.8 years. The mean follow-up period was 10.0 months. Firstly, all fractures were classified according to the position of the proximal and distal fragments. They include three types; "Intra-medullary" which means the proximal fragment comes into the distal fragment, "Extra-medullary" and "non-displaced." It is modified classification. The original was described by Utsunomiya et al. And the relevance between telescoping and fracture type was assessed. Secondly, the relevance between the position of main fragments after operation and telescoping was evaluated. Finally, the factor to prevent excessive telescoping was discussed.
Results: Excessive telescoping were observed only in four "Intra-medullary" type. There was no excessive telescoping in the cases in which anteromedial bony contact was achieved after the operation.
Conclusion: "Intra-medullary" type is the indicator of the excessive telescoping. One who treat femoral trochanteric fractures should not only pay attention to good alignment of main fragments but also try to get bony contact at the anteromedial part of the fracture site.
Reference:
1. Utsunomiya, K. et al. The classification for femoral trochanteric fractures. Seikei-saigaigeka. 2005;48:1561–8. (Japanese).
Disclosure: No significant relationships.

P237A

INTRACAPSULAR FEMORAL NECK FRACTURES: MANAGEMENT IN YOUNG PATIENTS

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Introduction: Intracapsular femoral neck fractures are relatively uncommon in adults under the age of 60 years old and consist of 2–3 % of all femoral neck fractures. Gold standard management for young patient with intracapsular fractured neck of femurs being closed reduction and internal fixation.
The injury is associated with higher incidence of femoral head osteonecrosis, with rates in the literature reported between 12–86 %. While achieving an anatomic reduction and stable internal fixation are imperative, other treatment variables, such as time to surgery and the

fixation methods remain debatable. Knowledge of these treatment options and potential complications are beneficial in managing femoral neck fractures in young adults.
Materials and methods: A retrospective radiological and case note analysis of patients under 60 with fractured neck of femur fractures between June 2008 and June 2012, assessing specifically for development of osteonecrosis and factors contributing to this.
Results: Of 87 intracapsular fractures, 56 patients underwent internal fixation. 29 % developed AVN of the femoral head. The highest incidence group was DHS fixation (86 %). 11 % operated before 24 h developed AVN, with 100 % operated beyond 36 h developing AVN.
Conclusion: Femoral neck fractures in young adults are uncommon, with osteonecrosis of the femoral head one of the most devastating and challenging complications following internal fixation of these injuries. We conclude that here are multiple other factors under the surgeon's control that can minimize and prevent this complication, including early diagnosis, early surgery, anatomic reduction and a stable internal fixation.
Reference:
1. Askin SR, Bryan RS. Femoral neck fractures in young adults. Clin Orthop 1976;114:259–64.
Disclosure: No significant relationships.

P238

GREATER TROCHANTERIC AVULSION FRACTURES: THE ROLE OF MRI IN DECIDING CONSERVATIVE VERSUS OPERATIVE MANAGEMENT

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Introduction: Fracture of the greater trochanter may be caused by direct injury or may occur indirectly as a result of the forced activity of abductor group of muscles. There has been recent increase demand from Orthopaedic surgeons for an MRI scan to look for the intertrochanteric extension of the fracture which might modify management. Traditionally these fractures used to be treated conservatively but there is an argument for fixation by DHS as there might be medial extension along the intertrochanteric region.
Materials and methods: We looked at all the MRI scans performed at our institution over a year for this indication. The idea is to look at the extension of the fracture, where radiographic abnormality was limited to avulsion of greater trochanter. We divided the fracture extension in three anatomic zones from lateral to medial (Zones 1 to 3) and looked at cases where the management was changed from conservative to operative.
Results: Results are being analysed and will be finalised before presentation.
Conclusion: MRI showing oedema extending up to the medial cortex, was better managed operatively with a DHS and a conservative approach for minimal extension of fractures.MRI more accurately defines the true geographic extent of greater trochanteric fractures sustained through acute trauma than do radiography and CT and thus could provide a more reliable basis for anticipating complications and for planning appropriate treatment.
References:
1. Fractures of the greater trochanter: intertrochanteric extension shown by MR imaging. Skelet Radiol. 2000;29:572–6.
2. MR assessment and its influence on patient management. Emerg Radiol. 2000;7:89–92.
Disclosure: No significant relationships.

P239

STUDY OF THE SEQUENTIAL TREATMENT WITHOUT INTERVAL USING EXTERNAL FIXATOR AND INTRAMEDULLARY NAILING OF FEMORAL FRACTURES. RESULTS IN OUR EXPERIENCE OF 67 CASES

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Introduction: Sequential treatment of a fracture continues to have some controversy, in their indications, in timing of change of fixation and in its results. The aim of the study is to describe the method of sequential treatment without interval between external fixator and nail.
Materials and methods: We retrospectively reviewed patients treated at our center who suffered a femur fracture and were treated initially with external fixation and in a second time with intramedullary nailing. We identified 67 patients, 46 men and 21 women, with mean age of 34 years. The most common mechanisms of injury were traffic accident (53 %) and precipitation (16.4 %). Over 90 % had associated injuries and their average ISS was 27.3. 62.8 % of the fractures were closed, 20.8 % were Gustilo I or II and 16.3 % were Gustilo III.
Results: External fixator was implanted the day of admission and the average time the external fixator was in place was 11.3 days. We used a single external fixator model and intramedullary devices are variable model. All changes were made in one single surgical session. We identified 12 % incidence of infection, half of them only cleaning required. 10 % were observed for delayed union.
Conclusion: Sequential treatment of femur fractures without interval between devices in the context of damage control or open fractures deliver optimal results.
References:
1. Scalea TM. J Trauma. 2000.
2. Bhandari M. J Orthop Trauma. 2005.
3. Yokoyama K. Indian J Orthop. 2008.
4. Giannoudis P. Injury. 2012.
Disclosure: No significant relationships.

P240

MULTIPLE CANNULATED SCREW FIXATION OF FEMUR NECK FRACTURES IN PATIENTS YOUNGER THAN SIXTY YEARS

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Introduction: We wanted to analyze the factors affecting the results of multiple cannulated screws fixation in patients younger than 60 years old with femur neck fracture.
Materials and methods: We reviewed 52 patients (30 males, 22 females) who treated with multiple cannulated screws fixation for femoral neck fractures. They were followed up more than 1 year during January 2002 to December 2012. They were classified by Garden's classification. The anatomic reduction was evaluated by Garden's alignment index on hip both anteroposterior and lateral images. Postoperative complication were analyzed during follow up periods.
Results: By Garden's classification, 6 cases for stage I, 13 cases for stage II, 30 cases for stage III and 3 cases for stage IV. During follow

up periods, avascular necrosis of the femoral head (AVN) was observed in 12 cases (23 %) and nonunion was observed in 5 cases (9 %). The 16 patients of complications underwent total hip arthroplasty (31 %). In non-displaced fracture groups (Garden I, II) did not occur AVN nor nonunion. The incidence of complications in displaced fracture groups were 51.5 %. The complicated cases were showed tendency of increased anterior angulation of femur neck on hip lateral images and the result was meaningful statistically ($p = 0.0260$).

Conclusion: The patients younger than 60 years old who treated with multiple cannulated screws fixation for displaced femoral neck fractures showed the incidence of complications more than 50 %. It needs a cautious approach for anatomical reduction, especially related to anterior angulation on hip lateral image.

References:

1. Swiontkowski MF. Intracapsular fractures of the hip. J Bone Joint Surg Am. 1994;76:129–38.
2. Koval KJ, Aharonff GB, Rosenberg AD, Schmigelski C, Bernstein RL, Zuckerman JD. Hip fracture in the elderly: the effect of anesthetic technique. Orthopaedics. 1999;22: 31–4.
3. Rodríguez-Merchán EC. In situ fixation of nondisplaced intracapsular fracture of the proximal femur. Clin Orthop Relat Res. 2002;399:42–51.
4. Strömqvist B, Nilsson LT, Egund N, Thorngren KG. Wingstrand H. Intracapsular pressures in indisplaced fractures of the femoral neck. J Bone Jt Surg Br. 1988;70:192–4.
5. Bosch U, Schreiber T, Krettek G. Reduction and fixation of displaced intracapsular fractures of the proximal femur. Clin Orthop Relat Res. 2002;399:59–71.
6. Whitman R. The abduction method. Considered as the exponent of a treatment for all forms of fracture at the hip in accord with surgical principles. Am J Surg. 1933;21:335–49.
7. Garden RS. Low-angle fixation in fractures of the femoral neck. J Bone Jt Surg Br. 1961;43:647–63.
8. Lowell JD. Results and complications of femoral neck fractures. Clin Orthop Relat Res. 1980;152:162–72.
9. Schmidt AH, Asnis SE, Haidukewych G, Koval KJ, Thorngren KG. Femoral neck fracture. Instr Course Lect. 2005;54:417–45.
10. Leadbetter GW. A treatment for fracture of the neck of the femur. J Bone Jt Surg Am. 1933;15:931–40.
11. Robinson CM, Saran D, Annan IH. Intracapsular hip fractures. Results of management adopting a treatment protocol. Clin Orthop Relat Res. 1994;302:83–91.
12. Asnis SE, Wanek-Sgaglione L. Intracapsular fracture of the femoral neck. Results of cannulated screw fixation. J Bone Jt Surg Am. 1994;76:1793–803.
13. Bray TJ. Femoral neck fracture fixation. Clinical decision making. Clin Orthop Relat Res. 1997;339:20–31.
14. Kyle RF. Operative techniques of fixation for femoral neck fractures in young adults. Tech Orthop. 1986;1:33–8.

Disclosure: No significant relationships.

ABDOMINAL EMERGENCIES III

P240A

ACUTE GASTRIC NECROSIS: A SUCCESSFUL CASE

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Introduction: Gastric necrosis is a rare cause of acute abdomen with a high mortality rate. The authors describe a case of acute gastric necrosis in which the patient survived. Clinical process consult. A 72-year-old woman with a history of noninsulin-dependent diabetes mellitus, hypertension, dyslipidemia and depression was brought to the emergency room after an episode of syncope, hematemesis and melenas. At admission the patient was conscient but confused, complaining vaguely of abdominal pain. Physical examination revealed hypothermia, tachycardia, a distended abdomen, painfull during compression with no guarding. The abdominal and chest X-ray revealed no acute abnormality, namely signs of free air. An upper gastrointestinal endoscopy was performed showing necrotic areas in the stomach, and abdominopelvic CT exhibited perigastric pneumoperitoneum. During investigation and stabilization the patient evolved to septic shock and, when proposed to laparotomy, was already under adrenergic support. Operative findings revealed extensive necrosis of the stomach. A total gastrectomy with no reconstruction and a feeding jejunostomy was performed. In the post operative period adrenergic support and invasive ventilation were needed for 6 and 12 days, respectively, antibiotherapy was completed and a nasogastric tube of Levin remained in the esophageal stump. Reconstruction of the gastrointestinal transit was performed on the 62nd post-operative day and recovery underwent eventless, besides surgical wound infection. A 1-year-follow-up was completed with no complaints. Emergent gastrectomy is indicated in acute gastric necrosis and postponed reconstruction is a surgical option, particularly in a patient presenting with shock.

Reference:

1. Vettoretto N, Viotti F et al. Acute idiopathic gastric necrosis, perforation and shock. J Emerg Trauma Shock. 2010;3(3):304.

Disclosure: No significant relationships.

P241

A RARE COMPLICATION OF GASTRIC LEIOMIOMA

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Introduction: Gastric leiomyomas constitute 2 % of all resected neoplasms of the stomach. They are usually asymptomatic and the rate of malignant transformation is low. We present a rare complication of the large leiomyoma with the base in the gastric cardia, entrapped in the descendent part of the duodenum, and concomitant mild acute pancreatitis.

Materials and methods: Case report.

Results: A 77-year-old female was delivered to the hospital with recurring upper abdominal pain and periodic bleeding from the gastrointestinal tract. The patient had a two-year history of polypoid structure in the stomach endoscopically and histologically confirmed as a leiomyoma. Increased lipase level (3,265 U/L) was significant for mild acute pancreatitis. Cardiovascular insufficiency, osteoporosis and chronic renal failure (the patient has a right-side nephrectomy due to a kidney tumor and thrice-repeated surgical spinal fixation) were the main reasons why she had not been operated earlier. During the laparoscopic intervention the localization of the leiomyoma 4 cm in diameter was specified using laparoscopic intra-operative ultrasound and endoscopy. The leiomyoma in a block with the gastric wall was resected using Harmonic scalpel. The patient was discharged on the fifth postoperative day for outpatient treatment.

Conclusion: Laparoscopic approach is feasible even in large-size gastric leiomyomas. Patient age, comorbidities and mild acute pancreatitis is a relative risk factor in the selective category of patients. Intraoperative ultrasound and concomitant endoscopy significantly improve the precision of the laparoscopic procedure.
Disclosure: No significant relationships.

P242

HIDDEN IN THE BASEMENT: AN INTERESTING CASE OF FOURNIER'S GANGRENE SECONDARY TO A BENIGN RETROPERITONEAL SIGMOID PERFORATION

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Introduction: A rare case of necrotizing fasciitis on the left lateral thigh region, secondary to retroperitoneal sigmoid perforation due to diverticulitis, is presented.
Materials and methods: A 73-year-old female with a notable past cardiovascular history, currently hospitalized for new-onset atrial fibrillation, presented with erythema over her left thigh. Differential diagnosis initially comprised decubitus ulcer and cellulitis, for which a wide-spectrum antibiotic regimen was prescribed. The lesion failed to respond to conservative treatment. Instead, crepitus and necrotic eschar developed and the patient's clinical condition dramatically deteriorated (decreased level of consciousness, oliguria, uncontrolled fever). Emergency imaging studies revealed widespread abscess formation expanding from the left iliopsoas muscle to the soft tissues lateral to the left iliac crest, in direct communication with the sigmoid colon.
Results: The patient underwent urgent laparotomy and Hartmann's sigmoidectomy procedure, along with extensive soft tissue debridement. Histology showed ruptured diverticulitis of the sigmoid, without evidence of malignancy. Her post-operative course was uneventful.
Conclusion: Cutaneous inflammation in the lower-abdominal/gluteal region in a severely ill patient should never be considered benign, unless prompt and extensive diagnostic studies have been undertaken. According to the literature, Fournier's gangrene in non-typical anatomic locations is associated with rectal malignancies or trauma, but is very rare in complicated diverticular disease of the sigmoid. Emergent and aggressive surgical intervention is the key to successful management of such cases.
References:
1. Singapore Med J. 2009;50(8):e271.
2. World J Gastroenterol. 2006;12(32):5256–8.
3. J. Plast Reconstr Aesthet Surg. 2009;62:e17ee19.
4. Ir J Med Sci. 2011;180:573–4.
Disclosure: No significant relationships.

P243

CAN PNEUMATOSIS INTESTINALIS COSTITUTES A FALSE INDICATION FOR SURGICAL OPERATION? DESCRIPTION OF A CASE

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Introduction: Pneumatosis Intestinalis is defined as the presence of gas in the bowel wall. It is a radiographic finding and not a diagnosis and as far as the etiology is concerned it is secondary in 85 %in the cases.
Materials and methods: An 82-year-old male patient arrived at the E.D. of our Hospital complaining of abdominal pain of acute onset localized at the upper abdomen and clinical findings of tenderness during the palpation of the epigastrium without signs of peritoneal irritation. Abdominal U/S revealed the presence of gas in the portal venous system. Abdominal CT-scan confirmed the U/S findings and also revealed the presence of free gas around the splenic flexure of the colon. The need for operation was obvious. Ischemia of small bowel and Pneumatosis Intestinalis localized on splenic colonic flexure were found intraoperatively.
Results: Resection of all the involved gut and its mesentery (length 25 cm approximately), was performed. The patient was remain in the clinic for 10 days post-operatively, he has no post-operative complications and discharge the clinic in good condition of health.
Conclusion: Pneumatosis Intestinalis constitutes a different diagnostic problem as it gives the impression of free abdominal gas after the imaging studies. This extremely rare situation it could lead under specific circumstances patient with non surgical causes of acute abdomen, to the surgical intervention.
References:
1. Keene JG. Pneumatosis cystoides intestinalis and intramural intestinal gas. J Emerg Med. 1989;7:645–650.
2. Pear BL. Pneumatosis intestinalis: a review. Radiology. 1998;207:13–9.
Disclosure: No significant relationships.

P244

SINGLE INCISION LAPAROSCOPY IN TREATMENT OF SOLITARY PEUTZ–JEGHER POLYP INTUSSUSCEPTION: CASE REPORT AND REVIEW OF THE LITERATURE

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Introduction: Single Incision Laparoscopic Surgery (SILS), is a minimal invasive surgical technique with important advantages which allows the reduction of intussusception and the resection of the polyp. The purpose of this study is to present the successful treatment of a small bowell intussusception which is caused by a 3-cm Peutz–Jeghers polyp with SILS, without post-operative complications.
Materials and methods: A 19-year-old woman complain about intermittent non-specific abdominal pain to the left lateral abdomen. She had been admitted to the Hospital because of incomplete obstructive ileus. The patient, present a clear personal drug history. An ultrasonography and abdominal CT-scan were carried out and revealed an intussusception of the small bowell. This pathogenic situation was treated by SILS and laparoscopic enterectomy.
Results: The patient had a quick recovery with out any complication and discharge Hospital at 5th post-operative day. Histopathology findings confirm the Peutz–Jegher polyp.
Conclusion: Peutz–Jegher syndrome should be diagnosed in patients as early as possible. Genetic counseling should also be provided. Many of the gastrointestinal lesions start developing early in life, even if the syndrome is not clinically apparent until the 2nd and 3rd

decade of life. We recommend SILS for the safe treatment of solitary Peutz–Jeghers polyps and their complications as represent a potential advance in minimally invasive approaches to this syndrome.

Reference:
1. Baba K, et al. Single-incision laparoscopic surgery for small bowel diseases. Department of Digestive Surgery, Graduate School of Medicine and Dental Sciences, Japan. SAGES 2013, Poster Presentation, P515. 2013.

Disclosure: No significant relationships.

P245

ASCARIASIS AS A CAUSE OF INTESTINAL OBSTRUCTION: A CASE REPORT FROM RURAL AREA

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Introduction: Ascaris lumbricoides is one of the most prevalent parasitic infections, especially in developing countries. While the vast majority of these cases are asymptomatic, infected persons may present with potentially severe gastrointestinal complaints. We describe a case of a children who presented to our emergency department complaining of abdominal pain, constipation, nausea and vomiting suggestive of intestinal obstruction.

Materials and methods: A 4 year old girl presented to our emergency department complaining of abdominal pain, constipation, nausea and vomiting suggestive of intestinal obstruction. An abdominal plain X-ray and an abdominal ultrasonography were used and the diagnosis of ileus cause by intestinal ascariasis. After 1 day of ineffective management of intestinal obstruction with treatment consisting of no oral intake, intravenous fluids, administration of albendazole via nasogastric tube, and hypertonic saline enemas, the patient underwent surgery. An ileal obstruction caused by ascaris lumbricoides was determined 20 cm proximal from ileocecal valve. Enterotomy was applied and the parasite taken out from ileum.

Results: Oral intake was started in third postoperative day. Patient was discharged in sixth postoperative day. There was no problem in first and third month control of the patient.

Conclusion: Our report highlights the importance of considering A. lumbricoides infestation and their atypical manifestations in the differential diagnosis of the abdominal pain in children, especially from endemic areas.

Reference:
1. Rodriguez EF, Gama MA, Ornstein SM, Anderson WD. Ascaris causing small bowel volvulus. Radiographics. 2003;23:1291–3.

Disclosure: No significant relationships.

P246

MASSIVE SPONTANEOUS CHEST WALL HAEMATOMA: A RARE CASE THAT NEEDED URGENT SURGICAL SOLUTION

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Introduction: A rare case of massive, rapidly expanding, spontaneous anterior chest wall hematoma is presented.

Materials and methods: A 74 year old male was admitted to our hospital with a diagnosis of urinary tract infection. During his hospitalization, he developed a spontaneous chest wall haematoma, while on treatment with a low-molecular-weight heparin derivative (fondaparinux) in prophylactic doses. His past medical history was unremarkable for inherited or acquired coagulation disorders and no abnormality was noted regarding his coagulation or platelet function assays. Similarly, no trauma mechanism was reported. Non-invasive imaging studies revealed a large, actively-extravasating haematoma in the right anterior chest wall, yielding a remarkable hematocrit drop without hemodynamic instability. Initial conservative treatment with FFP and PRBC transfusions was decided.

Results: Initial efforts to control the hemorrhage conservatively failed and decision to proceed to angiography ± embolization was made on an emergency basis. Angiography revealed active extravasation from a minor arterial branch of the right subclavian artery and selective embolism was attempted. Nevertheless, the hematoma was still expanding, leading to increased transfusion requirements. On these grounds, a decision for urgent surgical intervention was made. The patient underwent haematoma evacuation, identification of the bleeding vessel and surgical control of the bleeding. The post-operative course was uneventful and the patient was discharged on the 10th post-operative day.

Conclusion: Spontaneous anterior chest wall haematomas are extremelly rare and pertinent literature is scarce. This case underlines the fact that despite the increasing role of minimal invasive techniques, open surgery still remains a definitive and efficient solution.

Reference:
1. Rozhl Chir. 2013;92(2):95–7.

Disclosure: No significant relationships.

P247

DOUBLE STRANGULATION ILEUS IN A MONONEPHROUS TRANSPLANT PATIENT WITH ARTIFICIAL URINARY SPHINCTER

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Introduction: Although small bowel strangulation may happen in adhesive ileus, double strangulation in two separated areas, is extremely rare. We report the clinical presentation and imaging findings of this rare condition in a mononephrous transplant patient with artificial urinary sphincter.

Materials and methods: We describe the case of a 34-year-old woman admitted at our Emergency Department for severe epigastric pain and vomiting, with past history of several laparotomies concerning sequential nephrectomies due to septic pyelonephritis, partial cystectomy, placement of artificial urinary sphincter, recurrent adhesive ileus with intestinal resections and renal transplantation. Physical examination, laboratory tests, abdominal US and X-rays were not contributing. Analgesic drugs had no effect, so we decided to perform an abdominal CT-scan that revealed intestinal obstruction involving the jejunum and an exploratory laparotomy was performed.

Results: During laparotomy, an encasement of a jejunal loop by the great omentum caused by abnormal adhesion, and an encasement of terminal ileus between adhesions in the area of the graft, were found. The patient underwent resection of the strangulated loops with laterolateral intestino-intestinal anastomoses. The postoperative course was uneventful and the patient was discharged 9 days postoperatively.

Conclusion: Double strangulation ileus due to adhesions is rare and preoperative diagnosis based on clinical and radiological findings is very challenging. Management of this entity is performed through laparotomy, and is technical demanding in complex cases such as that we encountered.

Reference:

1. Kimura H, et al. Strangulation ileus resulting from encasement of a loop of the small intestine by the great omentum, caused by abnormal adhesion. J Gastroenterol. 1996;31(5):714–6.

Disclosure: No significant relationships.

P248

EXTENSIVE PNEUMATOSIS INTESTINALIS PRESENTING AS A SMALL BOWEL OBSTRUCTION WITH MESENTERIC TORSION: A CASE REPORT

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Introduction: Pneumatosis intestinalis (PI) is defined as the radiographic finding of gas within the bowel wall and is a rare condition associated with a wide variety of underlying diseases. We present a case of extensive PI presenting as a small bowel obstruction with mesenteric torsion.

Materials and methods: A 71-year-old male who complained of abdominal pain and distension for 2 days was referred to our hospital. The patient had been treated for emphysema for several years and there was a history of symptomless pneumoperitoneum which was not a surgical indication 7 years ago. Plain radiography revealed the presence of multi-septated pneumoperitoneum in the right subphrenic area. Abdominal CT showed pneumoperitoneum and intramural air in small bowel with mesenteric torsion.

Results: Laparotomy showed twisted small bowel loops and a stacked small bowel segment with large air bubbles into the right subphrenic space. The twisted and stacked small bowel loops were reduced and divided. After reduction, we confirmed the extensive and bulky PI extending from the proximal ileum to the terminal ileum, and a total of 100 cm of small bowel was resected. The post-operative recovery was uneventful, and the patients was discharged 2 weeks after admission.

Conclusion: Although PI can be managed conservatively in some cases, surgery should be performed in patients with PI presenting with evidence of bowel obstruction or mesenteric torsion.

Reference:

1. Khalil PN, Huber-Wagner S, Ladurner R, Kleespies A, Siebeck M, Mutschler W, et al. Natural history, clinical pattern, and surgical considerations of pneumatosis intestinalis. Eur J Med Res. 2009;14:231–9.

Disclosure: No significant relationships.

P249

FOLEY CATHETER ENTEROSTOMY: AN ALTERNATIVE TO A "FLOATING STOMA" IN DAMAGE CONTROL SURGERY

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Introduction: Stoma formation can be a difficult challenge in traumatic and non traumatic damage control surgery due to the presence of edematous bowel, thick foreshortened mesentery, a noncompliant abdominal wall and sometimes dense postoperative adhesions that preclude safe separation of adherent bowel loops. Performing a "floating stoma" or a "resect, leave unanastomosed and come back later" are two alternatives when conventional stoma formation is not feasible or when it may be potentially avoidable depending on first stage findings.

Materials and methods: Case-report where a 48-year-old woman underwent a lateral ileostomy reconstruction after previous rectal cancer surgery. Anastomotic leakage occured in the context of a distal-to-the-anastomosis obstruction caused by adhesion. The anastomosis was resected and an ileocecal anastomosis was performed. Later she developed respiratory-distress, shock and Abdominal-compartment-syndrome. A "double sandwich" dressing laparostomy was performed. After initial improvement, the patient's condition got worse and 4 days after there was an anastomotic leakage. After anastomotic takedown neither a terminal ileostomy nor a floating stoma weren't feasible due to excessive tension. A purse string secured Foley-catheter was placed in terminal ileum emerging at the lowest part of the open laparostomy.

Results: Five days later, after third-space depletion and global improvement a terminal ileostomy could be performed an the abdomen was closed with a Proceed® mesh. There was no intestinal contamination surrounding the catheter-bowel junction.

Conclusion: Foley-catheter-enterostomy is an option to be included in our armamentarium when an enterostomy is indicated but not feasible in damage control surgery.

References:

1. J Trauma. 2002;53:386–8.
2. World J Surg. 2010;34:2752–4.

Disclosure: No significant relationships.

P250

ACUTE PANCREATITIS MANAGEMENT OF PATIENTS WITH CHRONIC RENAL FAILURE: OUR EXPERIENCE

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Introduction: It has been suggested that the incidence of acute pancreatitis in patients with end stage renal failure is quite high. We tried to determine if patients with end-stage renal disease on peritoneal dialysis have a higher risk of developing acute pancreatitis than patients on hemodialysis. We used retrospective study.

Materials and methods: In 300 patients on haemodialysis, 6 patient developed an attack of acute pancreatitis. Patients on haemodialysis did not show an increased risk for acute pancreatitis compared with the general population.

Results: In 187 patients on peritoneal dialysis, 9 patients had attacks of acute pancreatitis. Patients on peritoneal dialysis had a significantly and highly increased risk for acute pancreatitis. There was no observed difference in length of hospital stay and ICU stay. All cases of acute pancreatitis were mild. There were no complications or deaths related to acute pancreatitis.

Conclusion: Peritoneal dialysis is a risk factor for acute pancreatitis. There is no statistical difference in acute pancreatitis-related mortality and morbidity between haemodialysis and peritoneal dialysis. The risk of acute pancreatitis in patients on long term peritoneal dialysis is

significantly and highly increased compared with the general population. Causal mechanisms is not very clear established yet.
Reference:
1. Dialysis, pancreatitis, renal failure.
Disclosure: No significant relationships.

P251

OUR EXPERIENCE IN TREATMENT OF FIREARM AND EXPLOSIVE INJURIES DURING THE POSTWAR PERIOD IN KOSOVO

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Introduction: Aim: The aim of this study is to present our experience in treatment of firearms and explosive injuries in postwar period June 1999–June 2009 in Kosovo.
Materials and methods: A retrospective descriptive study based on data collected from the operative protocols of Emergency Centre which have been treated surgically during the analyzed period. Were analyzed incidence, age, type of injuries and treatment.
Results: A total of 261 patients, (Male = 233 or 89.2 %, Female = 28 or 10.8 %), were included. The average age was 30–40 years, the mean age 38 years. Regarding the injured anatomic regions, abdominal injuries accounted 87 (33.3 %), thoracic 15 (5.7 %) and thoraco-abdominal injuries 31 (11.8 %) cases, whereas 128 (49 %) patients had multisystem organ injuries. The significant decrease in number was evidenced every consecutive year. All cases were treated by combined teams of specialists of surgery, according to the priority and anatomic localization of the lesion.
Conclusion: Our experience showed that firearm injuries are complex and mainly causes multisystem and multiorganic serious lesions. Early diagnosis and multidisciplinary team approach is recommended. The incidence of firearm injuries was very high in early postwar years, but the number of these injuries decreased by years.
References:
1. Michael M, et al. BMJ. 1999;319(7207):415–7.
2. Kopjar B, et al. Am J Public Health. 1995;85(8, pt 1):1163–4.
3. Stevanovic R, et al. Labin, Croatia, November 7–9, 1996.
Disclosure: No significant relationships.

P252

PERFORATED MECKEL'S DIVERTICULUM PRESENTING WITH ABSCESS FORMATION IN FEMORAL REGION: A CLUE IN DETERMINING CONTENT OF FEMORAL HERNIA

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Introduction: Meckel's diverticulum in femoral hernia sac is a very rare clinical presentation and to determine the presence of a complicated Meckel's diverticulum in femoral canal is a challenging situation (1).
Materials and methods: The patient was discussed as a case report with the presence of a diagnostic workup and recent literature.
Results: A 51-year-old male patient presented to the emergency department with a 36 h history of a right inguinal tender mass and high fever (39.5°). The mass was 6 cm in diameter with a reddish-yellow color, which was considered as a nearly spontaneous draining abscess. Ultrasonography revealed an infectious material and solid areas containing cavity in femoral region with a thickened bowel wall at the base. The patient was taken to the operation room with a preoperative diagnosis ''strangulated right femoral hernia''. In the exploration, the sac was opened cautiously and then pus and ileal content were drained. A 3 cm fragment of inflamed bowel was freed and extracted. This piece of bowel was defined as a tip of Meckel's diverticulum and incarcerated small bowel with remaining piece of Meckel's diverticulum was detected. Resection and end to end two layer hand sewn anastomosis was performed. No complications and complaints were observed at 1 year follow-up.
Conclusion: In patients with abscess formation in femoral region with a strangulated hernia, perforated Meckel's diverticulum should be taken in consideration as an extreme diagnosis.
Reference:
1. Mifsud M, Ellul E. Meckel's diverticulum in a strangulated femoral hernia. Case report and review of literature. Ann Ital Chir. 2011;82:305–7.
Disclosure: No significant relationships.

P253

CAUSES OF MORTALITY IN ELDERLY THAT HAD BOWEL RESECTION IN EMERGENCY SERVICE IN TURKEY

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Introduction: Our aim was to evaluate and analyse the factors associated with mortality in elder patients who went through bowel resection in emergency service in Turkey.
Materials and methods: Data of patients who went through bowel resection in emergency service over age of 60 between March 2010–November 2013 were collected retrospectively. Patients were evaluated according to age, sex, etiology, comorbidity, ASA score, type of procedure, hospital stay and mortality.
Results: In this period 57 patients (37 male, 52.6 %) over age 60 went through bowel resection. Mean age was 75(61–98). Etiological factors were 26(45.6 %) malignancy, 10(17.5 %) volvulus, 9(15.8 %) mesenteric ischemia, 4(7 %) incarcerated hernias, 4(7 %) brid ileus, 2(3.5 %) diverticulitis and 2(3.5 %) perforated appendicitis. 34 patients had comorbidities and among them 14 had more than one comorbidity. ASA score of 27(47.4 %) patient was 4 and 22(38.6 %) was 3. Preoperative perforation was detected in 28.8 % of patients. 51(87.5 %) patient required intensive care unit treatment. Mean stay in ICU was 8.8(1–79) days and mean hospital stay was 13.4(1–79) days. Mortality occured in 21(35.7 %) patient. Advanced age, presence of perforation, malignity and mesenteric ischemia as etiological factors, high ASA score, having more than one comorbidity were found significantly associated with mortality ($p < 0.05$).
Conclusion: Mortality risk factors in elder patients who had bowel resection in emergency service are well known. However, in Turkey, mortality factors associated with emergency bowel resection differs

from other European countries for etiological factors. In European countries diverticulitis and inflammatory bowel diseases are highly associated with mortality, where as in Turkey mortality is associated with malignancy and mesenteric ischemia.

Reference:

1. Bowel resection.

Disclosure: No significant relationships.

P254

EFFECT OF ANTIVENOM ADMINISTRATION AND INCISING REMOVAL OF VENOM ON JAPANESE MAMUSHI (PIT VIPER) BITE

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Introduction: In Japanese mainland, the most popular poisonous snake is called as mamushi. Antivenom and surgical treatment of bite area are recommended to treat mamushi bite in Japan. The aim of this study is to evaluate the effects of the antivenom administration and incising removal of venom on the clinical grade and the length of hospital stay in the patients with mamushi bite.

Materials and methods: Forty-eight patients with mamushi bite were treated in our hospital between August 2001 and September 2013. The antivenom was administered to 21 and incising removal of venom was performed in 39 of 48 patients. The grade progression score was defined the value obtained by subtracting the grade at first visiting emergency room from the highest one during hospital course.

Results: There was no death. The antivenom administration and inscising removal of venom did not affect the length of hospital stay as well as clinical grade and grade progression score in the patient with mamushi bite. However, incising removal of venom reduced the rate of blister formation in bite area from 0.44 to 0.1 significantly ($P = 0.047$). Otherwise, allergic reaction of delayed or immediate types were presented in 20 % patients treated with antivenom.

Conclusion: The antivenom administration and incising removal of venom did not influence on hospital stay and clinical grade, except blister formation. Then, It may be necessary to revise Japanese manual by prospective study, because unnecessary use of antivenom should be discouraged.

Reference:

1. Walker JP, Morrison RL, Current management of copperhead snakebite. J Am Coll Surg. 2011;212(4):470–4.

Disclosure: No significant relationships.

SOFT TISSUE AND RESEARCH

P255

CAN IMMEDIATE INTRAMEDULLARY NAILING COMBINED WITH NEGATIVE PRESSURE WOUND THERAPY (NPWT) BE MORE EFFECTIVE THAN DAMAGE CONTROL ORTHOPAEDICS USING EXTERNAL FIXATION FOR THE PATIENT WITH SEVERE OPEN LONG BONE FRACTURE?: A CASE REPORT

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Introduction: For the treatment of severe open fracture, external fixation (EF) itself could be problematic when the traumatized area is large and wide spanned-pins are not stable enough for preserving the soft tissue. NPWT is known to decrease the infection rate and simplify the complicated dressing change. Here we present two severe open fracture cases successfully treated by immediate nailing combined with NPWT.

Materials and methods: Case 1: 81 year-old female was run over by a car. Diagnose: severe open tibia shaft fracture. Operation: debridement, immediate nailing. NPWT: on entire damaged surface. On day 12, split-thickness skin graft was applied. Whole skin was epithelized and she was discharged on day 50 with canes.

Results: Case 2: 18 year-old female was run over by a track. Diagnose: severe open femur shaft fracture. Operation: debridement, immediate nailing. NPWT: on entire degloved skin. Her wound and fracture healed without any complications and she was discharged on day 54.

Conclusion: In our facility, severe open fractures including Gustilo IIIB open fractures have been treated by 2 staged management using EF. In this study, 2 cases with severe degloved open fractures had no appropriate areas for very stable EF pin insertion and we chose immediate nailing with NPWT. This resulted in very simple and clean wound management for the growth of granulation tissue to cover the fracture site and clinical course was smooth without any complications.

References:

1. Makridis KG, Tosounidis T, Giannoudis PV. Open Orthop J. 2013.
2. Blum ML, Esser M, Richardson M, Paul E, Rosenfeldt FL. J Orthop Trauma. 2012.

Disclosure: No significant relationships.

P256

COST EFFECTIVE NEGATIVE PRESSURE DRESSING ON WOUND HEALING

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Introduction: VAC has reformed the wound management in the last decade. The commercially available V.A.C system dressing which falls expensive for patient in developing and recession hit countries.[3]

Materials and methods: 50 patients were studied: 25 wounds were treated with NPWT and remaining 25 were treated with conventional dressing. Inclusion criteria: · post traumatic wounds exclusion criteria · Presence of Necrotic tissue · Directly exposed structures e.g. blood vessels, organs and nerves · osteomyelitis Materials · local open pore foam · cellophane · suction catheter · suction apparatus. After surgical debridement, autoclaved foam was cut in shape of wound. Suction tubing is placed in between 2 layers of foam. Cellophane is used to cover the foam and adhesive tape is applied to make system air tight and then attached to suction. The pressure is set to 125 mmHg and applied for 48 hours[1,2].

Results: In developing countries where the cost of dressing is a major concern, the locally constructed negative pressure dressings is an option[15]. The cost of VAC dressing set ranges 30–50 euros whereas locally constructed one cost ranges 70–90 cents. Wounds treated with NPWT dressing had early granulation tissue and decreased hospital stay.

Conclusion: · Cost effective Faster healing of wound · Decreased hospital stay · Early mobilisation and reduction in morbidity[4,5,6].
References:
1. Argenta, Morykwas: Vacuum-assisted closure: method for wound control and treatment. Ann Plast Surg. 1997.
2. NPWT with off shelf components Trung Bui AJS. 2006;192:232–235.
Disclosure: No significant relationships.

P257

COMPUTER SIMULATION FOR ABDOMINAL SEAT BELT INJURY

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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, the form of the seat belt was not revised too much.
Materials and methods: In order to clarify the effects of both the reclining angle of an occupant seat and slipping between hip and the seat with cushion under the hip on the occupant dynamics in frontal collision, computer simulations were carried out using multi-body models of whole-body of a human, and a vehicle interior including 3-point belt, air bag and the seat. We analyzed difference of body size, difference of seat angle and friction coefficient.
Results: Computer simulation showed that seat belt portion moves to slightly upper position in reclining or slipping seat pattern compared with non reclining and non slipping seat pattern and position moves to more upper position in reclining and slipping seat pattern (normal body size). Computer simulation showed that risk of seat belt injury rise so the angle of seat belt becomes high, and risk of seat belt injury rise too so the friction coefficient become low. In addition, small body size was high risk factor of seat belt injury.
Conclusion: We showed that seatbelt injury occurs with "submarine" in the cases of lower friction seat, reclining seat and small body size that are important factor for seat belt restriction.
Reference:
1. Delotte J, Behr M, Baque P, Bourgeon A, de Peretti F, Brunet C. Modeling the pregnant woman in driving position. Surg Radiol Anat. 2006;28(4):359–63.
Disclosure: No significant relationships.

P258

INDICATION AND LIMITATION OF FREE BONE GRAFTS FOR GIANT BONE DEFECTS

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Introduction: The objective of this research was to assess the indication and the limitation of the free bone grafts for the bone defects.
Materials and methods: We retrospectively reviewed 56 patients who underwent the free bone grafts. The free bone grafts were underwent for 26 fractures, 5 osteomyelitis and 25 nonunions. The kinds of the free bone grafts were 41 autografts, 9 allografts and 6 combined allograft-autograft. We evaluated incorporation rate, the comparison of the factors (age, open or closed fracture, bone defect type: partial or segmental defect) between union and nonunion, the comparison of the defective length between union and nonunion, the comparison of the defective length between partial and segmental defects and the cut-off point of the defective length due to ROC curve for bone incorporation.
Results: The incorporation rate was 86 %. All factors between union and nonunion were not different significantly. The average of the defective length was 2.6 cm for union and 4.5 cm for nonunion, and which were not significant difference. The average of the partial defective length was 3.3 cm for union and 2.6 cm for nonunion, and which were not significant difference. While the average of the segmental defective length was 2.5 cm for union and 8.2 cm for nonunion, and which were significant difference. The cut-off point of the defective length for bone incorporation was 6.5 cm.
Conclusion: This study provides the free bone graft might be underwent for the partial defect with the length less than 6.5 cm.
Reference:
1. Gruber HE, et al. J Orthop Trauma. 2013;27(5).
Disclosure: No significant relationships.

P259

THE USE OF S53P4 BIOACTIVE GLASS WITH OPEN REDUCTION AND INTERNAL FIXATION FOR INTRA-ARTICULAR FRACTURES OF THE CALCANEUS

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Introduction: We evaluated a consecutive series of patients who underwent open reduction and internal fixation of intra-articular calcaneal fractures with S53P4 bioactive glass (BG) as a bone graft substitute.
Materials and methods: Between January 2010–January 2012, 18 calcaneal fractures were surgically treated in our institution. Plain radiographs and computed tomography (CT) were obtained pre- and postoperatively. There were 9 type II, 6 type III and 3 type IV fractures (Sanders classification). We performed open reduction and internal fixation through a lateral approach. The bone defect beneath the posterior facet was filled with BG and bone chips (allograft). Patients were allowed to bear weight at 9 weeks postoperatively, and were followed for 18 months (9–29). For clinical outcome assessment we used the Rowe score.
Results: There were 3 early post-operative complications: 2 cases of wound dehiscence and 1 case of superficial necrosis. At the last follow-up, the Rowe score was excellent in 6 (33.33 %) patients, good in 9 (50 %) and satisfactory in 3 (16.66 %). At 6 and 12 months postoperatively, CT follow-up showed good bone integration in 16 cases, with no signs of loss of reduction. In 2 cases CT showed osseous resorption, but no signs of non-union.
Conclusion: We obtained good preliminary results with BG as bone graft substitute combined with bone allografts in open reduction and internal fixation of displaced intra-articular fractures of the calcaneus.
Reference:
1. Yang Y, Zhao H, Zhou J, Yu G. Treatment of displaced intraarticular calcaneal fractures with or without bone grafts: a systematic review of the literature. Indian J Orthop. 2012;46:130–7.
Disclosure: No significant relationships.

P260

PERIPROSTHETIC FRACTURES: A MECHANICAL ANALYSIS OF THE MAIN FIXATION COMPONENTS

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Introduction: For a reliable periprosthetic fracture fixation, the mechanical behaviour of each fixation component should be systematically investigated.
Materials and methods: Locking compression plates were fixed to diaphyseal fresh frozen human femur with either a single 1.7 mm cerclage cable, a 5.0 mm monocortical or a bicortical locking screw ($n = 5$ per group). A load-to-failure test was performed in lateral, torsional and axial direction. To visualize the stress distribution around the screw holes, a finite element modelling was performed.
Results: Stiffness and ultimate strength in axial compression and torsion was significantly higher for both screw fixations compared to cerclages (all $p < 0.01$). Ultimate strength in lateral loading and torsion was significantly higher for bicortical screws (mean 3,968 N $\pm$ 657; mean 28.8 Nm $\pm$ 5.9) compared to monocortical screws (mean 2,748 N $\pm$ 585; mean 14.4 Nm $\pm$ 5.7 Nm) and cerclages (mean 3001 N $\pm$ 252; mean 3.2 Nm $\pm$ 2.0) ($p \leq 0.04$). Bicortical screws showed favourable stress distribution especially in torsion and lateral loading. Stress distribution varied according to the screw type and load direction.
Conclusion: Due to their different mechanical behaviour, fixation components should be combined to achieve an optimal periprosthetic fracture fixation.
Reference:
1. Lenz M, Perren SM, Gueorguiev B, Höntzsch D, Windolf M. Mechanical behavior of fixation components for periprosthetic fracture surgery. Clin Biomech (Bristol, Avon). 2013. pii:S0268-0033(13)00211-8.
Disclosure: No significant relationships.

P261

MECHANICAL TORQUE MEASUREMENT TO ASSESS THE BONE STRENGTH OF THE POSTERIOR PELVIC RING IN HUMAN CADAVERS

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Introduction: The use of iliosacral screws in posterior pelvic ring fixation might be suitable, especially in geriatric patients when surgical access morbidity is of concern. However, the diminished screw purchase of iliosacral screws as a monocortical screw device in cancellous, osteoporotic bone does not meet the potential incompliance of geriatric patients.
Materials and methods: Bone strength was measured at the iliosacral joint, the sacral lateral mass and the center of the S1 at a superior and an inferior site under fluoroscopic control on five human cadaver specimens (3 female; mean age 87 years, range: 76 to 99) using the DensiProbe^{TM} Spine.
Results: The measured median (range) breakaway torque was 0.63 Nm (0.31–2.52 Nm) at the "iliosacral joint", 0.14 Nm (0.05–1.22 Nm) at the "sacral lateral mass", 0.57 Nm (0.05–1.42 Nm) at the "S1 center". The "sacral lateral mass" breakaway torque was lower than compared to that at the "iliosacral joint" ($p < 0.001$) or "S1 center" ($p < 0.001$). The breakaway torque was higher at the "iliosacral joint (inferior)" and the "S1 center (inferior)" only compared to that seen at the "sacral lateral mass (inferior)" ($p < 0.05$) but not compared to that at the "sacral lateral mass (superior)" ($p > 0.05$).
Conclusion: The highest bone strength is located at the center of S1, the iliosacral joint or the superior sacral lateral mass. Screws should be placed as superior as safely possible, should bridge the iliosacral joint and should allow for cement application at the sacral lateral mass through perforations.
Reference:
1. Deckelmann S, et al. Spine (Phila Pa 1976). 2010;35(6):607–12.
Disclosure: No significant relationships.

P262

HEMOSTATIC EFFICACY OF A NOVEL, PEG-COATED COLLAGEN PATCH (HEMOPATCH^{TM}) IN A HEPARINIZED PORCINE PULMONARY SEGMENTECTOMY MODEL

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Introduction: A pulmonary segmentectomy is performed to remove areas of lung disease with average perioperative blood loss of 715 $\pm$ 454 mL without complications and 988 $\pm$ 528 mL with complications [1]. The use of a sealing hemostat may reduce blood loss in this procedure. The hemostatic efficacy of a sealing hemostat (HEMOPATCH^{TM}) to treat a pulmonary segmentectomy in a heparinized porcine surgical model was investigated.
Materials and methods: Cross-sectional resections of the pulmonary parenchyma were performed in 18 domestic swine, 36 lesions in total. Blood loss was determined prior to treatment and 3, 5, 8, and 10 min after application using pre-weighed gauze. No staplers or other adjunctive treatments were used for sealing or hemostasis.
Results: The treated mean cross-sectional area was 5.4 cm^2 (range 1.4–18.3, SD 3.3), which created severe arterial bleeds with a median blood loss of 15.9 mL/min (range 5.3–42.5, SD 8.6). At the time of treatment, median direct systolic blood pressure was 97 mmHg (range 78–117, SD 9) and median airway pressure was 19 mmH_2O (range 15–23, SD 2). The sealing hemostat achieved a median rate of blood loss of 0.0 mL/min without hematoma formation at 3 (range 0.0–2.8, SD 0.47), 5 (range 0.0–0.8, SD 0.19), 8 (range 0.0–0.5, SD 0.13) and 10 (range 0.0–0.7, SD 0.17) min after application. Pneumostasis was observed in all applications.
Conclusion: A new sealing hemostat (HEMOPATCH^{TM}) is safe and effective in providing hemostasis of severe arterial bleeding and to seal tissue parenchyma in a heparinized porcine pulmonary segmentectomy model.
Reference:
1. Stéphan F, Boucheseiche S, Hollande J, et al. Pulmonary complications following lung resection: a comprehensive analysis of incidence and possible risk factors. Chest. 2000;118(5):1263–70.

Disclosure: Drs. Lewis and Baumgartner are employees of Baxter Healthcare Corporation. Drs. Muchitsch, Regenbogen and Goppelt are employees of Baxter Innovations GmbH. These relationships did not did not influence the study design, results, or conclusions.

P263

THE PREDICTIVE VALUE OF ARTERIAL LACTATE FOR EARLY MASSIVE TRANSFUSION IN TRAUMA PATIENTS

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Introduction: Transfusion is key treatment of hemorrhage with bleeding control and it is important to determine appropriate transfusion. We tried to identify the value of metabolic markers as a predictor for EMT.
Materials and methods: Between January 2008 and June 2010, patients who visited to emergency department arrived at ED from scene within 12 h, received at least 1 unit of RBC within 24 h after admission were reviewed retrospectively. Enrolled patients were divided into EMT group and non-EMT group.
Results: Total of 71 patients were enrolled. 54 patients were male, Comparing EMT group($n = 15$) and non-EMT group($n = 56$), EMT group received 17.7 ± 13.1 units of RBC transfusion and 2.8 ± 2.3 units in non-EMT group. There were significant differenced in injury severity score ($P = 0.001$), systolic blood pressure ($P = 0.010$), BD ($P = 0.003$), lactate ($P = 0.001$) and no significant differences in heart rate, pH, hemoglobin. On the logistic regression analysis, SBP < 90 mmHg group (odd ratio 11.705, $P = 0.009$), ISS ≥ 25 group (OR 23.390, $P = 0.015$), lactate ≥ 3.5 mmol/L (OR 6.986, $P = 0.039$) were identified as a predictive indicators for EMT. Area under curve of lactate was 0.790 and showed sensitivity of 76.7, 67.8 % of specificity at a lactate of -3.5 mmol/L. In lactate $\geq$3.5 mmol/L group, 30 day mortality was significantly increased ($P = 0.002$),
Conclusion: Lactate is important predictor of EMT and should be considered on initial phase of trauma resuscitation to predict and prepare for massive hemorrhage and massive transfusion.
References:
1. Cocchi MN, Kimlin E, Walsh M, Donnino MW. Emerg Med Clin North Am. 2007;25(3):623–42, vii.
2. Kauvar DS, Lefering R, Wade CE. J Trauma. 2006;60(6 Suppl):S3–11.
Disclosure: No significant relationships.

PEDIATRIC TRAUMA AND EMERGENCIES

P264

"THE WHEEL OF FORTUNE": CASE REPORT OF PEDIATRIC TRAUMA

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Introduction: Trauma is the leading cause of death in pediatric age. The child, when compared with adults, have anatomical, physiological, cognitive and psychological characteristics that influence the presentation, the approach and the treatment of traumatic injuries. However, in trauma, the threat to life is across all ages.
Materials and methods: The authors present the case of a 7-year-old girl, admitted to paediatric emergency, victim of trampling (tractor wheel), to whom it was requested the collaboration of General Surgery due to a scalp wound. The surgeon has evaluated the child, who was restless, asking to sit and showing apparent respiratory distress. Through the tracheal opening in the neck collar, a marked deviation from the trachea to the left was shown, which associated with the abolition of breath sounds on the right, suggested the diagnosis of tension pneumothorax. After thoracic decompression the patient became calm and cooperative. In the primary survey no other life threatening injuries were identified. The imaging tests revealed significant associated injuries. The child was transferred to the pediatric hospital, where conservative treatment of all injuries was done.
Results: The authors discuss the characteristics of child's that have conditioned the presentation of this case. Despite the differences, it is mandatory to assess trauma victims sequentially, identifying and treating life threatening injuries by priority.
Conclusion: The approval in credible and certified trauma courses must be required to all professionals managing trauma victims.
References:
1. Sharma M, et al. Pediatric thoracic trauma. Medscape, 2013.
2. Alterman, D. et al. Considerations in Pediatric Trauma. Medscape, 2013.
Disclosure: No significant relationships.

P265

RENTGENOLOGICAL PROGNOSTIC CRITERIA FOR TRAUMATIC BRAIN INJURY OUTCOMES IN CHILDREN

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Introduction: Literature data indicate that the character of brain damage revealed by CT and MRI has a prognostic value for severe TBI.
Materials and methods: 195 patients with severe TBI had CT. 14 % had 3–4 GCS; 38 %—5–6 GCS, 48 % had 7–8. Intracranial impairments were classified by the Marshall CT scale. Degree 1–4 %; degree 2–46 %,degree 3–27 %; degree 4–4 %. Nonevacuated mass-effect—15 %; evacuated mass-effect—4 %. The part of patients (131) had MRI. The Fishing scale was used to evaluate the severity of stem damage. No damage was revealed in 39 %; monolateral damage of the middle brain—in 42 %; bilateral—in 14 %; more caudally damages—5 %. Favourable outcomes—42 %; unfavourable—58 % (24 %—lethal).
Results: In patients with Marshall CT1-2 favourable outcomes were in 68.5 %; lethal outcomes—9 %. An average score by the Rotterdam prognostic CT scale was 1.9 ± 0.6. With Marshall CT 3–4 the mortality rate—43 %; favourable outcomes—14 %. The average score by the Rotterdam prognostic CT scale—4 ± 0.8. Favourable outcomes in patients with evacuated mass-effect were—46 %; death outcome—9 %. An average score by the Rotterdam prognostic scale—3 ± 1.1. In patients with nonevacuated mass-effect favourable

outcomes were seen in 24 %; death outcome—in 45 %. An average score by the Rotterdam prognostic CT scale was 3.7 ± 1.1.
Conclusion: The probability of death outcome is directly proportional to scores of the CT scale (Rotterdam and Marshall).
Reference:
1. Maas AIR, Hukkenlhoven CWPM, Marshall LF, Steyerberg EW.
Disclosure: No significant relationships.

P266

ICP AND MEAN SQUARE DEVIATION OF ICP IN PROGNOSIS OF OUTCOMES IN SEVERE TBI OF CHILDREN

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Introduction: Nowadays there are a number of recommendations and standards for the treatment of severe TBI are based on principles of the based-evidence medicine. It refers to indications for using invasive and non-invasive methods of diagnostic and monitoring as well as surgical approaches. Recommendations for optimal range of treatment in children are not specified. The aim was to evaluate importance of ICP-monitoring in prognosis for outcomes of severe TBI.
Materials and methods: The study included 129 patients with severe TBI (2005 to 2012). GCS was 6 ± 1.5. The total mortality was 27.9 %.
Results: Firstly, we constructed a classification matrix where as a predictor values of ICP was used, and as a grouping variable GOS was considered. Hypothesis: If the other things being equal where the average value of ICP statistically doesn't differ, predicatively the mean square deviation of ICP characterizing dynamics of process can be a significant factor. Accordingly the aim, we entered one more indicator—variability of process which consists of the sum of a square of average value of ICP and a square of dispersion of process, i.e. a mean square deviation. Retrospective discriminative analysis of the ICP data demonstrated significant dependence (72,2 %) of negative influence of the index E^2 ($E^2 = m^2 + \delta^2$; m—mean ICP, δ—dispersion of the daily monitoring).
Conclusion: According to the results a fundamental importance to maintain "physiological corridor" is revealed, wherein ICP-monitoring must be used as the main criteria to the indication for conservative or surgical strategy of medical treatment.
Disclosure: No significant relationships.

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LESS IS MORE- REDUCTION OF INTRAOPERATIVE FLUOROSCOPY TIME TO MINIMIZE RADIATION EXPOSURE IN CHILDREN WITH FOREARM FRACTURES

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Introduction: Operative interventions contribute to the radiation exposure in children and staff [1]. Forearm fractures are the most common fractures in children. Besides the operative results the reduction of radiation exposure is an important criterion.
Materials and methods: Retrospective analysis of the 2011 [Group 1] operated forearm fractures (distal and diaphyseal fractures), Radiation exposure intervention and prospective analysis after 3 and 12 month (Group 2). Radiation exposure intervention: Instruction of the theater personnel and doctors, structured fluoroscopy protocol, preoperative briefing, discussion of radiation data in postoperative conference. Descriptive analysis with SPPS 11.5.
Results: Of the 159 fractures we have treated, 58 distal forearm fractures with K-wire and 101 diaphyseal fractures with intramedullary nailing. Median age for distal fractures 11.2 years, 66.7 % boys and 63.3 % left arms. 80 % operated by residents with a mean fluoroscopy time of 21.8 s. 26.5 s before and 14.9 s after intervention. Median age for diaphyseal fractures 9.3 years, 68.3 % boys, 53.8 % left arms. 63.5 % operated by residents with a mean fluoroscopy time of 47.3 s. 55S before and 40.5 s after intervention. Logistic regression shows an independent influence of the intervention and operation time on fluoroscopy time in diaphyseal fractures.
Conclusion: The fluoroscopy times reflect different complexity of operation. 3 and 12 month after the intervention we find a significant reduction in fluoroscopy time. Repeated radiation exposure interventions in all disciplines using intraoperative fluoroscopy will minimize radiation exposure for patients and staff.
Reference:
1. Bar-On, et al. Intraoperative C-arm radiation affecting factors and reduction by an intervention program. J Pediatr Orthop. 2010;30(4):320–3.
Disclosure: No significant relationships.

P268

DETERMINATION OF CHILD ABUSE: WHAT IS NURSING ROLE?

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Introduction: Emergency Units are the most important place for determination of forensic cases and observation of the child abuse. In recent years, a significant increase of admission to emergency rooms was observed in cases of child abuse and neglect. According to WHO: child abuse includes all forms of physical and/or emotional ill-treatment, sexual abuse, neglect and negligent treatment and exploitation. The emergency unit team have a great importance to fulfilling social and legal responsibilities for the detection and elimination of physical and psychological trauma signs of child abuse cases, as well as emergency medical treatment and care.
Materials and methods: The WHO estimates that approximately 31,000 children <15 years of age died due to homicide worldwide in 2002. And according to WHO the incidence of child abuse in the world 40/1,000.
Results: As a result; Child abuse is a common phenomenon in many countries, with a considerable variation in prevalence across countries and regions. Every abuse case is a forensic and criminal case. For this reason; Nurses working in emergency departments must receive training on forensic nursing and must know the laws and regulations about how abused child must be secured. This is the advocacy and social responsibility role of the nurse.

Conclusion: There is a need for an interdisciplinary approach towards the collection of evidence. The key ring of this team is the nurse.
Reference:
1. World Health Organization. Preventing Child Maltreatment—A Guide to Taking Action and Generating Evidence. Geneva: WHO Press; 2006;
Disclosure: No significant relationships.

P269

GO-KART INJURIES IN CHILDREN: TALAR FRACTURES

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Introduction: Go-karting is a high-speed sport in the relatively unsafe environment of a go-kart. Different types of injuries were described following go-karting accidents, including pancreatic and neck injuries.[1] Another group of injuries are severe foot and leg injuries.
Materials and methods: We describe four cases of children with six talar fractures following a go-karting trauma.
Results: One girl and three boys aged 9 to 14 presented with 6 talar fractures following a frontal go-karting accident. Radiography showed four Hawkins type I and two type III fractures. Other injuries included a trimalleolar fracture, a bimalleolar fracture and five fractures of the medial malleolus of which two were dislocated. The Hawkins type III fractures were bilateral in one patient and treated with open reduction and screw fixation. The other talar fractures were treated by plaster immobilisation followed by weight-bearing after 9 to 12 weeks. The latter all healed with good results.
Conclusion: A talar fracture is the result of a high energetic axial trauma with the foot in dorsal flexion.[2] Non-displaced talar fractures can be treated non-operatively. In displaced talar fractures the risk of complications, e.g. avascular necrosis and long-term artrosis, increases. Therefore operative reconstruction is advised.[3] In conclusion, children in go-karting accidents are at risk of major injuries, including complex foot trauma with potential long-term implications. There should be more attention paid to primary prevention.
References:
1. Eker HH, et al. Open Orthop J. 2010;4:107–10.
2. Byrne AM, Stephens S. BMJ Case Rep. 2012.
3. Smith JT, et al. J Pediatr Orthop. 2010;30(8):779–84.
Disclosure: No significant relationships.

P270

MID-TERM RESULTS OF THE ELASTIC INTRAMEDULLARY NAILING IN THE PAEDIATRIC LONG BONE SHAFT FRACTURES: A PROSPECTIVE STUDY OF 102 CASES

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Introduction: The aim of this study was to evaluate the mid-term results of paediatric patients long bone shaft fractures which were treated with elastic intramedullary nailing.
Materials and methods: 102 patients' 108 long bone shaft fractures were treated with elastic intramedullary nails. The number of nails used, admission time, nail diameter/medullary canal diameter ratio of the non-traumatised extremity, weeks until radiological consolidation, weeks until full-weight bearing for the femur and tibia shaft fractures, weeks until the nails were removed, number of X-rays from the diagnosis time to removal time of nail/s, clinical complications and radiological results were recorded; the union rate, time to union, non-union, delayed union, mal-rotation, malalignment, follow-up time and functional outcomes were also recorded.
Results: The mean follow-up time was 22.2 months. The mean age was 9.6 years. Mean nail removal time was 19.2 weeks. Eighteen patients had complications. The mean number of X-rays from the diagnosis time to removal time of nail/s was 14. All patients showed excellent or satisfactory results according to Flynn's criteria. A nail diameter/medullary canal diameter ratio of over 0.4 showed good results.
Conclusion: According to our experience and opinion, elastic intramedullary nailing is the best choice for diaphyseal fractures in children with skeletal immaturity compared to other surgical choices like osteosynthesis with plate.
Reference:
1. Till H, Huttl B, Knorr P, Dietz HG. Elastic stable intramedullary nailing provides good long-term results in pediatric long-bone fractures. Eur J Pediatr Surg. 2000;10:319–22.
Disclosure: No significant relationships.

P271

PEDIATRIC TRAUMA CARE IN SERBIA: INTERDISCIPLINARY APPROACH IN MULTIPLE INJURED CHILDREN

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Introduction: Treatment of the multiple injured children is challenging tasks in trauma surgery. Pediatric patient response to trauma is different than in adults. Thus treatment approach to multiply injured children should be modified. Organization of trauma care of children significantly differs throughout World and specific countries as is case in Serbia.
Materials and methods: Organization of care of multiple injured children and approach to trauma management of pediatric patients in Serbia has been analyzed using publicly available data and survey.
Results: In the 4 statistical regions under full sovereignty of Serbia, five University children's hospitals provide permanent trauma care on tertiary level, with round-o'clock pediatric surgeon's service. Multiple injured children is treated in Emergency center of Clinical centre in Belgrade as well. In 24 counties, 36 general hospitals provide secondary level of care. In 15 of them there is at least one pediatric surgeon, but permanent service is organized in 6. General and orthopedic surgeons and urologists are present in all general hospitals, but plastic surgeons, vascular maxillofacial neurosurgeons are distributed unevenly.
Conclusion: True multidisciplinary approach to multiply injured children could be obtained at University Centers, which provide permanent service of all (sub) specialties. True multidisciplinary approach is obtained at University centers, which provides permanent

service of all specialties. But, because of significant transportation time, multidisciplinary approach in secondary centers may need improvement.

References:
1. Kay RM, Skaggs DL. Pediatric polytrauma management. J Pediatr Orthop. 2006;26(2):268–77.
2. Schalamon J, v Bismarck S, Schober PH, et al. Multiple trauma in pediatric patients. Pediatr Surg Int. 2003;19:417–23.

Disclosure: No significant relationships.

P272

TREATMENT OF CERVICAL SPINE FRACTURES HALO WEST METHOD IN CHILDREN AND ADOLESCENTS

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Introduction: Halo West method is alternative for surgical treatment of cervical spine fractures. Is successfully used in adults as confirmed by numerous studies, and in children and adolescents is rarely used. There is a poor bibliography in this area. Aim of this study is to present the effectiveness of the application of an external fixator Halo West type in children and to evaluate the frequency of complications of this method.

Materials and methods: A retrospective study includes 6 patients with cervical spine fractures with a mean age 13.3 years (10–17 years) they were treated in 2004–2013 by Halo West application. We evaluated the clinical outcome, nature of fracture, the cause of fracture and complications after surgery.

Results: Median time of observation is 55 months. In five cases, the treatment was achieved satisfactory results (83 %). One patient died due to multi-organ damage bonus. In one case (16.7 %) we observed pin site complication like inflammation.

Conclusion: Halo West is also effective in children and adolescents.

Reference:
1. Tavares JO, Frankovitch KF. Odontoid process fracture in children: delayed diagnosis and successful conservative management with a halo cast. A report of two cases. J Bone Jt Surg Am. 2007;89(1):170–6.

Disclosure: No significant relationships.

P273

FRACTURES OF TIBIAL TUBEROSITY IN ADOLESCENTS

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Introduction: Fractures oft the tibial tuberosity are a rare entity and usually occur in male adolescents before closure of the epiphyseal plate. Mechanism of Trauma is described as a combination of sudden tension of the quadriceps muscle in extended knee position followed by a passive flexion under tension which particularly happens during sports associated with jumps such as soccer or basketball. Ogden classified those injuries according to their severity.

Materials and methods: For illustration we show the case of a 14 year-old boy who suffered from an Ogden IIIb fracture from driving on his kickboard. CT and MRI showed no associated injuries. ORIF with cannulated screws was performed. Our research in pubmed showed 240 cases. Cases were classified according to Ogden and results were compared as possible.

Results: The healing was uneventful with no difference in functionality compared to the contralateral side. In our literature review the majority of patients returns to full activity without influence on bony length-growth. Tuberosity fractures without association of other structures have a slightly better outcome.

Conclusion: Tibial tuberosity fractures are beside their rarity an important form of injury in adolescents. In their maximal form of severity they can present as complex knee injuries. Sufficient diagnostic is necessary to evaluate the severity and recognition of concomitant injuries. A correctly performed osteosynthesis can deliver good results with return to the patient's former activity level.

Reference:
1. Ogden JA, Tross RB, Murphy MJ. Fractures of the tibial tuberosity in adolescents. J Bone Jt Surg Am. 1980;62(2):205–15.

Disclosure: No significant relationships.

P274

USE OF 'CLINICIAN CONCERN' OR MECHANISM FOR TRAUMA TEAM ACTIVATION IN A PAEDIATRIC TRAUMA CENTRE

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Introduction: Many criteria have been used for trauma team activation (TTA) in trauma centres. TTA often occurs based on presenting mechanism of injury. In our paediatric trauma centre, an Emergency Department (ED) 'clinician concern' criterion (CC) was introduced to replace earlier mechanistic criteria that were poorly predictive of severe injury. We aimed to review patients receiving TTA based on CC, and to compare their outcomes with other patients receiving TTA.

Materials and methods: Trauma registry data and patient notes for children receiving TTA between September 2010 and September 2013 were reviewed. Where CC was used in activating TTA, particular attention was paid to notes made at the time hospital notification and TTA occurred.

Results: A total of 379 children received TTA; CC was used in 90 patients (24 %). When compared with other TTA patients, CC was no more likely to be associated with severe vehicular trauma (OR 0.9; 95 % CI 0.6–1.5), weekend presentation (OR 1.2; 95 % CI 0.7–1.9) or after-hours presentation (OR 1.2; 95 % CI 0.8–2.0). CC patients were less likely to require high-level resources in ED (OR 0.2; 95 % CI 0.1–0.4). Thirty-nine of the 90 CC patients were determined to have been activated based solely on mechanism; 33 on suspicion of spinal cord injury and 18 based on other anatomic or physiological compromise. No differences were seen between these subgroups in terms of their need for high-level resources (Chi^2 $p = 0.28$).

Conclusion: ED clinician concern is a common TTA modality in our centre, but appears to be a poor predictor of outcome irrespective of its reason for use.

Disclosure: No significant relationships.

P275

PRE-HOSPITAL CARE FOR CHILDREN: ARE WE PREPARED?

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Introduction: The first quality care for trauma victims is crucial for a better prognosis. According to Ordinance 2048 05/11/2002 MS there is fragmentation, low utilization and inadequate curricula directed to emergencies in traditional training.
Objective: Evaluate options for training in Pre-Hospital Care (PHC) for pediatric health care provider in the Southeast.
Materials and methods: Research was conducted on the website of Societies of Pediatrics, Trauma and Cardiology, and all institutions that offer degree in Medicine certified by the Ministry of Education in the Southeast.
Results: Of the eight universities surveyed, three offer courses in pediatric life support, but do not meet the other criteria. From 75 educational institutions surveyed, seven have the discipline PHC, and of these only one addresses the pediatric care, however, does not cover clinical emergencies. As for the extension courses offered, five include the pediatric emergency, and one of them meets all the criteria of the research, but it is not focused on the medical professional. There were found still: a course of postgraduate and residency in emergency, and first aid courses in four medicine colleges.
Conclusion: The options for training in pediatric PHC for the medical professional are insufficient in the Southeast. Despite the growing appreciation of the PHC among us, more attention should be given to the training of professionals regarding pediatric emergency, in order to offer a more complete service to the population.
Reference:
1. Sociedade Brasileira de Pediatria [homepage na Internet]. Rio de Janeiro. c2010 [acesso em 05 de julho de 2013]. Educação Médica Continuada. Disponível em: http://www.sbp.com.br/show_item.cfm?id_categoria=24&tipo=I.
Disclosure: No significant relationships.

VISCERAL TRAUMA III

P276

EVOLUTION OF TRAUMATIC HEPATIC INJURIES' MANAGEMENT IN POLYTRAUMA PATIENTS

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Introduction: The management of traumatic hepatic injuries has changed essentially due to intensive care achievements and implementation of nonoperative treatment.
Materials and methods: The evaluation of 271 patients with traumatic liver injuries treated in our unit during 10 years was performed. Liver injury was a part of polytrauma in 99.3 %: cranial-173(63.8 %), thoracic-215(79.3 %); locomotor-102(37.6 %). ISS was 38.94 ± 0.94(5–75). Diagnosis was based on relevant clinical data and DPL-96(73.3 %); USG-150(55.4 %); CT-46(16.97 %); laparoscopy-4(27.3 %). Criteria for selection the treatment option were: hemodynamical parameters, grade of injury, USG and CT data.
Results: The patients were divided according to liver injury severity: gr.I-18(6.6 %); gr.II-89(32.8 %); gr.III-111(40.9 %); gr.IV-36(13.3 %); gr.V-17(6.3 %). Surgery was performed in 213(78.6 %). Liver injury was found at autopsy in 13(4.8 %), the cause of death being severe polytrauma. In non-severe injuries we applied conservative treatment (NOM, local hemostatics) and solitary hepatorrhaphy, while in severe injuries—hepatorrhaphy with omental patching, hepatic packing ($p < 0.001$). In 4(1.5 %) cases surgery for gr.V injury consisted of atypical liver resection (2), selective ligation of blood vessels and biliary ducts (2). In 23(8.5 %) patients with active bleeding from gr.III–V injury we used intermittent Pringle maneuver. Postoperative morbidity was noted in 135(49.5 %) patients, mortality rate 29.5 %.
Conclusion: The management of patients with traumatic liver injuries should be individualized in a wide range, the volume of surgery being determined by the injury severity and hemodynamic parameters. The rate of nonoperative treatment increased progressively, the efforts aiming the decrease of morbidity and mortality rates in these patients.
Disclosure: No significant relationships.

P277

THE MANAGEMENT OF BLUNT LIVER TRAUMA

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Introduction: Nonoperative management (NOM) of blunt liver trauma has become well established with a reported success rate of between 80–100 %. Concern has been expressed about the potential overuse of NOM and the fact that failed NOM is associated with a higher mortality rate. The aim of this study was to assess the safety of NOM and to look at factors that might indicate the need for surgical intervention.
Materials and methods: Prospective study of patients with blunt liver injuries (BLI) admitted between 2008 and 2013 to a busy level-1 Trauma Centre. BLI were diagnosed on CT-scan or at laparotomy.
Results: One-hundred and thirty-four patients with BLI were admitted. Thirty-five (26 %) patients required early surgical intervention and NOM was initiated for 99 (74 %) patients. Five (5 %) patients required a delayed laparotomy. The failure of NOM was not related to the grade of the liver injury.
Conclusion: The success rate of NOM for blunt liver trauma was 95 %.
References:
1. Arch Surg. 2003;138(5):475–80.
2. Arch Surg. 2006;141(5):451–8.
Disclosure: No significant relationships.

P278

TREATMENT OF LIVER INJURY

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Introduction: In the recent years, the treatment of liver trauma has evolved distinctly. Developments in the field of imaging have created new opportunities for a dynamic follow-up and much more efficiency of these injuries.
Materials and methods: We have analyzed 173 patients with hepatic trauma who were admitted to our hospital. Injuries were confirmed by ultrasonography, computed tomography, and surgical intervention.
Results: The main causes of liver injuries were: 52 % from motor vehicle crashes, 17.3 % firearms, 15.7 % falls from large heights, 12.6 % sharp tools, and 0.8 % electric arcs. The frequency of injuries, according to Moore's Classification, was: 20.8 % Grade I, 34.7 % Grade II, 27.2 %, Grade III, 12.1 %, Grade IV, 4.6 %, Grade V and 0.6 %. Grade VI. Conservative treatment was successful in 42.2 % of cases, and failed in 17.2 % of them. The success of conservative treatment in the Grade IV was 2.7 %. 86.3 % of the patients with RTS $\geq$ 7.8 and 13.7 % of patients with RTS $<$ 7.8 were treated conservatively. We have used: surgical diathermy 14.1 %, hemostasis and biliostasis with sutures 48.2 %, tampon with omental flap 8.2 %, perihepatic packing 11.8 %, anatomic hepatic resection 1.2 %, atipic resection 8.2 %, and hepatic artery ligation 1.2 %. The mortality rate was: 5 % Grade II, 2.1 % Grade III, 19 % Grade IV, 62.5 % Grade V, and 100 % Grade VI.
Conclusion: Perihepatic packing is a very effective method for control of bleeding in severe liver trauma. Application of stage-two surgery has significantly increased survival in patients with severe liver trauma.
Reference:
1. Moore EE, Feliciano DV, Mattox KL. Trauma. 5th ed. 2004;31:637–58.
Disclosure: No significant relationships.

P279

THE VALUE OF ANGIOGRAPHIC EMBOLISATION OF HEPATIC BRANCHES FLOR LIVER TRAUMA

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Introduction: The therapeutic and diagnostic approach of liver injuries has switched to conservative management, laparotomy representing the method of choice only for hemodinamic instable. Arteriography with angioembolisation constitutes a key technical tool in the context of liver trauma.
Materials and methods: We present two patients admitted with liver trauma that required angiography and angiographic embolisation as the last method to stop the visceral bleeding.
Results: We present 2 young males, aged 26 and 19, both car accident victims, with hepatic injury with active bleeding. The patients underwent several laparotomies that ineffectively tried to stop the parenchymal bleeding by perihepatic packing, and hepatorrhaphy. Both patients underwent angiography that showed active bleeding. In the first patient blood extravasation from a major right hepatic artery branch was noticed that was successfully embolisation. Persistence of the hemorrage required reembolisation. Several hours after the procedure the patient became critic, with high blood transaminase (8,500 U/l) and severe coagulopathy. The patient died due to multiple organ failure. The second patient showed bleeding area in segment IV and selective arterial embolisation was done successfully, with good bleeding control. The postinterventional evolution was favorable but significant bile exteriorisation required relaparotomy for bilistasis and necrotic tissue removal. The patient is still hospitalised, with a favorable evolution, being discharged form the ICU.
Conclusion: Selected cases of active hemorrage due to traumatic hepatic lesions may benefit the angioembolisation. Nevertheless angioembolisation is an invasive procedure, with specific morbidity. Significant hepatic necrosis may trigger MSOF followed by death.
References:
1. Beuran M, Negoi I, Paun S. SNOM of abdominal visceral injuries. Chirurg. 2010.
Disclosure: No significant relationships.

P280

A COMPARISON IN THE OUTCOME OF DAMAGE CONTROL LAPAROTOMY AND SUTURING OF LIVER INJURIES AFTER BLUNT ABDOMINAL TRAUMA

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Introduction: The liver is the most commonly-injured organ after blunt trauma. Damage control surgery(DCS) is safer in severely-injured patients, providing the time to properly resuscitate and avoiding multiple organ failure. The study focuses on long term outcome after DCS and primary suturing of liver injuries.
Materials and methods: A sample of 46 patients in Hilla Hospital, operated on, had been followed up for 1 year comparing the results following DCS (liver packing) and primary suturing. Half of patients (23) had DCS and the other half primary suturing.
Results: Intraoperative mortality happened in none and 4(17.4 %) of DCS and primary liver suturing patients respectively. Deaths occurred from bleeding. Postoperative bile leak happened in 3(13 %) and 1(4.3 %) of DCS and liver suturing respectively. Two of bile leak patients, both initially managed by DCS, required ERCP. The rest of bile leaks were managed by ultrasound-guided drainage. Subphrenic abscess occurred in 2(8.6 %) of DCS and none of liver suturing patients and both were managed by ultrasound-guided drainage. Postoperative adhesions happened in 4(17.4 %) and 1(4.3 %) of DCS and primary liver suturing patients respectively. All of which conservatively managed.
Conclusion: It may be safer and life-saving to do DCS to patients with liver injury but the higher possibility of complications should be kept in mind. There should be an appropriate selection for which patients to do DCS or primary liver suturing according to the general patient condition and liver status at the time of surgery.
References:
1. Beal SL. Fatal hepatic haemorrhage, an unresolved problem in the management of complex liver injuries. J Trauma. 1990;30:163–9.
2. Parks RW, Chrysos E, Diamond T. Management of liver trauma. Br J Surg. 1999;86(9):1121–35.
Disclosure: No significant relationships.

P281

NON OPERATIVE MANAGEMENT OF BLUNT HEPATIC TRAUMA

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Introduction: During the last 20 years, there appears to be an increasing trend towards conservative management of liver injuries. The progress achieved is related to the use of precise methods for exploring the liver injuries through ultrasound and especially abdominal computed tomography.
Materials and methods: We have studied a series of 88 patients with blunt liver injury. After the initial assessment, this series of patients followed under conservative treatment. Liver injuries were graded according to Moore's classification.
Results: From the 88 patients treated conservatively, the success rate was 73 patients (82.9 %) and the failure rate was 15 patients (17.1 %). According to the grade of injury, success rate were respectively: 28 cases of grade I (38.4 %); 22 cases of grade II (30.1 %); 21 cases of grade III (28.8 %); and 2 cases of grade IV (2.7 %). Conservative treatment has failed for: secondary hemorrhages in 3 cases (3.4 %), biliary peritonitis in 2 cases (2.3 %), intrahepatic biloma in 1 case (1.1 %), extra hepatic biloma in 2 cases (2.3 %), hollow organs injury in 2 cases (2,3 %), compartment syndrome in 1 case (1.1 %), post traumatic gangrenous cholecystitis in 2 cases (2,3 %), and peritoneal inflammatory syndrome in 2 cases (2.3 %). ISS > 20 in 16 cases and <20 in 72 cases.
Conclusion: There has shown increasing trends towards conservative management of liver injuries. Presence of hemorrhagic shock and hollow organs injury are contraindicated for conservative treatment. Hospital diagnostic performance and disponibility are the essential element to conduct conservative treatment.
Reference:
1. Moore EE, Feliciano DV, Mattox KL. Trauma. 5th ed. 2004;31:637–46.
Disclosure: No significant relationships.

P282

IMAGISTIC ASSESSMENT OF THE NATURAL EVOLUTION OF HEMOPERITONEUM IN SPLENIC AND HEPATIC INJURIES MANAGED NONOPERATIVELY

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Introduction: Imagistic follow up of natural evolution of hemoperitoneum after liver (LT) and splenic (ST) trauma in patients with nonoperative approach.
Materials and methods: Prospective-retrospective study of 95 patients (2007–2013) with ST-63 (66.3 %) and LT-32 (33.7 %) with hemoperitoneum and nonoperative treatment. Ratio m/f for ST 2:1, for LT 6:1, median age-37 years. FAST was performed in 100 % cases, CT-79(83 %), laparoscopy-18 (19 %). Dynamic imagistic assessment was performed in 73 (77 %) patients: USG performed in 100 %, CT-29 (40 %).
Results: ST-gr.I–IV (AAST), LT-gr.I–III (AAST). The median volume of hemoperitoneum at admission for ST was 453.36 ± 307.01 ml (100–2,000 ml), and for LT 280 ± 299.06 ml (50–1,300 ml). A statistically significant difference of median hemoperitoneum volume between different degrees of organ injury was noted ($p < 0.05$). In 52 (71 %) patients hemoperitoneum was still present at USG on days 3–5 after trauma with average volume in ST-314.10 ± 247.01 ml, and LT-145.56 ± 179.65 ml. At discharge (10–14 days) hemoperitoneum persisted in 20 (27.4 %) cases, with average volume in ST-78.87 ± 198.51 ml, in LT-47.2 ± 88.24 ml. Imaging studies after 20 days did not reveal any patients with fluid in peritoneal cavity. Failure of nonoperative management was in 8 (8.4 %) cases, mortality-3 (3.16 %) cases.
Conclusion: Blood absorption from the peritoneal cavity depends on the organ injury degree and initial volume of hemoperitoneum. Usually it is absorbed intensively in first 7–10 days after trauma and do not exceed 14–18 days.
Disclosure: No significant relationships.

P283

FEATURES PREVENTION OF POST-TRAUMATIC PANCREATITIS

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Introduction: The most common complication of pancreatic injury is traumatic acute pancreatitis, which is a major cause of death in these patients. Feature of acute traumatic pancreatitis is a high incidence of necrotic forms and septic complications. It is therefore important to develop a prevention of pancreatitis in case of damage of the pancreas.
Materials and methods: We studied the results of the treatment and prevention of acute pancreatitis in 23 patients with pancreatic trauma at blunt abdominal trauma. In 12 patients we applied the complex prevention.
Results: Methods of preventing the development of acute pancreatitis include surgical and medical prophylaxis. At operations we adhere to the following tactics: drainage without sutures on the pancreas during its wounds, the audit and the mobilization of the pancreas with the drainage of the parapancreatic hematoma, distal pancreatectomy and/or drainage in total or crush injury of the pancreas. The conservative prevention included the use of anti-inflammatory drug, proteases inhibitors, anti-cytokine drugs, antibiotics.
Conclusion: The use of developed complex can reduce the mortality and incidence of traumatic necrotizing pancreatitis.
Disclosure: No significant relationships.

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PANCREATIC FISTULA: A RETROSPECTIVE STUDY OF 50 CASES OF PANCREATIC TRAUMA

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Introduction: Pancreatic trauma has a high morbidity and mortality and represents a challenge for the surgeon. Its incidence varies from 1 to 12 %, with 11 to 62 % morbidity and mortality from 3 to 34 %. Pancreatic fistula is the second most common complication.
Materials and methods: Retrospective cross-sectional study. We included all patients diagnosed with pancreatic trauma admitted between 2010 and 2012. We evaluated demographic, clinical and laboratory. They were divided into two groups according to presence or absence of pancreatic fistula for analysis. Epi Info 7 was used for database and statistical analysis.
Results: 50 patients were admitted with a median age of 29.8 years, mostly men (96 %), penetrating trauma (90 %) and median Injury Severity Score of 15.7 and 28 % developed fistula. When comparing

both groups, there was statistically significant difference in complications ($p = 0.009$) and hospital stay ($p = 0.004$). There was no difference in the mechanism of trauma, surgical procedure for the pancreatic trauma (drainage alone vs pancreatectomy) and type of postoperative nutrition. Regarding the management of fistulas: ERCP was used in half the cases and none required surgery. The mortality of the series was 10 %.

Conclusion: Patients with pancreatic fistula will have an increased number of complications and hospital stay and can be managed successfully nonoperatively in most cases.

Reference:

1. Kao L, Bulger E, Parks D, Byrd G, Jurkovich G. Predictors of morbidity after traumatic pancreatic injury. J Trauma. 2003;55:898–905.

Disclosure: No significant relationships.

P284A

MULTIDISCIPLINARY MANAGEMENT OF SPLEEN TRAUMA- FRENCH ALPINE TRAUMA CENTER EXPERIENCE

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Introduction: Non-operative treatment indications in spleen injuries are not yet completely determined. In 2010, a standardized algorithm for multidisciplinary management splenic trauma care was introduced in our institution taking into account vitals signs, radiological findings and associated lesions. The purpose of this work was to evaluate the changes resulting from this new approach in our hospital.

Materials and methods: During the following two study periods, January 2004 to December 2009 and January 2010 to March 2013, 146 and 107 patients were respectively admitted at Grenoble's University Hospital for blunt abdominal trauma with splenic lesions. Authors collected all data retrospectively. Mean age was 34 (13–87) and gender was male in 76 %. Admission was direct in 69.9 % (177/253) and 45 % traumas (113/253) were related to winter and summer mountain outdoor activities. Regarding AAST classification, 12.5 % were grade 1 (31/253), 25.6 % grade 2 (65/253), 34.3 % grade 3 (87/253), 24.1 % grade 4 (61/253) and 3.5 % grade 5 (9/253).

Results: Mortality was 4 %, always related to associated injuries other than splenic. 76 patients needed embolization, 3 patients needed iterative embolization, 1 splenectomy due to embolization failure was performed. A total of 53 splenectomies were performed. A significant higher rate of splenic salvage was found during the second period (83 vs. 76 %, $p < 0{,}005$). No significant difference of embolization was found between the two groups (31 vs. 29 %, NS). Three secondary splenic ruptures occurred treated by splenectomy or embolization.

Conclusion: By following a multidisciplinary standardized management algorithm for splenic trauma patients, our institution has improved its splenic salvation without increasing embolization rate.

Disclosure: No significant relationships.

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OUR CHOICES IN EMERGENT SPLEEN SURGERY!

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Introduction: Conservative management of splenic injury has gained widespread acceptance. Inspite of that, surgery still have indications specially when there are haemodynamically instability or the resources to evaluate and follow the patient are scarcered. In that cases total splenectomy is generally performed but there are other options that may preserve spleen and should be considered.

Materials and methods: Our hospital is in a small town, named Covilhã, in the middle of Portugal. We review every spleen emergent surgery done in the period of 2005 until now that included trauma and iatrogenic lesions.

Results: In almost 9 years there have been 21 spleen surgical procedures related to trauma or other emergent situation. We performed 13 total splenectomies with 3 cases of autotransplantation, 5 applications of vicryl spleen prosthesis and 3 bleeding control with sutures and hemostatic products. The median age was 43 years and there were male prevalence (71 % of all cases). Most of the injuries happened after blunt abdominal trauma.

Conclusion: The understanding of spleen function and importance makes splenic conservation a major concern in splenic trauma. Splenectomy is generally performed in patients with multiple associated intraabdominal injuries and the more severe grades of splenic injury. When possible some conservative surgical procedures should be tried.

Reference:

1. Boffard KD. Manual of definitive surgical trauma care. 3 ed. I-ATSIC, Hodder Arnold.

Disclosure: No significant relationships.

P286

THE CHOICE OF NONOPERATIVE MANAGEMENT IN PATIENTS WITH SPLENIC BLUNT INJURY

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Introduction: Nowadays, non-operative management increases in patients with blunt splenic injury due to development of diagnostic and interventional technique. The purpose of this study is to evaluate the management in patients with blunt splenic injury and effect of clinical state such as shock on the choice of management.

Materials and methods: From April 2007 to July 2013, we retrospectively reviewed the medical cart of fifty patients who had splenic injury after blunt trauma. The demographic characteristics, AAST grade of splenic injury, management method (emergency operation, angiographic embolization or observation) and clinical outcome were analyzed.

Results: The mean age was 41.5 ± 21.4 years and male was 44 (88 %). Twenty patients (40 %) was in shock condition initially and five patients (10 %) underwent emergency operation due to hemodynamic instability. Emergency angiographic embolization was

performed in 20 patients (40 %) and 25 patients were managed conservatively. When patients were divided into shock group(SG) and non-shock group (NSG), Patients in SG had significantly higher serum lactate level and base deficit than NSG (lactate; 4.5 ± 3.4 mmol/L, base deficit; 5.8 ± 4.4 vs 1.9 ± 1.4 mmol/L, 2.8 ± 2.5 mmol/L, $p = 0.007$, $p = 0.013$). There was no significant difference of AAST grade and contrast blush rate in abdomen CT between two groups. Among 45 patients with non-operative management, four patients (8.9 %) got delayed angiographic embolization and 3 patient died from companied organ injury.

Conclusion: Non-operative management can be acceptable management option in patients with splenic blunt trauma under intensive hemodynamic monitoring.

Reference:

1. Haan JM, Bochicchio GV, Kramer N, Scalea TM. Nonoperative management of blunt splenic injury: a 5-year experience. J Trauma. 2005;58:492–8.

Disclosure: No significant relationships.

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