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VORTRÄGE

Österreichische Gesellschaft für Thorax- und Herzchirurgie:

Herz: Neue Technologien und Techniken

007 Trans-apical valve replacement with the Cribrier-Edwards prosthesis in high risk patients with severe aortic stenosis

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Background. Aortic valve replacement (AVR) in the elderly with significant co-morbidities is associated with increased operative risk. Trans-apical catheter based AVR is being evaluated in a phase 1 study. We report the initial results of the first generation equine pericardial Cribrier-Edwards-valve.

Methods. Access is through a small antero-lateral thoracotomy with direct puncture of the apex. After initial balloon valvuloplasty the Ascendra delivery system is used to position the balloon mounted crimped bioprosthesis under fluoroscopic and transesophageal echo guidance in the native aortic annulus.

Results. 30 high risk patients (log EuroScore 23.8 ± 13, 16 female and 3 male) with a mean age of 81 ± 6.6 years were operated. Valve positioning was successful in 27 pts (valve size 23 in 9 pts and size 26 in 18 pts) and 3 were converted to full sternotomy and conventional valve replacement performed. Deployment time was 11.9 ± 6.6 min. Delivery was achieved without cardiopulmonary bypass in 67% of patients. However in 7 pts CPB became necessary to treat bleeding complications. There were 3 deaths within 30 days (1 valve related, 1 cardiac, 1 abdominal). Operative revision was necessary in 6 patients for bleeding and was related to the apical access in 1, intercostals artery 1, lung laceration 1 and was diffuse in 3. Hemodynamic evaluation showed satisfactory results in regard to aortic insufficiency (none: 9, minimal 7) and excellent gradients (peak gradient: 13.1 ± 12.4 mmHg).

Conclusions. We conclude from our data that trans-apical aortic valve replacement with the Cribrier-Edwards bioprosthesis can be performed in high risk patients successfully. Cardiopulmonary bypass may be avoided. Complications may be attributed to the high risk profile of the elderly population treated in the early learning curve. Excellent imaging technology in the operating room and excellent collaboration between surgeons and cardiologist as well as anesthetists appears crucial for the successful implementation of this new treatment modality.

008 Aortic valve replacement through partial upper sternotomy: a safe alternative to full sternotomy

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Background. Aortic valve replacement (AVR) can be performed safely through a partial upper sternotomy.

Methods. Partial upper sternotomy has become the standard approach to isolated aortic valve surgery in patients with mod-

erate to good left ventricular function and without any previous cardiac surgery at our institution. We reviewed retrospectively data on 353 patients (183 males, 170 females) who underwent AVR through a partial upper sternotomy between 1998 and 2006. Mean age was 69.1 (28–95) years. Mean logistic Euroscore and mean peak transvalvular gradient were 6.9 (0.88–47.94) and 92.7 (40–150) mmHg, respectively.

Results. Mean cross clamp time, mean bypass time and mean operation time were 69.1 (33–138) min; 113.1 (52–344) min and 192.5 (95–424) min, respectively. In 17 patients (4.8%) a conversion into full median sternotomy was necessary. 15 Patients (4.2%) had to be reexplorated due to bleeding. The mean intraoperative and postoperative red blood cell transfusions were 1.3 and 0.8, respectively. Deep sternum infection occurred in 5 patients (1.4%). Mean ICU and total hospital stay were 2.2 and 11.9 days, respectively. There were 15 hospital deaths giving a perioperative mortality of 4.2%.

Conclusions. AVR through a partial upper sternotomy is a safe and effective technique with a similar perioperative morbidity and mortality to conventional aortic valve surgery showing superior cosmetic results.

009 State-of-the-art 2007: mitral valve repair – minimally invasive or median sternotomy?

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Background. More than ten years have passed since minimally invasive mitral valve surgery employing different access and different techniques has been introduced. In spite of obvious advantages acceptance by cardiac surgeons is generally low. To define its current position in clinical practice the development of our program, actual indications and results are presented.

Methods. Minimally invasive and conventional mitral valve procedures from 2001 to 2006 were documented prospectively. Indications for the minimally invasive vs. conventional approach through median sternotomy are compared.

Results. Seventy-five patients had minimally invasive mitral valve surgery through a 5 cm minithoracotomy. Carpentier type I, II and IIIa lesions involving the posterior, anterior or both mitral leaflets were treted using Carpentier repair techniques. Combined procedures of the Tricuspid valve, ASD and modified maze operations were performed in 23% of cases, 4 patients had prosthetic mitral valve replacement. 1 patient died at home on postoperative day 26 from unknown causes. Functional results: Residual MI grade 0: 89%, grade I: 8%, grades I–II: 1.3%, grade II: 1.3%, grade III or IV: 0. Reoperations after 21 months: 0. In 2006 in our department 62% of all mitral valve repairs needing no concomitant CABG or aortic valve operations were performed minimally invasive.

Conclusions. More than 60% of mitral valve repairs can be performed minimally invasive with excellent results. As the procedure is superior concerning cosmesis, the procedure is favored by patients and referring cardiologists. At this time disadvantages are neither proven nor suspected, advantages concerning surgical complications and rehabilitation are assumed.

010 Insights from 133 cases of remote access perfusion for minimal invasive cardiac surgery

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Background. Remote access perfusion (RAP) is a prerequisite for performance of minimal invasive cardiac surgery on the arrested heart. During implementation several technical challenges may be encountered. In this study we assess the incidence and the influence of these challenges on the perioperative outcome and we describe clinical results in a large patients' series.

Methods. We retrospectively analyzed 133 patients who underwent minimal invasive cardiac surgery (Totally endoscopic coronary artery bypass grafting: 96, endoscopic atrial septal defect repair: 35, totally endoscopic mitral valve repair: 2) using RAP (ESTECH: 118, Heartport: 15). Intra- and postoperative parameters were analyzed according to the occurrence or not of technical challenges attributed to remote access perfusion.

Results. We observed no perioperative mortality and no severe complications in this patients' series. Technical problems occurred in 23 patients (17%). Three patients (2%) underwent conversion to other operative method as severely atherosclerotic peripheral vessels did not allow positioning of the balloon in the ascending aorta. Another 2 patients required an additional arterial cannula in the contralateral femoral artery to ensure adequate perfusion. Balloon migrations occurred in 66 patients (50%). In 7 cases was a cannula replacement required (5%), in four of which due to balloon rupture. In 4 patients (3%) positioning of the balloon in the ascending aorta required the use of fluoroscopy, as this was not possible under echocardiographical guidance. Patients with technical difficulties (group 2) had no worse outcome than those in whom no RAP-associated problems occured (group 1) with the exception of longer total operative time (Group 1: 348 ± 116 min group 2: 404 ± 134 min, $p = 0.04$). Ventilation time, intensive care unit stay and hospital stay were all similar in the study groups ($p =$ ns). A comparison between the two cannula types showed only a higher balloon pressure needed for positioning of the ESTECH cannula vs the Heartport system (456 ± 61 vs. 352 ± 45, $p < 0.001$) although comparable injection volumes were used.

Conclusions. We conclude that technical difficulties are not rare during RAP but in most of the cases can be easily managed at the cost of increased operative time. The postoperative outcome is not compromized provided that major complications are avoided.

012 Neoangiogenesis after combined transplantation of skeletal myoblasts and angiopoietic progenitors leads to increased cell engraftment and lower apoptosis rates in ischemic heart failure

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Background. We previously reported that combined transplantation of skeletal myoblasts and AC-133 + cells leads to improved left ventricular function, reduced infarct size and myocardial apoptosis in a model of chronic ischemia. The aim of this study is to elucidate on the possible mechanisms and to assess new implications in increasing cell therapy efficacy in chronic ischemia.

Methods. Heart failure was induced by LAD-Ligation in nude rats. a) Homologous skeletal myoblasts (SM), b) human derived AC-133 + cells (SC), c) combination of both cells (Comb) and d) culture medium (CM) were injected in the infarct and peri-infarct area, respectively 4 weeks after infarction. Cell engraftment was detected by fluorescence microscopy and confirmed by immunohistochemical techniques. Cell survival was quantified by RT-PCR. Immunohistochemical analysis was used to define the fate of injected cells. Cardiac gene expression levels of VEFG-A, cardiac Troponin, ACTA2, SDF-1, TGF-beta1, were assessed by RT-PCR.

Results. Both cell types were detected in the injection areas 4 weeks after cell transplantation. AC-133 progenitors were identified not only in the border zone, but in the infarct area, as well, suggesting migration to the scar. Double cell therapy led to increased cell engraftment (SM: $52 \pm 13/\text{mm}^2$, SC: 45 ± 8 in the combination group vs. SM: 31 ± 9 and 23 ± 7 in the monotherapy groups, $p = 0.007$). This effect was confirmed using PCR. Apoptotic index among engrafted cells was significantly lower in the Comb group (Comb: 0.53 ± 0.12 for myoblasts and 0.34 ± 0.09 for SC, vs. SM: 0.76 ± 0.19 and SC: 0.63 ± 0.16, $p = 0.013$). Expression of cardiac troponin was higher in the combination group in the peri-infarct area suggesting higher survival rates of cardiomyocytes in the border zone. Evaluation of capillary density revealed increased angiogenesis in the combination group (Comb: 12.3 ± 2.3, SM: 5.2 ± 1.2, SC: 8.3 ± 1.8, $p = 0.002$). Neoangiogenesis was associated with higher levels of VEGF-A and TGF-beta1 in the injection areas as detected by RT-PCR. The higher SDF-1 expression in the injected areas implies an increased secretion of chemoattractants by the injected cells, which suggests that the effect of combined cell transplantation is mainly associated with paracrine mechanisms.

Conclusions. The mechanism of functional improvement after combined transplantation of skeletal myoblasts and AC-133 + progenitors in ischemic heart failure is mainly associated with increased angiogenesis based on paracrine factors which leads to improved survival and lower apoptosis rates of the injected cells.

013 Minimal access surgery for repair of atrial septal defects in infants below 15 kg of weight

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Background. We report on a modified minimally invasive and cosmetic approach of surgical repair of atrial septal defects (ASD) I with emphasis on infant patients weighing below 15 kg.

Methods. From August 2005 to July 2006, 13 patients underwent this procedure (MMIT-modified minimally invasive technique). The heart was exposed by a limited midline skin incision and partial sternotomy (newly developed sternal spreader, Fa. Fehling, Germany), and the atrial septal defect was closed through a right atriotomy using special new aortic and dual venous cannuals. Basic results were matched to those obtained from 10 patients (ST-standard technique).

Results. Atrial morphology was more complex in MMIT pts (3 overriding SVCs, 3 Sinus venosus defects), nevertheless OP times were accurate and similar to ST pts. Early extubation was forced and made possible by fast-track methods. Totally, 14 ASDs were directly closed, 9 pts had patch repair. Postoperatively we observed 3 mild postpericardectomy syndroms, 1 cholecystitis and 1 pneumothorax requiring drainage in ST pts, only 1 pt with mild pericardial effusion was found in MMIT group. Retention of pericardial effusions was not a risk factor and hospital stay was also not prolonged.

Conclusions. This approach achieves a cosmetically superior result with newly developed but standard instrumentation and cardiopulmonary bypass techniques, without compromising exposure or using peripheral incisions even in dysmorphic, low weight congenital patients.

MMIT vs ST patients:

	MMIT 13 pts	ST 10 pts
Age (years)	4.6	8.9
BSA (sgm)	0.73	1.05
OP time (min)	157	125
Perfusion (min)	60	36
X-clamp (min)	20	14
Modified ultrafiltration (ml)	489	542
Ventilation (hours)	3.9	12.2
Skin inzision (cm)	4.1	18.2

Österreichische Gesellschaft für Gefäßchirurgie: Tradition und neue Techniken: Suprarenaler Abschnitt

015 Perioperative Betablockade-Evidenz und Praxis

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„Demographischer Imperativ“ und Fortschritt der Medizin konfrontieren immer ältere und kränkere Patienten mit der Notwendigkeit großer Operationen. Zumindest 30% dieser Patienten leiden an einer manifesten koronaren Herzerkrankung bzw. an kardiovaskulären Risikofaktoren, die zum Zeitpunkt der Operation vielfach nicht adäquat behandelt sind. Die Häufigkeit des peripoerativen Myokardinfarkts liegt bei gefäßchirurgischen Patienten bei 15–20%. Das chirurgische Trauma induziert eine der Größe des Traumas proportionale Stressreakion. Hyperadrenerge Kreislaufreaktion und postoperative Hyperkoagulabilität gelten als Trigger langdauernder Myocardischämien. Während bei gefäßchirurgischen Patienten eine „prophylaktische“ Revaskularisierung die Häufigkeit kardialer Komplikationen weder unmittelbar postoperativ noch langfristig reduziert, weisen mehrere rezente Studien auf den anhaltenden Benefit einer perioperativen Stressprotektion mit Betablockern hin. Als mögliche Ursache für diesen kardioprotektiven Effekt werden Reduktion myokardialer Ischämien, Plaquestabilisierung sowie verminderte Lipolyse diskutiert. Die Empfehlungen zur perioperativen Betablockertherapie werden nach den Erkenntnissen der aktualisierten ACC/AHA-Leitlinen diskutiert. In interdisziplinärer Zusammenarbeit mit der Universitätsklinik für Anästhesie haben wir 2003 eine klinikweiten Standart für die perioperative Betablockade gefäßchirurgischer Patienten eingeführt. Derzeit können wir auf eine 70% perioperative Betablockade gefäßchirurgischer Risikopatienten verweisen. Die perioperative Myokardinfarktrate liegt bei 8%.

016 Long-term results for surgery in paraganglioma of the neck

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Background. Recent investigations showed hereditary disease as cause of development in paragangliomas and pheochromocytomas. Therefore diagnostic procedures and follow-up in patients with paragangliomas and their families need to be changed. We analyzed our current follow-up strategy in patients treated for neck paraganglioma (carotid body tumour) and the necessity for genetic investigation.

Methods. 41 neck paragangliomas (NPG) were treated surgically between January 1988 and December 2006 in 35 patients (pts). Clinical data and follow-up were collected prospectively and analyzed retrospectively. Statistical data are shown as mean values and Standard deviation. In larger tumors a preoperative interventional embolization was performed. Postoperatively pts were seen as outpatients once per year including ultrasound control.

Results. Of the 35 pts with a mean age of $53.6 + 15.5$ years there were 26 female and 9 male pts. In 18 pts the unilateral tumor was located on the right side, in 10 pts on the left side. At time of diagnosis 7 pts ($7/35$ pts $= 20\%$) presented with bilateral paraganglioma. Histological analysis showed benign paraganglioma in 34 pts and malignant paraganglioma in 1 pt. After a follow-up of 1 to 188 months (mean: $77.3 + 17.0$ months) 32 pts were alive and well whereas 3 pts were lost to follow-up. Duplex ultrasound gave no evidence for recurrence of NPG in 32 pts. The patient with the malignant tumor is alive and free of recurrence after 14 years and 5 months. The most recent patient with bilateral paraganglioma tested positive for SDH-D Mutation. Two brothers and 1 sister of this patient were diagnosed with phaeochromocytoma.

Conclusions. More female patients were affected than male pts. In male patients there was a higher incidence of bilateral paraganglioma of the neck. Long-term survival in patients after surgical removal of neck paraganglioma appears not limited. Because of the possibility to identify mutations in the SDH-gene (SDHD, SDHB, SDHC) further testing of patients with bilateral paraganglioma is mandatory. Screening for phaechromocytoma in these pts and evaluation of patients' families is recommended.

017 Incidence of cranial nerve injury (CNI) after surgery for internal carotid artery (ICA) stenosis: comparison of two different methods

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Background. Endarterectomy remains the treatment of choice for ICA stenosis. One major complication of surgery is CNI (3–25%), encouraging transfemoral stent placement for ICA stenosis. The aim of this study is to evaluate a possible reduction of this complication by the use of eversion endarterectomy (EEA) compared to standard patch endarterectomy.

Methods. Prospective study design in patients treated at a tertiary university based care center. 100 consecutive patients were enrolled into the study. Age (median 66 years, range 53–86 years), sex (male 58, female 42), medical risk factors (smoking 51%, hypertension 60%, diabetes mellitus 49%) and indication for surgery (asymptomatic stenosis 82%) were equally distrtributed among both groups (50 patients each). All patients were evaluated pre- and postoperatively for CNI by an independent neurologist and ENT specialist blinded for the operative procedure.

Results. One patient in the conventional group suffered patch rupture with consecutive stroke 2 days postoperatively. Two patients in the conventional group developed CNI (1 recurrent larygeal and facial nerve deficit, 1 hypoglossal and glossopharygeal nerve deficit). After 5 months

of follow up the latter patient showed spontaneous resolution of cranial nerve symptoms. No patient developed CNI after EEA.

Conclusions. CNI has been detected in 2% after endarterectomy of the ICA in our series. Symptoms of CNI may be transient, but are disturbing if no clinical improvement is observed. EEA requires less operative dissection in the neck compared to standard patch endarterectomy, and therefore seems to be favourable technique with regard to CNI development. EEA has the potential to curb the current trend toward application of endovascular surgery for ICA stenosis.

018 Ring-stripping retrograde common carotid endarterectomy: a retrospective study

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Background. Total occlusion or stenosis of the common carotid artery is rare and the indications and techniques of surgical treatment are still a matter of controversy. We demonstrate the feasibility of retrograde common carotid endarterectomy.

Methods. Retrospective case report study.

Participants. In a period of fifteen years thirty-nine patients underwent retrograde endarterectomy of the common carotid artery. Twenty-nine patients were males, middle age 71 (min 50, max 86). Ten patients were females, middle age 75 (min 51, max 89). Symptoms of brain ischemia were present in fifteen patients. Retrograde endarterectomy of the common carotid artery and endarterectomy of the internal carotid artery were done together in all patients. Indication for retrograde TEA was a verified stenosis >70% or occlusion of the common carotid artery diagnosed by duplex ultrasound and arteriography. In three patients iatrogenically dissection of the common carotid artery was seen as indication for that procedure.

Main measurements. Postoperative early mortality, stroke rate, medium and long-term endarterectomy patency.

Results. In all patients who underwent that procedure there was no occurence of major complications or statistically increased mortality. The 30 day mortality was 5.1% (2 patients). One of them died in cause of a heart attack and one because of a cerebral bleeding. There was one ipsilateral stroke (2.56%) eight month after the procedure. Three patients were lost to follow-up. Mean follow-up was 50 months (1 to 180). There were 12 (30.7%) late deaths caused by cardiovascular related problems, pneumonia and cancer. In all living patients, controlled by duplex ultrasound, no occlusion or stenosis was found.

Conclusions. Retrograde TEA can be done through only one cervical incision for common carotid artery stenosis/occlusion, for tandem lesions of the carotid arteries as well as for iatrogenic dissections of the common carotid artery. Compaired to bypass grafting this technique is a faster and easier method. Our retrospective study indicates a long-term patency and freedom from neurologic events.

019 Stenosis and occlusion of the proximal subclavian artery – surgical or interventional treatment? An analysis of our own patients and international studies

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Background. Seventeen percent of all supraaortic occlusions concern subclavian artery, but only 24% of them fulfil the clinical and angiographic qualification of steal syndrome.

Methods. Since 1988 50 patients with stenosis or occlusion of the proximal subclavian artery were treated on our department. 20 patients underwent end-to-side transposition of the subclavian into the common carotid artery; a carotid-subclavian bypass using synthetic grafts was applied to 30 patients. Surgical treatment and evaluation, complications, short and long term patency of our patients were compared to interventional techniques and international literature.

Results. The primary success rate of both operative techniques achieved 100%. 30-days mortality was 0%, 30-days morbidity 5% (1/20) in the transposition group and 3.3% (1/30) in the bypass-group respectively. Median follow-up time was 50 (1–180) months in the transposition-group vs. 55 (1–120) months in the bypass-group. Only in the latter one late occlusion (3.3%) was seen.

Conclusions. Our data show a slight (not significant) favour for the transposition, which is consistent with results from other studies. Concerning long term patency and infection rates the transposition of the subclavian into the common carotid artery by single incision is to be recommended first choice of treatment. Avoiding synthetic grafts leads to optimal compliance. Flow in natural direction and less mortality and morbidity rate are ensured.

Österreichische Gesellschaft für Chirurgische Forschung: Die Zukunft hat schon begonnen – Bedeutung der molekularen Biologie für Diagnostik, Prognose und Therapie in der kardiovaskulären Chirurgie

021 Gene expression profiles characterizing the progression of heart failure in patients with aortic valve stenosis

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Background. In patients with aortic valve stenosis (AS) the switch from the compensated to the decompensated state is

critical, because preoperative EF is predictive for long-term survival. Here, we report results from a genomic study in patients with AS in compensated and decompensated state and present candidate genes that could be predictive for the progression of heart failure.

Methods. Biopsies from the LV septum of male patients (73 Â ± 6 yrs) with isolated AS undergoing biologic aortic valve replacement (Carpentier Edwards MagnaÂ®) were harvested either from hearts with normal EF (>50%, $n = 3$) or from a group with low EF (60%, $n = 3$) and served as controls. Total RNA was analyzed on Affymetrix HG-U133A GeneChips, which allowed to measure expression levels of more than 22.000 human gene transcripts. Low level expression analysis was performed using the GC-RMA algorithm and statistical significance analysis was done by Bayesian *t*-test. Class prediction was performed using the BRB ArrayTools package (NCI).

Results. Expression levels clearly distinguished AS from CAD. Annotation of these transcripts revealed a close correlation with the hypertrophic response and progressive fibrosis. These targets completely reflected the current understanding of key processes involved in heart failure. Within a list of several (7) AS classifier genes that revealed well-known markers such as the natriuretic peptide precursors A and B and troponin I, we identified: (1) the connective tissue growth factor (1169 vs. 29; $P < 0.000001$), known to be triggered by mechanical stress in fibroblasts; (2) periostin (1139 vs. 22, $P = 0.000038$), an important matricellular component recently shown to be responsible for ventricular dilation. When specifically searching for low EF class predictors, we found 2 potential candidates of unknown function, which were consistently expressed at a higher level only in AS with EF <30%: (1) the POM and ZP3 fusion gene (163 vs. 16, $P = 0.0004$) and (2) the transcription factor ets variant 1 (268 vs. 105, $P = 0.0006$).

Conclusions. In this study we could clearly identify patients with CAD from those with AS by the help of gene expression profiling. Moreover, we were able to identify gene expression signatures that could be predictive for the progression of heart failure.

022 Proteomic-based identification of peroxiredoxin 6 and pyruvate kinase isozyme M2 as biomarkers for acute cardiac allograft rejection

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Background. Despite tremendous advances in immunosuppressive therapy acute rejection still remains a problem following solid organ transplantation. Proteome analysis has emerged as a valuable tool for the study of large scale protein expression profiles and biomarker detection. Here we applied this novel technology to identify specific biomarkers for acute cardiac allograft rejection.

Methods. Cardiac allografts of C57BL/10 mice were placed into fully MHC-mismatched C3H/He recipients. Syngeneic transplants served as controls. Protein expression analysis was performed using fluorescence two-dimensional difference gel electrophoresis (2D-DIGE) on day six post transplant. Spots of interest were subjected to nanospray ionization tandem mass spectrometry (MS/MS) for protein identification. Expression of selected proteins was confirmed by Western blot analysis.

Results. Median graft survival of untreated hearts was 8.3 ± 0.6 days whereas all syngeneic animals showed indefinite graft survival >100 days. Analysis of the 2D-DIGE gels revealed a total of 95 protein spots that were significantly regulated by more than 1.5-fold during acute rejection when compared to syngeneic controls. Spots with highest altered regulation identified with MS/MS were derived from coronin 1A, vimentin, protein disulfide isomerase A3 precursor, skeletal muscle LIM-protein 3, aconitate hydratase, and fumarate hydratase. Peroxiredoxin 6 and pyruvate kinase isozyme M2 were selected for further analyses. Western blotting and immunohistochemistry showed significantly higher expression of these proteins during acute rejection compared to syngeneic grafts.

Conclusions. This study demonstrates that proteomics is a powerful method to detect biomarkers of acute cardiac allograft rejection. Identified proteins like peroxiredoxin 6 and pyruvate kinase isozyme M2 represent novel indicators of acute rejection and may become useful surrogate markers for monitoring the alloimmune response.

023 Impact of Endothelin-A receptor blockade on myocardial gene expression post MI

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Background. Despite promising experimental results of Endothelin-A (ET-A) receptor blockade in treatment of Heart Failure (HF), clinical trials failed to confirm these findings. In order to elucidate this discrepancy, we decided to evaluate the impact of ET blockade on myocardial gene expression (GE) post myocardial infarction (MI).

Methods. MI was induced in male Sprague-Dawley rats using LAD ligation. Three days post MI, rats were randomized to receive either TBC3214-Na or placebo and to survive either 7 or 42 days. Sham-operated rats served as control group. Prior scarification, rats underwent echocardiography. Following excision, hearts were analyzed morphometrically. RNA was extracted from non-infarcted areas of the LV. Targets for quantification were identified using Affymetrix Gene Chip® Technology and subsequently quantified by Real Time PCR.

Results. ET-A blockade did not influence morphology or hemodynamics on day 7, while it significantly improved both parameters on day 42. In contrast, GE analysis revealed that the majority of MI-induced changes in GE occur early after MI, with the majority of genes returning to baseline after 42 days. Five days of ET-A blockade resulted in an attenuated expression of 38 MI-induced transcripts (e.g. TnC, Spp1, Sparc, Mmp14) involved in post-MI remodeling.

Conclusions. Apparently, Endothelin receptor blockade influences early post-MI remodeling. This data adds further evidence that timing is crucial in ET therapy post MI:

Administered to early, myocardial wound healing is disturbed and LV function deteriorates. Given in time, excessive ventricular remodeling is attenuated and LV function improves.

024 Identification of sex-specific targets in experimental heart failure

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Background. Sex-specific differences have been reported in ischemic heart failure. The aim of the present study was to screen for diferentially expressed genes in experimental ischemic heart-failure using GeneChip® technology.

Methods. MI was induced in male ($n=9$) and female ($n=9$) sprague-dawley rats by ligation of the LAD. 7 and 42 days post-MI, surviving animals were sacrificed and samples of the non infarcted free wall gained to perform transcription analysis. Sham-operated males ($n=6$) and females ($n=6$) served as control. Extracted RNA of 3 animals per group was pooled and Affimetrix GeneChip® technology was used to screen for differentially expressed targets. GeneChips® were analyzed using the MAS5.0 algorithm and the following rules employed comparing MI vs. corresponding sham to identify sex-specific targets:

1) increase in expression in one sex and a decrease in the other,
2) increase in expression one sex and absent in the other,
3) decrease in expression one sex and present in the other.

Results. Our strategy revealed 82 targets differentially expressed. 53 of these targets were expressed differentially on day 7 only, 28 on day 42, only one target was expressed differentially on both 7 and 42 days post-MI. Of this targets 9 were selected for further analysis including: Keratins, caspase-8, aldehydoxidase-1, cdkn-1a and triadin and will be evaluated using RT-PCR.

Conclusions. 1) There are Sex-specific targets in post-MI gene expression. 2) This targets can be identified using GeneChip as screening tool.

025 Bilirubin rinse suppresses early MAPK activation in cardiac ischemia-reperfusion injury

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Background. Heme Oxygenase-1 (HO-1) expression is crucial in preventing ischemia reperfusion injury (IRI). Bilirubin, a product of heme catabolism by HO-1 at least in part accounts for the protective effects mediated by HO-1, however, the mechanisms by which bilirubin mediates these effects remain to be elucidated and strategies to apply the bile pigment are needed. Mitogen activated protein kinases (MAPK) are activated upon stress and play an important role in the early phase of IRI. We hypothesized that in a mouse model of heart transplantation, a brief rinse with bilirubin of the graft before reperfusion would affect MAPK activation.

Methods. Isogenic C57BL/6 hearts ($n=4$/group and time point) were harvested, stored in UW solution at 4 degrees for 18 h and then rinsed with bilirubin at 0.125 mM or ringer lactctate as a control before anastomosis. Anastomosis time was kept constant at 15 min by using a cuff-technique, subsequently thereafter perfusion was restored. Samples were collected at various times. Western blot analysis was carried out for total (T) and phosphorylated (P) forms of Akt, ERK 1/2, JNK 1/2 and p38 MAPK. P/T ratio was quantified by ImageJ and statistically analyzed using ANOVA.

Results. After anastomosis and before any reperfusion phosphorylation of ERK and p38 MAPK was increased when compared to 18 h of ischemia allone. This was not seen when grafts were rinsed with bilirubin. Further, at 15 min after reperfusion, phosphorylation of all MAPKs being investigated was dramatically increased when compared to the non-reperfused isografts. At this time point, bilirubin significantly inhibited phosphorylation of ERK and JNK ($p<0.001$) as well as p38-MAPK and Akt ($p<0.05$).

Conclusions. Bilirubin rinse of mouse cardiac isografts causes a dramatic decrease of MAPK activation associated with the proinflammatory response to the stress of IRI. Bilirubin rinse of allografts before implantation might be a potent aproach to avoid early organ dysfunction.

026 Improvement of myocardial protection by a selective endothelin-A receptor antagonist added to cardioplegia in failing hearts

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Background. Ischemia/reperfusion (I/R) injury due to cardioplegic arrest is a problem in patients with reduced LV function. We investigated the effect of chronic versus acute administration of the selective endothelin-A receptor antagonist TBC-3214Na during I/R in failing hearts.

Methods. Male Sprague-Dawley rats underwent coronary ligation. Three days post infarction group 1 ($n=11$) was administered TBC-3214Na continuously with their drinking water, groups 2 and 3 received placebo. Seven weeks post infarction hearts were evaluated on a blood perfused working heart during 60′ ischemia and 30′ reperfusion. In group 2 ($n=10$) TBC-3214Na and in group 3 placebo was added to cardioplegia during ischemia.

Results. At similar infarct size postischemic recovery of cardiac output (group 1: $91\pm10\%$, group 2: $86\pm11\%$ vs. placebo: $52\pm15\%$; $p<0.05$) and external heart work (group 1: $90\pm10\%$, group 2: $85\pm13\%$ vs. placebo: $51\pm17\%$, $p<0.05$) group was significantly enhanced in both TBC-3214Na treated groups while recovery of coronary flow was only improved in group 2 (group 2: $121\pm23\%$ vs. group 1: $75\pm13\%$, placebo: $64\pm15\%$, $p<0.05$). Evaluation of blood gas measurements showed enhanced myocardial oxygen delivery and consumption with acute TBC-3214Na therapy. In addition high energy phos-

phates were significantly higher and transmission electron microscopy revealed less ultrastructural damage only under acute TBC-3214Na administration.

Conclusions. Acute endothelin-A receptor blockade is superior to chronic blockade in attenuating I/R injury in failing hearts. Ultrastructural and biochemical evaluation indicate an improvement in capillary perfusion by acute TBC-3214Na administration during reperfusion resulting in a better cardiac function post ischemia. Therefore acute andothelin-A receptor blockade might be an interesting option for patients with heart failure undergoing cardiac surgery.

AHC: Kunststoffe und Techniken – welchen Weg geht die Hernienchirurgie?

027 Femoral hernia repair: a review of 23 cases in a 3 year period

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Background. To review the clinical presentation, surgical technique and results of a consecutive series of femoral hernia repairs in a routine surgical setting.

Methods. Retrospective analysis of 23 patients undergoing femoral hernia repair between December 2002 and December 2005. Mean age was 63 (33–84 years), 87% of patients were female. Factors analyzed were the surgical repair technique, emergency operation, primary or recurrent hernia, duration of operation and hospitalization, BMI, DM, VAS, postoperative complication, recurrence rate, chronic pain.

Results. Six patients (26.1%) were operated as an emergency and 17 patients (73.9%) elective. The surgical technique was open direct repair in 19 (82.6%) and TAPP in 4 (17.4%) patients. 5 (21.7%) patients presented with recurrent femoral hernias preoperatively. Mean operative time was 63 min, hospitalization 8 days. Postoperative VAS was 2.5. The BMI was 23.4 in mean. 5 patients developed postoperative complications, there was no operative revision. Follow-up shows no recurrent hernia, 4 (17.4%) patients suffer from mild chronic pain.

Conclusions. Frequently, femoral hernias present as emergencies, thus affording a variation of surgical techniques and resulting in a high rate of direct repair. Nevertheless, results were excellent with respect to recurrence rate.

028 Transinguinal preperitoneal hernioplasty (TIPP) reinforcing the inguinal wall with a memory-ring armed polypropylene patch

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Background. Except in inguinal hernia with strong fascia, treatment of these hernias requires a reinforcement of the inguinal wall. Different methods have been established based on different approaches and different degree of reinforcement: partially (Lichtenstein, Rutkow/Robbins) or totally (Rives, Stoppa, Wantz, TIPP, TEP, TAPP). In Danish and Swedish hernia register a surprisingly high number of female (especially femoral) recurrencies were found emphasizing the problem, as mainly Lichtenstein procedure was performed. Increasing knowledge of reasons of fascial insufficiency give further hints towards using a total reinforcement of the inguinal region. Among these procedures the transinguinal preperitoneal hernioplasty with a memory-ring armed polyprolylene Patch (Polysoft Patch^{TM}) is new and promising.

Methods. Between 15.12.2004 and 15.01.2007 524 inguinal hernias in patients have been treated by TIPP with Polysoft Patch^{TM} (387 Bassum-Suhlingen, 137 Idstein). Operation and patient data were recorded prospective. We operated 475 male and 49 female hernias. After 6–12 month patients were interviewed with a standard questionaire. 138/183 patients (75.2%) answered.

Results. 195 medial, 192 lateral, 133 combined and 4 femoral hernias were done. 58/525 recurrent hernias (11.04%), 13/525 incarcerated hernias (2.5%). Intraoperative complications: 6/525 (1.14%). Postoperative complications have been 3 bleedings, 1 infection, 2 wound dissections. Haematomas/seromas we have seen preperitoneal in 15 cases, subcutaneous in 80 cases. 2 re-operations and 12 punctions have been performed. A hydrocele has been seen in 3/524 cases, an ileoinguinal syndrome we have noted in 4 cases (no resection has been performed). Under intention of a preperitoneal repair, 6 patients have got another treatment: 2 Lichtenstein, 2 Rutkow and 2 Shouldice procedures. In 6/524 patients (1.1%) the positioning of the patch was difficult mainly due to very small or fatty anatomy. Longterm results (1 year postoperative): 5.1% had some pain or heavy pain, 21.6% had occasional pain and 10.3% had little or some movement problems. There was 1 recurrent femoral hernia (5 mm hole with fat; 8 months post op), only one patch has been removed because of strong pain in riding or sitting in low seats.

Conclusions. TIPP is a safe procedure which fulfills the requirement of a total reinforcement of the inguinal wall. The memory-ring armed polypropylene patch covers the inguinal region and makes the procedure easier compared to the predecessors (e.g. Wantz).

029 Preliminary experience with a new self-gripping mesh in inguinal hernia surgery

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Background. Tension-free mesh repair in open inguinal hernia surgery (lichtenstein-technique) is an increasingly used method in specialized hernia centres. We report on our experience with the use of a new self-gripping mesh.

Methods. Between July and October 2006 10 patients (9 males, 1 female, median age 63) were operated using the preshaped, semi-resorbable mesh (Parietene, progrip PP1208DR und PP1208DL) consists of low-weight monofilament polypropylene and incorporates resorbable polylactic acid micro hooks. Perioperative complications and clinical results after a median followup of 2.7 months were analyzed.

Results. There were 9 primary and 1 recurrent hernias. In 8 cases local and in 2 spinal anaesthesia was used. No intraoperative complications occured, all meshes could be placed easily. 1 patient had local pain for 4 weeks. At followup 8 patients were symptom-free, 1 had paresthesia and 1 infra-inguinal swelling.

Conclusions. Parietene mesh is easy and fast to use and gives satisfying early results. Since part of the mesh will resorb within 1 year long-term results will have to be awaited.

030 Light versus heavy meshes for laparoscopic inguinal hernia repair – a biomechanical study

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Background. In laparoscopic groinhernia surgery, light and heavyweight meshes are used. Most important factors for avoiding recurrences are the mesh friction and the flexural stiffness as well as the size of the used mesh.

Methods. In our biomechanical study we tested light and heavy mesh on their mechanical behavior for the laparoscopic inguinal hernia surgery. For the determination of the mesh friction, these prostheses were taken between peritoneum and musculature of resently deceased cadavers. After that the mesh of the size of $15\,\text{cm} \times 10\,\text{cm}$ were placed in a hernienmodell with variable hernia orifices and were loaded over the total area with pressure.

Results. The average friction coefficient of the prostheses was $\mu_0 = 0.4$ and was used in the trial arrangement. In the smal opening size, only the Vypro I showed greater bending, all other meshes were sufficiently stable. In greater opening sizes in the hernia model, all light mesh prostheses sheared off whereas the heavy meshes resisted to the loads.

Conclusions. Meshes have very important material parameters as bending capacity and friction coefficient and all manufactors should test their products thoroughly before they get used in hernia surgery. Heavy meshes had a low bending behavior and did not shear off into the hernia, not even in repeated load strains, and therefore they should be preferred for the use in large inguinal hernias.

031 Fibrin sealant reduces adhesions to cPTFE meshes in experimental IPOM repair in rats and pigs

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Background. The use of Fibrin sealant (FS, Tissucol, Baxter Biosciences, Vienna, Austria) for mesh fixation in inguinal and incisional hernia repair decreases the risk of tissue trauma and the incidence of chronic pain. This study was designed to assess the potential impact of FS fixation on adhesion formation to cPTFE (condensed polytetrafluoroethylene) meshes (Motif® Meshes, MM, Proxy Biomedical, Ireland) in experimental intraperitoneal onlay mesh repair (IPOM).

Methods. Sixteen rats and four domestic pigs were assigned to the implant of MM with 4 non resorbable sutures and additional FS sealing vs. MM with 6 non resorbable sutures only ($n = 8$ per group in rats; $n = 4$ per group in pigs). One MM (2 cm in diameter) was implanted per rat, 4 MMs (oval shaped, $6 \times 8\,\text{cm}^2$) per pig and 0.3 ml of FS were applied for fixation in rats, 1 ml per MM in pigs. Observation period was 17 days and 4 weeks in rats and 4 weeks in pigs. Adhesions were scored, using the Vandendael score. Histology was performed.

Results. All MMs without FS elicited severe (grade III) adhesions to bowel, liver and the omentum. Eleven out of 12 sealed MMs were scored mild (7) to moderate (4). The margins of the MM as well as the suture knots were defined as critical areas primarily provoking adhesions.

Conclusions. In an experimental model of IPOM repair, FS fixation reduces adhesions to a synthetic mesh material. According to literature, our results emphasize the problematic issue of adhesion formation to corner zones of implants.

032 Five year experience with cicatriceal hernia repair in sublay technique applying the Rives and Stoppa method

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Background. Major abdominal operations, especially done by midline incisions have a rather high tendency to develop incisional hernias. Primary closure by a suture line is affected by an unacceptable high recurrence rate. The Reinforcement by an onlay mesh improved that rate but recurrences of more than 25% were even too much. So we changed our treatment for large inciscional hernias applying the sublay mesh technique introduced by Rives and Stoppa.

Methods. Retrospective analysis of our patients operated on for large incisional abdominal hernias by sublay mesh technique. The methods and results are presented.

Results. Between September 2001 and December 2006 we performed 67 Rives-repairs, 40 Stoppa-repairs, 14 combined Rives-Stoppa-repairs in 49 men and 58 women. There were two major complications (bowel obstruction, intestinal leakage) (1.8%). The infection rate was 10%, in one case the mesh had to be removed. In two cases an operative revision for seroma was necessary. Two recurrences occurred at the border of the mesh fixation (1.8%). The total reoperation rate was 7.5%.

Conclusions. To our opinion the sublay-mesh-repair for large incisional hernias fulfills all the criterias for effective treatment. This method is accompanied by a very low recurrence rate, major complications are rather low and the acceptance on the part of the patients is high. So we recommend this method for large incisional hernias.

033 On our experience with a laparoscopic reparation of abdominal wall and incisional hernia

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Background. Open repair of abdominal incisional hernia, umbilical-and epigastric hernia is assocaited with a poor outcome.

The incidence of recurrence, first of all, has been lowered by a laparoscopic technique.

Methods. During the last 3 years we have operated on 56 patients for incisional and abdominal wall hernias.

Results. There were 30 men and 26 women with a mean age of 58.1 years. We applied an intraperitoneal onlay mesh-technique (IPOM) by a laparoscopic way. Twenty-three patients had an abdominal incisional hernia, 13 an umbilical hernia, 15 an epigastric hernia, 4 a trocar-hernia and one patient a Spigelian-hernia. The diameter of abdominal wall defects was 2–12 cm. In 30 patients a Parietex Composite-Mesh has been used, in 22 a Proceed-Mesh, in 3 a Bard Composix-Mesh and in one patient two $15 \times 15\,cm^2$ TiMeshes. Mesh-size was $10 \times 15\,cm^2$ to $20 \times 30\,cm^2$. Hernia sacs were left in place, hernia contents, mostly omentum, were replaced into the abdominal cavity. Meshes were fixed using endo-clips in 4 patients, tacks in 22 and the Salute Fixation-System in 30 patients. Postoperative follow-up includes a control at 1 week, 1 month and 1 year postoperatively. There were no problems during operation. Patients were discharged on the second postoperative day. After a mean follow-up of 18.1 months (1–43 months) two patients have a hernia recurrence, three patients had local pain for one month and one patient had an umbilical infection, which could be managed without the removal of the mesh.

Conclusions. Laparoscopic incisional and abdominal hernia repair has a low incidence of complications and shows a rapid postoperative recovery of patients. Long-term follow-up is necessary for evaluation of mesh reactions with regard to infection as well as to adhesion formation with the intestine.

034 The fixation of hiatal meshes with fibrin sealant in an experimental model in pigs

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Background. The fixation of hiatal meshes with perforating devices, such as tacks or sutures, can be associated with potentially life threatening complications [1]. Fibrin sealant (FS, Tissucol, Baxter Biosciences, Vienna, Austria) is successfully used for atraumatic mesh fixation in inguinal and incisional hernia repair [2, 3]. The rationale of this study was to test the potential of FS fixation of hiatal meshes in pigs.

Methods. In general anaesthesia, 6 domestic pigs were subjected to laparotomy and designated meshes (TI-Sure, GfE, Nuremberg, Germany) were implanted at the hiatus. The titanized polypropylene material was found to be favorable in combination with FS in a previous study [4]. Meshes were sealed with 2 ml of FS, which was applied with a spray system. The observation period was 4 weeks in all animals in order to assess tissue integration after the FS was already degraded.

Results. All meshes showed excellent integration and no sign of dislocation or perforation into the neighbouring organs. Histology was used to confirm.

Conclusions. FS for hiatal mesh fixation provides a safe and effective alternative to perforating fixation devices in an animal model of repair.

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Ösophagus

035 Epidemiology of esophageal, cardiac and gastric carcinoma in Austria

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Background. We aimed to assess the incidence for esophageal, cardiac and gastric cancer.

Methods. Annual incidence data and age adjusted rates for the years 1990 to 2003 were obtained from Statistics Austria which operates the nationwide Austrian Cancer Registry. According to ICD-O-3 (International Classification of Diseases for Oncology, third edition), the following categories were considered: esophageal squamous cell carcinoma (C15, 805–808), esophageal adenocarcinoma, (C15, 801–804), cardiac adenocarcinoma (C16.0, 801–804) and non cardiac gastric adenocarcinoma (with known and unknown subsite, C16.1-9, 801–804), esophageal and gastric tumors with ill-defined histology and death certificate only (DCO)-cases.

Results. Annual incidence of esophageal squamous cell carcinoma increased from 93 cases in 1990 to 170 in 1997, peaked in 1998 (176 cases) towards 2001 (170), declined towards 137 and 135 cases in 2002 and 2003, respectively. From 1990 to 2003 adenocarcinoma of the esophagus increased 3 fold (33 vs. 100). The number of unspecified epithelial neoplasms of the esophagus remained stable (39–35 cases). DCO cases, comprising no histological information, were stable from 1990 ($n = 66$) to 1996 ($n = 61$), decreased until 2001 (35 cases) and increased in 2003 (73 cases). From 1990 to 1993 adenocarcinoma of the cardia increased 1.38 fold (93 vs. 128) and remained rather stable with about 120 cases per year until 2002; 2003 130 cases were registered. Non cardiac gastric adenocarcinomas and gastric adenocarcinomas with ill-defined location decreased 1.16 fold (214 vs. 184) and 1.59 fold (851 vs. 536), respectively. The numbers of histologically unspecified cases of malignant cardia tumors and DCO cases remained rather stable (unspecified: 29 in 1990 and 19 in 2003; DCO: 14 cases in 1990 and 10 cases in 2003). Gender distribution shows an increase of esophageal squamous cell carcinoma in females (male:female $87{:}6 = 14.5$ in 1990 to $98{:}37 = 2.6$ in 2003) and esophageal adenocarcinoma (male: female ratio 1990 vs. 2003; 26:7 vs. 86:14; ratio 3.7 vs. 6.1) and cardiac adenocarcinoma for males (65:28 vs. 100:30; ratio 2.3 vs. 3.3). Age adjusted rates per 100.000 population of non-cardiac gastric carcinomas decreases for both sexes (data not shown).

Conclusions. We observed an increase of esophageal squamous cell carcinoma in females and esophageal and cardiac adenocarcinoma for males and a decrease of non-cardiac gastric carcinomas for both sexes.

036 Endoscopic versus open esophageal resection: a prospective case-control study within the learning curve

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Background. Esophageal resection for cancer is followed by remarkable morbidity. Endoscopic surgery has been established to reduce the physical burden. In our institution endoscopic and open esophageal resection is performed transthoracally (TSE) or transmediastinally (LSTME) as appropriate. We aimed to compare outcomes of case matched open and minimal access esophageal resection by a case-control analysis.

Methods. Endoscopic minimal access esophageal resection (MAE) has been performed since 2004 (MAE). A retrospective case control study including patients (prospectively collected data) who underwent MAE (TSE, 17, LSTME, 3) has been undertaken with matched (pairs matched for sex, age, tumour type and type of resection) historical open (OE) cases operated between 2004 and 2006 (transthoracic esophageal resection TTE, 14, transmediastinal esophageal resection TME, 6). Groups were comparable regarding age, sex distribution, tumour type (as consequence of matching) as well as regarding tumour stage and comorbidities.

Results. Forty patients (males, 28; females, 12; mean age 60 ± 12 yrs) were included in the study. There were 19 adenocarcinomas and 21 squamous cell cancers. 15 patients had neoadjuvant chemotherapy (Fu/Cis). Duration of surgery, number of resected lymphnodes, duration of intubation, ICU stay and hospital stay was 424 vs. 373 min ($p = 0.01$), 19 vs. 23 ($p = 0.2$), 0.8 vs. 3.4 days ($p = 0.1$), 4 vs. 10 days ($p = 0.03$) and 16.2 vs. 28 days ($p = 0.02$) in the MAE and OE group, respectively. Due to preexistent anemia 2/20 MAE patients received erythrocyte substitution preoperatively, 7/20 patients of the OE group needed erythrocyte subsitution perioperatively. 1/20 and 5/20 patients underwent reoperation for a complication in the MAE and OE group. Overall surgical morbidity was 20% (4/20) and 40% (8/20). Postoperative pneumonia was observed in 1/20 and 4/20 among MAE and OE patients.

Conclusions. During the learning curve duration of MAE is significantly longer when compared with OE. Morbidity was reduced, ICU and hospital stay were significantly shorter after MAE, regarding duration of postoperative ventilation there was a trend towards MAE. Oncological quality was comparable between groups with respect to the number of resected lymph nodes. The need for blood substitution and reoperation was higher in open esophageal resection. Even during initial establishment MAE seems advantageous for the patient in this case-control study. Randomised trials are still missing.

038 Does the route of gastric pull-up influence the oxygen supply of the anastomosis?

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Background. Microcirculation and oxygen supply at the level of oesophagogastric anastomosis following oesophagectomy are among the crucial factors determining anastomotic healing.

Methods. Twenty-nine patients (mean age 61.7 yrs) were evaluated during oesophagectomy and on the intensive care unit by inserting a micro-probe (Licox) and continuously recording the interstitial pO2 of the tubulated stomach in the anastomotic region. Two different surgical procedures were applied: Group 1 (15/29) had gastric pull-up via a retrosternal, group 2 (14/29) via an orthotopic route. The interstitial pO2 values were averaged over specific consecutive periods: Intraoperatively after ligation of the short gastric vessels, after ligation of the left gastric artery, after forming the conduit and after gastric pull-up. Postoperative measurements were recorded during intubation, while breathing oxygen by mask or by nose delivery, respectively and finally while breathing air.

Results. Before ligating the left gastric artery the interstitial pO2-levels were significantly higher (mean 76.14 mmHg) than after ligation (mean 44.93 mmHg; $p < 0.05$). Comparing the retrosternal (24.64 mmHg) versus the orthotopic pull-up route (68.21 mmHg) a significant difference ($p < 0.05$) in favour of the orthotopic route could be found after gastric pull-up as well as during each postoperative measurement period. No differences could be detected when comparing the various oxygen supply systems.

Conclusions. These data suggest that the oxygen supply at the anastomosis of the pedicled gastric conduit reaches higher levels after orthotopic than following retrosternal gastric pull-up.

039 p53 tailored therapy for esophageal cancer – pilot study

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Background. Randomized trials could not yet prove clinical efficacy of neoadjuvant chemotherapy for esophageal cancer. A survival benefit could be shown for treatment responders only. Using platinum based regimen, yet about 20% of patients can achieve pathological complete remission which translates

in reported 3-year survival rates of 64% in this group. Factors identifying this subgroup of responders and selecting optimal drugs for non responders could dramatically enhance treatment efficacy. Several studies suggest that mutations in the p53 gene may induce drug resistance especially for agents whose effect is based on apoptosis induction, like Cisplatin.

Methods. In order to test the hypothesis that the p53 genotype is predictive for chemotherapy response, a prospective study was conducted. Thirty-eight patients with potentially respectable esophageal cancer were evaluated for the relation between p53 genotype and response to two different neoadjuvant treatments. P53 gene mutations were assessed by complete direct sequencing of DNA extracted from diagnostic biopsies. Response to neoadjuvant chemotherapy was assessed pathohistologically in the surgical specimen.

Results. Twenty squamous cell carcinoma and 18 adenocarcinoma were included. Overall the p53 mutation rate was 58% (22/38), with 66% for squamous cell and 53% for adenocarcinomas, respectively. 30 patients received CIS/5FU (Cisplatin 80 mg/m^2 d1 5-FU 1000 mg/m^2 d 1–5, q21,2 cycles), 8 received Docetaxel (75 mg/m^2, q21,2 cycles). The overall response rate was 48% (18/38). Patients with p53 mutation did not respond to CIS/5-FU (0/16), while all mutant patients responded to Docetaxel (6/6). The overall response to p53 adapted neoadjuvant therapy was 94%. P53 adapted treatment was associated with a significant survival advantage ($p = 0.042$) after a median follow up of 15.4 months.

Conclusions. A prospective randomized trial was initiated to test the interaction between the predictive marker p53 and response to CIS/5-FU and Docetaxel, respectively.

	Cisplatin/5-FU			Docetaxel		
	p53 normal	p53 mutant	p value	p53 normal	p53 mutant	p value
Response: CR, PR	12	0		0	6	
Failure: SD, PD	2	16	<0.001	2	0	0.002

040 A new method of anti-ischemic graft protection in retrosternal colon esophagoplasty

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Background. Retrosternal colon esophagoplasty is the operation of choice in infants with esophageal atresia with great diastasis. Although complications are rare, some cases of graft ischemia are registered. Epidural block have beneficial effect on splanchnic blood flow because of drug sympathectomy.

Methods. We retrospectively analyzed rate of graft ischemia in infants with retrosternal colon esophagoplasty and conventional postoperative course with anticoagulants and antiaggregants (group 1, $n = 17$). Group 2, $n = 11$ was investigated prospectively with preoperative catheterization of epidural space (Th10–Th11 level, lost of resistance test, G20 size) and 0.25% bupivacaine administration in daily dose of 2.5 mg/kg every 4 h. The rest of therapy was equal in all patients. Graft status was determined visually. Gut motility was considered to restore when stool have been obtained.

Results. Rate of graft ischemia was significantly lower in group 2 then in group 1 (0 vs 4, $p < 0.05$). Besides this, gut motility restoration in group 2 was significantly earlier (2.4 ± 0.2 vs 4.5 ± 0.3 days, $p < 0.05$).

Conclusions. Epidural block with local anesthetic is an effective method of anti-ischemic protection of neo-esophagus and powerful instrument in gut motility restoration.

ÖGTH – Herz: Varia

045 Concomitant left atrial ablation during heart surgery as treatment for atrial fibrillation

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Background. Atrial fibrillation (AF) is often associated with thromboembolic complications, heart failure and stroke; in addition an increase in mortality, even with adequate anticoagulation, is observed. The MAZE operation is an effective and accepted method to terminate AF, nevertheless the risk for intraoperative bleeding is increased compared to left atrial ablation procedures using variable energy sources. Left atrial ablation is an alternative method to convert AF into sinus rhythm (SR), as with this procedure linear lesions connecting the four pulmonary veins and the posterior mitral annulus are created with microwave or high frequency technique.

Methods. A consecutive series of 108 patients (51 females, 57 males; age 66a, range 38–85a) underwent ablation during various cardiac surgical procedures between 2001 and 2006. Endocardial ablation using either microwave or radiofrequency energy was performed 103 times (95.4%) and epicardial with microwave energy in five cases (4.6%). Preoperative parameters: Ejection fraction 53.6% ± 9.9%; diameter left atrium 54.7 ± 9.7 mm. Forty-one patients underwent mitral valve repair (MVP), 37 patients obtained mitral valve replacement (MVR), 18 patients received aortic valve replacement (AVR), 8 patients underwent coronary bypass surgery (CABG) and 4 patients had combined valve surgery (others).

Results.

Table 1.

		AVR	MVR	MVP	CABG	Others	
Rhythm	SR	14	21	24	7	4	70
	AF	4	15	12	1	–	32
	AFlut	–	–	5	–	–	5
	PM	–	1	–	–	–	1
Total		18	37	41	8	4	108

Others Combined valve replacement: MVR + TVP, MVR + AVR; *AF* atrial fibrillation; *AFlut* atrial flutter; *PM* pace maker

No intraoperative or postoperative complications related to the concomitant ablation procedure were observed. One patient died because of multiple organ failure. After a mean follow up period of 75 months ± 52 70 patients remained in SR (64.8%), 32 patients into AF (29.6%), 5 patients changed rhythm into atrial flutter (4.6%) and one patient required a pace maker (0.9%).

Conclusions. In approximately two thirds of patients left atrial ablation is effective in restoration and maintenance of SR in patients with structural heart disease and AF. This method represents a valid alternative to the MAZE technique, reducing myocardial ischemic time and risk of bleeding. Midterm results are promising; however for determination of a long term benefit especially regarding thromboembolic events, a higher number of patients and a longer follow up period are desired.

046 Endocardial and epicardial left atrial ablation in patients undergoing heart surgery

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Background. The study aim was to evaluate the efficacy and outcome of endocardial and epicardial atrial fibrillation (AF) ablation in patients undergoing heart surgery.

Methods. Between February 2002 and December 2006, 81 patients (mean age 67 years, range 48–80) underwent left atrial ablation combined with other type of cardiac surgery. In 73 patients endocardial left atrial ablation using a unipolar radiofrequency device (Cardioblate™, Medtronic, USA) was performed, mainly in combination with mitral valve (MV) surgery (43 MV repair, 27 MV replacements). In 8 patients epicardial pulmonary vein isolation using microwave energy (FLEX 10™, Guidant-Boston Scientific, USA) was done during Aortic valve replacement (4) and bypass grafting (4). Indication for atrial ablation was permanent AF in all patients. Endocardial ablation was performed during extracorporal circulation (ECC) with a mean time of 9 min (5–17), epicardial ablation before ECC with a mean ablation time of 16 min (14–19). 91% of the patients (74) received amiodarone postoperatively, 9% (7) betablocker. 21 patients underwent epicardial cardioversion with Synchrus™ (Guidant, USA) wires postoperatively.

Results. The overall mortality was 2.4% (2 patients during MV replacement due to posterior bleeding) complications were posterior rupture (4), LCO with the need of intraaortoc pallon pump (3), 2 resternotomies for bleeding, and and 11 (13%) pacemaker implantations (13.5%). There were no ablation procedure related complications. Sinus rhythm (SR) was achieved in 71% after operation, 42% at discharge and 68% at the 3 month follow up. A nodal rhythm was found in 20% after operation, 5% at discharge and in 4% after 3 months. 4 patients developed atrial flutter (3 in the group of endocardial and 1 in the group of epicardial ablation). AF persisted in 28% of the patients at 3 month.

Conclusions. AF ablation combined with cardiac surgery is safe and effective. Recurrent AF is frequent during the first three months after ablation also under therapy with antiarryhthmic drugs.

047 Patient-prosthesis mismatch can be predicted at the time of operation

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Background. Patient-prosthesis mismatch is a frequent cause of high postoperative mortality and gradients. The objective of this study was to determine whether mismatch can be predicted at the time of operation.

Methods. Indices used to predict mismatch were valve size, indexed internal geometric area and projected indexed effective orifice area (EOA) calculated at the time of operation, and results were compared with the indexed EOA measured by Doppler echocardiography after operation in 1097 patients.

Results. The sensitivity and specificity of these indices to detect mismatch, defined as a postoperative indexed EOA of 0.85 cm/m or less, were 30% and 84% for valve size 47% and 86% for indexed internal geometric area, and 79% an 87% for projected indexed EOA.

Conclusions. The projected indexed effective orifice area calculated at the time of operation accurately predicts mismatch, where as valve size and indexed internal geometric area cannot be used for this purpose.

048 Excellent long-term results after emergency cardiac surgery

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Background. Data from all adult patients undergoing emergency heart surgery between 1991 and 2003 at the Division of Cardiac Surgery, Medical University of Graz, Austria, were reviewed retrospectively.

Methods. Data were stored in a local cardiac surgery database. The registery included all relevant patients data and EuroSCORE. No patient was lost to follow-up. A series of relevant perioperative data were collected. Recorded complications were use of the intra-aortic balloon pump (IABP) and low cardiac output syndrome. Hospital and late mortality data were collected from the Austrian National Populations Register. Multivariante analysis was performed to determinate predictors for cardiac related death.

Results. Between 1991and 2003 568 patients underwent emergency cardiac surgery at our institution. There were 342 men (60.2%) and 226 women (39.8%) with an average age of 56.5 years. Coronary artery bypass was performed in 40.59%, 2.46% combined valve and bypass, 14.08% valve, 17.60% aortic dissection and 25.27% had other procedures. Eighty-seven patients (15.3%) had a postoperative low cardiac output syndrome. The intra-aortic balloon pump was used in 85 patients (15.3%). Variables identifying as high risk for perioperative cardiac related death were diagnosis other then coronary artery disease, patients with IABP and high catecho-

lamine demand. There were no postoperative wound infections. Eighteen patients (3.1%) had excessive postoperative bleeding and 6 (1.04%) required a late re-intervention. Hospital mortality was 18.16% and the late mortality after 13 years was 34.17%.

Conclusions. The hospital mortality was higher in the emergency group but there was no difference in the long-term results for elective and emergency surgery. Early mortality was significant higher in patients operated for other reason than coronary artery disease.

049 Risk factors for acute renal failure after cardiac surgery – evaluation of different methods to investigate renal function

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Background. Acute renal failure is a serious adverse event after cardiac surgery, which is associated with high perioperative mortality and prolonged hospitalization. The aim of our study was to evaluate pre- and intraoperative risk factors for the development of acute renal failure requiring hemofiltration (ARF) after cardiac surgery. The influence of different methods for evaluation of renal function was investigated.

Methods. From 01/2002 through 12/2005, 2652 patients underwent cardiac surgery at our institution. 197 Patients developed ARF (7.4%), Patients suffering from chronic end-stage renal insufficiency were excluded from the study. Patient characteristics and operative variables were analyzed. A multivariate logistic regression analysis was performed to determine risk factors for ARF.

Results. Patients, who developed ARF, were older ($p < 0.003$, OR: 1.037) as compared to patients who did not develop ARF. Furthermore, diabetes mellitus ($p = 0.001$, OR: 1.884), peripheral artery disease ($p = 0.003$, OR 1.979), cardiogenic Shock ($p = 0.043$, OR: 2.957), congestive heart failure ($p = 0.013$, OR: 1.601) und emergent surgery ($p = 0.001$, OR: 3.032) were predictive for development of ARF. Preoperative serum creatinine was not predictive for ARF ($p = 0.064$, OR: 1.366). Classification of preoperative serum creatinine into normal (≤ 1.2 mg/dl), slightly elevated (1.2 to < 2 mg/dl) and severely elevated (≥ 2 mg/dl), reveals a correlation with the development of for severely elevated creatinine levels ($p = 0.014$, OR: 3.826), as well as for slightly elevated levels ($p = 0.014$, OR: 1.871). Calculation of creatinine clearance mwith the Cockcroft-Gault formula demonstrated a strong correlation with the development of ARF ($p = 0.026$, OR:0.983). Calculation of creatinine clearance with the MDRD formula, however, failed to reveal any correlation with ($p = 0.122$, OR: 1.012).

Conclusions. Our data indicate, that advanced age, diabetes mellitus, peripheral artery disease, cardiogenic shock and congestive heart failure, as well as emergent surgery independently predict ARF after cardiac surgery. Even slightly elevated creatinine levels are a risk for the development of ARF after cardiac surgery. Calculation of creatinine clearance with the Cockcroft-Gault formula is more suitable for preoperative risk stratification as compared to calculation of creatinine clearance with the MDRD formula.

050 Reduced Tenascin-C expression under Endothelin-A receptor blockade is crucial for the development of heart failure post myocardial infarction

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Background. The matricellular protein Tenascin-C (TN-C) induces production of matrix metalloproteinases (MMPs), inhibits cellular adhesion and mediates cellular deadhesion. These effects are crucial in the dynamic process of cardiac remodeling. It has been reported that TN-C expression is up-regulated in ventricular remodeling following myocardial infarction (MI) in the border zone between scar tissue and non-infarcted area. We analysed the expression of TN-C in the post MI infarcted and non-infarcted area after the treatment with the selective endothelin A (ET_A)-receptor antagonist TBC3214-Na. Blockade of the ET_A-receptor decreases cell proliferation, LV hypertrophy, and secretion of pro-inflammatory mediators.

Methods. MI was induced in male Sprague Dawley rats by LAD ligation. Three days post MI, rats were randomised to receive either the endothelin antagonist TBC3214-Na ($n = 6$) or placebo ($n = 6$), as control rats were sham-operated without LAD ligation ($n = 4$). After 7 days hearts were harvested and tissue samples from scar, peri-infarct and free wall were analysed by western blot using a monoclonal antibody specifically recognizing the EGF like domain of TN-C. Tissue was homogenized in urea buffer and protein samples were subjected to 6% polyacrylamide gel SDS-PAGE, transferred on to a membrane and immunostained with the anti-TN-C monoclonal antibody and anti-mouse alkaline phosphatase antibody. Additionally on day 7 and 42 echocardiography and morphological analysis were performed to assess the effect of TBC3214-Na therapy on cardiac function.

Results. Infarct size was comparable in all groups (ET_A-group $44.07 \pm 9.56\%$, placebo group $44.59 \pm 7.35\%$). During early remodelling on day 7, in the placebo group, TN-C was up-regulated in scar tissue. In contrast, in the ET_A-group, TN-C was down regulated in scar tissue. On day 42 post MI, no differences were seen in the TN-C levels. Echocardiography showed significant improvements in hemodynamics in the ET_A-group in contrast to controls.

Conclusions. From these results, we can conclude that (1) Endothelin-A receptor blockade attenuates the development of heart failure post MI, (2) reduction of TN-C expression seems to have a positive effect on postinfarct remodeling, (3) TN-C regulation is influenced by ET_A-blockade and (4) that TN-C is a marker for LV remodeling after myocardial infarction.

051 Normothermic cardiopulmonary bypass reduces neurocognitive deficit in diabetic patients undergoing CABG – a prospective randomized trial

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Background. Diabetes is a risk factor for neurocognitive and neurological complications after cardiopulmonary bypass. We sought to determine if temperature management during cardiopulmonary bypass (CPB) affects the incidence of neurocognitive and neurological complications in diabetic patients.

Methods. In this prospective randomized study, we measured the effects of mild hypothermic (32 °C, $n = 40$) vs. normothermic (37 °C, $n = 40$) CPB on neurocognitive function. All patients underwent elective coronary artery bypass grafting (mean age 64.2 ± 4.8 years, mean ES 4.4 ± 2.2). Neurocognitive function was objectively measured by objective P300 auditory-evoked potentials before surgery, 1 week and 4 months after surgery, respectively. Clinical data and outcome were monitored.

Results. P300 evoked potentials were comparable between patients operated with mild hypothermic (368 ± 39 ms) and normothermic CPB (370 ± 33 ms) before the operation ($p = 0.674$). Patients operated with mild hypothermic CPB, showed marked impairment (= prolongation) of P300 evoked potentials 1 week (387 ± 30 ms; $p < 0.001$) and 4 months (380 ± 37 ms; $p = 0.042$) after surgery. In contrast, patients operated with normothermic CPB did not show impairment of P300 evoked potentials 1 week (374 ± 33 ms; $p = 0.098$) and 4 months (373 ± 39 ms; $p = 0.143$) after surgery. Group comparison revealed prolonged P300 peak latencies in the patient group operated with mild hypothermic CPB ($p = 0.046$) 1 week after surgery. Four months postoperatively, no difference between the two groups could be shown ($p = 0.173$). Operative data and adverse events were comparable between the two groups.

Conclusions. Normothermic cardiopulmonary bypass reduces neurocognitive deficit in diabetic patients undergoing elective coronary artery bypass grafting.

052 Die Behandlung mit Paclitaxel reduziert die neointimale Hyperplasie in der Venenkultur humaner Venae saphenae

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Grundlagen. Die neointimale Hyperplasie stellt einen frühen pathologischen Zustand von Vena saphena magna Bypässen dar. Wir verwendeten das etablierte Organkulturmodell zur Provokation einer intimalen Hyperplasie und deren Behandlung mit Paclitaxel (Taxol, als Beschichtung von Stents in klinischer Verwendung) in menschlichen Venae saphenae.

Methodik. Humane Venen ($n = 13$) wurden 2 Wochen kultiviert und mit unterschiedlichen Konzentrationen von Paclitaxel (1, 10, 25 und 50 µM) behandelt, die Kontrollgruppe wurde unbehandelt in Organkultur gehalten. Anschließend wurde die intimale Hyperplasie gemessen und mit den Ausgangswerten (baseline) verglichen. Zudem wurden Bindegewebsfärbungen (Elastica, Trichrom Masson) und immunhistochemische Färbungen (smooth muscle actin SMA, Desmin, Proliferationsmarker Ki67) durchgeführt.

Ergebnisse. Die Paclitaxelbehandlung führte zu einer dosisabhängigen Reduktion der intimalen Hyperplasie im Vergleich zur Kontrollgruppe ($p = 0.022$ bei 1 µmolar, $p = 0.035$ bei 10 µmolar, $p = 0.03$ bei 25 µmolar und $p = 0.011$ bei 50 µmolar). In der Elasticafärbung fanden sich sowohl in der Media als auch in der Intima meist nur vereinzelte elastische Fasern, wohingegen sich in der Trichromfärbung in der Media insbesondere subintimal reichlich kollagene Fasern fanden, die Intima selbst jedoch hierfür negativ blieb. Immunhistochemisch zeigte sich die Media und die Intima praktisch vollständig positiv für SMA. Bei der Desmin-Färbung fand sich die Media ebenfalls fast durchgehend spezifisch positiv für Desmin, die Intima hingegen färbte sich hierfür jedoch in unterschiedlichen Ausmaß (5–90%) an. In der Proliferationsfärbung mit Ki67 zeigten sich vorwiegend die längsverlaufenden Muskelfasern der Media stark proliferierend, wohingegen der subintimale Mediabereich und die Intima nur vereinzelt Ki67 positiv war.

Schlussfolgerungen. Paclitaxelbehandlung reduziert die intimale Hyperplasie in der Vena saphena im Organkulturmodell. Elastische Fasern, Kollagenfasern, SMA positive und Desmin-positive Zellen sowie Ki67 positive (proliferierende) Zellen weisen unterschiedliche bevorzugte Lokalisationen innerhalb der Gefässwand auf.

053 Heat shock proteins 27/60/70/90α and 20S proteasome in on- versus off-pump coronary artery bypass graft patients

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Background. Heat shock protein (HSP) 27, HSP60, HSP70, HSP90α and 20S immune-proteasome are known chaperons. They play a prominent role in housekeeping processes, in the intracellular regulation of the immune system and in apoptosis. Serum levels of circulating chaperons are not known in patients undergoing the on-versus off-pump coronary artery bypass graft (CABG) procedure.

Methods. Forty patients were prospectively included in the study (on-vs. off-pump CABG, each $n = 20$). ELISA technique was utilized to detect levels of soluble HSP27, 60, 70, 90α and 20S immune-proteasome in serum samples.

Results. On-pump CABG procedure is associated with an increased leakage of heat shock proteins into the vascular bed when compared to off-pump CABG technique. These differences were highly significant for HSP27, 70 and 90α 60 min after initiation of cardiopulmonary bypass (CPB) (all, $p < 0.001$). Concentrations of soluble 20S immune-proteasome were increased 24 h after operation in on-and off-pump CABG patients

($p < 0.001$) and correlated significantly with the serum content of HSPs 27, 70 and 90α at 60 min after initiation of CPB ($p < 0.001$).

Conclusions. Our data evidence the spillage of chaperons, normally intracellular restricted proteins, into the systemic circulation. As these proteins are related to immunomodulatory and apoptotic processes, we conclude that the innate immune system is more activated in on-pump as compared with off-pump CABG patients. However, the precise immunological consequence and interpretation requires further investigations.

Österreichische Gesellschaft für Gefäßchirurgie: Tradition und neue Techniken: Infrarenaler Abschnitt und venöse Insuffizienz

054 Abdominal aortic aneurysm rupture: enhancing chances of survival by offering both open and endovascular repair

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Background. In the treatment of ruptured abdominal aortic aneurysm (rAAA) the results of open graft replacement (OGR) remained constant but discouraging over the last four decades. Provided patients have a suitable vascular anatomy, elective endovascular abdominal aortic aneurysm repair (EVAR) turned out to be less invasive than OGR and led to improved perioperative mortality especially for patients with severe comorbidities. Thus, it is reasonable to assume that endovascular treatment should improve the results of patients with risk factors heavily impaired by rupture of their AAA. The purpose of this study was to test whether the use of both endovascular and open repair for rAAA was able to improve results.

Methods. Retrospective analysis of a consecutive series of 89 patients presenting with rAAA from October, 1999, until July, 2006. Observation period was divided in two periods of 41 months, respectively. During the first period 42 patients were treated by OGR exclusively. Period two started with the availability of an EVAR protocol to treat rAAA, according to which 31 patients received open repair while 16 patients underwent EVAR. Kaplan-Meier survival estimates were calculated and possible differences were analyzed by Log-Rank and Wilcoxon-Test.

Results. Kaplan–Meier survival estimates revealed a statistically significant reduction in overall postoperative mortality following the introduction of EVAR in 2003 ($p < 0.027$). Ninety day overall mortality was reduced from 54.8% during period one to 27.7% during the second period ($p < 0.011$). Especially survival of patients older than 75.5 years was improved (75% vs. 28.6%, $p < 0.014$). In parallel there was a significant reduction of the 90 day mortality rate after OGR from 54.8% (i.e. overall mortality) to 29% ($p < 0.034$).

Conclusions. Offering both EVAR and OGR in the treatment of rAAA led to significant improvement of postoperative survival. Especially older patients seem to benefit from the less invasive endoluminal technique.

055 Fast track concept for infrarenal aortic aneurysm repair

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Background. The aim and main benefit of the fast track concept in surgery are increased patient comfort and reduced perioperative morbidity and mortality. In abdominal surgery, this concept has proven efficient. We present our experience of fast track aortic surgery.

Methods. Retrospective analysis of prospectively collected data. Since initiating this method of perioperative patient management in January 2006, 22 patients underwent infrarenal aortic reconstructions for aortic aneurisms applying the fast track concept. This comprises of modified nutrition and fluid management, anaesthesiological management and a special retroperitoneal access allowing aggressive postoperative mobilisation.

Results. 22 patients were included in the study, their mean age was 68 years (range 59–76 years) None of the patients had surgical complications, no mortality was observed. The ICU days were reduced to 1 for all 22 patients. The mean hospital stay was 9 days (range 6–14 days).

Conclusions. Hospital stay and ICU days could be reduced dramatically compared to standard therapy at our institution. This new concept in aortic surgery is a valid alternative to EVAR for selected patients.

056 Aneurysma der A. lienalis: Fallbericht über interventionell-chirurgisches Management

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Aneurysms of splenic arteries are seldom (0.1% of all aneurysms). Nevertheless they are disastrous when ruptured since they bleed into the free abdominal cavity without any means of self-tamponade.

Occurrence of splenic aneurysms is related to female gender, esp. after multiple gravidities. These aneurysms are usually symptomless and tend to rupture during labour pains. This fact explains the reports on ruptured splenic aneurysms in

young women from developing countries whereas in western countries most findings are incidental in routine imaging scans.

We report on a 37 yo female from Chechnya with a huge splenic aneurysm and splenomegaly. She complained about chronic fatigue and nausea. Splenomegaly and a pulsating growth in the mid epigastrium were palpable in the physical examination. The WBC blood counts showed severe pancytopenia. CT-scan revealed a calcified aneurysm (Ø 12 cm) of a tortous splenic artery and an enlarged spleen (32 cm).

We decided to occlude the origin of splenic artery interventionally and and to perform a ''lone splenectomy'' leaving the unperfused aneurysm in situ. The intervention achieved total angiographic occlusion. However during surgery the aneurysm was still under pulsatile pressure. The pulsation ceased on surgical ligation of the proximal splenic artery. Subsequently the splenectomy was performed.

The patient recovered without surgery related complications. A year after surgery she has normal blood counts. The aneurysm has not shrunk but shifted to left to adopt the space left over by the spleen.

057 Transilluminated powered phlebectomy (TriVex®, TIPP) in treatment of varicosis – a review of 214 cases

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Background. The Transilluminated Powered Phlebectomy (TIPP; TriVex®, Smith and Nephew) was introduced in the year 2002 in our hospital. TriVex® is a procedure for minimal invasive vein surgery including an illuminator device, a powered vein resector, a light source and a controll unit. The use of tumescent solution allows hydrodissection and facilitates ablation (rotating inner blade of vein resector combined with suction).

Methods. In an retrospective study we report 214 patients (42 males and 172 females; mean age 48.7 years; 310 limbs) treated with this technology during the years 2005 and 2006. We used a combination stripping the saphenus veins (207 ligations of the sapheno-femoral junction, 46 ligations of the popliteo-femoral junction) or ligations of perforantes (62) if necessary according to sonography. Twenty-seven patients underwent single TriVex® treatment. 83.41% were done in general anaesthesia. A follow up is proposed to all patients after 3 to 9 months (64 patients, 29.90%).

Results. The average time of surgical treatment was 67.12 min, with single trivex 42.37 min. The TriVex® procedure for one single leg took about 15 min. The average stay was 3.3 days. Regarding to postoperative complications one patient experienced laceration of the femoral vein (0.5%), one profound bleeding caused a revision the same day (0.5%). 2 patients developed lokal wound infektion within the first 2 weeks (0.9%). During the follow up period complications like swelling (2), seroma (3), brown scars (3), nerve injury/numbness (3), haematoma (2) occured. There was no skin perforation, no phlebitis, none of our patients died.

Conclusions. According to these results the TriVex® procedure seems to be a quick and safe treatment for minimal invasive removement of superficial varicosities.

058 Randomisierte klinische Studie: Bipolar-koagulierendes versus konventionelles Stripping der V. saphena magna bei symptomatischer Varikose

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Background. This randomized, patient and observer blinded trial compared early postoperative outcomes in saphenectomy with either a new bipolar coagulating electric vein stripper (EVS) or invagination stripping.

Methods. The primary outcome was pain at rest and following physical stress (climbing stairs), as assessed by a Visual Analog Scale (VAS) 24 h after surgery. Secondary outcomes included haematoma formation (diagnosed and measured by ultrasound), duration of postoperative compression, and disability. Quality of life was assessed by a disease-specific Chronic Lower Limb Venous Insufficiency Questionnaire (CIVIQ), and the generic Short Form 36 (SF-36).

Results. Two Hundred patients were assigned to three vascular centers, with 99 patients randomized to the EVS and 101 to the conventional arm. There were no complications or conversions. Pain at rest averaged 1.6 in the EVS and 3.3 in the conventional group (mean difference 1.7, 95 per cent confidence interval (c.i.) 1.4 to 1.9, $p < 0.001$). Following physical stress, mean ratings were 3.3 and 5.5 (mean difference 2.3, 95 per cent c.i. 1.9 to 2.6, $p < 001$). No measurable haematoma was found in the stripping canal of the EVS group, while in the conventional arm 74 patients had haematomas within this region (risk difference 73 per cent, 95 per cent c.i. 65 to 82 percent). Duration of compression therapy was significantly decreased in the EVS group (mean difference 20 days, 95 per cent c.i. 17 to 23 days). In the EVS group, 30 patients returned to work after 1 week and 95 after 3 weeks, compared to 12 and 40 patients in group 2. CIVIQ and SF-36 ratings favored the EVS.

Conclusions. The EVS is a safe instrument. It is effective in avoiding painful haematomas following saphenectomy, reduces recovery time and improves patients' ratings of quality of life.

059 ELT in combination with PIN stripping in the treatment of epifascial truncal veins

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Background. In the treatment of varicose truncal veins, endolaser treatment has widely been accepted as the method of choice. Yet laser treatment – in particular in epifascial veins – may result in a painful contraction. We examine the functional and cosmetic results as well as the patients' comfort,

combining ELT and PIN Stripping in patients with epifascial truncal veins.

Methods. Preoperative evaluation is carried out by color duplex sonography. Emphasis is laid on patients with a partially epifascial course of the greater saphenous vein (GSV). Following extensive evaluation and information of the patient, the decision is made to use endolaser treatment (Biolitec, 980 nm) in combination with PIN-stripping (retriever-PIN by OESCH, Salzmann Medico). A guiding wire is inserted, duplex-controlled or through miniphlebectomy, into the GSV at the point of perforation through the fascia. A laser fiber is then positioned at the sapheno-femoral junction, and laser energy is applied to the intrafascial part of the truncal vein (40–70 J/cm) depending on the vein diameter. The epifascial part of the vein is then retrieved by the PIN stripper.

Results. Until now the combination of Endolaser plus PIN Stripping has been applied in 17 patients. Following observation periods of 6 to 12 months, endolaser treatment provides an occlusion rate of 92%. Skin incisions need not be wider than 4 mm. Crossectomy can be avoided. Patients tend to have more hematomas in the PIN-stripped region, yet a hardened, sometimes brown coloured and often painful strand – as often seen in patients treated by endolaser only – can be avoided thereby.

Conclusions. In about 15–30% of the cases, an epifascial position of the GSV might been detected by duplex sonography. In cases of epifascial course of the truncal vein, decision to use ELT treatment alone should be considered critically. In such cases, Endolaser treatment combined with PIN stripping should result in a higher degree of patient comfort, apparently providing an optimal solution for a minimally-invasive approach.

060 Endovenous laser treatment with the 810 Nm laser system; 5 years of experience, follow-up of over 2800 veins

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Background. Chronic venous insufficiency is a common desease. The aims are to offer a minimal invasive alternative to traditional surgery such as crossectomia and stripping with less pain for the patient and a short reconvalescence.

Methods. Since 5 years over 1800 patients with more than 2800 veins have been treated by EVLT, by 44 grand saphenous veins a valve repair by Venocuff II was possible. Only 3 patients have been treated by traditional crossectomia and stripping. Usually the grand and the short saphenous vein as well as the acessoria vein, insufficient perforaters and the giacomini anastomosis are treated by EVLT. The treatment is done in general or in local anaesthesia and monitored by permanent ultrasound control. In no case a surgical crossektomia was necessary. After treatment the patient has to wear a compression stocking for two weeks dayover and should not lift heavy duties.

Results. After treatment the results are verified by ultrasound. The patients are controlled after one week, 6 month and yearly thereafter. The total sucess rate is 93% in all cases (complete resorption of the treated vein). There were no complications like pulmonal embolia, infects or skin burns.

Conclusions. The EVLT is a very safe treatment of chronic venous insufficiency and offers a minimal invasive alternative to traditional surgery such as crossektomia and stripping.

Österreichische Gesellschaft für Chirurgische Forschung: Die Zukunft hat schon begonnen – Bedeutung der molekularen Biologie für Diagnostik, Prognose und Therapie in der gastrointestinalen Chirurgie

061 Proteomic profiling of the secretome of human liver endothelial cells (HLEC)

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Background. Liver endothelial cells play significant roles in the physiology and pathology of the liver. They are not simply barrier cells regulating the traffic of blood components to the parenchyma and vice versa, but highly specialized cells with complex roles, including scavenger functions and regulation of inflammation, leukocyte recruitment and host immune responses to pathogens and shaping of the microenvironment by secretion of functionally relevant proteins. Thus, investigation of the functional and physiological properties of LEC is critical in understanding liver biology and pathophysiology. The aim of this study was to establish techniques to isolate and cultivate Human Liver Endothelial Cells and to obtain a protein profile of the secretome of quiescent and VEGF-activated HLEC.

Methods. HLEC from unaffected tissue of resected liver segments from patients undergoing surgery for liver tumours were isolated using magnetic beads coated with anti-CD31-antibodies. Cells where cultured in Medium EBM-2(MV) supplemented with VEGF, bFGF, IGF, EGF, Heparin, Endothelial Cell Growth Supplement and 10% Fetal Calf Serum. Expression of endothelial cell surface markers CD31, CD34, CD62e, CD54 and podoplanin as well as fibroblast marker CD90 was investigated by FACS. HLEC where starved for 24 h in protein free medium and activated with VEGF for further 24 h. Supernatants were collected and subjected to shotgun proteomics. Human Umbilical Vein Endothelial Cells (HUVEC) served as a control.

Results. Isolated cells where morphologically similar to HUVEC. 98% of cells where positive for CD31, CD34, and CD54. 2% expressed CD90. 6% of CD31 positive cells where positive for podoplanin. Expression of CD34 was low, but consistent. CD62e was induced in 70% of cells and expression of CD54 was upregulated 4 fold after 6 h activation with TNF-α. Shotgun proteomics of the secretome revealed a distinct differ-

ence in the secretion pattern of several functionally relevant proteins compared to HUVEC.

Conclusions. Our results point towards a significant and persistent difference in secretion patterns of functionally relevant proteins between HLEC and other endothelial cells both in quiescence and after VEGF activation. These findings may lead to a better understanding of physiology of the liver. Finally, this study demonstrates the suitability of magnetic bead isolation in combination with *in vitro* cell culture and proteomics for investigation of HLEC functions.

062 Hypermethylation of sFRP1 gene in stool DNA test: a future technology in colorectal cancer screening

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Background. Stool DNA test is considered as a future technology in screening for colorectal cancer (CRC). Both genetic and epigenetic changes in shed cells from gastrointestinal tumours into stool could be detected. Epigenetic hypermethylation can result in transcriptional silencing of tumour suppressor genes and is considered to be a key event of sporadic colorectal carcinogenesis. sFRP1 is a tumour suppressor protein that contains a domain similar to one of WNT-receptor proteins and inhibits WNT-receptor binding to its signal transduction molecules. Detection of hypermethylation of sFRP1 gene in human DNA isolated from stools might provide a novel strategy for the detection of sporadic CRC. Our study aims to prove the methylation status of sFRP1 gene in stool samples, and compare the DNA methylation status before and after neoadjuvant radiochemotherapy.

Methods. To explore the feasibility of stool DNA test, fecal samples were obtained from 40 CRC patients (CRC patients post neoadjuvant radiochemotherapy $n = 10$). Twenty fecal samples were obtained from patients without evidence of gastrointestinal disease or neoplasia. Isolated genomic DNA from stool was modified with sodium bisulfite and analyzed by specific PCR for methylation of sFRP1 promoter.

Results. With stool DNA test we were able to detect the hypermethylation in the promoter region of sFRP1 gene in the fecal DNA from colorectal cancer patients ($p = 0.001$). Sensitivity was 89%, specificity was 86%. Methylation status of sFRP1 gene was significantly changed after neoadjuvant radiochemotherapy ($p = 0.050$).

Conclusions. The hypermethylation of sFRP1 gene in the stool DNA test has a high sensitivity and specificity for CRC and may be valuable for screening purposes, especial for the sporadic CRC. Compared with current colorectal cancer screening methods, stool DNA test is more patient-friendly, non-invasive, more sensitive and specific. The cost-effectiveness of screening may also be improved by using single DNA stool test with one sensitive DNA marker. The methylation status of sFRP1 seems to be changed after neoadjuvant radiochemotherapy, which may open new fields for CRC research. Summarized this new diagnostic tool may yield benefits in earlier detection and in the design of better antitumour interventions.

063 Dickkopf-3 protein as a new potential marker of neoangiogenesis in colorectal cancer

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Background. Although the function and interaction partners of the glycoprotein Dickkopf-3 (Dkk-3) still remain unclear, gene expression of Dkk-3 has been shown to be upregulated in tumor endothelium of colorectal cancer. For the first time, we analyzed expression of Dkk-3 protein and its potential as a marker of neoangiogenesis in colorectal cancer.

Methods. We utilized tissue microarrays (TMAs) to evaluate Dkk-3 protein expression in microvessels of colorectal cancer samples from 403 patients, in microvessels of 318 adjacent tissue samples from the same patients compared to 127 normal colorectal mucosa TMA samples. A second microarray section was stained with CD31 to quantify neoangiogenesis by defining the microvessel count.

Results. Out of 257 cancer samples with CD31 positive microvessels, 67.7% were Dkk-3 positive in all microvessels. These samples showed a significantly higher mean microvessel count (9.70 vessels) than Dkk-3 negative samples (6.82 vessels; $P = 0.001$). Dkk-3 protein expression increased with rising numbers of microvessels per sample ($P < 0.0001$). Out of 268 CD31 positive adjacent tissue samples, 56% were Dkk-3 positive. These samples also had a higher mean microvessel count (14.51vessles) than Dkk-3 negative samples (6.64 vessels; $P < 0.0001$). Similar to colorectal cancer tissue, Dkk-3 expression in non-cancerous adjacent tissue increased with rising numbers of microvessels ($P < 0.0001$). In contrast, all microvessels in normal colorectal mucosa samples demonstrated a negative staining reaction for Dkk-3. Univariate analysis of several clinicopathologic variables in correlation to Dkk-3 expression revealed significant differences in tumor site (colon vs. rectum; $P = 0.020$) and mean age ($P = 0.018$). Survival analysis according to Kaplan-Meier method showed a statistical trend toward a higher disease-free survival for patients with Dkk-3 negative samples ($P = 0.057$).

Conclusions. Our study demonstrates for the first time that microvessels of colorectal cancer and adjacent non-cancerous tissue are identical concerning Dkk-3 protein expression, but distinct from normal colorectal mucosa. Therefore, Dkk-3 can be considered as a putative pro-angiogenic protein in the process of neovascularization, may have the potential to serve as a marker for neoangiogenesis, and may represent a target structure for novel therapeutic approaches. Nevertheless, it is mandatory to further confirm these findings using normal tissue sections.

064 Proteases present in colon cancer support oncolytic growth of influenza A virus

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Background. We have developed the first genetically engineered oncolytic influenza A viruses (NS1 deletion viruses), which replicate and lyse cancer cells but are apathogenic in normal tissue. Infection of influenza A viruses are usually highly dependent on the presence of a serine-like protease (i.e. trypsin), which cleaves the viral entry protein, the hemagglutinin. Cancer cells are known to endogenously produce proteases.

Methods. We here investigate, whether colon cancer associated proteases support lytic growth of the oncolytic influenza viruses in those cells.

Results. NS1 deletion viruses grew to high titers in the colon cancer cell lines Caco2 or HT-29 independent of the addition of trypsin. Correspondingly, viral infection rate, cleavage of the hemagglutinin and virus-induced cytopathic was not compromised by the lack of trypsin in these cell lines. Zymogram analysis indicated that the Caco2 and HT-29 associated protease is not trypsin itself but trypsin unrelated.

Conclusions. The specific activation of the influenza A virus in colon cancer cell lines suggests an effective use of this virus for oncolysis in colon cancer in vivo.

065 Bilirubin: natural inhibitor of tumor cell growth

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Background. For decades the bile pigment bilirubin has been considered a toxic waste product of heme catabolism. However, serveral clinical studies show an inverse correlation between elevated plasma bilirubin levels in healthy individuals and the incidence/mortality of colorectal cancer. Based on these findings, we hypothesized that bilirubin and its precursor biliverdin may suppress tumor cell growth *in vitro* and inhibit tumor progression *in vivo*.

Methods. *In vitro* HRT-18 colon cancer cells were treated with bilirubin at various concentrations or PBS as a control. A Casy Cell Counter was used for proliferation assays. Cell cycle progression and apoptosis were analyzed by FACS. Western blot analysis was carried out using antibodies directed against p27, Rb, p53, PARP-1 and Caspase 7 as well as total and phosphorylated forms of ERK, MEK and Akt. Further, cells were treated with pharmacological inhibitors of MEK and PI3-kinase in presence or absence of bilirubin. *In vivo*, nude mice bearing HRT-18 tumors were treated with bilirubin i.p. at 70 mg/kg/day or PBS as a control. Tumor size was measured using a caliper. Statistical analysis was performed using ANOVA.

Results. Bilirubin significantly inhibited proliferation of HRT-18 colon cancer cells in a dose dependent manner. This mainly was mediated by induction of G0/G1 cell cycle arrest and apoptosis through strong activation of AKT, MEK and ERK resulting in overexpression of the cell cycle regulators p27, p53, hypophosphorylation of Rb as well as an increase of PARP-1 and Caspase 7 cleavage. The antiproliferative effects were dependent on AKT and ERK activation, in that inhibition of upstream PI3-kinase and MEK reversed the effects observed under bilirubin treatment. *In vivo*, bilirubin dramatically decreased tumor growth by 80% (SD ± 13.7) when compared to the control.

Conclusions. Bilirubin is a potent inhibitor of HRT-18 colon cancer cell growth *in vitro* and *in vivo*, presumably by modulating mitogen activated protein kinase signaling pathways resulting in cell cycle arrest and apoptosis.

066 Attenuation of microvascular reperfusion injury following murine pancreas transplantation by tetrahydrobiopterin

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Background. Tetrahydrobiopterin (BH_4) is an essential cofactor for nitric oxide synthases and thus a critical determinant of NO production. Recently we have shown that BH_4 depletion contributes to ischemia reperfusion injury (IRI) after pancreas transplantation. Here we analysed the therapeutic potential of BH_4 supplementation during organ procurement and the early post-transplant period.

Methods. Murine cervical heterotopic pancreas transplantation was performed with a modified no-touch technique. Pancreatic grafts were subjected to 16 h prolonged cold ischemia time (CIT) and different treatment regiments: untreated (I), BH_4 160 µM to perfusion solution (II), BH_4 50 mg/kg i.m. at reperfusion (III). Nontransplanted animals served as controls (IV). Intravital fluorescence microscopy was used for analysis of graft microcirculation by means of functional capillary density (FCD) and capillary diameters (CD) after 2 h of reperfusion. Quantitative assessment of inflammatory responses (mononuclear infiltration) and endothelial disintegration (edema formation) was done by histology (H&E) and peroxynitrite formation assessed by nitrotyrosine-immunostaining.

Results. FCD was significantly reduced after prolonged CIT, paralleled by an increased peroxynitrite formation, when compared with controls (all $p < 0.05$). Microcirculatory changes correlated significantly with intragraft peroxynitrite generation (Spearman: $r = -0.56$; $p < 0.01$). Pancreatic grafts treated with

BH_4 either during retrieval (II) or systemically (III) displayed markedly higher values of FCD ($p < 0.01$) and abrogated nitrotyrosine staining ($p < 0.05$). CD were not significant different in any of the investigated groups. Histologic evaluation showed increased inflammation, interstitial edema, hemorrhage, acinar vacuolization and focal areas of necrosis after 16 h CIT in group I, which could be diminished by both BH_4 treatment regiments ($p < 0.05$).

Conclusions. BH_4 treatment significantly reduces postischemic deterioration of microcirculation as well as histologic damage and might be a promising novel strategy in attenuating IRI in clinical pancreas transplantation.

067 Detection of parietal cells within columnar lined esophagus using an H^+/K^+ ATPase Beta antibody

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Background. Columnar lined esophagus (CLE) is the morphologic consequence of gastroesophageal reflux disease. CLE may contain mucus and parietal cells. Intestinal metaplasia (=Barrett esophagus) only develops within CLE-glands devoid of parietal cells. Intestinal metaplasia may progress towards esophageal adenocarcinoma. Therefore, parietal cells within CLE-glands aids to characterizes those without risk for malignant transformation. We compared detection of parietal cells using routine hematoxylin and eosin (H&E) stain vs. immunohistochemistry

Methods. Forty-seven biopsies obtained from the endoscopic esophagogastric junction in 23 patients (10 females, 13 males; age 53; range 28–73 years) with symptoms of gastroesophageal reflux disease were processed for histopathology and immunohistochemistry. Biopsies were stained with routine H&E and immunofluoresence staining using an antibody directed against hydrogen/potassium ATPase (H^+/K^+ ATPase Beta) (POT) for detection of parietal cells (POT = monoclonal clonal mouse IgG1 antibody, 2G11 clone, dilution 1:2000; Product numberMA30923 Affinity BioReagents D-20354 Hamburg, Germany). POT detects the beta-subunit of hydrogen/potassium ATPase in bovine, human, canine, porcine, rabbit, mouse, ferret, and rat tissues. Histopathology in H&E stained sections was conducted according to the Paull-Chandrasoma classification of columnar lined esophagus (CLE) including oxyntocardiac (OCM; mucus and parietal cells) and cardiac mucosa (CM; mucus cells only) with or without intestinal metaplasia (IM = Barrett esophagus). 18 out of 44 biopsies also contained gastric oxyntic mucosa (mucus, parietal and chief cells) and served as controls (these biopsies contained both CLE and OM). The detection of parietal cells in H&E and POT-staining was compared.

Results. H&E staining showed that 19 out of 23 patients had CM with IM (Barrett esophagus), 4 had CM without IM. A total of 88 slices was investigated (44 H&E 44 POT). POT stained the cytoplasma of parietal cells indicating the presence of biologic active acid pump. In 4 biopsies parietal cells were only detected in POT stained slices, whereas in the other biopsies parietal cells were detected by both H&E and POT-staining. Parietal cells were detected in all biopsies containing gastric OM. Therefore POT did not significantly increase the parietal cell detection rate in CLE compared to H&E staining.

Conclusions. Detection of OCM within biopsies from columnar lined esophagus is not significantly increased by the use of an antibody directed against H^+/K^+ ATPase. H&E staining is adequate for detection of parietal cells within CLE.

068 Lymphovascular invasion and lymphangiogenesis in adenocarcinoma of the esophagus: impact on patient survival

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Background. A special feature of esophageal cancer is its early lymphatic spread in comparison with other cancers of the gastrointestinal tract. Due to the discovery of specific markers for lymphatic endothelium, selective staining of lymphatic vessels has become possible. In recent studies the prognostic value of peritumoral lymphangiogenesis and lymphovascular invasion in various human malignancies has been shown. Tumor-associated macrophages (TAM), expressing the lymphoangiogenic growth factor VEGF-C, were shown to be related to tumor-associated lymphangiogenesis, lymphovascular invasion and lymph-node metastasis. Aim of this study was to assess tumor-associated lymphangiogenesis as well as the role of TAMs in a cohort of adenocarcinoma of the esophagus.

Methods. Fourty formalin-fixed, paraffin-embedded surgical specimens of patients (age range: 47–77) presenting with adenocarcinoma of the esophagus at the University Hospital of Vienna were included into this study. Specimens were stained with antibodies against podoplanin, VEGF-C and anti-CD34. Semiquantitative measurements of lymphatic microvessel density (LMVD) and lymphatic vessel invasion (LVI) were carried out.

Results. It could be demonstrated that lymphangiogenesis occurs in barrett adenocarcinoma and is correlated with LVI. Statistical analysis revealed that LVI is associated with disease-free ($p = 0.007$) as well as overal survival ($p = 0.011$) of patients with barrett carcinoma. Furthermore over-expression of VEGF-C was seen in Barrett carcinomas and VEGF-C expressing TAMs were detected peritumoral and therfore may play a role in lymphogenic metastasis of esophagus carcinoma.

Conclusions. These preliminary data demonstrate that lymphovascular invasion as well as tumor-induced lymphangiogenesis is associated with patient survival in barrett adenocarcinoma and anti-lymphangiogenic therapies might be a beneficial approach.

Metastasenchirurgie

071 TIMP-1-associated metastasis-promoting gene expression profile in liver-metastasis of colorectal cancer patients can explain tumor aggressiveness

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Background. The role of tissue-inhibitor of metalloproteinases-1 (TIMP-1) in cancer progression is still unclear. Although TIMP-1 is an important inhibitor of metastasis-associated proteases, it is often correlated with a bad prognosis. In an animal model, elevated levels of TIMP-1, achieved by adenoviral-gene-transfer, led to induction of hepatocyte growth factor (HGF)-signaling and expression of several metastasis-promoting genes in the liver, representing a host-microenvironment with increased susceptibility to a challenge of tumor cells. We examined the expression of candidate metastasis-promoting factors by qRT-PCR.

Methods. Liver-tissues of 6 consecutive metastatic colorectal cancer patients (4 males, 2 females; mean age, 63.3 ± 4.4 y) were obtained. To determine TIMP-1-associated gene expression signatures in the normal liver tissue, specimen were harvested from zones greater than 5 cm away from visible liver metastases and analyzed by quantitative-real-time-PCR (qRT-PCR, TaqMan®-Low-Density-Arrays) of 95 metastasis-associated genes.

Results. Human liver tissue with elevated TIMP-1 levels was associated with an identical pro-metastatic gene expression signatures as previously identified in the animal model, namely increased expression of HGF, PCNA, uPA, uPAR, tPA, matriptase, MMP-9, MMP-2, ADAM-10, cathepsin G, and neutrophil elastase.

Conclusions. We reveal here for the first time a ubiquitous (human and mouse/different tumor types) TIMP-1-related gene expression profile. This profile, consisting of metastasis-promoting genes, can explain the correlation between tumor aggressiveness in cancer patients and increased levels of TIMP-1 and demonstrates the impact of the host microenvironment on its susceptibility to invading tumor cells. This concept is important for future considerations of cancer therapies.

ÖGTH – Herz: Varia

079 RV-LV depolarisation-interval as a predictor of longterm-survival of CRT-patients: a criteria for intraoperative quality control

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Background. For cardial resynchronisation therapy the left-ventricular lead should stimulate the most delayed myocadial area. We introduce a method, established in or dayly routine, for intraoperative verification of the hemodynamically best lead-position.

Methods. The electrical distance between RV- and LV-lead we verify by measurement of the time between RV-pacing and LV-sensing (depolarisation-intervall). By a Cox regression-model we analized the data of 250 patients with regard to possible predictors of patients-survival following CRT.

Results. Significant predictors of survival were the age of patients ($p = 0.002$), LVEF ($p = 0.01$), biventricularly stimulated QRS-duration ($p = 0.001$), reduction of QRS-duration under biventricular stimulation in relation to RV-pacing in % ($p = 0.009$), depolarisation-intervall ($p = 0.04$), depolarisation-intervall in relation to QRS-duration under RV-pacing in % ($p = 0.03$).

Conclusions. Out of the predictors significant for the patients-survival following CRT only the depolarisation-intervall can be influenced activly during the implantation procedure. The RV- and LV-lead should be implanted so that the depolarsation-intervall is as long as possible. Ideally, the depolarisation-intervall covers the entire QRS-duration under RV-pacing. In that case the LV-lead stimulates exactly the latest depolarisized myocardial area.

080 The fibrin derived peptide B-beta$_{15-42}$ ameliorates ischemia-reperfusion injury in a rat heart transplant model

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Background. The purpose of this study was to evaluate the protective effect of the fibrin-derived peptide B-beta$_{15-42}$ on ischemia/reperfusion injury in a rat cardiac transplant model.

Methods. LEW hearts were flushed with chilled (0-1C) Custodiol preservation solution and either transplanted immediately or stored for 4 or 8 h in the same solution and then transplanted into syngeneic recipients. B-beta$_{15-42}$ was given i.v. at a dose of 1.2 mg immediately after transplantation or added to the preservation solution prior to harvest. At 24 h and 10 d, graft

function was assessed and hearts were retrieved for morphological evaluation. At time of harvest, serum samples were collected for troponin level analysis.

Results. Hearts transplanted immediately or after 4 h of cold ischemia did neither show any morphological damage at 24 h nor at 10 days. In contrast, 8 h of ischemia resulted in severe myocardial ischemia associated with an inflammatory response at 24 h. Lesions further progressed at 10 days. Administration of B-beta$_{15-42}$ resulted in a significant amelioration of myocardial necrosis together with a diminished inflammatory response. A protective effect towards myocyte damage was further underlined by reduced troponin levels in groups receiving B-beta$_{15-42}$.

081 Acute cellular rejection after cardiac transplantation – is there a way to reduce the number of biopsies?

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Background. Acute cellular rejection significantly contributes to mortality and morbidity after cardiac transplantation (HTX). Routine endomyocardial biopsies (EMBs) are performed to early detect and treat cellular rejection. Although EMB can be performed with little risk, a number of potentially fatal complications are inherent in the procedure. The aim of our investigation was to evaluate the incidence of acute cellular rejection after heart tranplantation and to evaluate possibilities to reduce the number of EMBs.

Methods. 119 patients underwent cardiac transplantation from January 1999 through December 2004 at our institution. The mean age of the patients was 52.6 ± 13.8 years. 17.6% were female. Indication for HTX was ICMP in 54.6%, DCMP in 34.5% und others in 10.9% of the cases. According to our institutional standard, patients underwent EMB weekly during the first month after HTX, biweekly during months 2 and 3, monthly up to month 6, once in month 8, 10 and 12. A total of 1209 EMBs were investigated over a follow-up period of 217 months after HTX.

Results. The majority of EMBs showed no signs of rejection (65.2% ISHLT 0°). Mild signs of rejection without therapeutical consequence (ISHLT Ia) were found in 23.7% of EMBs. Rejection ISHLT Ib was found in 6.4% of the evaluated EMBs. The incidence was 3.6% during the first month after HTX, in the second month 7.0%, in 3rd month 7.5%, in 4th and 5th month 5.1%, in 6th and 7th month 9.0%, and from the 8th month 9.8%. A moderate rejection (ISHLT II) was detected in 2.3%. During the first month after HTX, the incidence was 1.2%, during 2nd month 2.1%, during 3rd month 2.8%, in 4th und 5th month 2.5%, in 6th und 7th month 4.5% and from the 8th month 2.7%. More severe rejections were rare (7x ISHLT IIIa = 0.5%, 1x ISHLT IIIb = 0.08%) and occurred in month 2, 4, 6 and 7.

Conclusions. Severe cellular rejection after HTX is seldom. Mild to moderate rejection episodes, however, occur more frequently. In contrast to the traditional EMB schedules, rejection hardly ever occurs during the first weeks after HTX. Most rejection episodes are observed between the second and seventh month after HTX. Afterwards, the incidence of rejection lowers again. Based on these findings, the number of routine EMBs can safely be reduced, especially during the first weeks after HTX.

082 Impact of renal function on outcome after left ventricular assist device implantation

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Background. Renal dysfunction has consistently been one of the greatest risks for mortality with the use of left ventricular assist devices (LVAD). We aimed to determine the impact of renal function on survival and time-dependent changes in renal function after LVAD implantation.

Methods. We retrospectively reviewed 100 patients with advanced heart failure (mean age 53.4 ± 11.2 yrs, 86% male, 40% ischemic cardiomyopathy) who received LVAD implantation as a bridge to transplant therapy from 1994 to 2006. Renal function was assessed using the Modification of Diet in Renal Disease (MDRD)-derived glomerular filtration rates (GFR). Patients were divided into 2 groups based on renal function pre-LVAD implantation; Group 1: normal (GFR $\geq 60\,\mathrm{mL/min/1.73\,m^2}$, $n = 51$), Group 2: impaired (GFR $< 60\,\mathrm{mL/min/1.73\,m^2}$, $n = 49$) renal function.

Results. Patient survival was comparable between the 2 groups. The 1, 3 and 6-month Kaplan-Meier estimate of survival was 88.1%, 78.9% and 64.6% for Group 1 and 91.6%, 71.8 and 60% for Group 2 ($p = 0.551$). GFR paired sample analysis in Group 1 showed an early increase in GFR from pre-implantation ($79.5 \pm 14.2\,\mathrm{mL/min/1.73\,m^2}$) to postoperative day (POD) 3 ($92.5 \pm 32.5\,\mathrm{mL/min/1.73\,m^2}$; $p = 0.001$). There was no increase in GFR from pre-implantation ($82.7 \pm 15.4\,\mathrm{mL/min/1.73\,m^2}$) to heart transplantation ($83.8 \pm 16.1\,\mathrm{mL/min/1.73\,m^2}$; $p = 0.811$). In contrast, GFR paired sample analysis in Group 2 showed an early increase in GFR from pre-implantation ($41.03 \pm 11\,\mathrm{mL/min/1.73\,m^2}$) to POD 3 ($58.8 \pm 21.7\,\mathrm{mL/min/1.73\,m^2}$; $p < 0.0001$), and a further increase in GFR from POD 3 ($59.3 \pm 22\,\mathrm{mL/min/1.73\,m^2}$) to POD 7 ($68.7 \pm 32.4\,\mathrm{mL/min/1.73\,m^2}$; $p = 0.005$). There was a significant increase in GFR from pre-implantation ($39.06 \pm 11.6\,\mathrm{mL/min/1.73\,m^2}$) to heart transplantation ($62.2 \pm 16.2\,\mathrm{mL/min/1.73\,m^2}$; $p < 0.0001$).

Conclusions. Renal function improves rapidly after LVAD implantation. Renal dysfunction does not adversely affect outcome after LVAD implantation.

085 Benefit of initially high teicoplanin dosage in children undergoing open heart surgery

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Background. Gram positive bacteria such as coagulase negative staphylococci have become an important cause for infections after open heart surgery in children. In case of teicoplanin (TC) an increased thickness of the bacterial membrane leads to resistance in low concentrations of TC. The aim of this study

was to investigate the effects of 2 different TC dosages on the TC serum concentrations within 48 h of surgery.

Methods. 12 bed interdisciplinary paediatric intensive care unit, University Hospital.

Patients. 140 patients after open heart surgery; prospective controlled study. Group A received 10 mg TC/kg bodyweight pre- and post operation and 24 h after operation, whereas group B received 15 mg TC/kg bw in the same period. Drug levels and routine laboratory parameters were investigated daily in the PICU. The aim of both groups was a TC serum concentration of 20–30 mg/l by adapting dosage after 24 h.

Results. In group A TC concentration were 11.4 ± 0.7 and 20.2 ± 0.8 mg/l after 24 and 48 h, in group B 19.5 ± 1.0 and 24.8 ± 1.8 mg/l ($p < 0.01$ both), respectively. CRP Values were in group A 87 ± 4.9 mg/l and 111 ± 7.9 mg/l and in group B 61 ± 5.54 mg/l and 86 ± 10.2 mg/l ($p < 0.01$ and $p < 0.05$), respectively. There were no differences in physiological scoring.

Conclusions. To achieve drug levels of TC higher than 20 mg/l during the first 48 h after surgery, the higher dosage of 15 mg/kg bw had to be administered initially. The high TC dosage was well tolerated and was associated with significantly lower CRP in the first two days.

086 Strategies of Fontan palliation in patients with single ventricle physiology – 20 years and different concepts

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Background. The Fontan operation eliminates the systemic hypoxemia and ventricular volume overload in congenital patients with single ventricle physiology. Retrospectively, we report on our longtern results of surgical palliation and on different concepts concerning TCPC (total cavo-pulmonary connection).

Methods. Between 1987 and 2007, a total of 78 patients (mean age 4.8 ± 1.7 years) underwent surgical Fontan palliation at our institution by TCPC technigue. In 38% of all patients, a staged concept was carried out, 28 patients had a central fenestration (4 mm). All of our latest 21 patients in the operation series were palliated – according to the new ''Fontan concept'' – with an extracardiac conduit as second step. In 1993, inhalative NO (nitric oxyde) therapy was also introduced in the early postoperative phase.

Results. Kaplan–Meier overall survival after a mean follow-up of 8 years was 85.6% (in patients with staged procedure 87.5%, 86.3% in patients with fenestrated Fontan). 2 out of 3 patients survived a periopertive Fontan take-down. Without any exception, we lost 10 patients in the learning curve phase, 3 of them because of neurologic complications, 7 patients died due to low cardiac output (LCO). In those patients who were palliated with an extracardiac Fontan, mortality was 0%; furthermore under NO-therapy, perioperative mortality also was 0%. After 82 ± 18months of follow-up, 81% of all patients were in NYHA I, 19% in NYHA II, 89% of all patients were in sinus rhythm. Pleuropericardial effusions were found in 29% of all patients.

Conclusions. Definitive palliation by means of TCPC in patients with congenital single ventricle physiology leads to more than acceptable clinical results. Staged palliation, fenestration procedures, extracardiac Fontan and inhalative NO-therapy were introduced as ''modern'' surgical therapy concepts and resulted in a significant positive influence on perioperative and longterm clinical results.

Neue Erkenntnisse in der Mund-, Kiefer- und Gesichtschirurgie

088 The aging society and its influence on cranio-maxillofacial trauma – a comparative investigation. Der Einfluss des Alters auf Cranio-maxillofaciale Traumen – Eine Vergleichsstudie

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Background. As we are living in an aging society, the number of active patients older than 65 is increasing. The impact of age on trauma related injuries, e.g. femur neck fractures, and their outcome has been well documented in the literature. So far, data on a broad cohort suffering from Oral- and Maxillofacial injuries (OMFI) are missing. Thus it was the aim of the present retrospective analysis to observe the effect of increasing age on trauma related OMFI.

Methods. The records of 12572 patients with OMFI were collected at the Department of Cranio-Maxillofacial and Oral Surgery at the Medical University of Innsbruck in the period from 01/01/1991 to 31/12/2003. According to the WHO definition of elderly people the collected values were divided into persons older than 65 years of age and younger. 11798 were younger and 774 were older than 65 years. Data were registered regarding: diagnosis, age and gender, cause, type and localization of the injury and concomitant injuries. Subsequently the data of both groups were compared and statistically analysed. Statistical analysis was performed in SPSS (Version 7.5) using Chi-Square-Test, Fisher's exact test and Mann-Withney U test. This was followed by a logistic regression analysis in order to investigate trends and to demonstrate significant differences between the groups. A value of $p < 0.05$ was considered significant.

Results. With increasing age the risk for a domestic accident was raising. The accident mechanism in the elderly people was mainly a fall (72.2%) or was not reproducible (11.5%). There was a significant difference between both groups regarding concomitant injuries. 25.97% of the older and 14.8% of the younger patients suffered from additional neurological symptoms ($p < 0.001$). Until the age of 65 the risk for concomitant neurological injury is increasing, beyond there is no significant higher risk. The injuries in the older patients were mainly referred to the soft tissue and the mid face.

Conclusions. Thanks to major progress in general health care the percentage of elderly and most notably active old people in our society has been constantly stepping up in the past three decades. The increased number of concomitant injuries in elderly people requires a detailed investigation of the injured patient. Furthermore medication and possible cardiovascular disease of the older generation restricts the indication for surgical treatment of these patients.

089 Influence of different surface termination on surface energy and subsequently on connective tissue attachment *in vivo*

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Background. Connective tissue attachment is of major significance for the longevity of transdermal/-mucosal implants. A tight soft tissue sealing around the implant prevents from acute and chronic infections. Major focus of former investigations has been the influence of different surface roughness on the connective tissue attachment to the implant surface. The aim of the current investigation was to demonstrate the influence of different surface terminations of nano-crystalline diamond (NCD) on surface energy and subsequently its influence on *in vivo* connective tissue healing.

Methods. NCD coated titanium membranes were terminated either by hydrogen or oxygen and were compared to pure titanium membranes. These samples were evaluated by contact angle measurement, scanning electron microscopy, atomic force microscopy and electrostatic force microscopy to evaluate the surface potentials. To assess the *in vivo* integration, the different substrates were randomly distributed and inserted into the sub-dermal layer of 18 wistar rats. Animals were sacrificed after 1, 2 and 4 weeks to investigate the adjacent connective tissue histologically. Cell number, Connective tissue/implant contact ratio and scar formation were evaluated. Statistical analysis was performed using Wilcoxon–Rank Test and Kruskal–Wallis H-Test. $p < 0.05$ was considered significant.

Results. The NCD coating of the titanium membranes preserved its microstructure. Contact angle measurement confirmed H-termination hydrophobic and O-termination hydrophilic. O-termination resulted in a strong polarity, whereas no electrostatic interactions were observed at the hydrophobic surface. The histological evaluation demonstrated a comparable cell number after 1 week in all groups. After four weeks a significantly increased cell number at the O-terminated NCD with a less tight scar formation was observed. Furthermore a markedly higher connective tissue/implant contact was observed after 4 weeks at the hydrophobic surface.

Conclusions. O-termination of NCD renders the surface electrostatically active. The surface polarity promotes connective tissue healing *in vivo*. Furthermore the surface energy is of higher importance compared to the structure of the surface. The O-termination of surfaces thus is a promising technique for a controlled influence of connective tissue adhesion *in vivo*.

090 The risk of concomitant injuries and complications in cranio-maxillofacial trauma. Das Risiko von Begleitverletzungen und Komplikationen in der Kiefer-Gesichtschirurgie

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Background. The registration of concomitant injuries on patients with cranio-maxillofacial trauma is an important criteria to optimize the healing process and to minimize the incidence of complications due to unlevied diagnostic findings. Interdisciplinary, cranio-maxillofacial trauma management includes exact documentation. Therefore a large collective of patients was examined against the background of their maxillo-facial trauma to diagnose the additional injuries.

Methods. Between 2001–2003 at the Department of Oral- and Maxillofacial Surgery among 3028 patients with cranio-maxillofacial trauma, 505 patients (16.7%) with concomitant injuries were registered. Data of patients were recorded including age and gender, cause and type of injury, location and frequency of their additional trauma. Statistical analyses performed including descriptive analysis, chi square test, Fisher's exact test and Mann–Whitney′s U-test. Logistic regression analysis determined the impact of different ages on the type of injury.

Results. Within 505 patients (mean age = 39.15; ♂:♀ = 2.53) the most common sort of concomitant injury occured during sports, household and play (27.3% each). The most frequent type of additional injury was the commotio cerebri in 31.5% (159 patients). Fracture of the base of the skull occurred in 73 patients (14.5%), 30 patients had a fracture of the skull and 24 patients suffered from contusio cerebri. Even one patient had a paresis of the facial nerve. In 132 patients 190 injuries of the eye were denoted, among them 11.2% had a contusio bulbi and 2 patients a retrobulbar hematoma. Contusio of the lung appeared in 5.3%, blunt abdominal trauma in 1.8% and a fracture of the cervical spine in 3.8% of patients with concomitant injuries. In 379 patients 867 fractures of the facial bone were recorded. Soft tissue injuries of the face were found in 459 patients (90.9%). In concomitant injuries male persons aged between 40 to 60 are prone to cervical spine fractures (increase of 316%/year of age) and thoracal injuries (increase of 165%/year of age), as well as neurological trauma (increase of 93%/year of age) mainly found in traffic accidents.

Conclusions. In the catchment area of our department injuries of the neurocranium and the eye were often associated with trauma of the viscerocranium. Interdisciplinary and coordinated management is not only important for the initiation of preventive measurements but also for forensic causes. To minimize the complication rate and to optimize the therapy a neurological-, neurosurgical-, as well as eye-consiliary examination should be preferably accomplished at a preoperative stage on the awakened patient.

091 Image-guided endoscopic navigation in the treatment of orbital lesions

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Background. Orbital injury may lead to incarceration of periorbital tissue and to ocular motility disturbances and diplopia on a long-term basis. However, orbital surgery is not free of risks. The treatment of periorbital lesions demands a precise planning approach in order to secure high success rates without causing iatrogenic damage. We want to demonstrate computer assisted surgery as part of the surgical routine of posttraumatic orbital reconstruction.

Methods. Four cases of posttraumatic orbital deformities are presented. Two patients showed protruding bone fragments after unrecognized fractures of the orbital walls. Two patients presented with foreign bodies in the orbital cavity after shotgun injuries. In all four patients preoperative acquired CT-data was reformatted on a commercially available 3D-navigation system. Image guided surgery in the orbital cavity was performed using an intraoperatively calibrated high-resolution endoscope.

Results. The shotgun pellets and the protruding bone fragments were easily detected and removed via a minimal invasive access. Diplopia and bulb motility improved significantly. Postoperative rehabilitation was restricted to a few days.

Conclusions. According to our opinion computerized navigation surgery of the orbit can improve the results of surgery in terms of safety and accuracy. These extended techniques should lead to a more direct and less invasive method for approaching orbital lesions or posttraumatic deformities giving the surgeon a high degree of security in sparing vital anatomic structures.

092 Evaluation of skeletal and dental changes after surgically assisted rapid maxillary expansion

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Background. Surgically assisted rapid maxillary expansion (SARME) has become a widely used and acceptable technique to expand the maxilla in adolescents and adult patients. SARME takes the advantage of bone formation at the maxillary edges of the midline, while they are separated by an external force. SARME is indicated in patients with isolated, considerable (more than 5 mm) transverse maxillary deficiency. While surgically assisted palatal expansion is performed in patients after closure of the sagittal palatal suture, conservative rapid maxillary expansion can be used in younger patients. Studies concerning such cases show, that just 30% of the expanded width is located in the area of the palatal suture, while the rest of the extention (70%) are reached by dentoalveolar movements like tipping. The aim of this study was to evaluate the amount of expansion caused by expansion of the maxillary suture and by the dentoalveolar complex. Furthermore changes of the nasal cavity should be discussed.

Methods. All patients included in the study showed a tranverse maxillary deficiency of at least 5 mm. all patients were older than 18 years (18 min, 43 max). In all patients a fractional Le Fort I osteotomie consisting of sagittal osteotomie and osteotomie of the anterior maxilla and the pterygoid bone was performed. CT scans were performed preoperatively and about 8 weeks postoperatively (after the needed expansion). Measuring points were defined to evaluate the skeletal and the dental changes after maxillary expansion.

Conclusions. The results of the current study will be presented.

093 Chimera-flaps for covering complex facial defects after tumour surgery – first clinical results

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Background. The main indication for microvascular reconstruction of the face is the best possible functional and aesthetic outcome. Here every special kind of missing tissue is to be substituted. By using the Chimera-flap technique a combination of different transplants for individual defect coverage is possible.

Methods. In seven patients with extended or penetrating defects of the lower face, reconstruction was performed with a double flap technique. A combination of microvascular iliac crest transplants or microvascular femur transplants for mandibula reconstruction and an anterolateral thigh perforator flap (ALTPF) or saphenus perforator flap for soft tissue reconstruction was performed after ablative tumour surgery. The pedicle of the ALTPF or saphenus flap was used for elongation of the microvascular bone flap pedicle. All patients had radiotherapy 6weeks after surgery.

Results. All patients had good functional and aesthetic results and have been successfully treated with implant retained prostheses. There were no severe postoperative complications. There was no tumour relapse within 14–32 months postoperatively.

Conclusions. The Chimera-technique makes good aesthetic and functional outcome possible. The iliac crest transplant is of a good dimension for reconstruction of non-high atrophic mandibles after complete resection. The microvascular femur is well suited for covering partial defects of the mandible. Implant placement is possible in both transplant types. The ALTPF and the saphenus perforator flap have a low incidence of complications and donor site morbidity and can be shaped adequately to a soft tissue defect of the lower face.

094 Parry-Romberg-Syndrom (Hemiatrophia faciei progressiva) – interdisziplinäre Zusammenarbeit mehrerer übergreifender Fächer bei der definitiven Diagnosestellung und den daraus resultierenden Therapiemöglichkeiten

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Das Parry-Romberg-Syndrom, wahrscheinlich durch Infektionen oder Autoimmunerkrankungen ausgelöst, betrifft bevor-

zugt Gesichts- und Schädelskelett. Die Hemiatrophia faciei progressiva (v. Romberg) ist primär durch einen Schwund der betroffenen Gesichtsseite, an der die Haut, das subcutane Fettgewebe und Bindegewebe und später auch die Muskelatur und die Gesichtsschädelknochen beteiligt sind. Die ausgeprägte Gesichtsasymmetrie ist häufiger als ein Funktionsausfall Ursache der Behandlung. Nur eine effiziente Diagnostik sichert eine gute Therapie und gute Resultate bei einem Romberg-Syndrom-Patienten.

Bei der Diagnostik wird nicht nur die Mund-, Kiefer- und Gesichtschirurgie herangezogen, sondern interdisziplinär mit der Dermatologie, HNO, Mund-, Kiefer- und Zahnheilkunde, Augenheilkunde, Neurologie, Psychiatrie, plastischen Chirurgie und Radiologie zusammengearbeitet.

Es werden die jeweiligen Disziplinen mit ihrem Abklärungsgebiet beim Romberg-Syndrom präsentiert und dargestellt. In jeder Disziplin werden die Patienten in der Dermatologie auf eine Sklerodermie, in der Neurologie – anhand eines MRTs – die neuralgiformen Symptome und in der Augenheilkunde die ophthalmologischen Symptome, in der Radiologie – anhand von Bildgebungsverfahren (CT, Szintigraphie) die Knochenaktivität in bezug auf die fortschreitende Knochenatrophie untersucht und abgeklärt.

Die Therapieform wird nach der Diagnosestellung und der daraus resultierenden Diagnosebestätigung und anhand der Symptomatik beim Patienten bestimmt. Verschiedene Therapieoptionen wie eine autologe Lipoinjektion, eine Fettgewebstransplantation, eine freie mikrochirurgisch-anastomosierende Fettgewebslappenplastik oder Injektion allogener Materialien werden angewendet. Die Diagnostik und das chirurgische Vorgehen werden an zwei Fallbeispielen demonstriert.

– 47 jährige Patientin: Romberg Syndrom ausgehend vom Jochbein der linken Gesichtshälfte. Eine autologe Lipoinjektion wurde durchgeführt.
– 17 jährige Patient: Romberg Syndrom ausgehend vom Stirnbein der rechten Gesichtshälfte, in Abklärung.

095 Strategien im Management von ausgedehnten Traumen im Mund-, Kiefer- und Gesichtsbereich

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Grundlagen. Die Versorgungsstrategien bei ausgedehnten Traumen im MKG Bereich lassen sich in die Primärversorgung, in die protrahierte Primärversorgung sowie in die Sekundärversorgung einteilen. Zumeist liegt ein polytraumatisierter Patient vor, sodass andere Fachgebiete wie Neurochirurgie, HNO, Ophthalmologie und Intensivmedizin miteinbezogen werden müssen. Eine sofortige Primärversorgung ist oftmals nicht möglich. Eine retrospektive Studie wurde durchgeführt zur Ermittlung eines Zeitfensters, in welchem noch mit guten funktionellen und ästhetischen Ergebnissen gerechnet werden darf.

Methodik. Um ein möglichst homogenes Kollektiv zu erhalten, wurden aus dem traumatologoschen Krankengut der Abtlg. für MKG Chirurgie des AKH Linz jene Fälle ausgewählt bei welchen zentrolaterale Mittelgesichtstrümmerfrakturen mit frontobasaler Beteiligung und ausgedehnten Weichteilverletzungen vorlagen ($n = 84$). Es wurde der Versorgungszeitpunkt nach dem Trauma ermittelt (Einteilung in 1 Woche, 2 Wochen, +2 Wochen). Weiters wurde festgestellt, ob eine Polytraumatisierung vorlag. Als Untersuchungsparameter wurden das Vorliegen von Bulbusmotilitätsstörungen, Telekanthus, posttraumatische Nasendeformitäten, Narben und Okklusionsstörungen definiert.

Ergebnisse. Als kritischer Bereich wurde der 10. Tag nach dem Trauma ermittelt. Ab zwei Wochen lagen in 100% Telekanthus, Nasendeformitäten, Bulbusmotilitätsstörungen, Narben und Okklusionsstörungen vor.

Schlussfolgerungen. Es gilt letztendlich die Frage abzuklären, warum eine sofortige Primärversorgung bei polytraumatisierten Patienten vielfach nicht möglich ist. Liegt es am schlechten Allgemeinzustand unmittelbar nach dem Trauma, liegt es am Hirnödem oder liegt es am Fehlen von Kompetenzen im MKG Bereich besonders im Bereich kleinerer Versorgungskrankenhäuser?

096 Schussverletzungen – Einteilung, Strategien und Möglichkeiten der chirurgischen Versorgung

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In Friedenszeiten sind Schussverletzungen seltene Ereignisse und finden sich zumeist im Rahmen von suizidalen Handlungen. Die Gewebsstrukturen erleiden durch diese erheblichen Schaden. Betroffen sind neben den Weichgeweben auch knöcherne Strukturen, die ihrerseits als Sekundärgeschoss weitere Zerstörungen verursachen können.

Die grundlegenden Behandlungsstrategien stammen aus der Zeit der beiden Weltkriege. Änderungen der Konzepte ergaben sich im Bereich der sekundären Rekonstruktion verlorengegangener Strukturen sowohl im Weichgewebe als auch im Hartgewebsbereich durch Etablierung neuer Operationstechniken, welche die Erzielung besserer ästhetischer und funktioneller Ergebnisse ermöglichen.

Neben der Beschreibung des Traumamechanismuses erfolgt anhand von klinischen Fällen die Darstellung der Versorgungsprinzipien.

Hämorrhoiden

097 The vascular anatomy of the anorectum

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Background. The arterial blood supply of the internal hemorrhoidal plexus is commonly believed to be associated with the pathogenesis of hemorrhoids. Over decades several anatomical studies have revealed the complex topography of the anorectum and its vascularization. Still there is scarce knowledge about the exact mechanisms of filling and drainage of the arteriovenous network within the anorectal submucosa, which is likely to be

responsible for preventing fecal incontinence as well as enabling defecation.

Methods. Works on anorectal vascularization are presented and diagnostic tools for clinical practice are discussed.

Results. Filling and drainage of the internal hemorrhoidal plexus can be visualized by transperineal color Doppler ultrasound. The terminal branches of the superior rectal artery exclusively contribute to the arterial blood supply of the internal hemorrhoidal plexus. According to anatomical studies an intramural network of anastomoses exists between the superior and inferior rectal arteries. Ultrasound studies of the anorectum clearly highlighted a stage-dependent alteration of the morphology and perfusion of these terminal branches in different grades of hemorrhoids.

Conclusions. Hypervascularization of the anorectum is proposed to contribute to the growth of hemorrhoids rather than being a consequence of hemorrhoids. Pre- and postoperative assessment of the anorectal vascularization helps to judge the success of a technique for treatment of different grades of hemorrhoids.

100 Doppler-guided haemorrhoidal artery ligation (H.A.L.) – Efficiency and patient comfort 4 years after therapy

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The Doppler-guided haemorrhoidal artery ligation is a new, minimally invasive technique in the treatment of haemorrhoidal disease.

Since February 2000 486 patients with symptomatic second and third degree haemorrhoids have been treated this way at our department.

Postoperative complications occurred in 1, 6%. One month after treatment 82% of the patients were symptom-free and satisfied with the results.

Since there are very little data regarding the efficiency and the patient comfort on the long term, we questioned 250 consecutive patients which had undergone surgery between February 2000 until December 31st 2002.

The questionnaire was done via telephone using standardised questions. Patients with persisting or recurring symptoms were invited for a control re-examination.

The results of this follow-up will be presented.

ACO ASSO: Gültige Standards und Stand der Kunst in der Tumorchirurgie

107 State of the art in the management of hepatocellular and cholangiocellular carcinoma

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Background. Guidelines may be helpful to standardize the management of hepatocellular and cholangiocellular carcinoma as the diagnostic and therapeutic spectrum has been considerably enlarged by recent developments.

Methods. ''State of the art'' guidelines deducted from the literature and from recent consensus conferences are elaborated; issues that remain controversial or not sufficiently documented by data are discussed.

Results. Some standards have been introduced in hepatic surgery such as preoperative evaluation of liver function (and portal branch embolisation if required) or intraoperative ultrasonography. For other essential items such as techniques used for transsection of liver parenchyma or for hemostasis a variety of possibilities is at choice and the decision often depends on the personal attitude of the surgeon. As success of surgery is influenced by so many factors and imponderabilities, exact clinical evaluation is delicate and statements fulfilling the strict criteria of evidence based medicines are rarely found. Only in a minority of patients with hepatocellular carcinoma transplantation or resection is possible. For the remaining patients, a variety of therapeutic procedures are warranted with effects difficult to compare given the bias of patient selection and the great inter-patient and inter-institutional variability. In the treatment of patients with bile duct carcinoma, surgery (liver resections for Klatskin tumors stage Bismuth I–III, Whipple's procedure for more distally localized tumors), if feasible, plays a key role as well.

Conclusions. Excellent interdisciplinary cooperation is the clue to providing ''state of the art'' management of hepatocellular and cholangiocellular carcinoma. Treatment not only has to consider tumor type and stage, but also the individuality and the overall condition of every single patient.

108 Colorectal carcinoma: state-of-the-art

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Background. Colorectal carcinoma is one of the most common malignant diseases primarily diagnosed in the industrialized world. Thanks to standardized surgical procedures and multimodal treatment concepts, the prognosis has improved considerably in recent decades.

Methods. State-of-the-art treatment of colorectal carcinoma is presented and discussed on the basis of the current literature, including the current status of minimally invasive techniques in the surgical treatment of malignant colorectal disease.

Results. Carcinomas of the colon and rectum are two separate entities as far as biology, probability of local recurrences, metastasis patterns, surgical strategy and multimodal treatment regimes are concerned. Operative treatment of colon carcinoma is generally standardized, but the concept of sentinal node biopsy is a new aspect. A metaanalysis of stage II colon carcinoma showed a survival advantage of up to 5% for adjuvant therapies including 5-FU. The mortality rate for stage III colon cancer could be reduced by 10–15% with adjuvant chemotherapy. The operative standard for rectal carcinoma is Heald's technique of total mesorectal excision. For proximal rectal carcinomas, a partial mesorectal excision with a greater distance

(at least 5 cm) to the edge of the tumor is adequate. With rectal carcinoma, neoadjuvant radiochemotherapy is more effective at reducing local recurrences and involves fewer complications than does postoperative treatment. Accordingly, neoadjuvant radiochemotherapy is indicated at least for T-3 tumors of the lower and middle thirds of the rectum. In all, total survival and fewer local recurrences are seen with combined radiochemotherapy for rectal carcinoma. A number of randomized prospective studies published since 2005 showed comparable long-term results for laparoscopic and open colon surgery. The results of such studies on rectal carcinoma are not yet available.

Conclusions. The key factors for improving the prognosis of colon and rectal carcinoma are, besides early diagnosis, standardized surgery and multimodal, individualized treatment concepts.

Präventive Chirurgie

115 Prophylactic operations in palliativ surgery – a conflict?

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Background. To date approximately 25% of the EU-citizens decease on malign tumors. Here an increased tendency was noticed in the past. This circumstance is present in the surgical day-to-day life. Patients with predictable and linited prognosis often require the decision whether a prophylactic surgical procedure would prevent further complications or may declerate progression of malign tumors.

Methods. The status and progression of patients with oncological focus were analyzed in the Department of Surgery of the HELIOS-Hospital Schwerin. Two groups were studied. First surgical procedures due to general symptoms of the tumorous disease. Second, surgical therapy of specific symptoms as a consequence of the tumor.

Results. Inter-disciplinary diagnosis and discussion were crucial for the decision whether a palliativ-prophylactic operation was necessary or not. Futhermore, prophylaxis in palliative medicin and surgery required a multi-disciplinary therapy regime. For the inter-disciplinary decision, guidelines proposed by the established ''Tumorboard Organization'' were applied. For general symptomatic treatment, palliativ-prophylactic procedures due to pain therapy, gastro-intestinal symptoms, emesis, ileus, ascites, icterus, cachexia, respiratory and urological complications, and wound management were accomplished.

Conclusions. Prophylactic operations are frequent and represent the reality in palliative surgery. The ''Tumorboard Organization'' was administrable for a structured ultimate therapy decision. Here forensic guidelines regarding self-determination, protection of integrity, autonomy of the patient, and euthanasia have to be considered. The perception of the personally responsibility of the attending physician still possess highest priority.

ACE: Schildrüse/ Nebenschilddrüse

116 Neuromonitoring im Rahmen der Schilddrüsenresektion, ändert sich dadurch die OP-Strategie?

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Kontrovers diskutiert wird die intraoperative Vorgehensweise in der Schilddrüsenchirurgie durch das Neuromonitoring des Nervus laryngeus recurrens. Ziel unserer Untersuchung war es zu überprüfen, ob durch das Neuromonitoring die Stimmbandfunktion adäquat geprüft werden kann und ob daraus eine Änderung des operativen Procedere im Sinne eines zweitzeitigen Vorgehens gerechtfertigt wird.

Untersucht wurden bislang 179 konsekutive Strumaresektionen (106 Patienten), bei denen intraoperativ das Neuromonitoring angewandt wurde. Der Altersdurchschnitt betrug 55 Jahre, davon waren 72% weiblich und 28% männlich. Das Neuromonitoring musste mit einer vorgegebenen Einstellung durchgeführt werden, der Nerv durfte dabei kehlkopfnahe, kehlkopffern oder via Nervus vagus überprüft werden. Als positiv wurden nur Signale mit mehr als 300 μV gewertet. Bei negativem Signal und/oder postoperativ eingeschränkter Stimmfunktion wurde eine HNO-ärztliche Kontrolle durchgeführt. Am zweiten p.o. Tag erfolgte die laborchemische Kalziumkontrolle. Bei Pat. mit einer Minderbeweglichkeit, einer Stimmbandparese oder einer Hypokalziaemie wurde eine telefonische Befragung nach sechs Wochen durchgeführt, bei anhaltenden Beschwerden erneut nach sechs Monaten.

Im Rahmen der von uns durchgeführten Operationen wurden postoperativ drei (2.38%) passagere Paresen festgestellt, eine permanente Parese war nach sechs Monaten nicht nachweisbar. Bei sechs (5.66%) Patienten war eine passagere, substitutionsbedürftige Hypokalziaemie auffällig, bei einem Patienten (0.94%) war diese dauerhaft.

Bei 139 Recurrensüberprüfungen war der intraoperative Befund unauffällig, bei einem Patienten war dennoch eine passagere Parese nachweisbar. Bei 40 Recurrensüberprüfungen waren die intraoperativen Signale auffällig oder nicht nachweisbar, fünf Überprüfungen waren dabei mit einer unauffälligen Signalantwort vor Resektion und einem anschließenden Signalverlust auffällig. In der anschließenden HNO-ärztlichen Kontrolle konnte aber keine Parese festgestellt werden. Bei den übrigen 35 Patienten war bereits vor Resektion keine Signalantwort ableitbar, zwei Patienten aus dieser Gruppe hatten nachweisbar eine passagere Einschränkung.

Insgesamt fünf Patienten hätten sich nach Forderung anderer Autoren einer unnötigen, zweitzeitigen Operation mit den dazugehörigen Risiken unterziehen müssen. Bei weiteren 35 Patienten, also einem Drittel unserer Patienten, konnte aufgrund technischer Probleme keine sichere Signalableitung durchgeführt werden.

Wir sehen somit die endgültige Bewertung des intraoperativen Neuromonitorings des Recurrensnervens und das damit verbundene operative Vorgehen als noch nicht abgeschlossen

an, die Methode selbst scheint uns für eine Forderung für ein zweitzeitiges Vorgehen unsicher.

117 Dunhill procedure versus Thyroidectomy – a comparison

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Background. Within the last decade thyroid surgery has been radicalized. Two parties have emerged from the discussion. One group, trying to preserve thyroid as central element of the body – the other one, in light of an easy replacement therapy, does not feel the need for that.

Methods. We compare patients operated from 2003–2005 at our department. One group underwent Dunhilloperation (DH) n159, the second Thyroidectomy (T) n56. Complication rate and change of therapy were compared, remaining tissue was sonographed. The patient's opinions were sought using questionnaires.

Results. Monitoring period lasted 12–36 months. Recurrensrate showed no significant difference (DH:0.6/T:1.7) and bleeding results also didn't show any differences. We did notice a higher hypoparathyroidismus rate with the Thyroidectomy group (DH:1.8/T:7.1). 32% of all sonographies in the Dunhill group required further investigation because of remaining nodulare tissue. Changes with substitution therapy didn't show any differences. The patient's opinions were identical in both groups.

Conclusions. Both techniques require a simple substitution therapy. They are both safe methods, although the hypoparathyroidism is higher with Thyroidectomy. On the other had we observed a progress in learning over the years thus we noticed no significance in 2005. When using Dunhill procedure, remaining tissue must be checked regularly. In our opinion, it is no benefit for patients with replaced tissue.

118 Evaluation of a new needle for thyroid fine needle aspiration biopsy

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Background. To verify the destinction of thyroid tumors, the volume of harvested cells in fine needle aspiration biopsy is one of the significant parameters for histological criteria and diagnosis. In consequence of the new aeration valve, the new needle is deaerated after the aspiration. Thereby no blood or other not thyroid-cell elements are aspirated and more thyroid-cells are harvested.

Methods. Under blinded setting 45 punctures, 15 for each needle (standard needle, 1-needle with air valve and multi needle system with air valve), from fresh pig thyroid gland were made and recorded. The measurement was done according the manufacturers recommendations for CASY (CASY® technology, Reutlingen). The aspirated cell material was evacuated into 10 ml Casyton (cell-culture liquid, CASY® technology, Reutlingen) and calculated with the CASY (CASY® technology, Reutlingen) cell counter. Total cell amount and amount of vital cell was counted and recorded. Statistical analysis was performed using *t*-test ($p < 0.05$ was considered significant).

Results. Per needle respectively 15 punctures were made and counted. The mean cellular amount of the standard needle was 215 941 cells/ml. The mean cellular amount of the 1-needle system with aeration valve was 1 125 378 cells/ml. The average of cell amount for the multi needle system (Thyrosampler® Kurtaran-Frass, Vienna) was 1 723 137 cells/ml. The mean difference between the standard needle and the 1-needle system with air valve was significant with total cells ($p = 0.03$) and with vital cells ($p = 0.032$). The difference between 1-needle and multi-needle system was not significant with total cells ($p = 0.35$) and with vital cells ($p = 0.6$).

Schmerz	Tag 0	Tag 1	Tag 2	Tag 3	1. Woche	2. Woche	1. Monat	3. Monat	6. Monat
Dunhill gesam.	2.8	2.4	2.1	1.9	1.6	1.4	1.2	1.1	1.1
Thyreoidektomie gesam.	2.5	2.3	1.9	1.9	1.5	1.3	1.0	1.0	1.0
Atembesch.		1. Woche		2. Woche		1. Monat		3. Monat	6. Monat
Dunhill gesam.		1.7		1.6		1.5		1.4	1.4
Thyreoidektomie gesam.		1.4		1.3		1.3		1.2	1.2
Schluckbesch.		1. Woche		2. Woche		1. Monat		3. Monat	6. Monat
Dunhill gesam.		2.2		1.7		1.4		1.2	1.2
Thyreoidektomie gesam.		2.1		1.8		1.5		1.4	1.3
Leistungseinsch.		1. Woche		2. Woche		1. Monat		3. Monat	6. Monat
Dunhill gesam.		2.8		2.6		2.0		1.5	1.4
Thyreoidektomie gesam.		2.6		2.4		2.1		1.7	1.4
Schlafbesch.		1. Woche		2. Woche		1. Monat		3. Monat	6. Monat
Dunhill gesam.		2.2		1.9		1.6		1.6	1.6
Thyreoidektomie gesam.		1.9		1.8		1.5		1.4	1.4

Conclusions. The needle systems with the air-valve lead to a significant higher cell amount in needle aspiration biopsy. According to the requirement of cytological diagnosis more cell volume could be harvested, which is a well-defined benefit.

119 Does the lunar phase influence the incidence of postoperative haemorrhage after thyroid surgery? A preliminary report

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Background. It is claimed by non-scientific sources that operations carried out at waxing moon or especially at full moon are associated with a higher incidence of postoperative complications. Therefore patients referring to lay press confront surgeons with the lunar phase's influence and claim for special dates for surgery. Postoperative haemorrhage is a typical complication after thyroid surgery with an incidence of about 1.5%. Thus it is a suitable to assess this assumption by evidence-based data.

Methods. We retrospectively evaluated 203 patients requiring reoperation after thyroid surgery. The exact time of skin incision was evaluated by anaesthesia's reports and its lunar phase was calculated by an online-calculator.

Results. In a timeframe of 3 days (in all) around full moon 21 patients had to be reoperated, 3 days around new moon 22 patients needed surgical reintervention. 104 patients were operated during waxing moon, the phase that is believed to be a risk for postoperative complications, and 99 patients during waning moon. No differences were seen between the categories 1st + 4th quarter (102 operations), the quarters around new moon, and 2nd + 3rd quarter (101 operations), the quarters around full moon.

Conclusions. Our study shows no correlation between postoperative haemorrhage after thyroid surgery and lunar phase at initial surgery. These evidence-based data prove, that lunar phase does not influence the risk of bleeding after surgical interventions. These results should serve as information for those patients, who are convinced, not to be operated during full moon phase. The result should also bring the ''superstition'' to a halt.

120 Gender-specific differences in postoperative hypocalcaemia-related symptoms after thyroidectomy – evidenced by data?

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Background. Recently gender-specific medicine has become the focus of interest. After thyroid surgery we observed more hypocalcaemia-related symptoms in women than in men. Our goal was to find out gender-specific differences in the postoperative calcium- and parathyroid hormone (PTH)-kinetics.

Methods. PTH- and calcium-levels as well as postoperative hypocalcaemia-related symptoms were monitored according to a prospective protocol.

Results. A total of 319 women and 83 men underwent extensive thyroid surgery. Postoperative calcium levels revealed a non-significant difference of 0.05 mmol between women and men on the 1st postoperative day. Perioperative PTH-kinetics showed no significant differences too, neither in symptomatic patients, nor in the whole study population. The rate of postoperative hypocalcaemia-related symptoms was about higher in women than in men (18–11%, respectively).

Conclusions. Despite of similar perioperative PTH- and Calcium-kinetics women suffer more often from postoperative hypocalcaemia-related symptoms. The mechanism remains unclear and needs further research in gender-specific postoperative calcium-metabolism.

121 Surgery for Grave's disease – a higher risk of postoperative hypoparathyroidism?

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Background. Grave's disease (GD) is thought to be associated with a higher incidence of postoperative hypocalcaemia-related symptoms.

Methods. Parathyroid hormone (PTH)- and calcium-levels as well as postoperative hypocalcaemia-related symptoms were monitored according to a prospective protocol. Preliminary data were analysed for patients with an observation period of more than 12 months.

Results. Total or near-total thyroidectomy was carried out in 44 patients with GD and 198 patients with benign euthyroid multinodular goitre. Differences between patients with GD and patients with benign euthyroid nodular goitre were found for postoperative hypocalcaemia-related symptoms (34.1, 14.1%, respectively). These findings were statistically significant ($p < 0.5$). Furthermore, no significant differences were found in perioperative PTH- and calcium-kinetics between the groups. Patients with GD were of a significant ($p < 0.001$) lower mean age (40 ± 13) than patients with benign euthyroid multinodular goitre (56 ± 12).

Conclusions. There is a significant higher risk of postoperative hypocalcaemia-related symptoms after surgery for GD compared to benign euthyroid multinodular goitre. There is no significance concerning the risk of permanent hypoparathyroidism in our preliminary data set.

122 Intraoperative manipulation of parathyroid glands – a possible pitfall during PTH-monitoring

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Background. Intraoperative parathyroid hormone [PTH] monitoring is an important prerequisite for minimally invasive

parathyroid surgery. Thus, surgical success essentially depends on the correct intraoperative interpretation of the PTH-decay. PTH-''spikes'' caused by unintentional ''manipulation'' of the hypersecreting glands during dissection may lead to interpretation problems. It is unclear how often these ''spikes'' occur and how they influence the operative strategy. We evaluated manipulated PTH-excretion during surgery in a large number of patients and analyzed its influence on the interpretation of the intraoperative PTH-curve.

Methods. Intraoperative PTH-values (intact PTH, Nichols, San Jose, California) of 401 patients with primary hyperparathyroidism and single gland disease were analyzed. Of these 401 patients, 263 (65.6%) were successfully treated with open minimally invasive parathyroidectomy (OMIP), 106 (26.4%) with primary bilateral neck exploration (BNE) and 32 (8%) patients had to be converted from OMIP to BNE. To evaluate the occurrence of manipulation, patients were divided into 4 groups: ''Moderate'' PTH-increase (<150 pg/ml), ''extensive'' increase (>150 pg/ml), ''no'' increase (±50 pg/ml) and ''decrease'' before excision. Changes were referred to the ''baseline''-level which was sampled right after induction of anaesthesia and before incision. Intraoperatively, PTH was measured before, 5, 10 and 15 min after removal of the enlarged gland.

Results. Overall 36 (9%) had a moderate increase and 22 (5.5%) an extensive increase. No increase occurred in 162 (40.4%) and a decrease in 181 (45.2%) patients. In 263 patients undergoing OMIP, 17 (6%) glands were manipulated moderately, another 17 (6%) glands were extensively manipulated, 98 (37.2%) had no increase and 131 (49.8%) had a decline. In 106 patients undergoing primary BNE, 14 (13.3%) glands were manipulated moderately, 5 (4.7%) extensively and 46 (43%) had no increase. A decrease was observed in 41 (38.7%) patients. A conversion from OMIP to BNE was performed in 32 patients because of incorrect preoperative localization by sestaMIBI-scintigraphy and/or sonography. Five (16%) of them had moderate manipulation and no patient had extensive manipulation. Eighteen (56%) showed no PTH alterations and 9 (28%) a decrease, retrospectively. In none of the converted patients a misinterpretation of PTH-''spikes'' were the underlying cause.

Conclusions. The data show that intraoperative manipulation is documented in BNE and OMIP. The ''spikes'' caused by unintentional manipulation were identified by a subsequent prolonged PTH-decline but did not lead to a change in the surgical strategy.

123 Multiglanduläres, metastasierendes Parathyreoideakarzinom bei einer jungen Frau

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Parathyreoideakarzinome zählen zu den seltenen Tumoren und sind für weniger als 1% aller primären Hyperparathyreoidismen (pHPT) verantwortlich. Osteitis fibrosa cystica sowie extrem erhöhte Serumkalzium – und Parathormonwerte sind Leitmerkmale, die histopathologische Diagnose ist schwierig, Kapselinvasion und Gefäßinvasion gelten aber als zusätzliche Hinweise. Erkrankungsgipfel sind in der fünften Dekade, jedenfalls generell früher wie beim pHPT. Lokale Rezidive sind häufig, ebenso vor allem Lungenmetastasen (40%). Bislang gibt es keine Literaturberichte über ein multiglanduläres, metachrones Parathyreoideakarzinom.

Fallbericht: Im Mai 2000 wurde eine 23-jährige Patientin mit einer frakturgefährdeten Osteitis fibrosa cystica der Tibia bei primärem Hyperparathyreoidismus mittels minimal invasiver Parathyreoidektomie bei uns behandelt und ein 16 mm haltendes Parathyreoideaadenom links entfernt, worauf sich das Parathormaon normalisierte.

2001 neuerlich erhöhte iPTH-Werte sowie positive Lokalisationsdiagnostik mittels Mibi-Scans. Im November 2001 Entfernung eines 13 mm großen Epithelkörperchens rechts, weitere Epithelkörperchen wurden nicht gefunden. Das iPTH postoperativ 4 pg/ml, laufende Kontrollen bis 2004 zeigten Normalwerte um 30 pg/ml.

2005 wieder erhöhtes iPTH mit 311 pg/ml, die neuerliche Diagnostik mit Halssonographie, MRT und MIBI-Scinthigraphie sowie ein Venensampling auswärts ergaben ebenfalls keinen Lokalisationshinweis. Zu diesem Zeitpunkt wurde bei einem erstmalig angefertigten Routineröntgen ein 17 mm großer Lungenrundherd im Bereich der linken Lingula erstbeschrieben und als dringlich beobachtenswert eingestuft.

Bei neuerlicher MIBI-Scintigraphie und Hals-MRT 2006 ergab sich übereinstimmend eine Läsion am links caudalen Schilddrüsenpol, intraoperativ fand sich narbiges Gewebe sowie ein nach cervikal reichender Thymusrest, histologisch fanden sich darin maligne Zellen eines neuroendokrinen Tumors.

Eine pathohistologische Zweitmeinung aus dem Referenzzentrum ergab überraschender Weise sowohl bei den beiden bereits 2000 und 2001 entfernten Epithelkörperchen, wie auch im jetzigen OP-Resektat ein Parathyreoideakarzinom mit Kapsel- und Angioinvasion.

Eine postoperative Abklärung mit Somatostatin-Rezeptorszintigraphie mit 855 MBq In-111 Octreotide sowie F-18-DOPA-PET ergab keinen Hinweis auf ein neuerliches Geschehen im Hals, jedoch eine diskrete Mehrspeicherung im Lungenrundherd. Somit wurde bei der Patientin im Dezember 2006 mittels Thorakoskopie sowohl der Lungenrundherd wie auch der Thymus entfernt. Es fand sich in der Lunge eine 17 mm große Metastase des Parathyreoideakarzinoms, keine weiteren Tumorherde im Thymus. Eine Biopsie des Tibiatumors ergab keinen Malignomhinweis. Das postoperative iPTH ist 5 pg/ml, so dass wir von einer derzeitigen Tumorfreiheit ausgehen. Entsprechend der Literatur können die Zeitspannen bis zu einem neuerlichen Rezidiv zwischen wenigen Monaten und bis zu 20 Jahren reichen. Jedenfalls soll das niedrige Parathormon für einen weiteren positiven Verlauf sprechen. Die genetische Abklärung ist noch nicht abgeschlossen, familienanamnestisch auffälliger Weise wurde die Schwester ebenfalls an einem pHPT operiert.

Perspektiven der chirurgischen Laufbahn

125 Survey of the Austrian society of surgery on current surgical training

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Background. At international meetings, delegates from many countries report an increasing lack of young doctors willing to choose operative specialities. The aim of this study was to evaluate the working conditions for surgeons in Austria and to define the most crucial items calling for amelioration.

Methods. An anonymous survey was prepared and by e-mail all the members of the Austrian Surgical Society were asked to complete a questionnaire which could be reached online by a direct link. It comprised twenty questions and was kept deliberately short in order to require a minimum of time for response.

Results. Just some examples of the essential items can be given here: Working conditions (such as working hours and payment) have to be improved. Notably the young surgeons require career perspectives that are better and defined more clearly. The time spent for non-medical duties such as organization and documentation must be reduced. More priority is needed for surgical training both in the operating room and in practically oriented courses.

Conclusions. This evaluation provides the basis for further discussion at a session dedicated to this topic during the Austrian Surgical Congress of 2007.

130 The Vienna Medical Chamber shortens training permission for surgical education – no evidence based procedure

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Background. Surgical training and education is neither standardized nor regulated. There is no validation, no obligatory training goal and no implementary rotation system. Recently, the training permission for surgeons in education in the surgical department of Kaiserin Elisabeth Spital has been shortened by the Austrian medical Association from 4 to 2 years without evidence based data i.e.without the consideration of the underlying number of operations performed in the clinic.

Methods. The surgical department is a center of thyroid and parathyroid surgery, which also covers the extended oncological cases, minimal invasive surgery, hernia operations and has the largest capacity for acute abdominal diseases in Vienna. To analyze the quality of surgical education, the whole number of operations as well as the number of trainees in 2^{nd} and 4^{th} training year are tallied for analysis.

Results. In 2006, a total number of 2160 operations (1008 thyroid and 1152 non thyroid operations) have been performed in our surgical department. Trainee A (4 years of education) performed 1552 (822 thyroid and 730 non thyroid operations), Trainee B (2 years of education) 195 operations (115 thyroid and 80 non thyroid operations). The non thyroid operations of trainee A included 123 Cholecystectomies, 53 herniotomies, 57 appendectomies, 27 operations of colon or small bowel, all other will be listened in detail. Trainee A had 487/289, trainee B 534/253 gastroscopies/colonoscopies performed.

Conclusions. The number of operations prove that the goal of training for 2 surgeons in education is easily achievable. The reduction of training permission by the Vienna Medical Chamber was not evidenced by data. However, this procedure has once again raised the insufficient structures in surgical education, the lack of valid training program and standardized approaches for a defined rotation and the obligation for both, senior surgeons and trainees to perform a certain number of teaching operations. A structured reform of rules and regulations for training is necessary.

ÖGTH – Herz: Aorta

131 Successful surgical management of posttraumatic aortic injuries yet the cornerstone of successful treatment

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Background. The purpose of this study was to review our hospital's experience in a retrospective single-center analysis of all patients undergoing surgery for posttraumatic thoracic pathologies between 1972 and 2006.

Methods. From 1972 to October 2006 a total of 635 aortic procedures were performed at our institution. Eighty eight patients (14.9%) underwent an intervention (79 surgical procedures, 12 stentgraft implantations) due to a posttraumatic injury of their thoracic aorta. In >90% the descending aorta was involved, the injuries consisting of 50% aortic rupture, 42.7% posttraumatic pseudo-aneurysms and 18.9% aortic dissection. In the surgical cohort 50.6% of the patients had to undergo an emergency procedure, 16.9% an urgent and 32.5% an elective procedure. There were 8.3% female patients and 81.7% male patients with a mean age of 39.2 years (range 15–82 yrs).

Results. During the three decades total hospital mortality was 10.39% with a decrease over the years, thus resulting in a hospital mortality of 5.8% (1995–2006) versus 13.95% (1974–1994). Hospital mortality in the emergency group dropped from 20.8% (1974–1994) to 6.6% (1995–2006). Improved outcome is mainly due to preoperative aggressive control of blood pressure and aortic shear forces using β-blockade, intraoperative the use of heparin bounded circuits with cardiopulmonary bypass and most of all, a selectively delayed operative procedure (!).

Conclusions. Although endovascular stent graft techniques continue to evolve, emergent/urgent patients will be

anatomically not suitable for stent grafts and long term outcomes have yet to be determined. We therefore still consider selectively delayed surgery in patients with posttraumatic aortic pathology as a cornerstone in the choice of treatment for these patients.

133 Combined surgical and endovascular repair of complex aortic pathologies with a new designed hybridprosthesis

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Background. In the present study the use of a new combined surgical and endovascular approach in the treatment of aortic dissection or aneurysm is evaluated. The aim of this technique is to treat extensive aortic diseases in a single stage procedure. The operative and follow up data are summarized in this report.

Methods. Between 08/05 and 12/06 six patients (62 ± 11 years; 2 female) with different aortic pathologies (4 dissections, 2 aneurysms) underwent replacement of ascending aorta, aortic arch and stentgraft implantation into the descending aorta using the E-vita open endoluminal stentgraft under circulatory arrest in moderate hypothermia with selective antegrade cerebral perfusion. The stentgraft was deployed under direct vision through the open aortic arch into the true lumen.

Results. Intraoperative antegrade stenting of the descending aorta combined with distal ascending aorta and aortic arch repair was performed successfully in all patients. All patients survived the procedure One patient had neurological deficit, which recovered completely. A complete thrombosed perigraft space was observed in 4 patients after one to eleven days. In two patients a partial thrombosis of the false lumen of descending aorta was observed. One patient underwent thoracoabdominal repair five months later.

Conclusions. This report shows that a combined surgical and endovascular approach of extended aortic lesions is a feasible option and extends aortic repair in a single stage method without increase of risk.

134 Mid-term results of supraaortic transpositions for extended endovascular repair of aortic arch pathologies

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Background. To evaluate mid-term results of supraaortic transpositions for extended endovascular repair of aortic arch pathologies.

Methods. From 2002 through 2006, 27 patients (mean age 72 yrs) with aortic arch diseases were treated (arch aneurysms $n = 18$, type B dissections $n = 5$, perforating ulcers $n = 4$). Strategy for distal arch disease was autologous sequential transposition of the left carotid artery and of the left subclavian artery in 17 patients. Strategy for entire arch disease was total supraaortic rerouting using a reversed bifurcated prosthesis in 10 patients. Endovascular stent-graft placement was performed metachronously thereafter.

Results. Two in-hospital deaths occured (myocardial infarction on the day prior to discharge $n = 1$, rupture while waiting for stent-graft placement $n = 1$). At completion angiography, all reconstructions were fully patent. Four patients had small type Ia endoleaks, two of them resolving spontaneously. Mean follow-up is 15 months (1–43 months). Three late deaths occured (myocardial infarction $n = 2$, sudden unknown death $n = 1$). One year survival was 83% and three year survival was 72%, respectively. Redo stent-graft placement was performed in one patient after 25 months (type III endoleak). The remaining patients had normal CT scans with regular perfusion of the supraaortic branches without any signs of endoleaks.

Conclusions. Mid-term results of alternative treatment approaches in elderly patients with aortic arch pathologies are satisfying. Extended applications provide safe and effective treatment in patients at high risk for conventional repair.

135 Mid-term results of patients after endovascular stent-graft placement due to perforating atherosclerotic ulcers

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Background. To determine mid-term durability of endovascular stent-graft placement in patients with perforating atherosclerotic ulcers (PAU) involving the thoracic aorta and to identify risk factors for death as well as early and late adverse events.

Methods. From 1997 through 2006, 27 patients (mean age 66 yrs) presented with PAU, seven patients had rupture. Seventy-eight percent were unsuitable for conventional repair. Mean numeric EuroSCORE was 11 and mean logistic EuroSCORE was 35. Median follow-up was 35 (2–86) months, being complete in all patients. Outcome variables included death and occurrence of early and late adverse events.

Results. In-hospital mortality was 11%. Primary success rate was 100%. Actuarial survival rates at 1, 3 and 5 years were 93, 78 and 70% and actuarial event-free survival rates were 89, 74 and 62%, respectively. Hemodynamic instability as well as logistic EuroSCORE was identified as independent predictos of early and late adverse events.

Conclusions. Endovascular stent-graft placement in patients with PAU is an effective palliation for a life-threatening sign of a severe systemic process. Hemodynamic instability at referral and a high preoperative risk score predict adverse outcome. During mid-term follow-up, patients are mainly limited by sequelae of their underlying disease.

136 Endovascular stent-graft placement of aneurysms involving the descending aorta originating from chronic type B dissections

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Background. The performance of endovascular stent-graft placement in patients suffering from aneurysms involving the descending aorta originating from chronic type B dissections is unclear.

Methods. Within a two-year period, we treated six patients with this pathology. Four patients required extension of the proximal landing zone (autologous double transposition $n = 2$, subclavian-to-carotid artery transposition $n = 2$) prior to stent-graft placement.

Results. Supraaortic rerouting procedures and endovascular stent-graft placement were performed successfully in all patients. Closure of the primary entry tear, full expansion of the stent-graft and consecutively, thrombosis of the false lumen was achieved in five patients. In one patient with a short proximal landing zone, a persisting type Ia endoleak had to be observed. In all patients with successful primary entry closure, a reduction in aneurysm diameter could be seen. Mean follow-up is 16 months (4–25 months).

Conclusions. Endovascular stent-graft placement of aneurysms involving the descending aorta originating from chronic type B dissections may serve as a valuable treatment option in a complex pathology. The chronic dissection membrane can be successfully approximated to large parts of the native aortic wall. A sufficient proximal landing zone is mandatory for early and late success.

137 Vascular events after endovascular repair of thoracic aortic disease

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Background. The aim of the study was to determine late vascular events in patients after endovascular stent-graft placement of thoracic aortic diseases.

Methods. Between 1996 and 2006 a total of 174 patients (mean age 67a; % male = 73) underwent endovascular stent-graft placement of thoracic aortic diseases at our institution. Indications were aneurysms ($n = 87$), acute and chronic type B dissections ($n = 42$), penetrating ulcers ($n = 33$) and traumatic transsections ($n = 12$).

Results. During a median follow-up of 42 months (1–108 months), in 21% of patients, late vascular events were observed. The highest incidence was observed in patients after stent-graft placement for type B dissections (29%), closely followed by patients after stent-graft placement for penetrating ulcers (24%). The incidence after stent-graft placement for aneurysms was 18%. No events were observed in patients after traumatic transsections. Interestingly, patients undergoing stent-graft placement due to dilatative arteriopathy developed further dilatations in other regions and patients undergoing stent-graft placement due to obliterative arteriopathy were more prone to sustain obliterative diseases in other vascular beds.

Conclusion. This study clearly outlines the necessity of a close follow-up in these patients, not only to assess long-term outcome of endovascular stent-graft placement, but also to monitor these patients for new vascular pathologies.

138 Tenascin-C as a key factor in the remodeling of the ascending aorta leading to chronic dilatation and acute Type A dissection

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Background. The extracellular matrix molecule tenascin-C (TN-C) plays an important role in embryonic development, wound-healing, cancer invasive fronts and myocardial remodeling by loosening the linkage between connective tissue and cells lying within. As there is clear evidence for an involvement in vascular remodeling as well, we hypothesized TN-C being a mediator in the pathogenesis of chronic dilatation of the ascending aorta and acute aortic dissection.

Methods. Ascending aortic wall specimens were obtained from patients undergoing aortic reconstruction due to chronic dilatation of the ascending aorta ($n = 12$) and acute aortic dissection Stanford Type A ($n = 10$). Specimens of patients ($n = 5$) undergoing aortic valve replacement with a macroscopically normal aorta served as controls. Formalin-fixed paraffin-embedded specimens were morphologically evaluated by hematoxylin-eosin staining and immunostaining for TN-C expression.

Results. There were no differences in clinical characteristics concerning age and gender between patients with acute dissection, chronic dilatation and control. Patients with a known connective tissue disorder or bicuspid aortic valve were excluded from the study. Histologic examination showed a clear difference between chronic dilatation and acute dissection. In chronic dilatation TN-C staining was homogenously distributed throughout the media parallel to the orientation of vascular smooth muscle cells. In contrast specimens in acute aortic dissection showed a focal strong positive staining especially surrounding vasa vasorum and sites of intramedial hemorrhage and subsequent dissection throughout the whole vessel wall with TN-C negative areas in between. Whereas in control aorta TN-C expression was almost absent.

Conclusions. These data suggest a role for TN-C in the remodeling of the ascending aorta leading to chronic dilatation and Type A dissection. Keeping in mind the differences in TN-C expression between chronic dilatation and acute dissection one may speculate that changes of the vascular wall leading

to aortic dissection are mediated or at least accompanied by a change in TN-C distribution.

139 A complicated type B-dissection: how (not) to do it

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Complex type B-dissection is still accompanied with high mortality. We report on a 49 years old male with a 2 weeks ongoing history of thoracic pain. He was admitted to another hospital where a left renal artery stenosis in CT scan was suspected and a stent was applied into the false lumen of this artery. Then the patient was transferred to our institution. Angiogram revealed a type B-dissection with a hugh entry distal to the left subclavian artery, the coeliac trunk arising from the false lumen but the hepatic arteries adequately collateralized by the superior mesenteric artery. Though guidewire insertion to the true lumen of the common hepatic artery was feasible, stent application was not possible.The entry in the proximal descending aorta was covered with an endostent, thoracic pain disappeared immediately. Though a slight pain in the right upper abdomen and a moderate raise of GOT, GPT and y-GT was to be seen for a few days, the patient could be discharged 2 weeks after stenting in good condition without having pain or signs of cholecystitis.

Another 10 days later he was readmitted in bad condition with signs of peritonitis in the right upper abdomen, 20,000 WBC and a massive increase of liverenzymes.

Laparatomy was performed immediately. The gallbladder presented necrotic, the whole liver dark blue without any pulsation in the hepatic arteries.

After choecystectomy an autologous venous bypass from the common iliac to the propriet hepatic artery was performed.

The postop. course presented uneventful, Angio-CT at postop. day 4 showed a well contrasted bypass.

The patient could be discharged at postop. day 11 without any signs of infection and only slightly elevated liverenzymes.

Varia – Neue chirurgische Strategien

140 ASA class IV patients with abdominal aortic aneurysms being unsuitable for endovascular repair: is conservative management of risk factors superior to open repair?

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Background. Endovascular aneurysm repair (EVAR) evolved as a treatment option for high risk patients, in whom previously open graft replacement (OGR) could only be carried out with a high, nearly prohibitive risk or open repair even had to be denied. By employing EVAR the mortality rates (MR) were lowered to 2–3% in specialized centers. Unsolved is the problem of how to deal with patients unsuitable for EVAR. The hypothesis of this study was to test whether thoughtful watching combined with management of present risk factors or OGR were second best to EVAR in ASA class IV patients with abdominal aortic aneurysms (AAA).

Methods. Out of a total of 854 AAA-patients two groups of ASA class IV patients were selected and compared. Group 1 consisted of 34 patients who underwent OGR from 1995–2005. Group 2 included 27 patients unfit or unwilling to undergo EVAR in the period from 2001–2005. Kaplan-Meier survival estimates were calculated and possible differences were analyzed by the Log-Rank-Test.

Results. The 30 day survival was 84.59% in Group 1 versus 100% after 30 days following the denial of operation in Group 2 ($p < 0.0380$). The 90 days survival was again significant with $p < 0.0116$, Group 2 100% versus Group 1 77.95%. After one year survival was not significant anymore, i.e. Group 1 67.46% versus Group 2 75.52% ($p < 0.3554$).

Conclusions. OGR has a significantly worse survival than conservative treatment in ASA class IV patients in the first 3 months after operation. After one year both treatment options show similar results.

141 Elective abdominal aortic aneurysm repair: does size influence long term outcome?

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Background. Abdominal aortic aneurysm (AAA) size has been recognized as risk factor of rupture. Several reports presented evidence that AAA with diameters exceeding 5.5 cm are associated with increased risk of rupture compared to smaller aneurysms. Regarding these findings a diameter of more than 5.5 cm is generally considered as indication for exclusion. This analysis was undertaken to determine the influence of aneurysm diameter on long term outcome after either type of elective AAA repair.

Methods. Eight hundred and sixty four consecutive patients underwent elective repair of an infrarenal AAA either by open graft replacement (OGR, $n = 425$) or endovascular aneurysm repair (EVAR, $n = 439$) from January, 1995, through June, 2006. Median AAA diameter was chosen as threshold to discriminate between small and large aneurysms. Patient characteristics, distribution of preoperative risk factors and postoperative outcome after either type of AAA exclusion were assessed. Survival was compared using Kaplan–Meier estimates at 7 years.

Results. Overall median AAA diameter was 5.8 cm as well as in both treatment groups. Analysis of risk factors only re-

vealed that patients with larger aneurysms were significantly older (OGR 66.2 years vs. 70.7 years, $p < 0.0001$; EVAR 73.6 vs. 75.4 years, $p < 0.013$) but comparison of individual health status expressed by the American Society of Anesthesiologists (ASA) score did not reach statistical significance. At 7 years, overall survival was higher in patients with small aneurysms (52.0 vs. 39.6%, $p < 0.0002$). Similar results were obtained in patients undergoing OGR (56.6 vs. 42.3%, $p < 0.005$) as well as EVAR (48.7 vs. 37.2%, $p < 0.013$).

Conclusions. Patients with aneurysms smaller than 5.8 cm have improved survival at 7 years after either type of elective AAA repair. Large aneurysm diameter is accompanied with increased age, which might negatively influence long term outcome. Thus, the provoking issue to exclude small AAA before they reach 5.5 cm may rise again.

142 Is the mechanical microanastomosis an alternative to the conventional technique?

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Background. About microsurgical techniques without sutures many references in literature databases are found. Among facilities like rings, clips, stents, laser and adhesives the vessel coupling system (Coupler®) is mentioned. Thereby two coupling rings interlock, which anastomose the vessels.

Methods. Over the last two years in our Division the Coupler® was used in nine cases of free tissue transfer for breast reconstruction. In six of them the arterial and venous anastomosis were performed with the Coupler®, in three cases only the venous anastomosis was done mechanically. In all cases the anastomosis was end-to-end.

Results. Because of insufficient arterial adaptation in two cases we switched to a conventional procedure with sutures. All the other anastomosis showed a normal flow. Except of one partial necrosis of a flap, which was not due to the Coupler®, all flaps survived. The mean duration of doing the anastomosis was less than five minutes.

Conclusions. The coupling system (Coupler®) is a useful, secure and time saving tool for the venous anastomosis when performing a free tissue transfer. For the arterial anastomosis the conventional method is preferable, especially in cases of arteries with thick walls.

143 Patient quality of life early after traumatic splenic injury

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Background. Non-operative management of splenic injuries is beneficial compared to surgery in hemodynamically stable patients. Aim of this study was to assess whether conservative treatment would also translate into better quality of life post injury.

Methods. All consecutive patients with splenic injuries between January 2000 to February 2006 were included. Splenic injuries were graded according to AAST recommendations [1]. Patients were identified from our electronic inpatient index and stratified by non-operative treatment (non-operative group, NOG) or primary surgery (splenectomy) (surgical group, SG). Post-discharge quality of life was evaluated by a standardized telephone questionnaire. Data are reported as total numbers (%) and statistical analysis performed using chi2-tests. Significance was assumed if $p < 0.05$.

Results. Of a total of 48 patients enrolled, 27 (56.24%, NOG) were treated non-operatively, and 21 (43.75%, SG) underwent splenectomy. Splenic injury grading was comparable between both groups. After trauma, most patients were able to leave their bed three days after trauma (3rd postoperative (po) day: NOG 18 (66.67%) vs. SG 12 (57.14%), $p = 0.353$; 1st week po: NOG 6 (22.22%) vs. SG 3 (14.29%), $p = 0.377$; 2nd week po: NOG 3 (11.11%) vs. SG 5 (23.81%), $p = 0.217$), and the majority felt seriously ill during hospitalization (critically ill: NOG 9 (33.3%) vs. SG 12 (57.14%), $p = 0.087$; seriously ill: NOG 11 (40.74%) vs. SG 6 (28.57%), $p = 0.286$; not very ill: NOG 7 (25.93%) vs. SG 3 (14.29%), $p = 0.268$). Unlike SG patients, about half of the NOG patients could be discharged one week after trauma (1 week: NOG 12 (44.4%) vs. SG 4 (19.05%); $p = 0.060$). SG patients significantly longer felt severe pain compared to NOG patients (2 weeks: NOG 12 (44.44%) vs. SG 3 (14.29%), $p = 0.025$; >3 months: NOG 1 (3.7%) vs. SG 7 (33.33%), $p = 0.009$). After discharge, NOG patients were able to resume daily life activities earlier compared to patients after surgery (2 weeks: NOG 6 (22.22%) vs. SG 1 (4.76%), $p = 0.096$; <1 month: NOG 18 (66.67%) vs. SG 8 (38.10%), $p = 0.046$; ≥3 months: NOG 3 (11.11%) vs. SG 12 (57.15%), $p = 0.281$).

Conclusions. Patients with non-operative management reported less pain and were earlier able to resume daily life after splenic trauma compared to patients undergoing splenectomy.

Reference

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144 CMV Hyperimmunoglobulin evidences antiproliferative properties and reduces natural occuring cell mediated cytotoxicity in vitro

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Background. CMV hyperimmunoglobulin (CMVIg) containing drugs are routinely administered in solid organ trans-

plantation in order to prevent CMV disease. We recently evidenced immunomodulatory properties of pooled human immunoglobulines. The aim of this study was to evaluate influence of Cytotect® and Cytoglobin® a) on proliferative properties of peripheral blood mononuclear cells (PBMCs), b) on cell viability and c) on natural occurring cell mediated cytotoxicity.

Methods. PBMCs from healthy donors ($n = 10$) were stimulated with anti-CD3 (10 µg/mL) or in an allogeneic mixed lymphocyte reaction (MLR). Proliferation was determined by incorporation of 3[H]-labeled thymidine. Apoptosis was measured by flow cytometric analysis (AnnexinV, 7-AAD, CD4, CD8, CD19, CD56). Transmission Electron Microscopy (TEM) was utilized to support FACS data. Antibody dependent cell mediated cytotoxicity (ADCC) was determined utilizing a standard europium release assay. CMVIg (Cytotect® Biotest, Cytoglobin® Bayer) was used at therapeutic concentrations in all experiments.

Results. Cytotect® and Cytoglobin® evidenced anti-proliferative properties in T-cell specific stimulation and in MLR blastogenesis assays. This effect was dose dependent and ceased at concentrations of 0.031 mg/mL ($p < 0.005$). FACS analysis and TEM pictures revealed that the reduced proliferation was associated with induction of apoptosis in stimulated as well as in resting PBMCs ($p < 0.05$). Furthermore, ADCC against PANC-1 and JURKAT cell lines was significantly reduced after preincubation of effector cells with CMVIg ($p < 0.001$).

Conclusions. Our results provide evidence that CMVIg containing drugs possess, in addition to their known application as passive CMV immunization, immunological features related to tolerance induction.

145 Multichannnel intraluminal impedance monitoring for esophageal motility and reflux evaluation: current state and future prospects

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Background. Multichannel intraluminal impedance (MII) monitoring is a new diagnostic tool for esophageal bolus transport and reflux assessment.

Methods. Review on MII technology for diagnosis of esophageal disorders.

Results. Impedance is a measure of resistance to the flow of an alternating electrical current. A low voltage current is applied to surface ring electrodes on a nonconductive catheter. Impedance is determined by the conductivity of the medium bridging these electrodes. Entry of liquid into the esophageal lumen produces a drop of impedance. Gas entry results in a sudden rise of impedance. Monitoring impedance in several channels detects direction, velocity and extent of the movement of liquid or gas through the esophagus. Stationary equipment combining manometry and impedance is used for simultaneous esophageal motility and transit studies. Transport studies using impedance only can also be done with probes intended for reflux testing. Saline and a viscous gel are used to assess transport through the esophagus. In a recent study with combined impedance and manometry a significantly higher proportion of patients with incomplete transport of both liquid and viscous boluses (32/56, 57%) presented with dysphagia than patients with complete transport of both (50/216, 23%) or incomplete transport of only one (21/69, 30%) of the test substances. Equipment joining impedance with high-resolution manometry is currently being developed. A higher sensitivity and specificity for regional motility and transport abnormalities is to be expected from this technical advancement. Portable recorders are available for 24-hour MII- and pH-monitoring. Refluxes are detected by retrograde impedance changes: Liquid refluxes are characterised by retrograde drops, gas refluxes by rapid increases and mixed liquid/gas refluxes by a sequence of both deviations from the baseline. The main advantage of impedance technology over conventional pH-monitoring is the detection of refluxes independent of pH. Off antisecretory medication refluxes with $pH > 4$ are mainly encountered postprandially, at a time when regurgitation is commonly experienced by reflux patients. The diagnostic yield of symptom to reflux association analysis is significantly increased by the inclusion of refluxes with $pH > 4$. Distribution of impedance channels along the catheter facilitates the calculation of reflux exposure at different levels above the lower esophageal sphincter.

Conclusions. MII is a valuable new diagnostic tool for esophageal transport assessment without radiation exposure. Combined MII- and pH-monitoring significantly increases the diagnostic yield of reflux testing. Both applications of impedance technology have implications on surgical decision-making.

146 Trans-illuminated powered phlebectomy

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The trans-illuminated powered phlebectomy was introduced in Austria in about 2000 by Smith and Nephew as the ''TRIVEX System''. A 3.5 mm shaver, as used by Orthopaedists for cartilage, was used in order to mill out subcutaneous veins in a transilluminated technique. Due to only a few and small incisions needed, the method seemed very attractive, so many surgical departments started using this orthopaedic equipment. Most surgeons had a lot of complications, such as disastrous extensive haematomas, which made them stop using this method.

Mean while the trans-illuminated powered phlebectomy has been further developed. Instead of the orthopaedic tools, a special phlebologic equipment is used now which allows the vein to be ''sucked'' out in a very non-traumatic order, instead of being milled out. The procedure is standardized and can be reproduced easily. It shows to be a non-traumatic and minimal invasive method to extract subcutaneous varicose veins, leaving a minimum of scares. Large clusters of varicose veins are the best indication to use this procedure. The veins are made visible by transillumination in order to be accurately removed through a minimal number of small incisions.

The new equipment and the technique will be described and explained. Examples and results will be shown.

Neue Trends in der Unfallchirurgie – gemeinsame Sitzung der OeGU und der AOOe

147 Experience with UNI 2 total endoprosthesis in wrist joint

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Background. Total endoprosthesis in wrist joint is a rather new procedure compared to hip and knee surgery. Biomechanics of the wrist joint is very complex and therefore designing the carpal and radial component of the prosthesis should respectfully consider this. Indication for joint replacement and total endoprosthesis are posttraumtic and degenerative arthrosis of wrist joints. Generally we tend to perform a partial fusion depending on where the arthrosis is located, but we have stopped to perform total arthrodesis of the wrist joint due to unsatisfying long term results, according to literature. We perform total endoprosthesis in all cases when a partial fusion is impossible for any reason or a total arthrodesis would be indicated.

Methods. Nine males [55–72a] four females [56–67a].

Seven of nine men suffered from a posttraumatic arthrosis (4 SLAC 3 SNAC). All patients sufferd from serious reduction of range of motion and severe pain. In one case a partial fusion was converted into a total prosthesis. Two women had degenerative alterations of their wrists based on rheumatoid desease.

The follow up covered 6 months to 2 years.

Results. In 11/13 cases range of motion was improved impressively and pain was relieved almost completely. Seven men displayed a ROM of S50/0/40; pro-supination totally unaffected and free. In one case we found RDS. X-ray examination revealed a slightly false implant position of the radial component to us. ROM in women was at least S60/0/40.

Conclusions. In the beginning of wrist joint endoprosthesis results were less well and it was shown that this was due to misunderstanding biomechanical basics of the wrist joint. The fixation of the carpal element was a severe problem, like passing through the CMC 3, 4 and 5 joint line distally into the basis of the metacarpal bones and since CMC 4 and 5 joints have a rather high ROM the distal element consequently often loosened immediately. Recent implants respectfully avoid passing through these joints and loosening of the distal element has never been seen in all our cases. In our opinion the endoprosthesis of wrist joint is a real alternative to common procedures in the treatment of wrist arthrosis.

148 Volar fixed-angle plate osteosynthesis of instable distal radius fractures with the Aptus® plate

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Background. Volar fixed-angle plate osteosynthesis of distal radius fractures is a new method of treatment that provides the benefits of stable internal fixation without incurring the disadvantages of the dorsal approach. The Aptus® plate is a new fixation implant that was introduced specifically for the purpose of managing dorsal displaced fractures (Colles fracture) from the volar aspect. The Aptus® system provides stepless multidirectional placement of screws. The range of swivel $\pm 15^\circ$ in all directions, can be freely selected by the surgeon.

Methods. Between April and September 2005 (6 months) we have seen 753 patients with a distal radius fracture. Eighty five patients (55 women, 30 men; mean age 58.4 years) were treated with the Medartis® Aptus® plate.

Our Therapy regimen:

- Closed reposition in the operating room
- Palmar access along the radial side of the flexor carpi radialis (FCR) muscle
- Plating with subchondral screw placement
- Begin of physiotherapy on the first postoperative day and removeable Orfit splint for 5 weeks.

Results. The clinical and radiological follow up after Ø 7 months showed no secondary loss (relative protrusion of the ulna, dorsal or radial tilting) of correction. Compared to the contralateral side the range of motion was decreased for 19% in extension/flexion, 11% in ulnar/radialduction, 7% in pronation/supination. The grip strength was decreased for 35% compared with the contralateral side. The Castaing score shows 30 perfect results, 49 good results, 1 adequate result and no moderate, poor or bad results.

Conclusions. Our data clearly show that secondary correction loss can be avoided with the Aptus® system. The system provides a reliable subchondral screw placement and solid support for the joint surface. This new plate makes meaningful early mobilization possible. The palmar approach provides exact fracture reposition and with its good soft-tissue coverage not only reduces the risk of infections but also offers the possibility of not having to remove the plate. A cancellous bone graft is not necessary.

149 The treatment of Rhizarthrosis with saddle-joint prosthesis Elektra versus Martini operation

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Background. The Arthrosis of the first carpometacarpal joint is one of the most common problems in handsurgery. Primarily elderly women are affected by Rhizarthrosis. Under conservative treatment the continuing progress leads to operation indication, for pronounced pain and insufficiency of

conservative therapy options. The huge amount of well-know operation methods shows, that no satisfying option could have been described. Next to simple resection procedures, today Interposition and Suspensionarthroplasties play a key role in the care of arthrosis of the thumb saddle joint. The amount of endoprothetic procedures in the first carpometacarpal joint has been rather small, the results often remained unsatisfying. A rather new concept is the prosthesis Elektra, developed by Fixano in 2002, that reminds of the classic de la Caffiniere prosthesis, first described in 1974.

Methods. In the years 2004/2005 in our Department 51 patients (Ø 56.3 years 38–76, male:female = 42:9) with advanced saddle joint arthrosis were treated with different operation methods: 26 patients received an Elektra-prosthesis, 25 patients a resection-suspension arthroplasty Martini. Thirty seven of these were recorded in the follow-up study. The rest of the patients were deceased, removed or not accomplishable. The follow up examination contained following criteria: DASH Score, Subjective Pain Scale, range of motion and radiology.

Results. In the follow-up examination of 37 patients no significant differences in average results of the different operation methods could be investigated. Thus, the group of patients with very good results contained significantly more patients with Elektra prostheses than patients treated with Martini Operation. In the opposition a higher complication rate could be seen in patients with Elektra Prostheses. Especially the loosening of the implant cup was a frequent complication In average Dash Score, Subjective Pain Scale and range of motion showed similar results in both methods.

Conclusions. Our results show that the Elektra Prosthesis is a good and efficient alternative method to other well-known treatment concepts of Rhizarthrosis. The amount satisfying results of the Elektra group excel the good results in the Martini group. The biggest problem concerning the Elektra Prosthesis is the high frequency of cup loosening, that is unacceptable high. The treasons for that matter could be complex: 1. biomechanical problem, because of the converting of a saddle joint to a universal joint, 2. metallurgic problem that could be solved by the use of different surface material, 3. vitality problem of the os trapezium because of an unfavourable quotient of metal and bone. Unsettled remains, if revision or cementing of the cup could be a possibility to salvage of the implant. A conversion of the procedure to resection methods is possible anytime. So the use of the Elektra prosthesis still is a good alternative under the condition of a clear indication and information of the patient about the possibilities of loosing.

150 Experience with PIP-endoprosthesis LPM and Avanta SR

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Background. Posttraumatic arthrosis as well as loss of function in the PIP joint due to rheumatoid disease mean for the patient to be afflicted with pain. In many cases this leads to serious diminution of quality of life and in some cases the patient looses his occupation. It is the goal of implantation of total endoprosthesis to sustain movement and improve the range of motion, but most importantly to exterminate the pain. Certainly removement of pain can be obtained by a simple arthrodesis but this of course is less satisfying in comparsion with mobility in the PIP joint provided by the prosthesis. Since PIP joint endoprosthesis is a relativley young and new procedure there are only view experiences found in literature.

Methods. Nine PIP-endoprostheses have been implanted without cement so far. In 6 cases posttraumtic arthrosis was the indication for this procedure; in 3 cases rheumatoid destruction of the joint. In all cases the collateral ligmantes were intact. Four LPM and 5 SR Avantas were used. Postoperative the finger was placed on a splint for one week in intrinsic plus position. After 4 days we commenced passive ergotherapiy and after one week we started with active motion.

Results. Mobility was improved impressively in 5 cases. All patients were almost completely free of pain. All pip-joints were stable. There was one patient who suffered from a new trauma after the operation and the proximal component had gotten loose, so we had to convert it to an arthrodeses. In 4 cases we found a significant loss of extensor tendon function.

Conclusions. Development and design of PIP endoprosthesis has not found its final goal; this can be told by the variety of PIP-joints which are found in the free market. Passing throgh the extensor tendon is a sensitive point in the procedure and it should be noted in the preoperative information that there might be a decreased extensor tendon function. Nevertheless in our eyes the PIP prosthesis represents an intersting alternative to PIP-arthrodesis and in cases of failure of the prosthesis it can be easily converted into a classical arthrodesis.

151 Osteosynthesis of proximal humeral fractures using a dynamic angular stable plate

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Background. Fractures of the proximal humerus are frequent and represent a therapeutic problem. The proximal humerus plate of the DFD system (double-fix-dynamic) fixes the fragments angular and rotational stable and is implanted minimally invasive. A special instrument allows precise closed reduction. Due to the dynamic character of the osteosynthesis bone healing is stimulated.

Methods. Two plates are connected with short screws in linear holes so that they can move against each other. The head fragment is fixed to the main plate with 3 long screws coming steeply from distally. The dynamizing plate fixes this situation to the humeral shaft. For implanting the plate is fixed to a guide instrument, which therefore can be used as a joy-stick. So it is possible to reduct the shaft to the head exactly. To implant the DFD only two small incisions are required. One of 4 cm to slip the plate under the delta muscle and to insert the head screws. And a second of 1 cm proximally to fix the guide instrument and insert the shaft screws.

In Bad Ischl the DFD-PHP is in use since November 2004. Up to now 63 patients were operated. Fourty three were female, 20 male. The average age was 69.8 years (19–100). In 25 cases it was a dislocated subcapital fracture. Nineteen had a threepart-, 9 a fourpart fracture. Four fracture dislocations and 2 true headsplits also could be done with closed reduction on this technique. Four fractures were located at the anatomical neck.

Results. Our first experiences were very well. Currently we cannot report any complications due to the implant. There was no loosening or breakage. We watched no loss of reduction. Noticeable was lack of pain immediately after the operation. So the patients came back to their former level of activity very fast. Our complications were one infection forcing us to remove the implant – the case came to an end in pseudarthrosis which the patient bears well. Another lady suffered a repeated fracture caused by a slight injury. One pseudarthrosis happened due to too early removal.

Conclusions. With the DFD-PHP now an implant is available that enables us to expand the indications for head preserving therapy of proximal humeral fractures. Especially older people benefit from this method because there is hardly soft tissue damage but nevertheless a reliable stable situation that leads to bone healing in correct position and a good shoulder function.

152 Morbidität und Mortalität nach operativer Versorgung von Schenkelhalsfrakturen

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Grundlagen. Die Schenkelhalsfraktur ist eine häufige Fraktur des älteren Menschen. Häufig handelt es sich hierbei um multimorbide Patienten. Ziel der Studie ist die Evaluation von Einflussfaktoren auf die peri- und postoperative Morbidität und Mortalität nach osteosynthetisch und endoprothetisch versorger Schenkelhalsfraktur.

Methodik. Zwischen 01/2001 und 12/2005 wurden 311 Patienten (230 w, 81 m) mit 311 Schenkelhalsfrakturen operativ versorgt. Das Durchschnittsalter betrug 77,25 Jahren (9–97Jahre). Es erfolgte die retrospektive Evaluation der präoperativ vorhandenen internistischen Begleiterkrankungen. Diese wurden mit den postoperativen Komplikationen korreliert. Der postoperative Beobachtungszeitraum betrug 90 Tage. Eine Multimorbidität im Sinne drei relevanter Vorerkrankungen bestand bei 189 Patienten, eine solitäre Vorerkrankung lag in 56 Fällen vor. Lediglich 45 Patienten waren ohne Risikofaktoren. Es dominierten kardiovaskuläre Erkrankungen gefolgt von Diabetes mellitus und pulmonalen Erkrankungen.

Ergebnisse. Bei 60 Patienten (19%) erfolgte eine osteosynthetische- und bei 251 Patienten (81%) eine endoprothetische Versorgung der Schenkelhalsfraktur. Insgesamt traten bei 45 Patienten (14,56%) unspezifische perioperative Komplikationen auf. Hierbei überwogen die Harnwegsinfekte (5,5%), gefolgt von Pneumonien (5,17%) und kardio-vaskulären Folgeveränderungen (2,91%). OP spezifische Komplikationen traten in 6,14% der Fälle auf. Twelve Patienten (3,88%) verstarben innerhalb der ersten 90 Tage postoperativ. Ninety-two Patienten (29,58%) hatten $\geq$3 und 62 Patienten (19,94%) nur eine internistische Grunderkrankung. Thirty four Patienten (10,93%) hatten keine Grunderkrankung. Multimorbide Patienten erlitten gegenüber dem Restkollektiv signifikant häufiger postoperative Komplikationen.

Schlussfolgerungen. Schon präoperativ benötigen die oft multimorbiden Patienten eine erhöhte Aufmerksamkeit und die Idendifikation von Risikofaktoren ist notwendig, um den Patienten eine adäquate perioperative Vorbereitung und Überwachung zukommen zu lassen. Wichtig ist eine möglichst frühe operative Versorgung (<24 h bei Endoprothese, <6 h bei Osteosynthese) nach dem Trauma und eine suffizienten Analgetikatherapie, sowohl präoperativ als auch postoperativ. Bezüglich der erfolgreichen Frührehabilitation stellen primär belastungsstabile Verfahren die Operation der Wahl dar.

153 Intramedullary nailing in unstable distal tibial fractures – a (bio) mechanical approach

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Background. Treatment of unstable distal metaphyseal tibial fractures with intramedullary nailing remains challenging even in fractures without intra-articular involvement. Proximity to the ankle and biomechanical aspects makes the surgical treatment more complicated compared to fractures of the midshaft. Intramedullary nailing (IMN) is the ''golden standard'' for midshaft fractures but can be challenging in distal metaphyseal fractures. Therefore, optimal surgical treatment of these fractures remains controversial. The aim of our study was to evaluate 4 different tibial nails of the newest generation in a biomechanical approach.

Methods. Defined osteotomy was performed in 12 Sawbone composite tibial fractures to create an unstable distal tibial fracture model. After nail insertion, distal tibial locking was performed with 3 or 4 locking screws. Samples were cyclically loaded with 60,000 cycles and increasing load from 700 ± 600 N to 1400 and 2600 N. Defined parameters such as alignment, varus, valgus deformation, antecurvation and recurvation were recorded. Samples were then statically loaded until failure. Acoustic emission technique was used to detect microfractures of bone, screws and nail. Data according to failure of screws and nail were obtained.

Results. In case of physiological loading (20,000 cycles; 700 ± 600 N) loss of stability and damage of screws, nails and bone could not observed. Failures occurred in loading series. Stiffness was significantly higher in tibial nails with 4 distal locking screws. Stability of nail-bone construction was significantly higher in nails with 4 distal locking options and in nails with diameter of distal locking screws more than 4 mm.

Conclusions. Intramedullary nailing can be recommened in unstable distal metaphyseal tibial fractures without intra articular involvement. Four distal locking screws with 4.7 mm diameter should be used. Our data suggests that immediate full weight bearing is possible postoperatively in young healthy patients without osteopenia even in this fracture type.

154 Mistake proofing in open reduction and internal fixation with screws

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The most important organizational strategies for mistake proofing are described and a failure modes and effects analysis on the example of a screw-osteosynthesis is shown. Complexity factors are computed and their use in order to decrease failure rates is demonstrated. The use of Poka Yokei and simple rules in situations of dynamic complexity are described.

155 Osteosynthesis in femoral periprosthetic fractures after hip arthroplasty or total knee replacement – is there any place for the 95° angled blade plate?

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Because of the rising number of implantation rates of hip and knee arthroplasty as well as the increase number of osteosyntheses of the femur in geriatric patients the periprosthetic fractures are becoming more importance in orthopedic and trauma surgery.

Osteoporosis and the high rate of comorbidity makes a strong preoperative planning of the operation procedure necessary.

Prosthesis loosening or defects of the periprostetic bone may indicate a revision arthroplasty.

In the new literature ostheosynthesis is usually conducted with locked screw plates as well as with intramedullary locking nail systems.

A traditional alternative is the application of a 95° condylar plate. Usually used in trochanteric and subtrochanteric fractures of the proximal femur as well as in complex distal femur fractures it is also an effective implant system in periprosthetic fractures. Several examples are shown and discussed.

We respect to the classification of periprostetic fractures of Johanson in our report about 25 patients. Six of them underwent a revision arthroplasty and in 19 cases an osteosynthesis was done. Five of them include the implantation of a 95° condylar plate.

156 The improved trauma room management by installation of a four-phase watch

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Background. Since 2001 the parameters of the severe traumatised patients of the Trauma hospital Graz have been collected and analysed at the Trauma register of the DGU. According to the recommendation of the DGU a special four-phase watch was installed in 2006 to improve the effectiveness of the diagnosis and treatment process optimize in the trauma room.

Methods. The watchface has the typical colour coded phases and a flipchart shows the prepared standard sequence of trauma room management which has been developed interdisciplinary by surgeons, anesthetists, radiologists and carers. The parameters and the time process are further documented according to the guidelines of the trauma register of the DGU.

Results. The timelapse to X-ray or CT is reduced, the diagnoses are found quicker and patients can therefore be treated earlier at their adequate therapy. The motivation of the medical team is increased.

Conclusions. The four-phase trauma room watch has a many advantages and as recommended by the DGU should be installed in each trauma room.

Akutes Abdomen

157 Treatment of acute abdomen in Erlangen in the timeframe from 01.01.2004–31.12.2005

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Background. The treatment of an acute abdomen is without a doubt a domain of the surgical department. There are already specific treatment algorithms in place. Due to the ever-present pressure to keep costs to a minimum, as well as the ever-changing technical advancements of diagnostics, it is vital to re-think and possibly modify existing treatment algorithms. Therefore, patients in our facility were analyzed.

Methods. In Erlangen, 444 patients with an acute abdomen were treated in the timeframe from January 1, 2004 to December 31, 2005. The average age was 54 years, and the ratio males:females was 1:1.094. All data were collected prospectively through patient histories as well as clinical documentation. Consequently, they were retrospectively evaluated. Following the case history, labarotory tests and physical examination, sonography of the abdomen was used as the baseline diagnostic modality, as well as conventional radiography of the abdomen.

Results. Of the 444 treated patients, only 187 (42%) required surgery. The average length of stay was 7 days. In 78 patients, a clinical diagnosis of appendicitis was made. In 74% of these patients, the confirmation of their diagnosis could be made, using the baseline diagnostic modalities. For the rest of the patients, further diagnostic modalities were needed (such as CT). In 117 patients, a primary diagnosis of coprostasis was made. In 55% of these patients, a conservative treatment could be offered, and the patients left our facility without symptoms. In 45% of the patients, further diagnostic modalities (radiological and/or endoscopic) showed a finding that required surgical attention.

Conclusions. In the normal/routine clinical picture of appendicitis, baseline diagnostics are sufficient. However, behind apparently harmless diagnoses such as coprostasis,

there are serious illnesses that may be masked. Therefore a different course of action must be considered (CT). As a possible side-effect of this course, patients without pathological manifestations could be treated on an out-patient basis, thus reducing total costs.

158 Epidemiology of acute appendicitis

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Background. The aim of the study was to investigate: i) relevant and combined determinants of the development, management and outcome of a representative patient cohort ($n = 9.991$) with acute appendicitis enrolled in a prospective unicenter study through a time period of 27 years (middle Europe), and ii) the frequency and impact of specific categories (e.g., characteristics of the medical history, clinical and intraoperative findings, complications), correlation and relative risk factors of the disease and its prognosis.

Methods. By the mean of a prospective unicenter observational study, numerous characteristics as mentioned in the "Aims" were documented and influencing variables with significant impact on the outcome were statistically determined.

Results. 1) The wound abscess rate was 10.9%. Perforation, surgical intervention on time, acute, gangrenous and chronic appendicitis, age, adverse diseases such as obesity, arterial hypertonus, diabetes mellitus, sex and missing pathological finding intraoperatively showed a significant impact on the postoperative development of a wound abscess. 2) The longer the specific appendicitis-related medical history lasted, the i) more frequent a perforated appendicitis occurred (interestingly, this rate significantly increased up to 13.1% through the various time periods), ii) greater the false-positive appendectomy rate was ($P < 0.001$), and iii) higher the rate of the required second (subsequent) interventions was (4.3%; $P < 0.001$), which occurred significantly more often in obesity (6.5%) and wound abscess (5.8%). 3) The mean postoperative hospital stay was 11 days. 4) There was a significant decrease of the percentage of patients with no pathological finding of the "Appendix vermiformis" intraoperatively, who underwent appendectomy, in particular, to only 6.8% through the last investigation period from 1997 to 2000 (1974–1985, 15.5%; 1986–1996, 10.3%). 5) The mortality was 0.6% showing no significant difference between male and female patients ($P = 1.0$), between the 3 investigation periods ($P = 0.077$) and between the patients with false-positive appendectomy (0.4%) and that with acute appendicitis (0.6%; $P = 0.515$).

Conclusions. In summary, this study demonstrated a substantial progress of the quality of surgical care within the participating clinics with regard to the rates of false-positive appendectomies, of postoperative wound abscesses and, in particular, to mortality, one of the strongest criteria of quality control. Despite this, there is an increasing rate of perforated appendicitis in the investigated cohort. In conclusion, quality control remains an indispensable tool for evaluation and assessment of surgical care even in the most frequent diseases of the daily practice, which can be further improved by a multicenter study setting.

159 Acute mesenteric ischaemia – looking at the past, learning for the future

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Background. Acute mesenteric ischaemia (AMI) is a rare disease with still – despite all progresses in medicine – a high mortality rate ranging from 70 to 90% according to literature. The aim of this study was to analyse the outcome of our patients after traditional therapy, in order to be able to conduct new strategies of treatment.

Methods. In this retrospective study all clinical reports (since 03/2003) containing the diagnosis AMI (ICD10: K55.0) were analyzed with regard to initial laboratory findings, pre-operative diagnostics, surgical methods, intra-operative results, etc.

Results. The diagnosis AMI was encoded for 69 patients in the aforementioned period of time. Twenty patients had to be excluded from the study, due to other collateral diseases. Among the remaining 49 patients (with an average age of 70.2 years) 30 died initially (initial mortality 61.2%). The main risk factor (51.0%) was arrhythmia absoluta. 32.7% of the patients presented the symptoms of an acute abdomen, 24.5% were suffering from progressive abdominal pain. Besides anamnesis, physical examination and laboratory only 20.4% of the patients obtained an abdominal CT and 10.2% obtained a DSA. Because of the unambigousness of the anamnestic and clinical findings 18.4% of the patients received an immediate explorative laparotomy without any further diagnostic.

Conclusions. Despite the typical triphasic progression of the AMI (intense abdominal pain – apparent recovery – acute spreading peritonitis) and all modern possibilities of diagnostics the mortality rate of AMI is still appallingly high. Looking at the past, diagnostics as well as therapy should be included in modern findings and open up new possibilities.

160 Viszerale Ischämie – warum kommen wir häufig zu spät?

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Die akute mesenteriale Ischämie bereitet besonders jungen Ärzten differentialdiagnostische Schwierigkeiten und ist noch immer mit einer schlechten Prognose vergesellschaftet. In dem Vortrag soll auf Gründe dafür eingegangen werden unter Berücksichtigung der unterschiedlichen Ätiologie und der stadienabhängigen diagnostischen Besonderheiten. Besonders die Abhängigkeit der Symptome, der Klinik und der diagnostischen Parameter von der Ischämiezeit wird herausgearbeitet. Die Beschreibung der pathophysiologischen Grundlagen und der anatomischen Verhältnisse soll zur Formulierung eines diagnostischen und therapeutischen Algorithmus führen. Dabei wird auf die interdisziplinäre Zusammenarbeit zwischen Gastroenterologen, interventionellen Radiologen, Viszeral- und Gefäßchirurgen und Anästhesisten eingegangen. Am eigenen Patientengut werden Therapiekonzepte und Kasuistiken dargestellt. Insbesondere die Schnittstellen von Viszeral- und Gefäßchirurgie werden an Beispielen gezeigt.

161 Postoperative mortality is highly associated with infection – what are the significant factors?

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Bckground. Data are rare about the impact of infection on postoperative mortality in an unselected surgical population. Aim of the study was to analyze whether infection is a significant cause of death in these patients.

Methods. At a department of general, vascular and thoracic surgery in a secondary to tertiary referral centre, all patients operated from 1/05 to 9/06 ($n = 6101$) were included in a prospective database and analyzed retrospectively. Overall mortality rate 1.26% ($n = 77$ (38 abdominal, 33 vascular, 6 thoracic surgery)). 71.4% emergency – 28.6% planned operations. Cause of death was defined by clinical chart review and post mortem section. Stratification criteria (sex, age group, ASA, malignancy, infection prior to surgery, abdominal surgery, emergency operation) were analyzed by multivariate regression analysis.

Results. Cause of death: $n = 34$ (44.2%) infection, $n = 28$ (36.4%) cardiovascular, $n = 13$ (16.9%) progression of malignancy, $n = 2$ (2.6%) pulmonary embolism. Subgroup analysis of postoperative death due to infection revealed that 55.9% ($n = 19/34$) of patients had infection already prior to surgery and 44.1% ($n = 15/34$) developed postoperative lethal infection. Mortality caused by infection was 60.5% ($n = 23$) in abdominal, 24.2% ($n = 8$) in vascular and 50% ($n = 3$) in thoracic surgery. Regression analysis identified infection prior to surgery ($p = 0.000$) and abdominal surgery ($p = 0.018$) as statistically significant independent risk factors for postoperative mortality due to infection.

Conclusions. Postoperative mortality is highly associated with infection. In an unselected cohort of surgical patients those presenting with infection prior to surgery and those undergoing abdominal surgery are at highest risk of death from infection.

162 Management of complications in laparoscopic colo-rectal surgery

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Background. Laparoscopic colo-rectal surgery is considered to be a standardized procedure for the two main-indications: diverticular disease of the sigmoid colon and complicated Crohn's disease of the ileo-cecal region. Moreover these procedures seem to have served as a sort of pacemaker to so-called fast-track-protocols. While the extension of laparoscopic procedures to oncological indications is in a wide-spread controversial discussion, only few publications are considering the impact of complications in the outcome of surgical therapy of benign diseases.

Methods. A retrospective study of 106 laparoscopic colorectal procedures performed between 08/2001 and 01/2007 was undertaken. Indications and technical approaches as well as rates of conversion, duration of intervention and hospital-stay are detailed. Complications leading to relaparotomy, interventional or conservative therapy are reviewed in detail to analyse their reasons.

Results. With a conversion-rate of 4.8%, a mortality of 1.8% and an overall morbidity of 22.3% the occuring complications may be categorised in different groups, distinguishing intra-operativly, early or late, major or minor and procedure-related or intercurrent-ones solicitating either conservative, interventional (5.9%) or surgical (5.9%) treatment. Several causes are being isolated such as learning-curve, body-mass-index, comorbidity, sequelae of previous operations and severity of intraoperative findings.

Conclusion. As for conversion, complications influence parameters as hospital-stay or feasibility of fast-track-protocols somewhat watering the advantageous results of laparoscopic colo-rectal surgery. A careful analysis is therefore advisable not only to avoid reiterating complications but also to permit the access to oncological colo-rectal laparoscopic surgery as well.

163 Local value of infection as an indication to unplanned reoperation

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Background. The value of quality control in general surgery is actually soaring. Unplanned reoperation is seen as one of the most important quality measures. However, there is a lack of data regarding the impact of infection as an indication to unplanned reoperation.

Methods. At our department of general (including kidney transplant), vascular and thoracic surgery in a secondary to tertiary referral centre, all patients undergoing unplanned reoperation from 10/04 to 08/06 were included in a prospective database. Unplanned reoperation was defined as unplanned return to the OR within 30 days during hospitalization. Targets were unplanned reoperation due to infection, type of infection, type of primary surgery, mortality and a comparison to a former data collection from 01/03–09/04 after starting a monthly review of reoperation data in terms of a morbidity-/mortality conference 10/04.

Results. One hundred and thirty nine (2.16%) of 6399 patients were undergoing unplanned reoperation. 40 (28.8%) due to infection, 43 (30.9%) due to postoperative bleeding and 56 (40.3%) due to other indication. Subgroup analysis of those reoperated due to infection identified leakage of the anastomosis in 50% (20/40) and abdominal wall rupture in 22.5% (9/40) as predominant causes to reoperation. Other indications to unplanned reoperation were small bowel perforation (4/40), abscess (2/40), leakage of ileostoma (1/40), thoracical phlegmon (1/40), ureter-necrosis (1/40), recurrent infection of lung parenchyma (1/40) and superficial surgical site infection (1/40). Mortality in the infection subgroup was 7.5% (3/40) compared to 8.6% (12/139) of all reoperated patients. Overall mortality was 1.2% (79/6399). Furthermore we could achieve a decrease of mortality in infection subgroup from 20 to 7.5% comparing to our former data collection of 01/03–09/04. An additional analysis of infection germs was not striking.

Conclusions. Postoperative infection is the underlying mechanism leading to reoperation in a significant number of patients. Data analysis showed a much higher mortality in these patients. The reported decrease of mortality from 20 to 7.5% maybe attributed to the consequent prospective monitoring and monthly review of reoperation data we had introduced 10/04.

164 Gallstone-ileus – nowadays still a remaining important differential-diagnosis to consider at presence of acute abdominal pain

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Background. 1–3% of all mechanical obstructions in small bowel are represented by gallstone-ileus as a complication of cholelithiasis. As it is frequent in the elderly population (it accounts for almost 25% of non-strangulated intestinal obstruction in patients >65 years), there is a high mortality-rate of 10–15% depending on age and co-morbidity. In less than 1% of patients with gallstones cholecystoenteric fistula occurs (most likely cholecystoduodenal in 60%, cholecystocolic, cholecystogastric- and cholecystodochoduodenal have also been described).

Methods. Between October 2002–December 2006 we performed cholecystectomy on 776 patients and laparatomy on 505 patients due to mechanical obstruction of the small bowel. The frequency of gallstone-ileus can be reported on 10 patients, which underwent surgery due to intestinal obstruction because of gallstones. One recurrence of gallstone-ileus due to the lack of exploration on finding massive postinflammatory adhesions and adherence of the major omentum was seen. In all patients clinical evidence of intestinal obstruction detected pneumobilia as well as ectopic gallstones was confirmed by either plain X-ray or CT-scans.

Results. At our department a frequency of 10 patients (average age 78.5 yrs (range 64–84 yrs) 2 males, 8 females) presenting with gallstone-ileus (in a total of 776 patients undergoing cholecystectomy and 505 Patients undergoing laparotomy due to small-bowel-obstruction) were treated, that means a rate of gallstone-ileus in 1.28% (10/776) compared to the patients with CHE, and 1.98% (10/505) in 505 laparotomies due to small-bowel obstructions performed at this period. All patients underwent an one-stage operation, in 6 cases consisting of enterolithotomy and stone-extraction as single procedure only (without dismantlement and exploration of the fistula), in further 5 cases cholecystectomy and suturing of the entero-biliary fistula synchronously were additionally performed. The obstruction occurred 2× duodenal, 4× jejunal and 5× ileal, the location of the fistula situated duodenal in 7 times, once jejunal and 3× non-explored. The diameter of the obstructing stone varied between 3 and 7 cm (average of 4.3 cm), 9 patients recovered well, one expired because of the development of ARDS.

Conclusions. Gallstone-ileus is a rare diagnosis, nevertheless it should still be kept in mind and considered as important differential-diagnosis in acute abdominal pain as shown on the numerous cases at our department. For reducing perioperative mortality the treatment has to be adapted on patients conditions, if necessary performing enterolithotomy as a single procedure only, and considering to correct the fistula in a second procedure on symptomatic patients.

Strukturkonzepte im Spitalswesen

179 Schlanke Prozesse im Krankenhaus – Sinn oder Unsinn einer externen Beratung

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Grundlagen. Zur Prüfung der optimalen Nutzung von Ressourcen wurde der Ablauf in unserer Chir. Klinik Bietigheim von einer externen Unternehmensberatung (Porsche Consulting) untersucht.

Methodik. Nach einwöchiger Analysephase mit detaillierter Dokumentation von Patientenwegen, OP-Ablauf, ärztlicher und pflegerischer Tätigkeit, wurde dann in einer 2-wöchigen Workshop-Phase mit Mitarbeitern der Abteilung Lösungen für die festgestellten Probleme gesucht.

Ergebnisse. Wesentliches Ergebnis war, dass unser „Patientendurchlauf“ fast lückenlos und ohne Warte- bzw Leerlauftzeiten für Patient und/oder Arzt war. Aber es wurde ein enormer Aufwand an Verschwendung (im Sinne von Lean-Management) ersichtlich, der in Form von Mehrfach-, Dokumentations-, Schreib- und Codierarbeit geleistet wird – sowohl ärztlich als auch pflegerisch. Optimiert wurden bereits bestehende Standards für den Visitenablauf und unsere Patientenpfade, eingerichtet wurden neu feste Sprechzeiten für Angehörige. Wesentlich vereinfacht wurde auch unsere Bettenplanung, die Stationsverteilung und -belegung (Reduktion von 11 auf 3 Arbeitsschritte!). Insgesamt konnten – neben nicht messbaren deutlichen Verbesserungen und Vereinfachungen in Organisation und Kommunikation – vor allem durch Vermeidung von Doppelarbeit und Umwidmen von nicht ärztlicher Tätigkeit sofort etwa 500 h/a freigesetzt werden, die in der Versorgung unserer Patienten fehlen. Bei Umsetzung aller Verbesserungen werden im ärztlichen und pflegerischen Bereich etwa 2000 h/a frei; dh aber nicht Abbau von Stellen, sondern wieder Schaffung von „wertschöpfender Arbeit“ – bei uns: mehr Zeit für Aufklärung, Patientenzuwendung und -versorgung, mehr Zeit für Angehörigengespräche.

Ergebnisse. Unsere Ergebnisse zeigen, dass die Untersuchung durch eine externe, berufsfremde Beratungsfirma sehr sinnvoll und effektiv ist. Wir konnten durch Vereinfachungen in manchen Abläufen erheblich Zeit einsparen, die jetzt zur Patientenversorgung eingesetzt wird und damit sowohl zu einer Qualitätssteigerung unserer Arbeit, als auch zu einer besseren Außenwirkung und Darstellung unserer Klinik in der Bevölkerung führt. Mit der bei uns angewandten Methode des „kontinuierlichen Verbesserungsprozesses“ wurden nicht mitgebrachte Lösungen der Firma Porsche angeboten, sondern durch die berufsfremde Sicht Probleme dargestellt und Fragen aufgeworfen. Passgenaue Lösungen konnten/mußten dann – gecoachet – durch uns selber erarbeitet werden.

Schlussfolgerungen. Diese Art von „Einsparung“ ist neben Kürzung von Leistungen oder Erhöhung der Kassenbeiträge ein bislang zu wenig beschrittener „dritter“ Weg und kommt der Forderung einer „Leistungsverbesserung statt Mängelverwaltung“ nahe.

180 Development of specialisation in a general surgical department 1985–2005

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In the program of the Austrian Surgical Convention 19 different working groups and specialised societies are listed up, stating that the specialisation in surgery is increasing. However, the question remains, which fields of specialisation are realistic for a general surgical department with a limited staff?

In the last 20 years a main focus of interest has been established for the following fields:

Endoscopy: Gastroscopy, sigmoideoscopy, colonoscopy with interventions is performed by all, ERCP by two surgeons of the staff.
Minimal-invasive surgery: Choleystectomy, appendectomy, hernia surgery is performed by all surgeons, colon resections, gastro-oesophageal surgery by three of the staff.
Endocrine Surgery: Surgery of the thyroid and parathyreoid gland by three surgeons.
Specialized breast surgery: such as oncoplastic surgery and breast reconstruction by two surgeons.
Varicositas Surgery: Crossectomy and Stripping, EVLT, Trivex, Venocuff by two surgeons.

The development of specialization in a general surgical unit will be presented.

AEC: Interventionelle Endoskopie

183 Update on diagnosis and management of columnar lined esophagus (CLE)

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Background. Discrepancy exists concerning diagnosis and management of columnar lined esophagus (CLE), a morphologic consequence of gastroesophageal reflux disease (GERD).

Methods. Review on CLE.

Results. Due to reflux esophageal squamous epithelium is damaged and replaced by CLE, which is of esophageal origin and interposed between squamous and gastric oxyntic mucosa (OM). The Paull-Chandrasoma histopathology CLE classification includes oxyntocardiac (OCM; mucus and parietal cells) and cardiac mucosa (CM; mucus cells only) without or with intestinal metaplasia (IM = Barrett esophagus). Via low (LGD) and high grade dysplasia (HGD), IM may progress towards esophageal adenocarcinoma (AC; annual incidence 0.2–2.0%). Presence of CLE is associated with pathologic esophageal acid exposure and impaired esophageal motility and dysfunction of the lower esophageal sphincter, as assessed by pH monitoring and esophageal manometry, respectively. CLE without and with IM is assessed in 100 and 14–30% of symptomatic GERD patients, respectively, irrespective of presence or absence of endoscopic visible CLE. Surveillance endoscopy and biopsy sampling are recommended after 3–5, 2–3 and 0.5 years for CM, IM and LGD, respectively. Treatment of HGD and AC stage Ia include endoscopic mucosal resection or esophagectomy. Esophagectomy is recommended for AC > stage Ia. Recent studies indicate that antireflux surgery may reverse IM and low grade dysplasia (LGD). Seven years after pH-monitoring-proven effective ($n = 49$), but not ineffective ($n = 9$) Nissen fundoplication, IM reversed towards CM without progression towards AC. Fourty months after Nissen fundoplication and bile diversion ($n = 78$), 60% regressed from IM to CM, 40% remained at IM. 2.5 years after gastric bypass ($n = 15$), IM-patients regressed ($n = 8$) or had IM ($n = 7$), none progressed. A recent study compared the effect of proton pump inhibitor (PPI) ($n = 19$) vs. fundoplication ($n = 16$) in patients with CLE containing low grade dysplasia (LGD). Eighteen months after PPI treatment and fundoplication, 12 out of 19 (63.2%) and all out of 16 patients, respectively, reversed from LGD towards intestinal metaplasia.

Conclusions. CLE is defined by histopathology. Evidence justifies to investigate impact of effective fundoplication on CLE within prospective studies.

184 Columnar lined esophagus in patients with gastroesophageal reflux disease

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Background. During endoscopy the stomach is considered to commence at the level of the rise of ''gastric'' rugal folds. Anatomy studies suggested that rugal folds may contain columnar lined esophagus (CLE), the morphologic consequence of gastroesophageal reflux disease (GERD). We investigated the histopathology of endoscopic ''gastric'' rugal folds in GERD patients.

Methods. Seventy-five consecutive GERD patients (34 males), age: 51 (23–80) years, prospectively underwent endoscopy, including biopsy sampling from the endoscopic esophagogastric junction (EGJ): 0, 0.5, 1.0 cm distal and 0.5 and 1.0 cm proximal to the rise of the rugal folds. CLE was cataloged according to the histopathologic Paull-Chandrasoma classification.

Results. Normal endoscopic esophagogastric junction, visible CLE ≤ 0.5 and > 0.5 cm was assessed in 33 (44%) and 37 (49%) and 5 (7%) patients, respectively. *Histology:* All patients had CLE at the level of rise of the ''gastric'' folds. In 33 and 85% of patients CLE extended 1.0 and 0.5 cm, respectively, distal to the rise of the rugal folds. Gastric oxyntic mucosa was not assessed above the level of the rise of rugal folds. Intestinal metaplasia (= Barrett esophagus) was assessed histologically in 14 (19%) patients.

Conclusions. Regarding the diagnosis of CLE, the esophagogastric junction (EGJ) cannot be assessed by endoscopy, but

by histopathology (i.e. level of transition from CLE towards gastric oxyntic mucosa). Presence or absence of Barrett esophagus can not be excluded by endoscopy. Histopathology of multi level biopsy sampling should be considered for definition of EGJ and exclusion of Barrett esophagus in GERD patients.

185 Pre-clinical trial of a modified gastroscope that performs a true anterior fundoplication for the endoluminal treatment of GERD

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Background. Laparoscopic fundoplication provides good reflux control but side effects due to the surgical procedure are known. Different endoluminal techniques have been introduced but all with disappointing results. Evaluation of the feasibility and safety of a new device, that enables a totally endoluminal anterior fundoplication for the treatment of GERD.

Methods. The device is a modified video gastroscope, which incorporates a surgical stapler (using standard 4.8 B shaped surgical staples) and an ultrasonic sight. The cartridge is mounted on the shaft and the anvil is at the tip. This enables accurate stapling of the fundus to the esophagus, using the ultrasonic sight to guide distance and alignment of the anvil and the cartridge. Sixteen female swine of mixed breed were used in the study, 12 underwent the endoscopic procedure, and 4 were used a controls to monitor weight gain. The 12 study animals were sacrificed at 2, 4, and 8 weeks (4 pigs each time) and visually inspected for complications, healing and fundoplication. The study was sponsored by MediGus Ltd. and monitored for compliance with GLP regulations by an external company (Econ Inc.), which is GLP certified by the German Federal Government. It was conducted at the animal testing facility of the Charite Virchow Clinic in Berlin.

Results. The procedure went smoothly in all pigs, median procedure time was 12 min (range 9–35 min). At sacrifice the stapled area had healed well, all animals had a satisfactory 180° anterolateral fundoplication, and there were no procedure related complications.

Conclusions. Creating a satisfactory anterior fundoplication with the new device is feasible, easy, and safe. Proof of efficacy must await clinical trials, which are underway.

186 Design and instrumentation of new devices for performing appendectomy at colonoscopy

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Background. Appendectomy is the most common operation in the gastrointestinal tract. There is increasing interest in interval appendectomy as a treatment for refractory ulcerative colitis. A less-invasive flexible endoscopic method for removing the appendix might offer advantages especially for interval appendectomy in patients undergoing colonoscopy. *Aim*: To design, develop and test new devices for removing the appendix via Natural Orifice Transluminal Endoscopic Surgery (NOTES).

Methods. Tests were performed on the bench in 11 colons from adult human cadavers. Various prototypes were tested, which could be inserted into the appendiceal orifice to its tip and could invert the appendix at its base in a controlled fashion into the lumen of the cecum. The advantage of using a tubular structure as counter force to aid inversion of the appendix was evaluated. After partial inversion the growing strain was relieved by endoluminal incision of the mesenteric side of the appendix. Closure methods with endoloops, clips and thread ties were studied. Appendiceal resection was completed by snare diathermy leaving an inverted intraluminal stump.

Results. The position of the appendix was retrocecal in seven cases, pelvic in two, and pre-ileal or post-ileal in one each. The median length and luminal diameter was 85 mm (52–125 mm) and 5.5 mm (3–7 mm), respectively. Partial obstruction of the lumen was present in $4/11$ cases. It was possible to advance the guide-wires and retraction devices to the tip of the appendiceal lumen in all cases. Partial inversion of the appendix was successful in $10/11$ tests. The median length of the inverted stump was 13 mm (3–18 mm). The tension and volume (due to fat deposit) of the mesoappendix was the main reason for incomplete inversion. Complete inversion was achieved by endoluminal incision in $10/11$ tests. The mean volume of the resected tissue (inverted appendix incl. its mesoappendix) was 6.8 ± 1.9 ccm.

Conclusions. Despite high individual variability, appendectomy at flexible colonoscopy proved to be feasible and relatively easy. New devices to allow appendix inversion were successfully tested.

187 Endoscopic necrosectomy – a feasible and safe alternative treatment option for infected pancreatic necroses in severe acute pancreatitis (case series of 18 patients)

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Background. Endoscopic necrosectomy of infected pancreatic necroses in severe acute pancreatitis is considered an alternative but minimally invasive treatment option instead of the more traumatic open surgery. The aim of the study was to investigate feasibility and outcome of endoscopic necrosectomy in infected organized pancreatic necroses (IOPN).

Methods. Through a 4-year time period, all consecutive patients with symptomatic IOPN who underwent this novel endoscopic approach were prospectively documented in a computer-based registry and were retrospectively evaluated (systematic case series). The endoscopic approach comprised: 1. Necrosectomy via the transgastric route under EUS guidance; and (optionally). 2. Additional a) transpapillary stenting of the pancreatic duct; or b) percutaneous drainage if indicated. Feasibility was characterized by success rate (clearence/downsizing of IOPN, hospital stay) and outcome by complication

rate (frequency of bleeding or perforation), mortality and short-term follow-up.

Results. From 09/13/2002–03/16/06, 18 patients with symptomatic IOPN (maximal diameter, 4–19 cm) who underwent endoscopic necrosectomy were enrolled in the study. Sixteen of them (88.9%) were necrosectomized from all non-viable tissue using 1–3 (range) necrosectomies (mean, 1.7). In 2/18 cases (11.1%), IOPN were incompletely removed. The pancreatic duct was drained through the papilla because of duct disruption or dilatation in 4/18 cases (22.2%). A percutaneous drainage was placed into fresh, non-organized necroses or because of acute septic problems in 8/18 patients (44.4%). Complications occurred in 3/18 subjects (rate, 16.6%): Bleeding ($n = 2$) managed endoscopically; cardiac arrhythmia ($n = 1$); no perforation. At the time of discharge (mean hospital stay, 21.8 d), i) internal drainage was still in situ (range, 3–8 double pigtails) in 15/18 individuals (83.3%), which was extracted in the post-hospital range of 56–340 d; ii) 17/18 patients (94.4%) were asymptomatic indicated by normal inflammatory laboratory parameters; iii) 7/17 subjects (41.2%) showed no further IOPN whereas in 10/17 patients (58.8%), there was a 6-fold (mean) down-sizing of IOPN. One patient (5.6%) died from cardiac infarction on the 68th day of hospital stay (intervention-related mortality, 0%). Follow-up investigation (range, 12–588 d): 2/18 subjects (11.1%) developed pancreatic pseudocyst, which was endoscopically approached.

Conclusions. Endoscopic necrosectomy combined with endoscopic placement of a internal (transgastric) drainage or transpapillary stent into the pancreatic duct is a feasible and safe treatment option even in the case of extended IOPN with large pieces of necrotic tissue.

188 Treatment of gastro-jejunal fistulas or leaks by coated stents

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Background. Leakage and fistulization of the gastro-jejunostomy have been the major drawback of gastric bypass surgery since its first description. Most authors agree that operative treatment is the mainstay of therapy in all patients with signs of sepsis. However, intestinal contents causing localized infection may impede healing of sutured leaks in some patients and fistulas develop. As the anastomosis cannot be disconnected or exteriorized for anatomical reasons other forms of treatment have to be applied.

Results. Leakage of the gastro-jejunostomy occurred in three patients after gastric bypass and resulted in formation of a fistula; one fistula developed in a patient 63 days after surgery. Coated self-extending stents were implanted endoscopically in all patients. Enteral nutrition could be started six days later. Stents were removed two months after implantation without problems. Weight loss and quality of life after stent removal were excellent in all patients.

Conclusions. In our experience implantation of coated self-expanding stents represents a very effective and minimally invasive therapy of gastro-jejunal anastomotic fistulas after gastric bypass when surgical repair is not possible. In these cases application of stents allows septic source control without any other intervention.

Österreichische Gesellschaft für Kinder- und Jugendchirurgie: . . . aus der Tradition offen für das Neue

189 Does fetal magnetic resonance imaging influence the surgical procedure in congenital malformation? a resume after 126 surgical cases

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Background. Since 1999 174 cases underwent fetal MRI because of suspect extra central-nervous system (CNS) malformations. It was only in the last few years when these indications increased as a consequence of further methodical MR development.

Methods. Fetal MRI studies were performed on a 1.5 T (Philips) superconducting unit using a five-element surface phased-array coil, usually after 17th gestational week. No sedation is necessary. In addition to routine T2-weighted (w) sequences, T1w sequences (mainly to demonstrate meconium-containing bowel loops), T2*w-sequences (in case of hemorrhagic lesions), steady state fast precession (SSFP) sequences (to depict vessel-abnormalities), dynamic SSFP sequences to show swallowing and peristalsis, FLAIR and diffusion-weighted sequences (for further tissue characterization) were done.

Results. One hundred and twenty-six fetuses with extra-CNS malformations, prenatally examined with fetal MRI, had postpartal or postmortal follow up at the Medical University Clinic of Vienna: Among these, congenital diaphragmatic hernias (CDH, 20) could be selected for primary repair (12) because of adequate lung maturity, 4 with extreme lung hypoplasia underwent Extra Corporal Membran Oxygenation. Cystic adenomatoid malformation (8) and lung sequestration (5) were diagnosed, requiring immediate postnatal or later repair. Abdominal anomalies (45): stenosis, obstructions or atresias of small bowel (6) were treated by adequate therapy from the very beginning. Anal atresias (4) were differentiated into high and low forms, cases which needed colostomy or could be corrected in an one stage repair. Nine Gastroschisis (6) and Omphaloceles (5) were delivered pretermly dependent on the amount of eventerated bowels. Ovarial cysts (7) were differentiated from abdominal tumors (4), the latter requiring immediate surgery, the former only depending on size and content. Urologic pathologies (29) could often be treated conservatively.

Conclusions. The results of fetal MRI do not have an impact on the type of surgical procedure. However, early accurate diagnosis of pathology, including information about vital functions (such as the degree of lung maturity) may influence the decision of the time to perform the operation, to achieve a most successful outcome for the patient.

190 Current use of imaging tools in the management of common bile duct stones in children

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Background. Common bile duct (CBD) stones represent a diagnostic and therapeutic challenge in pediatric age group. The aim of the study was to evaluate our management of children with suspected CBD stones and to develop an algorithm for the rational use of perioperative ERCP, MRCP and intraoperative cholangiography (IOC).

Methods. Between 1999 and 2005, 38 children that had undergone laparoscopic cholecystectomy (CHE) were evaluated for preoperative findings suggestive for CBD stones, preoperative use of ERCP or MRCP, use of IOC and findings during surgery. A diagnostic and therapeutic algorithm for CBD stones was developed.

Results. Twelve children (32%) had preoperative findings suggestive for CBD stones. Of the 7 children with elevated liver enzymes AND abnormal ultrasound findings, 6 (86%) were identified to have CBD stones. Five had preoperative ERCP which detected and successfully cleared stones in 3 patients. IOC identified CBD stones in 3 children, including one patient with a preoperative negative ERCP. Of the 5 children with either elevated liver enzymes OR abnormal ultrasound, only one stone in the cystic duct was identified by a gall bladder edema in the preoperative MRCP followed by IOC. Three children received preoperative MRCP and IOC was performed in 4. No retained stones were detected postoperatively.

Conclusions. Cases with high suspicion for CBD stones should undergo a preoperative ERCP followed by intraoperative cholangiography, if no stones could be found. In case preoperative findings are ambiguous, prevalence of CBD stones is low and we suggest MRCP or IOC as the diagnostic methods of choice.

191 Pure esophageal atresia with normal outer appearance – a new subtype? – case report

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Background. Isolated esophageal atresia (Vogt type II) is characterized by an agenesia of the midportion of the esophagus. This paper presents a case of such a form of esophageal atresia with a 1 cm long fibrous segment between the two esophageal pouches resembling the subtype II3 according the Kluth's atlas.

Methods. Thirty-seven week gestation boy born by uneventful vaginal delivery with 2000 g birth weight was transferred to our department because of inability to pass a nasogastric catheter. Resection of the fibrous segment and primary anastomosis of the esophagus was performed succesfully.

Results. The postoperative course was uneventful and the patient was discharged on the postoperative 21 day. Histological examination of the atretic segment showed an haphazard distribution of not functional lumina and blood vessels.

Conclusions. Kluth has described ten types of esopageal atresia in his atlas; pure esophageal atresia is classified as type II in which the proximal and distal segments are atretic without a tracheo esophageal fistula. Matsumoto described a subtype in which the midportion of the esophagus is atretic and there is a cyst located in the atretic strand. Loosbroek also described in 1991 a new type of isolated esophageal atresia that included double membranes with a 2 cm gap between them. We describe here a similar case of pure esophageal atresia, showed neither a cyst nor a membrane. Extensive review of the literature failed to disclose any similar case showed this kind of histological character.

192 Frühe Ergebnisse bei Patienten mit Ösophagusatresie: Fortschritte in den letzten 30 Jahren

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Grundlagen. Seit der Erstbeschreibung von Ösophagusatresie (ÖA) in der Literatur und der ersten erfolgreichen direkten Ösophagusanastomose konnten wesentliche Veränderungen in Zugang und Methodik beobachtet werden. Für die Kinderchirurgie ist eine Behandlung von Kindern mit dieser Fehlbildung noch immer eine Herausforderung. Ziele dieser Studie waren die Evaluierung der Ergebnisse und die Analyse von frühen Komplikationen und Folgeerkrankungen nach Wiederherstellung des Speiseweges.

Methodik. Von Jänner 1975 bis Dezember 2005 wurden 99 Patienten mit ÖA mit/ohne tracheo-ösophagealer Fistel erstbehandelt. Diesbezügliche Daten wurden erhoben und ausgewertet. Um Veränderungen anschaulicher zu machen, wurden die Patienten in 2 Gruppen unterteilt: GROUP I ($n = 55$) 1975–1989, GROUP II ($n = 44$) 1990–2005. Klassifizierungen nach Waterston und Spitz wurden vorgenommen. Informationen bezüglich Geburt, Typ der ÖA, assoziierter Fehlbildungen, operativer Behandlung, Komplikationen, Folgeerkrankungen, Sterblichkeit und Todesursache wurden verglichen.

Ergebnisse. Von 99 Patienten hatten 81 (81,8%) ÖA mit distaler Fistel, 6 (6,1%) reine ÖA, 6 (6,1%) ÖA mit proximaler und distaler Fistel, 4 (4,0%) ÖA mit proximaler Fistel und 2 (2,0%) Fistel ohne ÖA. Die Überlebensrate in den beiden Perioden stieg von 76,4% auf 90,9% ($p = 0{,}06$). Insgesamt war die Überlebensarte 82,8%. Im Zeitraum der Studie stieg die Überlebensrate von Frühgeborenen (<37 GA) (60 vs. 81%), von Patienten mit assoziierten Fehlbildungen (66,6 vs. 86,7%) und Patienten mir präoperativer Pneumonie (75 vs. 77,8%). Dagegen sank die mittlere Dauer des ersten Krankenhausaufenthaltes (103 vs. 58 d) bzw. des Aufenthaltes auf der Intensivstation (80 vs. 40 d). Die durchschnittliche Dauer der notwendigen künstliche Beatmung konnte reduziert werden (494 vs. 175 h). In GROUP II gab es weniger Patienten mit frühen postoperativen Komplikationen: Stenose (88,9 vs. 58,5%; $p < 0{,}05$), Leck (13,3 vs. 7,3%), wiederkehrende Fistel (13,3 vs. 7,3%). Bei mehr Patienten in GROUP II wurden gastroösophagealer Reflux (74,1 vs. 90,0%) und/oder Tracheomalazie (35,7 vs. 40,0%) diagnostiziert.

Schlussfolgerungen. Heute ist die erfolgreiche Behandlung von ÖA in den meisten Fällen möglich. Unvermeidbare Todes-

fälle werden durch schwere assoziierte Fehlbildungen, speziell durch schwere Herzfehler und andere tödliche Fehlbildungen verursacht. Überlebende leiden vor allem an ösophagealer Dysmotilität und gastro-ösophagealem Reflux.

193 Extended modified NUSS procedure following pectus excavatum recurrence

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We report our experience with the minimal invasive method of surgical reconstruction of pectus excavatum recurrence.

Since 2001 at our department 135 pectus excavatum patients have been operated on by the modified minimally invasive method of reconstruction (modified NUSS technique). Seven patients aged 19.6 ± 9.8 showed a severe recurrence (6 patients after Ravitch-Welsh-Rehbein method primarily operated elsewhere, one after explantation of the ''Nuss Bar'' operated in our department). Five patients suffered on reduced physical effort and 3 patients aim for a better cosmetic result. Preoperative investigations include blood samples, ECG, heart sonography, chest x-ray, chest MRI/CT with 3-D reconstruction and spirometry.

The following intraoperative events deserve mention:

1. Severe retrosternal scarred tissue complicate the retrosternal preparatory mobilisation of the pericardial sac and the sternal portion of the diaphragm $n = 3$.
2. Intraoperative thoracoscopy showed pleural adhesions which were divided thoracoscopically $n = 3$.
3. Non compliant stiff thorax due to sternal kinking and/or ossification of the regenerated ribs after Ravitch procedure made the following procedures necessary:
   a. Additionally osteotomies of the ossificated ribs ($n = 2$).
   b. Implantation of a second bar ($n = 3$).
   c. An oblique wedge shaped partial sternal osteotomy ($n = 3$).

Due to preparation we had 2 intraoperative bleeding episodes of the internal mammaric vessels, 1 lesion of the pericardial sac (scar tissue) and 1 superficial lesion of the right visceral pleura (adhesions). Vertebral Index changed from 31 preoperatively to a normal range of 25 postoperatively. Postoperative cosmetic results were perfect in 90%.

In summary cases with Pectus excavatum recurrence are manageable with extremely satisfactory results using the described extended modified correction technique. Osteotomies do not destabilize the chest and can be sufficiently combined with the NUSS technique.

194 Modified laparoscopic repair of retrosternal diaphragmatic (Morgagni) hernias

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Background. Former surgical approaches to laparoscopic repairs of Morgagni hernias in children involved prosthetic as well as nonprosthetic repairs. We simplified a nonprostethic laparoscopic method to an easily feasible procedure.

Methods. Two boys with retrosternal diaphragmatic hernias (Morgagni) underwent primary laparoscopic repair. A nonabsorbable suture was inserted directly through the anterior abdominal wall and the hernia was tightened in a lateral to medial fashion by a continous suture and tied in the subcutaneous tissue of the xiphoid region.

Results. Two boys, 22 months and five-year old, with coincidentally diagnosed bilateral retrosternal diaphragmatic hernias (Morgagni), underwent laparoscopic repair of their hernias. They had an uneventful postoperative recovery, apart from a port site hernia in one.

Conclusions. This technique for primary laparoscopic repair of Morgagni hernia is safe and easy to perform. Laparoscopic closure of the defect by suturing the posterior rim of the hernia to the anterior abdominal wall with a continous nonabsorbable suture provides a safe and effective therapy for this type of diaphragmatic hernias.

195 Our experience of post-natal diaphragm paralysis treatment in newborns

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Background. The paralysis of right cupula of diaphragm in newborns in many cases is the result of birth trauma and is indicated as Erb-Duchene syndrome. The paralysis declares itself by the high standing of diaphragm and its paradoxical movements during respiration, displacement of mediastinum and lung compression which bring to heavy respiratory distress, cardiovascular insufficiency development and requires artificial pulmonary ventilation in first post-natal hours.

Methods. In the period of 2003–2005, 3 children with post-natal paralysis of diaphragm right cupula and 1 child with post-natal paralysis of diaphragm left cupula have been treated in our clinic. The body weight at birth was 1800–3200 g. The basic symptoms were: hard respiratory distress and cardiovascular insufficiency, pulmonary hemorrhage, depression of the central nervous system. Two children with low body weight had been on artificial pulmonary ventilation during period from the birth to surgical treatment. Conservative therapy was done from 1 to 2.5 months without positive clinical effect – respiratory insufficiency had not been reduced, the children had retarded in physical growth and development. All children were operated on diaphragm goffering from thoracotomy on the affected side.

Results. After surgery all patients needed artificial pulmonary ventilation during 3–7 days. With good clinical results all children were discharged from the hospital.

Conclusions. The newborns with post-natal diaphragm paralysis with not effective treatment during 2–3 weeks needed surgical correction – diaphragm goffering on the affected side.

196 Long term experience with the PAUL-procedure in a large animal model

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Background. This study was designed to assess the long term efficacy of the PAUL-Procedure for abdominal wall defect repair in a large animal model (LAM).

Methods. We created $10 \times 6\,cm^2$ full-thickness abdominal wall defects in Goettinger miniature piglets ($n = 10$; body weight: 7.0–10.0 kg). The defect was repaired by the PAUL-Procedure, using an extracellular matrix of xenogeneic origin as an interpositional graft. A weekly examination of the animals followed, including measuring of bodyweight and observation the possible development of a hernia. Additional the abdominal cavity was evaluated laparoscopically at 3, 6, 9 and 12 months after PAUL-Procedure. The adhesions to the intestine were measured and the neo-abdominal wall was taken for histological examination.

Results. (1) The Paul-Procedure could be performed technical easily in LAM. (2) No wound infection could be observed throughout the experiment and no animal died during the time of observation. (3) Compared to an untreated control group, all animals showed physiological grow and a normal bodyweight curve. (4) No abdominal hernia developed. (5) Laparoscopically only a minimal adhesion to the intestine could be found. (6) Histological examination of the neo-abdominal wall showed a moderate remodelling process of the xenogeneic extracellular matrix graft.

Conclusions. Our long term experimental results in a LAM indicate that the PAUL-Procedure can be used easily for the therapy of congenital abdominal wall defects.

197 Gastroschisis – surgical tradition versus new concepts

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Background. Gastroschisis is a relatively rare congenital anomaly in which eviscerated fetal abdominal organs are exposed to amniotic fluid in utero through an anterior abdominal-wall defect. Since the first surgical treatment of gastroschisis by Fear in 1878 the evolution of therapeutical concepts is steadly proceeding.

Methods. A retrospective study enclosing all children with gastroschisis treated at Vienna General Hospital from 1994 to 2006 was carried out using patient charts. Statistics was performed using SPSS 12.0. The results are compared with the literature.

Results. Fifty-five children with gastroschisis were treated. Birth was performed between 28 and 40 week of gestation (92% caesarean section). Diagnosis was established between 11 and 40 week of gestation. In 75% of the patients primary surgical closure was performed. Oral feeds were started on 8.2 day, mechanical ventilation was stopped after 4.4 days. Twenty children developed infection/sepsis/pneumonia (36.4%) 18 children developed ileus/perforation/vovolus/NEC/patch infection (32.7%). Thirty four children had single gastroschisis related surgery (61.8%), secondary surgery up to 7 operations. Mortality was 3.6% (2 deaths).

Conclusions. Since Bianchi's publication of minimal intervention management for gastroschisis in 1998 traditional surgical concepts have often been questioned. Our results are comparable with international data. Although very tantalizing there are no large prospective randomized multicenter studies that show clear superiority of one or another strategy. Epidemiologic data show an increasing incidence of gastroschisis which shows the importance of standardized successful procedures for the future.

Rektum/Kolon

198 Surgical therapy of colorectal cancer – 10 year experience and outcome from an oncological center

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Background. Colorectal Cancer is one of the most common cancers in western countries with incidence rates that are quite stable through the last 10 years. While surgical therapy with high central vessel ligation and adequate lymph node dissection seems well standardised – in laparoscopy as well as conventional surgery – great efforts have been made in new adjuvant treatment strategies and in treatment of colorectal liver metastases.

Methods. We report about a consecutive series of more than 600 patients treated with colorectal cancer since 1.1.1998. Data about epidemiology, localisation of the primary, surgical methods, tumor classification, complication and mortality rates and survival will be presented in detail.

Results. The median age was 71 years, 2% of the patients were more than 90 years old, 51.8% were female. Fifteen percentage were treated with an acute onset like ileus or perforation. Thirty five percentage had right sided primary, Hartmann procedure was performed in 6%. About 22% of patients were operated as stage 4 (UICC), the 5 year survival rates of all groups including stage 4 was 45%. Pathohistological assessment showed 78% R0 resections (stage 4 included) and a median lymph node count of 24 (pN). Perioperative mortality was 4%, complication rate with the necessity for at least 1 surgical reintervention was 8.8%.

Conclusions. We demonstrate that surgical therapy of colorectal cancer is safe and effective in terms of oncological outcome and perioperative morbidity and mortality, although colon resections in our department are typical teaching operations. Modern anaesthesia and intensive care allows radical oncological surgery even in the elderly. Interdisciplinary

treatment keeps its way, exact pathohistological processing and cooperation with the pathologist still is the most important factor in quality assessment of oncology surgery of the colorectum.

199 p53 – a predictive marker for 5-FU based chemotherapy in stage II colorectal cancer?

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Background. Although adjuvant 5-FU-based chemotherapy showed to increase 5-year survival in stage III colon cancer, the role of adjuvant chemotherapy in stage II colon cancer is still unclear. p53, a frequently mutated tumour suppressor gene needed for correct induction of apoptosis, is a promising marker to define subgroups of patients who benefit from adjuvant chemotherapy in stage II colon cancer.

Methods. In order to evaluate the clinical relevance of p53 mutations, we investigated 145 stage II colorectal tumor biopsies from a previous randomised study of adjuvant chemotherapy, who were randomly assigned to adjuvant chemotherapy or surgery alone. For detection of p53 mutations we used single-stranded conformation polymorphism analysis.

Results. p53 mutation was detected in 51 (35%) of 145 informative tumor DNAs. When receiving 5-fluorouracil-based adjuvant chemotherapy, patients with p53 mutation turned out to have a significant better disease-free 5-year survival (95.5 vs. 77.7%, $p = 0.044$). In contrast, when assigned to the surgery alone group there was no significant difference in 5-year disease-free survival between patient with p53 mutation and patients with wildtyp p53. The difference between the patients receiving chemotherapy as compared to those which did not in respect to the presence of p53 mutations was significant ($p = 0.024$).

Conclusions. In our patient cohort patients whose cancer had a mutation of p53 had a significantly better benefit from 5-fluorouracil-based therapy, what is contrary to previous observations. This discrepant result emphasise the need for a standardisation and validation of the methodology, patient selection and interpretation of clinical data before any prognostic marker can be routinely used.

201 Is TME an adequate treatment for low rectal cancer?

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Background. Two patients who had had neo-adjuvant chemotherapy followed by surgery for cancer in the lower rectum presented with metastases in pre-aortic lymph-nodes after 6 and 17 months, respectively. This rose our suspicion that distant spread may in some cases follow the lymphatic vessels along the aorto-iliac axis.

Methods. After having performed very low anterior or even abdomino-perineal resection for cancer in the lower third of the rectum, biopsies are taken from nodes at the pelvic wall, along the iliac arteries, and the aorta. These are all compartments that remain untouched during routine TME.

Results. In one out of four patients we find at least one of the above mentioned groups of nodes to be involved. This is most often the case in patients, in whom the mid rectal vascular bundle requires ligation on at least one side. So there are obviously metastases that cannot be detected during the pathological work-up of the TME-specimen. Twenty five p.c. of the patients considered to be N–O are already in Dukes' stage C, thus requiring additional treatment. These findings – confirmed by the recent literature – suggest, that metastases may arise via lymphatic vessels along the mid rectal arteries and – further on – along the aorto-iliac vessels.

Conclusions. After standard TME for low rectal cancer lymph node biopsies should be taken in order to avoid understaging of the disease and to allow accurate patient stratification in clinical trials.

202 Transanal endoscopic microsurgery for rectal carcinoma: own experiences after 59 cases

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Background. Transanal endoscopic microsurgery (TEM) is an one access technique for local excision of rectal tumours using gas dilatation of the bowel and a stereoscope for unrestricted vision on the operation field. The TEM-technique was invented by Buess, Theiss and Hutterer and has been performed at our department since 1993. Sessile benign adenomas of the rectum inappropriate for colonoscopic resection represent the vast majority of cases indicated for TEM-procedure, using the advantages of sphincter preserving resection in all thirds of the rectum without considerable access trauma. Furthermore, TEM can be applied to a highly selected group of rectal carcinoma patients in curative objective, including T1G1 or G2L0V0 lesions, classified as low risk carcinomas after Hermanek's criteria for malignant potential, with recurrence and 5-year-survival-rates equal to radical surgery. Under palliative purposes TEM can be considered in more advanced carcinomas such as high risk carcinomas (T1G3) or in T2–3 carcinomas without stenosis in patients with high risk for general anaesthesia, rejection of stomal construction or present distant metastases.

Methods. From 01/1997 until 12/2006 198 TEM procedures were performed in 194 patients, 104 males, 90 females, mean age was 68.9 years (38–91), the median hospital stay was 8 days (2–68). Following diagnoses were included: rectal adenomas ($n = 127$), rectal carcinomas ($n = 59$), carcinoids ($n = 4$), fistulas ($n = 2$), GIST ($n = 1$) and melanoma ($n = 1$). All patients underwent TEM-procedure as described by Buess et al., the median operation time was 101 min (20–275). Highlighting the carcinoma patients regarding to postoperative histopathology TEM was performed in $n = 19$ Tis-lesions, $n = 25$ T1 low risk carcinomas, $n = 1$ T1 high risk carcinoma, $n = 10$ T2 and $n = 4$ T3 carcinomas.

Results. In carcinoma patients undergoing TEM for curative objective recurrence rate was 3.3%. If TEM was performed in primarily palliative intention recurrence rate was 66%. No conversion to open technique had to be performed, no postoperative surgical complications were observed, one patient died

4 weeks postoperative due to liver failure following esophageal varices bleeding.

Conclusions. Transanal endoscopic microsurgery is a technically highly demanding but excellent procedure for curative therapy of rectal adenomas and low grade early carcinomas. Furthermore, TEM is feasible in more advanced carcinomas for palliative purposes. Besides the technical advantages the procedure can prevent patients of rectal resection or stomal construction.

203 Anastomotic leak after low anterior resection for rectal cancer

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Background. Anastomotic leak is the most feared early complication in the postoperative period after low anterior resection. The incidence varies between 3 and 21%. Use of TME technique lessens the percentage of local recurrences but increases the incidence of an anastomotic leak. A surgeon has to assess the risk factors and decide whether to create a protective stomy that protects the patient from fatal consequences of an anastomotic leak.

Methods. One hundred and three patients who had a low anterior resection without a protective ileostomy in the period 2004–2005 were included in the analysis. Data of those who developed an anastomotic leak and those without were compared and the connection between specific risk factors and the incidence of an anastomotic leak was assessed.

Results. Eleven patients (10.7%) developed a clinically confirmed anastomotic leak. Death after low anterior resection occurred in 5 cases (4.1%), in two cases in patients who developed a leak, resulting in a 18.2% mortality rate for anastomotic leakage. There was no difference between males and females ($p = 0.25$) and age groups (<60 vs. >60 years), ($p = 0.15$). Tumor localization in the lower third of the rectum was roughly showing statistical importance ($p = 0.085$). The stage IV. of disease showed obvious connection ($p = 0.018$). Connection between the anastomotic leak and preoperative radiotherapy or high ASA score (>2) was not established ($p = 0.31$ and $p = 0.25$).

Conclusions. The incidence of an anastomotic leak was comparable with results of other studies. Localization of a tumor in the lower third in advanced disease represents an important indication for protective ileostomy.

Fehlervermeidung und Komplikationsmanagement

205 Root cause analysis – an investigative technique for the analyis of severe adverse events

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Background. While adverse events occur in up to ten percent of all patients admitted to hospitals sentinel events do not happen often. However, these events represent great risks for medical institutions and persons involved. A thorough analysis of sentinel events is mandatory and can be achieved by root cause analysis (RCA).

Methods. Root cause analysis has been designed in order to assess underlying human, technical, and organizational factors contributing to adverse events. RCA has to be performed in a standardized way by a team approach. The main goal of this analytic technique is to establish a relationship between causal factors and events under systemic aspects. After identifying incidental findings causal statements are formulated and actions are developed.

Conclusions. Root cause analysis is a standardized investigative technique which allows to identify causes of severe adverse events and to develop preventive actions for the future.

206 Impact of individual performance and refined technique on the outcome in thyroid surgery – an analysis of more than 20,000 thyroid operations in a high volume clinic

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Background. Thyroid surgery can be followed by 3 typical complications i.e. recurrent laryngeal nerve injury, postoperative hypoparathyreoidism and postoperative haemorraghe. Refined surgical technique has improved the outcome and lowered the risk of complication to a minimum.

Methods. We analyzed global outcome and individual performance in more than 20,000 thyroid operations. The complication rates were compared in 4 consecutive periods representing different surgical techniques and individual surgical performances. The data were repeatedly presented to the surgeons. The effect of this quality control procedure was reevaluated.

Results. Exposure of the recurrent nerve and the parathyroid glands significantly reduced the global rate of postoperative/permanent RLNI and hypoparathyreoidism. Some but not all surgeons improved their results by recurrent nerve dissection (e.g., permanent RLNI rates ranged from 0 to 1.1%) and refined dissection of the parathyroid glands (e.g., parathyroid insufficiency ranged from 0 to 2.7%). Global outcome and individual performance were compared in 4 periods and presented to the surgeons. The effect of this quality control procedure and the selective improvement of outcome will be shown by data. The extent of resection and the individual refinement of surgical technique was the source of variability.

Conclusions. Refined surgical dissection significantly reduces the risk of complications in thyroid surgery. Quality control can improve the global outcome and identify the variability in individual performance. This cannot be eliminated by merely confronting surgeons with comparative data; hence, it is important to search for the underlying causes.

208 Recent developments in medical litigation and liability in Austria

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The recent medical judgements of the highest court (e.g.: wrongful birth OGH 5Ob165/05 h) have been debated very controversially in medical profession and have attracted closer attention to the legal aspects of medical documentation and enlightenment.

Particularly in the surgical disciplines the patient should be made fully aware and get a detailed information about the risk of treatment failure, possible complications, limits to the procedures and long term outcome. Exact information by the doctor is the condition necessary for the patient to give valid consent to the treatment and to avoid medical negligence litigation in these risky specialties.

Unfortunately these often for the doctors existentially important aspects are not part of the medical or surgical training nor are there any compulsory guidelines of medical enlightenment in the Austrian legal practice which creates widespread individualism in all disciplines. We want to give an overview of the latest medico-legal lawsuits and judgements and their consequences for the daily working routine focussing on issues that can result in a doctor or facility being sued.

209 Informed consent in surgery – can quality be improved and do patients realize the changes?

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Background. Every patient has the right to be informed about the consequences of surgery enabling him to give his informed consent. Until recently the process of giving this information was not well organized. In the context of improving quality control at the hospital, a uniform process for patient information was established and the training of interns for giving informative talks was standardized and intensified. To measure whether these changes are reflected by an improved patient satisfaction, patients were surveyed before and after the changes.

Methods. Two surveys were performed on patients before and after the improvements were introduced, and the results were compared.

Results. In each survey 186 and 165 questionnaires were returned. With the improved process the number of patients satisfied with the length of the informative talk rose (78–99%, $P<10^{-9}$), less patients wanted a more detailed talk (16–9%, $P=0.055$) and more patients considered the sketches on the informed consent protocol helpful (87–95%, $P<2\times10^{-5}$). Fewer patients thought the surgery was worse than expected (34–22%, $P=0.013$).

Conclusions. Using the new information process, a measurably better patient satisfaction could be observed. Thus, by relatively simple means a highly efficient information process can be established even at a large hospital.

210 The discontented patient

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The number of claims after surgical procedures (not only bariatric or cosmetic surgery) is still increasing and patients nowadays are getting better informed about medical malpractice/error in the media and the various possibilities to assert their rights. In Austria various kinds of out-of-court settlement are installed to facilitate patient's compensation without the risk of litigation. In many cases misconceptions in the patient-doctor relationship can be solved without motion to court.

But how can the terms ''malpractice'' or medical error be defined at all? Which conditions must be fulfilled for the motion to court or the medical arbitration committee? We want to give a survey of the activity of the arbitration committee, the members, and the possibilities of compensation. Moreover, the different consequences between criminal and civil law should be explained. The role of the expert witness, the course of procedure at the arbitration committee and possible consequences for the doctor or the facility will complete the presentation.

Leber-Gallengang

212 Auswirkungen der Infrarot-basierten Navigation auf die erzielten Sicherheitsabstände bei Leberresektionen

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Background. Negative resection margins are significant for prevention of recurrence in liver surgery. Preoperative 3D models of imaging data provide significant improvements for visualization and planning, but intra-operative realisation is still a challenge. Possibly navigation technology can improve oncological safety in liver resections.

Methods. Fifty-four of 130 liver resections for liver metastases were selected for intra-operative navigation due to complex anatomical situations. Exact surgical plan was documented on virtual 3D models. Planned resection margins were assessed and measured preoperatively. Intra-operative 3D ultrasound data were acquired and localized with an optoelectronic tracking system, thus navigation of surgical instruments was provided in a virtual environment of these registered ultrasound data. Surgical resection margins were compared with the surgical plan.

Results. Navigated surgery was realized in 52 of 54 resections. R0 resection was achieved in 49 of 52 patients. Mean histological resection margins were 9 (0–15) mm. Maximum deviation from the surgical plan was 8 mm.

Conclusions. 3D ultrasound-based optoelectronic navigation is a feasible device for liver surgery, provides optimal anatomic orientation and can realize precise resection margins.

213 A standardized intra-operative protocol for optimal fluid replacement therapy during elective liver resection reduces blood loss, postoperative complications and hospital length of stay

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Background. During liver resection, a low central venous pressure plays a crucial role in reducing blood loss and intra- as well as post-operative morbidity. However, excessive volume restriction could lead to microcirulatory impairment and organ hypoperfusion. In the present study, we evaluated a standardized intra-operative protocol for optimal fluid replacement therapy.

Methods. In a prospective study, 32 patients for elective liver resection were included. Intra-operative fluid replacement was restricted to 8 ml/kg/h in patients with thoracic epidural analgesia or 6 ml/kg/h for patients without thoracic epidural analgesia. Following target parameters were defined: central venous oxygen saturation >70%, intra-operative lactate levels <1 mmol/l, urine output >15 ml/h, central venous pressure <10 mbar, and norepinephrine dosage <0.15 µg/kg/min. In patients where at least one of the parameter values exceeded the predefined limit, fluid replacement therapy was intensified and dobutamine 2.5 µg/kg/h was started. Patients were monitored for intra-operative blood loss, intra- and post-operative complications, and length of hospital stay.

Results. Patients that remained within the intra-operative target parameters for central venous oxygen saturation, lactate levels, urine output, central venous pressure, and norepinephrine dosage had lower blood loss, fewer complications, and shorter hospital length of stay.

Conclusions. The standardized protocol is a good approach for optimal intra-operative fluid replacement and to minimize blood loss, post-operative complications and hospital length of stay.

215 Bile duct injuries after cholecystectomy

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Background. Bile duct injuries (BDI) are still the most feared complication of laparoscopic cholecystectomy. The patient has to face prolonged postoperative treatment, even life threatening complications; the hospital and the surgeon rising costs and pricely and possibly time-consuming malpractice procedures. The repair of BDI requires special hepatobiliary expertise, but the long-term results even in the best centres are still sobering. There are different types of BDIs requiring a tailored approach. We analyzed predisposing factors and types of bile duct injuries treated in our institution.

Methods. We analyzed our operative and endoscopy database from 1999–2006 for patients treated with bile duct injuries after cholecystectomy. Bile duct injuries were classified according to a system proposed in 1994 by Siewert and colleagues.

Results. Between 1999 and 2006 a total of 2850 cholecystectomies were performed at our institution. There were 2422 laparoscopic (LC) and 428 open procedures (OC; inculuding procedures with conversion from LC to OC); during the same period, 55 patients (30 females/25 males, mean age 45 years; range: 34–93) were treated for bile duct injuries; 5 of these patients were initially operated in an other hospital.

There were 34 patients with Class I lesions (bile leak of the cystic duct or lesion of Luschka ducts), 26 patients with Class II leions (stricture of the CBD). Two patients with class III injuries (incomplete trans-section of the common bile duct) and 12 patients with Class IV lesions (transsection of the CBD or CHD). Thirty four of the initial 50 (68% – all open and converted and 9 laparoscopic) operations were considered difficulty by the surgeon performing the cholecystectomy. 30 of 55 operations were laparoscopic (52–1%), 10 converted from LC to laparotomy (18%) and 15 laparotomy from the incision (30–3.5%). Of the original operations, 31 had been performed by an experienced surgeon, 24 by a novice.

Conclusions. Cystic duct leakage is still the most common type of biled duct lesions after cholecystectomy. Bile duct injuries occur a s commonly in operations performed by by novices as in procedures done by experienced surgeons.

Österreichische Gesellschaft für Handchirurgie: Traumatische Läsionen des Plexus brachialis

219 Reconstructive strategies in brachial plexus surgery

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In order to present the current concept for treatment of BPL patients suffering from traumatic brachial plexus lesion (BPL) who underwent microsurgical reconstruction were analysed.

Within one year in our institution 11 male patients, aging from 21 to 63 years were scheduled for surgery. Three suffered from complete, 8 from upper BPL. Six patients were diagnosed as supraclavicular lesions and 5 as infraclavicular lesions.

Patients with diagnosed supraclavicular lesions were scheduled for surgery between 2 and 5 months after trauma. Surgical exploration revealed root avulsion and or rupture in all cases. Classic intraplexual reneurotisation was performed in 4 patiens, whereas all 6 patients received extraplexual reneurotisation procedures, utilising the spinal accesssory, the ulnar and intercostal nerves. Three patients received secondary reconstructive procedures. Patients with infraclavicular lesions were treated surgically between 6 and 12 months after injury. In all 5 patients nerve grafts were used to reconstruct the injured fascicles,

a nerve transfer was used in 1 case only. One patient required secondary reconstructive surgery.

The reconstructive strategy in BPL surgery has been changed dramatically during the last 10 years. The strategy changed from a single surgical intervention one year after the trauma to a prozessual concept consisting of early primary nerve reconstruction and secondary reconstructive procedures. Nerve grafting with use of autologuous nerve grafts for ''intraplexual'' reconstruction is still state of the art, additionally nerve transfers were introduced to utilize ''extraplexual'' sources for reeinnervation. Regarding this concept most of the patients regain not only some motor function but functionality of their impaired upper extremity.

Perspektiven der chirurgischen Laufbahn

229 Teaching means learning – who benefits from academic teaching duties?

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Background. In 2005 the Department of Surgery at the Danube Clinics inTulln, a level I hospital, has been named a teaching institution associated with the Vienna Medical University.

This has certainly led to various organisational changes the results and consequences of which we attempt to identify.

Methods. All teaching institutions are subject to continuous evaluation by the students. In addition to that, we undertook an extra evaluation aiming at potential organisational and medical improvements from which patients, personnel, and students may benefit.

Results. 1) As the students are available only from 7.30 through 12.30 O'clock, all organisational routines at the Department (staff-rounds, meetings, lectures, etc.) now follow a more rigorous daily schedule. 2) Bed-side teaching means explaining everything that is undertaken in the presence of the patients. So the patients receive more information on their diseases and treatments. 3) Students tend to question everything, and so we also call in question many routines ''that have always been performed like that''. This allows us to simplify numerous operating procedures and means continuous organisational learning to the institution. 4) For the same reason lecturers – and all those who are involved in teaching (physicians, nurses, and others) – have to keep their academic knowledge up-to-date any time. 5) Teaching during meetings and ward rounds is of course not ''limited'' to University students, but also comprises interns and residents.

Conclusions. The Department's current status as an academic teaching institution turned out beneficial for patients, personnel, and students, concerning professional, technical, and organisational aspects. Though the additional workload – especially in the beginning – must not be under-estimated, the advantages clearly exceed the burdens.

Österreichische Gesellschaft für Kinder- und Jugendchirurgie: Neue chirurgische Strategien

230 Necrotizing Enterocolitis: a five years review of surgical procedures and their outcomes

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Background. Necrotizing enterocolitis (NEC) is the most common gastrointestinal complication of prematurity at the neonatal intensive care unit. The first aim of the study was to investigate the correlation between clinical parameters, extent of disease and mortality, and the second purpose was to analyse the surgical procedures and their outcomes.

Methods. In a retrospective study we reviewed medical charts of 37 patients who were operated within a five years periode. Preoperative blood results and demographic data were collected and evaluated. According to the extent of disease, birth weight and operative procedure different groups were analysed.

Results. A total number of 37 patients underwent surgical procedures for NEC from 2000 to 2005, and 75% ($n = 28$) weighted less than 1050 g. In 14 patients focal disease, in 15 patients multifocal disease and in 8 children panintestinal disease were found. Preoperative blood tests revealed a median CRP level of 4.3 mg/dl (normal range ≤ 0.6), median WBCC of 12.1G/l and a median platelet count of 146 000 G/l. Primary laparotomy with defunctioning enterostomy was performed in 89%. Overall mortality was 51%.

Conclusions. The extent of disease and the condition of the infants still determines the survival. Preoperative blood results are of limited prognostic value. Primary laparotomy with defunctioning enterostomy was the preferred technique in our unit, and even in the group of VLBW and ELBW neonates surgery was well tolerated. Discussion regarding the best operative procedure is still going on and no consensus in the management of NEC is agreed on.

231 Spontane Dünndarmperforation bei sehr untergewichtigen Neugeborenen

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Grundlagen. Die zunehmende Anzahl Frühgeborener mit sehr niedrigem Geburtsgewicht (500–1500 g) bringt es mit sich, dass neben den durch eine nekrotisierende Enterokolitis bedingten Darmperforationen vermehrt auch isolierte, bezüglich ihrer Ätiologie bislang nicht ausreichend geklärte Darmperforationen (muskuläre Malformation (?), Peristaltikstörung (?), Wandschädigung durch Pharmaka (z. B. Ibuprofen) (?) etc.) beobachtet werden. Die Behandlung dieser Kinder hängt von ihrem Allgemeinzustand und vom abdominellen Befund ab: Punktion/

Drainage der Bauchhöhle, primäre End-zu-End-Anastomose oder Resektion des betroffenen Darmsegmentes und Anlage eines doppelläufigen Enterostoma.

Methodik. Während der letzten 8 Jahre wurden 14 Neugeborene (Gestationsalter 24–32 Wochen, Geburtsgewicht 530–1220 g, Alter bei der Darmperforation 3–15 Tage) mit einer oder mehreren Dünndarmperforationen beobachtet. Die Symptome waren jeweils etwa ident: Abdominelle Distension mit Verfärbung der Flankenhaut bei initial insgesamt stabilem Allgemeinzustand. Bei „nur" 10 der 14 Kinder zeigte sich im Abdomen-Leer-Röntgen freies Gas in der Bauchhöhle, bei allen aber war sonographisch intraabdominell freie flockige Flüssigkeit festzustellen, ohne NEC-typische Veränderungen am Intestinaltrakt. 2 Kinder wurden aufgrund ihres schlechten Zustandes nur punktiert/drainiert und antibiotisch behandelt. 12 Patienten wurden laparotomiert: Bei 3 Kindern fand sich die Perforation im Bereich des Jejunum, bei weiteren 3 im unteren Jejunum/oberen Ileum und bei 6 im terminalen Ileum, davon hatte eines 2 und eines 4 Perforationen. Der betroffene Darmabschnitt wurde jeweils reseziert; bei 4 Kindern wurde eine End-/End-Anastomose durchgeführt, bei den verbleibenden 8 Patienten wurde wegen der Peritonitis eine doppelläufige Enterostomie angelegt. Eines dieser 8 Kinder verstarb aufgrund einer Sepsis-bedingten Gerinnungsstörung. Eines der beiden drainierten Kinder wurde 7 Wochen nach der Intervention wegen eines „Verwachsungsbauches" adhäsiolysiert.

Ergebnisse. Die Überlebenschance sehr kleiner Frühgeborener nahm während der letzten Jahre deutlich zu. Parallel dazu mußte bei diesen Kindern eine Zunahme umschriebener, ätiologisch nach wie vor nicht ganz geklärter Darmperforationen zur Kenntnis genommen werden. Zur Behandlung stehen 2 grundsätzlich differente Vorgehensweisen zur Verfügung: Im Vordergrund steht eine Resektion des lädierten Darmabschnittes und, abhängig von den lokalen Gegebenheiten (Peritonitis ja/nein), entweder eine End-zu-End-Anastomose und/oder nur eine doppelläufige Enterostomie. Als zweite prinzipielle Therapieform gibt es die Möglichkeit, die Bauchhöhle zu punktieren/drainieren, wodurch die Affektion auch beherrscht werden kann; im Einzelfall kann sie letztlich aber doch nur chirurgisch zu sanieren sein. Dieses Vorgehen gilt für uns als ultima ratio.

Schlussfolgerungen. Auch wenn eine isolierte Darmperforation bei einem kleinen Frühgeborenen relativ gut behandelbar ist, sollte durch Klärung ihrer Ätiologie eine Prävention dafür möglich werden, da diese Kinder wegen ihrer kritischen Voraussetzung bereits per se außerordentlich gefährdet sind.

232 The endorectal pull-through procedure (ERPT) for Hirschsprung's disease

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Background. Whereas in the past various operative techniques in patients with Hirschsprung's disease (HD) were used, ERPT was introduced as a single-stage operation.

Methods. Sixteen patients with HD (3 females, 13 males) aged 2 months to 5 years were treated using the ERPT procedure and the level of bowel resection was determined by intraoperative biopsies.

Results. The length of HD was in 12 patients up to the sigmoid colon, in 3 patients up to the transverse colon and one patient had a total colonic HD. Two patients required a laparoscopic mobilisation of the left colonic flexure. In the patient with total colonic aganglionosis, the resection of the entire colon and Sauer's procedure was performed using a periumbilical laparotomy. Oral nutrition was started in all but on the first post operative day and they were discharged after 5–7 days. Complication occurred in two patients: one had to be reoperated due to misinterpretation of intraoperative biopsies and a second patient with 5 years of age developed a retrorectal abcess which was treated coservatively. In a follow-up, 1–6 years postoperatively, all patients are continent and have normal bowel movements.

Conclusions. ERPT is an advance in the treatment of HD and can be performed at any age. It avoids the creation of enterostomies, is a single step procedure with excellent functional results and low complication rates. In long segment HD this procedure can be combined with laparoscopic or open surgical procedures.

233 Single-port appendectomy in obese children – a useful alternative?

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Background. The rapidly increasing prevalence of obesity among children poses challenging problems in abdominal surgery. There is a growing body of evidence that single-port appendectomy (SPA) is a feasible and safe alternative to open appendectomy (OA). Very little is known about the clinical outcome of SPA in overweight children. We present our experience with the treatment of suspected appendicitis in obese children using SPA.

Methods. From January 2003 to December 2005 we performed 21 SPA in obese children with suspected appendicitis (14 females, 7 males, median age of 12.8 years). Obesity was defined as a BMI > 95th percentile for age and gender (median weight 69.3 kg). In the procedures a 10-mm instrument was introduced through the umbilicus (combination of a 10-mm 6° wide angle optic with 5-mm working channel). After exploration of the abdominal cavity and Meckel's search, the appendix was exteriorized through the umbilical trocar and removed by open technique. Patients' records were evaluated regarding anaesthetic time, complications, time until reintroduction of solid diet and histopathological findings.

Results. Average operating time was 53.3 min (range 32–75 min). Neither intra- nor postoperative complications occurred. Reintroduction of solid diet to all patients was possible on the first postoperative day. The histology is presented in the below table.

Acute catarrhal appendicitis	$N = 7$ (34%)
Acute suppurative appendicitis	$N = 4$ (19%)
Phlegmonous appendicitis	$N = 4$ (19%)
Chronic appendicitis	$N = 3$ (14%)
Neurogenic appendicopathy	$N = 3$ (14%)

Conclusions. Our results indicate that the advantages of SPA such as: excellent evaluation of the peritoneal cavity, minimal rate of intraoperative incidents and superior cosmetic results make this technique a valid alternative for the treatment of appendicitis in obese children.

234 A report about ovarian torsion in children – experience with 41 cases

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Background. Ovarian torsion is a surgical emergency. Because of unspecific clinical findings, diagnosis can be delayed and therefore may result in oophorectomy. Recently preservation of ovarian function by means of laparoscopic detorsion has been proposed even in advanced cases.

Methods. We retrospectively reviewed 41 patients with diagnosis of ovarian torsion who presented at our institution between 1995 and 2005. A total of 27 ovarectomies and 14 detorsion were performed. Twenty patients underwent minimal-invasive surgery, in 30 cases laparotomy was performed. In 9 cases a conversion was necessary. The accuracy of preoperative imaging modalities, surgical technique, correlation with postoperative histopathologic findings, complications and outcome were assessed.

Results. All patients were investigated by means of ultrasound. MRI was applied in 13 patients whereas CT-scan was done in 7 patients. Histopathological and intraoperative findings revealed 16 simple torsions, 17 twisted cysts and 8 twisted teratomas. Sensitivities to detect ovarian torsion were 75% for ultrasound (US), 87% for MRI, and 100% for CT. Entirely 27 oophorectomies and 14 detorsions in 41 patients were performed. One of these patients presented with asynchronous bilateral ovarian torsion caused by a unilateral benign teratoma. In 4 patients a laparoscopic contralateral oophoropexy was done. Mean hospital stay was 4 (laparoscopic) versus 7 days (open approach). The complication-rate was marginal in both groups.

Conclusions. Preoperative imaging is essential to improve the diagnostic accuracy. However, sensitivity only approaches 75%, emphasizing the importance of surgical exploration when symptoms are compatible with torsion. When a neoplasm is suspected, MRI or CT imaging is essential. In order to preserve ovarian function and fertility, laparoscopic detorsion without primary resection should be the procedure of choice. It constitutes an easy, quick and equally safe procedure. The need for contralateral oophoropexy has to be discussed.

235 Ovarian pathologies in pediatric surgery

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Background. Differential diagnosis of lower abdominal pain include beneath common causes such as appendicitis and gastrointestinal infections some not so common diseases as ovarian pathologies in female patients. This may be ovarian cysts but can also be pathologies like ovarian torsions or tumours that have to be operated. However, the differential diagnosis between ovarian cysts and ovarian torsions is often radiologically inclonclusive and therefore makes a surgical intervention mandatory.

Methods. We analysed retrospectively the data from 29 female patients hospitalised for ovarian pathologies in between 2000 and 2006. Twenty nine patients underwent surgical intervention for different causes.

Results. Most patients presented with acute abdominal pain demonstrated signs of peritonitis and required pain relief. On the other hand we had patients with only mild clinical signs such as newborns with already prenatally diagnosed ovarian cysts. We found in our patients 11 cases of benign ovarial cysts, 4 cases of benigne teratomas, 2 cases of serous cystadenomas, 1 case of serous cystadenofibroma, 1 case of yolk sac tumor and 10 cases of ovarial torsions.

Conclusions. Diseases of the ovaries are a rather rare but important cause of lower abdominal pain in children and adolescents and requires a mediculous diagnostic procedure and often an urgent surgical intervention.

236 Rare adrenal tumors in children

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Background. Adrenal tumors, other than neuroblastoma, are rare in children. The aim of the study was to present the outcome of functioning tumors of the adrenal gland in children.

Methods. We reviewed medical records of 5 children with adrenal tumors treated in our unit from 1995 to 2005. Demographic datas, clinical features, operative details, histopathological details and follow up were studied.

Results. There were 5 children with the mean age 5.6 ± 3.6 years. Two patients had virilizing tumors and presented with an acute abdomen, one patient had Conn's syndrome, one patient Cushing's syndrome and one patient presented with severe haemorrhagic shock syndrome. All patients were treated surgically. Histopathological diagnosis were adrenocortical carcinoma (ACC) in two patients, adrenocortical adenoma (ACA) in two patient and adrenocortical cyst in one patient. Ultrasound sonography, computerized tomography and magnet resonance imaging were used for diagnosis and follow up. Patients with ACC had advanced-stage disease and died despite total surgical resection and agressive chemotherapy. Patients with ACA and adrenocortical cyst were cured by surgical resection.

Conclusions. Adrenal tumors constitue less than 1% of paediatric neoplasm. ACA and adrenocortical cyst are cureable by surgical treatment, but the outcome is still poor in cases of ACC.

237 Subureteral injection of Deflux for correction of vesicoureteral reflux: analysis of factors predicting success

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Endoscopic subureteral injection of bulking agents has become an established alternative to long-term antibiotic prophylaxis and ureteral reimplantation. We evaluated the effectiveness of dextranomer/hyaluronic acid copolymer (Deflux®) and predicting factors for success or failure.

A total of 156 ureters/113 patients with a mean age of 4.4 years underwent endoscopic treatment with dextranomer/hyaluronic acid (Dx/HA) copolymer. VUR in duplex ureters

was treated in 10 patients. The presence of voiding dysfunction and renal scars, the volume of Deflux injected and the endoscopic appearance of the ureter were recorded.

Dextranomer-hyaluronic-acid was injected submucosally beneath the intramural part of the ureter at 6 O'clock, but if the appearance was not satisfying or the ureter opens during flow an additional injection at 4 and 8 o'clock was performed. All patients received antibiotic treatment till a voiding cystourethrography (VCUG) was performed 8 weeks after injection. Ultrasound Examination was performed after 24 hours, 3 months, 6 months and one year. Success was defined as no reflux on postoperative voiding cystourethrography.

A total of 156 ureters underwent 1 to 2 treatments. The overall success rate was 83%. The cure rate according to reflux grade was 100% for grade I, 81% for grade II, 74% for grade III. In VUR grade IV and V the endoskopic treatment failed in most cases. There was no case of obstruction at up to 24 month postoperatively. Haemorrhage occurred in one patient. In five ureters an increase of VUR grade developed. New contralateral VUR was seen in six patients. In 0.7% VUR was found on postoperative VCUG at 2 years after endoscopic treatment. There was no statistic significant difference in volume injected when successes were compared with failures. Among children with a small kidney the response rate was 54%. A positive response was observed in 80% of children with duplex ureters. The presence of voiding dysfunction had no influence on success. Patients in whom endoscopic treatment failed underwent open surgery.

The subureteral injection of Dextranomer/Hyaluronic Acid is an effective and well tolerated alternative to open surgery or conservative treatment, also in patients with duplex ureters. In patients, who subsequently require reimplantation, the operative repair does not appear to be compromised.

238 Endoscopic treatment of VUR with Deflux

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Background. Almost all patients with symptomatic VUR were treated with a Cohen procedure and a very high success rat. Since 2002 we offer the endoscopic procedure with Deflux. The outcome of the endoscopic treatment is evaluated.

Methods. Between 1/2002 and 1/2007, 99 Patients with 164 refluxing units were treated (I° = 15, II° = 80, III° = 58, IV° = 10, V° = 1). The control after treatment was between 2 and 66 months. Additional urological diseases are: solitary kidney (3), double kidney (13), neurogenic bladder with MMC (3), bladder trabeculation w/o neurological disease (6), cloacal malformation (2), bladder exstrophy (2), urethral valve (1). Age at treatment was between 8 mths and 14 yrs. Injection was performed under general anesthesia, bolus was between 0.2 and 3.2 ml. Three patients were additionally treated with Botox.

Results. Sixty patients need no further treatment after 1 injection (48 resolved and 12 patients have 1° reflux). In 17 of 19 patients, who need a second injection (9 overactive bladder), reflux resolved as well as in 2 patients after third injection. In 2 patients with neurogenic bladder and MMC we had no success and further treatment (augmentation) was necessary. In 4 patients reflux worsened and Cohen operation was performed. In 9 patients a VCUG will performed in the near future and three are lost for control.

Conclusions. In cases of moderate reflux with no neurogenic bladder it is an excellent method to treat reflux. In cases of neurogenic bladder, we cannot recommend it and cases with bladder trabeculation need an additional medical treatment or operation with a higher success rate. All these patients need a long term follow-up.

Evolution der Adipositaschirurgie

239 The development of bariatric surgery in Austria – update 2007

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Background. Bariatric surgery in Austria has a long tradition since 1973, but has always been different to the international trends. In order to obtain an overview of growth and time trends of obesity surgery in Austria a nationwide review has been done by the Austrian National Federation for Surgery of Obesity every two years since 2002.

Methods. E-mail requests are sent to every department of surgery in public hospitals and clinics to collect the recent number of operations including revisional procedures.

Results. The last reviews (including 2004) showed a steady increase of obesity surgery particularly in the years 1998 through 2001 the number of operations increased 500%. Since 2001 a constant number of interventions of about 1400 per year (2004:1445) had been observed. Predominant operation techniques were restrictive procedures: 1992–1998 VBG (vertical banded gastroplasty) and since 1998 AGB (adjustable gastric banding). Since the late nineties Austria is a Gastric-banding country (75% in 2004) compared to the worldwide review data (25% in 2003), but since 2002 we observe a steep increase of gastric bypass paralleled by a decrease of AGB. By the time of the conference data of the review starting in January 2007 will be presented a showing the trend of the last two years.

Conclusions. Bariatric surgery as the only effective treatment against the alarmingly increasing disease of severe obesity is already an important part of the surgical work of some Austrian surgical departments. In view of this fact quality control by continuous data collection is of major importance.

240 Restrictive bariatric procedures – long term results and complication management

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Background. Vertical banded gastroplasty (VBG) has been in clinical use since 1979 and the adjustable gastric band (AGB)

since 1985. As promising results were achieved with the adjustable gastric bands available in the market, some surgeons came to the conclusion that VBG might be entirely abandoned and replaced by the adjustable gastric band. The aim of this study was to compare the long term outcome of the two different restrictive procedures.

Methods. Within a period of 7 years (1994–2001), 1117 gastric restrictive procedures were performed in the course of a prospective non-randomized comparative trial. We report the outcomes of 563 VBGs and 554 AGBs performed by two surgeons. The mean BMI was 46.9 ± 09.9 for VBG and 46.7 ± 07.8 for AGB. Patient selection was performed by admittance to one of the two surgeons. VBG was performed via laparotomy and AGB by the laparoscopic procedure. The Bariatric Analysis and Reporting Outcome System (BAROS) was used to evaluate the postoperative health status and quality of life.

Results. The mean duration of follow-up was 92 months, with a minimum of 5 years (range, 60–134 months). The overall follow-up rate was 92%. In the short-term follow-up of 3 years, no statistically significant difference was registered between AGB and VBG in terms of weight loss, reduction of co-morbidity or improvement of quality of life. The 30-day mortality rate was 0.4% (2 patients) for VBG and 0.2% (1 patient) for AGB. The overall re-intervention rate in the long term was 49.7% for VBG and 8.6% for AGB ($p < 0.0001$, OR 0.0937, 95% CI 0.065–0.133), the re-operation rate 39.9% for VBG and 7.5% for AGB ($p < 0.0001$), respectively. The excess weight loss (EWL) was significantly higher in the VBG group after 12 months (58% for VBG vs. 42% for AGB; $p < 0.05$). In the long-term follow-up with a mean value of 92 months, no significant weight loss was registered between the study groups (59% for VBG and 62% for AGB; $p = 0.923$). The BAROS score in the short term (3 years) was good to excellent in 94 and 90% of the VBG and AGB groups, respectively. In long-term follow-up the BAROS score was significantly in favor of the AGB group (83.9 vs. 57.8%; $p < 0.0001$, OR 3.797, 95% CI 2.072–7.125). The overall loss of co morbidities was 80% in both groups.

Conclusions. This long-term follow-up study shows that VBG and AGB are effective restrictive procedures to achieve weight loss, and loss of comorbidities. A statistically significant lower re-intervention and re-operation rate and an improved health status and quality of life were registered for AGB.

241 Pilot study on the effects of gastric electrical stimulation (TANTALUS™) on glycemic control in morbidly obese patients with type 2 diabetes (T2DM)

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Background. Previous work suggests that non-excitatory electrical stimulation, synchronized to the gastric refractory period and applied during meals, can induce weight loss in morbidly obese subjects. The TANTALUS™ System (MetaCure N.V.) is a minimally invasive implantable gastric stimulation modality that does not exhibit malabsorptive or restrictive characteristics. Aim: to investigate the potential effect of the TANTALUS™ system on glycemic control and weight in morbidly obese subjects with T2DM.

Methods. In this European multi-center, open label study, 24 T2DM obese (9 m, 15 f, BMI: $41.7 \pm 0.9\,kg/m^2$) subjects treated either with insulin (7) or oral anti-diabetic medications (17) were implanted laparoscopically with the TANTALUS™ System. The system includes a pulse generator and three bipolar leads and delivers a non-excitatory signal initiated upon automatic detection of food intake.

Results. Twenty subjects have completed one year and exhibit a decrease in HbA1c from $8 \pm 0.2\%$ at baseline to $7.5 \pm 0.2\%$ ($p = 0.06$) and in fasting blood glucose from $180 \pm 15\,mg/dl$ to $150 \pm 8\,mg/dl$ ($p < 0.05$). Sixteen subjects on oral anti-diabetic medications showed a decrease in HbA1c from $8.11 \pm 0.3\%$ at baseline to $7.37 \pm 0.2\%$ ($p < 0.05$) and an average weight loss of $5.5 \pm 2\,kg$ ($p < 0.05$), Self glucose monitoring available at 9 months post-op from 12 subjects shows a significant ($p < 0.05$) decrease in 2 hours post-prandial glucose ($184 \pm 11\,mg/dl$ vs.$148 \pm 11\,mg/dl$). In a subset of 9 patients at 9 months of post-operative follow-up we could find an increase in adiponectin (9.5 ± 2.3 vs. $11.5 \pm 2.3\,\mu g/ml$, $p < 0.05$) and a decrease in fasting ghrelin (428 ± 80 vs. $252 \pm 20\,pg/ml$, $p < 0.05$). The areas under the curve (AUC) measured during meal tolerance test were significantly higher for adiponectin and lower for ghrelin ($p < 0.05$) compared to pre-therapy. Four insulin subjects have completed one year and showed no significant changes in HbA1c and weight.

Conclusions. Interim results with the TANTALUS™ System suggest that this stimulation regime can potentially improve glucose levels and induce weight loss in obese T2DM subjects on oral anti-diabetic therapy. Further evaluation is required to determine whether this effect is due to induced weight loss and/or due to direct signal dependent mechanisms.

242 Laparoscopic sleeve gastrectomy: results of a large series from three Austrian centers

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Background. Gastric sleeve resection was initially devised as the first step of the duodenal switch operation in bariatric surgery. Later, it was performed as an isolated restrictive procedure, mostly laparoscopically. We present intermediate to long-term results from a large series of laparoscopic sleeve resections (LSG) in three Austrian centers.

Methods. Ninety-eight patients (19 males, 79 females) who all met the IFSO criteria for bariatric surgery were included in this study. The mean BMI was $48.17\,kg/m^2$ (range, 36–80 kg/m^2). Patients with symptoms of gastro-esophageal reflux or large hiatal hernias as well as ''sweet eaters'' were excluded and allocated for a different procedure (usually Roux-en-Y gastric bypass). Ninety-five of the operations were performed laparoscopically: after establishing a pneumoperitoneum of 14 mmHg, four to five working trocars were introduced. Beginning opposite the crow's foot, the greater curvature was dissected from the

omentum up to the angle of His. The left crus of the diaphragm was always identified to ensure complete resection of the gastric fundus. The stomach was then reduced to a tube over a 48F gastric bougie with several magazines of an endostapler, the staple line was finally oversewn with a continuous 2-0 PDS suture. Three patients had sleeve resection via an open access.

Results. After a median follow-up of 15 months, patients had lost 11.3 kg/m^2 of their BMI or 51% of their excessive weight on the average. There were six failures of LSG: three patients had gained weight despite LSG and three patients had lost less than 25% of their EW within one year. Three of these patients underwent gastric bypass operations that were successfully performed laparoscopically. Major complications included leaking of the staple line necessitating reoperation (three patients), severe wound infection (two cases, one of them after conventional SG), minor wound infections (three cases), and postoperative gastro-esophegeal reflux (one case), resulting in an overall complication rate of 5.1% for severe and 4.8% for minor complications. There was no operative mortality.

Conclusions. Laparoscopic gastric sleeve resection is an effective and safe procedure with encouraging intermediate results. There is no implantation of foreign material, the procedure is less invasive than malabsorptive techniques. In the case of failure, it can readily be converted to gastric bypass or duodenal switch (with or without biliopancreatic diversion). On the other hand, this method has yet to stand the test of time within the spectrum of bariatric surgical procedures.

243 Laparascopic gastric bypass (LGB), a prospective analysis of the first 30 patients

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Background. Bariatric surgery is indicated in patients with a BMI exceeding 35 and presenting comorbidities or BMI $\geq$40. LGB is accepted as one of most successful surgical procedures to treat obesity. Aim of study: a prospective analysis of the first 30 patients who had been treated with LGB in our centre.

Methods. According to our treatment protocol at least 3 dietetic attempts have to be failed to enrol the patient in the surgical program. LGB is performed in patients with a BMI $\geq$35 with comorbidities or a BMI $\geq$40 when gastric banding is unlikely to succeed. Thirty patients (f:m = 21:9) with a mean age of 47 (35–75), mean BMI 44.6 (SD 6.11%) underwent an antecolic, laparoscopic gastric bypass, performing the gastro-enteric as well as the entero-enteric anastomosis with linear stapler, closure of the enterotomies with manual continuous suture with PDS, closure of the mesenteric defect with a non absorbable running suture. The postoperative controls had been performed on month 1., 2., 3., 6. and 12. calculating the corresponding BMI.

Results. Perioperative morbidity: two reoperations due to intestinal obstruction, two intraluminal bleeding of the anastomotic suture line, one case treated endosopically, one conservatively, no mortality was observed. The EWL 12 months after performance of LGB was calculated to be 54% (SD 15%).

Conclusions. This series document that acceptable results may be achieved even during the learning curve of laparoscopic gastric bypass.

244 Technique and results of revisional gastric bypass

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Background. In up to twenty five percent of morbidly obese patients restrictive procedures as vertical banded gastroplasty (VBG) or adjustable gastric banding (LAGB) do not lead to adequate weight losses. Transformation to a gastric bypass represents a therapeutic option in these patients.

Methods. From 2002 to 2006 revisional gastric bypass was performed in 50 patients (24 after VBG, 25 after LAGB, and 1 after sleeve gastrectomy). The main indication for redo surgery was inadequate weight reduction.

Results. Four (8%) surgical complications (incarcerated trocar hernia, intra-abdominal abscess, subphrenic abscess, leakage gastro-jejunostomy) occurred and had to be treated by a reoperation. One patient died of septic shock caused by a subphrenic abscess resulting in gastro-jejunal leakage and peritonitis (mortality rate: 2%). On follow-up patients after complications lost equal amounts of excess weight compared to uncomplicated cases.

Conclusions. Revisional gastric bypass is a safe and potentially effective option for patients with inadequate weight loss after restrictive surgery. However, postoperative morbidity and mortality rates are higher compared to primary operations.

AMIC: Freie Vorträge

245 Economic aspects in colon surgery: open – laparoscopic – fast tracking

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The method of fast tracking drastically changed the post-surgery handling of patients after colon surgery. In our department almost all patients undergoing colon surgery are being treated by this method since August 2004. From August 2004 until September 2005 we used fast tracking, respectively the alteration of short tracking, on 83 patients – not only laparoscopic but also open colon surgery.

Operational cost accounting reflects in an impressive manner the medically already evident advantages for our patients.

A laparoscopically performed colon resection with fast tracking costs € 8.251,57 including pre- and post-surgical hospitalization. The same procedure without fast tracking results in costs of € 8.470,50. Open colon resection including fast tracking adds up to € 8.720,05. Conventional procedure without fast tracking even amounts to € 13.455,59.

Furthermore combining the operational results with the economical calculation results in a cost cutting potential of an

extra € 608,71 per person, who has undergone laparoscopic surgery and was treated with fast tracking.

In conclusion it can be stated, that this strategy of treatment means not only a severe post-surgical improvement of quality of life but in addition also shows significant economical advantages.

The best method of treatment from both the medical but also the economical point of view is therefore the combination of laparoscopic colon surgery with fast tracking.

246 Is the laparoscopic sigmoid resection with a primary anastomosis in acute sigmoid diverticulitis the optimal surgical therapy?

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Background. The late elective laparoscopic sigmoid resection for diverticulitis has become an acceptable therapy for diverticulitis, but the optimal surgical procedure of the acute diverticulitis has not been established. The optimal waiting period after acute symptoms of diverticular disease is still discussed controversial. The resection and primary anastomosis in acute diverticulitis may advance the challenging process for this surgical approach.

Methods. From May 2005 to January 2007 a laparoscopic sigmoid resection was performed in 55 patients (male: 28, female: 27) with a sigmoid diverticulitis. The average age was 54 years for the males and 61 years for the females. 19/55 patients were operated early elective within 10 days after acute signs of diverticular disease (according to Hansen and Stock Grade IIa and IIb) by a single surgeon, and 36/55 patients late elective by different surgeons. From all patients the clinical course, the operative time, the length of the sigmoid resection, the post-operative hospitalization and the complication rate were evaluated.

Results. According to the ASA-classification 14/55 patients were graded as ASA I, 36/55 as ASA II and 5/55 as ASA III. Patients were divided in three groups. Group I (19/55): early elective operations, Group II (11/55): late elective operations but with intraoperatively signs of an acute diverticulitis and Group III (25/55): late elective operations without manifestations of an acute process. The average operative time in minutes was in Group I: 119 (range 60–168), Group II: 154 (range 91–240) and Group III: 126 (range 67–286). The length of the resection specimen was comparable in Group I and III with an average length of 174 mm, in Group II 191 mm. The average extent of hospitalization was in Group I: 7.6 days, Group II: 7.1 days and Group III: 8.6 days. None of the patients had conversion to laparotomy. Complications were: Group I one wound seroma, Group II one ureteral injury, one incision hernia and Group III three wound infections, one anastomotic leak and one incision hernia. Since the localization and operative technique of the wound suturing was varied, an incision hernia was not observed.

Conclusions. The advantage of the early elective sigmoid resection after acute sigmoid diverticulitis is a short one-stage hospitalization with a low complication rate. In experienced centers the laparoscopic early-elective sigmoid colectomy seems to be a feasible and optimal surgical procedure for the acute sigmoid diverticulitis.

247 Laparoscopic resections for colorectal diseases: indications, operations, results

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Background. Laparoscopic assisted surgery for colorectal diseases has potential advantages over the traditional open technique. Several studies reported that the laparoscopic approach offers multiple benefits such as faster recovery, better cosmesis, a lower incidence of adhesion-related complications and incisional hernias. The current study was designed to assess the role and feasibility of laparoscopic procedure in colorectal surgery.

Methods. From 1997 to 2006 309 patients (174 females, 135 males) underwent laparoscopic colorectal resections. Mean age was 42 (range 15–99 years) with a mean Body Mass Index of 20.9 kg/m^2 (range 14.0–52.2 kg/m^2). Indications included benign (Inflammatory bowel diseases, Diverticulitis, Slow Transit Constipation, Colon Adenoma, FAP) and malignant conditions with curative and palliative intent. All operations were performed or directly supervised by one single surgeon. Intra- and postoperative parameters were documented and statistically analysed retrospectively.

Results. Over a 10 year period 404 operations in 309 patients were performed, including 352 bowel resections (66 malignant) and 350 anastomoses. Average duration of operation was 150 min (range 50–420). The mean time of hospital stay was 8 days (range 3–30). The total conversion rate was 2.2%. Postoperative complications were observed in 37 patients: Surgical complications occurred in 24 cases, with 10 patients requiring reoperation (bowel obstruction $n=3$, anastomotic leak $n=4$, trocar hernia $n=2$, anastomotic bleeding $n=1$). Thirteen patients developed medical complications after operation and were treated conservatively. One patient (0.3%) died due to cardiorespiratory failure.

Conclusions. The present study included a wide range of indication criteria. Notable, despite a high number of patients with inflammatory bowel diseases, there was a low rate of surgical complications. Thus the minimal invasive approach seems to be safe and effective for a broad spectrum of colorectal diseases.

248 Rectal carcinoma in the era of "minimal invasive"- and "fast track"-surgery

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Background. Laparoscopic surgery for colon cancer is feasible and effective with good results in regard of postoperative recovery. Fast track protocols are changing perioperative treatments to the same aim. At the time there are no randomized studies available to compare the effect of laparoscopy and fast tract strategies to an open and conventional procedure for rectal carcinoma, which is still surgical standard.

Methods. From 2002 to 2006 60 patients were operated laparoscopically for rectal cancer (31 males and 29 females; mean age 64a, 48a–83a). Patients staged T4 were excluded. Excessive preoperative surgery (i.e. right hemicolectomy, sigmoid resection, prostate resection), severe cardiac and pulmonary diseases

or a high BMI did not effect the indication for laparoscopy. 20 patients, (33%) staged T3 preoperatively, received chemotherapy and long time radiation. In the first period (-II/2004) 17 patients were treated according to a conservative perioperative management. Thereafter (2004–2006) a fast track protocol was applied to the following patients.

Results. Abdominoperineal extirpations ($n = 12$), anterior resections in double stapler technique ($n = 36$) and coloanal anstomosis ($n = 12$) were performed. Conversion to open surgery was necessary in two cases (3.33%), [bulky disease and a narrow male pelvis ($n = 1$), anatomical reasons ($n = 1$)]. Operation time was long and varied from 145 to 500 minutes (mean 237 minutes). R0 was achieved in 94% (2 patients with metastatic disease were staged R1, one patient with a colonic wall lesion and potential spillage). Postoperative stay for the laparoscopic group was 14 days, for the combined laparoscopic + fast track group was 8 days (in comparison with 21 days for conventional and open surgery). Complications, mortality and side effects were reported.

Conclusions. Exceptional view inside a narrow pelvis by the means of laparoscopy creates good conditions for total mesorectal excision and nerve sparing technique. Minimal invasive surgery reduces the surgical trauma as a basis for an early postoperative recovery. The combination with a fast track protocol furthermore helps to establish even better results.

249 The importance of laparoscopy in the management of postoperative complications

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Background. Postoperative complications, especially anastomotic leakage after laparoscopic colon surgery are a hazard for all surgeons. Most important is to recognize the early signs of complications such as abdominal pain, fever, chill, persisting nausea and vomiting and increasing abdominal swelling. The erlier a reintervention is done the better is the outcome for the patient. Requesting a single and sufficient procedure, most surgeons don't even think about a minimal invasive reintervention. From 07/02 until 01/07 389 patients underwent laparoscopic colon surgery, 35 patients had to be reoperated. Twenty-five patients had a relaparoscopy, only two times we converted to the open procedure. 4 patients had to underwent primarily open abdominal surgery, 8 patients had abdominal wall problems and did not need an intraabdominal procedure.

Methods. Concerning the intraabdomial complications we performed 8 laparoscopic washouts, 2 Patients had a laparoscopic incisional hernia repair, 2 patients bleeded from the trocarincisions, a laparoscopic anastomosis resection was performed, 5 patients got a laparoscopic ileostomie, 4 times it was necessary to perform a laparoscopic bowel diversion and 5 times the Hartmann procedure was performed minimal invasive.

Results. The traditional open reinvention was required in 4 patients, all showed a peritonitis and a colon diversion with stomatherapie was done. Eighteen patients had a single reintervention. After laparoscopic redos the median postoperative stay was far shorter than after open procedure. 4 patients died.

Conclusions. Laparoscopic reinterventions are feasable in most cases, the advantages are less postoperative pain, shorter hospital stay, quicker return of bowel fuction and improved cosmetic results.

250 Compensatory sweating after endoscopic sympathetic block at T4

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Background. Endoscopic thoracic sympathectomy is the treatment of choice for patients with primary hyperhidrosis (HH). Compensatory sweating (CS) is the most frequent unwanted side-effect of this surgical procedure. Recently, clip application (endoscopic sympathetic block, ESB) has been introduced as it provides reversibility. Furthermore, sympathetic block solely at the level of the 4th thoracic ganglion (T4) was proposed to reduce CS and still effectively cure palmar HH. The aim of the study was to analyze the outcome of patients treated by ESB at the level T4 with special reference to CS.

Methods. Between 2001 and 2005 112 patients (mean age 30.4 ± 9.1 years) prospectively underwent 223 procedures (one unilateral and 111 bilateral operations). Satisfaction rates and quality of life scores have been evaluated. Mean follow up was 21.9 ± 10.1 months obtainable from 106 patients (94.6%).

Results. One hundred and three patients (92.0%) had palmar, 87 (77.7%) axillary and 75 (67.0%) combined HH. At follow-up, all patients with palmar and 88.3% with axillary HH were completely or nearly dry. CS was observed in 18 (17.0%) patients. Most frequently, the back (72.2%), the thighs (38.9%), the abdomen (33.3%), the feet (33.3%) and breasts (22.2%) were affected. In 38.9% one single body region was affected, in 27.8% two and in 22.2% three regions became humid. CS significantly diminished quality of life ($p < 0.05$ for both questionnaires). Consequently, 16.7% were unsatisfied with the final outcome. However, the vast majority of patients were completely or almost completely satisfied.

Conclusions. ESB at T4 gives excellent results for palmar and good results for axillary HH. However, CS primarily affecting the back and the thighs diminishes patients' quality of life and satisfaction.

251 Laparoscopic assisted right living donor nephrectomy for kidney transplantation – technical ascpects

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Background. Laparoscopic organ procurement is well established in living donor kidney transplantation. For laparoscopic

right donor nephrectomy, a major challenge is adequate renal vein length, due to vascular anatomy.

Methods. All patients undergoing laparoscopic donor uretero-nephrectomy between 2004 and 2006 were included. Side of nephrectomy was selected based on selective renal function assessment and vascular anatomy. Standard laparoscopic access was gained through 4 trockars, the kidney dissected from its capsule, the vessels isolated, and the ureter transsected. Following transsection of the renal artery (proximal closure with clips to maximize retrieved vessel length), and the renal vein (proximal closure with vascular stapler), the organ was procured through a mini-laparotomy connecting two trokars. In laparoscopic assisted right nephrectomy, the vein was retrieved with a vena cava patch using a semi-open approach: Following isolation of the vascular structures and ureteral transsection, the confluens of the renal vein with the inferior vena cave was excluded using a curved clamp through a mini-laparotomy in the right upper quadrant. The caval patch was created by cutting the vein closely distal to the clamp, with reconstruction of the vena cava by a running Blalock suture. Patients undergoing laparoscopic assisted right resection (study group SG) were compared to patients with laparoscopic left nephrectomy (control group CG). Data are reported as mean ± standard deviation or total numbers (%). Significane was assumed if $p < 0.05$.

Results. A total of 29 patients (SG 5 vs. CG 24) were included. Mean patient age was 47.56 ± 8.86 years with a male:female ratio of 1:3.1. Mean operation time was SG 193.00 ± 50.17 vs. CG 189.38 ± 55.21 min ($p = 0.978$). Intraoperative warm ischemia time was equal for both groups 1.26 ± 0.25 min. Length of hospital stay was SG 12.00 ± 2.24 vs. CG 11.52 ± 4.24 days, $p = 0.318$. Upon discharge, serum creatinine levels were SG 1.27 ± 0.25 vs. CG 1.18 ± 0.25 mg/dl ($p = 0.739$), serum urea SG 30.98 ± 12.71 vs. 29.61 ± 9.08 mg/dl ($p = 0.928$), and c-reactive protein levels SG 1.91 ± 1.52 vs. CG 2.01 ± 1.67 mg/dl ($p = 0.940$). Total morbidity was 9 (31.0%), including 3 (10.3%) infections, and 2 (6.9%) postoperative lymphatic leaks. Two (6.9%) major complications (bleeding (1) and intraabdominal abscess (1)) resulted in reoperation (SG 0 vs. CG 2; $p = 0.680$).

Conclusion. The laparoscopic assisted approach to right kidney procurement is feasible, allows for sufficient length of the right renal vein for transplantation, and donor morbidity is comparable to laparoscopic left nephrectomy.

252 Clinical implementation of radius surgical system in MIS

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Limited mobility of instruments and absence of depth perception are significant issues in advanced laparoscopy. By that procedures including complex suturing and anastomoses in narrow operating fields in difficult angles of visualisation exceptionally challenge experienced surgeons.

The Radius Surgical System (Tübingen Scientific Medical GmbH, Tübingen, Germany) consists of 2 manipulators for MIS (right and left hand) suitable for 10 mm trocars allowing a 360° freedom of movement comparable to robotic devices. The instrument tip can be deflected by 70° by handle deflection and rotated 360° via handle knob. Compressing and releasing of the instrument jaws works conventionally.

Radius System was implemented in the EKH Vienna by 12/06. In advance a 2-day training course was absolved by the surgical team. Radius system was used for a series ($n = 12$; 01/06) of reflux operations to perform hiatal suturing and fundoplication. In practice handling of Radius taking advantage of all features turned out so physically mandatory, that a training course is unanimously recommended even for surgeons with experience in all MIS suturing techniques. In pratice the needle could be guided with significantly higher precision if compared to convention needle-holders. Even suturing in narrow cavities and in difficult angles became feasible (Video). After full accomodation to Radius the next step of implementation is the creation of handsewn anastomoses, esp. in bariatric surgery.

Precision, reliability, safety and tightness of sutures and sewn anastomoses are crucial for the outcome quality of advanced MIS procedures. For that the Radius Surgical System has shown to be extremely beneficial.

253 Does lifting of the abdominal wall for the set up of the pneumoperitoneum for laparoscopy increase the safetiness?

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Background. To evaluate the intraabdominal changes while lifting the fascia with regard to the distance between the fascia and the retroperitoneal vessels and the intestine for access in laparoscopy. Fifty percent of all complications during laparoscopic procedures occur during the establishment of the pneumoperitoneum. The blind insertion of the Veress needle is the most popular way of access. Elevation of the abdominal wall or the fascia is recommended, though the benefit has not been proven yet.

Methods. For 10 patients scheduled for laparoscopic cholecystectomy the operation started in the CT scan. After orotracheal intubation a CT scan was performed of the umbilical region with 10 cm proximal and distal margin. After a supraumbilical incision the fascia was freed and elevated with stay sutures. During maximal elevation, a second CT scan was performed. The distance between the fascia and the intestinal structures (small bowel) and the retroperitoneal vessels (iliac artery, aorta, vena cava) was measured after both scans and the difference was evaluated.

Results. Lifting of the fascia increased the distance between the fascia and the intestinal structures with a mean of 1.92 cm (range 0.87–2.67 cm), the distance between the fascia and the retroperitoneal vessels with a mean of 7.83 cm (range 3–11 cm).

Conclusions. Elevation of the fascia at the umbilical region prior to the first entering into the abdominal cavity for laparoscopy does increase the safeties due to enlargement of the

distance between the fascia and the intraabdominal and retroperitoneal structures.

ACO ASSO: Resektionsgrenzen im Zeitalter multimodaler Therapie

254 Breast reconstruction: facts versus rumour (Brustrekonstruktion: Gerüchte und Wirklichkeit)

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Background. Despite many years of experience in breast reconstruction even as an immediate one stage procedure, there are still rumours about this technique, even among oncologic surgeons. These are concerning the influence on the oncological outcome, radio- and chemotherapy, severity of the operation, possible complications and patient's satisfaction. The presentation offers answers to most of these rumours from our own experience and the recent literature.

Methods. One hundred and eighty breast reconstructions were performed between 2003 and 2006 in our department, 95 as immediate and 85 as delayed procedures. Eighty-seven were done with microsurgical autologous flaps and 54 with a latissimus dorsi flap, in the rest various techniques like prostheses and expanders were applied. Patient data were collected concerning early and late complications, oncological outcome, influence on radio-and chemotherapy and patient's satisfaction.

Results. Reconstructions with prostheses required shorter operating times, but mostly late revisions were more frequently, especially in combination with radiotherapy. Among the group of patients, in whom flaps were applied, only one was lost. With increasing experience, the need for blood transfusions, the postoperative morbidity and the length of the hospital stay decreased. In no case radio- or chemotherapy had to be delayed due to immediate breast reconstruction. Secondary axillary lymph node dissection due to a positive sentinel node was possible even after a flap which was pedicled in the axillary vessels. Our experience is well reflecting the results of the recent literature.

Conclusions. Despite many existing rumours breast reconstruction, even as an immediate single stage procedure, can be regarded as an operation which does not inflict the oncological therapy. To optimise the results, however, indications must be set very carefully.

255 Early assessment of response during neoadjuvant radiochemotherapy in esophageal squamous cell carcinoma patients by 18-FDG-PET

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Background. Positron emission tomography with the glucose analog [18F]-fluorodeoxyglucose (FDG-PET) has been used for response evaluation in patients with esophageal squamous cell carcinoma (ESCC) during neoadjuvant radiochemotherapy (RTx/CTx). This prospective study was undertaken to compare FDG-PET assessment of tumor response during RTx/CTx with histopathology in patients with ESCC, and to correlate the findings with survival.

Methods. Sixty-one patients with histologically proven ESCC (cT3, cN0/+, cM0) underwent preoperative, simultaneous RTx/CTx followed by esophagectomy between 1996 and 2004. The patients underwent FDG-PET prior to and 2 weeks after the begin of RTx/CTx (20Gray). Histopathological response was quantified as the percentage of residual tumor cells. The threshold pre-therapy-to-during-therapy decrease in standardized uptake value by FDG-PET used to define metabolic responders (ΔSUV_R) was -30%.

Results. Receiving-operator-curve analysis (ROC) for determination of metabolic response revealed an area-under-curve (AUC) of 7140 ($p = 0.005$) with a sensitivity of 76%, specificity (70%), a positive predictive value of 81% and a negative predictive value of 64% ($p < 0.0001$). Responder by FDG-PET during the neoadjuvant treatment ($p = 0.016$) as well as Histopathology ($p < 0.0001$) showed substantially better survival compared to nonresponders.

Conclusions. Changes in tumor metabolic activity by FDG-PET during neoadjuvant RTx/CTx allows an accurate determination of response due to the multimodal approach in patients with ESCC. This stratification may lead to a change of the neoadjuvant into a definitive therapy concept in nonresponders (individualized tumor therapy).

Roboterchirurgie

264 Robotic technology – probably a safe tool for development of completely endoscopic coronary revascularization procedures

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Background. Totally endoscopic coronary artery bypass grafting (TECAB) requires telemanipulation technologies because attempts using conventional thoracoscopic instrumentation have completely failed. These complex operations take individual and team learning curves and a stepwise approach is necessary.

Methods. From 2001 to 2006 161 CABG procedures were performed using the daVinci^{TM} system. A low risk patient population (age 59 (31–76) years, EuroSCORE 1(0–7)) was treated. The following procedures were carried out: endoscopic IMA takedown in MIDCAB, OPCAB, and CABG ($n = 25$), robotic suturing of LIMA to LAD anastomoses through sternotomy ($n = 30$), single vessel TECAB ($n = 95$), double vessel TECAB ($n = 11$).

Results. The number of totally endoscopic approaches through ports only increased from 13% in 2001 to 94% in 2006. There was no hospital mortality and cumulative risk adjusted mortality (CRAM) plots showed that 2.48 predicted events did not occur. Given 161 event free procedures Clopper Pearson estimations revealed a 95% confidence interval between 0.0% and 2.3% for perioperative mortality. Cumulative 5 year survival was 99%, and 5 year freedom from angina was 97%.

Conclusions. Introduction of robotic totally endoscopic coronary artery bypass grafting seems to meet current CABG safety standards. Initial application in low risk patients and a stepwise approach to completely endoscopic versions of the operation seem worthwhile. Using this way single and double vessel TECAB can be performed. Intermediate term survival and revascularization results appear to be very satisfactory.

265 BHTECAB versus AHTECAB: advantages and disadvantages

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To compare our beating heart and arrested heart TECAB experience with the Da Vinci system.

During 2003 to 2005 we intended to perform a TECAB in 26 patients with coronary artery disease (mean age of 62 ± 5.3 years, female to male ratio 7:19, mean EF 61%, mean Euroscore 1.3%.

A total of 9 patients were operated on the beating heart (BH) with the aid of an endostabilizer system whereas 11 patients underwent TECAB on the arrested heart (AH) with the femoral vessels as access for cardiopulmonary bypass (mean ECC 135.182 ± 34.793 min, ACC 82.545 ± 19.639 min).

Op time was mean 353.90 ± 73.811 min in the BH group whereas $310.778 + 74.983$ min in the AH group, $p = 0.213$.

The time to perform the LIMA ad LAD anastomosis lasted on average 27.667 ± 6.000 min in the BH group and 24.750 ± 4.621 min in the AH group ($p = 0.283$).

ICU stay was a mean of 1 day in both groups and Hospital stay lasted on average 8.667 ± 3.000 days in the BH group and 7.000 ± 0.943 days in the AH group ($p = 0.133$).

The advantages of arrested heart TECAB are various

- more space through the relaxed heart,
- superior anastomosis quality through the arrested heart,
- no manipulation of the LAD with tapes and a clear operating field through the use of crystalloid cardioplegia,
- no occlusion of the LAD with the risk of ischemia,

and result in shorter anastomosis as well as operating times and do not increase ICU and hospital stay.

266 Experience with the application of a flexible stapling system in open and laparoscopic surgery

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Background. A flexible shaft stapling system has been introduced into open and minimal access surgery. The device consists of a flexible shaft with a removable head that allows for linear and circular stapling techniques. The purpose of this study was the assessment of initial clinical experience, the problems during the learning period and technical feasibility in open and laparoscopic procedures.

Methods. Initially an experienced GI-surgeon was trained in an experimental centre in the application in both, open and laparoscopic application of the flexible shaft stapling system. After 4 experimental sessions the system was used in clinical open surgery in 20 cases before the laparoscopic approach was used. For laparoscopic procedures a stepwise learning curve was applied (from laparoscopic appendectomy, colon resection to laparoscopic gastric resection and esophageal resection). For intraabdominal application of the linear stapling device a 15 mm trocar and for the circular stapling device a 33 mm trocar was used. Technical problems, operation time and operative complications were prospectively documented.

Results. The flexible stapling device was used in 134 patients (77 conventional, 57 laparoscopic surgery). A mean of 2 stapling procedures (range 1–6) was performed per patient. During the early phase technical problems were observed in 4 patients (1 formation of gastric tube for esophageal reconstruction, three formations of colonic anastomoses). All problems were solved by repetition of the anastomoses. Nine leakages (6.7%) were observed: two after esophageal surgery (2/16; 12.5%), one after gastric surgery (1/21; 4.8%) and six after colon surgery (6/76; 7.9%).

Conclusions. The flexible shaft stapling device is safe in open and laparoscopic surgery. Technical problems in the early phase were not due to malfunction of the device. The problems and complications are within the limits of conventional stapling. Since there is a learning curve for handling,

proper training in laparoscopic and open surgery is advised. The new flexible stapling device showed beneficial in special indications in laparoscopic surgery. The handling of the device is possible in any location in the abdomen, which makes procedures like COLLIS-plasty feasible to be performed laparoscopically. Circular stapled anastomoses of the colon above the rectosigmoid junction can easily be performed in circular stapling technique.

Österreichische Gesellschaft für Handchirurgie: Freie Vorträge (Traumatische Läsionen)/ Obstetrische Läsionen des Plexus brachialis/Freie Vorträge

268 Selektive Nerventransfers in der Rekonstruktion posttraumatischer Plexus brachialis Patienten

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Background. Intra-und extraplexuale Nerventransfers kommen routinemäßig in der Rekonstruktion posttraumatischer Plexus brachialis Läsionen zur Anwendung. In den letzten Jahren wurden einige neue selektive distale Nerventransfers beschrieben, welche ein geringes Defizit an Spendernerven hervorrufen, möglichst nur motorische Fasern beinhalten und ein hohes Maß an funktioneller Synergie besitzen. In der vorliegenden retrospektiven Arbeit werden die operativen Details, und Langzeitergebnisse von Patienten bei welchen diese Techniken zur Anwendung kamen vorgestellt und analysiert.

Methodik. *Demographie:* Es wurden neun männliche Patienten identifiziert. Das durchschnittliche Alter war 36.8 Jahre (von 23 bis 73 Jahre) der durchschnittliche Nachuntersuchungszeitraum 73,1 Monate (von 12 bis 133 Monate) Als Ursache konnten vier Motorrad-, drei Auto- und zwei Schiunfälle identifiziert werden. Bei fünf Patienten resultierte ein oberer, bzw. erweiterter oberer Plexus mit C7 Beteiligung. Bei drei Patienten war eine isolierte untere Plexusläsion festzustellen, bei einem Patienten eine globale Plexusläsion. Sechs Patienten präsentierten eine unilevel Läsion, drei Patienten eine multilevel Läsion. Die Erstversorgung erfolgte durchwegs an einer auswärtigen unfallchirurgischen Abteilung. Der Revisionseingriff erfolgte im Durchschnitt 6,6 Monate nach dem Unfall. *Chirurgische Techniken:* In Summe wurden bei sechs Patienten Äste der Pektoralisnerven als Spendernerven verwendet. Bei zwei Patienten wurde ein selektiver Ulnaristransfer, bei einem anderem ein selektiver Medianustransfer durchgeführt. Bei fünf Patienten musste ein Nerveninterponat (N. suralis) verwendet werden. Bei einem Patienten musste der M. bizeps brachii mittels eines freien Muskeltransfers ersetzt werden. *Analyse:* Die retrospektive Analyse inkludierte eine Durchsicht der Operationsberichte, Beurteilung der elektroneurographischen Befunde und schliesslich eine detaillierte Bestandaufnahme des klinischen Istzustandes mittels des British Medical Research Scales (M0–M5), bzw. Beurteilung des aktiven und passiven Bewegungsumfanges mittels der Neutral-Null Methode.

Ergebnisse. Bei allen Patienten konnte eine erfolgreiche Reinnervation des Zielorgans festgestellt werden. Bei sechs Patienten war eine suffiziente Kraftentwicklung durch den alleinigen Nerventransfer möglich. (M3+/M4) Bei zwei weiteren war ein zusätzlicher Sehnentransfer notwendig. (Trizepstransfer/Steindler Plastik) Bei einem Patienten musste der Verlust der Muskulatur durch einen freien Muskeltransfer ersetzt werden.

Schlussfolgerungen. Selektive Nerventransfers stellen eine exzellente Erweiterung des chirurgischen Armamentariums in der Behandlung traumatischer Plexus brachialis Läsionen dar.

269 Selektive Nerventransfers zur verbesserten Steuerung myoelektrischer Armprothesen

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Die Bewegung myoelektrischer Armprothesen erfolgt bis dato über 2 transkutane Elektroden welche über zwei getrennt innervierte Muskelgruppen angesteuert werden. Die verschiedenen Steuerungsebenen werden durch Kokontraktionen dieser Muskeln angewählt und in der jeweiligen Ebene mit denselben Muskeln gesteuert. Ein harmonischer, dem natürlichen Bewegungsmuster entsprechender Bewegungsablauf ist mit diesem Steuerungsmechanismus nicht möglich. Eine wesentliche Verbesserung wäre eine Ansteuerung der einzelnen Bewegungsebenen mit Signalen welche neuronal mit dem natürlichen Bewegungsablauf übereinstimmen. Technisch sind Prothesen mit 6 Steuerungsebenen seit Kurzem realisiert. Ziel ist es einzelne Stammnerven wie N. musculocutaneus, N. radialis, N. axillaris, N. medianus und N. ulnaris aus dem proximalen Armnervengeflecht herauszulösen und an verbliebene Nervenäste von stammnahen Muskeln zu transferieren. Als Zielmuskeln würden sich alle Muskeln der Rotatorenmanschette und Pectoralis major/minor anbieten. Diese Muskeln würden schließlich entsprechend der Aktivität der Spendernerven kontrahieren und über transkutane Elektroden die Prothese steuern. Auf diese Weise ist eine harmonische, intuitive dem natürlichen Bewegungsmuster entsprechende Steuerung gewährleistet, ohne dass der Patient ständig zwischen den verschieden Steuerungsebenen wechseln muss.

Voraussetzung sind intakte proximale Muskelgruppen und weitgehend intaktes proximales Armnervengeflecht mit der Möglichkeit Spendernerven entsprechend topographisch anatomisch isolieren zu können. Diesbezüglich ist eine MRI Untersuchung, hochauflösender Ultraschall und bilanzierende NLG und EMG sinnvoll. In der präoperativen Planungsphase als auch in der postoperativen Verlaufskontrolle ist gemeinsam mit der Innovationsabteilung der Fa. Otto Bock ein detailliertes Procedere ausgearbeitet worden um möglichst sinnvolle Schaltebenen zu schaffen, die Elektrodenpositionierung zu optimieren und auch die Prothesenanbindung zu klären. Schliesslich ist ein komplexes Rehabilitationsprogramm notwendig um dem Patienten ein optimales Ergebnis zu ermöglichen.

270 Free functional muscle transplantation in brachial plexus surgery

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Background. Long lasting brachial plexus lesions (BPL) require free functional muscle transplantation to restore some distinct motor function.

Methods. Five patients, receiving a total number of 7 free vascularized muscle transplants are presented. All patients were male, aging 9, 10, 11, 30 and 45 years. 2 patients suffered from obstetrical, 3 from traumatic BPL. Unstable shoulder ($n=4$) and lacking biceps function ($n=3$) were the indications for surgery. The gracilis muscle was used in 6 cases to replace deltoid ($n=3$) and biceps ($n=3$). In one case a rectus femoris muscle was transferred into deltoid position. Reinnervation of the muscle transplants at the shoulder was perfomed end-to-side to the spinal accessory nerve. In biceps position the motor nerves of the gracilis were coaptated end-to-end with the ulnar nerve (Oberlin procedure, $n=2$) or intercostal nerves ($n=1$).

Results. Surgery was successful in all cases primarily. All transplants showed reinnnervation starting 6 months after surgery. Stabilisation of the shoulder was achieved in all 4 cases, furthermore 3 of these cases regained active shoulder abduction/flexion up to 90degree. 1 gracilis in biceps position reached M4, 2 are reinnervating.

Conclusions. Free vascularized muscle transplantation seems to represent an useful tool for reconstruction of some distinct, essential motor function in paretic limbs due to BPL.

272 Extraplexual neurotisation by terminolateral neurorrhaphy in brachial plexus surgery

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Background. Since Viterbo presented his exquisite results from terminolateral coaptation in small animals a new source for neurotisation seemed to be provided. Viterbos results and our own good experience with free functional muscle transplantation encouraged us to use the technique in brachial plexus surgery. In a retrospective analysis we wanted to prove whether or not terminolateral neurorrhaphy produces functional results in brachial plexus surgery.

Methods. In 6 patients, suffering from minimum C5,6 avulsion and/or rupture a total of 8 terminolateral procedures was carried out: 6 times the suprascapular nerve was connected with the spinal accessory nerve and 2 times the biceps motor nerve with the ulnar nerve, after creation of an epineureal window in all cases.

Results. Patients were investigated 24.5 (± 10) month after surgery. The modified oberlin procedures ($n=2$) showed M0. The SS to XI procedures ranged from M1 ($n=1$) to M3 ($n=5$). Multichannel EMG evaluation did not reveal isolated function of the reinnervated muscles but action in parallel with the ''source muscles''. In 5 out of 8 procedures the terminolateral neurorrhaphy was sufficient to regain useful muscle function, i.e. to stabilise the shoulder and to add some minimal active function.

Conclusions. With respect to the severity of the lesions one might consider this an acceptable result. Actually we did expect better results from the procedures, as we did achieve M4 and M5 function with free functional muscle transplantation and terminolateral neurorrhaphy in children. Regarding our experience, the technique represents an useful tool for reinnervation, provided an unimpaired function of the donor nerve.

275 Current concept for treatment of obstetrical brachial plexus lesions

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Background. For a long time the treatment of obstetrical brachial plexus lesions (OBPL) consisted of conservative treatment mainly. Surgery was indicated only in severe cases suffering from persistant complete flail arm. Gilbert introduced a much more aggressive concept with surgical intervention whenever the biceps is not working at three months of life, a strategy which caused discussions permanently. As a result of this discussion and with respect to Clarkes work the concept was modified in the last years again.

Methods. The diagnosis of an OBPL has to be followed by monthly clinical examinations. Testing for muscle regeneration is not only focussed on biceps muscle but also on time and topographic course of regeneration. Lack of shoulder and biceps activity at three months of life or negative ''handkerchief-test'' at six months represent indications for immediate surgical revision of the brachial plexus (primary early nerve surgery). In cases showing ongoing regeneration the conservative treatment is maintained. Relevant deficiencies in motor function (less than 50% of ROM or power in correlation with the unaffected side) at twelfe months of life represent an indication for brachial plexus surgery again (primary late nerve surgery). Further nerve procedures, usually isolated nerve transfers (secondary late nerve surgery), can be performed in selected cases up to two years of life. After that time musle transfers and osteotomies (secondary procedures) are perfomed to achieve further increase in function.

Results. In brachial plexus surgery new concepts of ''extraplexual neurotisation'' and ''end-to-side neurorraphy'' have increased the possibilities of reconstruction by increasing the amount of nerve sources. Secondary procedures, including free functional muscle transplantation, have become an integrative part of the overall treatment strategy.

Conclusions. Although obstetrical techniques have improved in the industrialized countries, there still exists an incidience of 1–2 OBPL per 1000 newborns, last but not least with regard to an increasing number of babies weighing more than 4500 g. It is known that 8 of 10 OBPL recover spontaneously. New investigations have revealed relevant deficiencies in 4 out of 10 of these children at an age of 15 years. Actually the number of children requiring surgery is small. But for these children it is important to make the right decisions in time to minimise deficiencies and achieve optimal results.

276 External derotation osteotomy of the humerus in patients with Erb's palsy – effects on upper extremity kinematics

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Background. Patients with untreated upper brachial plexus lesions frequently develop an internal rotation contracture of the shoulder, deficient active shoulder abduction and especially external rotation. The humeral derotation osteotomy combined with muscle transfers is one of the most common secondary reconstructive procedures to correct this deformity and improve the upper limbs function. The aim of this study was to investigate the patients' benefit of the surgical intervention. In order to objectively assess the functional outcome an optoelectronic motion analysis system was used to capture and analyze the kinematics of the involved limbs pre- and postoperatively.

Methods. Eight children with secondary deformities following an obstetrical Erb palsy were investigated before and after humeral derotation and muscle transfers. The patients' movements were captured by tracking the reflective markers which were applied to the upper limb and the trunk. The motion analysis was finished on the PC, resulting in various kinematic parameters, such as joint angles, motion curves, velocity and acceleration. Static data was calculated to measure the amount of the shoulder malposition.

Results. Results of the motion analysis document a dynamic as well as a static improvement of the involved limb in all eight patients. The average effective external derotation of the upper arm was 30°, which means a correction to a nearly physiologic rotational positioning. Active abduction increased in 7 of 8 patients with enhancement between 5° and 27°. Active shoulder rotation improved in all patients (∼10°). The maximum active elbow flexion did not increase, but the motion curves describing the movement changed: the velocity increased (24%), the compensatory shoulder abduction, which was observed during elbow flexion preoperatively in all patients, was reduced to a physiologic extent (compared to healthy probands).

Conclusions. Derotation of the humerus as a secondary procedure allows functional improvement in patients with Erb's palsy. This can be assessed by using a 3D motion analysis system.

277 Surgical correction of the supination contracture of the forearm in obstetrical brachial plexus lesions

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Following global or lower brachial plexus lesions with intact biceps function in combination with missing radial nerve and weak median nerve function a supination contracture of the forearm is resulting. The supinated position of the forearm is functionally useless and often causes neglect of the extremity.

Five patients underwent surgical correction of this deformity, 3 females (aging 10, 19 and 28 years) and 2 males (aging 8 and 10 years). The biceps tendon was rerouted to the outside of the radius in 4 cases and to the medial side of the ulna in one case. Additionally correction osteotomies of radius and ulna had to be performed in the 28 y old patient. Reconstruction of extensor function was done in classical manner by tendon transfers. The tendon transfers did not only reanimate the extensors of carpus and hand but also augmented the light pronation of the forearm.

All patients regained normal biceps and some simple hand function. Regarding this, all patients started to use the extremity during ADL for some, mostly bimanual tasks.

Correction of the supination contracture was highly beneficial for the patients. The procedure changed a useless extremity into a functioning part of the body.

Österreichische Gesellschaft für Plastische, Ästhetische und Rekonstruktive Chirurgie: Wann Tradition, Wann Innovation?

281 Distally based medial plantar flap – anatomic considerations and clinical impact for diabetic foot ulcers

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Background. Reconstruction of the distal weight-bearing area of the foot is surgical challenge, especially in diabetic patients. Skin grafts do not provide adequate and permanent coverage of a weight-bearing region. Local surgical options to cover these distal skin defects include forefoot amputation, a toe fillet flap and a reverse medial plantar island flap. The reverse medial plantar island flap is based on a very thin and possibly damaged intermetacarpal network. Conventional angiography often is not a helpful tool for preoperative assessment, because foot vessels often remain occult.

Methods. The purpose of this study was to evaluate the viability of the distally based medial plantar flap in 40 cadavers. Angiographic imaging was possible in only 19 cadavers reflecting the clinical preoperative assessment. Distally based medial plantar flap dissection was done in all cadavers, as well as vascular dissection of the superficial and deep plantar arch.

Results. We found a well developed deep plantar arch in all cases. The deep plantar artery formed the main feeder of the deep plantar arch in 79%, while the second proximal perforating artery contributed to the deep plantar arch in 41%. The superficial plantar arch usually appeared slender and incompletely.

Conclusions. The distally based medial plantar flap could be dissected in all cadavers, whereas the quality of vessels was varying explicitly. The results of dissection always showed a constant vascular supply, but varying quality of supply. No clinical conclusions can be drawn, considering the slender vas-

cular supply of the distally based medial plantar flap. Optimized diagnostic angiographic procedures like MRA or biplane selective DSA are essential for preoperative assessment planning distally based medial plantar flap.

282 Limberflap – Salvage procedure for the non healing pilonidalis sinus

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Background. Surgical treatment of pilonidal sinus disease has a significant morbidity and recurrence rate. The rhomboid flap of Limberg is a transposition flap that has been advocated for treatment of this condition. We present the technique and our experience.

Methods. In a prospective study starting in January 2006 we analysed 16 consecutive patients (6 females), median age 24 years (range 19–38 years), with recurrent pilonidal sinus disease. We performed a complete rhomboid excision and closed the lesion by an excentric transposition flap designed to obliterate the middle cleft. Morbidity was recorded and patient's satisfaction was analysed by a visual analog scale (VAS).

Results. The median hospital stay was 5.9 days (4–7 days). We found in all patients a primary healing. Minor complications were found in two patients. There was one flap oedema and one wound dehiscence, which were conservatively treated. No wound infection was observed. During the median follow-up of 8 months (2–12 months) no recurrence occurred and high patient satisfaction was noticed.

Conclusions. Although the Limberg flap results in a slight asymmetric gluteal region patient's acceptance is high. Fast healing, low complication and recurrence rate are the important advantages for this procedure.

283 Treatment of human painful neuromas and complex regional pain syndromes (CRPS) by CO_2 Laser welding and regional subcutaneous venous sympathectomy (RSVS) – A new Surgical Approach

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Background. Since nearly 200 years the treatment of painful neuromas is an unsolved problem. Up to 150 techniques are described with a recurrency rate of the pain between 20 and 50%. The intramuscular transposition, the implantation into a vein and the end-to-side coaptation of the nerve stump are the state of the art operations. Besides for 140 years the treatment of Complex Regional Pain Syndromes Type II (CRPS II) has been an unsolved problem. Therapeutic approaches have included conventional pain medication, physical therapy, sympathetic blocks, transcutaneous or spinal cord stimulation, injections or infusion therapies and sympathectomy. Alone or in combination these therapies often yielded unfavorable results. The majority of physicians, dealing with CRPS patients are convinced that surgical treatment only exacerbates the symptoms, and after the third neuroma pain-operation no improvement can be expected.

Methods. After unsuccessful anaesthesiologic pain therapy over more than 6 months, 160 patients, with chronic neuroma or phantom pain were operated by CO_2 laser welding of the nerve stump in the last 10 years. One third of the patients had 3 or more pain operations. Subsequently 16 patients developed a CRPS Type II at the upper or the lower limb. The exact pain area was determined and the most proximal part where the CRPS commenced was infiltrated with 2% Xylocain. When the sympathetic, deep, burning pain could be blocked, the subcutaneous veins in the previously determined area were removed surgically in a second step. A visual analogue scale (VAS), the Nottingham Health Score (NHS) and physical examinations were used to evaluate outcome of the operation.

Results. Ninety-five percent of surgically treated painful neuromas and CRPS Type II patients showed significant improvement of limb function, the visual analogous scale (VAS) and the Nottingham Health Score (NHS). The medical pain therapy could considerably be reduced.

Conclusions. The presented data show that the superficial epicritical pain of neuromas can be treated successfully with CO_2 laser welding. The sympathetic, deep pain of the Complex Regional Pain Syndrome Type II can be treated successfully by a Regional Subcutaneous Venous Sympathectomy (RSVS).

284 First clinical study of successful erbium-yag laser vaporisation of cutaneous neurofibromas

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Background. With a prevalence of 1 in 3000 births neurofibromatosis Type I is one of the most common genetic defects. The mode of inheritance is autosomal dominant and affects a gene (NF1), which is responsible for the production of the tumor suppressor protein neurofibromin. The consequence is an uninhibited expansion of neural tissue which leads to cosmetic disfigurement of the patients. In comparison to the plexiform neurofibromas the cutaneous tumors do not undergo malignant transformation. Excision and CO_2 laser vaporisation were established as standard treatment but cause unattractive scars.

Methods. In 6 operations on two patients more than 2000 neurofibromas were removed with an Erbium:YAG laser. The tumors were dissected by shooting holes into the skin and vaporising the neurofibromas in-between or underneath. From test areas several biopsies were harvested for Er:YAG-, CO_2 – and electrosurgical treatment in vitro to evaluate the difference of thermal necrosis histologically. Photographs were taken to assess the cosmetic results.

Results. The fast healing by second intention as well as the minimal discomfort and scar formation following Er:YAG laser vaporisation was judged as excellent by patients and surgeons. We did not observe any hypertrophic scarring or lasting dyspigmentation. Histologic evaluations revealed minor thermal damage to adjacent tissue resulting from this laser.

Conclusions. Scars and changes in pigmentation resulting from excision or CO_2 laser-vaporisation often yield unfavourable results and the treatment is time consuming. Er:YAG laser-vaporisation of huge numbers of cutaneous neurofibromas is an uncomplicated and rapid procedure that achieves excellent cosmetic effects.

285 Management of near circumferential lichen sclerosus of penile skin

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Background. Lichen sclerosus usually presents a precancerous skin lesion of the genital region. Skin grafting of penile defects is difficult because of the flexibility of the underlying recipient bed. This leads to disruption of the vascular ingrowth into the skin graft and compromises the results of the reconstruction.

Methods. We successfully used a circumferential vacuum-assisted closure dressing with an incorporated urethral catheter to secure penile skin grafts in place during the early postoperative period.

Results. We achieved perfect take-rate of the graft and postulate good functional result concerning the stretched penile position during application of the VAC-device.

Conclusions. A vacuum-assisted closure dressing can be used successfully to secure large and circumferential skin grafts, as well as skin grafts on concealed penises.

286 From modern defect coverage back to tradition

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Background. There is a trend in reconstructive surgery towards modern techniques of defect coverage. Such techniques are expected to combine high levels of safety, low donor-site morbidity, high aesthetic claims, short patient immobilisation and inpatient periods. The speculative applications for free, microvascular tissue transfers are expanded monthly while traditional reconstructive flap designs are no longer accepted as ''state of the art''. We present a case where modern defect coverage was not successful due to multiple comorbidities, localisation and complexity of the defect, and a step back to traditional flap designs was inevitable.

Methods. A previously healthy 60-year-old woman found a tumour on her back four years ago. Diagnostic imaging and multiple biopsies revealed a 13 cm-diameter chondrosarcoma with partial osteolysis of Th 11/12, tumour reaching into the spinal canal. She underwent radical resection and orthopaedic stabilisation from TH9-L2, followed by chemotherapy and radiation of 52 Gy. One year after the operation metastatic lesions were found in both lungs. They were resected by video assisted thoracic surgery. Due to resection of the erector trunci, the spine stabilisators loosened, two screws broke and the metal parts penetrated the skin. After local necrectomy, VAC-therapy was performed for more than one year. Severe headache and massive exsudation of the wound started in 2006, suggesting dural leakage. A reversed latissimus dorsi-flap was performed, additional microanastomosis could not be done due to the very small calibre of the intercostal vessels. After one week, the metal-covering part of the flap showed muscle necrosis and had to be resected. A large fasciocutaneous transposition flap was designed and cautiously raised in 4 steps of delay and could finally cover the defect.

Results. In this rare case of a chronic vertebral defect including spinal instability and liquorrhea reconstructive aims could not be reached by microsurgical techniques but by returning to traditional local flap designs. The patient is mobile and painfree, and there is no recurrence of liquorrhea since discharge.

Conclusions. Technical advances and refinements in defect coverage are the basis for progress in reconstructive surgery. Selected indications for traditional flap techniques still remain in modern reconstructive surgery dominated by microsurgical tissue transfer to cover problem defects.

287 The missing link between tradition and innovation: Skin tissue engineering

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Background. The need to achieve rapid wound closure in patients with massive burns and limited skin donor sites led to the investigation of in vitro cellular expansion of keratinocytes. The use of cultured epithelial grafts was first reported in the treatment of major burns. Since 1981, support for the use of keratinocytes has varied. The factors potentially limiting the use of cultured keratinocytes were cultivation time, reliability of 'take', vulnerability of grafts on the newly healed surface and long-term durability. The aim of this review is to evaluate the real impact of the clinical use of keratinocytes. One of the main aspects is to introduce new methods, which found or will find their way into clinical practice.

Methods. This study is mainly based on our long lasting experience in cultivating and transplanting cultivated keratinocytes (more than 350 patients and 5600 sheets).

Results. The coverage of burn wounds with viable keratinocytes renders constant and reliable results. Understanding keratinocyte-matrix interactions has not only allowed us to influence keratinocyte outgrowth, adhesion, and migration, but also has guided us to modify matrices for enhancing keratinocyte take. Due to these improvements we have achieved a proper material in the adequate situation.

Conclusions. As surgeons, our goal is to help burn patients with the best quality of skin in the shortest time possible. As tissue engineers, we have not achieved the goal of a universal skin product yet, but by continually reviewing new options and using them, the anatomy and physiology of engineered skin substitutes will improve and they will become more similar to native skin autografts. Thereby tissue-engineered skin may match the quality of split-skin autografts in future.

288 Securing skin grafts with VAC-experiences in deep and full thickness pediatric burn patients

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Background. The survival of patients with major burns goes hand in hand with early escharectomy and the survival of skin grafts.

Methods. The application of Topical Negative Pressure has improved increased graft take especially in difficult anatomic regions.

Results. Securing skin grafts in 18 pediatric burn patients enabled a near 100% graft take. Perfect protection from shear forces, early mobilisation, patient comfort, nursing comfort and abandonment of splinting are major advantages concerning conventional dressings.

Conclusions. We postulate the application of VAC for securing skin grafts as a valuable tool in pediatric burns management. Wide meshed grafts and including donor sites protected by silicon layers into the dressing in extensive burns should be evaluated carefully because of possible bleeding.

289 Versajet, a new hydrosurgical system – indications and advantages

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Background. Versajet is a high – pressure hydrosurgery system, which enables a very precise surgical procedure. This single device technique combining lavage, excision, cleansing and aspiration allows a sharp debridement on any surface, or space. There are lot different indications for the use of Versajet in Plastic and Reconstructive Surgery. This system is appropriate for a variety of burn and traumatic wounds. Because of the precise handling the use of this device is also in cosmetic surgery possible.

Methods. In this device a high velocity stream of sterile saline jets across the operating window and into an evacuation collector. Because of a physical effect, a localised vacuum is created across the operating window. This holds and cuts targeted tissue while aspirating tissue from the site. Therefore it enables to precisely target damaged tissue and spare viable tissue. Surgical techniques can be enhanced, for instance the device holds targeted tissue during irrigation and excision. In addition, Versajet cleans and cools at the same time as debriding, so additional cleaning techniques are not required. The depth of the skin – debridement is absolute predictable. In about 100 cases the Versajet has been used. The range of indications included burns, infected wounds (decubitus ulcers, traumatic wounds, Fournier gangrene, necrotizing fasciitis). The advantage of this hydrosurgery system compared to sharp debridement using scalpels, dermatome, etc. is a more rapid and precise debridement, therefore the preservation of viable tissue, the precise and easy treatment of concavities and convexities and a reduction of blood loss could be achieved. Histological findings proved the feasibility of an exact abrasion into different layers of the dermis.

Results. By using the Versajet device, a reduction of the debridement procedures, an earlier reconstruction and a shorter time of hospitalisation could be achieved. The most important indication is the treatment of 2b° burn-wounds. In 3° burn cases the necrosectomy with some other devices may be quicker and more useful. Although there is a learning curve which is very short, this tool is easy to handle. There has been no adverse effects.

Conclusions. The Versajet-handpiece is a disposable product, but because of the advantages it is at least cost-covering. Debridement is highly effective since it enables selective tissue targeting. Removal of non-viable tissue is more complete as a result.

Österreichische Gesellschaft für Kinder- und Jugendchirurgie: Freie Kinder-/Jugendchirurgische Themen

290 The surgical treatment of deep dermal scalds in children – changes and improvements

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Background. In 2005 more than 3500 children (age <5 years) were suffering from burns. The gold standard of surgical care is still under discussion. The aim of the study was to evaluate an optimised treatment regime for scalds in children.

Methods. Between 1997 and 2002, 124 children underwent surgical intervention due to salds. Thirty-six of them were enrolled into the study. Twenty-two children with deep dermal scalds (total-body-surface-area burned (TBSA) 18.5%) were treated by early excision and keratinocyte-coverage (keratinocyte-group). Fourteen children (TBSA 17.2%) were treated with autologous skin grafts (skin-graft-group). Both groups were comparable according to age, burn depth and TBSA. The complete clinical follow-up was at least 17 months. The scar formations were classified (Vancouver-Scar-Scale (VSS) and the need of blood transfusions were administered.

Results. The use of keratinocytes led to complete epithelialisation. No secondary skin grafting was necessary. Skin take rate was 100% in the skin-graft-group. The mean volume of transfused blood was 63.9 ml in the keratinocyte-group and thereby significantly lower than the volume of 151.4 ml, which was administered in the skin-graft-group ($p = 0.04$). The VSS observed in the keratinocyte-group was 2.33 and thereby significantly lower than the VSS of 5.22 in the skin-graft-group ($p = 0.04$).

Conclusions. In children the use of keratinocytes renders constantly reliable results in deep dermal scalds. It minimizes the areas of skin harvesting and reduces the amount of blood transfusions. The fact that also less scarring is observed leads to the conclusion that skin grafting should be restricted to full thickness scalds.

291 The lesson we learned out of 35 years experience and retrospective analysis of complications in ventriculo-peritoneal shunted patients

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Background. Ventriculo-peritoneal (VP) shunting is the treatment of choice for hydrocephalic children. However, serious complications related to infectious and non-infectious reasons may subsequently appear during lifetime of these patients. As we attend nearly all our patients from birth to adulthood we had to face various kinds of abdominal problems over the years.

Methods. During a 35 year period (1970–2005) 364 hydrocephalic children underwent VP shunt placement. Outcome and follow-up of these patients were discussed.

Results. Our analysis showed that non infectious complications like: shunt dislocation, kinking and obstruction including some rare phenomenon are well described in literature and can hardly be avoided. But being confronted with various infectious complications we had to change our strategy over the years. Severe shunt infection appeared after appendicitis in 9 patients. Therefore we consequently performed elective appendectomies since 1980. Consecutively we had to face problems with following MALONE procedure. Because of abdominal pseudo cysts after recurrent shunt revisions bacterial culturing methods and antibiotic therapy regimen changed. Treatment of post haemorrhagic ventricular dilatation in premature very low birth weight infants had changed over the years from intervention with external drainage, early lumbar punctures, repeated ventricular punctures to implantation of the new ''Side-Inlet Integra Reservoir''.

Conclusions. The lesson we learned out of this retrospective analysis is that treatment of these hydrocephalic patients needs to be designed concerning all problems of the disease during life time period. Therefore we think that experience and retrospective analysis is a very important point of view for the future.

292 12 Years' experience with lymphangiomas in children

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Background. The management of lymphangioma in children is still challenging. Complete resection is difficult to achieve in some cases and recurrences are common.

Methods. A retrospective study over a period of 12 years was carried out. Fifty-one patients were treated. 32 males and 19 female patients. The involved sites were head and neck, trunk and extremities as well as retroperitoneal, intraabdominal or intrathoracic location. Prenatal MRI was introduced to plan operative strategy especially for cervical location.

Results. There were 43 recurrences. Recurrence rate was highest in intrathoracal location. There was so significant differences, in terms of outcome, between those who had their surgery immediately at the time of diagnosis and those who had delayed surgery.

Conclusions. Prenatal MRI is a helpful tool in planning operative strategies like EXIT-procedure (ex utero intrapartum-procedure). Risk factor for recurrence included location, size or complexity of lesion.

293 Management of hemangiomas in childhood

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Background. Hemangioma is the most frequent tumor in childhood. In more than 50% of cases hemangiomas are located in the face and the decision about the need for treatment, and the type of treatment may be difficult. Complex hemangiomas need emergent systemic drug therapy, which may be combined with other types of interventional therapy, such as surgery or laser treatment. The aim of this study was to evaluate our experience in the treatment of complex hemangiomas.

Methods. Analysis of complete records of patients who were treated in the period between 1.1.2001 and 31.12.2006.

Results. Out of 547 patients referred to us, 196 patients (36%) needed hospital treatment (60% girls), mainly because of rapid growth, and complications which were present in 27 patients (14%). The most frequent localization of hemangiomas were the head and neck region (52%) and 21% of patients had multiple hemangiomas. Median age at first referral was 4 months, with 65% of patients referred to us before 6 months of age. More than half of patients received their first treatment before 5 months of age, and within 7 days after referral. Treatment consisted in laser therapy (61%), excision (26%), and additional (or exclusive) drug therapy in 13% of patients (cortisone, interferon). Interdisciplinary treatment was necessary in 34 patients (17%), involving mostly plastic surgeon, dermatologist, pediatric oncologist, pediatric radiologist, ophthalmologist, and psychotherapist. The majority of interdisciplinary treated patients (60%) received initial treatment in other centers, 12 patients (35%) presented with complications, and rapid growth was present in 90% of patients. Parotid hemangiomas ($n = 6$) were treated solely by systemic cortisone treatment ($n = 3$). Intra-tracheal hemangiomas ($n = 5$) required often a laser treatment ($n = 3$), in addition to administration of systemic cortisone. Massive segmental facial hemangiomas ($n = 8$) needed additional treatment with interferon ($n = 5$). In one case a PHACES syndrome was diagnosed and the patient needed a complex therapy.

Conclusions. The need for treatment of hemangioma must be made on the individual basis. Most hemangiomas need only observation. However, patients with complications and/or facial localization of hemangioma with rapid growth require often emergent treatment in medical centers with the possibility for an interdisciplinary management. Early therapy may be a precondition for a good cosmetic result.

294 The abscesses of omentum majus in the children

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Background. Treatment of appendicular peritonitis is closely connected with prophylaxis and treatment of surgical complications during postoperative period. The abscess of omentum major is one of such a complications, elsewhere discussed in medical literature. The aim of the study was the reduction in frequency of this complication.

Methods. During 1995–2005 years we treated 7 patients with the abscess of caul. All of the patients were also treated for the appendicular peritonitis in the past. The time since the discharge from outpatient department to re-admission to the hospital varied within 21–83 days. The disease manifested with abdominal pain, increase in body temperature to the febrile grade. All the patients presented with tumour-like abdominal mass of various size. Two patients presented with umbilical fistula and purulent effusion. Abdominal ultrasound elicited masses with fluid content in 4 patients. Laboratory work-out

revealed significant increase of tests relevant to endotoxicosis. All patients were operated. Five patients underwent dissection of infiltrate, and the total resection of caul. Two patients passed drainage of abscess through the anterior abdominal wall.

Results. All the patients recovered. Complications of early and late postoperative period were not observed. Patients were on the close follow-up for 1 to 7 years without any sequalae. Hospitalisation span was 22.7 ± 1.4 days.

Conclusions.

1. Abscess of caul can manifest during early as well as late postoperative period.
2. Management of omental abscess:
   – complete resection within visually intact tissues;
   – careful washing of abdominal cavity with antiseptic solutions;
   – vigorous antibacterial therapy in postoperative period.

295 Beneficial effects of mixed hyperalimentation in children with septic form of acute hematogenic osteomyelitis

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Background. Septic form of acute hematogenic osteomyelitis (AHO) is severe sepsis with multiple organ dysfunction syndrome (MODS) according to ACCP/SCCM consensus conference committee, 1992. Mortality and morbidity rates from this remain unacceptably high, in spite of achievements in intensive care medicine. Nutritional support is the method of intensive care with proven efficacy, but the ''perfect'' regimen of it is unknown.

Methods. In 2002–2006 in our clinic 12 children with septic form of AHO were treated. They received standard therapy of severe sepsis which included surgical treatment (osteoperforation, suppurative focus drainage, pleural drainage in case of pyopneumothorax), antibacterial therapy, hemodynamic support. All of patients were mechanically ventilated (MV) because of acute hypoxemic respiratory failure on the basis of metastatic pneumonia. Regarding to nutritional regimen patients were randomized on two groups: control (enteral alimentation with isocaloric isonitrogenic diet fitting basic energy expenditure (BEE) multiplied by coefficient 1.6), and basic (mixed enteral (1.6BEE) plus parenteral (protein $= 2\,g/kg*day$, energy $= 1.6$BEE) hyperalimentation).

Results. There was strong tendency of patients in basic group to have less pulmonary complications, better gas exchange values, less ventilation days and less intensity of hypermetabolic-hypercatabolic syndrome (see Table, $^*p < 0.05$).

	control group ($n = 7$)	basic group ($n = 5$)
SOFA, mean (SD)	8.5 (0.9)	9.1 (1.2)
PaO2/FiO2, mean (SD)	202.4 (14.1)*	244.5 (16.7)*
Pyopneumothorax, *n* (%)	13 (92.8)*	3 (21.4)*
Days on MV, mean (SD)	31 (5.2)	18 (7.1)
Albumin g/l, mean (SD)	27.5 (3.1)*	36.8 (2.2)*
Mortality, *n* (%)	1 (7)	0 (0)

Conclusions. Mixed enteral-parenteral hyperalimentation in children with septic form of AHO is an effective method of prevention of pulmonary tissue destruction and respiratory function improvement.

296 School-accidents in Austria

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Background. The aim of this study was to gain information about the mechanisms of injuries and injury pattern at primary and secondary schools in Austria.

Methods. At the Department of Pediatric Surgery in Graz and six participating hospitals (Klagenfurt, Salzburg, Steyr, Krems, Schladming and Innsbruck) all children from 0 to 18 years presenting with trauma were included within a two year study period. In total, 28983 pediatric trauma cases were filed. Data were analyzed regarding personal data, site of the accident, circumstances and mechanisms of accident and the related diagnosis.

Results. At the Department of Pediatric Surgery, Medical University of Graz, 21582 questionnaires were completed, out of which 2148 children had suffered from school accidents (10%). 7401 questionnaires from outside hospitals included 890 school accidents (12%) with a mean age of 11.5 years in the children from Graz and 11.3 years in children from participating hospitals. The male/female ratio was 3:2. In general, sport injuries lead to a higher rate of severe trauma (42% severe injuries) compared with other activities in and outside of the school building (26% severe injuries) with ball-sports being the most dangerous activity with a 44% proportion of severe injuries. Over all, the upper extremity was most frequently injured (34%), followed by lower extremity (32%), head and neck area (26%) and injuries to thorax and abdomen (8%).

Conclusions. Half of all school related injuries occur in children between 10 and 13 years of age. There are typical gender related mechanisms of accident: Boys get frequently injured during soccer, violence, and collisions in and outside of the school building and during handicrafts. Girls have the highest risk of injuries at ball sports other than soccer.

297 *In-vitro* study of ingested coins: leave them or retrieve them?

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Background. Objects and notably coins are frequently swallowed by children 3–5 years old. Their precise management on asymptomatically passing the gastro-esophageal junction remains controversial. This study was performed to assess dissolution of specific metals from coins immersed in simulated gastric juice.

Methods. Four types of euro and US coins were immersed in simulated gastric juice for 4, 24, 72 and 120 hours. Six metals were evaluated by inductively coupled plasma-atomic

emission spectrometry (ICP-AES). Weight loss and corrosive behavior were also determined.

Results. After only 4 hours, metals had dissolved from euro (Cu: 2.86–7.85 mg; Ni: 0.23–0.52 mg; Zn: 0.09–0.99 mg; Al: 0.24 mg; Sn: 0.02 mg) and US (Cu: 1.45–6.65 mg; Ni: 0–0.62 mg; Zn: 0–0.14 mg) coins. Their concentrations in simulated gastric juice peaked after 24 to 72 hours (mg/hours) in euro (Cu: 218/48; Ni: 82.50/72; Zn: 83.00/72 h; Al: 14.65/72; Sn: 0.66/72) and US (Cu: 126.50/24 h; 88.00/72 h; Zn: 149.00/24) coins. All coins underwent corrosion and weight loss (by 2.56–4.8%).

Conclusions. Coins retained in the stomach will release a number of heavy metals well known to cause dose-dependent poisoning. Studies to evaluate their toxicity and absorption are needed to optimize treatment.

298 The surgical tactic on the splenic injury in children

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Splenectomy in children often leads to various complications. Retrospectively, results of the management of 45 children (range from 3 to 14 years), which underwent surgery due to the liens' injury, were examined. The immunological and hormonal investigations were performed. Out of 45 operations in 33 the splenectomy, in 6 cases the splenectomy with the tissue autotransplantation of the lien in the greater omentum and in 6 cases the organ-preservation operations were performed. Purulent-septic postoperative complications were noted in 7 (15.6%) patients, which connected with the inadequate of the immune answer. The obvious T-cellular immunodeficit, low concentration of IgM, decrease of phagocytosis were observed in this category of patients. By that, on the background of activation of the renin-aldosteron system and changes of the eicosanoids synthesis, the danger of the sepsis and septic shock development were arisen. The autotransplantation of the lien tissue did not protect the organism from the purulent-septic complications in the nearest postoperative period. As the answer to the transplanted tissue and necrobiotic processes, which had been occurred in it, the autoimmune processes and reactions of the hypersensitivity of the immediate type (the increase of IgE and DNA antibodies levels) were intensified. With the goal to prevent complications in the postoperative period the thymic hormones, interferon a, aspirin and dipyridamol were applied. In the remote terms, the postsplenectomy syndrome manifested itself in patients, which underwent the splenectomy in childhood. Predisposition to the infections and thrombohemorrhagic processes prevailed. The disturbances of hemostasis are linked with the significant increase of the T-helpers that connected with the intensifying of the IL-1 action, which also evokes the proliferation of the preactivated B-lymphocytes, and, as the result, the obvious synthesis of IgG. IgG in the composition of the immune complexes can stimulate the function of the neutrophyles. All this promotes to transfering the Hageman factor in the active condition, activation of the coagulative and kininogen-kinin blood system, intensification of the fibrinolysis, the deposit of fibrin and the development of the hemorrhages. The autotransplantation of the lien tissue could not enhance defence of the organism in full value. Thus, at the traumatic injury of the spleen the prevalence must be given to the organpreserving operations.

Mamma

311 10 years experience with preoperative breast cancer staging with MR-Imaging

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Background. MRI of the breasts has been described the most sensitive imaging modality for detection of multicentric or multifocal malignant tumor manifestations. In 1995 we began with routine preoperative MRI-staging in breast cancer patients. The aim of this study is to analyse the benefit of preoperative MR-Imaging regarding surgical treatment and follow up in patients with invasive breast cancer.

Methods. The retrospectice study ($n = 275$) includes all female patients with histologically verified invasive breast carcinoma, which have been operated at our department between 1995 and 2002. Exclusion criteria were carcinoma in situ, local recurrence, inflammatory carcinoma and neoadjuvant therapy. Demographic, radiological, operative and histological data, standardized follow up (DFS, OS) and recurrence rate were analysed.

Results. Surgical treatment consisted in BCT (57.6%) and MRM (42.4%). 83% of tumors showed an invasive ductal differentiation. Lymph nodes were positive in 35%. Tumor size showed the following pattern: pT1 67%, pT2 29% and pT3/4 4%. Grading was 4.2% (G I), 75% (G II) and 19.8% (G III), respectively. MR-Imaging revealed multifocal or multicentric tumor manifestations in 24% of patients, the MRI results changed surgical treatment in 15% of cases. Mean follow up was 66 months. The local recurrence rate was 2.5%, 1.6% of patients developed carcinoma in the contralateral breast, incidence of distant metastases was 10.8%.

Conclusions. The data confirm the importance of routinely performed MR-Imaging in preoperative staging of breast cancer patients. MRI-identification of multifocal or multicentric tumor manifestations is essential to choose the optimal surgical treatment and reach a minimal recurrence rate.

312 Intraoperative sonography: a valuable diagnostic tool in the surgeon's hand for the operation of non-palpable breast lesions

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Background. Breast Cancer is increasingly being diagnosed at early non-palpable stages. The prognostic important primary tumor-resection with adequate clear margins often poses a challenge for the surgeon. Besides preoperative wire localisation of breast lesions intraoperative imaging may be an essential support. Primary objective of our study was to investigate

feasibility of intraoperative sonography in the hand of the surgeon, second to show the rate of primary R0-resections.

Methods. Between July 2001 and October 2006 567 patients with operable breast cancer were treated at General Hospital Feldkirch. Of 360 subsequent patients with non-palpable lesions intraoperative sonography was used in 299 (group 1), wire localisation in 61 cases (group 2). The study was conducted as non-randomised trial with prospective data collection.

Results. Breast-conserving surgery was performed in 88% in group 1 and 75% in group 2. Primary R0-resection was significantly higher in group 1 (81%) than in group 2 (62%, $p < 0.01$) while median clear margins were 4.7 and 6.8mm in these groups ($p < 0.01$). Both wire localisation and intraoperative sonography proved to be feasible with tumor identification rates of 100%.

Conclusions. Intraoperative sonography proved to be reliable and feasible in breast cancer patients in the hands of the surgeon. Clear advantages next to tumor identification and topographic orientation for excision were organisational acceleration and improvement: discomforting, time and labour intensive wire localisation can be avoided and breast lesions can be excised in a tissue-sparing and breast-conserving technique in a very high percentage.

313 Intraoperative ductoscopy and intraductal biopsy for evaluation of intraductal breast cancer

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Background. Extensive intraductal disease represents an important clinical problem in the management of patients with invasive or in situ breast cancer. We present a new method for intraoperative ductoscopy with intraductal biopsy of suspicious lesions.

Methods. Intraoperative ductoscopy was performed in 109 women undergoing operation for breast cancer or nipple discharge. A rigid gradient index microendoscope (0.7 mm) with a special biopsy device for vacuum assisted biopsy was used for all examinations. Ductoscopy findings were documented prospectively and correlated with preoperative mammography and histology of the resection specimen.

Results. Ninety-two percent of the patients were examined successfully. Ductoscopy identified intraductal lesions (ie, red patches, ductal obstruction, or microcalcifications) in 64% of the patients. Abnormal ductoscopic appearance was found in more than 80% of the patients with extensive intraductal disease 82%. Patients with an abnormal ductal appearance on ductoscopy, compared with those with a normal ductal appearance, had a greater incidence of extensive intraductal spread of cancer (76% vs. 16%) and a greater incidence of positive surgical margins (44% vs. 12%). Ductoscopic biopsy of intraductal lesions was technically successful in all but one case. Generally, the quality of the biopsy samples was good. Diagnostic biopsy samples were obtained in 26 of 28 patients (93%). Two samples contained necrosis and were considered to be non-representative. Histological analysis of the biopsy specimens showed 22 papilloma, 2 in situ carcinoma and 2 invasive carcinoma.

Conclusions. High-resolution ductoscopy is able to detect extensive intraductal disease in a considerable number of women with breast cancer. Vaccum assisted biopsy allows intraductal tissue sampling of very small lesions. In selected patients, a combination of both preoperative imaging and intraoperative ductoscopy may help to avoid incomplete resections and re-excisions.

314 Neoadjuvant chemotherapy in trials conducted by the ABCSG

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Background. Preoperative chemotherapy (PC) for breast cancer was initially focused on locally advanced tumors. Later on it has been established to downstage operable tumors primarily not suitable for breast conserving surgery. Now PC is often used as an invivo test for chemotherapy regimens.

Methods. Since 1991 the Austrian Breast and Colorectal Cancer Study Group (ABCSG) conducted 3 trials with PC. ABCSG-07 analysed the effect of pre- and postoperative versus postoperative chemotherapy alone with cyclophohamide/methotrexate/fluorouracil. ABCSG-14 compared 3 versus 6 cycles of epirubicin/docetaxel + G-CSF regarding the rate of pathologic complete response (pCR). ABCSG-24 analysis the rate of pCR between 6 cycles of epirubicin/docetaxel and 6 cycles of epirubicin/docetaxel/capecitabine ± Trastuzumab for Her-2 positive patients.

Results. From 1991 to 1999 ABCSG-07 enrolled 423 eligible patients. After a follow up of 9 years recurrence-free survival is worse in the PC arm (HR 0.7, 0.515–0.955; $p = 0.023$), overall survival doesn't differ significantly (HR 0.8; 0.563–1.136; $p = 0.213$). 292 patients were accrued to the ABCSG-14 trial between 1999 and 2002. The rate of pCR was significantly higher in patients after 6 cycles than in those after 3 cycles (18.6% vs. 7,7%; $p = 0.0045$). Also significantly more patients had a negative axillary status after 6 cycles than after only 3 cycles (56.6% vs. 42.8% $p = 0.02$). Recruitment of ABCSG-24 started in 2004 and is still ongoing.

Conclusions. While PC fails to improve prognosis so far, regimens which improve the rate of pCR have been found and we are still hoping to tranpose this effect in better prognosis.

316 Sentinel node biopsy performed before preoperative chemotherapy for axillary lymph node staging in breast cancer

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Background. Sentinel node (SN) biopsy following preoperative chemotherapy (pCT) in breast cancer patients is associated with a lower identification rate (IR) and an increased false negative rate (FNR) compared to SN biopsy in patients with primary breast cancer.

Methods. SN biospy was performed in 45 breast cancer patients with a clinical negative axilla prior to pCT. Following chemotherapy SN mapping was repeated and the current lymph node status was assessed with axillary lymph node dissection (ALND).

Results. SN mapping prior to chemotherapy successfully identified a mean of 2.3 SNs in all patients (IR 100%). 19 patients revealed a negative SN, 26 a positive SN (micrometastasis in 6/26). Following pCT re-SN mapping was successful in 29/45 patients (IR 64%). IR for re-mapping was 80% for patients with a primary negative SN or a micrometastatic SN compared to 45% for patients with primary macrometastatic SNs. None of the 19 patients with a negative SN biopsy and none of the 6 patients with micrometastasis prior to chemotherapy revealed positive lymph nodes following pCT. Contrary to that 17/20 patients with a macrometastasis prior to pCT revealed positive nodes following chemotherapy, and this was irrespective of the type of tumor remission due to pCT. The FNR of re-mapping was 50% and false negative SNs were only found in patients with macromatastatic SNs in the primary SN mapping.

Conclusions. Patients with a negative SN biopsy or with a micrometastatic SN prior to pCT may forego complete ALND following pCT, whereas this may not be valid for patients with macrometastatic SNs. SN biopsy following pCT is associated with a low IR and a high FNR.

Pankreas

321 Carcinoma of the pancreatic head – Improvement of long-term Results of an oncologic center

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Background. Standard pancreatoduodenectomy (PD) for the treatment of resectable tumors of the periampullary region or the pancreatic head involves a radical pancreatoduodenectomy with an extensive gastric resection. The modified Whipple operation aims to preserve the stomach, pylorus and proximal duodenum so as to decrease postgastrectomy complications and improve the patient's quality of life. However, there were still many postoperative complications after pylorus-preserving pancreatoduodenectomy (PPD). Unfortunately, in some retrospective studies tumors of the periampullary region and the ductal carcinoma of the pancreatic head are still not differentiated. This methodological problem and the improved surgical strategy (lymphadenectomy, etc.) in combination with the excellent histopathological diagnosis by experienced pathologists are decisive factors in determining the ultimate outcome as demonstrated.

Methods. Patients (all treated at SMZ-Süd – Kaiser Franz Josef Spital Department of Surgery) with a exocrine malignant tumor of the pancreatic head or periampullary region were retrospectively analyzed by comparing a 10 year period before and after 1995.

Results. In the last period of observation the complication rate and lethality was reduced (There was one cases of death because of technical reasons). The number of R0 resections (incl. mesoduodenum) improved from 68% to 85%. Also the number of the resected lymphatic nodes increased from 15 to 20 (13–60). The actuarial 5 year survival rate in patients after resection of a pancreatic ductal adenocarcinoma at R0, N0 stage increased from 21% up to 40%. An increase in long-term survival could also be observed in the N-positive group.

Conclusions. At an oncologic center with optimal interdiciplinary collaboration of the different departments (internal medicine, surgery and pathology) a respectable actuarial 5 year survival (40%) of the pancreatic ductal adenocarcinoma can be achieved without interfusing different tumorentities. The Lethality caused by technical reasons should be almost 0%. Detailed information will be discussed during the presentation.

322 Lessons to be learned from 200 consecutive patients with pancreatic cancer and their treatment

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Background. Complete surgical resection remains the only potentially curative treatment, improving 5-year survival, for patients diagnosed with pancreatic cancer. Preoperative administration of chemotherapy or combined radiochemotherapy may present a way in increasing the number of patients were radical surgical therapy is reasonable and feasible. Lower perioperative mortality and morbidity rates are reported in high volume centres.

Methods. Between Jan. 2000 and Dec. 2004 47 patients, diagnosed with locally advanced non metastatic pancreatic cancer, received preoperative chemotherapy with neoadjuvante intent. 88 Patients had curative surgery at time of diagnosis and adjuvant chemotherapy depending on their stage of disease. A subset of 66 patients have been diagnosed at an far advanced stage of disease and were treated in palliative ways.

Results. The observed perioperative mortality rate was 4.8% (5/104). A total of 14 (13.5%) patients required reoperation because of complications after curative resection. Minor Complications, which have been treated in conservative ways, occurred in 22.1% of patients. Sixteen patients (16/47, 34.1%) demonstrated sufficient tumor response to undergo surgical curative resection after neoadjuvante chemotherapy. In this group the median survival time was 15 month (12.3–19.6 95% CI). Median survival time for patients who underwent curative tumor resection at the time of diagnosis, was 16 month (12.3–19.6 95% CI). For patients, unable to undergo curative surgery after neoadjuvant therapy ($n = 30$), median survival (8 month, 6.1–9.8 95% CI) did not differ from life expectance of primary palliative treated patients (6.4–9.5 95% CI).

Conclusions. We suggest that in several patients, suffering from nonresectable cancer of the pancreas, preoperative chemotherapy significantly rises overall survival to a level so far reserved to patients with operable carcinoma. In other malignancies neoadjuvante chemotherapy is an accepted

standard of cancer treatment. There are many potential advantages of neoadjuvant chemotherapeutic regimes for both resectable and advanced pancreatic carcinoma. Novel targeted molecular therapies and their combination with established chemotherapeutic agents may lead to higher conversion rates after neoadjuvante therapy and improved 5-year survival rates in the near future.

ÖGTH – Thorax

323 Haemodynamic complications after pneumonectomy: Reopening of the foramen ovale and atrial inflow obstruction

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Background. Haemodynamic impairments after pneumonectomy are rare complications and present in two different forms or a combination of both. Changes in the anatomical situation of the left atrium and elevated pulmonary artery pressure can lead to a significant right-left shunt via a previously closed foramen ovale (PFO) and diaphragmatic relaxation can lead to a dislocation of the liver into the right hemithorax, compressing the right atrium with subsequent inflow obstruction.

Methods. We retrospectively analysed our patient cohort from 1997 to 2006 for occurrence of haemodynamic complications requiring surgical intervention after pneumonectomy.

Results. Five patients (1 female, 4 males, age 59 ± 9 years) were identified. All underwent right pneumonectomy due to NSCLC ($n = 4$) or atypical carcinoid ($n = 1$). Two patients were readmitted 3 months and 2 years postoperatively due to increasing platypnoea and orthodeoxia. After closure of a PFO which was found as the underlying pathological mechanism respiratory symptoms were resolved. One patient required reintubation already 2 hours postoperatively; after surgical closure of a PFO the respiratory situation significantly improved. One patient was readmitted due to right atrial inflow obstruction 17 months after right pneumonectomy. Underlying cause was a severe diaphragmatic relaxation with compression of the atrium by the liver. After diaphragmatic plication all symptoms resolved. One patient was readmitted 3 months after pneumonectomy and partial atrial resection due to cyanosis and dyspnoea. Diagnostics revealed a PFO and a massive raise of the right diaphragm with compression of the right atrium. After surgical correction of the contorted foramen ovale and diaphragmatic plication symptoms vanished.

Conclusions. Haemodynamic alterations due to a reopened foramen ovale or right atrial inflow obstruction are rare however severe complications after pneumonectomy. They occur at variable points in time after pneumonectomy. Closure of the PFO either surgical or interventional and/or plication of the elevated diaphragm are mandatory. In our experience these complication occur only after right pneumonectomy.

324 Chronic sequels after thoracoscopic procedures for benign disease – long-term results

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Background. Video-assisted thoracic surgery (VATS) is recognized to be as effective as open surgery for a variety of diagnostic and therapeutic conditions, but with significantly less morbidity. Chronic postoperative pain (CPP) is defined as persisting more than 2 months after the procedure. CPP and other neurological sensations like disesthesia or numbness are found frequently, but little is known about the outcome of those patients many years after the primary procedure.

Methods. In 1999 we retrospectively investigated a group 46 (31.9%) out of 144 patients who were identified with sequels at a mean of 32 months after a VATS procedure. Now at 123 months post-operation we reinvestigated those patients for ongoing sequels.

Results. From 46 patients 36 were still alive and could be reached for an interview. 18 (50%) were now free of symptoms while 18 (50%) still suffered from sequels. From the group of 144 patients operated on, sequels were now present in 18 (12.5% at 123 months vs. 31.4% at 32 months, $p = 0.0002$) patients. Pain was present in 17 (11.8 vs. 20.1%, $p = 0.11$), in three (2.1 vs. 18.1%, $p < 0.000001$) even at rest, and in 4 (2.7 vs. 12.5%, $p = 0.0002$) patients only at exercise. Ten (6.9 vs. 28.5%, $p = 0.096$) patients suffered from pain occasionally e.g. due to changing weather. Painkillers were only taken by one (0.7 vs. 16.6%, $p < 0.0001$) patient occasionally, and the sequels impacted the life of one woman (0.7 vs. 13.2%, $p < 0.0001$) badly. Numbness was present in 16.9 vs. 1.3% ($p = 0.0013$) of patients.

Conclusions. Early postoperative sequels are frequently found in VATS procedures, but patients with pain even after years have a nearly 50% chance to eliminate their problems. In addition, numbness and disesthesia seem to disappear almost completely several years after the procedure.

325 Intrapulmonary injection of fibrin glue as a treatment of persistent parenchymal fistulas after pulmonary surgery: a case series

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Background. Persistent parenchymal fistulas are a major problem after pulmonary operations particularly in lung emphysema patients. Conventional surgical remedies, like over-suturing or stapling of injured lung surfaces are rarely efficient. Here we present our preliminary experience with a novel application of fibrin glue as a sealant of persistent parenchymal fistulas.

Methods. Patients with postoperative parenchymal fistulas persistent for more than six days, and not responding to conservative measures, underwent re-operation. Lung surfaces not anymore suitable to reconstruction by suturing were sealed by peripheral intrapulmonary injection of fibrin glue. After discharge, the patients were regularly followed-up. In addition, the macroscopic distribution of injected fibrin within lung tissue has been investigated in a porcine *in vitro* lung preparation.

Results. A total of six patients underwent the above described procedure. The primary operation was upper lobectomy in four cases, laser resection in the upper lobe in one case, and empyema evacuation by VATS in one case. The mean volume of injected fibrin was 18 ± 6.8 ml. In five out of six patients the fistula was stopped permanently. In one case, however, the parenchymal fistula re-appeared and had to be treated by combined application of fibrin glue and hemostyptic tissues. After a mean follow-up of 71.5 ± 25.5 days, all patients are well and symptom-free. In the animal tissue preparation, the fibrin was macroscopically distributed exclusively in peripheral lung parenchyma.

Conclusions. In selected cases of persistent postoperative parenchymal fistulas, peripheral intrapulmonary injection of fibrin glue offers a low-risk and efficient surgical option.

326 F-18 FDG-PET/CT image fusion is highly predictive in mediastinal lymph node staging of non-small-cell lung cancer

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Background. Survival of patients with lung cancer is strongly affected by lymph node metastases. Identification of N2 disease is thus crucial. We compared the diagnostic accuracy of image fusion of positron-emission tomography (PET) and computed tomography (CT) with that of CT only and that of PET only for mediastinal lymph node staging in patients with non-small-cell lung cancer (NSCLC).

Methods. In 35 patients with proven NSCLC a preoperative FDG-PET and CT examination of the body trunk were performed. PET, CT and PET-CT image fusion were evaluated separately; nodal stations were identified according to the mapping system of the American Thoracic Society. A lymph node was considered to be infiltrated by tumor if the minimal diameter was 1cm or more in CT, or the standard uptake value (SUV) was larger than 2.5 in PET. All patients underwent mediastinoscopy, biopsies from 87 lymph node regions were taken (ATS 2 5.7%, ATS 4 65.6%, and ATS 7 28.7%). If primary pulmonary resection was achieved, ipsilateral lymph nodes were dissected and the histological findings were considered for statistical analysis. Histological findings were compared with results of CT, PET and PET-CT image fusion. Sensitivity and specificity were obtained using the confusion matrix.

Results. Histopathological assessment revealed 12 positive mediastinal lymph nodes out of 87, sensitivity was 83.3% for CT, 66.6% for PET and 91.7% for image fusion, specificity was 62.6% for CT, 77.3% for PET and 78.6% for PET-CT fusion.

Conclusions. PET-CT image fusion improves sensitivity, specificity and accuracy in mediastinal staging of NSCLC patients. The high negative predictive value of PET-CT image fusion (0.983) may abandon mediastinoscopy in NSCLC patients with negative mediastinal PET-CT image fusion. However, larger series are mandatory in order to gain statistical significant power.

328 Local resection of stage I primary lung cancer by 1318-nm Nd-YAG laser in functionally inoperable candidates: a prospective study

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Background. Recent case-matched studies demonstrate that stage I non-small cell lung cancer (NSCLC) in functionally inoperable patients can be treated by limited resection approaches without compromising the oncological result. The recently introduced 1318-nm Nd-YAG laser enables the highly selective and parenchyma-saving excision of pulmonary lesions, and was thus originally designed for the removal of multiple lung metastases and more central lesions. In this prospective study, we are evaluating for the first time the mid-term results after local resection of stage I primary NSCLC by laser knife in functionally inoperable patients as defined by predicted postoperative FEV1 (ppoFEV1) less than 40%.

Methods. Between 2001 and 2005, 15 functionally inoperable patients underwent local resection of stage I NSCLC by 1318-nm Nd-YAG laser. We assessed their postoperative course, tumor recurrence, and survival by statistical means.

Results. Postoperative mortality was zero. Three patients (20%) had minor surgical complications in the postoperative period (persistent air leak, delayed wound healing). The postoperative respiratory function was unchanged as compared to the pre-operative value. The median follow-up was 13.7 months (range 4–25 months). Recurrence rates (6.6%) and actuarial 2-year survival (68%) were comparable to standard lobectomy results, as reported in the literature. None of the three deaths observed during the follow-up period was cancer-related.

Conclusions. The 1318-nm Nd-YAG laser enables the resection of stage I NSCLC in functionally inoperable patients under complete preservation of respiratory function, but without jeopardizing the oncological outcome.

Zentrumsbildung

332 Breast-cancer centers – between European visions and regional feasibility

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Background. There have been major improvements in the Western world in recent decades in early diagnosis of breast cancer, breast conservation and survival. Nonetheless, there are blank spaces on the map of Europa and very likely of Austria as well, where diagnosis and treatment of breast cancer are not optimal. Collecting and treating patients with diseases of the breast in a few defined ''breast centers'' should give every patient with breast cancer the same highest quality treatment.

Methods. In 1998, a working group was formed in Florence, Italy, to define the tasks to be met by such a center. In 2000, the results produced by this group were published (EUSOMA 2000). The aim of this guideline was to improve quality and quality control in the treatment of breast cancer. One of the main demands made of a breast center is to treat at least 150 new primary breast cancer cases per year. Further, a multidisciplinary nucleus team specialized in the treatment of breast cancer should be in place and should hold regular interdisciplinary tumor conferences. This team should include a surgeon/gynecologist, radiologist, pathologist, medical oncologist, radiotherapist, breast-care nurse, data manager, etc.).

Results. As early as 1998, Roohan et al. (Am J Public Health 88, 454) showed that the probability of survival of breast-cancer patients was directly proportional to the treatment volume of the hospital. Regardless of tumor stage, patients treated in a hospital that saw less than 10 cases per year had a 60% higher mortality risk than those treated in hospitals with more than 150 operated cases per year. An operation performed by a breast cancer specialist reduces the mortality risk by 16% in comparison to operations performed by non-specialists (Gillis Cr, Hole DJ 1996 BMJ 312, 145). The results of DuBois et al. (2003) and others also indicate a better outcome for breast cancer when patients are operated in a specialized hospital with a large number of cases and a suitable interdisciplinary environment. The minimum number of 150 cases of primary new breast cancer cases per year and center recommended by EUSOMA (but with an evidence level of 3 and so not scientifically verified) would reduce the number of breast centers in Austria to about 30. An analysis of the Austrian situation nonetheless showed that many small surgical units produced excellent results, with interdisciplinary cooperation, in some cases together with external services.

Conclusions. Certified, highly qualified interdisciplinary breast centers are intended to provide breast-cancer patients with highest quality care. The extent to which the EUSOMA criteria can be adapted to the Austrian situation remains to be seen.

333 Breast cancer centres – can quality only be achieved in high-volume-institutions?

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Background. Discussion is ongoing about institutional caseload and technical equipment that both may be required for up-to-date-treatment of breast cancer. We present the network architecture our Department of Surgery at the Danube Clinics in Tulln is part of, aiming at multi-disciplinary diagnosis and treatment of approx. 35 cancer patients per year.

Methods. 1. Diagnosis: Mammogram, ultrasound and MRI can – and shall – be performed in an outpatient setting, considering that a close partnership with an experienced radiologist has been established. This is true also for the imaging techniques for staging. 2. Interventional diagnosis with core needle biopsy, Mammotome®, ecc., should be left to the surgeon! This may facilitate localisation of a non-palpable lesion during the subsequent operation. 3. Surgery for breast cancer is not *that* demanding per se, on condition that the technical equipments for sentinel biopsy, specimen radiography, and frozen section are at hand. The procedures must be left to permanent team if surgeons with an individual experience of more than 150 cases each. 4. Systemic adjuvant treatment requires the availability of a clinical oncologist, at our institution on a consultant basis. Patients are treated in clinical trials whenever feasible, preferably in those launched by ABCSG. 5. Radiotherapy is typically performed on an outpatient basis, disregarding at which institution the previous operation was performed. 6. Follow-up needs to be co-ordinated by a qualified physician. We have established an oncological outpatient department, but co-ordination could also be left to an office-based oncologist. The mandatory management tools for close follow-up as well as for the prevention of unnecessary examinations are IT-support and a patient log-book.

Conclusions. Being embedded in a multi-disciplinary network, our institution's self perception is that of a part in a ''virtual centre of excellence''. We think that we are not only able to provide high medical quality, but that this quality is also subject to external control by our partners.

334 Is the peritonectomy and heated intraoperative intraperitoneal chemotherapy a feasible therapeutic concept only for specialized centres?

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Background. The expectancy of life of patients with intraabdominal malignancies and peritoneal dissemination is usually poor. The surgical approach of a combination therapy of complete resection of the primary cancer, the peritonectomy and a perioperative intraperitoneal chemotherapy was developed to improve the prognosis of these patients. This treatment is cost-intensive and associated with special technical expertises. The aim of this study was to determine the modalities and to discuss the feasibility of this approach.

Methods. Since June 2005, a combination-therapy of visceral resections, cytoreduction of the peritoneal cancer and a heated intraoperative intraperitoneal chemotherapy was performed in 10 patients (6 female, 4 male, average age 51.4 years) with visceral malignancies and peritoneal carcinomatosis as a curative approach. The same procedure was designated for six more patients but was not performed because of inoperable tumor masses. Mitomycin C (40 mg/m^2) was utilized for the intraperitoneal chemotherapy and applied to the abdomen using a heart-lung machine to guarantee a steady circulation and to keep the intraperitoneal fluid at 42 °C. The handling with the chemotherapeutic substance required special protective clothing for the staff as well as the competent disposal of all used materials.

Results. A multi-visceral resection was performed in 8/10 patients. A complete cytoreduction (CC-0) was obtained in eight patients, in one a CC-1 and in another one a CC-2 situation remained. The average operative time was 595 minutes (range 456–895 minutes). A peridural catheter was necessary for a sufficient postoperative pain therapy. The average time at the intensive care unit was 4.3 days (range 1–16 days) and the average hospitalization was 21.2 days (range 14–32 days). No complications were observed associated with the surgery. Morbidity was determined by gastrointestinal symptoms like prolonged postoperative ileus. In the follow-up three patients had a recurrence of the malignancy, 2/3 with a cystadenocardinoma of the pancreas after three and five months, respectively, and 1/3

patients after 3 months with a metastatic sigmoid carcinoma. One patient died eight months after surgery because of malignancy progress. The average expense of this treatment was 13.752 EUR.

Conclusions. Specialized centres may provide the logistics and expenses to establish this treatment innovation to the surgical approach of intraabdominal malignancies to extend the long-term survival of patients with otherwise poor outcome. Prospective studies are needed for additional adjuvant and neoadjuvant concepts in diseases with peritoneal malignancies.

Rektum

339 Multimodality treatment of rectal carcinoma – outcome and quality assessment of a consecutive patients series in an oncological center

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Background. Rectal carcinoma needs careful preoperative staging. In our department neoadjuvant treatment with long term radiation and chemotherapy is standard in patients with carcinoma of low and middle part of the rectal wall. Main prognostic factors for long term survival are R0 resection, sharp dissection of the mesorectal fascia without coning, distal resection margin of at least 10 mm and complete lymph node dissection along the mesentery vessels. There is no recommendation about the lymph nodes that should minimally be dissected in this group of patients until now.

Methods. We consecutively evaluated patients after neoadjuvant Radiochemotherapy (RCT) and surgery in terms of survival, local recurrence, perioperative mortality and morbidity. Tumor regression grading (TRG) and number of dissected lymph nodes (ypN) were analysed and correlated with survival.

Results. In our series local recurrence rate was lower than 7%, the R0 resection rate reached 82% and sphincter preserving surgery was possible more than 80%. The median number of dissected lymph nodes (ypN) reached >20, the perioperative morbidity was lower than 20%. Especially leakage and anastomotic stenosis with the need for reoperation or dilatation are typical complications of radiation therapy. The tumor regression grade clearly correlates with outcome.

Conclusions. Multimodality treatment of rectal carcinoma including preoperative Radiochemotherapy (RCT) is well standardised with good results in outcome and morbidity. We show that high numbers of lymph nodes even after RCT can be collected and suggest a minimum account of at least 15. Tumor regression grading is a marker with prognostic significance and should be taken into clinical-pathohistological classification. We suppose that some patients are overtreated with preoperative RCT. To proof this hypothesis, a randomised multicenter trial – together with German cancer centers – based on MRI diagnostic is currently planned.

ACP: Viruserkrankungen im Anorectalbereich

341 Applicability of anal HPV-testing with Digene's hybrid capture 2 (hc2)

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Background. The incidence of (HPV)-associated disease of the anal canal is rising. Efficient anal screening by cytology is hampered because of poor specificity. HPV testing is proposed in addition to PAP testing for the detection of cervical neoplasia. The purpose of this study was to determine the usefulness of a HPV-DNA detection test (hc2) to detect HPV-associated disease and to compare two different methods of sample collection.

Methods. In 555 patients anal samples were obtained using a cervix brush and a Dacron swab to test for HR- and LR-HPV-DNA. Qualitative (positive/negative) and quantitative (RLU's, relative light units) were obtained. Patients positive for HPV DNA underwent anoscopy. Biopsies were taken from visible lesions.

Results. LR-HPV-DNA was found in 325 of 555 patients (58.6%) and HR-HPV-DNA in 285 of 555 patients (51.4%). Dacron swab sampling yielded more positive results than sampling by cytobrush (2.3% vs. 4.3% for LR-HPV, $p < 0.0001$; 3.1% vs. 4.9% for HR-HPV, $p < 0.001$). A positive correlation of RLUs was found for both sampling methods in the total cohort ($p < 0.0001$), and patients with positive results ($p < 0.0001$). Sampling with dacron swabs yielded higher RLU values compared to sampling with cervix brush for LR-HPV-DNA and HR-HPV-DNA.

Conclusions. Anal screening for HPV-DNA by hc2 is a useful method for detection of HPV-associated disease. Sample collection using Dacron swabs identifies more HPV-positive patients, and yields higher RLU values, than using the cervix brush.

342 Grade of dysplasia in anal intraepithelial neoplasia correlates with high risk HPV-viral loads

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Background. Persistent human papilloma virus- (HPV-) infection, immunedeficiency (HIKV, immunosuppression after organ transplantation) are known risk factors for anal intraepithelial neoplasia (AIN) and squamous cell cancer (SCC)

of the anus. The incidence in high rik groups is rising (HIV-positive, men who have sex with men (MSM)). Screening programms employing anal cytology or anal colposcopy have been implemented in these risk groups. However, sensitivity and specificity are low for both screening methods. Since persistent HPV-infection seems to be a prerequisite for AIN and SCC it seems reasonable to use HPV-typing as an adjunct to screening in risk groups.

Methods. Three hundred and eighty-five consecutive patients with HPV-associated anal disease were included. Sexual orientation, HIV-status, smoking habits and psychological strain were documented. All patients underwent clinical examination, rigid sigmoidoscopy and anal HPV-testing. Biopsies from macroscopically visible lesions were taken and categorized in condyloma or the three grade-scale of AIN according to the Bethesda terminology for reporting results in cervical histology. HPV-testing for low-risk (LR) and high-risk (HR)-types was performed using hybrid capture 2 (hc2). Qualitative (positive/negative) and semiquantitative results (relative loight units, RLU's) as an indirect measure of ''viral load'' were obtained.

Results. HIV-status was the only significant risk factor for hr-HPV-infection in univariate and multivariate analysis. In univariate analysis positive HIV-status and patients tested positive for hr-HPV-DNA or both types of HPV-DNA were significant risk factors for presence of any type of AIN. Smoking habits, presence of psychological stress and detection of lr-HPV-DNA did not significantly influence presence of AIN. In multivariate analysis only presence of hr-HPV-DNA was a significant risk factor for AIN. Univariate interclass correlation showed a significant correlation between grade of anal dysplasia and presence of hr-HPV-DNA, grade of anal dysplasia and smoking, grade of anal dysplasia and positive HIV-status, presence of lr-HPV-DNA and hr-HPV-DNA and presence of hr-HPV-DNA and positive HIV-status Mean number of RLUs for hr-HPV-DNA was 213.3 for HIV negative patients and 559.7 for HIV positive patients. There was also a significant difference in the number of RLUs for hr-HPV-DNA for different grades of anal dysplasia. This difference was only seen in HIV-positive patients, but not in HIV-negative patients.

Conclusions. Our results show the strong relation between persistent HR-HPV-infection and grade of dyplasia. This warrants HPV-typing to be introduced as an adjunct to screening for AIN in risk groups.

343 Human papillomavirus and anogenital lesions: burden of illness and basis for treatment

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Background. Human papillomavirus (HPV) infections in the anogenital region have become an immanent disease pattern in daily clinical routine. Still there is ignorance concerning the etiology and course of HPV associated anogenital lesions, thus demanding an interdisciplinary approach to this disease, which affects more frequently younger individuals. High recurrence rates and the propensity of high-risk HPV associated lesions for malignant transformation (cervical/anal cancer) led to the assessment of diagnostic and treatment options within our association.

Methods. The results of a consensus meeting in the framework of the 3rd Innsbruck Coloproctology Winter Meeting based on this topic are presented.

Results. The incidence of anogenital HPV associated lesions (anogenital warts, anal and cervical intraepithelial neoplasia, AIN and CIN, and anal/cervical carcinoma) has dramatically increased over the last years. In our centre the number of patients presenting with anogenital warts has been doubled from 1996 to 2001, closely associated with an increase of diagnosed anal cancers. In the last two years 22 new cases of AIN III° (mean age 43 years; 9 males, 13 females), 10 cases of AIN II° (mean age 48 years; 8 males, 2 females) and 5 cases of AIN I° (mean age 48 years; 4 males, one female) were treated in our proctologic unit and introduced to the gynaecologists. Treatment algorithm includes excision, electrocauterization or laservaporisation of perianal or anal warts or AIN I, II and anal AIN III° on the one hand and radical excision of perianal AIN III° on the other hand. Immunomodulatory treatment with imiquimod (Aldara®) should be preferentially applied for recurrent anogenital warts. Histological examination of suspect lesions has to be performed routinely.

Conclusions. HPV associated anogenital lesions should be treated by a multidisciplinary approach. Histological investigation of the excised material should be performed routinely as well as patients' surveillance including standard anoscopy and colposcopy in a specialized unit.

GIGIP: Tissue Engineering und Implantat induzierte immunologische Reaktionen

344 TH2-Immunresponse to xenogeneic matrix grafts

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Background. Extracellular matrix (ECM) biomaterials of xenogeneic origin, such as Lyoplant®, Pelvicol® or Surgis® are beginning to be used as acellular, resorbable bioscaffolds for tissue repair in pediatric surgery. Although a vigorous immune response to ECM is expected, to date there has been evidence for only normal tissue regeneration without any accompanying rejection. The purpose of this study was to determine the reason for a lack of rejection.

Methods. Full-thickness abdominal wall defects were created in 15 wistar-WU rats and reconstructed with either a Lyoplant®-matrix (B/Braun Aesculap, Germany) or Prolene®-matrix (polypropylene-matrix [PPP], Prolene®, Ethicon Germany). Animals were checked daily for local and systemic complications in both treatment and control groups. Bodyweight was recorded and the possible development of a hernia was monitored. After 6 weeks the abdomen was reopened and adhesions

to the intestine were determined. Histopathology and immunohistochemistry were performed to evaluate the immunological reaction to the xenograft.

Results. Compared to the untreated animals, all rats had a physiological growth and body weight curve: No wound infection could be observed throughout the experiment. Only in one rat, treated with a PPP-matrix, an abdominal hernia developed at the implant site. All other animals showed excellent clinical recovery and cosmetic results. PPP animals showed a pronounced inflammatory response indicated by an increased number of fibroblasts. The Lyoplant®-matrix implantation induced an infiltration of CD4 and CD68 positive cells. In addition an active neovascularization was found, observing a remodelling process. This inflammatory response was significantly milder than in PPP implanted rats. Interestingly some CD8 positive cells were detected in the Lyoplant®-group.

Conclusions. Xenogeneic extracellular matrix, such as Lyoplant®, induces an immune response, which is predominately TH2-like, comparable with a remodeling reaction rather than rejection.

345 Treatment of mesh graft infection following abdominal hernia repair – role of the VAC system and influence of the type of mesh used

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Background. Mesh graft infections after hernia repair are an awkward complication. In more extensive infections many surgeons recommend removal of the mesh, due to the difficulty to treat microbes in th infected artificial material. The VAC system now offers a new possibility in the treatment of complicated wounds, including mesh infections.

Methods. In this study, records of patients with mesh graft infections after incisional abdominal wall hernia repair were retrospectively analysed who have been operated on between January 1st 2000 and February 28th 2005 at the Department of Surgery, General Hospital Vienna.

Results. 32 of 445 patients (7%, 15 female and 17 male) operated in the period of investigation were suffering from mesh graft infections (13 Vypro II mesh, 14 Composix mesh and 5 Surgipro mesh). Mean age of patients was 60 years. Mean duration of wound therapy was 128 days. 56% of the patients had an extensive infection. In those, topical negative pressure therapy (VAC) was used. This led to a preservation of 50% of meshes in this group. In patients with a wound smaller than 2 cm, infection could be successfully treated in 5 of 8 cases (63%). The type of mesh had an influence, whether it could be preserved. All 13 of 13 Vypro II-mesh grafts (100%), 3 of 14 Composix mesh (21%) and 1 of 5 Surgipro mesh (20%) could be preserved by conservative treatment.

Conclusions. Data suggest that Vypro II mesh grafts are superior to Composix and Surgipro mesh regarding mesh graft preservation in case of postoperative mesh graft infection. VAC therapy should be considered for successful treatment of more extensive infection. Finally, small wounds (<2 cm) seem to have a good prognosis for mesh graft preserving healing.

Österreichische Gesellschaft für Medizinische Videographie: Laparoskopische Chirurgie

346 Technique of revisional gastric bypass

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Background. Revisional procedures after restrictive bariatric operations are necessary in increasing numbers of patients. These procedures may be performed laparoscopically but represent demanding and in some cases risky operations. A meticulous technique is mandatory in order to achieve good postoperative results.

Methods and results. Laparoscopic Roux-Y gastric bypass is performed as revisional procedure after laparoscopic gastric banding, sleeve gastrectomy and vertical gastric banding. The indication for a transformation to gastric bypass is inadequate weight loss or weight regain and technical failures of procedures. Formation of the gastric pouch may be difficult because of adhesions and formation of a capsula in case of banding. Gastro-jejunostomy may be performed by different techniques.

Conclusions. Revisional gastric bypass is a more complicated procedure than primary bypass. In order to achieve good results a number of technical details have to be respected.

347 Laparoscopic sleeve gastrectomy: a modified technique

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Background. Laparoscopic sleeve gastrectomy has become a standard bariatic procedure in the last five years. This procedure has been performed with a number of different techniques using laparoscopic staplers and mobilizing the greater curvuture as primary step of the operation.

Methods. Sleeve gastrectomy with a modified technique starting with the formation of the gastric sleeve prior to mobilisation of the greater curvuture is demonstrated. Stapling is performed with linear straight staplers.

Conclusions. The advanages of performing laparascopic sleeve gastrectomy by a modified technique are shorter operating times, and a better overview especially near the His angle. The modified technique may therefore become a surgical standard in bariatric surgery.

348 Laparoskopische Therapie einer traumatischen Zwerchfellhernie

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Grundlagen. Berichte über die laparoskopische Versorgung traumatischer Zwerchfellhernien sind außerordentlich selten [1]. Es soll daher ein typischer Fall im Video dargestellt werden.

Methodik: Eine 20jährige Patientin wird mit Dyspnoe, Stuhlverhaltung seit 4 Tagen, zunehmenden Schmerzen im linken Hypochondrium seit 5 Tagen über die Notfallaufnahme stationär aufgenommen. Das Abdomen ist weich und nicht druckdolent. In der Anamnese findet sich ein Status post Schenkelhalsfraktur nach einem Skiunfall vor 8 Jahren. Seit damals sind mehrfache ambulante Untersuchungen wegen rezidivierender Dyspnoe und abdomineller Beschwerden bekannt. Die durchgeführten Untersuchungen (Labor, Abdomensonographie) zeigten keine pathologischen Befunde. In der Thoraxübersichtsaufnahme zeigt sich bereits eine große Zwerchfellhernie links. Die CT-Diagnostik zeigt die Herniation von Dünndarmschlingen und Colon in den Thorax mit ventraler Verlagerung der Milz. Die Operation wird in Rücken- bzw. halbsitzender Lage durchgeführt. Der laparoskopische Eingriff erfolgt über 4 Ports (Kamera umbilikal, 2 Ports li. Rippenbogen, 1 Port li. Mittelbauch). Als technische Schwierigkeit erwies sich die perisplenische Adhäsionsbildung. Eine Verletzung der Milz konnte vermieden werden. Bei der Operation wurde eine freie Kommunikation des Peritoneum mit dem Thorax festgestellt. Über die 15 cm große Bruchpforte wurden zunächst die hernierten Dünn- und Dickdarmsegmente wieder ins Peritoneum reponiert, die Zwerchfelllücke wurde nach Absaugung des Pneumothorax mit Einzelknopfnähten verschlossen. Die postoperative Röntgenkontrolle des Thorax zeigte keinen Pneumothorax.

Ergebnisse. Die Entlassung der Patientin erfolgte am 4. postoperativen Tag völlig beschwerdefrei. Bei der ambulanten Kontrolluntersuchung zeigen sich keine Auffälligkeiten.

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349 2 Cases of laparoscopic reoperation for "lost gallstones" after laparoscopic cholecystectomy

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We present a video showing the technique of laparoscopic approach for reoperation on 2 cases with complications due to "lost gallstones" after laparoscopic cholecystectomy.

Case 1 is a 71 years old female patient, operated for symptomatic cholecystolithiasis in August 2005. In August 2006 she presented with right upper quadrant pain, the computertomography revealed a liver abscess in the right lobe and a retroperitoneal abscess. Case 2 is a 77 years old male patient, operated for symptomatic cholecystolithiasis in November 2005. In July 2006 he presented with right upper quadrant abdominal pain, the computertomography showed a small suspected abscess formation between liver segment 6 and the right kidney.

Laparoscopic reoperation was performed the day after diagnosis. In Case 1 after adhesiolysis the liver was elevated and the abscess opened to perform rinsage and drainage of the cavity. The "lost gallstones" were taken out with a suction device.

In Case 2 multiple stones were found in the upper abdomen under the peritoneum and in the abscess cavity. Adhesiolysis and rinsage was performed.

If abscess formation around the liver is seen even years after laparoscopic cholecystectomy, the diagnosis of a complication from "lost gallstones" should be suspected. Reoperations for "lost gallstones" after laparoscopic cholecystectomy can be performed by laparoscopy if the abscess formation is accessible; results will be superior to CT-guided drainage due to the stone extraction by laparoscopy.

350 Technik der laparoskopischen intersphinktären Rektumresektion

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Grundlagen. Die ISR ist eine Technik, bei der auch tiefsitzende Karzinome des Rektum sphinktererhaltend reseziert werden können. Wir haben kürzlich eine Operationstechnik entwickelt, bei der dieser Eingriff laparoskopisch ohne großen zusätzlichen Zeitaufwand durchgeführt werden kann.

Methodik. Dieser Eingriff wird nach genauer präoperativer Abklärung durch 1) Digitalbefund, 2) Endoskopie und Biopsie, 3) MRT des Rektums und 4) Sphinktermanometrie geplant. Ausschließungsgründe für die Operation sind: undifferenzierter Tumor, T4-Stadium und schlechte Sphinkterfunktion. Der abdominelle Teil wird im 4 Trokarttechnik ($1 \times 11\,mm^2$ Optikport, $3 \times 5\,mm^2$ Arbeitsport) durchgeführt. Die Präparation erfolgt entweder mit dem 5 mm Ultracision oder dem 5mm Ligasure-Atlas. Der Eingriff wird synchron von abdominell und peranal von 2 Teams durchgeführt. Dafür wurde eine eigene Lagerungstechnik entwickelt. Die Operation verläuft in folgenden Phasen: 1) totale mesorektale Exzision, 2) peranale intersphinktäre Resektion des Rektum 3) Bildung eines axialen Kolonpouches, 4) Durchzug des Kolon und koloanale Anastomose, 5) protektive Transversostomie oder Ileostomie. Die Präparatbergung erfolgt von peranal, sodass keine zusätzliche Inzision am Abdomen notwendig ist. Der Stomaverschluß erfolgt nach 6 Wochen.

Ergebnisse. Von den insgesamt 160 intersphinktären Resektionen wurden 7 laparoskopisch durchgeführt. Die mittleren Operationszeiten betrugen bei der offenen ISR 175 min, bei der laparoskopischen 237 min.

Schlussfolgerungen. Die laparoskopische intersphinktäre Resektion ist ein praktikables Operationsverfahren, dass mit vertretbarem Zeitaufwand durchgeführt werden kann. Die Vorteile der laparoskopischen Vorgangsweise können derzeit bis auf das hervorragende kosmetische Ergebnis noch nicht abgeschätzt werden.

Chirurgie und Ernährung

353 Fast-Track-Rehabilitation: Ein gangbares Konzept auch außerhalb der Zentren der Maximalversorgung? Erfahrungen von über 200 Patienten nach einem kolorektalen Eingriff

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Grundlagen. Fast-Track-Rehabilitation ist ein modernes multimodales Therapiekonzept, welches an großen Zentren

angewandt wird. Das Ziel der Untersuchung war herauszufinden, ob für uns Fast-Track-Rehabilitation als Regelablauf ein realistisches Konzept ist.

Methodik. Wir behandeln seit 2004 regelhaft Patienten nach elektiven kolorektalen Eingriffen im Sinne der Fast-Track-Rehabilitation. Wir haben >200 Patienten im Rahmen einer Studie erfasst. Einziges Kriterium war der elektive Eingriff. 110 Männer und 100 Frau hatten in 38% der Fälle benige und in 62% malinge Erkrankungen. Das Durchschnittsalter betrug 65 Jahre, der BMI 28,7. Eingeschränkte präoperative Damreinigung. Den Patienten wurde etwa 2 h präoperativ ein hochkalorisches Getränk mit langkettigen Zuckern gereicht. Wir haben laparoskopisch oder konventionell operiert, regelhaft keine Drainagen, Magensonde und Harnableitung. Es wurde perioperativ auf eine ausgeglichene Flüssigkeitsbilanz geachtet. Da regelhaft ein hochthorakaler PDK nicht gelegt werden konnte, haben wir Oxycodon oral verabreicht. Zusätzlich erhielten alle Patienten Metamizol 500 oral 4x/d. Die Schmerzintensität wurde 3x/tägl. abgefragt und objektiv über die VAS dargestellt. Erste Kost 2 h postop., mit der Mobilisation wurde 5 h postop. begonnen. Bis zum 1. Stuhlgang wurde über PDK und/oder mit Laxantien stimuliert. Die Entlassung war zum 7.postop. Tag geplant.

Ergebnisse. Von 210 Patienten wurden 15% laparoskopisch und 85% konventionell an Colon oder Rektum operiert. Allg. Komplikationen erlitten insgesamt 4 Patienten, wobei eine fulminante LE am 2. postop. Tag zum Exitus letalis führte. Spez. Komplikationen waren bei 21 Patienten festzustellen (5 × Anastomoseninsuffizienzen, 2 × MD-Atonie und 15 Wundheilungsstörungen). Drei Wiederaufnahmen, in einem Fall wurde eine Anastomoseninsuffizienz festgestellt, die anderen beiden Fälle waren nicht behandlungsbedürftig. Die Vollmobilisation war bei uns in 95% am 5.postop. Tag, der 1. Stuhlgang in 90% der Fälle am 3.postop. Tag erreicht.In der Schmerzintensität unterschieden sich die Patienten mit PDK nicht von den Patienten, die Oxycodon oral verabreicht bekamen. Die durchschnittliche VWD betrug 8,4 Tage (3–32).

Schlussfolgerungen. Der konsequente Einsatz eines hochthorakalen PDKs mit adäquater Füllung zur Schmerztherapie und Sympathikolyse war von unserer Anästhesieabteilung nicht regelhaft umsetzbar, so dass wir in der oralen Gabe von Oxycodon plus oraler Stimulation des Gastrointestinaltraktes eine hervorragende Alternative zur Durchführung der Fast-Track-Rehabilitation gefunden haben. Unsere Ergebnisse decken sich mit den Resultaten die derzeit von den chirurgischen Zentren publiziert werden. Die Wiederaufnahme- (1.4%) und die Gesamtkomplikationsrate (12%) ist bei längerer Verweildauer etwas niedriger. Unsere Ergebnisse zeigen, dass das Konzept der Fast-Track-Rehabilitation gut in einem nicht ausgewählten Patientengut umsetzbar ist. Aufgrund der Ausbildungssituation ist die Zahl der lap. Eingriffe relativ gering.In der oralen Opiod-Analgesie haben wir eine unerwartet gute Alternative zum PDK gefunden.

354 Fast track surgery without thoracic peridural anaesthesia?

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Background. Thoracic PDA is considered to be one of the main pillars of Fast Track Surgery (FTS). Our anaesthetists being reluctant to perform thoracic PDA as a routine, we decided to make an attempt to do surgery without thoracic PDA yet following all other criteria of FTS.

Methods. Between Jan. 2005 and Dec. 2006 we have performed 69 elective colonic procedures following our modified criteria. In these patients we have prospectively examined those parameters which could be expected to be influenced the most by PDA:

- postoperative intestinal paralysis
- postoperative pain control
- rate of complications

Results. The postoperative need of antiemetic drugs and the time of the first clinical signs of bowel activity (passing winds or stool) were examined as criteria for postoperative paralysis:

- 85.5% of patients never needed an anitemetic drug
- 79.7% of patients were having bowel activity not later than on po day 2

Standard postoperative pain control regimen contained two doses of 500 mg Paracetamol and two doses of 75 mg Diclofenac iv. as long as needed followed by the same combination given orally. 15 mg of Piritramid sc. was presribed as reserve treatment.

- 13% of patients needed the standard iv-regimen for longer than three days
- 84% of patients never needed a single dose of Piritramid
- 1.4% of patients needed more than two doses of Piritramid

In the last 20 months of the study only 2 patients (4.1%) needed Piritramid for sufficient pain control (learning curve of nurses and doctors!).

Overall we have seen 8 complications (11.6% of procedures):

- 4 anastomotic leaks (5.8%), 2 of them being lethal (2.9%)
- 2 postoperative pneumonias (2.9%)
- 1 intraoperative lesion of ureter (1.5%)
- 1 postoperative intraabdominal bleeding (1.5%)

Conclusions. We have not found an obvious increase in complication rate without thoracic PDA. Thoracic PDA does not seem indispensable neither for prevention of postoperative paralysis nor for sufficient analgesia.

355 Comparison of enhanced recovery treatment ("fast track") after colorectal surgery in young and old patients

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Background. Multimodal fast track rehabilitation is based on modified perioperative fluid management, avoidance of preoperative fasting, effective analgesic therapy using epidural anesthesia, early postoperative mobilisation and immediate oral nutrition in order to accelerate recovery, reduce general morbidity and decrease length of hospital stay. Young people seem to be the most suitable patients for fast track rehabilitation, but majority of

the patients requiring colorectal surgery is older than 65 years and often has several comorbidities. In this analysis we compared "fast track" feasibility and efficacy in young and old patients to examine, whether an age dependent management is required.

Methods. During one year all patients scheduled for colorectal surgery for colorectal cancer or sigmadiverticulitis on one ward were treated according to our multimodal "fast track" program. Demographic and perioperative data, postoperative follow up (e.g. first bowel movement, vomiting, intravenous infusion therapy, fluid balance), local and general complications were prospectively assessed and evaluated on the basis of two groups (Group A: age $<$ 65a, $n = 26$; Group B: age $>$ 65a, $n = 32$).

Results. Median postoperative hospital stay was 6 days (A) and 7.5 days (B) with one readmission in both groups. The incidence of local and general complications was 3.8% and 21%, respectively. A 85 aged patient with stenotic rectal cancer with liver metastases and parkinsons disease died because of multiorgan failure.

Conclusions. The multimodal "fast track" rehabilitation concept is feasible in young and old patients. Although older patients have a higher morbidity, our data show, that especially older patients benefit from enhanced recovery programs.

356 The role of fluid management in multimodal enhanced recovery ("fast track") rehabilitation in colorectal surgery

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Background. The restrictive perioperative intravenous (i.v.) fluid management is an important element of multimodal fast track surgery. Recent studies have shown a better outcome for patients with moderate or restrictive intravenous i.v. fluid therapy, but adequate interdisciplinary standards are missing and therefore optimal perioperative fluid management still remains controversial. In October 2004 we started "fast track" treatment in colorectal surgery on one ward, in this study we present our experience with modified perioperative fluid management.

Methods. During one year 66 consecutive patients underwent elective surgery for colorectal cancer or sigmadiverticulitis (30 laparoscopically, 36 conventionally). Demographic, pre-, intra- and postoperative data (e.g. fluid supply, urine excretion, creatinine, electrolytes, first bowel movement, vomiting), local and general complications were prospectively assessed and evaluated, median age of patients was 63 years (33–80 years).

Results. Intraoperative i.v. fluid administration was 11.3 ml/h/kg. On the first postoperative day patients oral intake was 1600 ml (0–3500 ml) with an urine excretion of 2300 ml (500–5000 ml). No hypovolemia associated complications were observed, creatinine and electrolytes showed no significant pre- and postoperative changes. General morbidity was 12% (urinary tract infection, pneumonia). Median postoperative hospital stay was 7 days (no readmissions).

Conclusions. Reduced intraoperative and restrictive postoperative i.v. fluid therapy is feasible and has no negative impact on water and electrolyte balance. Early oral fluid administration guarantees a sufficient hydration with adequate urinary output and contributes significantly to fast (track) rehabilitation and improvement of patients comfort.

ÖGTH – Thorax

357 Outcome after extrapleural pneumonectomy for malignant pleural mesothelioma

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Background. Malignant pleural mesothelioma is a mainly asbestos-related neoplasm with increasing frequency associated with a poor prognosis. Extrapleural pneumonectomy was initially performed as a stand-alone treatment in patients with respectable disease, however is currently almost uniformely applied as part of a multi-modal approach. Its value and advantage over other therapeutic strategies remain point of discussion. We therefore analysed our experience with extrapleural pneumonectomy in the treatment of malignant pleural mesothelioma.

Methods. We retrospectively reviewed our institutional experience with all consecutive patients undergoing extrapleural pneumonectomy for malignant pleural mesothelioma from 1994 to 2005. Patients were analysed with regard to hospital data and outcome.

Results. Forty-nine patients (10 females/39 males, mean age 58 ± 12 years) underwent extrapleural pneumonectomy during the observation period. Median ICU stay was 1 day, median postoperative length of hospital stay was 13 days. After a mean follow-up of 2573 days median survival was 376 days (mean 672 ± 121 days, range 9–3384). 1 year survival was 53.06%, 3 years survival 27.06% and 5 years survival 19.28%.

Conclusions. Extrapleural pneumonectomy as part of a multi-modal treatment regimen is a good treatment option for selected patients with malignant pleural mesothelioma. The long term results of this limited series compare favourable to non-surgical treatment regimens. Larger randomised prospective multi-center trials are warranted to establish clear guidelines.

359 Molecular profiling of lung cancer (stage III): identifying clinically useful markers for chemotherapy resistance and prognosis

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Background. The accelerated progress in genomics and data analysis technologies give a new view to customized treatment for stage III lung cancer. The histopathological diagnosis will be accompanied by molecular classification. Present treatment for advanced lung cancer is unsatisfactory and nearly 90% of newly diagnosed patients will die within two years.

Methods. From 2000 to 2006 54 patients underwent neoadjuvant treatment with platin-based chemotherapy followed by surgical resection. A panel of genes (p21, p53, MIB-1,

CyclinD1, CyclinE, ERCC1) were identified in pre- and post-therapeutic specimens. The expression profile was correlated to the histological regression grade and survival.

Results. The investigated different pathways allow an explanation of platin-based chemotherapy resistance and short duration of response according to the gene expression levels.

Conclusions. A prediction of a patient's prognosis could be improved by combining standard clinical staging methods with molecular-pathological evaluation.

360 The role of VATS in recurrence and contra lateral spontaneous pneumothorax after primary surgical intervention

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Background. In the last 15 years the video assisted approach (VATS) has become the standard of care for persistent or recurrent (after tube drainage) spontaneous pneumothorax (SP). But what is the standard treatment in recurrent pneumothorax after primary operation in the era of VATS? Moreover, we only have little information about the rate of contra lateral pneumothorax in those patients. To find answers to these questions we investigated the patients operated for SP in recent years.

Methods. We retrospectively analysed patients with SP treated by VATS between 1/2000 and 12/2006. Only patients with 45 years of age or younger without any underlying chronic lung disease were included. The treatment of choice was bullectomy or apical lung resection with apical partial pleurectomy (APP) by VATS.

Results. We identified 50 patients at a mean age of 27 years (17–42) with the female: male ratio of 1:3.2. The interval of the study and the operation was at mean of 35 (1–72) months. The primary VATS for SP was successful in 94% ($n=$ 47 patients). In three patients with primary failure persisting pneumothorax was reoperated by VATS (postoperative day 4, 20, 27). None of these three patients had a recurrence. Of 47 patients treated successfully for spontaneous pneumothorax 6.3% ($n=3$ patients) suffered from recurrence at a mean of 19 (6–30) months with one case of a second recurrence. Only minor or no adhesions were found at the apex of the thoracic cavity, a bulla was found in one woman. Moreover, in all patients an intact neopleura was found. Major morbidity was postoperative hemothorax treated conservatively in 4% ($n=2$ patients). Interestingly, 12% ($n=6$ patients) developed primary pneumothorax on the contra lateral side at a mean 13.2 (0–45) months. All these patients underwent VATS without recurrence.

Conclusions. 1. Successful treatment of SP can be achieved by VATS with low recurrence rate, low morbidity and a high primary success rate. 2. In SP with bullae the role of APP is not defined as yet and in recurrence or primary failure a thoracoscopic pleurodesis e.g. with talcum, should be considered. 3. In the light of the high rate of almost 12% of contra lateral SP a primary intervention on both sides should be considered. 4. A study to identify patients of risk for contra lateral SP with e.g. low dose CT in the first event should be considered.

361 Myasthenia gravis and thymoma: totally endoscopic resection with the Da Vinci telemanipulator

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Background. Surgical treatment of Myasthenia gravis and thymoma necessitates the complete resection of the thymus with the whole fatty tissue adherent to the pericardium. The aim was to investigate the efficacy and safety of robotic approach.

Methods. From 12/2004 to 12/2006 20 Patients with Myasthenia gravis ($n=12$) or thymoma ($n=8$) (mean age 48 ± 18 years, male to female ratio 8:12) were operated with the intention to perform a totally endoscopic, complete resection with the daVinci telemanipulator system. In all but one patient a left sided approach was chosen.

Results. In 18 out of 20 patients the operation was carried out totally endoscopic. Two patients had to be converted because of bleeding (patient 2) and thymus carcinoma (patient 4) requiring extensive resection. In the remaining patients, operative time was 175 ± 6 minutes, intubation time 120 ± 262 minutes. ICU stay was 1 day, in hospital 4 ± 1.8 days. In all patients it was possible to identify both phrenic nerves and the complete fatty tissue above the anonymal vein along the supraaortal vessels was resected. Histology revealed normal persisting thymus tissue ($n=8$) and thymoma ($n=6$) – WHO stage B2 and B3 (in 3 cases each); Masaoka stage I ($n=2$), II ($n=3$) and IVb ($n=1$), respectively. All resection borders were free of tumor. In all Myasthenia gravis patients acethylcholinereceptor antibodies decreased during follow up.

Conclusions. Complete endoscopic thymus surgery with the da Vinci surgical system, is feasible and safe to implement into clinical practice. Due to the minimal trauma, patients can return to full activity in a short time period.

362 Self-expandable covered metal tracheal type stent for sealing cervical anastomotic leak after esophagectomy and gastric pull-up: pitfalls and possibilities

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Background. The rate of anastomotic leakage after cervical esophagogastrostomy following esophagectomy and reconstruction with the tabulated stomach ranges between 10 and 30%. The treatment options comprise redo-surgery, endoscopical stapling, glueing or insertion of plastic stents, or conservative management with drainage procedures. The aim of this study was to evaluate the efficacy of self-expandable covered metal tracheal type stents for sealing the anastomotic leak.

Methods. From 01/00 to 06/06, 6 patients with leakage of the cervical esopahgogastrostomy following esophagectomy and reconstruction underwent endoscopic stenting using the self-expandable covered tracheal type device. The extent of

the dehiscences ranged from 10 to 30% of the anastomotic circumference. Mortality, morbidity, healing rate of the anastomosis and hospitalisation time were evaluated.

Results. In all cases stenting was done without any complication. Stent extraction could be performed after an average period of 91 days, ranging from 13 to 230 days. In all cases, healing of the anastomosis was satisfactory. 3 patients developed stenosis after removal which was successfully managed by bouginage. Stent migration was observed in 2 patients, treated by repositioning in one and two attempts of re-stenting followed by eventual suturing of a small residual leak in the other.

Conclusions. Endoscopic insertion of a self-expandable covered metal tracheal stent represents a safe approach resulting in immediate closure and subsequent healing of cervical anastomotic leakage. There was no leakage-related morbidity, oral intake of food was resumed one day after successful stenting. However, stent dislocation and stricture after stent removal may occur.

Pankreas

366 Squamous-lined cysts of the pancreas – a reason for pancreatic resection

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Background. Squamous-lined cyst of the pancreas is a rare entity with only about one hundred reported cases. Three types of cysts are differentiated: Lymphoepithelial, dermoid and accessory-splenic epidermoid cysts. The literature on this entity is limited to reports of single or small numbers of cases. The two most common cystic tumors of the pancreas are serous cyst adenoma and mucinous cystic neoplasms. We herein report the case of a lymphoepithelial cyst of the pancreas.

Case report. A 41-year-old man presented with a 6 month history of upper abdominal pain and bloating. The disorders were related to food ingestion and were not followed by nausea or vomiting. He experienced low weight loss. He was in good general health with a normal physical examination and no tenderness in the upper abdomen. Laboratory investigation including CA 19-9, CEA and βHCG were within the normal range. Imaging studies with CT, MRT and EUS showed a $2 \times 3\,\mathrm{cm}^2$ mass in the uncinate process of pancreas with contact on 270° to the mesenterial vessels. The mass presented in CT/EUS as a solid, expansive tumor, whereas MRT showed a cystic mass. Fine-needle biopsy revealed squamous epithelial cells with sebaceous material, but without atypia. Because of the progressive symptoms with compression of the duodenum and to rule out malignancy we resected the cystic tumor. No encasement, invasion or other aspects of malignancy were found. The resection defect was drained with a jejunal Y-Roux-loop. Histological findings showed a benign lymphoepithelial cyst and the patient had an uneventful postoperative and four-month follow-up period.

Conclusions. Establishing a preoperative diagnosis of a lymphoepithelial cyst is not possible. Squamous-lined cysts of the pancreas have a low malignant potential, however, there are reports of mature dermoid cysts developing into malignant forms. To distinguish squamous-lined cysts from other cystic lesions of the pancreas, particularly malignant processes, is rather difficult. Therefore we recommend a complete surgical removal of every cystic lesion suspicious to be a squamous-lined cyst to avoid or treat malignancy.

367 Ten year experience with duodenum preserving pancreatic head resection in chronic pancreatitis

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Background. The chronic head accentuated pancreatitis is on the rise in industrialised countries. Alcohol is the predominant aetiological factor.The incidence is 13 per 100.000 inhabitants. In up to 30% of patients with chronic pancreatitis the head of the gland will be grossly enlarged by an inflammatory mass, often associated with bile duct stenosis and duodenal hold-up.In our institution the standard Whipple operation has been replaced by the duodenum preserving pancreatic head resection (DPPHR).

Methods. We present our meanwhile 10 year experience with DPPHR. Our patients are analysed retrospectively.

Results. Between November 1996 and November 2006 we performed 39 DPPHR in 31 males and 8 females patients. The average age was 49.6 years (30–77 years). The follow-up was done by the aid of an inventory referring to postoperative pain control, development of diabetes, postoperative weight gain and subjective success assessment. The complications are described and discussed as well. The results are presented.

Conclusions. The DPPHR developed by Beger about 35 years ago has become the standard procedure for the operative treatment of.chronic head accentuated pancreatitis in our institution. The intervention is demanding but offers the advantages of maximal organ preservation, satisfactory endocrinological and functional results, a justifiable low complication rate as well as a high degree of satisfaction on the part of the patients.

368 Segmental duodenectomy at periampullary lesions – an adequate therapy?

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Background. The radical surgical procedure for treatment of the resectable periampullary tumors is the partial pancreatoduodenectomy or the pylorus-preserving pancreatectomy. In rare selected cases a segmental duodenectomy with reinsertion of the pancreatic and choledochus duct might be suitable alternative to improve the patient's quality of life.

Methods. About 30 to 40 Patients were hospitalized annually with the diagnosis of a pancreatic or periampullary tumor at the SMZ-Süd – Kaiser Franz Josef Spital Department of Surgery. To ensure radical resection either a partial pancreatoduodenectomy or a pylorus-preserving pancreatectomy was performed. In two patients with low- and/or high-grade dyspla-

sia of the papilla and the peripapillar mucosa a segmental duodenectomy with resection of the papilla vateri was performed. After radical excision (proven by an intraoperative frozen-section diagnosis) a duodeno-duodenal anastomosis with reinsertion of the splinted pancreatic and choledochus duct was performed.

Results. The postoperative course was uneventful. Three months after the operation, clinical follow-up including gastroscopy revealed a normal mucosa of the duodenum and an excellent quality of life.

Conclusions. Accurate surgical technique and pre- (gastroscopy), intra- and final histopathological diagnosis by an experienced pathologist are decisive factors in determining the ultimate outcome. If the histological findings as to benignity are uncertain, resection of the head of the pancreas with or without preservation of the pylorus by an experienced surgeon is indicated. The segmental duodenectomy might be an adequate therapy of the periampullary lesions in carefully selected cases.

Varia – Neue chirurgische Strategien

369 Cytoreductive surgery + intraperitoneal hyperthermic chemoperfusion ± systemic chemotherapy for peritoneal carcinomatosis: Where are the limits of an aggressive multimodal therapy?

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Background. Five randomized trials and an increasing number of phase 2 studies confirm the opinion that the combination of peritonectomy-procedures and intraperitoneal chemotherapy positively influence the outcome in patients suffering from peritoneal carinomatosis (PC) of appendiceal tumors, colon cancer, ovarian cancer and gastric cancer as well as rare tumors of the peritoneum per se. Nevertheless, according to the literature postoperative mortality was observed in 0–15%, postoperative minor and major morbidity in 11–40%.

Methods. In the last 13 years 202 patients (pts) suffering from pc arising from different primary tumors were treated at our institution in cooperation with surgical, gynecological or oncological departments in Austria and Germany. At the time of writing complete records from 151 patients (mean age: 55.4 ± 11 yrs, ovary – 56 pts, colon – 31, appendix – 22, stomach – 21, others 21) are evaluated for analysis. Primary objectives to assess were overall survival and time to progression of intraperitoneal or general disease. Factors influencing these parameters were determined. Secondary objectives to assess were postoperative mortality and morbidity.

Results. Completeness of cytoredutive surgery, favourable histology (ovary, appendix, colon) and N – stage 0–1 ($n = 70$ pts) made a 5-year survival rate of 44% and a 10-year survival rate of 37% possible. (Updated extended analysis of the different groups of patients will be presented) Postoperative mortality within 30 days was 2.6%, within 90 days 4.6%.

Conclusions. Cytoreductive surgery in combination with intraperitoneal, hyperthermic chemoperfusion ± systemic chemotherapy has a curative potential in selected patients.

370 Experiences with a Palliative Liaison Service (PLS) 1 year after implementation – is there a benefit for surgical patients or staff members in the hospital?

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Background. An increasing amount of patients confronted with an incurable or chronic progressive disease demands a special palliative procedure in physical, psychosocial and spiritual treatment. Medical and nursing staff members in the hospital are not always prepared to handle with these patients and their relatives in a proper way. Reasons behind may be lack of time, skills and experiences. Deficits in management and in multiprofessional communication complicate the situation. A Palliative Liaison Service provides, in this context, support in pain management, control of severe symptoms, treatment of terminal patients, coordination of professionals, discharge management, cooperation with mobile hospiz teams and support in ethical conflicts.

Methods. In 2004 we asked 230 medical and nursing staff members for the importance and the need of palliative support in their daily routine. From May to December 2005 we documented 442 consultations of 104 patients, which means an effort of 201, 2 hours. In 2006 we asked 40 members of the medical and nursing staff in leading positions about the amount of satisfication with the provided support and the acceptance of the instution PLS 1 year after the implementation.

Results. In 2004 89% of the staff members asked, confirmed the importance of Palliative Care and 67% agreed to the cooperation with a Palliative Liaison Service. From May to December 2005, 58, 7% of the demands for support came from surgical wards. The primary reasons for the first contact were pains and other severe symptoms. About 60% of the patients had cancer in the diagnosis. In 2006 the extent of satisfaction with the performances of the Palliative Support Team was between 1, 2 and 1, 6 (satisfaction is defined until 2, 5 within a range of 1 to 5). 53% to 89% from the provided performances were already requested.

Conclusions. The service of a Palliative Support Team in the hospital was highly accepted already after a short time. More than the half of the consultations took place on surgical wards. We conclude that a Palliative Support Service provides benefits for staff and patients in a difficult situation. Especially in a time of rapid medical progress, limited resources and increasing ethical demands of autonome patients, the public health institutions may request for the right balance between curative and palliative settings.

371 Surgical palliation of incurable malignant ileus

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Background. The ileus is often the sign of an advanced stage of malicious illnesses that require palliative treatment. Medicine and especially palliative medicine has changed medical treatment in the way that it now aims at an improvement of life quality.

Methods. In our hospital 104 cases with 87 patients were analysed. These patients suffered from ileus in connection with an advanced malicious illness.

Results. An ileus was localised with 78 patients in the field of the small intestine and with 26 patients in the field of colon. 37 cases were treated in a conservative way, 67 cases required operative treatment. Primary tumors were found predominantly in the colon and also in the feminine genitals as well as in the stomach. On average the remaining life time was two months. 45% of the patients with ileus in the field of the small intestine were treated without operation.

Conclusions. The life time of patients with ileus and advanced malicious illness is short. Operations with high risk should be avoided. Patients with ileus in the field of the small intestine should be given conservative treatment which in case of failing may be converted into interventional or operative treatment. Operation can hardly be avoided with patients with ileus in the field of colon. If available, interventional therapy for the removal of stomach and intestine contents should be applied. The patient's wish is to be considered. Treatment should aim at improving the patient's life quality.

372 Penetrating abdomino-thoracic injuries – report of four impressive cases

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Background. Penetrating wounds are distinguished in impalement and gun shot or stab wounds (stab/impalement injuries more frequently in Europe), which are often very spectacular. The aim of the representative case reports is to analyze the kind of injury + the adequate surgical, in particular, the complex wound management.

Methods. The impressive case series includes 4patients with abdomino-thoracic penetrating traumas (2stab/impalement wounds each) who were treated in a surgical university hospital centre during 12 months.

Results. (1) Impalement injury by a steel pipe i) entering the body above the right kidney behind the liver, through the mediastinum via the right thorax, passed heart and aortic arch up to the left clavicle, ii) approached with sternotomy/median laparotomy to remove the rod including suture of the left subclavian vein only (postoperatively, residual lesion of the left brachial plexus/temporary pneumonia). (2) One leg of a chair drilled into the left ''Foramen obturatorium'' leaving the body at the right anterior iliac spine: Initial removal/excision of the gluteal penetration canal. Developing abdominal signs/symptoms indicated explorative laparotomy revealing peritonitis because of perforated ileum: Segmental resection/anastomosis (postoperatively, i) right inguinal wound necrosis requiring excision/vacuum-assisted closure sealing; ii) remaining paresthesia in the left leg due to sacral plexus lesion). (3) Due to a violent conflict, 2 stabs entered the right thorax while one injured the right pulmonary lobe/diaphragm/liver dome between segment VIII&V + a big scalp avulsion at the left/right parietooccipital site + a transection of the right biceps muscle approached with right subcostal incision/anterior thoracotomy/liver packing (2 towels removed after 2d)/suture of the diaphragm/pleural drainages. (4) Stab injury at the left thorax (pneumothorax/lesions of the diaphragm & left third of the transversal colon) and neck (lesions of the pharynx/internal jugular vein) approached with left thoracic drainage/suture of the colonic & diaphragmatic lesions (postoperatively, i) right thoracotomy because of a right pleural empyema due to bronchopneumonia as a consequence of the blunt right thoracic trauma; ii) relaparotomy because of an abscess within the Douglas' space; iii) Billroth-II gastric resection because of recurrent Forrest-Ia bleeding).

Conclusions. Important aspects of such trauma care are immediate life-saving measures, transferral to a trauma centre, first care, prompt diagnostic/initiation of an adequate surgical treatment provided by trauma/general/abdominal/vascular and/or cardiac surgeons (e.g., surgical interventions at vessels/organs/soft tissue) as well as the postoperative course and rehabilitation. If these measures are provided with high medical standards and an interdisciplinary setting, optimal outcome can be achieved in order to prevent fatal outcome, to ensure maximal organ function, and to minimize permanent damages.

373 Gas gangrene through Clostridium perfringens – Pandora's Box?

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Background. Today infections with Clostridium perfringens are rare, but still most of the cases turn out lethal, although receiving timely medical treatment. This report deals with three different patients, who were transferred to our surgical department since June 2006. The first patient (male 47), with the suspected diagnosis ''femoral hematoma'', a second patient (male 73) because of an ''acute abdomen'' and the third patient with suspicion of gas gangrene after chronic ulcer of the right food.

Methods. *First patient*: Already at the physical examination of the femoral an impressive crepitation was palpable. Besides this the man was suffering from myelodysplasia and showed a marked ulcer on the left side of the scrotum. On suspicion of gas gangrene we performed an exarticulation of the left femoral after intensive-care stabilization. Besides all efforts this patient died the same day because of an acute circulatory failure. *Second patient*: Because of an acute abdomen the second patient received a CT and in suspicion of appendicitis an explorative laparotomy was indicated. Furthermore a known haematoma at the right shoulder began to extend in sizeand shortly after the typical crepitation was palpable as well. Even though the arm was exarticulated during an immediate operation the patient died because of the massive progressing infection. *Third patient*: This patient was sent to our

hospital because of the suspicion of gas-gangrene. During physical examination the typical crepitation was palpable at the right femoral and lower leg with associated emphysema. During operation the wound seemed unsuspicious. Immediate examination of the tissue (Department of Hygienic and Microbiology) showed a negative result concerning an infection with clostridum perfringens, so it could be refrained from an amputation of the femoral. Entirely some incisions of the skin and the fascia were done. Postoperative we kept watch on the wound in short intervals – showing consistent results the patient was transferred to our general ward to be treated because of his chronic ulcer on the right leg.

Conclusions. Once Pandora's Box has been opened, still 100% of all gas-gangrene-infections pass off lethal. The first two cases demonstrate that (besides the low incidence of 1.5 events per 100 Mio. persons and year) infections of clostridum perfringens should always be kept in mind, especially in high-risk-patients. In contrast to this the third patient shows, that severe consequences because of a precipitate indication can be avoided by experience and careful evaluation.

374 Rectus sheath haematomas: features and management

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Background. Rectus sheath haematoma (RSH) is a rather uncommon differential diagnosis of acute abdomen, characterized by pain and abdominal wall mass.

Methods. Clinical features, diagnostic work-up and treatment of patients with RSH seen between March 2000 and December 2006 were investigated.

Results. Altogether 16 patients were treated for RSH at our institution during the study period. Seven patients were on oral anticoagulation, 3 patients were taking acetylsalicylic, 1 was on clopidogrel and 1 patient was on anticoagulation with low dose heparin, whereas 4 patients had no anticoagulation. A previous trauma event was apparent in six of the cases, one of this patient was on oral anticoagulation, one on acetylsalicylic, one was taking clopidogrel and three had no anticoagulation. RSH was correctly identified by means of ultrasound in 7 of 12 cases, in which this investigation was performed. A CT scan investigation demonstrated the haematoma in all (12 of 12 cases) cases. Thirteen patients were managed conservatively, 3 patients underwent surgical treatment. Eight patients needed blood transfusion and four patients received vitamin K medication. All patients could be discharged from hospital in good general condition. Clinical re-evaluation (median follow up 3 years, range 1 month–6 years) showed all patients were free of symptoms at this time.

Conclusions. Our data confirm the multifactorial aetiology of RSH and the strong association with different forms of anticoagulation. CT scan is the diagnostic tool of choice, whereas identification with ultrasound is strongly dependent on the experience of the examiner. Conservative as well as surgical management have good results, with good restitution to fine health of all patients. Surgery seems to be only indicated when complications appear (homodynamic instability, severe pain, which cannot be managed conservatively).

Ösophagus

375 Progression of Barrett's esophagus under acid-suppression or antireflux surgery

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Background. Intestinal metaplasia (IM) in specialized columnar lined epithelium in the distal esophagus is a precancerous lesion with a cancer risk of 0.5% or 1 case in 200 patient-years. There are no prospective multicenter-data available for Germany regarding the cancer-risk and also no data regarding different therapeutic treatment options. The purpose of this study was to evaluate the progression of dysplasia in Barrett's esophagus (BE) in patients under antireflux therapy – laparoscopic fundoplication (LF) or treatment with proton pump inhibitors (PPI) – based on the data of the german Barrett Esophagus registry.

Methods. In a consensus process a protocol was established by pathologists ($n = 3$), gastroenterologists ($n = 22$) and surgeons ($n = 9$). Patient history, findings on endoscopy, histopathology and functional diagnostics were collected in a multicentric database. Patients gave their informed consent for a central data registration. Barrett's esophagus was defined as specialized, intestinal metaplasia in the endoscopic visible columnar lined epithelium of the esophagus independent of its length. The natural and posttherapeutic course of patients with IM was registered prospectively. Participating centres were free to decide for their own treatment approach for each patient regarding IM as well as the underlying reflux disease. Patients were followed with routine endoscopy and biopsy every 3–6 months.

Results. Since January 2000, 555 patients with BE were prospectively registered and analysed. Of fourteen participating centres three were surgical ($n = 397$) and 11 gastroenterological ($n = 158$). Symptoms of reflux were present in 56% of patients daily or weekly, in 25% they were absent. The mean age of patients was 57 years (range 10–89). Two hundred and ninety six were male and 159 female. Three hundred and fifty patients (63%) had short-segment-BE and 205 (37%) long-segment-BE. Intraepithelial neoplasia was initially diagnosed in 35 patients (low grade intraepithelial neoplasia (LGIEN) in 24, high grade intraepithelial neoplasia (HGIEN) in 5, indefinite in 6). In the second histological confirmation 3 HGIEN, 9 LGIEN and 2 indefinite IEN were confirmed. In the other patients IEN was excluded. From all patients 2 (1 insufficient and on competent LF) have shown progression from IM to LGIEN and one from IM to cancer (PPI) in a total of 1560 patient-years.

Conclusions. The current analysis shows a low rate of progression of IM to IEN for PPI treatment as well as antireflux surgery. This confirms recent reports on Barrett's esophagus,

that progression is a rather infrequent problem, which cannot be prevented by antireflux surgery or PPI.

376 Szintigraphy and manometry for measuring esophageal motility in GERD: medical versus operative therapy

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Background. Impaired esophageal motility plays an important role in the pathogenesis of gastroesophageal reflux disease (GERD) and its evaluation is important for the assessment of a therapeutic effect. The comparison of szintigraphic, manometric and symptomatic evaluation has not been shown yet.

Methods. Sixty patients were evaluated with endoscopy, esophageal manometry, radionuclide scanning of esophageal emptying and assessment of symptoms prior to treatment (operation or medical therapy) and 6 months later. In 20 GERD patients with normal esophageal peristalsis the Nissen fundoplication was performed, in further 20 patients with impaired esophageal peristalsis a partial posterior fundoplication was chosen and further 20 patients received continous medical treatment with PPI. All groups were comparable regarding age and gender of the patients. Esophagitis was most pronounced in those patients who underwent partial posterior fundoplication.

Results. On endoscopy acute esophagitis resolved in all patients after fundoplication, whereas after 6 months of medical therapy 2 patients still had an acute esophagitis. On manometry there was a significant improvement of the competence of the lower esophageal sphincter postoperatively regardless of the performed technique. However, LES relaxation was complete only after the Toupet fundoplication but incomplete after the Nissen fundoplication. Esophageal peristalsis measured manometrically did not improve after medical therapy, was significantly strengthened after partial posterior fundoplication but was worsened by the Nissen fundoplication. On szintigraphic evaluation of esophageal emptying for solid meals, there was no improvement after medical therapy but a significant improvement after partial posterior fundoplication. After the Nissen fundoplication there was a significant deterioration of esophageal emptying. There was a strong correlation between szintigraphic and manomteric evaluation of peristalsis, preoperatively ($rs = -0.87\ p < 0.05$) and postoperatively ($rs = -0.82\ p < 0.05$). Evaluation of symptoms showed no change regarding dysphagia after medical therapy and after the Nissen fundoplication but a significant improvement after partial posterior fundoplication. Globus sensation was significantly improved after partial posterior fundoplication but did not change after medical therapy or the Nissen fundoplication. Postprandial bloating and inability to belch were significantly more common after the Nissen than after partial posterior fundoplication.

Conclusions. Antireflux surgery controls GERD better than medical therapy with PPIs. However, partial posterior fundoplication is the more physiologic approach than the Nissen fundoplication.

377 Multichannel intraluminal impedance- and pH-monitoring of the esophagus: experience with 350 procedures

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Background. Combined impedance-and pH-monitoring (MII-pH) is a recently introduced diagnostic tool to assess gastro-esophageal reflux. We report our experience with this technology.

Methods. Three hundred and fifty-seven MII-pH studies were performed in patients with clinical signs of gastro-esophageal reflux disease (GERD) between May 2005 and December 2006. A catheter was introduced into the esophagus via the nose and connected to a portable data logger. pH was monitored 5 cm and impedance 3, 5, 7, 9, 15 and 17 cm above the manometrically located lower esophageal sphincter. Symptoms were entered by the patients by pushing buttons on the data logger. Diagnostic criteria for GERD were: Pathologic acid exposure: pH < 4 during >6.3% of total, >9.7% of upright, or >2.1% of recumbent recording time. Pathologic impedance monitoring: >73 liquid or mixed liquid/gas refluxes detected by retrograde impedance drops >50% from the baseline.

Positive symptom to reflux correlation: >50% of >3 symptom events within a 5-minute time window after a reflux episode detected by MII-pH.

Results. Three hundred and nine MII-pH procedures were performed after discontinuation of antisecretory medications for ≥10 days in patients without prior esophageal or gastric surgery (age 51.8 ± 12.3 years). Recording time was 22.9 ± 1.1 hours. The diagnostic yield of MII-pH is summarized in Table 1.

Median total acid exposure was significantly higher in males than females (5.0 vs. 2.65%; $p < 0.01$) as was the median number of reflux episodes detected by impedance (76 vs. 36; $p < 0.001$). The median number of symptoms was almost equal (11 vs.12; n.s.). Positive symptom correlation was significantly more frequent in females than males ($p = 0.006$). The overall diagnostic yield of MII-pH was not significantly different between genders.

Table 1

	Pathologic acid exposure	Pathologic impedance	Positive symptom correlation	Any pathology	Total
Males	62 (56%)	48 (44%)	36 (33%)	72 (65%)	110 (100%)
Females	78 (39%)*	27 (14%)	95 (48%)	118 (59%)*	199 (100%)
Total	140 (45%)**	75 (24%)	131 (42%)	190 (61%)**	309 (100%)

*$p < 0.001$, **$p < 0.001$

Conclusions. MII-pH is a valuable new tool for the diagnosis of GERD with significantly increased diagnostic yield over conventional pH-monitoring. Acid exposure and the number of reflux episodes were significantly higher in male than female patients. Sensitivity to reflux was significantly higher in females. Diagnosis of GERD based on acid exposure alone lacks diagnostic sensitivity, especially in female patients.

378 Esophageal motility-disorders after bariatric surgical procedures

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Background. The surgical treatment is the most effective method for weight reduction in morbid obesity Laparoscopic adjustable silicone gastric banding (LSGB) for morbid obesity has been reported to provide long term weight loss with a low risk of operative complications. Nevertheless, esophageal dilation leading to achalasia-like and reflux symptoms is a feared complication of LASGB. Patients undergoing obesity surgery were prospectively included in an observation study. This study evaluates the clinical benefit of routine preoperative esophageal manometry in predicting outcome after LASGB in morbid obese patients.

Methods. Before surgery, each of the patients underwent pulmonary functional test, esophageal manometry and gastroscopy. Drug medication and esophageal symptoms were recorded. A review of prospectively collected datas on 357 Patients (male 282, female 75), who underwent esophageal manometry routine prior to LASGB for morbid obesity from January 2001–December 2006 were performed. Aberrant motility and other non specific esophageal motility disorders noted on preoperative esophageal manometry defined patients of the abnormal manometry group. Outcome differences in weight loss, emesis, band complications were compared between patients of the abnormal and normal manometry groups after LSAGB.

Results. Of the patients tested 112 had abnormal esophageal manometry results, whereas 245 had normal manometry results before LSAGB. There was no significant difference in wheight loss between the groups after gastric banding. Severe postoperative emesis and achalasia like esophageal dilation occurred more frequently in patients with abnomal manometry results. Band related complication were found in both groups. There was no difference in the prevalence of reflux symptoms or esophagitis before and after GB. The lower esophageal sphincter was unaffected by surgery, but contractions in the lower esophagus weakend after LSAGB.

Conclusions. Postoperative esophageal dysmotility and gastresophageal reflux are not uncommon after LSAGB. Preoperative testing should be done routinely. Low amplitude of contraction in the lower esophagus and increased esophageal acid exposure should be regarded as contraindication to LSAGB. Patients with such findings should be offered an alternative procedure, such as laparoscopic sleeve gastrectomy or gastric bypass.

379 The occurrence of esophageal dilatation in a cohort of 209 patients treated with laparoscopic adjustable gastric banding for morbid obesity – a serious long term problem

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Background. Laparoscopic implantation of an adjustable gastric band (AGB) still represents the most frequently performed bariatric operation in Austria. However, in recent years a general tendency to gastric bypass procedures can be observed. A mayor cause for this development may be long term problems such as the development of an esophageal dilatation.

Methods. From January 2000 until November 2006, 206 patients (172 female, 37 male) were treated with AGB for morbid obesity at the krankenanstalt rudolfstiftung in Vienna. Adjustments of the band were performed under radiologic control 6 weeks after the operation and on demand thereafter. Of these 206 patients, 36 patients (35 female, 1 male, median age: 40 years, range: 22–67 years), an equivalent of 17%, developed an esophageal dilatation during follow up. The median time from the operation to the occurrence of esophageal dilatation was 35 months (range: 4–68 months). At the time of esophageal dilatation the median excess weight loss was 52% (range: 2–111%), the median filling volume was 7 ml (range: 5.5–9.5 ml). Twelve patients had to be reoperated in a median of 5 months (range: 1 month–17 months) after the dilatation occurred. Eleven patients had a gastric bypass operation after band explantation and one was converted into a sleeve gastrectomy. In the other 24 patients a conservative approach has been persued so far, consisting of a deflation of the band and careful refillings after approximately 1 month. Eleven patients were already available for follow up a median of 7 months (range: 1 month–24 months) after the dilatation. Ten patients significantly gained weight again. The median excess weight loss was reduced from 56% (range: 6–111%) at the time of the dilatation to 35% (range: −24–87%) at follow up. Only one patient managed to lose further weight without radiologic signs of esophageal dilatation after refilling of the band.

Conclusions. Esophageal dilatation is a serious long term complication after AGB which occurs approximately 3 years after the operation and leads to a failure of this bariatric procedure in the majority of cases. Further studies are needed to identify potential candidates for esophageal dilatation after AGB.

380 Oversewing of gastric pull up staple line in reconstruction after esophageal resection: counterproductive or helpful procedure?

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Background. Radical surgery is the only treatment modality potentially offering cure of esophageal cancer, but it carries

considerable postoperative morbidity and mortality. Recent studies have emphasized a notable improvement in morbidity rates at specialized centers. In our analysis we put special considerations on the need for an invaginatig suture of the mechanical staple line used for gastric tubulization.

Methods. Between 2000 and 2006, 156 patients were treated for esophageal cancer by resection. Perioperative data were collected prospectively. Among those 156 patients 111 (71.2%) underwent gastric pull-up reconstruction. The gastric tube has been constructed by GIAs using 3 mm staple cartridges. These patients were included in the presented study. It was put upon the discretion of the treating surgeon, whether the staple line has been oversewn by an interrupted invaginating suture or not in a non-randomized manner. The main endpoint measure of the study is leak rate at the longitudinal staple line of the gastric tube without signs of major gastric ischemia.

Results. The mean age of the patients was 62.4 ± 9.2 years, 74.3% of the patients were male. In 61/111 (55.1%) patients an adenocarcinoma was diagnosed, whereas 48/111 (43.1%) patients had a squamous cell carcinoma and 2/111 (1.8%) were classified as others. In 68/111 (61.3%) patients the gastric staple line was not oversewn (Group A). In 43/111 (38.7%) patients the gastric staple line has been reinforced by an invaginating interrupted suture (Group B). A leak at the staple line has to be reported in 4/68 (5.9%) patients in group A, whereas no leak was seen in group B ($p = 0.09$). Two/111 patients (1.8%, A:1, B:1) experienced ischemic gastric tip necrosis. Other surgical complications were anastomotic leakage (13/111 patients; 11.7%; A:5/68, B:8/48), temporary recurrent nerve injury (13/111 patients; 11.7%; A:4/68, B:9/48), anastomotic stenosis (8/111 patients; 7.2%; A:2/68, B:6/48) and chylus fistula (6/111 patients; 5.4%; A:5/68, B:1/48).

Conclusions. No significant difference was found between group A and B. However, all staple line leaks of the gastric tube developed, when the gastric tube staple line has not been oversewn.

Qualitätssicherung

386 Outcome and perioperative determinants in the surgical treatment of cardia carcinoma – results of a prospective observational multicenter study for quality control

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Background. Cardia carcinoma (Ca) is characterized by different features compared with the remaining gastric Ca; its incidence in Western countries is increasing. The aim of the study was to investigate diagnostic, therapeutic and outcome measures of cardia Ca in daily surgical practice.

Methods. All consecutive patients with cardia Ca out of a pool of patients with histologically confirmed diagnosis of gastric Ca who were treated in surgical departments were enrolled in this prospective observational multicenter study through a period of 12 months. Detailed patient, diagnostic and treatment characteristics were recorded in a computer-based format for analysis. Short-term outcome was characterized by hospital stay, complication rate, morbidity and hospital mortality.

Results. From 01/01–12/31/2002, 1.139 patients with gastric Ca from 80 surgical departments of each level of care were registered out of them 198 subjects (17.4%) with cardia Ca. Tumor localization was classified in 186 patients according to Siewert: TypI, $n = 44$ (22.2%); TypII, $n = 80$ (40.4%); TypeIII, $n = 62$ (31.3%). One hundred and seventy two patients underwent surgical intervention (operation rate, 86.9%) of whom 145 individuals underwent resection (rate, 84.3%). A potentially curative resection could be offered to 111 patients (R0 resection rate, 56.1 vs. 82.3% in all gastric Ca). Fresh frozen section was only used in 72 resections (rate, 49.7%). Of 142 standard resections (distal esophagectomy with proximal or total gastrectomy), systematic D1, D2 and D3 lymphadenectomy was performed in 81.0, 67.6 and 7.7%, respectively. Histologic investigation revealed UICC stage I/II in 39.5% of all operated patients: III/IV, 54%; not classified, 6.5%. Distant metastases occurred most frequently at the peritoneal site (15.2%), liver (10.6%) and non-regional lymph nodes (7.1%). Postoperative morbidity was 33.7%. Anastomotic leakage occured in 13 patients (9.1 vs. 5.8% in total of all gastrectomies in gastric Ca) from whom 8 subjects (5.6%) underwent surgical reintervention. Hospital mortality was 8.6% ($n = 17$) compared to 8.0% in all patients with gastric Ca.

Conclusions. More than 50% of patients diagnosed with cardia Ca show an advanced tumor stage at the time of surgical intervention. Not all resections estimated as potentially curative were accompanied by D2 lymphadenectomy. In particular, to further improve hospital volume and R0 resection rate, to consequently use intraoperative fresh frozen section for the detection of an adequate tumor-free resection margin and to lower the rate of anastomotic insufficiency, it is suggested to treat patients with cardia Ca at surgical centres for optimal outcome (5-year survival rate is being under investigation).

Varia – Neue chirurgische Strategien

389 Deep brain stimulation therapy for psychiatric diseases

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Background. Obsessive-compulsive disorder (OCD) and major depressive disorder (MDD) causes tremendous suffering in those affected and in their families. Neurosurgical lesioning procedures have been in existence for several decades and the overall reported success rate is widely quoted in the 35–70% range. Over the past years deep brain stimulation (DBS) has

become available for a variety of conditions including OCD and MDD and has largely replaced lesoining procedure.

Methods. We report on our experience with 10 patients with OCD (5) and MDD (5) treated with DBS of the anterior limb of the internal capsule (AL-IC). Patients who did not have multiple medication trials of adequate length and dose AND trials of psychotherapy or behavioral therapy were excluded. Also, MDD patients were required to have had a full course of electro-shock therapy (ECT). Patients were evaluated by a panel of independent psychiatrists before being referred for neurosurgery. All patients underwent a routine DBS surgery with implantation of bilateral electrodes into the AL-IC. The stereotactic coordinates were 4–5 mm anterior to the anterior commissure (AC) and 5–10 mm lateral to anatomical midline, the electrode tip reached into the area of the nucleus accumbens. All patients had pre-and postoperative neuropsychology evaluations with testing batteries including the Yale-Brown-Obsessive-Compulsive-Disorder Scale (YBOCS), global assessment of functioning scale (GAF) and Hamilton-Depression Scale (HAM-D) or the Montgommery Depression Scale (MDS).

Results. Patients were followed for 24–60 months (average: 3.5 years), follow-up was complete for all patients (100%). 3/5 patients (60%) with OCD had improvements in their YBOCS scores of more than 35% which was found to be significant ($p<0.01$). Also, these patients showed a significant ($p<0.01$) improvement in their overall GAF. It was furthermore noted that the depression scores had a tendency towards improvement. Of the five patients with MDD 4/5 patients (80%) had a significant improvement in their HAM-D scores and GAF scores ($p<0.01$). Complications included one postoperative seizure, slight wound healing problems which did not require surgical intervention (1/10, 10%). Of note is the fact that the DBS batteries have to be changed very frequently (on average every 9–18 months).

Conclusions. DBS for OCD and MDD is a viable treatment for patients who have failed all other known therapeutic options. It is currently reserved for research centers who have a team of psychiatrists dedicated to the treatment of such patients. Controlled studies will be necessary to develop guidelines for electrode placement and programming parameters.

390 The transoral access in endoscopic thyroid resection

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Background. The number of patients demanding endoscopic neck surgery is rising. The access trauma of the axillary, breast and chest approaches is bigger than in open or video assisted surgery. We tested the feasibility of he sublingual transoral access which is in our opinion the only real minimally-invasive extracollar endoscopic access to the thyroid gland.

Methods. We performed an experimental investigation in a porcine model. In 10 pigs we made 10 endoscopic transoral thyroidectomys with a modified axilloscope with the help of ultrasonic scissors and a neuro-monitoring system for identification of the recurrent laryngeal nerve.

Results. The average operation time from the introduction to the removal of the obturator just above the larynx was 57 seconds. The mean operation time was 43 minutes. With the help of the neuro-monitoring system we proved in all cases the function of the recurrent laryngeal nerve on both sides. The pigs were observed for another two hours after operation. During and after the operation no complications appeared.

Conclusions. We could show that the endoscopic transoral thyroid resection in pigs is possible and save. Our results might be useful for using this access for endoscopic thyroid resection in humans.

391 "Notes" – pleading for a surgical engagement by performing f.e.min.in. tra.p. (flexible endoscopic minimaly invasive transperitoneal) cholecystectomy

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Background. Actually, the surgical community receives some new impulses from interventionally orientated and skilled gastroenterologist by the so-called ''n.o.t.e.s.'' – natural orifice transluminal endoscopic surgery. This seems to be challenge enough to cooperate and contribute some surgically constructive ideas and critics. The surgical answer – with the intention to develop the arguments for a surgical engagement – to the presently still extra-clinical concept of ''notes'' may be given through an alternative procedure named ''flexible endoscopic minimally invasive transperitoneal'' (f.e.min.in. tra.p.) cholecystectomy.

Methods. After presentation of ''notes'', it's principles and aims, it's supporting societies and boards and their self-definition, a summary of already existing ''notes''-procedures and description of instrumental developments will be given. In contrast surgical considerations will be focused on more or less established surgical transluminal or even natural-orifice-transluminal techniques. In this context a special attention will be paid to surgical history and the life and times of E.MÜHE and the fact of a nearly-missed change of paradigms. As testimony for surgical endoscopic competence in interventional procedures the hybrid-model of f.e.min.in. tra.p. cholecystectomy will be opposed as surgical pendant to the conceptual idea of ''notes'' throughout a short clip-sequence.

Results. Arguments for a surgical engagement in the development of ''notes'' are based on the following items:

- Tradition and competence in matters of surgical interventional endoscopy.
- Surgical skills in organ transgressing procedures.
- Alertness on gastro-enterological activities.
- Participation in highly invasive developments.
- Professional and corporate consequences.
- Avoidance of the ''E. MÜHE-phenomenon''.

Conclusions. Only a close interdisciplinary cooperation may show weather the idea of ''notes'' will lead to clinical usefulness. It's invasivity as well as it's apparent strangeness to surgical behaviour and thinking should incline to an at least active interest.

393 Chronic sacral nerve stimulation in patients with obstipation

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Background. Sacral nerve stimulation (SNS) proves to be an effective therapy in patients with faecal incontinence. During the past years there were as well some promising results in the therapy of chronic obstipation. This study describes the experience with SNS in patients with outlet obstruction.

Methods. Four patients suffering of outlet-obstruction (3 women), median age 64 years (range 53–75) underwent test stimulation with a permanent electrode (tined lead). All patients had multiple previous conservative and operative unsuccessful therapy attempts. When complaints could be reduced by at least 50% with external stimulation, a permanent stimulator was implanted (two staged procedure). Success of treatment was evaluated by: clinical examination, patient satisfaction (visual analogue score;VSA), Cleveland-Clinic-Obstipation-Score, and morbidity. Evaluations were performed before start of treatment, before implantation and 6 months after implantation.

Results. Three of four patients completed the test stimulation stage successfully and received a permanent implant; median duration of stimulation stage was 22 days (range 16–26). All these patients had a clear improvement according to their VAS and Cleveland-Clinic Obstipations-Score. There was no postoperative morbidity. The median follow-up was 8 months (6–8).

Conclusions. Chronic obstipation can be treated successfully with chronic sacral nerve stimulation even after other therapeutic approaches have failed. However, this observation has to be confirmed in larger, controlled trials.

394 Stapled transanal rectal resection with contour trans-starr

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Background. The stapled transanal rectum resection (STARR) is an accepted technique for the treatment of the obstructed defecation syndrome (ODS). However, the technique with a circular stapling device (PPH-01) is limited in large prolapse and the resection is performed ''blind''. A new device, the Contour Trans-Starr (STR5G), has been designed with the aim of overcoming pitfalls of the current STARR technique. This study describes the new technique and the initial experience in treating outlet obstruction or rectal prolapse.

Methods. All patients had multiple previous conservative or operative unsuccessful therapy attempts. The procedure was performed in lithotomy position and under spinal or general anaesthesia. The prolapse was sutured at the apex with the goal to obtain a uniform circumferential traction (parachute technique). Then the new device was introduced into the rectum and a circumferential resection was performed step by step. Success of treatment was evaluated by: clinical examination, ODS-Score, and morbidity. Evaluations were performed before the treatment and 3 months later.

Results. The study started in January 2007 and we estimate to enrol eight patients until the end of May 2007. Indications, patient's inclusion and exclusion criteria, morbidity and short term outcome will be discussed.

Conclusions. With the new device the STARR procedure may become easier and more effective in the treatment of ODS. However, safety and effectiveness has to be confirmed in larger, controlled trials.

Leber-Gallengang

396 Therapeutic options for pyogenic liver abscesses

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Background. Clinical management of PLA (pyogenic liver abscess) has changed in the last decades due to constant improvements, for instance, in inventional radiology and antibiotic therapy. In surgical departments, we usually treat a selected group of patients with particularly severe forms.

Methods. Our clinical study comprised a series of 76 patients with PLA. Antibiotic treatment was modified according to sensitivity testing. Additional therapy consisted of percutaneous puncture/drainage, endoscopic papillotomy/stenting and surgical interventions when indicated.

Results. Fifty-eight patients (76%) had single and 18 patients multiple PLA. The disease was confined to the right hepatic lobe in 76% and to the left lobe in 7%; both lobes were affected in 17%. Etiology was biliary in 38%, hematogenous in 11%, posttraumatic in 9% and cryptogenic or attributable to rare reasons in the remaining patients. Microbiological culture was sterile in 24%, which was at least partly due to antibiotic pre-treatment. *Staphylococci*, *Streptococci* and *E. coli* were most often identified. Anaerobes were found in 15%. Factors associated with the need for surgery included: empyema of the gallbladder, underlying malignancy, perforation, multicentricity, vascular complications (hepatic artery thrombosis) and foreign bodies (e.g., toothpick, infected ventriculo-peritoneal shunt). In patients with biliary fistulae it was crucial to ensure prompt bile flow (for instance, by papillotomy/stenting).

Conclusions. Assessment of underlying diseases is decisive for timely identification of patients requiring more invasive treatment. Microbiological testing provides clinically important information for treatment monitoring and modification. Special attention must be paid to diagnosis and treatment of concomitant biliary fistulae.

397 Therapy methods of Hydatid disease from the tradition to the future

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Background. Hydatid disease is a parasitic infestation by a tapeworm of the genus *Echinococcus*. It is not endemic

in Europe. However there are some regions: Upper Bavaria, Suedwuerttemberg (Swabian Alb), bathing (Black Forest), furthermore Tirol, Kaernten and Steiermark, Switzerland and north Italy involved with this parasite. Also people from Turkey and the Balkans bring the illnesses again and again. This lead to the necessity for physicians to be aware of its clinical features, diagnosis and management.

Methods. Thirty patients with cyst *Echinococcus* (CE) in liver, lung, kidney and spleen were in three different pediatric surgery departments Innsbruck, Bursa and Kocaeli surgically treated. In the patients were cystotomy capitonage, simple cystotomy, unroofing, splenectomy, cyst excision performed. Seven patients underwent minimal invasive surgery.

Results. Postoperative bronchopleural fistula resolved spontaneously under negative pressure in five cases. The long-term postoperative results are considered good, with no recurrences observed.

Conclusions. Surgery has remained the mainstay for the treatment of CE. The basic steps of the surgical procedures are eradication of the parasite by mechanical removal, sterilization of the cyst cavity by injection of a scolicidal agent, and protection of the surrounding tissues. PAIR technique in CE; performed using either ultrasound or CT guidance, involves aspiration of the contents via a special cannula, followed by injection of a scolicidal agent for at least 15 minutes, and then reaspiration of the cystic contents. In the last years Video assisted intervention has also been performed successfully.

398 Management of hepatic trauma

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Background. In 2000 a pathway regarding the management of liver trauma was established in our hospital. The aim of the study was to assess the outcome after implementation of the guidelines.

Methods. Data on all patients with liver injuries managed in our institution in the past 6 years was evaluated. Liver trauma was classified using Moore's trauma score. Additionally, coexisting injuries were assessed.

Results. From 2001 to 2006 a total of 57 patients with liver trauma (motor vehicle accidents 44, falls 6, horse riding accidents 3) were admitted to our trauma unit (median age of 37.5 years). Grade III traumas (36.8%) were the most common injuries, followed by Grade IV (28.1%), Grade I (12.3%), Grade II (10.5%), Grade V (8.8%) and Grade VI (1.8%). The laparotomy rate varied from 28.6% in Grade I injuries to 60% in Grade V injuries, resulting in an overall laparotomy rate of 38.6%. Two patients required second look laparotomy for removal of liver packing and one patient required puncture of a posttraumatic bilioma. The most common associated concomitant injuries were right or bilateral rib fractures (27), pelvic fractures (22), long bone fractures (22), laceration of the spleen, spine injuries (19), and head injuries (18). The mortality rate of patients with liver trauma ranged from 25% in Grade IV injuries to 14% in Grade I injuries with an overall mortality rate of 12% (7). All patients with Grade V or Grade VI traumas survived (6). If laparotomy was required because of hemodynamic instability or concomitant abdominal injury the mortality rate increased to 27%.

Conclusions. The clinical pathway of management of hepatic trauma in our patients showed favourable results. Apart from the grade of liver injury the overall laparatomy rates and mortality rates largely depend on concomitant injuries.

399 Biliary tract infections caused by streptococcus milleri

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Background. Group Milleri Streptococci (GMS), a heterogeneous group of streptococci, are associated with purulent infections.

Methods. Retrospective analysis of all consecutive biliary infections due to GMS in a four-years period.

Results. Out of 452 GMS positive patients the Innsbruck Medical University within the study period, the biliary tract was affected in 99 (21.9%). The mean patient age was 60.84 ± 15.69 years, with a female:male ratio of 1:1.2. Polymicrobial infections were present in 56.60%. Thirty percent of all patients were immuno-compromised after liver transplantation (30/99). Seventy-nine patients (79.80%) had clinical signs of infection, which was confined to the gallbladder in 30 (30.30%) (group I), while 49 patients (49.50%) presented with cholangitis (group II). Underlying diseases in the cholangitis group were biliary complications following liver transplantation in 24, other causes for mechanic cholestasis in 12, malignant intrahepatic disease in 6, ascending infections in 5 and a ductus choledochus cyst in one patient. Twenty patients (20.20%) had GMS positive bile cultures without clinical signs of infection (group III) obtained during evaluation of cholestasis (12), status post liver transplantation (6), bilioma post liver resection (1), and PSC (1). Antibiotics were administered to 19 patients (63.33%) in group I, all patients (100.00%) in group II, and one patient (5.00%) in group III. In group I, all patients also underwent cholecystectomy. Interventions were required in 15 patients (75.00%) in group II (ERCP (10), external drainage (3), surgery (2)), and 42 patients (85.71%) in group III (ERCP (27), external drainage (7), surgery (8)). GMS isolates were susceptible to all penicillins, clindamycin and most cyclosporins, but were resistant to aminoglycosides and showed intermediate susceptability to ciprofloxacin.

Conclusions. The biliary tract was affected in one out of five patients with Group Milleri streptococci (GMS). GMS cause infection in 80% of all cases, and are often associated with mechanical cholestasis.

POSTER

Hauptthema

P01 Colitis cystica profunda associated with rectal prolapse: case report

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Colitis cystica profunda is a rare benign disorder of the large intestine characterized by submucosal cyst formation. The clinical appearance of the disease can be highly variable; it can be associated with rectal prolapse and chronic inflammatory bowel disorders such as Crohn's disease and ulcerative colitis.

We describe a case of colitis cystica profunda associated with rectal prolapse. The female patient had a one-year history of constipation and rectal pain. An Altemeier procedure was performed to correct the rectal prolapse. Histology confirmed the presence of colitis cystica profunda. The operative and postoperative course was uneventful.

It should be borne in mind that Colitis cystica profunda can be associated with rectal prolapse. Conservative management is usually satisfactory, but a mucosal resection (Delorme's procedure) or perineal protectomy (Altemeier procedure) is recommended when there is rectal prolapse.

P02 Peritonitis ossificans – a rare situation after acute major abdominal surgery

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Background. Peritonitis ossificans is a rare disorder with only few reported cases in literature. Metaplastic bone formation in abdominal scars seems to be an own entity with only several descriptions mostly associated with trauma, gun shot wounds and repeated abdominal surgery. We report about a case with development of metaplastic bone formation and peritonitis ossificans after multiple acute surgical interventions.

Methods. Chronological review of our patients medical history, pathohistological features and comparison of published data of ''peritonitis ossificans'' and ''metaplastic bone formation'' via pub med.

Results. Our patient developed multiple nodular lesions with massive calcifications between the small bowel mesentery (heterotopic mesenteric ossification) after primary adhesive ileus and revision surgery because of colonic leakage. The situation developed within 9 days from a prior abdominal situs without calcification. Small bowel fistula occurred and we used abdominal VAC therapy. Ten weeks later partial secondary closure was performed and no sign of calcification could be observed. Histological features showed fatty necrosis and scary tissue with metaplastic cartileage and bone tissue. Literature is rare, pathophysiology, therapy and prognosis remains unclear.

Conclusions. Male gender, multiple abdominal surgery or trauma with peritonitis, peritoneal dialysis and pancreatitis seem to be predisposing factors. Extensive activation of myofibroblasts appears to be the major cause for hyperproliferation. The prognostic impact depends on secondary complications including postoperative fistula and leakage and intestinal obstructions. Actually, literature shows no causative therapy.

P03 Eosinophilic esophagitis: an underestimated cause of dysphagia

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Background. The differential diagnosis of dysphagia predominantly includes GERD, neoplasm, diverticula or achalasia. Infrequent causes are diffuse esophageal spasm, scleroderma and other systemic diseases. Eosinophilic esophagitis as a cause for dysphagia is found increasingly in recent literature and as a headline topic at congresses.

Methods. Case report of a 30a old adipose male patient with multiple allergies who was suffering from dysphagia and bolus events for about 15 years. They have been independent from pain, stress, temperature or consistency of food. Gastroscopic examination showed a narrow esophagus with fragile, slightly corrugated mucosa. Barium radiography and MRI did not show any pathology. The patient underwent an esophageal manometry which showed a normal LES with normal relaxation, but pressure peaks of 241 mmHg on swallowing and 20% simultaneous waves. Iced water or metoclopramide had no effect. PPI and Nitro showed no improvement. Sample biopsies of the whole upper GI during a second endoscopy revealed massive eosinophilic infiltration of the whole esophagus.

Results. The diagnosis eosinophilic esophagitis was herewith confirmed. The patient was treated with orally administered topic steroids (Pulmicort Spray bid orally for three months). His symptoms improved markedly.

Conclusions. Eosinophilic esophagitis is an uncommon disorder. Only 22 publications with all over 325 patients are published. Male to female ratio is 3 to 1. In 52% of the patients, food allergies can be found. Peripheral eosinophilia can be detected in 31% and high IgE in 50%. Most of the patients are in the range of normal weight. The main symptoms are dysphagia in 93%, food impaction in 62% and heartburn in 24% of patients. Endoscopically mucosal fragility can be detected in almost all patients, furthermore edema 59%, rings 49%, strictures 40%, corrugated esophagus, papules 16% and small caliber esophagus in 5%. Eosinophilic infiltration (20/hpf) in the upper and lower esophagus without presence of eosinophils in the stomach or duodenum are detected histologically. The recommended therapy is oral administration of fluticason – propionate or bethametason spray for two months. The initial response is about 95%, but relapse is common. Systemic steroids are also effective. Dilatation should not be performed because of a significantly elevated perforation risk and a high relapse rate.

Sample biopsies of the upper GI should be taken in every patient with unclear dysphagia since eosinophilic infiltration exclusively in the whole esophagus is pathognomonic for eosinophilic esophagitis and consequently dilatation should not be performed.

P04 Cholangiocellular carcinoma of the bile duct after resection of a congenital choledochal cyst – a rare manifestation

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Background. The risk of malignant degeneration of a bile duct cyst is reduced by an early resection, but the risk of malignant change persists, as we show in our case. Only few cases are published in the literature. As the prognose of a malignant degenerated choledochal cyst is very poor, the only useful possibility to minimize the risk of carcinoma is the early cystectomy. Based on our case we like to discuss the indication for surgery, incidence of malignant change, risk factors, discovery and diagnosis, detection and prevention, the surgical procedures for the treatment of chledochal cysts and especially whether the typ of surgery have an impact on malignant transformation?

Methods. We report about a female patient who was examinated by ERCP because of recurrent cholangitis. In her medical history we found out that on our patient a cholecystectomy has been carried out at the age of 8 years and in addition to that procedure a congenital choledochal cyst typ I was resected, nevertheless the patient developed a massive cholangiocellular carcinoma which leaded to death at the age of 42 years. After examination using multiphase CT we diagnosed a carcinoma to a great extent, which was inoperable. With the intention to obtain an operable condition, our patient was treated with neoadjuvant chemotherapy which remained unsuccessful.

Results. There are series of theories in the literature which try to explain the genesis of choledochal cysts, the real reason of their development is not clear, many possibilities for their emergence are discussed: i.e. weakness of the bile duct, distal obstruction, pancreatico-choledochal reflux caused by a long common channel, a wrong estuary of the pancreatic duct in the choledochus or also a pathologic distribution of ganglion cells on the wall of the choledochus. Reviewing the worldliterature, the risk of degeneration of choledochal cysts is described differently, but the early resection is always recommended.

Conclusions. Choledochal cysts are associated with an increase in the incidence of bile duct carcinoma. As it is shown, excision of a choledochal cyst is not protection by itself against the development of cancer in the future. After resection patients should have long term follow up. Any patient, especially any adult, with recurrent symptoms following cyst related surgery must be evaluated for malignancies in the biliary tract. A surgical treatment after diagnosis of a choledochal cyst is necessary to avoid bile duct carcinoma.

P05 Retroperitoneal first manifestation of lymphangioleiomyomatosis in a 35-year-old female

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Background. Sporadic lymphangioleiomyomatosis (LAM) is a nonmalignant proliferation of immature smooth muscle cells, usually in the lung but occasionally in the retroperitoneal lymph nodes as well. There is perilymphatic, perivascular and, with pulmonary manisfestation, peribrochiolar proliferation and invasion. It is an extremely rare disease (prevalence 1:1 000 000) that exclusively afflicts women of childbearing age. The most common presenting symptoms are dyspnea, cough, recurring pneumothorax or chylous ascites. The definitive diagnosis is obtained by biopsy. LAM has a typical histological picture featuring diffuse, sometimes nodular proliferations of immature smooth muscle that stain specifically with the marker HMB-45. Unlike tuberous sclerosis (TS), sporadic LAM is triggered by a mosaic mutation of the TSC-2 gene in the involved tissue. TS in contrast is caused by a somatic mutation of the TSC-2 gene. This somatic mutation leads above all to neurological symptoms (a trias of epilepsy, cognitive impairment, dermatological manifestations) but, in some cases, to a pulmonary manifestation of LAM. At present, there is no curative treatment for LAM, though a trial with gestagens is an option. Terminal pulmonary failure is an indication for lung transplant.

Case report. In the course of a routine sonographic examination, a 35-year-old woman was found to have an expansive cystic process in the retroperitoneum. Abdominal CT showed a pre-aortal lesion measuring $4.5 \times 4 \times 3\,\mathrm{cm}^3$ with a partially cystic, partially soft-tissue structure suggestive of a cystic lymphoma or a cystic lymphangioma. The cyst was drained and partially resected laparoscopically. The histological diagnosis was lymphangioleiomyomatosis without indication of malignancy. Preoperative chest X-ray and spirometry were within normal limits, but high-resolution thorax CT showed the cystic alterations typical for pulmonary LAM. At present, the patient is free of complaints but due to the typical chronic course of the disease, close follow-up is indicated.

Conclusions. Although it is a very rare disease, the diagnosis of a cystic retroperitoneal expansive process should suggest LAM as a differential diagnosis. A definitive diagnosis can only be obtained with histology. Because pulmonary involvement tends to be the rule, a thorax CT is indicated with primary abdominal manifestation. If there are neurological or dermatological manifestations, tuberous sclerosis should also be considered in the differential diagnosis.

P06 Fetal MRI: what is its worth outside the central-nervous system

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Background. Fetal MR was performed in the early 1980s first for fetal nervous system problems but has gained importance

in extra-central-nervous system regions as it is mandatory in pediatric surgery. Since 1998 fetal MRI is performed at our institution, whenever a congenital malformation is suspected in the prenatal ultrasound.

Methods. Fetal MRI studies are performed on 1.5 T (Philips) superconducting unit using a five-element surface phased-array coil, after 18th gestational week to avoid the possibility of magnetic fields interfering with organogenesis. No sedation is necessary. In addition to routine T2-weighted (w) sequences, T1-weighted sequences (mainly to demonstrate meconium-containing bowel loops), T2-sequences (in case of hemorrhagic lesions), steady state fast precession (SSFP) sequences (to depict vessel-abnormalities), dynamic SSFP sequences to show swallowing and peristalsis, FLAIR and diffusion-weighted sequences (for further tissue characterization) were performed.

Results. Fetal MRI is applied the following pediatric surgery cases: suspected lung anomalies (26 cases), abdominal anomalies (58), anal atresias (4), esophageal atresias (17 suspected), congenital diaphragmatic hernias (CDH) (30), head- and-neck diseases (5) and for urologic cases (38).

Conclusions. Detailed morphological description of congenital malformations is possible with fetal MRI which may have a bearing on prognosis. It has become mandatory for antenatal counseling. In some findings such as esophageal atresia, gastroschisis or CDH an antenatal transport can be arranged to a perinatal center.

P07 The FXIII V34L polymorphism influences inflammatory response in experimental endotoxinema in vivo

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Background. In inflammation, activation of coagulation and inhibition of fibrinolysis lead to microvascular thrombosis. Thus, clot stability might be a critical issue in the development of multiple organ dysfunction syndrome. Activated FXIII (FXIIIa) forms stable fibrin clots by covalently cross-linking fibrin monomers. In recent studies, multiple polymorphisms have been described in the FXIII-A subunit gene. The Val34Leu polymorphism affects the function of FXIII by increasing the rate of FXIII activation by thrombin, which results in an increased and faster rate of fibrin stabilization. In the present study, we analysed the influence of the common FXIII Val34Leu polymorphism on inflammatory and coagulation parameters in human experimental endotoxemia.

Methods. Healthy volunteers received 2 ng/kg endotoxin (LPS, $n = 62$) as a bolus infusion over 2 min. Blood samples were collected by venipunctures into EDTA anticoagulated vacutainer tubes before LPS infusion. For determination of the fibrinogen promoter polymorphism, we developed a new mutagenic separated polymerase chain reaction assay.

Results. FXIII levels were higher for homozygous carriers of the FXIII V34L polymorphism in comparison to wild-typ and heterozygous. Homozygous carriers had lower levels of TNF and IL-6 in comparison to wild-type. Interestingly, subjects homocygous for the FXIII V34L polymorphism had lower monocyte and neutrophil levels throughout the timecourse. The FXIII V34L genotype was not associated with clinically relevant differences in plasma D-Dimer or $F1 + 2$ levels after LPS challenge, which is consistent with the lack of effect on early thrombin generation.

Conclusions. Our findings indicate, that the common FXIII V34L polymorphism is associated with differences in the selected inflammation parameters and in monocyte and neutrophil cell counts in response to systemic LPS infusion in humans. Those findings may have an impact on clinical treatment for patients with inflammatory diseases.

P08 Stamm-Kader gastrostomy or PEG

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Time-honoured or forgotten? The Stamm-Kader gastrostomy, introducing a Nelaton catheter via a stab incision through the upper abdominal wall, guided by direct vision after laparotomy or using a minilaparotomy or even by laparoscopy can be considered an easy alternative to the widely used PEG or similar endoscopic procedures.

The ''old'' and simple Stamm-Kader procedure offers not only direct vision, possibilities of local anaesthesia and a minimum of instruments and therefore costeffectiveness, but is also a welcomed addition to the surgical armamentarium – once learned.

The actual procedure includes an abdominal access – whether minimal or already present in case of operations for bowel obstruction, further a double pursestrig suture between large and small curvature of the stomach, stab incision and introduction of a large lumen balloon catheter, the double pursestring sutures are tied in such a way that a short channel in the stomach wall is formed and then covering sutures between abdominal wall and stomach are tied. The catheter can be used immediately for decompression and early feeding.

Obviously this is a surgical method and has therefore a much smaller following and tends to be forgotten as there are no ''progressive'' endoscopic devices to be advertised and there is minimal economic interest to be generated for medical companies.

Nonetheless it is in my opinion and experience an useful route in more ways than the PEG or button gastrostomies can ever offer.

P09 Comparison of conventional and endoscopic management of adrenal tumors

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Endoscopic surgery is widely applied in the management of adrenal tumors. The advantages, as well the disadvantages and risk of laparoscopic surgery as compared with open surgery, have been discussed in recent years.

During 2000–2006 years 56 patients with adrenal tumors were operated, 32 of them underwent the open adrenalectomy (1st group) and 24 – laparoscopic adrenalectomy (2nd group).

The blood levels of C-reactive protein (CRP), interleukin (IL) 6, 18, and ICAM-1 were measured using the ELISA technique in all patient before, immediately after operation, at the first and third day after surgery.

The pre-operations levels of CRP and all mediators had no differences in both group of patients. Significant increase of IL-6, IL-18 and ICAM-1 level was noted in the first group vs. insignificant changes of mediators' levels in patients of the laparoscopic group immediately after operation. The gradually increase of all mediators' plasma levels were noted in first group up to the third day after operation. CRP was peaked at the third day in both group, but the increase after open adrenalectomy was more pronounced ($p < 0.001$). Levels of IL-18 and ICAM-1 had strong correlation with the hematological changes that observed in the postoperative period.

The cytokines play a pivotal role in the orchestration of the immune response. The increased levels of IL-6 and IL-18 pointed on enhance of Th1 response. Activation of Th1 cytokines may provoke the immunosuppression and the catabolic stage and may have adverse consequences for patient recovery.

Thus, there is a clear correlation between the changes in cytokine levels and the degree of surgical trauma.

P10 Retroperitoneal pancreas transplantation with systemic-enteric drainage – case report

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Background. Enteric drainage and intraperitoneal graft position is the preferred technique for pancreas transplantation at most transplant centers. The technique of retroperitoneal pancreas transplantation was first described by Boggi et al. [Transplantation 2005 May 15: 79(9): 1137–1142]. We present a modified model of retroperitoneal pancreas transplantation with systemic-enteric drainage.

Methods. Combined retroperitoneal pancreas-kidney transplantation was performed in a 48-year-old patient with type-I-diabetes and diabetic nephropathy. The patient had a BMI of 31 and had undergone renal transplantation in the right iliac fossa 6 years ago. After mobilization of the colon and mesocolon ascendens, the graft was anastomosed end-to-side to the aorta and to the inferior caval vein. The graft was in a retroperitoneal position. For exocrine drainage a side-to-side duodenojejunostomy was performed after bringing a jejunal loop through a window in the colon mesentery.

Results. The anastomoses could be performed with ease. Duration of the pancreas implantation was 90 minutes, 100 minutes for implantation of the kidney in the left iliac fossa. Ischemic time was 5 hours. A revision was necessary due to obstruction of the graft ureter. From day 2 after transplantation the patient required no more insulin, and lipase and amylase levels were within the normal range.

Conclusions. The first experience with retroperitoneal pancreas transplantation with systemic-enteric drainage showed, that the technique was safe, and had technical advantages as compared with the classic method. It should be especially applied in high risk patients (obesity, severe atherosclerosis).

P11 ReCell® – a new treatment option for burns, skin defects, scars and vitiligo

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Background. ReCell® is a new medical product for yielding a cell suspension of the skin. In this process cells are removed from the basal layer of a thin split skin graft. The removal of the skin graft, the preparation of the cell suspension and the covering of the defect can be done in one treatment session in the operating theatre. ReCell® could be used for the coverage of superficial defects in burns, scars, skin resurfacing and vitiligo. The advantages of this new technique are a shorter healing period, better scar quality and the ability of repigmentation.

Methods. For yielding cell suspension, which is quickly available, a thin split skin graft (thickness 0.2–0.3 mm) is taken. Depending on the defect, the size of the split skin biopsie is from $1 \times 1\,cm^2$ for coverage of $80\,cm^2$ to $2 \times 2\,cm^2$ for coverage of $320\,cm^2$ treatment area. After separation of the different layers of the skin, the special cell suspension could be prepared. Then the cell suspension is immediately sprayed or trickled on the prepared wound area. A special laboratory is not required. The first change of the wound dressing is done 1 week postoperatively.

Conclusions. The result of this new treatment option is a skin of good quality, colour and function – comparable with the original skin. The first experiences show ReCell® as an interesting amendment to the previous therapeutical options. However, other studies should be done to fathom the spectrum of the indications and to confirm the first results.

P12 Early experience with ductoscopy guided minimal invasive surgery for intraductal breast lesions

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Background. Intraductal breast lesions which have been diagnosed by radiological ductography are sent to breast surgery. By a cirumareolar incision a poorly defined extent of tissue will be removed. It can be supported by presentation of the main duct by injection of blue dye. Taking into consideration that papillomas are benign in 88–96%, it is worthful to minimize the extent of the intervention. This fact and the aim to visualize the origin of most types of breast cancer – the Terminal ductolobular unit (TDLU) – induced the development of endoscopes for the milk ducts.

Methods. After canulating the ductus lactiferous it will be distended by a special dilatator. The endoscope (LaDuSkop®, Polydiagnost Comp.) is inserted through this dilatator and the inspection of the ductal system is possible til over the fourth bifurcation. Endosopes are available with device for flushing and working ducts for biopsies.

Results. This a first report about the experience with ductoscopy in 23 patients presented with unilateral secretory disease. After successful localisation of an intraductal leason a tissue sparing excision of the affected duct follows guided by the in situ lying ductoscope.

Conclusions. Endoscopy of the mammary duct system is a precious diagnostic tool for onesided secretory disease und is able to minimize the extent of the removed tissue. The role of the method in the perioperative visualisation of intraductal diessemination of breast malignancies needs further evaluation.

P13 Ruptured aneurysma of arteria lienalis with massive bleeding because of fibromuscular dysplasia

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Background. Fibromuscular dysplasia (FMD), a non-atherosclerotic/non-inflammatory vascular disease, is a rare cause of visceral artery aneurysmas (VAA). In about 22% of all cases, VAA presents first with rupture and leads to a overall-mortality of 8.5%. About 10% of FMD are familial, most likely in female and often as multifocal lesions.

Patient's history. A 45 years old female patient was admitted to our department with nausea and epigastric pain. Former history showed an aneurysma of the iliacal artery treated by iliacofemoral bypass (pathohistological examination of the aneurysma showed FMD), and several episodes of spontaneous subcutaneous haematomas. Abdominal ultrasound, X-ray and gastroscopy showed no abnormalities. Moderate anaemia without any sign of gastrointestinal bleeding made us perform a CT-scan which showed an intraabdominal and peripancreatic haematoma without any sign of a recurrent aneurysma. Under ICU-monitoring the patient showed another episode of acute epigastric pain and developed signs of haemorrhagic shock. We performed an acute median laparotomy and found no cause of intraabdominal bleeding. Exploration of the peripancreatic haematoma showed the cause of bleeding as a ruptured aneurysma of the central splenic artery. Resection of the aneurysma and splenectomy had to be performed. The patient was discharged from the hospital on the 17th postoperative day.

Conclusions. Ruptured VAA caused by FMD as rare reasons for acute abdominal pain need most aggressive treatment to avoid postoperative mortality.

P14 Case of acute low bowel obstruction in the newborn

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Background. Treatment of the congenital intestinal obstruction of newborns is one of the main problems of the pediatric surgery.

Methods. Patient P. had been hospitalized to the intensive care unit 2 days after birth with symptoms of absence of stool from birth, frequent vomiting, full-blown abdominal distension. The signs of endotoxicosis, the intestinal loops posterized image through the anterior peritoneal wall, dilatation of the venae anterior peritoneal wall, abdomen lower sections and scrotum edema were noted at the time of admission. X-ray of the abdominal cavity reveals the signs of the low intestinal obstruction, bowel perforation – presence of liquid and free air at the abdominal cavity. Diagnosed – the intestinal obstruction, peritonitis and after a short-term of the preoperative preparation patient underwent surgery. Atresia of the sigmoid colon, necrotic enterocolitis with the affection of the 2/3 of the large bowel, perforation of rising section of the large intestine, the meconium peritonitis were established during surgery. The right side hemicolectome, terminal ileostomy and transverse colostomy. The reoperation at the 11 month was done: ileotransversostomy, descendosigmostomy with the preserving of transverse colostomy were performed. The diameter of the descending large bowel exceeded the diameter of the sigmoid colon by 3–3.5 times, that's why the anastomosis had been raised by the type ''side to side''.

Results. Within the course of 2 weeks after the radical surgery the child started to have stool passage through the rectum. Presently the child's condition is satisfactory, the physical development corresponds to the age norms, stool passage takes place only through the rectum. The final stage of the treatment will be the closure of the transverse colostomy with the complete restoring of the passage of the chyme through the bowels.

Conclusions. The bringing of the intestinal stomas out with the delayed radical surgery in some case of newborns may significantly improve the prognosis of the results of treatment.

P15 Post-cholecystectomy hemobilia due to a cystic artery stump pseudoaneurysm

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Background. Today, iatrogenic injuries are the most common cause of hemobilia. The hepatobiliary system is at risk for damage as side effect from procedures such as percutaneous bile drains and liver biopsies. Complications of open and laparoscopic surgical procedures can also be responsible for hemobilia.

Methods. We report of a rare case of iatrogenic hemobilia occurring after laparoscopic cholecystectomy.

Results. A 49-year-old patient was readmitted to our department, 14 days after laparoscopic cholecystectomy, complaining about upper abdominal pain and presenting with signs of jaundice ($Bi = 0.7\,mg/dl$ but $AP = 572\,U/l$) and anaemia ($Hb = 7.5\,g/dl$). The patient, who was a Jehovah's Witness, refused blood transfusions. On readmission ERCP demonstrated fresh active bleeding from the papilla of Vater. Cholangiography demonstrated obstruction of the common bile duct by intraluminal blood clots. Blood clots were retrieved by means of an endoscopic ballon-catheter. CT scan and angiography showed a 3.5 cm contrast retaining pseudoaneurysm in the hilus of the liver oroginating from the stump of the cystic duct. Interventional radiological selective stenting of the hepatic artery could not be performed for technical reasons. The patient was re-operated, the site of bleeding was identified as the

cystic artery stump and surgically controlled with sutures. The patient's further postoperative course was uneventful with quick recovery and without the need for blood transfusion.

Conclusions. Hemobilia is a rare complication after cholecystectomy, which may stem from a pseudoaneurysm of damaged vessels, e.g., the stump of the cystic artery. When management by interventional radiology fails, surgical intervention is mandatory.

P16 Case report: non-traumatic esophageal perforation with esophagopleural fistula

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Background. We describe on of the rare cases with a perforated Barrett-ulcer resulting in an esophagopleural fistula. The importance of recognizing esophageal disorders and catastrophes in the management of acute abdominal emergencies is emphasized.

Methods. Chronological review of our patients medical history, pathohistological features and comparison of published data of ''esophageal perforation'' via pub med.

Results. A young, male, alcohol-addict patient presented to the Emergency Department after a fall over staircase with serial rips-fracture and only little discomfort. Chest X-ray and blood sample were inconspicuous. On the following day patients general condition got worse, a pneumothorax occurred. So it was necessary to install a Bulau drainage which encouraged food out of the left pleuracave – therefore an ''esophageal perforation'' was supposed. The patient was transferred, now with a mediastinial sepsis and multi organ-failure, to our medical surgery unit, where primarily a esophageal stent and a thoracotomy with cleansing and drainage of the mediastinum and the pleural cavity was set. But within a week the stent became insufficient and an esophagectomy and a gastrostomy were necessary. After 4 weeks therapy on the intensive care unit, the patient underwent again a thoracotomy with decortication of a pleura callositiy because of the persistence of a fluidopneumothorax. The patient is now disposed to a colon interposition.

Conclusions. Possible risk factors for perforation in general and in this patient included alcoholism, severe gastroesophageal reflux, noncompliance with antacid and PPI blocker therapy and the presence of acid-secreting parietal cells in the Barrett's epithelium. Misdiagnosis is the most important contributing factor in the continuing high morbidity and mortality of esophageal-perforation as shown by all reported cases.

P17 Die Spontanperforation der Gallenwege durch Cholangiolithiasis

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Spontanperforationen im Bereich des Gallengangssystems sind seltene Beobachtungen, die auf Grund des konsekutiven Gallenaustritts zum klinischen Bild eines akuten Abdomens führen. Als Rupturorte werden die gesamte Leberfläche selbst, das Gallenblasenbett nach Cholezystektomie, sowie das Ligamentum triangulare beschrieben. Kongenitale Wanddefekte, sowie aberrierende Gallengänge können als Ursache eruiert werden, wobei häufig eine intraduktale Druckerhöhung, wie bei Cholangiolithiasis, die Ruptur bewirkt.

Aus dem eigenen Krankengut sollen Kasuistiken beschrieben werden, bei denen es zu einer Ruptur aberrierender Gallengänge nach Cholezystektomie gekommen war. Neben dem intraoperativen Befund einer galligen Peritonitis war eine eitrige Cholangitis auf dem Boden einer Cholangiolithiasis zu diagnostizieren und zu dokumentieren. Eingegangen wird dabei auf Pathophysiologie, Klinik, Diagnostik, Therapie und Verlauf bei diesen Patienten.

P18 Anal necrosis, rectal prolapse and incontinence due to an ergotamine suppository

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Background. The use of ergotamine, e.g., suppositories for migraine headaches, may have systemic as well as local side effects. Systemic poisoning is known as ergotism, historically mostly due to the ingestion of rye infected with Claviceps purpura fungi. Local complications, like rectal ulcers and rectovaginal fistula may require surgical management.

Methods. We report about the case of a 51 year old female patient with deep anal necrosis, insufficiency of the anal sphincter, anovaginal cloaca and rectal prolapse, as long-term sequelae of ergotamin suppository application.

Results. The patient was hospitalized for treatment of the rectal syndrome mentioned above. The anoderm appeared completely destroyed, with extensive scarring and manifestation of an anaovaginal cloaca. Anal manometry showed almost no anal pressure. Anal sonography demonstrated an anterior semicircular defect of the internal as well as the external anal muscles. The patient had already been seen in our hospital two years previously, when a perineal necrosis had raised suspicion of a locally advanced anal cancer. That time, she had refused to undergo further diagnostic work-up (including re-biopsy, etc.) and treatment, after endosonography had suggested an infiltrative process affecting the anal sphincter and the histopathologic diagnosis spoke of a ''tumor necrosis . . . but without viable tumor cells''. Now, after exclusion of a neoplastic process, the patient underwent a complex surgical procedure for management of her incontinence syndrome: A laparoscopic resection of the rectum and rectopexy was performed. Furthermore sphincter and perineum were reconstructed using an anterior levator plasty and ventral sphincter-overlapping repair. A temporary protective loop ileostomy was created in addition.

Conclusions. This case describes the – to our knowledge – most extensive local complication due to ergotamine suppositories, in the world literature. It suggests that ergotamine suppositories should be used with precaution, and a close follow-up by the prescribing practitioner is mandatory. Furthermore, patients with unclear inflammatory destructive alterations of the perineum and unexplained rectal syndrome should be asked for ergotamine suppository (ab)use.

P19 Intrapancreatic accessory spleen: a differential diagnosis of pancreatic tumour

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Background. According to autoptic studies, accessory spleens may be found in 10 to 15% of the population and most of them are usually located at or near the splenic hilum. Only in 1 to 2% they are located in the pancreatic tail. We report a rare case of intrapancreatic accessory spleen which radiologically mimicked a tumor in the tail of the pancreas.

Methods. A 54-year-old man was diagnosed with a tumor at the pancreatic tail. In the preoperative computed tomography (CT), there was a lesion (2.6 cm in diameter) in the pancreatic tail and two locoregional lesions (1.0 and 1.5 cm in diameter), which had intensive contrast enhancement. It was diagnosed as a nonfunctioning endocrine pancreatic tail carcinoma with lymph node metastasis.

Results. Intraoperative examination showed two accessory spleens nearby the pancreatic tail. As pancreatic cancer could not be excluded because of the local findings, an oncological left pancreatectomy was performed. Histological examination excluded cancer and revealed an intrapancreatic accessory spleen and two accessory spleens nearby the pancreatic tail.

Conclusions. Intrapancreatic accessory spleen should be included in the differential diagnosis of pancreatic neoplasm. A useful diagnostic tool is scintigraphy with Technetium-99 marked, heat shock denaturated autologous erythrocytes.

Tumorchirurgie

P20 Sacral nerve stimulation and rectal resection

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Background. Sacral nerve stimulation (SNS) is a widely accepted therapeutic options for patients suffering from faecal incontinence based on a neurogenic dysfunction. More recently case reports have been published showing a positive effect of this treatment in patients suffering from faecal incontinence after low anterior rectal resection. The purpose of this study was to perform a nationwide survey for this selected indication for SNS in order to gain more information by recruiting a larger number of patients.

Methods. In the period 2002 to 2005 three Austrian departments reported data of patients who underwent SNS for faecal incontinence following rectal resection. Data were available of 8 patients (3 females, 5 males) with a median age of 57 years (min 42–max 79). Six patients had undergone rectal resection as a treatment for low rectal cancer. One patient had undergone rectal resection for Crohn's disease, one patient subtotal colectomy and ileorectostomy for slow colon transit constipation.

Results. In all patients test stimulation was performed in the foramen S3 unilaterally over a median period of 14 days (2–21 d). Seven patients reported a marked reduction of incontinence in the observation period. Five patients reported a marked improvement compared to the baseline of their continence situation. Three patients had no further incontinence episodes following the permanent implant. Two patients reported ''rare events'' (1–2 incontinence episodes/month). One patient who had previously reported an improvement of his continence function during his test stimulation complained about repeated urgency problems as well as incontinence episodes.

Conclusions. Despite our observations and the promising results of others the role of SNS in the treatment of faecal incontinence following rectal resection needs further research as well as more clinical data by a larger number of patients.

P21 Lymphatic vessel invasion in upper GI cancer: an indication for an additive or adjuvant therapy?

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Background. Lymphatic vessel invasion (LVI) has been proven to be an independent prognostic factor in primary resected esophageal squamous cell carcinoma (ESCC) and adenocarcinomas (AC). So far no data are available, if multimodal therapy leads to a decrease of LVI. We investigated in locally advanced tumor categories (T3/4) the effect of (1) neoadjuvant radiochemotherapy (RTx/CTx) in ESCC and of (2) chemotherapy (CTx) in AC on the postoperative LVI-rate compared to primary esophagectomy.

Methods. Determination of LVI was performed within the following patient cohorts: (*1-ESCC*): $n = 404$: $n = 209$ (esophagectomy) vs. $n = 195$ (RTx/CTx + esophagectomy). (*2-AC*): $n = 292$: $n = 146$ (esophagectomy) vs. $n = 146$ (CTx + esophagectomy).

Results. (*1-ESCC*): RTx/CTx led to a LVI-reduction from 46.9% (primary esophagectomy) to 26.2% (RTx/CTx + esophagectomy) ($p < 0.0001$). Multivariate analysis revealed complete tumor resection (R0-Resektion) (0.01) and neoadjuvant RTx/CTx ($p = 0.009$) as independent prognostic variables. Histopathological nonresponder (residual tumor cells > 10%) had significant higher LVI-rates (34%) compared to responder (16%) ($p < 0.0001$). (*2-AC*): Primary resected patients revealed a LVI-rate of 45.9 vs. 44.5% in CTx-patients (n.s.). Histopathological responders showed significant lower LVI-rates compared to nonresponder ($p = 0.005$).

Conclusions. Different multimodal regimen seem to lead to a different effect regarding the postoperative detectable LVI-rate: (*1-ESCC*): RTx/CTx led to significant lower LVI-rates compared to primary resected patients. (*2-AC*): CTx did not lead to this effect. (*3*) Histopathological responder in ESCC

and AC had significant lower LVI-rates compared to non-responders. These data warrant prospective data and might result in the future into an additive or adjuvant multimodal therapy.

Hernienchirurgie

P22 Comparative time analysis of transinguinal preperitoneal hernioplasty with memory ring armed polypropylene patch (TIPP) and Lichtenstein technique

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Background. Different inguinal hernia operationtechniques must be compared to their recurrency rate, acute and long term complication rate, patients comfort and duration before returning to daily life, return to work and to sports etc. Under economical aspects they should be safe, quick, and require limited resources (personal, equipment, implantate). With increasing economical pressure the latter features gain increasing importance. We therefore made a comparative time analysis between TIPP and Lichtenstein.

Methods. Between 1.9.2005 and 30.9.2006 195 Hernias were operated in TIPP technique and 73 hernias in Lichtenstein (LICH) technique. Patients were from an identical district and comparable in epidemiological data, comorbidity, hernia distribution and in- resp outdoor treatment. Each series was performed by 1 surgeon in the same operation unit. Implantates used were Polysoft Hernia Patch™ (TIPP) and Ultrapro Mesh™ (LICH). Total operation time was recorded (min). Additionally, 4 operation phases were defined:

Opening phase: from skin split to
Preparation phase: from opening of the external aponeurosis to introduction of the mesh
Repair phase: from introduction of the mesh to the end of the suture of the external aponeurosis
Closing phase: end of repair phase to skin closure.

Assuming individual differences between the surgeons and management-associated differences as well as intermethodical differences relative phase intervals were deduced from the original recordings and compared. Statistical comparison was done by *t*-Test and Pearson correlation coefficient.

Results. Average operation time of LICH was 61 ± 14.6 min (range 41–127 min, median 59 min), average operation time of TIPP 29.29 ± 9.83 min (range 16–73 min, median 27 min). Up to now there was $1/163$ recurrent hernia in TIPP and $0/73$ in LICH (n.s.). The correlation of preparation phase time and operation time was high (Pearson coefficient: TIPP 0.890; LICH 0.906) and lower for repair phase (TIPP 0.655; LICH 0.529). There was no difference in the correlation of the preparation phases in TIPP and LICH ($p < 0.05$). On this basis we estimated the expected time of the compared method to each series, i.e. presumable time for LICH in TIPP series and vice versa. Comparison of LICH vs. TIPP (expected) and LICH (expected) vs. TIPP revealed that TIPP was faster and required 92.2% time of LICH ($p < 0.05$).

Conclusions. TIPP and LICH show a comparable time effort towards preparation, TIPP is significant faster in repair phase enabling a quicker total operation time.

P23 Transinguinal preperitoneal hernioplasty (TIPP) using a memory ring armed polypropylene patch: which factors influence the operation?

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Background. Inguinal hernia operation is the most common operation in western countries. Very often, it can be performed under non-hospital conditions without any disadvantage to patient or surgeon. But several factors can influence the operation course as well as its economical impact. The knowledge of such factors may improve the preoperative planning and influence the choice of method and hospital or non-hospital treatment.

Methods. Between 15.12.2004 an 31.12 2006 we operated 410 hernias (Bassum & Sulingen) in 373 patients with transinguinal preperitoneal hernioplasty (TIPP) using a memory ring armed polypropylene patch (391 Polysoft Hernia Patch™, 19 individual designed ring-armed patches). [Up to now $1/410$ recurrencies (0.2%) were seen.] All patient data were collected prospectively. In the present study we compared all patients with an operations time of 45 minutes or more with those with operation times <45 minutes and compared patient related factors (ASA, BMI, type of hernia, recurrent hernia, scrotal hernia, incarcerated hernia and situs-related Problems) and operation related factors (surgeon's experience, intraoperative problems, anaesthesiologic problems).

Results. Mean operation time was 34.02 ± 12.96 minutes. Operation time did not increase with ASA and BMI (Pearson coefficient 0.174 resp 0.083). Direct hernia were faster operated than indirect, combined or recurrent hernias in total (average time 30.9 ± 12.7; 34.5 ± 11.4; 34.9 ± 13.7; 38.24 ± 16.18). The proportion of recurrent (13.54%) and scrotal hernia (3.44%) in operations longer than 45 minutes was significantly higher (n.s. resp. $p < 0.05$), in incarcerated hernia (3.56%)and hernias with long anamnesis and difficult scarred situs (2.7%) or combined with additional operations (0.74%) as well. In operation related factors individual designed ring-armed patches demanded 8–15 minutes more operation time and thus clearly prolonged the operation ($p < 0.05$), unexpected intraoperative problems (e.g. in positioning the patch) or complication (bladder injury) as well. In rare cases anaesthesiological problems (insufficient SPA) caused delay as well. Most important seems to be surgeon's experience. With increasing experience the average operation time and the proportion of long lasting operations decrease.

Conclusions. While patient's ASA and BMI do not influence the TIPP operation significantly, hernia type, recurrency,

incarceration and scrotal hernia resp scared situs influence the operation clearly. In operation related factors surgeon's experience seems to be most important, intraoperative problems or complications result in an unexpected delay as well. In preoperative planning knowledge of recurrency (previous operation method), scrotal hernia or incarceration or scar-inducing anamnestic factors give hints to a prolonged hernioplasty.

P24 Biomechanical analysis of the ventral abdominal wall for incisional hernias

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Background. For the therapy of ventral abdominal wall hernias, different reinforcement techniques with mesh are available. Nevertheless the outcome of treatment for ventral abdominal wall hernias is currently unsatisfactory. Biomechanical load flow calculations are introduced in this study.

Methods. We took peritoneum and abdominal wall muscles of recently deceased cadavers to determine the friction coefficient for mesh protheses. Therefore we placed the mesh between peritoneum and muscles and loaded them with tension. Furthermore we analyzed the different fixation elements for their load resisting capacity.

Results. The prostheses demonstrated a frictional coefficient of $\mu_0 = 0.4$. The elasticity module E of polypropylene is $= 1200\,N/cm^2$. For laparoscopic techniques, leight meshes showed an unproportional high bending and sheared off at low loads. For the reinforcement elements, large differences between different tensile load capacities were detected.

Conclusions. The overlap of the protheses over the hernia orifice should be selected proportionally to the hernia size. Light meshes are unfit for the laparoscopic techniques and should not be used for the therapy of ventral wall hernias.

Minimal Invasive Chirurgie

P25 The axillary access in unilateral thyroid resection

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Background. With this study, we intended to find out if it is possible to avoid the typical scar after thyroid resection by using a 20 mm axillary access and a 3.5 mm incision in the jugulum.

Methods. We present the results of our proof-of-concept study with 12 patients. For this technique, a modified axilloscope and ultrasonic scissors were used, which permit a total resection of the unilateral thyroid.

Results. The feasibility of this endoscopic technique was shown by the successful operation of these patients with unilateral pathological findings. Furthermore, we showed that this technique allows to resect tissue up to a whole lobe while at the same time finding and identifying the recurrent laryngeal nerve and subsequently verifying the findings by using the neuromonitoring system.

Conclusions. This study shows that endoscopic thyroid surgery approximates the norms of endocrine neck surgery. The presented method is useful in thyroid surgery for patients with single nodules and a small thyroid gland.

P26 Laparoscopic incisional hernia repair with mesh implantation – 6 years experience with 3 different meshes

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Background. Ventral incisional hernias have a high incidence after laparotomy closure. Laparoscopic hernia repair is a minimal invasive technique with less operative trauma. The aim was to assess the reccurence rate and morbidity after the laparoscopic repair.

Methods. Data of all patients with laparoscopic incisional hernia repair operated in our department between December 2000 and November 2006 were recorded in a prospective data base. Forty two patients (m:f = 17:25) with a mean age of 57 years (25–84) and a mean BMI of $30\,kg/m^2$ (21–45) were operated.

Results. Conversion rate was 10% due to intraoperative lesions to small bowel during adhesiolysis. Mean operation time was 106 min (39–284). In 17 patients the Dual-Mesh, in 9 patients the Bard composite EX mesh and in 12 patients the parietex mesh was implanted. Mean hospital stay was 7 days (3–14). The morbidity-rate was 7.14% (3 hematomas). Four patients complained about prolonged pain. In the long term follow up 1 patient had to be reoperated due to mesh related complications. Mean follow up time was 26 months, 2 patients presented with a recidive hernia.

Conclusions. Laparoscopic ventral hernia repair can be performed with acceptable recurrence rate (4.8%) and low morbidity (7.14%) independent of the used mesh.

P27 Outcome of clip removal after endoscopic sympathetic block

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Background. In 1998 endoscopic sympathetic block by clipping (ESB) has been introduced in sympathetic surgery claiming potential reversibility after clip removal (CR). To date, only

anecdotal reports are available on clinical outcomes after CR. The aim of the study was to investigate whether CR actually resulted in reversal of compensatory sweating (CS), and whether the initially obtained therapeutic effect on hyperhidrosis of the upper limbs (HH) and the face (FH) and facial blushing (FB) diminished with time.

Methods. Between 6/2001 and 11/2006 a total of 23 patients (6 females, 17 males) with a mean age of 34 ± 7 years underwent CR after ESB. Three patients underwent unilateral clip removal due to mild ptosis (one patient with ESB2, 2 patients with ESB3). Twenty patients had their clips removed due to unbearable CS. Levels of HH, FH, FB and CS were graded by a visual analogue scale ranging from 0 (no sweating/blushing) to 10 (most severe sweating/blushing). Mean follow-up after CR was 19 ± 16 months obtainable from 20 patients (87%).

Results. The 3 patients who suffered from ptosis started to improve 2 weeks after CR, complete relief was observed 3 months thereafter. In each group with ESB2 and ESB3, 9.5% of patients underwent CR. Only one patient after ESB4 had to be reoperated (0.7%, $p < 0.05$ compared to ESB2 and ESB3). Four patients (20%) reported no change in CS after CR, in 3 patients (15%) CS dissolved completely. Overall, CS improved from 8.4 ± 1.3 to 5.1 ± 2.4 ($p < 0.05$). HH, FH and FB recurred to about 40% of the initial levels, 4 patients (20%) reached preoperative levels.

Conclusions. Clip removal because of unwanted side effects is more common in patients after ESB2 and ESB3 than after ESB4. CR results in partial reversibility of CS and causes partial recurrence of the initial complaints. Although some patients do not benefit from CR, our study provides valid data that ESB is a reversible technique.

P28 Acute reinterventions following laparoscopic transabdominal preperitoneal inguinal hernia repairs (TAPP)

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Background. Today the TAPP method is a frequently used surgical procedure for treating inguinal hernia. Although this type of operation has some advantages compared to open procedures, some complications typical for laparascopy might arise. We report about managing such complications as based on our experience.

Methods. Between January 2000 and December 2006 TAPP was applied in our hospital to 531 ($n = 531$) patients. From among those 6 patients ($n = 6$), (6 m, aged 38–78) laparoscopy had to be repeated because of acute complications which occurred between the 1st and 8th postoperative day. Three patients presented post op a bilateral TAPP. Reasons for interventions were: obstruction of the small intestine due to incarceration with a dehiscent peritoneal suture ($n = 3$), hematoma in the area of surgery applied ($n = 2$) and one hemorrhage caused by a trocar ($n = 1$). In three patients ($n = 3$) with a mechanical obstruction of the small intestine, repositioning by laparoscopy of the incarcerated ileus was carried out, followed by a peritoneal suture. In two cases with intraabdominal hemorrhage, the bleeding was stopped and the prolene nets were removed via laparoscopy. In only one of the cases replacement of the net was possible, in the other one the procedure was changed to open surgery for inguinal hernia because of an infected net. In one patient ($n = 1$) hemorrhage due to injury by trocar repair was possible by a simple suture.

Results. In 4 out of 6 cases the complication was successfully repaired by way of laparoscopy. In one case the Shouldice repair was applied. In the other a paralysis of the ileus occurred post laparoscopy, requring a smoothing of the ileus by laparotomy.

Conclusions. Among our patients severe complications following TAPP needing surgical intervention occurred but rarely (1.1%). Frequently treatment by way of laparoscopy was successful.

P29 Clip displacement does not effect postoperative outcome after endoscopic sympathetic block

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Background. Endoscopic thoracic sympathectomy is the treatment of choice for patients with severe primary hyperhidrosis (HH). Recently, clip application (endoscopic sympathetic block, ESB) has been introduced providing potential reversibility. The clips are visible on X-rays allowing postoperative evaluation. At our institution ganglion oriented procedures are performed taking rib levels into account. The aim of the study was to investigate if failures, recurrences and unwanted side-effects (compensatory sweating, CS) can be explained by clip displacement.

Methods. Between 2001 and 2005, 129 patients (mean age 32.1 ± 9.7 years) prospectively underwent 255 ESB procedures. ESB2 was performed in 30 patients (23.3%) with facial blushing (FB), ESB3 in 21 patients (16.3%) with facial sweating (FS) and ESB4 in 78 patients (60.5%) with HH of the upper extremities following the Lin-Telaranta scheme. A 5 mm titan clip was placed above and below the corresponding ganglion. Two quality of life scores have been evaluated. Mean follow up was 21.9 ± 10.1 months obtainable from 114 patients (88.4%).

Results. Ninety-eight patients (76.0%) had palmar, 89 (69.0%) axillary HH, 40 (31.0%) FS and 30 patients (23.3%) FB. CS was observed in 25 (19.4%) patients. A total of 14 clips (5.5%) were displaced in 11 patients (8.5%). Two patients with FS (9.5%) and 6 with HH of the upper extremities (7.7%) showed up with side differences regarding placement. In each group, one single patient was found with clips one level below the expected destination (3 patients, 2.3%). Four patients (36.4%) were completely and 5 patients (45.5%) partly satisfied after ESB despite displaced clips. Two patients have been lost to follow-up. Moderate CS was observed in one patient (9.1%) in each of the FB and FS groups. The patient from the latter group suffered from a mild transient ptosis additionally. Two recurrences (9.1%) were documented.

Quality of life improved significantly in all patients with clip displacement.

Conclusions. ESB has a displacement rate of less than 6% and gives excellent results for quality of life, which are not diminished by inappropriate clip application.

Qualitätssicherung in der Chirurgie

P30 Langzeitergebnisse des post anal repair bei fäkaler Inkontinenz

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Grundlagen. Post anal repair ist eine Methode zur Verbesserung der Kontinenzfunktion bei diffuser Schädigung des Schließmuskels. Die Methode wurde in den letzten Jahren kontrovers diskutiert. Langzeitergebnisse wurden nur sporadisch publiziert.

Methodik. Die Operation wurde in der Technik von Parks [i] in Steinschnittlage und Allgemein-, oder Spinalanästhesie durchgeführt. Eine präoperative Darmreinigung und eine perioperative Antibiotikaprophylaxe wurden routinemäßig durchgeführt. Prä-, und postoperativ wurde eine Sphinktermanometrie in der Durchzugstechnik mit einem perfundierten dreilumigen Katheter vorgenommen. Die Auswertung erfolgte mit einem Programm der Firma Gastrosoft. Bei der klinischen Untersuchung wurde der Kontinenz-Score nach Williams verwendet.

Ergebnisse. Von 1979 bis 2005 wurden insgesamt 82 Patienten operiert. Es handelte sich um 70 Frauen und 12 Männer, das Durchschnittsalter betrug 65 Jahre, die Anamnesedauer 50 Monate. Die mediane Beobachtungsdauer betrug 50 Monate. Als Ursache der Inkontinenz fand sich in 78% eine idiopathische Inkontinenz, bei 9% Wirbelsäulenproblem, bei 9% vorausgegangene Operationen im Analbereich und bei 5% ein Descensus perinei. Alle Patienten waren präoperativ inkontinent für festen Suhl (Williams 3–4). In der Langzeitbeobachtung waren 40% Vollkontinent (Williams 1), 37% nur für festen Stuhl (Williams 2), 6%waren unverändert und 17% hatten sich verschlechtert. Die Manometrie zeigte nur geringe Anstiege des Ruhedrucks (35,8 auf 36,7 mmHg) und des Kontraktionsdruckes (33,5 auf 36,3 mmHg (Mediane).

Schlussfolgerungen. Post anal repair ist durchaus geeignet die Kontinenzsituation bei Patienten mit diffuser Sphinkterschädigung zu verbessern. Die Methode ist komplikationsarm und im Vergleich zu anderen Verfahren kostengünstig.

Literature

1. Parks AG, McPartlin JF (1971) Late repair of injuries of the anal sphincter. Proc R Soc Med 64: 1187–1189

Adipositaschirurgie

P31 An unusual complication of gastric bypass: perforated duodenal ulcer

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Background. Peptic ulcer in the excluded segment of a gastric bypass has been reported in the literature in only 17 cases. We report a 54-year-old woman with a perforated duodenal ulcer, who underwent laparoscopic Roux-en-Y gastric bypass surgery for morbid obesity 15 months ago.

Methods. On physical examination, the patient's abdomen was marginally tender to palpation. Laboratory findings were unremarkable except for an elevated leucocyte count of 11.200/µl (normal 4.000–10.000/µl). Abdominal radiography and sonography showed no pathology. Because of the persistent abdominal pain we performed an abdominal computed tomography scan, which demonstrated free air.

Results. She was successfully treated by a laparoscopic repair of the perforated duodenal ulcer. After surgery, a standardized analgesic regimen was administered for pain relief. Intravenous piperacillin-tazobactam was continued for at least 4 days, then a Helicobacter eradication therapy was performed. Feeding was resumed on the first postoperative day and the patient was discharched on day six without any complications.

Conclusions. Peptic ulcer in the excluded segment of a gastric bypass has been reported in the literature in 17 cases. The pathogenesis of ulcer perforations in the excluded stomach/duodenum is unclear. Of the 18 total cases, free air in the abdominal radiography was only noted in one case. Recognizing that free air under the diaphragm will be absent is one of the most important diagnostic considerations when gastric or duodenal ulcer perforation is suspected in the postgastric bypass patient. Abdominal CT scan and early surgical exploration remain the treatment of choice.

Chirurgische Forschung

P32 Blood interleukin 12 as preoperative predictor of fatal postoperative sepsis after neoadjuvant radiochemotherapy

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Background. The value of preoperative whole-blood interleukin (IL) 12 levels in predicting death from postoperative sepsis was evaluated, in patients stratified by underlying malignancy, neoadjuvant tumour treatment and surgical procedure.

Methods. Blood samples were collected from 1444 patients before major surgery. Whole blood was incubated with Escherichia coli lipopolysaccharide (LPS) and IL-12 production in supernatants was assessed by enzyme-linked immunosorbent assay. The prognostic impact of ability to synthesize IL-12 before surgery was investigated in patient subgroups with respect to sepsis-related mortality using multivariate binary logistic regression analysis.

Results. IL-12 synthesizing capability in patients who survived sepsis was significantly higher than that in patients who developed fatal sepsis ($P = 0.006$). In multivariate analysis only IL-12 was associated with a lethal outcome from postoperative sepsis ($P = 0.006$). The prognostic impact of IL-12 was evident in patients with underlying malignancy ($P = 0.011$) and in those who had undergone neoadjuvant tumour treatment ($P = 0.008$). When patients were analysed according to the type of neoadjuvant therapy, preoperative ability to synthesize IL-12 had a significant prognostic impact in patients who had neoadjuvant radiochemotherapy ($P = 0.026$), but not in those who had neoadjuvant chemotherapy.

Conclusions. IL-12 production after stimulation of whole blood with LPS appears to be useful for the preoperative assessment of risk of sepsis-related death after operation in patients who have undergone neoadjuvant radiochemotherapy.

P33 Lipocalin-2, regulator or byproduct during ischemia and reperfusion?

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Background. The main focus of this work was to analyze the possible implication of Lipocalin-2 (Lcn-2) upregulation for the course of ischemia/reperfusion (IR) during heart transplantation and effects on polymorphonuclear cells (PMN) as well as to investigate the nature of the Lcn-2 producing cell.

Methods. Male inbred C57BL/6 and the Lcn-2$^{-/-}$ mouse were used in our transplantation experiments. PMN from wildtype and Lcn-2$^{-/-}$ mice as were isolated and promyeloid cell lines (32D) used to demonstrate the effect of Lcn-2 on cell physiology. Western blot, RT-PCR, immunohistochemistry and TUNEL assay were performed to determine Lcn-2 expression and apoptosis in the graft. Cell viability and migration assays after various stimuli (e.g. IR) were applied to elucidate cell growth and viability.

Results. Infiltrating PMN were the major contributors to Lcn-2 expression during IR peaking 24 h after reperfusion. The number of infiltrating PMN was significantly reduced in Lcn-2$^{-/-}$ recipients. No difference was observed in the apoptotic rate between wildtype and Lcn-2$^{-/-}$ donors and Lcn-2 expression also increased during acute graft rejection. Migration of PMN during reperfusion was negatively influenced by the absence of Lcn-2 or lack of Lcn-2 specific cell surface receptors in the Lcn-2$^{-/-}$ mice. The promyeloid cell lines responded to IR with increased Lcn-2 mRNA and protein levels.

Conclusions. Our data suggest a chemoattractant function of increased Lcn-2 expression in the transplanted heart due to infiltrating PMN. Lcn-2 is a novel inflammatory marker upregulated during IR and acute graft rejection. Our observations shed light on a possible function of Lcn-2 to the recruitment of PMN to the site of IR and identify possible targets for therapeutic intervention.

P34 Preliminary results of a tumour-lysate loaded dendritic cell vaccination therapy in patients with recurrent or metastatic skeletal malignancies

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Background. Vaccination with tumour-lysate loaded dendritic cells (DC) has shown to modulate potent immune response in several animal models and clinical trials. This study presents preliminary data of patients treated with DC-vaccination for recurrent or metastatic skeletal malignancies.

Methods. In 11 patients suffering recurrent chondrosarcoma (1), haemangio-endothelioma (1), Ewing's sarcoma (2), osteosarcoma (3), or osseous metastatic disease of renal cell carcinoma (4) DC-vaccination was applied additional to standard therapy such as surgery and/or chemotherapy and/or radiation. DC precursor cells were obtained from peripheral blood mononuclear cells by apheresis and incubated with autologuous tumor cell lysate gained by surgery. In each patient 6 vaccinations of $1 \times 10E6$ cells ($= 0.5$ ml) were administered intranodally under sonographic guidance in weekly intervals. Delayed type hypersensitivity (DTH) controls and standard clinical and radiological follow-up was performed before and after treatment.

Results. No adverse or side effects were observed in any patient throughout treatment. DTH reaction was negative in all patients after therapy. Six patients died of disease, 3 patients showed progressive state of disease in terms of local recurrence or pulmonary metastasis, 2 revealed stable disease. Helper as well as cytotoxic T-lymphocytes of 3 patients showed in vitro reactivity in terms of CD4 expression against tumour antigens and against the tracer antigen KLH by both CD4 and CD8 expression. One patient had no increase of CD4 and CD8 expression neither against tumour nor tracer antigen, one patient showed positive immunological reaction against KLH but not tumour.

Conclusions. In all patients with recurrent or metastatic skeletal malignancies investigated in this study DC vaccine therapy was primarily administered at very late stage of disease. The best clinical results could be achieved in patients with metastases of renal cell carcinoma, who both revealed stable disease over more than 12 months. All patients with metastatic disease of recurrent sarcoma showed poor clinical response to therapy, though some showed immunological reaction. The absence of adverse reactions and uncomplicated therapeutic regimen, however, together with monitored immunological responses suggest that the effects of DC-vaccination should be investigated in earlier stages of sarcoma to improve clinical outcome in these patients as well as in all stages of metastatic disease of renal cell carcinoma.

P35 Analysis of the risk factors Helicobacter infection, overweight, sex, and age in gallstone disease and gallbladder carcinoma in Germany

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Background. Helicobacter infection of the hepatobiliary system has been proposed as a novel risk factor in the pathogenesis of gallstone disease (GSD) and gallbladder carcinoma (GBC). Because there seem to be differences in the incidences of Helicobacter infection in various populations, we investigated whether Helicobacter infection of the biliary tract is present in Germany, a region with a high incidence of GSD, but with a low incidence of GBC.

Methods. Gallbladder tissue from 99 patients who had undergone cholecystectomy were investigated: 57 patients with GSD, 20 cases with GBC, and 22 control patients. The presence of Helicobacter spp. was investigated by culture, immunohistochemistry, and a group-specific PCR targeting the 16S rRNA and detecting all currently known Helicobacteraceae.

Results. Of the 99 cases investigated, only one patient with GSD was PCR-positive for Helicobacteraceae. In this subject, sequence analysis of the 16S rRNA showed closest homology to the 16S rRNA sequence of H. ganmani. Helicobacteraceae were not detected by culture or immunohistochemistry. There was a higher body mass index in patients with GSD compared to controls ($P<0.05$). Mean age of patients with GBC was significant higher than for GSD ($P<0.01$) or control patients ($P<0.005$), whereas there was no difference between GSD and controls.

Conclusions. These data suggest that Helicobacteraceae play no predominant role in the pathogenesis of GSD and GBC in the German population. The low prevalence of Helicobacteraceae in the gallbladder mucosa of German patients could be a possible explanation for the relatively low prevalence of GBC although GSD is frequent.

P36 Measurement of different cell death modes in the sera of colorectal cancer patients

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Background. Apoptosis is implemented in colorectal cancer (CRC) development and has emerged as a potential target for cancer treatment at various stages of tumor progression. Measurement of the apoptosis (M30)/necrosis (M65) ratio may have a role in therapy monitoring. To define the value of preoperative assessment of apoptosis and necrosis we measured these parameters in the sera of CRC patients and correlated these values with conventional clinical parameters.

Methods. We used an enzyme linked immunosorbent assay (ELISA) to detect an apoptotic product and necrosis (M30 and M65-antigen) in the sera of 51 patients with CRC; UICC I: n: 17; UICC II: n: 7, UICC III: n: 12; UICC IV: n: 10; Relapse: n: 5 and 27 healthy controls.

Results. Patients with colorectal cancer showed significant higher M30 antigen levels than healthy controls ($p<0.001$). When stratified to tumor stages the different preoperative M30 antigen expressions between healthy controls and tumor patients remained throughout all stages.

Detailed results are depicted in the following table:

Association between median M30 antigen levels (U/L; 25th–75th perc.) among UICC stages

Stage	Median M30 concentrat. (U/l; 25–75 perc.)/p Value
N vs. Tumor	72.7 (61.1–112.0) vs. 160.0 (104.5–503.2)/ <0.001
N vs. UICCI	72.7 (61.1–112.0) vs. 144.9 (104.5–270.2)/0.001
N vs. UICCII	72.7 (61.1–112.0) vs. 147.2 (30.95–217.4)/0.166
N vs. UICCIII	72.7 (61.1–112.0) vs. 123.5 (83.84–140.8)/0.088
N vs. UICCIV	72.7 (61.1–112.0) vs. 232.2 (148.1–503.1)/ <0.001
UICCI-II vs. IV	146.5 (30.9–270.4) vs. 232.2 (148.1–503.1)/0.017
UICCI-III vs. IV	138.5 (30.9–270.4) vs. 232.2 (148.1–503.1)/0.014

M65 results and the clinical applicability of the M30/M65 ratio are under investigation and will be presented at the meeting.

Conclusions. Levels of circulating M 30-antigen are increased in patients with colorectal cancer. Clinical follow up studies will reveal the usefulness of a ratio value of apoptosis and necrosis.

P37 The role of FGF18 in colorectal carcinogenesis

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Background. Fibroblast growth factors are a family of 23 peptide growth factors that play a crucial role in cell growth, morphogenesis, tissue repair and angiogenesis. FGF18 was found to be progressively overexpressed during colon carcinogenesis and affects both the tumor cells and the connective tissue compartment in a way that furthers tumor growth and spread. To assess the pathophysiological impact of FGF18 we have performed a comprehensive study of gene expression in specimen of normal, premalignant and malignant tissues as well as premalignant and malignant cell lines.

Methods. Expression of FGF18 in tumor tissue was determined from tissue specimen obtained from 38 patients with colorectal carcinoma by RT-PCR relative to GAPDH. Furthermore immunostaining in carcinoma, adenoma, normal mucosa and liver metastases was performed. The biological function of the growth factor was analysed using cell lines expressing high (SW480) or low FGF18 (Caco2, LT97, Vaco235) as a model. Low expressors received exogenous FGF18 while expression in SW480 cells was knocked down by siRNA. The Effects on tumor cell growth was determined by MTT and colony formation assays. Signaling events were investigated by western blotting. In addition paracrine effects on fibroblasts and endothelial (HUVEC) cells were investigated using scratch assay for migration and tube formation for blood vessel formation.

Results. Addition of the growth factor to the culture medium of slowly growing colorectal tumor cell lines LT97, VACO235 and Caco2 stimulated growth within 48 hours. The stimulatory effect involved increased phosphorylation of ERK1/2 5–10 minutes after factor addition and increased phosphorylation of S6 5–15 minutes after FGF18 addition. SW480 cells that produce large amounts of autocrine FGF18 were not affected within this time frame, but FGF18 supported tumor cell survival under conditions of serum starvation. In addition down-modulation of FGF18 production by siRNA significantly reduced colony formation after plating at low density in SW480 cells and restored sensitivity to exogenous FGF18. Secreted FGF18 also affected colonic fibroblasts inducing growth and migration and stimulated HUVEC cells to differentiate.

Conclusions. FGF is upregulated during tumor progression in the majority of the investigated patients. We showed that FGF18 can induce both autocrine and paracrine effects on the epithelial as well as the stromal compartment of colorectal tumor cells to further tumor growth, spread and neovascularization. This makes FGF18 an **oncogene**. Further studies should prove the clinical relevance of FGF18 as a prognostic marker and as a potential target in antitumor therapy.

P38 Immunohistochemical peculiarities of gastric carcinomas in patients younger than 50 years

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Background. Young patients (<50 years) comprise 7–15% of all gastric carcinomas. Therefore, immunohistochemical peculiarities were analyzed in our facility.

Methods. The examined group had 40 patients. The median age of the group was 46 years (28–49 years), the ratio male/female was 2.1/1. Tumor tissue, which was embedded in paraffin, was initially marked, so that it could be further examined using the Tissue Array technique and consequently immunohistochemically stained. Following this, the following markers were analyzed: COX2, EGFR, E-Cadherin, p53, TFF1 and CDX 2. After semi-quantitative representation, a link to data of the tumor register was performed.

Results. In the younger patients, the diffuse Type (Laurén-Classification) was overwhelmingly represented with 77%. Early tumor stages (I and II) were distributed similarly with 52% as advanced stage carcinomas with 48%. The 5-year survival rate was 57%. Notable was that Stage IIIA had a distinctly better 5-year survival rate with 65% than those patients with Stage II (55%). In our evaluation of the immunohistochemical stains, it showed that younger patients with the diffuse type showed significantly more down-regulation of COX 2. This is particularly noticeable when one compares tumor stages II and IIIa (16 vs. 0%). With TFF1, there was a notable over-expression shown ($p > 0.05$) in Stage II and IIIa (16 vs. 3%). CDX 2 and E-Cadherin were significantly more frequently extracted for the diffuse type.

Conclusions. It is known that younger patients with worse histological results (diffuse vs. Intestinal 77/13%) display a better 5-year survival rate. In particular, there seems to be a difference between Stages II and IIIa. This could be contributed to and explained by a down-regulation or an over-expression of COX 2 or TFF1.

P39 Toxic responses and side effects using various antineoplastic drugs in an experimental setting of peritoneal carcinomatosis in rats

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Background. During the last decade, intraperitoneal (i.p.) chemotherapy against peritoneal tumor spread originating from GI-cancers has been increasingly used. The aim of this systematic comparative study was to investigate various toxic responses/side effects of various cytostatic substances, which had been primarily tested for their efficacy to prevent/treat experimentally induced peritoneal carcinomatosis in rats.

Methods. Using a basic experimental trial, established/novel antineoplastic drugs such as mitomycin (10 mg/m^2), cisplatin (25 mg/m^2), 5-FU (425 mg/m^2), oxaliplatin (60 mg/m^2) and CPT-11 (300 mg/m^2) (limited dosage adapted according to their LD50) were applied i.p. to prevent/treat peritoneal carcinomatosis induced in rats by transfer of 1,000,000 tumor cells (colon adenocarcinoma cell line CC-531; Cell-Lines Service, Heidelberg, Germany) via laparotomy (groups of 8 animals per drug; 2 control groups [sham operation ± tumor cells]). Animals were sacrificed under general anesthesia on the 30th postoperative day and autopsied. Toxic responses/side effects were characterized by occurrence of i) necrosis assessed as "+" vs. "−" (equal to yes/no) at the peritoneal surface, ii) hepatic necrosis, iii) bleeding at the mesenteric tissue, and iv) death. The cytostatic effects were used as control for the therapeutic efficacy of the 5 agents indicated by tumor weight and "±" detectable tumor growth, which were correlated with the non-favorable adverse phenomenons.

Results. (Table 1): Mitomycin and cisplatin were the most toxic substances (e.g., peritoneal necrosis in 5 and 7 animals out of 8, respectively) comparing the 5 chemotherapeutic drugs but, however, this correlated with the most pronounced cytostatic effect (no detectable tumor growth). Though the use of oxaliplatin showed also a high rate of necrosis ($n = 8/8$) and death

($n = 4/8$), its therapeutic potential was only low (tumor detectable in each animal). It was not surprising that the occurrence of necroses at the peritoneal surface was the most sensitive characteristic of toxic responses/side effects. In addition, the induction of a treatment-related bleeding was associated with earlier death prior to the 30th day after tumor cell transfer, the end of the experimental observation period, in the majority of cases. Interestingly, CPT-11 provided the best compromise in decreasing i.p. tumor growth on one hand and an acceptable rate of side effects on the other hand.

Conclusions. The results suggest that, despite some favorable effects of novel/established cytostatic drugs in i.p. chemotherapy, toxic responses/side effects need to be simultaneously tested even in earlier stages of drug development as well as experimental/clinical studies for an appropriate dose escalation/adaptation. Further studies should also focus on other parameters/study characteristics, e.g., i) combination of drugs, ii) various application time/mode (e.g., i.p./i.v.), and iii) effects on wound/anastomosis healing as well as iv) induction of peritonitis.

P40 Retrograde reperfusion via inferior vena cava reduces ischemia/reperfusion injury after orthotopic liver transplantation in a rat model

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Background. A serious impediment in transplantation medicine especially after liver-transplantation is the damage by ischemia and reperfusion. We compared different types of reperfusion within a rat model and investigated the different consecutive ischemia/reperfusion injuries.

Methods. Arterialized orthotopic liver transplantation (OLT) was performed in syngenic male Lewis rats. The animals were divided into 3 experimental groups: I- and II-control groups with antegrade reperfusion and group III with retrograde reperfusion. Laboratory parameters as well as histopathological changes of the liver-graft-tissue were evaluated 1, 24 and 48 hours after OLT.

Results. The GOT-values showed 24 hours after OLT significant differences between group I/II (antegrade reperfusion) and group III (retrograde reperfusion) (2613.3 ± 343.9 U/l vs. 1186.4 ± 252.9 U/l; $p < 0.001$). GPT- as well as GOT-values were significantly lower in group III (retrograde reperfusion) 48 hours after OLT. Evaluation by histopathology revealed significant less areas of necrotic liver tissue within group III compared to group I/II ($p < 0.002$).

Conclusions. These results show that the retrograde reperfusion (by order of: infrahepatic inferior vena cava – opening suprahepatic inferior vena cava – hepatic veins – retrograde reperfusion of the liver) has a protective effect on the graft in regard to the ischemia/reperfusion injury.

Gefäßchirurgie

P41 The value of somatosensory evoked potentials (SEP) in predicting cerebral ischaemia during carotid endarterectomy (CEA)

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Background. Clamping of internal carotid artery during carotid endarterectomy (CEA) leads to cerebral ischemia in 8–15% of patients. Routine carotid shunting has a high morbidity as described in literature. Selective carotid shunting under general anaesthesia requires an intraoperative monitoring. The registration of somatosensory evoked potentials (SEP) is a well accepted technique.

Methods. From 2002 to 2006 we assessed prospectively 477 consecutive CEA under general anaesthesia and SEP monitoring, without primary shunting. Routinely preoperative neurological assessment, duplex sonography and MR-angiography were performed. The onset of a clinical neurological deficit after carotid artery clamping was related to changes in the N20/P25 waveforms in SEP-recording. SEP was evoked by stimulating median nerve. Criteria for shunting was reduction in SEP-amplitude >50%. Routinely postoperative neurological examination and duplex sonography were performed.

Results. 477 patients underwent CEA between 2002 and 2006. Intraoperativ SEP-monitoring was available in 390 patients. In 14 patients (3.6%) SEP-monitoring was inadequate (primary shunting). In 330 procedures (87.8%) SEP-monitoring didn't show deviations. Significant SEP-alterations appeared in 46 of 376 cases (12.2%). In 42 cases SEP-alterations normalised after shunting without neurological deficits. In 4 cases SEP-alterations were reversible after shunting, but were associated with postoperative neurological deficits (2 permanent, 2 transient). 10 cases (2.6%) had normal SEP-findings (false negative), but postoperative neurological deficit occurred (7 permanent, 3 transient).

Conclusions. The selective use of carotid shunting during CEA requires an intraoperative monitoring technique. Based on our data and literature findings, SEP-monitoring is a reliable method to prevent neurological vascular deficits and effectively minimizes shunting frequency.

P42 Perioperative changes in internal carotid endarterectomy

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Background. Internal carotid endarterectomy is a standard operation of best evidence. Ocular complications are rare, current data are only based on clinically found impairment of vision. The goal of our investigation was to find or rule out evidence for clinically occult microemboli in the ocular fundus or in the optical nerve.

Methods. In a pilotstudy 20 patients with a significant internal carotid stenosis will be investigated prae- and postoperatively for visual field changes.

Results. At the time of the congress we will present the study design in detail and early results.

Conclusions. In case of no changes perioperatively, the study will be closed. In case of perioperative changes a larger prospective trial with additional neurological assessment will follow.

P43 Occlusion of the common femoral artery after misplacement of an Angio-Seal™ vascular closure device

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Background. Femoral closure systems are becoming increasingly popular. They promise to shorten both the time to hemostasis and to mobilization. The most frequently used systems are Angio-Seal(tm), Perclose® and VasoSeal®.

Case report. A 70-year-old male patient underwent successful percutaneous transluminal coronary angioplasty, stenting and hemostasis with Angio-Seal™, which, however, was followed by acute deterioration of pre-existing stage IIb peripheral arterial occlusive disease (PAOD) with incomplete ischemia of the right lower extremity and development of a dry necrosis of the right great toe. Magnetic resonance angiography showed occlusion of both superficial femoral arteries (AFS) and of the right common femoral artery (AFC). Intraoperatively, the right AFC was found was found to be completely occluded by a collagen plug from the Angio-Seal(tm), which was removed without difficulty. The symptoms improved significantly after the operation. Due to the patient's critical cardiac situation, no further reconstructive measures were undertaken.

Conclusions. The literature indicates that femoral closure systems have led to complications in the form of vascular stenoses or occlusions that are unknown with conventional compression. These systems may be contraindicated in patients with known PAOD.

P44 Comparison of laser technology to traditional stripping of the vena saphena magna

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Background. Ablation of the vein by endovenous laser treatment (EVLT) is a new procedure that is less invasive than surgery and has a lower complication rate. EVLT works by means of thermal destruction of venous tissues.

Methods. We retrospectively analysed the results of the endoluminal laser-treatment, which we applied at 80 patients in a time frame of 3 years (2004–2006). We compared them with the effect of the traditional surgical approach ligation and division of the saphenous trunk and all proximal tributaries followed by the stripping of the vena saphena magna.

Results. There was no significant difference in the rezidiverate between endoluminal laser technique and the traditional stripping of the vena saphena magna. The biggest problem of the laser technique appeared to be a lower sensibility in the range of the inner ankle during a year (50%). In 13% of the cases the vena saphena magna was rechannelled. And also 13% reported about a still noticeable cord for a year. Ninety six percentages demonstrated remarkable improvement.

Conclusions. The EVLT-procedure is simple and effective. It takes less than an hour and get patients back to their everyday activities right away. With a high success rate and minimal side effects EVLT is a new standard in varicose vein treatment. Although we know that saphenofemoral recurrence occurs even after correct saphenofemoral ligation, it does not imply that this ligation has become obsolete.

P45 Functional phlebologic surgery of venous leg ulcers

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Background. This study presents long- and short-term results after surgery of currently active, chronic venous leg ulcers, focusing on the effects of ulcer healing, recurrence and concomitant risk factors.

Methods. Between January 1997 and March 2004, 173 patients (239 legs) with a currently active, chronic venous leg ulcer were surgically treated, based on the two main steps of functional phlebologic surgery: the surgical interruption of reflux in the superficial and perforating veins to reduce venous hypertension in the entire leg and/or the affected area and occasionally, the surgical procedure involving the ulcer. A total of 123 patients (173 legs) who came to the follow-up were examined. The data collection included a preoperative examination incorporating medical history and clinical diagnoses and various measurements at the follow-up.

Results. Initial ulcer healing occurred in 87% of the cases (151 legs), 13% (22 legs) of the venous ulcers never healed, and recurrent venous ulcers occurred in 5% (9 legs).

Conclusions. We conclude that surgery is indicated before an ulcer is intractable to treatment. Based on the understanding and identification of the causes and symptoms of venous ulceration we recommend standard surgical methods for the therapy of venous leg ulcers at any stage.

P46 Popliteal artery aneurysm: "the silent killer of the leg circulation" – a case report

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Background. Popliteal artery aneurysm (PAA) is a rare condition with an incidence of approximately 1% in men (65–80 years). It involves the risk of peripheral embolism or progressive thrombosis that may result in acute or chronic ischemia with claudication or loss of the extremity. Distal vessels are increas-

ingly embolized through a persistent dispersion of mural thrombi, and the possibilities for surgical vascular reconstruction are limited by the absence of open outflow vessels.

Case report. A 66-year-old male patient with an acute ischemic left leg was referred for emergency treatment. He presented with a 2-year history of intermittent claudication in his right leg. No signals were detected by duplex screening above the foot arteries of the left leg, and typical symptoms of acute occlusion were present. Imaging tests revealed a PAA on each side (diameter left 3 cm; right 4.3 cm). The left PAA was completely occluded, the right PAA was partially open but the distal popliteal artery and the the posterior tibial artery were already completely occluded. A vascular bypass reconstruction to improve circulation was not possible due to occlusion of the outflow vessels. The patient was treated conservatively (systemic heparinization, i.v. prostacyclin administration). Circulation in the left leg gradually improved, with remaining claudication, a free walking distance of 50 m, and rest pain. Amputation was prevented for the time being.

Conclusions. Elective surgery for asymptomatic PAA >2 cm is recommended to prevent permanent limited mobility or amputation. The procedure of choice is to ligate the aneurysm and to restore blood flow by a concurrent interposition of a vein segment, from the superficial femoral artery to the open infragenual popliteal artery. The male risk population (65+) should undergo duplex screening of the popliteal artery. While asymptomatic aneurysms >2 cm should be treated surgically, smaller ones should be observed, since aneurysms <2 cm in diameter have a distinctly lower occlusion and amputation rate. In symptomatic cases a revascularisation with venous bypass should be attempted, if there are open outflow vessels to connect the venous graft to. If a vascular bypass reconstruction is not promising a conservativ treatment may prevent amputation.

Handchirurgie

P48 Investigation of patients with brachial plexus lesions by 3D motion analysis

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Background. Three dimensional motion analysis is a new evaluation method of upper extremity function. This video based system provides accurate and reproducible 3D kinematic data by tracking movements. The method is derived from clinical gait analysis which has already reached global acceptance within this field. It should overcome the deficiencies of subjective investigations. In order to demonstrate the use of the system the analysis of patients with brachial plexus lesions before and after surgical treatment is presented.

Methods. A 3D optoelectronic camera system with passive markers was used to capture the possible active ROM. Twenty seven markers coated with retroreflective tape were applied over anatomical landmarks on both upper limbs and recorded simultaneous by 6 cameras. A 3-dimensional reconstruction of the position of the markers was done by special designed software. Joint centres and joint movements were calculated by using the Expert Vision and ORTHOTRAK software (Motion Analysis Corporation). Healthy probands and patients suffering from brachial plexus lesions and receiving primary nerve surgery or secondary reconstructive procedures were investigated.

Results. The motion curves of all, probands and patients with different questions argue for a reproducible motion sequence. We were able to produce and analyse static data, ROM and position of segments as well as kinematic data, especially motion curves of distinct movements. Moreover compensatory movements could be investigated. Obtained pre- and postoperative kinematic data document the enhancement of the involved limbs' function.

Conclusions. The method enabled objective analysis of patients suffering from brachial plexus lesions. Measured angles are reliable and reproducible but generally lower than angles obtained from physical measurements. This is due to several reasons concerning the biomechanical model. Because of the more complex nature of upper limb kinematics the transfer of the system from lower to upper extremity still involves unsolved problems.

P52 Thoracic outlet syndrome: objective criteria to indicate surgery

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Background. Reviewing the literature the indication for Thoracic Outlet Syndrome (TOS) – surgery is based on clinical findings only in the majority of the cases due to lack of objective findings. In a retrospective study we have analyzed our cases in order to evaluate objective criteria for surgical intervention.

Methods. Seventeen patients (2 men, 15 women aging from 12 to 59) were diagnosed clinically 20 times for TOS (Duration of symptoms 44 months, NRS 6). Additionally objective investigations were performed: X-ray of the cervical spine to detect a cervical rib; a comprehensive electroneurographic investigation to detect signs of nerve compression; MR-angiography of the subclavian artery with elevated and adducted upper extremity to detect a stenosis of the artery as an indirect sign of compression of the brachial plexus.

Results. Concerning the objective assessment a cervical rib was present in 50% of our cases. The electroneurographic investigation revealed signs of nerve compression in 47% of our cases. In nearly 90% of our cases a stenosis of the subclavian artery confirmed the clinical diagnosis. All patients underwent TOS-surgery via a small single supraclavicular incision and recovered from their symptoms.

Conclusions. In our series we did base the indication for TOS surgery not only on clinical examination but also on objective findings, either the presence of a cervical rib and/or positive electroneurographic findings and/or a stenosis of the subclavian artery. The MR-angiography was the most significant investigation to objectify the clinical findings. The presented investigation setup seems to be appropriate to objectively diag-

nose TOS and indicate surgery. The small supraclavicular incision gave adequate access to perform neurolysis of the brachial plexus, scalenotomy and resection of cervical or first rib without major complications in all cases.

Kinder- und Jugendchirurgie

P53 Drug selection for antibacterial prophylaxis in the clinic of pediatric surgery

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Background. The necessity of antibiotic prophylaxis in the clinic of child surgery is caused by following:

– increase invasive method of investigation;
– increase cases of postoperative supurative complication;
– high economic expenses;
– spreading of polyresistent microorganism.

Methods. The clinic retrospective investigation of the 164 patients, who were treated in the surgical department of Lviv Regional children's hospital ''OHMATDYT'' from 2002 till 2004 yr. The antibiotic prophylaxis was performed in surgical operation of II category (conventional purity) and III category (contaminational) of purity, which are accompanied by middle or high individual risk of the development of pyo-septic complications. Eighty two of the patients took combined medications of clavulane acid with amoxicillin (Augmentin, Amoxuclav in dose 30 mg per kg, the others 82 patient took Cephalosporinus of I–II generastion (Cephazolinum, Cephuroximus in dose 100 mg per kg)

Conclusions. Effective ABP allows to reduce the amount of the postoperative complications (1 group-3%, 2 group-14%), postoperative fever (1 group-12.3%, 2 group-74.5%), duration of the hospital treatment in the 1 group-6.3 days, in the 2 group-8.4 days), and treatment expenses. Optimal drugs of choice for ABP in the clinic of pediatric surgery are combined preparations of clavulane acid with amoxicillin.

P54 Blunt abdominal trauma in children

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Significant increase of blunt abdominal trauma (BAT) was observed worldwide. Unfortunately, the results of management children with BAT are far from sufficient.

The goal of this study was to improve the results of management children with BAT.

One hundred twenty-eight children with the age ranged from 4 weeks to 15 years were enrolled in this study. Among these patients the splenic injury was established in 26 (20.3%), liver injury – in 10 (7.8%), intraperitoneal hematoma – in 36 (28.1%), and retroperitoneal hematoma – in 5 (3.9%) of patients. According to the Moor's classification grade I of the liver damage was established in 2 patients, grade II – in 3, grade III – in 4, and grade IV – in one patient. According to the classification of American Association of trauma surgery the grade I of splenic injury was diagnosed in 7 patients, grade II – in 9, grade III – in 4, grade IV – in 3, and grade V – in 3 patients. Laparoscopic drainage of abdominal cavity was performed in 12 patients with active bleeding, which stopped by the Surgicel® (Ethicon) and electrocoagulation, from the hematoma of mesocolon and mesojejunum and in 10 patients with grade I liver and splenic injury. The laparoscopic coagulation with applying of Surgicel was performed in all patients with grade II liver and splenic damage and in 3 patients with grade III. Laparotomy was performed in 5 patients with grade III and in all patients with grade IV–V. Resection of the spleen was applied in 2 patients with grade III and in two patients with grade IV. For the bleeding control, the Surgicel Nu-Knit® (Ethicon) was used in one patient with the grade IV of splenic damage. Splenectomy was performed in patients with the grade V. Parenchymal suture was used in 3 patients with the grade III of the liver damage and non-anatomical resection – in one patient with grade IV. Retroperitoneal endoscopy with coagulation was performed in all patients with retroperitoneal hematoma. One child died with the grade IV of the liver damage.

Thus, the endoscopic coagulation with applying of Surgicel® is effective in the management of patients with BAT. The choice of management dependent of the grade of damage.

P55 A new device and technique for "Malone procedure" Antegrade Continence Enema (ACE) in children with faecal incontinence and constipation

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We used Malone antegrade continence enemas (MACE), administered through a continent cutaneous appendicostomy or a caecal flap to achieve reliable evacuation and faecal continence in seven children with myelomeningocele and after surgery of anorectal malformation.

Postoperative complications included one subcutaneous pericaeceal abscess requiring exploration and in one case stenosis of the stoma.

Except well known and already described complications all seven patients are continent of stool at a mean of 60 months follow-up.

Despite our efforts to develop an effective bowel management program regarding application of the enema regimen this procedure provided some technical problems especially for children who have had prior appendectomy. So we developed a new simple technique to perform a caecal tube stoma.

We also want to demonstrate a new device to simplify handling and application of enemas.

The basic idea of a simple method of bowel cleansing like MACE is followed by significant improvement in quality of life and more social acceptance of patients. But overall success will be achieved by improvement of technical procedure and handling.

P56 Poland syndrome with partial heart ectopia and dextrocardia

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Background. Poland syndrome is seen in 1/30 000 of the newborns. It can declare itself by its different components and joining of the additional defects in every concrete patient.

Methods. A girl, born by the Cesarean section, with the weight of 2930 g and 39 week gestational age was brought to the pediatric surgery clinic on the 25.10.02 in a couple of hours after birth. When examined the skewness and chest distortion attracted attention, especially on the right side. The oval form defect of the chest wall $5 \times 6\,cm^2$ was seen in the anterior of the chest parasternal on the right in the II rib level from the costal margin, an also thinning of body of sternum. A part of liver with the size of $5 \times 1.5\,cm^2$ covered with peritoneum was projecting form the lower part of the latter. A gastric part of the heart, covered with pericardium and non-epithelized membrane with the upper part directed to the right was projecting over it from the defect. There were no signs of heart and respiratory failure. During the echocardiography the following was discovered: heart rotation in the chest, right ventricular and atrial hypertrophy, good running of the great vessels, not violated valve function and good myocardial contractility. Ejection fraction from the left ventricle 68%. During the intraoperative inspection the diaphragm defect in the right place parasternal triangle with the size of $4 \times 5\,cm^2$ through which the part of liver prolapses. The hepatic lobectomy was done as well as diaphragma defect repair.

Results. In eight months the plastic operation was done on the defect through the replacement of the front edge of the costal arch and musculocutaneous flap, formed from the greater pectoral muscle. The child was discharged from the hospital in a good shape.

Plastische, Ästhetische und Rekonstruktive Chirurgie

P57 Limitations of traditional abdominoplasty – new indications for innovative lifting procedures around the central and lower torso

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Background. Traditional abdominoplasty aims at elimination of redundant fat tissue and skin as well as tightening of muscular aponeurosis on the abdomen. In the massive weight loss (MWL) patient this procedure often yields only mediocre results. Specific areas such as hips, buttocks and the lateral thigh are addressed inadequately.

Methods. Patients after MWL are treated with a central or lower body lifting according to the specific needs at our institution. The central body lift includes a circumvertical dermolipectomy concentrated on the central torso without significant mobilisation of caudal tissues. In the lower body lift, the circumvertical dermolipectomy is located more inferior on the torso with an additional extensive mobilisation of the subcutaneous tissue down to the level of the knee.

Results. These new innovative techniques led to a much improved contour and results compared to the traditional abdominoplasty procedure. Although there is an increase in operative time, postoperative recovery and complications appear comparable according to our initial limited experience. We present in detail representative cases with step-by-step explanation of operative techniques.

Conclusions. Especially after MWL, such as after bariatric surgery, the surgeon has to deal with a tremendous amount of redundant tissue on the lower part of the torso and thighs. Traditionally this problem was solved in a staged manner with multiple surgeries, such as abdominoplasty, buttock lift or medial thigh lift. However, in many cases this approach led to unsatisfying results. New innovative techniques allow for an optimal repositioning of the descended tissues und most often to a much improved postoperative result compared to the traditional techniques.

P58 Extended modified pectus excavatum repair in adults

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Background. We report our experience using the modified minimal invasive method of pectus excavatum repair in adults. Thirty one adults with a mean age of 24 (18–39.2) suffering from pectus excavatum have been corrected using by the extended modified minimally invasive repair method. The Ravitch/Welsh/Rehbein Technique, performed elsewhere, has corrected 2 patients insufficiently. Reduced physical capacity, mild cardiac valve dysfunctions (prolapse, pulmonary valve insufficiency), chest pain in the area of the funnel and reduced ventilatory function were detected. Two thirds of the patients emphasized the wish of a better cosmetic result. Preoperative investigations include blood samples, ECG, heart sonography, chest X-ray, chest MRI/CT with 3-D reconstruction and spirometry.

Methods. Retrosternal mobilization and intraoperative stretching of the anterior thorax by long lasting sternal elevation modified the original NUSS technique. Additionally an oblique wedge shaped partial sternal osteotomy and/or osteotomies of the ossificated ribs were performed. In adults usually 2 Pectus pars (PS – Implant® Fa. Hofer Austria) should be used.

Results. Due to preparation we observed 1 intraoperative bleeding episode from the internal mammaric vessels, 1 superficial lesion of the right visceral pleura (adhesions). Postoperatively we saw 5 pleural effusions, 1 subcutaneous hematoma and two prolonged wound-healing episodes (superficial infections with no necessity of bar removal). Vertebral Index changed from 33.3 preoperatively to a normal range of 23.7 postoperatively. Postoperative cosmetic results were perfect in 90%. In summary adults with Pectus excavatum are manageable with extremely satisfactory results using the described extended modified correction technique. Osteotomies do not destabilize the chest and can be sufficiently combined with the NUSS technique.

Thorax- und Herzchirurgie

P59 Minimal invasive atrio-ventricular valve surgery: program development and learning curve issues

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Background. Minimal invasive AV-valve surgery is an increasingly popular procedure in cardiac surgery, but – due to the complexity – still reserved to few selected centers. Aim of this study was to present learning curve issues for program introduction.

Methods. A total of 76 minimal invasive AV-valve procedures were performed by a single surgeon and were successful in 75 (98.7%). Seventy one patients (94.7%) underwent AV-valve repair, 4 (5.3%) received mitral valve replacement. In 10 patients (13.3%), concomitant ASD closure and/or tricuspid valve repair had to be performed. One intraoperative conversion to valve replacement had to be performed due to residual mitral regurgitation. For calculation of learning curves, regression models with logarithmic curve fit for operating time (OT), aortic cross-clamp (AXT) and cardio-pulmonary bypass time (CPBT) for all patients and for patients with posterior mitral leaflet prolapse were applied.

Results. Within approximately 30 consecutive minimal invasive procedures, a steady decline of either OT, AXT and CPBT could be observed for the overall surgical population even despite the increasing number of concomitant procedures and was similar in patients with posterior mitral leaflet prolapse. After overcoming this steep learning curve, a mean AXT of 116 ± 45 min, a CBP time of 165 ± 46 min and a total OT of 285 ± 45 min is required to treat isolated posterior leaflet prolapse.

Conclusions. Minimal invasive AV-valve surgery can be safely introduced into a heart surgery program. However, sufficient number of cases per year are required per surgeon to come over this learning curve.

P60 Gigantic coronary fistula: rare finding without clinical symptom

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Case report. A 43-year-old male patient without clinical symptoms presented an enlarged heart shadow in a routine radiological examination. The following CT revealed a structure in the pericardial sac that was initially classified as a pericardial cyst. In order to confirm the diagnosis, an ECG-triggered multi-slice CT was performed resulting in the diagnosis of a gigantic coronary fistula originating from the left main coronary artery leading to the right atrium. The shunt volume of the coronary fistula was estimated to be 50%. Echocardiography demonstrated dilatation of the right chambers due to volume overload. Since operative mortality was deemed extremely low in this patient surgical correction was advised. After median thoracotomy, initiation of heart lung machine and extensive cardioplegia, the coronary fistula was identified to originate from the left main coronary artery meandering around the posterior side of the left heart with a mean diameter of 2 cm and entering the right atrium at the level of the vena cava superior. The fistula was ligated in the right atrium and at its origin at the branching site of the circumflex artery. To secure optimal surgical outcome bypass grafting was performed to LAD (left anterior descending) and its diagonal branch as well as the circumflex artery. Postoperatively performed ECG-triggered multislice-CT evidenced successful repair of this anatomical malformation. The postoperative course was uneventful.

P61 Prospective evaluation of clinical scoring systems in infants and children after cardiac surgery: experience over 17 years

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Background. To document severity of illness and to evaluate the predictive value of clinical scoring systems in infants and children after cardiac surgery. Prospective study with follow up to hospital discharge. A 12 bed multidisciplinary paediatric ICU in a University Hospital. Between 1/1990 and 12/2006 1463 infants and children were admitted after open heart surgery.

Methods. Data relevant to the Acute Physiologic Score for Children (APSC), Pediatric Risk of Mortality (PRISM III), Therapeutic Intervention Scoring System (TISS 28) and Organ System Failure (OSF) score were collected in all patients during the first 4 days of postoperative intensive care. Eighty one percentages of the patient underwent a total repair, 19% had a palliative correction.

Results. The mean age of the patients was 4.0 ± 5.5 years. There were 1416 survivors (s) and 49 non survivors (ns). The mean duration of mechanical ventilation was 4.8 ± 16.8 days for survivors and 8.9 ± 8.8 days for non survivors. On the first postoperative day the mean APSC and PRISM III scores of survivors and non survivors were 7.04 ± 4.9 vs. 19.9 ± 9.2 ($p < 0.0001$) and 1.61 ± 3.3 vs. 11.5 ± 10.7 ($p < 0.0001$), respectively. The mean TISS 28 and OSF scores of survivors and non survivors were 31.7 ± 12.0 vs. 42.2 ± 15.7 ($p < 0.0001$), and 1.12 ± 0.89 vs. 2.5 ± 1.91 ($p < 0.0001$), respectively. The overall hospital mortality rate was 3.3%. Patients with an APSC score <10 and a PRISM score <4 had a survival rate of 99%, whereas patients with an APSC score >26 and a PRISM score >20 had a mortality rate of 81%. The area under the receiver operating characteristic (ROC) curve for APSC, PRISM, OSF and TISS was 0.889, 0.893, 0.898 and 0.729, respectively.

Conclusions. APSC, PRISM and TISS describe accurately the severity of illness in infants and children after cardiac surgery, and all physiologic scores identify those patients at increased risk for mortality.

P62 Non-bacterial pyopericardium leading to lethal sepsis in a patient with severe humoral immunodeficiency

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Background. Pyopericardium is the accumulation of pus in the pericardium mainly caused by bacterial infection. Purulent pericarditis most commonly occurs as a direct extension of an infection from an adjacent pneumonia or empyema. Alternatively, a distant infection can haematogenously seed the pericardium. Primary pericardial infection is rather rare. Pyopericardium is an illness requiring acute intervention by the heart surgeon (pericardial drainage) and adequate medication.

Methods. A 55-year-old man was admitted with diffuse chest pain, dyspnoea, tachycardia and nausea. Laboratory examination revealed massive leukocytosis and elevation of C – reactive protein. Echocardiogram showed circumferential pericardial effusion without valvular vegetations. After a subsequent clinical impairment to a highly septic state, he underwent surgical pericardial drainage. The pericardium was full of pus of creamy aspect. After continuous pericardial lavage and operative revision in several steps, final sternal closure took place ten days later. No infectious agent could be identified to be responsible for the purulent pericarditis.

At the term of next surgery, 1.5 litres of serous ascites and 0.5 litres of serous pericardial effusion were drained. The patient developed a gangrenous cholecystitis, op-site findings revealed a non-purulent ascites, intra-operative cholangiography was without pathological findings.

Results. Detailed immunological analysis showed a severe decompensated immunodeficiency with adentritocytaemia. The therapy with polyvalent immunoglobulin and imutin was ineffective, the patient died one day later from a therapy-refractory septic shock.

Conclusions. In cases with unclear non infectious purulent pericarditis, it is of high importance to carry out the correct diagnosis as soon as possible to provide an adequate therapy.

Unfallchirurgie

P63 Minimally invasive (MI) internal fixation of fractures of the proximal humerus (PH) using the Non-Contact-Bridging (NCB®) plate. Thirty five cases with an average follow-up of 1 year

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Background. Early results of MI treatment of proximal humeral fractures using the NCB®-PH plate showed promising results reaching 62 points (86% of age related normal value) in the Constant Score 6 months postoperatively and an acceptable complication rate (23.5%). The purpose of this study was to analyze the long-term results focusing on functional outcome and complications.

Methods. So far out of a total number of 90 cases we have gained the data of 35 patients (24 women, 11 men; age 68 in the mean) who sustained fractures of the proximal humerus treated MI with the NCB-PH® plate (Zimmer Company, Winterthur, Switzerland). In 16 cases (46%) osteoporosis had been diagnosed preoperatively. Radiological follow-up in two planes and functional outcome is assessed clinically (ROM) and using visual analogue scale (VAS) for pain and function, Constant Score and a modified adl score (activities of daily living).

Results. Average ROM (in degree) for anteversion was 101, glenohumeral abduction 87, external rotation 31 and internal rotation 81. Average VAS for pain was 1, 9 points (10 = worst) and for function 6, 4 points (10 = best). Average Constant Score was 65 points, average adl score was 16 points (30 = best). Between 6 and 12 months postoperatively one case (2, 9%) of sintering of the humeral head and one case (2, 9%) of avascular necrosis was detected. In 3 cases (9%) of reversed impingement we performed total removal of hardware. Four younger patients (11%; age 60 in the average) underwent the same procedure demanding it though not suffering of limited ROM or pain.

Conclusions. In the early results NCB-PH® proved to be an effective MI method of treatment of fractures of the humeral head. The 1 year follow up data show further functional improvement (approx. 5% of Constant Score). The complication rate remains low ($5/35 = 14\%$). Especially, no cases of lesions of the axillary nerve or frozen shoulder were seen. The latter we believe is due to the MI procedure and the early functional treatment which is possible since the NCB-PH® plate creates high primary stability. The long-term results prove the NCB-PH® plate to be a safe and effective method of treatment reaching a functional outcome that enables the mostly old patients to regain an acceptable level of activity. Removal of hardware is easy to perform and offers especially in the younger patient a possibility to at least improve patients' subjective outcome.

Sonstige

P64 Coecum duplex in an adult

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Background. The gastrointestinal duplication in adults is a rare congenital abnormality and only few cases are described in the literature. Although intestinal duplications are considered to be benign lesions, mostly asymptomatic, they may result in significant morbidity and mortality, if left untreated. This study reports of one case of caecal duplication with an overview of the literature.

Methods. A 31-year-old female patient was hospitalised with pain in the right lower abdomen. A relocatable and solid Tumor (7 cm DM) was palpable. Blood examination revealed a slight increase of Leu and CRP. The gynaecologic examination was entirely unremarkable. The sonography showed only an

extended caecum. The appendix could not be detected. A surgical intervention was decided with the intention for an appendectomy. At the operative sight a caecum duplex was revealed. The lumen of the blind caecum was completely filled by a large fecolith. Also the appendix vemiformis was inflammated. Caecal duplex resection and an appendectomy was performed. The pathology report described ulcerations and segmental ischemia of the resected caecum. An oxyuriasis of the vermiform appendix was also reported. There was no immediate or delayed post-operative complication.

Conclusions. Approximately 75% of duplications have been reported to be located within the abdominal cavity. Small bowel lesions are the most commonly described (50%), while colonic lesions are found in 10% of cases. A review of the literature has revealed 84 cases of colonic duplications, that occurs mostly in pediatric patients. Surgical intervention is indicated in case of complicated colonic duplications such as obstruction of the colon as a result of direct compression, volvulus, hemorrhage, ulcerations, ischemia or perforation. In most instances duplications can be completely excised as described in our case. Special care should be taken of the possible abnormal blood supply to the adjacent intestinal segment.

P65 Intravenöse Lasertherapie beim chronischen Ulcus cruris venosum

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Grundlagen. Die chirurgische Versorgung des venösen Grundleidens ist Voraussetzung für die definitive Abheilung venöser Ulcerationen der distalen unteren Extremität. Die endoluminale Laser-Therapie wird an unserer Abteilung als begleitende Technik zur Ulcustherapie eingesetzt. In einer retrospektiven Analyse haben wir die Methode überprüft.

Methodik. Von 2004 bis 2005 wurden 36 Patienten mit chronisch venöser Insuffizienz und Ulcera cruris mit endoluminaler Laserobliteration der Vena saphena magna behandelt. Zum Einsatz kam eine 810 nm Sonde, bei 24 Patienten wurde eine Komplettausschaltung der V. s. magna erzielt. Die Therapie der Ulcera erfolgte interdisziplinär, nach dem Konzept des modernen Wundmanagements. Bei 7 Patienten wurde im Behandlungsverlauf eine Mesh-Plastik vorgenommen.

Ergebnisse. Bei allen Patienten war die Wundheilung erfolgreich. Die postoperative Hämatombildung nach Varizenoperation war gering, lokale Komplikationen wurden nicht beobachtet Die durchschnittliche Behandlungsdauer bis zur Ulcusheilung betrug 23 Tage.

Schlussfolgerungen. Der Einsatz der Lasertechnologie stellt ein schonendes Operationsverfahren der venösen Begleiterkrankung des uUlcus cruris dar. Vorteile der Methode sind die geringe Gewebstraumatisierung im Ulcusbereich und die hohe Patientenakzeptanz. Die Verkürzung der Behandlungsdauer beim Gesamtmanagement des venösen Ulcus cruris rechtfertigt die erhöhten Behandlungskosten.

P66 Prospective evaluation of complication rates in general surgery using a standardized classification system

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Background. Reports on complications are part of every medical scientific investigation. Regarding the definition of a surgical or post-interventional complication there are different views. This is one reason for the variation width in complication reporting concerning the same interventions in the surgical literature. The following work presents the advantages of a prospectively standardised documentation of complications in a surgical department as a part of a hospital quality management.

Methods. Over a period of one year in patients data sheets about post surgical complications were collected and entered in a electronically data base. All abdominal procedures, including the abdominal wall and additionally varices surgeries were enclosed in the following evaluation. Patients were excluded from the investigation when treated in the surgical ambulatory or treated as day-surgical patients. The complication system according to Clavien was used to classify the complication grades. This system encloses five grades, lower grading indicating lower level of complication whereas grade three is divided in subclasses a and b (Dindo et al. (2004) Ann Surg 240: 205–213). For statistical analysis the Mann–Whitney *U*-test and Spearman correlation were used ($p < 0.05$).

Results. Out of 875 operations there were 496 (53.6%) operations according to our inclusion criteria with patient's average age of 62.5 ± 17.8 years (51.2% male patients). The overall complication rate according to Clavien averaged 10.7% (differences between different surgical methods and surgeons are given in a table). Referring to general used grading the mean complication rate ranged between 2.6 and 6.0%.

Conclusions. Using the system of Clavien complication rates appear higher than usual. This is caused by the fact that all post surgical events apart from normal stay slip into the system. The system allows a good comparability between single surgeons and between different operations. Results from prospectively entered data evaluation can be used to detect weak points in a team, and to find out technical as well as personal problems. As a consequence, for instance education programs could be provided to compensate weaknesses or the team could be restructured. Periodical evaluation of a standardized data bank allows fast reactions to occurring problems and guaranties an adequate surgical complication management.

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