

ESSR Abstracts 2009

The 44th Congress of the European Society for Surgical Research takes place this year at Hôtel Atria, Nîmes, France, 20–23 May 2009, under the presidency of Roland G. Demaria, MD, PhD, FETCS.

Oral Session

O-WB Walter Brendel Award Session

O-WB-1 Bacterial lipoprotein tolerance attenuates a novel damage-associated molecular pattern (DAMP) MRP8/14-mediated inflammation

J. Kelly^a, J. H. Wang^b and H. P. Redmond^c

^aDepartment of Academic Surgery, Cork University Hospital, University College Cork, Wilton, Cork, Ireland; ^bDept of Academic Surgery, Cork University Hospital, Wilton, Cork, Ireland (e-mail: justinjoshkelly@gmail.com)

Aim: To examine whether tolerance induced by bacterial lipoprotein (BLP), a TLR2 agonist, attenuates MRP8/14-mediated inflammation.

Methods: THP-1 cells were pre-treated with BLP for 24 h to induce BLP tolerance. Tolerised and non-tolerised cells were stimulated with high dose BLP or LPS. Both were also stimulated with exogenous MRP8 and MRP14 subunits. Levels of MRP8/14 and cytokines were determined (ELISA). Wild-type HEK293 cells and HEK293 cells stably expressing TLR2 were co-transfected with pNF-kB-Luc and pRL-CMV reporter vectors, and stimulated with exogenous MRP8 and MRP14. NF-kB activation was assessed by measuring luciferase activity.

Results: BLP and LPS augmented a time-dependent release of MRP8/14. Stimulation with MRP8 and MRP14 resulted in a significant increase in proinflammatory cytokine TNF- α release, (278 pg/ml and 185 pg/ml respectively *versus* 30.5 pg/ml for naive cells, $p < 0.05$). Exogenous MRP8 and MRP14 activated NF-kB > 10 times stronger than naive cells ($p < 0.01$) via a TLR2 signal transduction pathway. BLP tolerance didn't prevent BLP- or LPS-stimulated MRP8/14 secretion, but significantly attenuated MRP8/14-induced TNF- α release (250 pg/ml, non-tolerised *versus* 9.2 pg/ml, tolerised, $p < 0.05$).

Conclusion: BLP and LPS activate monocytes/macrophages to secrete MRP8/14, which augment phagocyte-produced proinflammatory cytokines via both TLR2-dependent NF-kB activation. BLP tolerance attenuates MRP8/14-mediated inflammation, through downregulation of TLR2.

O-WB-2 Probiotics induce activation of intestinal plasmacytoid dendritic cells in a MyD88- and IL-10-dependent manner

S. Lavasani^a, M. Nouri^a, I. Lazou Ahrén^b, H. Björkbacka^c, B. Jeppsson^a and H. Thorlacius^a

^aDepartment of Surgery, Lund University, UMAS, 20502 Malmö, Sweden; ^bProbi AB, IDEON, Gamma 1, 22370 Lund, Sweden; ^cDepartment of Clinical Sciences, Lund University, UMAS, 20502 Malmö, Sweden (e-mail: shabram.lavasani@med.lu.se)

Introduction: Although the probiotic bacteria, including Lactobacilli, have been shown to colonize the gut and exert beneficial health effects in inflammatory diseases, little is known about how they modulate the immune system. Dendritic

cells (DCs) are the critical antigen-presenting cells regulating the host response to the microbiota. Plasmacytoid dendritic cells (pDCs) have been shown to have the unique ability to link innate and adaptive immunity. In our study, we evaluated the mucosal pDCs of mice treated with probiotic bacteria with known anti-inflammatory properties.

Methods: C57BL/6 mice, Myd88-deficient, and IL-10-deficient mice were orally treated with Lactobacillus paracasei 8700:2, Lactobacillus plantarum HEAL9 and Lactobacillus plantarum HEAL19. Peyer's patches (PPs) and mesenteric lymph nodes (MLNs) were isolated. CD11c+B220+CD11b-pDCs were analysed and assessed for intracellular cytokine expression.

Results: Probiotic administration resulted in the expansion of pDCs in both PPs and MLNs and produced TNF- α and IL-10 upon activation. Interestingly, administration of a combination of three bacteria showed a synergistic effect on pDC activation. We also found that probiotic induced pDC activation was dependent on IL-10 and MyD88-dependent signaling pathway.

Conclusions: Our results provide a step forward in understanding the ability of probiotics to modulate mucosal DCs, helping us to design novel therapeutic approaches.

O-WB-3 Inhibition of platelet GPIIb-IIIa and P-selectin expressions by aspirin is impaired by stress hyperglycemia

A. Le Guyader^a, G. Pacheco^b, N. Seaver^b, G. Davis-Gorman^b, J. Copeland^c and P. McDonagh^b

^aHôpital Universitaire Dupuytren, Chirurgie Cardiovasculaire, Université de Limoges, 87042 Limoges, France; ^bHealth Sciences Center, University of Arizona, Tucson, AZ 87042, United States of America; ^cUniversity Medical Center, Cardiac Surgery Department, Tucson, AZ 87042, United States of America (e-mail: alexandre.le-guyader@unilim.fr)

Objectives: Increased aspirin resistance has been described in type 2 diabetes patients. We examined if acute exposure to increased plasma glucose impaired the inhibitory effects of ASA on platelet activation.

Methods: Whole blood samples from 11 volunteers were incubated with different glucose concentrations (200, 300 and 600 mg/dl) followed by incubation with aspirin (325 or 1000 mg/d). Using flow cytometry, GPIIb-IIIa and P-selectin were analyzed in arachidonic acid (AA)-stimulated platelets.

Results: At physiological glucose concentration, AA-stimulated platelets significantly increased GPIIb-IIIa (TFI 319.6 ± 42.7 *versus* 59.5 ± 8.2 , $p = 0.002$) and P-selectin (TFI 179.5 ± 38.5 *versus* 4.4 ± 0.7 , $p < 0.001$). Both doses of aspirin caused a significant inhibition of expression of GPIIb-IIIa (36.5%, $p < 0.005$) and P-selectin (81%, $p < 0.005$). Glucose at 200 mg/dl impaired the inhibitory effect of low dose aspirin (84% GPIIb-IIIa, $p < 0.005$ and 48% P-selectin, $p = NS$). Glucose at 600 mg/dl completely overwhelmed the inhibitory effect of aspirin. Increasing the dose of aspirin partially reversed the effect of hyperglycemia only on GPIIb-IIIa expression. A statistically significant interaction between glucose concentrations and aspirin doses was found ($p < 0.001$ for GPIIb-IIIa and $p = 0.004$ for P-selectin).

Conclusions: In vitro concentration-dependent stress hyperglycemia significantly impaired the inhibitory effects of aspirin on human platelet GPIIb-IIIa and P-selectin expressions.

While every effort is made by the Editorial Team and the Publishers to avoid inaccurate or misleading information appearing in *BJS*, data within the individual abstracts are the responsibility of the Authors. The *BJS* society, the Publishers and members of the Editorial Team accept no liability whatsoever for the consequences of any such inaccurate or misleading data, opinion or statement.

O-WB-4 Effects of FGF-2 genetically modified myoblasts on the peripheral muscle after open crush injury

I. Stratos^a, H. Madry^b, R. Rotter^a, A. Weimer^b, J. Graff^a, M. Cucchiari^b, T. Mittlmeier^a and B. Vollmar^a

^aUniversity of Rostock, Schillingallee 69a, D-18057 Rostock, Germany; ^bSaarland University, Kirrbergerstr. 1 - Gebaeude 37, D-66421 Homburg, Germany (e-mail: john.stratos@gmail.com)

The fibroblast growth factor 2 (FGF-2) is known as pleiotropic cytokine with myoblast proliferative properties. In the present study, we tested the hypothesis that gene transfer of human FGF-2 via transplantation of encapsulated genetically modified L8-myoblast stimulates the peripheral muscle regeneration after muscle injury in Wistar rats. Therefore we performed a crush injury to the soleus muscle in 11 animals and transplanted encapsulated spheres containing myoblasts which overexpress FGF-2 (FGF-2, n = 6) or luciferase (LUC, n = 5) at the site of injury. At day 4 after trauma the FGF-2 group showed higher mean values of cell proliferation (BrdU immunohistochemistry) and microvascular density (CD31 immunohistochemistry) as well as a significant reduction of apoptotic cells (TUNEL histology) compared to the LUC group. In vitro analysis for 14 days of the FGF-2 modified spheres demonstrated a 3, 8-fold increase of the initial cell count compared to an only 0, 8-fold increase in the luciferase modified spheres. Additionally the expression of FGF-2 (ELISA analysis) and luciferase (chemiluminescence analysis) persisted in vitro for 7 and 14 days respectively. These results demonstrate that FGF-2 overexpressing myoblasts enhanced the muscular regeneration and may represent a promising therapeutic option to optimize recovery after injury.

O-WB-5 Ghrelin preconditioning for protection of musculocutaneous tissue from ischemia

F. Rezaeian^a, R. Wettstein^a, M. Menger^b and Y. Harder^a

^aPlastic & Reconstructive Surgery, Rue Micheli-du-Crest 24, 1211 Geneva, Switzerland; ^bClinical & Experimental Surgery, Kirrbergerstrasse, 68421 Homburg/Saar, Germany (e-mail: faridrezaeian@gmx.de)

Introduction: The influence of Ghrelin - a gastric peptide with anti-inflammatory, angiogenic and vasodilatory properties in the heart - on tissue necrosis was investigated in a model simulating persistent ischemia.

Materials & Methods: 32 C57BL/6-mice equipped with a dorsal skinfold chamber containing a musculocutaneous flap were randomized to four groups: 1. Ghrelin; 2. L-Name (unspecific nitric oxide (NO)-inhibitor); 3. Ghrelin & L-Name; 4. Control (NaCl). Drug application started 24hrs preoperatively and was performed twice a day for three days. Microhemodynamics, inflammation, angiogenesis and tissue survival were assessed with epi-fluorescence microscopy, protein profiling of iNOS and VEGF with Western blot.

Results: Increased expression of iNOS in critically perfused tissue of Ghrelin-pretreated animals correlated with arteriolar dilation, increased perfusion and sustained functional capillary density (FCD). Also, a reduction of leukocyte-endothelium interaction, apoptotic cell death and a VEGF-upregulation associated with angiogenesis (p < 0.05 Ghrelin versus Control) was observed. This led to a significant reduction of flap necrosis. In contrast, administration of L-Name abrogated tissue protection (reduced FCD and tissue survival), without counteracting neither inflammation nor angiogenesis.

Conclusion: Preconditioning with Ghrelin prevents critically perfused tissue from ischemic necrosis. Tissue protection is the result of an iNOS-dependent improvement of the microhemodynamics and a VEGF-mediated angiogenic response.

O-WB-6 A polydioxanone (PDO) bioabsorbable valved patch seeded with autologous mesenchymal stem cells (MSCs): A promising tissue-engineered product in congenital heart surgery

D. Kalfa^a, A. Bel^b, A. Chen-Tournoux^a, P. Rochereau^a, C. Coz^a, V. Bellamy^a, E. Mousseaux^c, P. Bruneval^d, J. Larghero^e and P. Menasché^a

^aINSERM U633, Hôpital Broussais, 96, rue Didot, 75014 Paris, France; ^bHôp. Européen Georges Pompidou, Dpt. of Cardiovascular Surgery, 20, rue Leblanc, 75015 Paris, France; ^cHôp. Européen Georges Pompidou, Dpt. of Radiology, 20, rue Leblanc, 75015 Paris, France; ^dHôp. Européen Georges Pompidou, Dpt. of Pathology, 20, rue Leblanc, 75015 Paris, France; ^eHôpital Saint-Louis, Laboratory of Cell Therapy, 1, avenue Claude-Vellefaux, 75010 Paris, France (e-mail: davidkalfa@gmail.com)

Introduction: A major issue in congenital heart surgery is the lack of viable right ventricular outflow tract (RVOT) replacement materials. We assessed whether a living RVOT could be restored in a growing lamb model, using autologous MSCs seeded on a bioabsorbable valved patch.

Methods: Monocopy-fitted PDO bioabsorbable patches, seeded with quantum-dots labeled autologous circulating MSCs, were implanted in a transannular position into the RVOT of 8 growing lambs (follow-up: 8 months). Autologous pericardial standard-of-care valved patches (n = 2) were used as controls. Results were assessed by echocardiography, MRI, histology, immunohistochemistry and calcium content assays.

Results: Compared to standard-of-care patches, tissue-engineered patches demonstrated a better tissue growing, were less calcified (0.08% ± 0.03% Ca2+ versus 3.6% ± 0.65%), less dilated (pulmonary annular dilation: +18% ± 9% versus 53%) and non-stenotic. Histologically, there was a complete biodegradation of the PDO scaffold, a layered, endothelialized neo-tissue, an extracellular matrix (with elastic fibers) comparable to native one. The effects of local cues were demonstrated by the presence of cardiac myosin-expressing cells in the proximal portion versus α -SMA-expressing myofibroblasts in the distal portion. Presence of quantum dots in these cells suggested their donor-derived origin.

Conclusion: An autologous MSC-seeded PDO valved transannular patch restores at mid-term a living and functional RVOT, histologically close to the native one.

O-01 Gastrointestinal Surgery

O-01-1 REPLACE Procedure: a novel method of resection of complete rectal prolapse

D. Marzouk and S. Mangam

QEJM Hospital, Department of Surgery, St. Peter's Road, CT9 4TN Margate, United Kingdom (e-mail: drmsudbakar@yahoo.com)

Purpose/Introduction: Complete rectal prolapse is fairly common in elderly omen and is associated with distressing symptoms including incontinence. A large variety of surgical techniques have been described to treat rectal prolapse. We report a novel technique requiring short operating time & minimal blood loss with early postoperative recovery.

Patients and Methods: Six female patients with a median age of 86 (range: 77-92) underwent this new procedure, which has been named "REPLACE PROCEDURE" (REctal Prolapse Linear And Contour stapled Excision). This essentially utilizes a stapled resection of the externally prolapsed rectum using a linear 75 mm stapler as well as multiple use of Contour 45 mm [Ethicon Inc.] stapler through perineal approach and under laparoscopic control to avoid damage to any intra-abdominal contents. (HD Video included).

Results: The Median operating time was 35 minutes (range 25-45). Median Blood loss was 10 mls (range 5-15). All the patients were discharged within 2 days of procedure. No postoperative complications were encountered. Follow up between one month to six months has revealed no recurrence, no urgency, no postoperative incontinence & general satisfaction with the outcome.

Conclusion: REPLACE Procedure provides a safe, quick and effective method for treating complete rectal prolapse especially in the elderly patients.

O-01-2 Neutrophil - lymphocyte ratio: an independent predictor of survival in colorectal cancer

S. Nyasavajjala, F. Runau and J. Lund

University of Nottingham, IV Floor, Clinical Sciences Wing, Derby GEM School, City Hospital, DE22 3DT Derby, United Kingdom
(e-mail: sitaramachandra.nyasavajjala@nottingham.ac.uk)

Introduction: Colorectal cancer evokes a systemic inflammatory response that may predict the risk of mortality. An elevation in neutrophil/lymphocyte ratio (NLR) has been shown to be associated with poorer prognosis in patients with other diseases. Our study aimed to determine whether preoperative NLR can be used to predict survival in colorectal cancer.

Methods: Consecutive colorectal cancer patients between 1st January 1991 and 31st December 2007 were identified; demographic and tumour details were recorded. The NLR was defined as the absolute neutrophil count divided by the absolute lymphocyte count. All patients were followed-up for at least 2 years post-operatively. Overall survival and cancer-specific survival were recorded. Prognostic factors were evaluated by univariate and multivariate Cox regression model of survival to test for independence.

Results: 1324 patients met the inclusion criteria, male: female 7:5, median age 73 (40–99) years, 713 patients had NLR > 3.5 and 611 had NLR < 3.5. Mean survival was 441 (402–480) weeks in patients with NLR < 3.5 versus 327 (298–355) in those with NLR > 3.5, $p < 0.0001$. NLR was independent of T, N and Dukes stage.

Conclusion: Patients with a proportionately greater peripheral lymphocytic response to colorectal cancer survive significantly longer than those with a lesser response.

O-01-3 Is the cancer epigenome altered by neoadjuvant chemoradiotherapy treatment of rectal cancer?

J. Tsang^a, W. Chung^a, J. Orr^b, R. Sweetnam^a, E. Leen^a, A. McCann^a and E. Mulligan^a

^aDepartment of Surgical Research, Connolly Hospital, Blanchardstown, D15 Dublin, Ireland; ^bUCD Conway Institute, Belfield, D4 Dublin, Ireland (e-mail: julianst@yahoo.com)

Background: Epigenetic marks such as DNA methylation are heritable non-structural genomic changes widely studied in human cancer. Both hyper- and hypo-methylation changes are observed in colorectal neoplasms. For rectal cancer specifically, neoadjuvant chemoradiotherapy reduces local recurrence and improves prognosis. However, the effect this might have on the methylation fingerprint is unknown. Therefore, the objective of this study was to examine the role neoadjuvant treatment plays in altering the global rectal tissue epigenome.

Methods: Rectal cancer patients on whom pre and post neoadjuvant treatment tissues were available, were analysed for global methylation changes using automated immunostaining and the commercially available 5-methylcytidine antibody. Quantitative image analysis of nuclear DNA methylation percentage positivity and average intensity was carried out using the Aperio automated image analysis platform.

Results: Variable patterns of global methylation were identified highlighting the epigenetic diversity of each patient sample. Interestingly, in patients demonstrating pathological response a trend towards global hypomethylation was evident in the post treatment specimen compared to the pre-treatment biopsy.

Conclusion: Global DNA methylation appears to be affected by neoadjuvant chemoradiotherapy in rectal cancers. Pathological responders to neoadjuvant treatment may express epigenetic changes not apparent histologically, identifying them as patients who may benefit from more aggressive management and follow-up.

O-01-4 The effect of exercise training after gastric bypass surgery. A pilot study

S. Stegen^a, W. Derave^a, P. Calders^b and P. Pattyn^c

^aUniversity Ghent, Watersportlaan 2, 9000 Ghent, Belgium; ^bUniversity Ghent, De Pintelaan 185, 9000 Ghent, Belgium; ^cUniversity Hospital Ghent, De Pintelaan 185, 9000 Ghent, Belgium (e-mail: sanne.stegen@ugent.be)

Introduction: The purpose of this pilot study is to investigate the effect of gastric bypass surgery on physical fitness and to determine if an intensive training program is beneficial.

Methods: Fifteen morbidly obese patients were tested before and 4 months after gastric bypass surgery. Eight of them followed a combined endurance and strength-training program starting one month after the operation. Before and 4 months after the operation anthropometrical characteristics were measured and an extensive assessment of physical fitness was performed.

Results: Trainers as well as non-trainers evolved positively regarding weight loss and decrease in fat-mass, with no significant differences between the two groups. Non-trainers also lost fat-free-mass, while trainers did not. With regard to physical fitness, non-trainers stayed at the same low level as before the operation, they even deteriorated in handgrip-strength and muscle-strength-of-upper-body. On the other hand, trainers mostly improved for these tests.

Conclusions: These preliminary results suggest that: 1) despite a better body composition and a huge weight loss, functional capacities and muscle strength do not improve 4 months after gastric bypass surgery, more over muscle strength declines; 2) a training program can prevent this deterioration and even improves some physical fitness tests.

O-01-5 Effects of omega-3 fatty acids on normal colon anastomosis in the rat model

O. Ozer^a, R. Pekcici^b, B. Kavlakoglu^c, O. Guler^a, N. Dindar^a and H. Ustun^a

^aAnkara Training Hospital, Ankara Training Hospital, 06340 Ankara, Turkey; ^bAnkara Training Hospital, Ankara Training Hospital, 06400 Ankara, Turkey; ^cAnkara Oncology Hospital, Birlik Mah 5. Cad No:68/4, 06450 Ankara, Turkey (e-mail: pekicci@yahoo.com)

Introduction: This study was to examine the effects of omega-3 fatty acids (O-3FA) on colon anastomosis in the rat model by measuring the levels of perianastomotic tissue hydroxyproline (HYP), anastomotic burst pressures (BP) and histopathologic scores (HS).

Materials/Methods: In this study 24 rats were divided into four groups and colonic anastomosis were performed. Group1=anastomosis+killed on third day; group2=anastomosis+ (O-3FA)+killed on third day; group3=anastomosis+killed on seventh day; group4=anastomosis+ (O-3FA)+killed on seventh day. Orally 50 mg/kg per day of eicosapentaenoic acid therapy were applied in group 2&4 before operation for 3 days and whole postoperative period. Six rats of group 1 and 2 were killed on postoperative days 3, and six rats of group 3 and 4 were killed on days 7. Perianastomotic tissue HYP, BP and HS were measured. Significance of factors were estimated. P values were accepted under 0, 05.

Results: O-3FA groups 2&4 were resulted in higher BP levels ($p < 0, 05$), but increasing of perianastomotic tissue HYP levels were statistically insignificant ($p > 0, 05$). On the contrary HS were worse in groups 2&4 than 1&3 and statistically insignificant either ($p > 0, 05$).

Conclusions: Omega-3 fatty acids may affect positive effects on anastomotic healing, but according to HS, tissue healing was poor. However, this agent can be used as feeding supplement.

O-01-6 Changes in the biliar composition and the liver histomorphology after partial intestinal resections

M. I. Correa Antunez^a, J. M. Moran Penco^b, J. L. Amaya Lozano^b, A. Leal Macho^b, J. Salas Martinez^c and V. Climent Mata^c

^aExtremadura Faculty of Medicine, AV/Elvas, 06071 Badajoz, Spain; ^bExtremadura Faculty of Medicine, AV/Elvas, sn, 06071 Badajoz, Spain; ^cExtremadura Faculty of Medicine, AV/Elvas, 06071 Badajoz, Spain (e-mail: jmmoran@unex.es)

Theoretically, the partial intestinal resection would affect the liver towards the nutrients absorption, bile acid entero-hepatic circulation, entero-hepatic hormonal complex and also through the bacterial translocation. All of that could provoke changes in the bile composition and in the re-circulation between the both sinusoidal and biliar poles. The aim of this experimental work is to know more deeper the liver changes after jejunal and ileum resection. M&M: We have used three experimental groups: Group A (10 guinea pigs), with jejunal resection. Group B (10 guinea pig), with ileum resection. They were nutrient by oral nutrition, during 21 days. Group Ctr: (Control group, 6 guinea pig) with a sham laparotomy. At the end, bile samples for biochemistry analysis were taken from the hepatic duct and liver samples for the optical and electron microscopy.

Results: The phospholipids and cholesterol in bile remain in the normal limits in both GA & GB. The Colic bile acid concentration, but not the Ketocolic bile acid decreased. Although we observed minimal macro-steatosis changes in both groups, and also a minimal decrease in the mitochondrial amount in the GB, not other ultra-structural changes were observed in the pole and bile channels.

O-01-7 Comparison of single-layer running with two-layer interrupted anastomosis in the gastrointestinal surgery a prospective, randomized, multicenter clinical trial

G. Weber^a, E. Odermatt^b, H. Bahri^c, I. Gál^d, G. Csáky^e and P. Horváth Örs^f

^aUniversity of Pécs, Kodály Z. str.20., H-7624 Pécs, Hungary; ^bB. Braun Aesculap, Am Aesculap-Platz, 78532 Tuttlingen, Germany; ^cUniversity of Pécs, Kodály Z. u. 20., 7624 Pécs, Hungary; ^dDept. of Surgery, Hegyalja u 13., 3232 Mátrafüred, Hungary; ^eDept. of Surgical Research, Nyárfa u. 68, 7632 Pécs, Hungary; ^fUniversity of Pécs, Ifjúság u.13, 7624 Pécs, Hungary (e-mail: gyorgyweber@yahoo.com)

Background: A randomized clinical trial was conducted to confirm the hypothesis that single-layer, continuous, hand-sewn anastomosis could be as reliable as the two-layer, interrupted one.

Methods: Three trial centers in Hungary took part in this 3-5-year period of study. One hundred ninety-one (191) patients were randomly assigned to single- and two-layer anastomosis. Both types of suturing technique were performed using the same coated multifilament absorbable polyglycolic acid-composed suture material (Safil® Green, B. Braun Aesculap). The primary endpoint was the anastomotic complications, while the anastomotic time, cost of the suture material, and duration of the hospitalisation were used as secondary endpoints.

Results: Single-layer anastomosis was constructed in ninety-five (95) patients and in ninety-six (96) the two-layer anastomosis was performed. The numbers of early postoperative complications were 3 (3.15%) for single- and 6 (6.25%) for double-layer anastomosis. The mean anastomotic time was longer for two-layer method. Single-layer anastomosis was less costly than two-layer anastomosis. There was no significant difference in the mean length of hospital stay, neither between centers nor between suture techniques.

Conclusions: Single-layer, continuous anastomosis is as safe as the two-layer, interrupted one. It has also the benefits of being performed faster, and of being more economic than double-layer anastomosis.

O-02 Hepatobiliary Surgery

O-02-1 Surgery-affected pharmacokinetics of gemcitabine (2', 2'-difluorodeoxycytidine) after 70% hepatectomy in rats

T. Goto, M. Kume, R. Kimura, Y. Abe, H. Uchinami and Y. Yamamoto
Dept. of Surgery, Akita Univ., Akita Univ. School of Medicine, 1-1-1 Hondo, Akita, 010-8543 Akita, Japan (e-mail: s4005542@wm.akita-u.ac.jp)

Introduction: In adjuvant chemotherapy for postsurgical patients of cholangiocarcinoma, a standard dose of gemcitabine has been administered but hepatectomized patients often don't tolerate this treatment. To determine the influence of hepatectomy on gemcitabine metabolisms, changes in blood concentrations of gemcitabine were analyzed in hepatectomized rats.

Materials/Methods: Male Wistar rats weighing 200–230g were allocated into two groups (n = 6 in each). A: 70% hepatectomy according to the Higgins and Anderson procedure, B: Sham operation. Forty-eight hours after these treatments, 24 mg/kg of gemcitabine was injected intravenously. Concentrations of gemcitabine (ng/dl), ALT (IU/l) and creatinine (mg/dl) in the blood were measured 2 hours after gemcitabine administration. Student t-test was applied to all data (mean ± s.d.) and a p-value less than 0.01 was considered to be statistically significant.

Results: Blood concentration of gemcitabine was significantly higher in group A than in group B (A, 12700 ± 1039; B, 10283 ± 740, p < 0.01), indicating that a lesser dose achieved intended blood concentration in hepatectomized group. ALT and creatinine were also significantly higher in group A.

Conclusions: Liver resections strongly affected the drug disposition of gemcitabine. An individual schedule would be recommended for efficacious, safe administration of gemcitabine peculiarly in patients after major hepatectomy.

O-02-2 Histone deacetylase (HDAC) encoding gene expression in pancreatic cancer cell lines and cell sensitivity to HDAC inhibitors

M. Ouaiissi^a, S. Cabral^b, J. Tavares^b, A. Cordeiro Da Silva^b, F. Mathieu-Daude^c, I. Sielezneff^a, N. Pirro^d, E. Mas^e, J. P. Bernard^e, B. Sastre^a, D. Lombardo^e and A. Ouaiissi^f

^aAP-HM hôpital Timone, Service de Chirurgie Oncologique, 264 rue Saint Pierre, 13385 Marseille, France; ^bUniversidade do Porto, Portugal, Rua Campo Alegre 823, 4150-180 Porto, Portugal; ^cIRD 008, 911 Av. Agropolis, 34394 Montpellier, France; ^dDigestive Surgery, 264 rue Saint Pierre, Hôpital La Timone, 13385 Marseille, France; ^eUMR 911 INSERM, 27 bd jean moulin, 13385 Marseille, France; ^fCNRS UMR 5235, Place E. Bataillon - Bât. 24 cc, 34095 Montpellier, France (e-mail: mebd.ouaiissi@mail.ap-bm.fr)

In this study, we explore the level of expression of members of histone deacetylase encoding genes (HDACs) in four pancreatic tumor cell lines: Panc-1, BxPC-3, SOJ-6 and MiaPaCa-2; and two non-related tumor cells: Jurkat and HeLa. The possible relationship between the levels of HDACs expression and the sensitivity/resistance to HDAC inhibitors (TSA, Nicotinamide, Sirtinol) was further explored. Methods: Four human pancreatic tumor cell lines and two non-related tumor cells, were used to evaluate the expression of HDAC encoding genes by RT-PCR and Western blot analysis. We also measured the effect of certain HDAC inhibitors (HDIs).

Results: Although a slight variation in the profiles of gene expression among cell lines could be evidenced, HDACs protein synthesis seem to be similar. Furthermore, the cells were equally sensitive to inhibition by Sirtinol whereas some variation in the IC50 could be seen in the case of TSA. We also demonstrate that the drugs had the capacity to induce the death of cells by apoptosis.

Conclusions: Taken together, our data support the notion that the level of cell sensitivity to the HDIs might be related to the level of expression of genes such as those encoding proteins playing a role in cell cycle checkpoints control but not HDAC per se.

O-02-3 MRC'P in suspected CBD stones: are we aware of the cost implication?

A. Bagul, S. Yule and A. Bagul

Aberdeen Royal Infirmary, Foresterhill, Ashgrove road west, AB25 2ZD Aberdeen, United Kingdom (e-mail: anil.bagul@nhs.net)

Background: A precise analytic approach is indispensable for reducing the jeopardy of an unpredictable outcome in cases with common bile duct (CBD) stones. Magnetic resonance cholangiopancreatography (MRCP) has been shown to be a useful diagnostic tool prior to cholecystectomy in cases with suspected CBD stones.

Aim: To scrutinize our application of MRCP in all patients admitted with suspected CBD stones.

Methods: A retrospective review of 2039 consecutive patients admitted with symptomatic gallstones between 2005 & 2007. Those with suspected CBD stones underwent MRCP.

Results: Three hundred and fifty two (17%) patients had MRCP from which we excluded 47 (13%) due to various reasons. No CBD stones were found in 249 patients (71%) while 56 (16%) had CBD stones on MRCP. However 23 (7%) of them had dilated bile ducts on ultrasound (US). The remaining 33 (9%) patients had CBD stones with no duct dilatation. The cost per diagnosed case in a patient with non dilated CBD is £3666. High GGT levels may have an added predictive value but other LFTs were not significantly different in patients with a negative MRCP.

Conclusion: There is a substantial cost implication per diagnosed case. There is a need for development of policy/guidelines for MRCP use which could increase pick up rate and cost effectiveness.

O-02-4 Analysis of the sonocoagulation in liver and new horizons in the surgical management of liver malignancies

B. Seket^a, C. Lafon^b, N. Owen^b, J. Y. Chapelon^b, J. Y. Scoazec^c and D. Cathignol^b

^aHôpital Edouard Herriot, Department of HPB surgery and LT, Pavillon D, 69437 Lyon cedex 03, France; ^bINSERM, Unité 556 INSERM, 151, cours Albert Thomas, 69424 Lyon 03, France; ^cHôpital Edouard Herriot, Department of Cyto-Pathology, 69437 Lyon cedex 03, France (e-mail: bbsket@aol.com)

Introduction: Thermal ablation devices have opened a new way in the surgical management of liver malignancies. This work aimed to analyse the thermal ablation and coagulation capabilities of an interstitial ultrasonic device.

Materials and Methods: A sononeedle incorporating a flat transducer was developed. Two types of lesions were induced on porcine liver in vivo with and without hepatic inflow occlusion: elementary lesions obtained with a transducer's single shot at a given angular position and cylindrical lesions resulting from a 360°-deployment. All cylindrical lesions underwent, on POD 7, a morphological study using 3D reconstruction from MR images. Histological examination was done for all the lesions.

Results: Ninety-four elementary and twenty-seven cylindrical lesions were obtained with and without Pringle manoeuvre. Bleeding due to probe insertion was easily controlled by the ultrasonic coagulation. On histology, the lesions presented as complete and homogenous areas of tissue coagulation. Large ablation areas were obtained (up to 92 cm³) and the lesion's size could be adapted by the correct tuning of the ultrasound parameters.

Conclusion: The sonocoagulation provides an effective thermal ablation in liver with highly directional haemostatic capabilities which may be developed for thermal ablation and also for parenchymal liver transection and resection of liver malignancies.

O-02-5 Low-grade aortic inflammation in long-term prehepatic portal hypertensive rats

A. Cruz^a, N. Heras^b, M. A. Aller^c, M. Losada^d, M. P. Nava^e, N. Paz^f, V. Cachofeiro^g, V. Lahera^g and J. Arias^h

^aGeneral Unit Surgery, Hospital del Henares, Avda. Maria Curie s.n., 28822 Coslada (Madrid), Spain; ^bPhysiology Dept., School of Medicine, UCM, 28040 Madrid, Spain; ^cSurgery Dpt Medicine School, UCM, Plaza Ramon y Cajal s/n, 28040 Madrid, Spain; ^dSurgery Unit Hospital Sureste, Camino Valdecipreste s/n, 28500 Arganda del Rey. (Madrid), Spain; ^ePhysiology Dept, School of Biology, UCM, 28040 Madrid, Spain; ^fSurgery Dept., School of Medicine, UCM, 28040 Madrid, Spain; ^gPhysiology Dept, School of Medicine, UCM, 28040 Madrid, Spain; ^hSurgery Dpt. Medicine School, UCM, Plaza Ramon y Cajal s/n, 28040 Madrid, Spain (e-mail: maaller@med.ucm.es)

Introduction: Low-grade inflammation in portal hypertension could involve the splanchnic and systemic circulation. We performed this study to verify this hypothesis.

Material and Methods: Male Wistar rats: sham-operated (SO; n = 10) and partial portal vein ligated (TPVL; n = 12) at evolutive 22 months. Aorta mRNA expression of oxidative and nitrosative stress enzymes, like xanthine dehydrogenase (XD), the subunit p22phox of NAD (P)H-oxidase, eNOS, catalase and SOD; NFκB e IκB; and vascular fibrosis parameters, like VEGF, TGF-β, connective tissue growth factor (CTGF), collagen-1 and MMP-9 were evaluated by real time RT-PCR.

Results: In TPVL-rats aortic mRNA relative expression of p22phox of NAD (P)H oxidase, (100 ± 13.6 versus 186 ± 20; p < 0.05), eNOS (100 ± 10.1 versus 200 ± 21.1; p < 0.01), SOD (100 ± 5.6 versus 159 ± 20; p < 0.05), NF-κB (100 ± 7.1 versus 205 ± 20.5; p < 0.05), CTGF (100 ± 8.5 versus 154 ± 18, 6; p < 0.05), collagen-1 (100 ± 8.5 versus 143 ± 19.4; p < 0.05), and MMP-9 (100 ± 9.5 versus 168 ± 20; p < 0.05) increased. On the contrary, aortic mRNA expression of XO, catalase, VEGF and TGF-β were similar in both groups.

Conclusion: In portal hypertensive-rats the aortic wall increase of oxidative-nitrosative stress could activate anti-oxidative mechanisms, NFκB up-regulation and remodelling with downstream production of CTGF, collagen-1 and MMP-9. Hence, a low-grade aortic inflammatory response is confirmed in long-term portal hypertension in the rat.

O-02-6 Establishment of a post-hepatectomy porcine model of acute liver failure that closely simulates the true clinical syndrome resulting after extensive hepatic resection: a progress in liver failure

G. Defterevas^a, K. Nastos^a, A. Papalois^b, N. Papoutsidakis^a, K. Kalimeris^c, A. Mikrova^a, A. Pafiti^d, G. Kostopanagiotou^e, N. Arkadopoulos^a and V. Smyrniotis^a

^aAretaieion Hospital, Surgical Dpt, Vassilisis Sofias 76, 11528 Athens, Greece; ^bExperimental-Research Unit ELPEN, Marathonos Ave. 115, Pikermi, 152 35 ATHENS, Greece; ^cAttikon Hospital, Anesth. Dpt, Chaidari, 12462 Athens, Greece; ^dAretaieion Hospital, Pathology Dpt, Vassilisis Sofias 76, 11528 Athens, Greece (e-mail: geodef78@hotmail.com)

Introduction: Advents in liver surgery led to performance of extensive liver resections, which occasionally result in acute liver failure (ALF). This study was designed to develop a reproducible porcine model of ALF that would be suitable to test the safety and the efficacy of various liver support systems.

Methods-Materials: Twelve Landrace pigs (weight 25–30 kg) were randomly assigned in two groups; half (n = 6) of them underwent extended left hepatectomy (around 70%–75%) while applying Pringle's maneuver for 21/2 hours-reperfusion of the remnant liver parenchyma ensued and animals were monitored for a 24h-period (ALF group); the other half (n = 6) that did not undergo hepatectomy and subsequently liver ischemia-reperfusion injury were included in the sham (or control) group.

Results (mean ± SD): Induction of ALF was confirmed by the significant increase in NH₃ (633.00 ± 252.21 versus 51.50 ± 9.49 p = 0.004) and intracranial pressure (24.00 ± 4.69 versus 10.17 ± 0.75 p = 0.004) levels; Mean arterial pressure (MAP), on the contrary, decreased significantly (P < 0.01) early after liver reperfusion. Histopathological evaluation demonstrated diffuse coagulative necrosis and severe architectural distortion of hepatic parenchyma, reflecting ischemia-reperfusion liver damage and ALF establishment.

Conclusion: This novel approach creates a valid animal model of ALF, which can enable testing and optimization of new therapeutic modalities.

O-02-7 Elective umbilical hernia repair in patients with liver cirrhosis and ascites: a safe strategy

H. Eker, G. Van Ramshorst, H. Tilanus, H. Metselaar and G. Kazemier Erasmus Medical Center, 's Gravenoordijk 230, 3015CE Rotterdam, Netherlands (e-mail: h.eker@erasmusmc.nl)

Twenty percent of patients with liver cirrhosis and ascites develop umbilical hernia. Patients are at higher risk of mortality due to incarceration in emergency setting than in elective setting. The safety of elective repair was assessed in this study.

Patients with liver cirrhosis and ascites undergoing elective umbilical hernia repair between July 2004-January 2009 were included. Child-Pugh-Turcotte

classification, MELD (Model for End-Stage Liver Disease) score, kidney function, cardiovascular comorbidity, complications, hospital stay and mortality were prospectively collected.

Twenty-nine consecutive patients (21 males, 8 females) were operated at a mean age of 52 years (SD \pm 13 years). Six patients (21%) classified as Child-Pugh-Turcotte grade A, 19 (68%) grade B and 3 (11%) grade C; median MELD score was 12 (interquartile range 9–19). Mesh was used in 8 patients (29%). No operation-related complications were reported. Mean hospital stay was 3 days (interquartile range 2–5) in patients without simultaneous liver transplantation (23/29). Postoperative complications included pneumonia, transient decompensation of cirrhosis resulting in prolonged admission and wound infection (each one case). Four patients (14%) died during a median follow-up of 10 months, none attributable to the operation.

Conclusions: Elective umbilical hernia repair is a safe approach in patients with liver cirrhosis and ascites.

O-03 Surgical Anatomy

O-03-1 Automatic 3-dimensional reconstruction of the portal vein distribution

R. Mazars^a, B. Gallix^b, F. Banegas^c, S. Chemouny^c, M. Bossy^a, G. Godlewski^a and M. Prudhomme^a

^aDepartment of Anatomy, CS 83021, Avenue Kennedy, Faculté de Médecine de Nîmes, 30900 Nîmes, France; ^bDepartment of Radiology, Montpellier University Hospital, CHU St Eloi, Av Bertin Sans, 34000 Montpellier, France; ^cINTRASENSE SAS, Cap Omega, Rond Point Benjamin Franklin, 34960 Montpellier, France (e-mail: romainmazars@yahoo.fr)

Introduction: To assess a new automatic 3-Dimensional (3D) reconstruction algorithm of the intra hepatic portal vein distribution from multi-detector computed tomography (MDCT).

Materials and Methods: Ten cadaver livers were injected by the portal vein with methyl-metacrylate (Altu P-10®) and a radiological contrast (Minium®). MDCT were performed after the livers were isolated. An automatic reconstruction of the intra hepatic portal architecture was obtained by a new vascular 3D recognition and reconstruction algorithm (Myrian® Expert). Portal modelling was obtained by parenchyma corrosion into acid solution. A comparison between the portal modelling and the 3D reconstructions was performed by two experts. The number, the shape and the distribution of each portal branch were compared.

Results: The 3D reconstruction allowed to precisely define the segmental and sub-segmental ramifications of the portal vein. There was a good correlation between 3D reconstructions and the portal modelling.

Conclusions: Myrian® Expert with this new portal vein reconstruction algorithm permits an accurate tumour location improving surgical or endovascular procedures. Moreover, these automatic and fast reconstructions are convenient for a current medical practice.

O-03-2 Functional significance of the morphological particularities of the human hinge joints (or ginglymi): interests of a comparative approach within mammals

J. M. Le Minor^a and F. Billmann^b

^aUniversité de Strasbourg, 4, rue Kirschleger, 67000 Strasbourg, France; ^bSt. Vincentius Kliniken, Südendstrasse, 32, 76137 Karlsruhe, Germany (e-mail: jean-marie.leminor@medecine.u-strasbg.fr)

Introduction: Hinge joints (or ginglymi) are one type of synovial joints mechanically compared to a hinge, with a convex articular surface often described as a pulley. They present only one degree of freedom (monoaxial joint) allowing movements in a sagittal plane i.e. around a transversal axis (=flexion/extension). In human species, hinge joints are present in the elbow, the femoro-patellar, the talo-crural, and the interphalangeal joints of the fingers and toes. The purpose of this work was to use comparative anatomy in order to increase the comprehension of these articular structures.

Material and Methods: Skeletons representing the various locomotor modes in Primates were studied: 1) quadrupedal walk (arboreal or terrestrial), 2) leaping, 3) brachiation (and derived knuckle-walking), 4) bipedal walk. For comparison, skeletons of running mammals were observed (principally Artiodactyles and Perissodactyles).

Results: Morphological traits of hinge joints appear to be linked to functional specificities and more particularly to the degree of evolutionary specialisation in flexion-extension and to the necessity of joint stabilization: 1) depth, 2) height, 3) torsion, 4) asymmetry, 5) angular amplitude, 6) orientation.

Conclusion: Comparative anatomy is a helpful approach for understanding the significance of morphological structures and in particular functional characteristics of human joints.

O-03-3 Anatomy of the mediastinum: a cadaver dissection video

M. Prudhomme^a, R. Mazars^a, N. Pirro^b and M. Bossy^a

^aDepartment of Anatomy, CS 83021, Avenue Kennedy, Faculté de Médecine de Nîmes, 30900 Nîmes, France; ^bDigestive Surgery, 264 rue Saint Pierre, Hôpital La Timone, 13385 Marseille, France (e-mail: prudhomme.michel@chu-nimes.fr)

Aims: To describe the anatomical relationship of the posterior mediastinal structures using a cadaver dissection.

Materials and Method: The dissection of the posterior mediastinum was conducted by a left side thoracotomy on a fresh anatomical specimen. Esophageal vascularization was studied as the precise location of the thoracic duct.

Results: Left side thoracotomy allowed exposing of the posterior mediastinum. The esophageal arteries were individualized. The location of the thoracic duct from the esophagus, the aorta and the azygos vein was described.

Discussion: The left side thoracotomy is not often performed in thoracic surgery. However, it allows a fine exposure of the mediastinum. Precise knowledge of the thoracic duct location permits to avoid its surgical damage.

Conclusion: Videos of anatomical dissections are a helpful educational tool for teaching anatomy and for surgical practice as well.

O-03-4 Laparoscopic total extraperitoneal inguinal hernia repair: anatomy of the extraperitoneal space

J. P. Faure, P. De Wailly, P. Rigoard, C. Doucet, M. Carretier and J. P. Richer

Institut of Morphology, Poitiers, 6 rue de la milétrie, 86000 Poitiers, France (e-mail: j.p.faure@chu-poitiers.fr)

Introduction: The totally extraperitoneal laparoscopic approach for the treatment of inguinal hernia is a well recognized technique with proven efficacy, low failure rate, and reduced post-operative pain. This laparoscopic technique is reputed to be a difficult procedure to learn and practice than a laparoscopic trans-abdomino-pré-péritonéal procedure: we hope this is because many surgeons don't well know extra-peritoneal anatomy of groin. So we proposed a "step by step" anatomical analysis, with pitfalls to avoid, of a totally extraperitoneal laparoscopic approach for treatment of inguinal hernia.

Methods: Our experience with totally extraperitoneal laparoscopic inguinal hernia repair with regard to the morphology of the inguinal-femoral region, 23 cadaver dissection and more than 400 surgical procedures, now permits clarification of a surgical technique that has hitherto not been well known.

Conclusion: Photographic representations of surgical views are displayed, and detailed descriptions applicable anatomic structures are presented.

O-03-5 Diameter and blood pressure estimation in arteries using an echographic instrumented probe

J. Triboulet^a, F. Veye^a, A. Perez Martin^b, M. Dautat^b and E. Dombre^a

^aLIRMM, UMR 5506, UM2 CNRS, 161 rue Ada, 34392 Montpellier, France; ^bLPCV, EA 2992, CHU Nîmes, Faculté de médecine, av Kennedy, 30907 Nîmes, France (e-mail: jean.triboulet@lirmm.fr)

Introduction: The non-invasive detection and follow up of vascular diseases is mainly performed by B-mode ultrasound techniques. The biomechanical characteristics of the arterial wall (Peterson's elastic modulus...) are assessed either indirectly from the pulse wave velocity or directly by measuring diameter changes on ultrasound images, correlatively with systolic and diastolic blood pressure. We instrumented an ultrasound probe to simultaneously and non-invasively acquire images from which we could extract the arterial diameter, together with a force signal proportional to the arterial pressure and to the force applied by the sonographer.

Materials/Methods: Echographic images of the brachial artery were obtained with a a10 ProSound ultrasound unit (Aloka) with a 10Mhz linear probe implemented with a force sensor. The ultrasound signal was digitized by a video acquisition board (Matrox) while the force was digitized via an acquisition board (NI). Image analysis extracted arterial diameter along the cardiac cycle.

Results: The brachial artery diameter decreased (from 4.6 down to 3 mm) when the force applied on the ultrasound probe was increased (from 0 up to 6.75 N). Moreover, the sensor clearly detected the force transmitted back to the probe by blood pressure.

Conclusions: Our system is able to measure non-invasively arterial diameter and detect blood pressure changes.

O-03-6 Biomechanics analysis of the weakened mandible

J. Yachouh^a and P. Goudot^b

^amaxillo-facial surgery unit, Lapeyronie hospital, 34000 Montpellier, France; ^bmaxillo-facial surgery unit, Lapeyronie hospital, 34000 Montpellier, France j-yachouh@cbu-montpellier.fr

Introduction: head and neck surgeons need sometimes to perform partial mandibular resection for cancer treatment. We don't know until which quantity of remaining bone the weakened mandible is about to break when submitted to mastication. The purpose of this study was to study biomechanics of the weakened mandible.

Material and method: eight frozen human mandibles were used. Ropes glued on each one represented masticatory muscles. The mandibles were installed in a mastication simulator to reproduce a static bite. Progressive bone resection was performed in the posterior corpus and bone deformation was analyzed with an original device using digital image correlation.

Results: bone strains were always located from the posterior angle of the resection downward to the basilar border of the mandible. The fracture occurred for a mean bone resection of 35% of the mandible high, for bite forces of 300 Newtons.

Conclusions: we discuss the interest of the device we used to highlight bone strains and try to analyse our results to be able to reinforce the weakened mandible when necessary.

O-03-7 Charles Emmanuel Sédillot (1804–1883), member of the Academy of Sciences of the Institute of France: a pioneer in surgical research

F. Billmann^a and J. M. Le Minor^b

^aSt. Vincentius Kliniken, Süüdendstrasse, 32, 76137 Karlsruhe, Germany; ^bUniversité de Strasbourg, 4, rue Kirschleger, 67000 Strasbourg, France (e-mail: franck.billmann@wanadoo.fr)

Among the pioneers in surgical research during the 19th century, Charles Emmanuel Sédillot (1804–1883) merit a distinguished place. Born in Paris in 1804, he became during his college years a friend of the future surgeon Hippolyte Larrey (1808–1895), son of the famous Dominique Larrey (1766–1842), military surgeon of Napoleon Bonaparte. This friendship encouraged Sédillot to become himself a military surgeon. From 1835 to 1841, he was professor in the military hospital of Val-de-Grâce and professor "agrégé" at the Faculty of Medicine in Paris. Living from 1841 to 1870 in Strasbourg, he was professor at the Faculty of Medicine, chief of the military hospital (1841–1860), and director of the Imperial Military School of Medicine (1856–1870). He was at the origin of many discoveries in operative technics, plastic surgery, endoscopic surgery,

infectiology and anesthesiology. He was the first in the world to realize the coxo-femoral disarticulation (1831) and the gastrostomy (1846), and a pioneer of general anesthesia in France (1847). He invented the name "microbe" for infectious agents. For his exceptional works, Sédillot became member of the French Academy of Medicine (1846) and one of the rare surgeon member of the Academy of Sciences of the Institute of France (1872).

BJS Award Session

O-BJS-1 Patient INR self testing program improves the quality of oral anticoagulant therapy after mechanical heart valve replacement

K. Azarnoush^a, L. Camilleri^a, R. Henaine^b, P. Chabrot^a, E. Geoffroy^a, S. Monzy^a, S. Combes^a, A. Innorta^a, C. Dauphin^a, P. Jaffieux^a, V. Batel^a and C. De Riberolles^a

^aCardiovascular Surgery, G. Montpied University Hospital, 63000 Clermont-Ferrand, France; ^bHôpital cardiologique L. Pradel, 28 Av du doyen Lepine, 69677 Lyon, France (e-mail: kazarnoush@cbu-clermontferrand.fr)

We report the results of the first French, prospective, randomised, single centre study with fluindione, which compares the patient self testing of international normalised ratio (INR), with the conventional laboratory monitoring. Aims of the study are to prove the correlation between the laboratory and the self testing measurements, estimation of INR variability within a target therapeutic zone and frequency of hemorrhagic and/or thromboembolic events after mechanical heart valve replacement.

Patients and methods: Between May 2004 and September 2008, 206 consecutive patients were post operatively, randomly included: 103 patients in each group, with a one year follow up. Two INR control devices were selected: CoaguChek® (Roche) and INRATIO® (Hemosense). The antivitamin K therapy was achieved by Fluindione in 98% of patients. INR target zones were selected according to the ACC/AHA guidelines recommendations.

Results: The laboratory INR measurement and the device INR control were well correlated with a coefficient of 0.80 (for a confidence interval of 95%, correlation coefficient from 0.78 to 0.82, $p < 0.0001$). The average time spent within the target zone was significantly higher for the device group 61% (+/-0.19) than the laboratory group 55% (+/-0.20), $p < 0.05$. Variability of INR outside the target range was significantly lower 47.4 (+/-51.5) in the self testing group compared with the laboratory group 60.1 (+/-70.2), $p < 0.0007$. Severe hemorrhagic events (five cases) and thromboembolic events (two cases, one cerebral ischemic accident and one lethal mesenteric infarct) were all recorded in the laboratory group ($p < 0.011$). One patient died, of unknown cause, in the self testing group, two days after hospital discharge and before the device utilization.

Conclusion: This first French, randomised study, related to INR control of oral anticoagulation therapy after mechanical heart valve replacement, displays the beneficial effects of the patient INR self testing.

O-BJS-2 The role of stem cell factor and anti-stem cell factor in chemotherapy

N. Jelly^a, I. Hussain^b, J. Eremin^c, O. Eremin^d and M. El-Sheemy^d

^aUniversity of Lincoln, Brayford Pool, LN6 7TS Lincoln, United Kingdom; ^bUniversity of Lincoln, Brayford Pool, LN6 7TS Lincoln, United Kingdom; ^cResearch & development, Lincoln County Hospital, Greetwell Road, LN2 5QY, United Kingdom; ^dLincoln County Hospital, Research and Development, LN2 5QY Lincoln, United Kingdom (e-mail: njelly@lincoln.ac.uk)

Introduction: Resistance to neoadjuvant chemotherapy in breast cancer patients is well documented. Overexpression of Bcl-2 and low level of annexin V in cells are surrogate markers for chemoresistance. The importance of stem cell in chemoresistance is being diagnosed. The role of stem cell factor (SCF), however, is poorly defined. The aim of this study was to examine the effect of Paclitaxel and Adriamycin chemotherapy on wild type breast cancer cells (MCF-7) and resistant variants; Paclitaxel resistant (MCF-7/PacRes) and Adriamycin resistant (MCF-7/AdrRes).

Methods: MCF-7, MCF-7/PacRes and MCF-7/AdrRes cells were cultured, treated with the relevant chemotherapy and IC50s were calculated for each. The cells were assayed either alone or combined with or without SCF and/or Anti-SCF. The proteins Bcl-2 and Annexin V were evaluated by ELISA.

Results: MCF-7/AdrRes and MCF-7/PacRes cells showed significant overexpression of Bcl-2 in the presence of SCF, compared with MCF-7 (76%, 35% and 13%, respectively). Adding anti-SCF to MCF-7/AdrRes and MCF-7/PacRes MCF-7 cells decreased Bcl-2 expression in the presence or absence of SCF. However, annexin V expression increased after treatment with anti-SCF compared with SCF in MCF-7 and MCF-7/AdrRes cells (62%, 41% and 20%, respectively).

Conclusion: SCF may contribute to hemoresistance; anti-SCF may enhance cytotoxicity of chemotherapy.

O-BJS-3 Toward the intraoperative molecular diagnosis of occult sentinel lymph node metastasis in oral and oropharyngeal squamous cell carcinoma

V. Burcia^a, J. Solassol^b, V. Belle^b, V. Costes^c, E. Barbotte^d, C. Cartier^a, M. Makeieff^a, L. Crampette^a, B. Guerrier^a, T. Maudelonde^b and R. Garrel^a

^aENT, Head Neck Surgery, Montpellier University Hospital, 34090 Montpellier, France; ^bLaboratory of Cellular Biology, University Hospital Center, 34000 Montpellier, France; ^cPathology Department, University Hospital Center, 34000 Montpellier, France; ^dStatistics Department, University Hospital Center, 34000 Montpellier, France

Introduction: The sentinel node (SN) biopsy is efficient in occult metastasis diagnosis in head and neck squamous cell carcinomas (HNSCC). However, the definitive histopathology, i.e., immunohistochemistry (IHC), is not compatible with intraoperative use. Hence, pN (SN)+ patients (30%) will undergo a second surgery. Molecular analysis is a faster technique compatible with an intraoperative use, but the best marker remains not yet established.

Materials/Methods: Twenty patients with oral or oropharyngeal cT1-T2N0 had SN biopsy. Every SN had a cross matched analysis with IHC and quantitative RT-PCR (Q-PCR) focusing on the 3 best markers published: PVA (Pemphigus Vulgaris Ag), SCC, and cytokeratin 17.

Results: Eighty-eight SN were harvested (mean = 4, 4 SN/patient). IHC showed 3 macrometastasis (MA) and 5 micrometastasis (MI) in 6 patients (30%). For each node, and each patient, RNA expression rates of target markers were compared. SCC and CK17 only diagnosed MA and MI sized more than 250 µm. PVA allowed to discriminate all occult metastasis (MA and MI) from pN- and pN0 (SN) including isolated tumor cell. Significant differences were found regarding SN and patients staging ($p < 0.005$). ROC curves analysis, studying metastatic *versus* non metastatic status, showed areas under curve of 97, 2% for SN and 97, 6% for patients.

Conclusion: PVA is a promising marker for intraoperative Q-PCR analysis in HNSCC SN analysis.

O-BJS-4 Higher recurrence rate at sublay than onlay mesh reconstruction in abdominal hernias: five-years results of a randomised, multicentric clinical trial

J. Baracs^a, I. Takacs^b, S. Horvarth^b, P. Horváth Örs^c and G. Weber^b

^aSurgical Dept. Univ. of Pécs, 13 Ifjuság str., 7624 Pécs, Hungary; ^bUniversity of Pécs, Kodály Z. str.20., H-7624 Pécs, Hungary; ^cUniversity of Pécs, Ifjuság u.13, 7624 Pécs, Hungary (e-mail: j_baracs@yahoo.com)

Background: There are well known procedures to treat abdominal wall hernias, but the results are controversial. The aim of our study was to compare long-term results of mesh-performed and suture repair of open abdominal wall reconstruction (group 'A'- hernia orifice between 5–25cm²) and also compare the results of onlay *versus* sublay position of mesh (group 'B' - orifice larger than 25cm²).

Methods: A five-years randomised, multicentric, internet-based, clinical trial has been started in 2002. During two years 953 patients were randomised. In

group 'A', suture repair were performed in 184, and sublay mesh repair in 180 cases. In group 'B' we have 370 cases, with 189 sublay and 181 onlay mesh reconstruction.

Results: After five years follow-up at 734 cases - 77, 02% of randomized patients - have completed study. In small hernia group from 184 suture repair 50 (27, 17%) and from 180 cases in mesh repair group 15 (8, 33%) recurrences were developed. In group 'B' from 189 sublay mesh reconstructions 38 (20, 11%) recurrence, and at 181 cases of onlay mesh repair subgroup 22 (12, 16%) definite recurrences were recognized.

Conclusions: Mesh repair provides better results than suture repair and higher rate of recurrence at sublay than onlay reconstruction in large hernias.

O-BJS-5 Anti- and proinflammatory effects of sodium selenite on a molecular level in the therapy of sepsis

T. Zimmermann, S. Albrecht and S. Kersting

Technical University of Dresden, Fetscherstrasse 74, 01307 Dresden, Germany (e-mail: tbomas.zimmermann@uniklinikum-dresden.de)

In sepsis, sodium selenite can inhibit the binding activity of NF-κB. However, the transcription factor AP-1 is activated by sodium selenite. The modulation of both transcription factors influences the formation of proinflammatory mediators in mononuclear blood cells. In 34 patients included into the SIC-Study, the authors evaluated the NF-κB- and AP-1-binding activity in MBCs, the translocation of the subunits p50/p65 into the nucleus, and the mRNA expression of MIF and TNF, and their protein expression. Treatment with selenite lead to an increase in the NF-κB binding activity of surviving patients in the selenite group. Patients not surviving the sepsis of both groups exhibited a markedly lower NF-κB binding activity. Selenite did not inhibit, but rather promote the translocation of NF-κB into the nucleus. The mRNA expression of TNF, but not of MIF, was enhanced by selenite. In surviving patients, selenite enhanced the AP-1 binding activity. Altogether, selenite displays both proinflammatory as well as antiinflammatory effects. The modulation of both transcription factors by selenite can crucially influence the course of sepsis but even perpetuate the inflammatory reaction. This could explain that in sepsis high doses of selenite do not have a positive effect on mortality. A patient adapted therapy using molecular monitoring could help to reduce the mortality of sepsis.

O-04 Cardiac Surgery

O-04-1 Outcome of cardiac transplantation after long term circulatory support. A bicentric study

G. Maxant^a, M. Kindo^b, R. Demaria^a, P. Rouviere^a, E. Epailly^b, J. M. Frapier^a, B. Albat^a and J. P. Mazzucotelli^b

^aDepartment of Cardiac Surgery, Hôpital Arnaud de Villeneuve, 191 Av Doyen Giraud, 34090 Montpellier, France; ^bDepartment of cardiac surgery, Hôpital civil, 1, place de l'hôpital, 67100 Strasbourg, France (e-mail: g-maxant@cbbru-montpellier.fr)

Objectives: To compare the outcome of cardiac transplantation among patients who required pre-transplant long-term circulatory support (VAD group) *versus* patients transplanted without prior circulatory support (non-VAD group).

Patients and Methods: Over the period 2001–2006, 32 patients required heart transplantation with previous long - term circulatory support with THORATEC VAD (VAD group). Over the same period, 93 patients were transplanted without circulatory support (non-VAD group). We considered the short- and mid-term outcome of cardiac transplantation through five criterias: in-hospital mortality, overall mortality, acute allograft rejection, allograft coronary disease, 6 months creatininemia.

Results: Any difference appeared concerning in-hospital mortality and actuarial survival. The rate of acute rejection was similar, and the frequency of allograft coronary disease was greater in the VAD-group, without statistical significance ($p = 0 \cdot 17$). Six-month renal function was significantly ($p = 0, 016$) poorer (creatininemia 157 µmol/l in VAD group *versus* 120 in non-VAD group).

Conclusion: Long-term circulatory support doesn't worsen short and mid-term results of cardiac transplantation. Long-term survey is mandatory, with special concern on renal function and allograft coronary disease.

O-04-2 A new miniaturized hollow fiber oxygenator for a rat model of cardiopulmonary bypass (CPB)

B. Walpoth^a, G. Cresce^b, F. Innocente^b, D. Mugnai^a, A. Rungatscher^b, M T Tessari^b, A. Mazzucco^b, A. Kalangos^c and G. Faggian^b

^aUniversity Hospital of Geneva, Dept. of Cardiovascular Surgery, 24, Rue Micheli du Crest, 1211 Geneva, Switzerland; ^bUniversity of Verona, Cardiovascular Surgery, Piazzale le Stefani 1, 37126 Verona, Italy; ^cUniversity Hospital of Geneva, 24, Rue Micheli du Crest, 1211 Geneva, Switzerland (e-mail: beat.walpoth@bcuge.ch)

Introduction: CPB is an essential component of conventional cardiac surgery, with still unknown device/patient interactions. To evaluate the response of CPB to hemodynamic/biochemical/inflammatory/thermo-pharmacodynamic interactions, a novel, miniaturized oxygenator with controlled/standardized specifications was developed, with improved surgical central cannulation technique.

Materials/Methods: A hollow-fibre small priming volume (6.3 ml) oxygenator was manufactured from specifications resulting from engineering, heart surgery and perfusionist expertise (Dideco-Sorin Group/Italy) with the following characteristics: Gas Exchange Surface-450cm²/Heat Exchange Surface-16cm². The oxygenator was tested in vitro and in vivo in 5 anaesthetised-ventilated-open-chest rats using a miniaturized roller pump and heat exchanger. Pressures were monitored before and after the oxygenator. Central venous cannulation through the right atrium, and aortic cannulation, through the carotid artery, were used.

Results: In vitro: blood oxygenation increased 10-fold (from room air to 100% FIO₂) and PCO₂ removal was 2.5-fold. In vivo: CPB was performed without blood prime (HCT-16%) for 60mins (no ventilation) maintaining stable haemodynamics. A maximal blood flow rate of 124ml/min/kg was obtained. Arterio-venous PO₂ gradients were 10-fold (FIO₂@100%) with only 2-fold variations when changing blood flow rates.

Conclusions: Results obtained with this new, standardized, miniaturized hollow-fibre oxygenator, new cannulation technique and CPB circuit, achieves optimal gas transfer with small asanguinous priming volumes. This study opens new potentials for various CPB-related study protocols in the small animal.

O-04-3 Increased cerebral blood flow velocity after coronary artery surgery is associated with inflammatory response and reduced by heparin-coated cardiopulmonary bypass

C. Baufreton^a, J. J. Corbeau^a, A. Chevailler^a, D. Jolivot^a, A. Ter Minassian^a, D. Henrion^b and J. L. De Brux^a

^aUniversity Hospital of Angers, 4 rue Larrey, 49933 Angers, France; ^bFaculty of Medicine, Rue Haute de Reculée, 49000 Angers, France (e-mail: cbaufreton@cbu-angers.fr)

Introduction: The goal of the study was to assess whether heparin-coated cardiopulmonary bypass, that reduces complement activation, influences blood flow velocity in the middle cerebral artery.

Materials/Methods: Twenty four patients undergoing coronary artery surgery were randomly allocated to non-coated (NC group) or heparin-coated (HC group) CPB. Complement activation was assessed by measuring sC5b-9. Transcranial Doppler (TCD) examination was performed on right and left middle cerebral arteries after induction of anaesthesia and 4 hours after start CPB.

Results: Increase of sC5b-9 ($p = 0.003$) was observed in the NC group whereas changes observed in the HC group were not significant ($p = 0.31$). Intergroup difference at stop CPB was significant ($p = 0.012$). Mean blood flow velocity (MBFV) was available pre- and postoperatively in 19 patients. In the NC group, MBFV increased after operation by 33% ($p = 0.04$) but remained unchanged in the HC group (-3%). Postoperative MBFV was higher in the NC group than in the HC group ($p = 0.03$) although cardiac index, systemic vascular

resistance, hematocrit and pCO₂ were similar between groups. Postoperative MBFV was correlated with sC5b-9 at stop CPB ($r = 0.598$; $p = 0.007$).

Conclusions: Increased MBFV after coronary artery bypass grafting was associated to the proinflammatory nature of CPB and may be abolished by heparin-coating.

O-04-4 Mini-extracorporeal circulation with low dose of heparine in cardiac surgery: a safety option?

F. Doguet^a, F. Bouchart^a, A. Tabley^a, P. Y. Litzler^b, D. Scheerlink^a, H. Bocaert^a, V. Pavan^a, J. Harmoy^a, N. Eliot^a, J. Arrignon^a and J. P. Bessou^c

^aRouen University Hospital, 1 Rue de Germont, 76000 Rouen, France; ^bCHU Rouen, chirurgie cardiaque, 1 rue de Germont, 76000 rouen, France; ^cCHU Rouen, chirurgie cardiaque, 1 rue de germont, 76000 rouen, France (e-mail: fabien.doguet@chu-rouen.fr)

Introduction: The aim of these prospective non randomized study was to evaluate the effects of heparine reduction in Mini-ExtraCorporeal Circulation (MECC) comparing with standard Cardiopulmonary bypass (CPB) on postoperative bleeding and blood transfusion in cardiac surgery.

Patients and methods: Patients who underwent aortic valve replacement (AVR) or coronary artery bypass grafting (CABG) were included. Heparine dose was 3 mg/kg in CPB and 2 mg/kg in MECC. Activated Clotting Time (ACT) trigger was 350 seconds in AVR and 250 seconds in CABG. Results In CPB group (n = 39), 22 (AVR), 9 CABG, 7 AVR+CABG, and 1 Bentall+CABG were performed. 51% of patients received preoperative anticoagulation. In MECC group (n = 53), 16 AVR, 32 CABG, 4 AVR+CABG, and 1 Bentall were performed. 72% of patients received preoperative anticoagulation. Preoperative ACT were similar in MECC and CPB (122sec versus 119sec). Mean postoperative bleeding was 403 ± 194 ml in MECC group versus 528 ± 331 ml in CPB group ($p = 0.002$). Require for blood transfusion was reduced in MECC group (36% versus 49%). Mean red cell unit transfusion/patient was 0, 6 ± 0, 96 in MECC group and 1, 4 ± 1, 8 in CPB group ($p = 0.007$).

Conclusion: Heparine dose reduction associated with MECC is a safety option. It allows postoperative bleeding decrease and requires less perioperative blood transfusion.

O-04-5 Combined coronary artery bypass grafting and total thyroidectomy

E. Poli, D. Lardo, G. Lissidini, A. Gurrado, V. Carrieri, L. Greco, G. Piccinni and M. Testini

University of Bari, Dept. of General Surgery., 70125 Bari, Italy (e-mail: eli.poli@libero.it)

Introduction: The prevalence of thyroid dysfunction in patients with coronary artery disease reaches 11.2%. Thyroid function plays an important role on the cardiovascular system and surgery is frequently needed in patients with thyroid disease. A thyroid assessment is thus mandatory before heart surgery. The anatomic proximity of the heart and the thyroid gland makes a single staged procedure feasible, even though combined thyroid and cardiovascular surgery has been rarely reported.

Materials/Methods: At our academic surgical department, during the last year (January-December 2008), four patients (1 F, 3 M; age range 65–70 years) underwent a surgical procedure combining total thyroidectomy and coronary artery bypass grafting. In all cases, the preoperative diagnosis was coronary artery disease and substernal multinodular goiter, which was toxic in one.

Results: Postoperative mean stay on ICU was 22 hours; recovery was complicated by transient right laryngeal nerve palsy in one case and by transient hypocalcemia in the patient with the toxic goiter. No hemodynamic or cardiovascular compromises were noted, and mean hospital stay was 7.5 days.

Conclusions: Literature review and our experience suggest the safety and feasibility of a single staged procedure versus delayed operations, showing a lower perioperative and anaesthesiologic risk.

O-04-6 Predictive factors of multiorgan failure during long term circulatory support in bridge to heart transplantation

G. Maxant^a, M. Kindo^b, R. Demaria^a, B. Eisenmann^b, P. Rouviere^a, J. M. Frapier^a, J. P. Mazzucotelli^b and B. Albat^a

^aDepartment of Cardiac Surgery, Hôpital Arnaud de Villeneuve, 191 Av Doyen Giraud, 34090 Montpellier, France; ^bDepartment of cardiac surgery, Hôpital civil, 1, place de l'hôpital, 67100 Strasbourg, France (e-mail: g-maxant@cbru-montpellier.fr)

Objectives: To identify predictors of multiorgan failure in long-term circulatory support patients, and to seek ways of prevention of such a condition.

Patients and Methods: Over the period 2001–2006, 50 patients underwent long term circulatory support with THORATEC VAD. Among them, 8 patients died of multi organ failure, defined as the worsening of renal and hepatic function despite the correction of the cardiogenic shock. We studied preoperative and operative datas by statistical univariate analysis, looking for predictive factors of multiorgan failure.

Results: Two clinical datas was found to be statistically significant: an antecedent of arterial hypertension ($p = 0, 047$) and a sepsis at the time of the implantation ($p < 0, 001$). No hemodynamical datas was significant. Cholestasis was the only biological data found statistically significant ($p = 0, 047$). Those datas was found in an overall group analysis, and confirmed in a 'chronic dilated cardiomyopathies' subgroup excluding acute myocardial infarction.

Conclusion: Those results are consistent with other published issues, and support the key role of both hepatic centrolobular necrosis and vasoplegia in the priming and maintenance of multi organ failure.

O-04-7 Effects of roller and centrifugal pumps on splanchnic perfusion during hypothermic cardiopulmonary bypass

C. Baufreton^a, R. Trouvé^a, F. Pinaud^a, A. P. Brosseron^a, D. Loisanç^b and J. L. De Brux^a

^aUniversity Hospital of Angers, 4 rue Larrey, 49933 Angers, France; ^bHôpital Henri Mondor, 8 rue du général Sarraill, 94000 Créteil, France (e-mail: cbaufreton@cbru-angers.fr)

Introduction: Comparison of splanchnic perfusion and pulsatile flow delivered by roller (RP) or centrifugal pump (CFP) during cardiopulmonary bypass (CPB).

Materials/Methods: in two groups ($n = 6$) of 50 Kg pigs, after median laparotomy, a transit-time flow probe was placed on the superior mesenteric artery and the laser-Doppler flow (LDF) probe into the ileal lumen. CPB lasted for 120 minutes including a hypothermic (28°C) 60 minutes period of aortic cross clamp. Peak to peak arterial pressures served as a reflect of perfusion pulsatility. Water filling was provided when necessary for CPB maintenance.

Results: Compared to RP, higher mesenteric flows were provided using CFP ($p < 0.05$) although LDF were similar in both groups except during rewarmering. Using CFP, pulsatility was lower than in the RP group ($p < 0.03$) whereas gut peristalsism was visually completely abolished during aortic cross clamp time. Using CFP, water filling was higher (4150 ± 698 mL versus 415 ± 154 mL using RP; $p = 0.004$) whereas arterial pO₂ was lower after weaning CPB (38 ± 12 mm Hg versus 175 ± 101 mm Hg using RP; $p = 0.006$).

Conclusions: Although splanchnic perfusion was better preserved with CFP, pulsatile flow was better delivered by RP and this was associated with lower water intake and improved arterial pO₂ after hypothermic CPB.

O-05 Surgical Oncology

O-05-1 Malignant potential in advanced hepatocellular carcinoma depends on glucose metabolism but not angiogenesis

K. Kitamura^a, E. Hatano^a, S. Seo^b, M. Narita^a, T. Higashi^c, I. Ikai^a and S. Uemoto^a

^aKyoto University, 54 Sbogoin-Kawabara-cho, Sakyo-ku, 606-8507 Kyoto, Japan;

^bMitsubishi Kyoto Hospital, 1 Katsuragosho-cho, Nishikyo-ku, 615-8087 Kyoto, Japan;

^cShiga Medical Center, 5-4-30 Moriyama, Moriyama-shi, 524-8524 Shiga, Japan (e-mail: koji1976@kubp.kyoto-u.ac.jp)

The vascular endothelial growth factor (VEGF) has been known to the most potent and direct-acting angiogenic factor involved in tumor growth, but its pathogenic role in advanced hepatocellular carcinoma (HCC) has yet to be controversial. The PURPOSE of this study was to clarify a role of tumor angiogenesis or glucose metabolism on malignant potential in HCC.

Methods: A retrospective analysis of 63 hepatectomized patients with HCC who underwent preoperative FDG-PET scan was performed. These patients were divided into three groups (Low, Intermediate, and High) according to expression levels of Ki-67. Tumor angiogenesis was evaluated by immunohistochemical analysis of VEGF and CD34. Glucose metabolism was evaluated by immune staining for glucose transporter (Glut)-1 and FDG uptake calculated with FDG-PET scans.

Results: Overall and disease-free survival rates in the High group were significantly lower than those in other groups. Tumor angiogenesis was reduced in the High group compared with those in the other groups. Glucose metabolism in the High group was significantly enhanced than those in the other groups, and glucose metabolism was negatively correlated with tumor angiogenesis.

Conclusion: These results suggest that glucose metabolism, but not angiogenesis, may play an important role in determination of malignant potential in advanced HCC.

O-05-2 Low molecular weight heparin inhibits tumor associated angiogenesis in vivo

I. Debergh^a, N. Van Damme^a, W. Derave^b, M. Peeters^a and W. Ceelen^a

^aUniversity Hospital Ghent, De Pintelaan 185, 9000 Ghent, Belgium; ^bUniversity Ghent, Watersportlaan 2, 9000 Ghent, Belgium (e-mail: isabelle.debergh@ugent.be)

Background: Recently, low molecular weight heparins (LMWH) were found to confer a survival advantage in advanced cancer patients by inhibiting tumor associated angiogenesis.

Methods: Syrian golden hamsters were fitted with dorsal skinfold window chambers and tumor fragments were implanted in the chambers. Animals were treated with 10 daily injections of 0.07 ml saline or 200 IU of nadroparin. In vivo microscopy was performed on day 0, 3, 6 and 9 following tumor fragment implantation. Changes in the number of microvessels per area (N), microvessel diameter (D), and vascular area fraction (VAF) were calculated. Microvessel density (MVD) and vascular maturation (pericyte coverage, PCI) were assessed histologically.

Results: In the control group ($n = 23$), a moderate increase in N was observed while D increased significantly between day 0 and 9. Vascular area fraction did not change significantly over this period. In the nadroparin group ($n = 23$), however, N decreased slightly, VAF decreased significantly and MVD increased significantly between day 0 and 9. Histologically, we found an statistically significant decrease in MVD in the control group compared to the nadroparin group, whereas the PCI increased significantly.

Conclusions: The LMWH nadroparin inhibits early tumor associated angiogenesis and affects microvessel maturation in vivo.

O-05-3 Specific gene expression profiles in normal esophageal mucosa as an early indicator for the development of squamous cell cancer of the esophagus

C. Rimkus, J. Mages, M. Raggi, B. Holzmann, H. Friess and J. Theisen
Dept. of Surgery, Klinikum r.d.Isar, TU Muenchen, 81675 Munich, Germany (e-mail: theisen@chir.med.tu-muenchen.de)

Introduction: Esophageal squamous cell cancer may occur anywhere in the esophagus, making it difficult to detect it at an early stage. The gene expression profile of esophageal mucosa in the context of squamous cancer is not very well studied, but may be used as a tool for early detection of malignant potential in otherwise normal appearing mucosa.

Methods: Specimens of 12 patients with esophageal squamous cell cancer and their corresponding normal tissues were used for microarray (Affymetrix U133 plus 2.0) analysis. Differences in gene expression profiles between the control group with a normal esophagus, the normal mucosa and the cancer tissue were analyzed.

Results: Comparison of gene expression profiles identified gene profiles specific to the three groups. There were 184 genes significantly ($p = 0.01$) differentially regulated between the control group and the normal tissue in cancer patients. These "Esophageal cancer clusters," represented proteins known for their involvement in the early events in the carcinogenesis of squamous cell cancer of the esophagus, such as proliferation, immune response, and alcohol related genes.

Conclusion: These results may provide evidence for the fact that the exposure of the esophagus to the carcinogens accounts for clonal changes detectable by microarray analysis before visible lesions occur.

O-05-4 Anti-proCOL11A1, a new marker of infiltrating breast cancer

C. García Pravia^a, N. Fuentes Martínez^a, M. García Ocaña^b, J. Del Amo^c, J. R. De Los Toyos^d, M. Fresno Forcelledo^e, L. Simón Buela^f and L. Barneo^g

^aHospital Universitario Central, Servicio de Anatomía Patológica, 33006 Oviedo, Spain; ^bUniversidad de Oviedo, Spain, Unidad de Biotecnología, 33006 Oviedo, Spain; ^cProgenika Biopharma, S.A., Parque Tecnológico Zamudio, 48160 Derio, Vizcaya, Spain; ^dUniversidad de Oviedo, Area Immunología, 33006 Oviedo, Spain; ^eHospital Universitario Central, Servicio Anatomía Patológica, 33006 Oviedo, Spain; ^fProgenika Biopharma, S.A., Parque Tecnológico Zamudio, 48160 Derio, Vizcaya, Spain; ^gHospital Universitario Central, Servicio Cirugía general, 33006 Oviedo, Spain (e-mail: cgpravia@botmail.com)

Introduction: Early and accurate diagnosis of breast cancer can be achieved by core biopsy. Pitfalls and problems in differential diagnosis with benign lesions (e.g. sclerosing adenosis) can occur when dealing with a limited sample of tissue. We have validated the new antibody anti-proCOL11A1 in this setting.

Methods: 52 benign and 51 malignant samples of breast tissue were evaluated. Gene expression on a subset of the above samples was evaluated by Q-RT-PCR. A new polyclonal antibody anti-proCOL11A1 against the less homologous region between proCOL11A1 and other procollagens was generated. Immunostaining was double blind scored by two pathologists and by means of the image analysis software Qwin. Sensitivity and specificity were depicted as a receiver operator characteristics (ROC) analysis

Results: Q-RT-PCR showed overexpression of COL11A1 gene in malignant samples. Anti-proCOL11A1 stained fibroblasts in 98% of malignant samples, and in 13% of benign samples. Specificity and sensitivity were 92% and 96% respectively. When we compared sclerosing adenosis (SA) and infiltrating ductal breast cancer (IDC), 11% of SA and 100% of IDC were positive for anti-proCOL11A1. Specificity and sensitivity were 96 and 98%, respectively.

Conclusions: The new antibody anti-proCOL11A1 recognizes desmoplastic fibroblasts of IDC and can be useful for differential diagnosis with benign lesions, particularly sclerosing adenosis.

O-05-5 Changes in hepatic perfusion detected with CT perfusion during the growth and development of experimental micrometastases in a rat model

C. Hatwell^a, F. Bretagnol^a, M. Zappa^b, A. Alves^a, V. Paradis^c, V. Vilgrain^b and Y. Panis^a

^aBeaujon Hospital, Department of colorectal surgery, 100 bd du général leclerc, 92110 Clichy, France; ^bBeaujon Hospital, Department of radiology, 100 bd du général leclerc, 92110 Clichy, France; ^cBeaujon Hospital, Department of pathology, 100 bd du général leclerc, 92110 Clichy, France

Background: A quarter of patients who undergo curative resection of primary colorectal carcinoma has occult hepatic metastases which cannot be detected by conventional imaging. The aim of this study was to assess whether hepatic perfusion changes induced by micrometastases can be depicted by CT perfusion in a hepatic colorectal metastases rat model.

Methods: Hepatic metastases were produced in 43 BD IX rats by injecting 1 million DHDK12 colorectal carcinoma cells into the portal vein. Eight normal rats served as controls. CT perfusion was performed for the measurement of the hepatic portal blood flow, the mean transit time and the hepatic artery index. Rats underwent imaging at time of micrometastases stage and macrometastases stage.

Results: Compared to the control group, micrometastases and macrometastases induced significant hepatic perfusion changes: a 42% and 38% decrease in the mean transit time ($P < 0.008$), a 46% and 57% increase in the portal hepatic blood flow ($P < 0.05$). These findings suggest shunts around the hepatic metastases.

Conclusion: Significant hepatic perfusion changes were induced by occult micrometastases in rats and could be detected by perfusion CT. Such detection of occult micrometastases represents a considerable diagnostic challenge to define "high-risk" patients and to propose neoadjuvant or adjuvant chemotherapy.

O-05-6 A definitive role for sentinel lymph node mapping with biopsy for cutaneous melanoma of the head and neck

J. Kelly and H. P. Redmond

Department of Academic Surgery, Cork University Hospital, University College Cork, Wilton, Cork, Ireland (e-mail: justinjosbkelly@gmail.com)

Aims: To evaluate the role, if any, of sentinel lymph node mapping (SLNM) with biopsy (SLNB) in patients with cutaneous melanoma of the head and neck.

Methods: Patients with cutaneous melanoma of the head and neck undergoing SLNM were identified from a database comprising 480 patients. Factors examined included histological subtype, site and depth of lesion, preoperative lymphoscintigraphy, percentage of positive SLNs, regional recurrence in the setting of a negative SLNB result (false-negative rate), complications, further lymphadenectomy and follow up.

Results: Median patient age was 51. Mean Breslow depth was 3.25 mm (range 1–19). A SLN was identified in 27/40 patients who underwent SLNM (mean 2 lymph nodes per patient). Of these, 6 (22%) patients were positive for metastatic melanoma. The false-negative rate was 9.5%. Median follow up was 39.6 months (range 12–96). No facial nerve injury or other morbidity occurred.

Conclusions: SLNB is a reliable and safe technique to diagnose regional spread from head and neck cutaneous melanoma. It is more difficult than at other sites. These lesions have a higher incidence of failed SLNM and a higher rate of recurrence following negative SLNB, when compared to truncal and extremity lesions. Nodular melanomas are more likely to fail SLNM.

O-05-7 Interfere IGF-I pathways to augment sensitivity of colon cancer cells to current chemotherapeutic agents

P. Vasas, S. Y. Yang and M. Winslet

University College London, Division of Surgery, Rowland Hill Street, NW3 2PF London, United Kingdom (e-mail: vasasdr@gmail.com)

Introduction: The resistance of tumour cells to apoptosis is a major contributor to the limited effectiveness of chemotherapies. Insulin-like growth factor-I (IGF-I) and its receptor (IGF-IR) play multiple roles in the malignant transformation of colonic mucosal cells. Blocking IGF-IR has been proven to induce colorectal cancer cell apoptosis.

Aim: To explore the possibilities of using different IGF-IR inhibitors to increase efficacy of current chemotherapy agent to treat colorectal cancers.

Method: Two types of colorectal cancer (p53 wild type and p53 mutation type) cells and 5-FU (the most common used chemotherapeutic agent for colorectal cancers) was used in the experiments. Different concentration of IGF-IR inhibitors (M1557 and AG1024) were employed together with 5-FU. The effects of combinations of IGF-IR inhibitors with 5-FU were assessed by measuring cancer cell proliferation, viability and cell death with non-radioactive assay.

Results: The AG1024 augmented the 5-FU cytotoxic effect in dose-related manner in colorectal cancer cells. The combination of 5 μ M AG1024 with 5 μ M

5-FU enhanced cancer cell death by 60%, while it did not cause any muscle cell's death.

Conclusion: Our data suggest that IGF-I signalling is involved with cancer cell survival and inhibition IGF-IR can enhance chemotherapy agents to kill cancer cells.

O-06 Organ and Cell Transplantation

O-06-1 Liver transplantation of human progenitor cells in NOD/SCID mice: a new therapy for liver failure

A. Herrero^a, M. Daujat^b, C. Duret^c, S. Gerbal^d, J. Ramos^e, F. Borie^f, F. Navarro^a and P. Maurel^g

^adigestive surgery, Saint Eloi Hospital, 34090 montpellier, France; ^binserm, IRB, Saint eloi hospital, 34090 montpellier, France; ^cInserm, IRB, saint eloi hospital, 34090 montpellier, France; ^dinserm, IRB, Saint Eloi hospital, 34090 montpellier, France; ^eanatomopathologie, saint eloi hospital, 34090 montpellier, France; ^fDigestive Surgery, CHU Caremeau, Place du Pr Robert Debré, 30900 Nîmes, France; ^gInserm, IRB, Saint Eloi hospital, 34090 montpellier, France (e-mail: a-herrero@cbu-montpellier.fr)

Background: Non parenchymal epithelial cells (NPE) isolated from human livers contain progenitor cells able to differentiate in vitro. We have tested their ability to nest and differentiate in vivo in NOD/SCID mouse livers.

Methods: One million of NPE, transduced by a luciferase expressing the lentiviral vector, were directly injected in the liver parenchyma of six mice. A proliferative advantage was brought by intraperitoneal injection of retrorsine, to block proliferation of native hepatocytes, and by performing a partial hepatectomy to stimulate regeneration. Mice were observed through a chemoluminescent camera, and a blood test was sampled to monitor human albumin (hAlb) secretion every other day for one week and weekly thereafter. Animals were sacrificed at 4 weeks for tissues and blood identification of hAlb and α IAT by RT-PCR, immunohistochemistry, and Elisa.

Results: A strong positivity of Luciferase was observed as day 3 and hAlb was detected at one and peaked at 3 weeks. NPE were detected in the liver where they were clustered and located around portal tracts. hAlb and α IAT were positive.

Conclusion: NPE cells can implant in the liver and acquire the function of human albumin secretion. These cells are able to proliferate in vitro, could therefore be an alternative cell source for hepatocytes transplantation.

O-06-2 Role of oxygen during hypothermic machine perfusion preservation

B. Luer, P. Efferz and T. Minor

Surgical Research Division, Sigmund Freud Str. 25, 53127 Bonn, Germany (e-mail: tminor@uni-bonn.de)

Introduction: Grafts from non-heartbeating donors are thought to be best preserved by hypothermic machine perfusion (HMP). Controversy exists concerning the role of oxygenation during HMP. Here we wanted to evaluate the relative role of oxygenation for graft integrity during and after HMP.

Material & Methods: Cardiac arrest was induced in male Wistar rats (250–300 g) by phrenotomy. Thirty minutes later livers were flushed via the portal vein and subjected to 18 h of HMP at 5ml/min at 4°C. During HMP the preservation solution was equilibrated with 100%oxygen (HMP100), with

air (HMP20) or not oxygenated at all (HMP0). Graft viability was assessed thereafter upon warm reperfusion in vitro.

Results: During preservation HMP100 and HMP20 equally reduced ALT-release by 50% compared to HMP0. HMP100 enhanced oxygen free radical mediated lipid peroxidation (LPO) during preservation, but to a similar extent reduced LPO upon warm reperfusion compared to both HMP20 and HMP0. Enzyme release during reperfusion was reduced by ~40% (HMP20) or ~70% (HMP100) after oxygenation compared to HMP0. Functional recovery (bile production) was only enhanced by HMP100 (approx. 2fold increase *versus* HMP20 and HMP0 p < 0.05, resp.).

Conclusion: Efficiency of HMP might be markedly increased by additional aeration of the perfusate, most successfully by equilibration with 100% oxygen.

O-06-3 Fasting protects against hepatic ischemia-reperfusion injury and has no negative effect on liver regeneration

M. Verweij, T. Ginhoven, J. Mitchell, S. Van Den Engel, J. Hoeijmakers, J. Ijzermans and R. Bruin

Erasmus MC, dr. Molewaterplein 50, 3015 GE Rotterdam, Netherlands (e-mail: t.vanginboven@erasmusmc.nl)

Introduction: Previously, we found that fasting protects against renal ischemia-reperfusion injury (IR). In the present study, we investigated if the protective effect extended to the liver.

Materials and Methods: Male C57BL/6 mice were fed ad libitum or fasted 24–72 hours prior to surgery. 70% hepatic ischemia was applied for 75 minutes. Liver damage and inflammatory markers were investigated. The regenerative capacity was assessed after resection of the left liver lobe by proliferation (PCNA staining), liver-to-body-weight ratio, and protein-, DNA-, and glycogen content.

Results: Fasting for 24–72 hours protected against hepatic IR. The fasted group had significantly lower ALAT values and mRNA levels for IL-6 and p-selectin 6 hours post-reperfusion. At 24 hours post-reperfusion there was significantly less hemorrhagic necrosis. On post-hepatectomy day (PHD) 5, the liver-to-body-weight ratio of fasted animals was significantly increased compared to fed animals. Livers of fasted animals contained less glycogen before surgery, but significantly more on PHD 5. Proliferation rate and protein content were similar. Liver DNA content was significantly lower in fasted animals before surgery, but equal to the fed controls on PHD 5.

Conclusions: 24–72 hours of fasting significantly protects the liver against IR, and preserves the regenerative response after partial hepatectomy.

O-06-4 The use of hemoglobin based oxygen carriers for machine preservation at subnormothermic temperatures - a new alternative for improving the preservation of marginal donor livers?

P. Olschewski, V. Ariyaghagorn, M. Mentzel, V. Schmitz, U. Neumann, P. Neuhaus and G. Puhl

Department of Surgery Charité, Augustenburger Platz 1, 13353 Berlin, Germany (e-mail: peter.olschewski@charite.de)

Machine perfusion (MP) is suggested for marginal donor livers. In this study MP at 21°C was compared to static cold storage (CS) or MP at 4°C. An artificial-haemoglobin-based-oxygen-carrier (Oxyglobin) was used for providing sufficient oxygen under low flow conditions.

	HTK-MP 4°C	Belzer-MP 4°C	Oxy-MP 21°C	HTK-CS 4°C
AST mU/l/g liver weight	16713 ± 7793*	3538 ± 1885	4809 ± 2682	n.a.
Oxygen consu mlO2/min	2, 45 ± 0, 56	1, 65 ± 0, 90	182 ± 62	n.a.
ATP content nM/mg	335, 54 ± 63, 48	473, 02 ± 241, 21	319, 52 ± 169, 74	32, 96 ± 18, 92#
Survival (> 60 days)	0/5	5/6	6/6	3/5

*p < 0, 05 vs Belzer-MP4C and Oxy-MP21C; #< 0, 05 vs HTK-CS4C

Methods: Livers from non-heparinized Lewis rats (250–270 g) were harvested 60min after cardiac death induced by phrenotomy. Livers were preserved for 6h either by cold storage (HTK-CS) or oxygenated MP (5mls/min flow rate) at 4C (Belzer-MP, HTK-MP) and 21C (Oxyglobin based solution, Oxy-MP) respectively. Finally livers were transplanted orthotopically using male Lewis rats as recipients (n ≥ 5 for each group).

Results after 6 hours of machine perfusion: (See table previous page)

Summary: MP facilitates revitalizing and transplantation of marginal livers even after 60min of warm ischemic time. Livers preserved at 4C using Belzer-MP-solution or at 21C using an artificial-haemoglobin-based-solution had a significant lower release of transaminases during MP and higher ATP levels as well, resulting in an improved survival rate compared to CS or MP using HTK solution. For the first time the successful use of artificial-haemoglobin based-oxygen carriers for MP at subnormothermic temperatures was shown.

O-06-5 Effect of human placenta-derived mesenchymal stem cells pretreated with hyaluronic and butyric esters on renal ischemic damage in rats

F. Neri^a, M. Tsivian^a, F. Bianchi^b, G. Piras^a, S. Cantoni^b, G. Cavallari^a, G. Pasquinelli^c, G. La Manna^d, C. Ventura^b, S. Stefoni^d, A. Faenza^a and B. Nardo^a

^aGeneral Surgery and Transplants, V. Massarenti 9, S. Orsola Hosp., 40100 Bologna, Italy; ^bMolecular Biology, Cardiology, V. Massarenti 9, S. Orsola Hosp, 40100 Bologna, Italy; ^cClinical Pathology, V. Massarenti 9, S. Orsola Hosp, 40100 Bologna, Italy; ^dNephrology and Dialysis, V. Massarenti 9, S. Orsola Hosp, 40100 Bologna, Italy (e-mail: flavia_neri84@hotmail.it)

Introduction: Acute renal failure (ARF) remains a major health care problem nowadays. Mesenchymal stem cells (MSC) seem to offer promising treatment options in ARF. In this study we assess the effect of human placenta-derived MSC (hPD-MSC), alone and pre-treated with hyaluronic-butirric esters (HBE), on renal function recovery in an ARF model in rats.

Materials and Methods: ARF was induced by bilateral renal pedicles clamping for 45' in 18 animals randomly assigned into 4 arms: (A)sham operated, (B)intraparenchymal injection of PBS, (C)intraparenchymal injection of hPD-MSC, and (D)intraparenchymal injection of hPD-MSC pre-treated with HBE. Renal function was assessed on days 1, 3, 5 and 7. We evaluated tissue damage and the presence of MSC through light microscopy and immunostaining analyses.

Results: MSC-treated groups showed better renal function at 24h (creatinine:1.8 mg/dL for groupsC-D, 3 mg/dL for groupsA-B; sodium excretion respectively 1% versus 5%). Renal function values recovered by day 3 in groupsC-D and day 7 in groupsA-B. At 7 days tissue damage was far less severe in groupD than in all other groups (p < 0.0001).

Conclusions: hPD-MSC accelerate renal functional recovery from ARF in rats. Their beneficial effects is significant as early as 24 hours from injury. HBE pre-treatment seems to reduce tubular damage as shown by histology.

O-06-6 Improved microcirculation after liver transplantation with polysol, a novel preservation solution

J. Fujishiro^a, L. Wei^b, N. Schaefer^c, B. Doorschodt^d, E. Kobayashi^c and R. Tolba^d

^aDept. Pediatric surgery, University of Tsukuba, Tennodai 1-1-1, Tsukuba, 305-8575 Tsukuba, Japan; ^bHouse of experimental therapy, University of Bonn, Sigmund-Freud Str.25, 53115 Bonn, Germany; ^cDept. of surgery - Fac. Medicine, University of Bonn, Sigmund-Freud Str.25, 53115 Bonn, Germany; ^dInstitute for Lab. Animal Sc., RWTH Aachen Technical University, 52074 Aachen, Germany; ^eDep. Organ Replacement Research, Jichi Medical University, Yakushiji 3311-1, 329-0498 Shimotsuke, Japan (e-mail: jfujishi@md.tsukuba.ac.jp)

Introduction: Improving organ preservation strategy is a crucial key to solve the deteriorating donor shortage in organ transplantation. Recently, Polysol, a new preservation solution which consist of 60 components, with low viscosity and high buffering capacity, was developed. The aim of the study is to investigate the effect of Polysol on liver preservation in rat liver transplantation.

Methods: Orthotopic liver transplantation was performed after 16-hour cold preservation with the University of Wisconsin (UW) solution or Polysol, using Wistar rats as donors and recipients. In vivo microcirculatory data in the liver grafts were obtained using a combined laser Doppler flowmeter and a tissue spectrometer system (O2C: oxygen-to-see). Tissue and serum samples were also taken for analysis.

Results: Six hour after reperfusion, Polysol group showed better microcirculation with higher capillary blood flow in the liver graft than UW group (684 ± 62 versus 447 ± 44 [AU], p < 0.05). Interestingly, there is a tendency that serum level of liver enzyme (ALT) and interleukin-6 was lower in UW group than Polysol group (p = n.s.).

Conclusion: Cold preservation with Polysol resulted in better graft microcirculation after rat liver transplantation. Polysol is a promising preservation solution for improve microcirculation of the graft.

O-06-7 Surgical versus radiological routes for intra portal islet transplantation

R. Caiazzo^a, L. Arnalsteen^a, G. Sergent^b, V. Gmyr^c, V. Raverdi^b, N. Declercq^b, C. Noel^b, O. Ernst^b, J. Kerr-Conte^c, M. C. Vantghem^a and F. Pattou^a

^aLille University Hospital INSERM, 2, Avenue Oscar Lambret, 59000 Lille, France; ^bLille University Hospital, 2, Avenue Oscar Lambret, 59000 Lille, France; ^cUniversity of Lille 2 INSERMU859, 2, Avenue Oscar Lambret, 59000 Lille, France (e-mail: robert.caiazzo@cbrv-lille.fr)

Background: Intraportal islet transplantation is increasingly proposed to restore endocrine pancreatic function in patients with severe diabetes. Islets are generally infused in the liver with a minimally invasive radiological procedure that remains associated with a significant morbidity.

Methods: Fifty five islet infusions were performed in 22 patients with severe diabetes (n = 14) and/or previous kidney graft (n = 8). The intra portal catheter was placed by radiological percutaneous technique or by surgery through a 3 cm Mac Burney incision and catheterization of a proximal mesenteric branch (n = 38).

Results: Preop characteristics of the islet preparations were similar for both infusion routes. The overall duration of the procedure was superior for surgical route. Infusion time and portal pressure increase were similar in both routes, as well as the post-operative stay. The infusion route had no significant influence on liver nor on islet non specific immediate destruction. Primary graft function were not statistically different between both route. Two (12%) procedure related severe adverse events were observed after radiological infusion versus one (3%) after surgical infusion.

Conclusions: Reducing the risk for procedure related complications without modifying islet transplantation outcome, even if little more invasive, the surgical route could represent a better option in selected patients.

O-07 Inflammation

O-07-1 Use of green fluorescent protein (GFP) to monitor translocation and characterizing the immunoregulation of probiotic lactobacilli in the intestinal tract of mice

M. Nouri^a, S. Lavasani^a, I. Lazou Ahrén^b, E. Zhang^c, B. Jéppsson^a and H. Thorlacius^a

^aDepartment of Surgery, Lund University, UMAS, 20502 Malmö, Sweden; ^bProbi AB, IDEON, Gamma 1, 22370 Lund, Sweden; ^cDiabetes Centre, Lund University, UMAS, 20502 Malmö, Sweden (e-mail: mebrnaz.nouri@med.lu.se)

Introduction: Probiotic bacteria are health beneficial microorganisms that can colonize the gut and induce immunomodulatory effects on immune system. Their interactions with antigen-presenting cells can highly influence the outcome of T-cell responses. The aim of our study was to introduce GFP-gene to probiotic bacteria and study their interaction with intestinal dendritic cells (DCs) and macrophages (MQs).

Methods: *Lactobacillus plantarum* HEAL9 was transformed with GFP expression vector pRV85. The GFP expressed clones were characterized by flow cytometry (FACS) and fluorescence microscopy. C57BL/6 mice were orally treated with GFP-bacteria. Peyer's patches were isolated and analyzed for presence of GFP-bacteria and their interaction with DCs and MQs.

Results: The stable expression of GFP in transformed bacteria was demonstrated. Confocal microscopic analysis confirms translocation of our bacteria in Peyer's Patches through intestinal tract. FACS analysis of immune cells in these organs demonstrated uptake of GFP-bacteria by DCs and MQs followed by activation and upregulation of regulatory cytokine IL-10 in both populations and IL-12 only in MQs.

Conclusions: GFP-labelled probiotics can be used to characterize bacterial translocation and elucidate the interaction between the bacteria and gut-associated lymphoid organs in order to reveal the mechanism behind the immunomodulatory action of probiotics.

O-07-2 The synthetic human chorionic gonadotrophin related oligopeptide LQGV reduces CLP induced mortality and inflammation

J. W. Van Den Berg, W. Dik, N. Khan, F. Bonthuis, M. Van Der Zee, J. Van Holten, J. Ijzermans, R. Benner and R. De Bruin

Erasmus MC, Dr. Molewaterplein 50, 3015GE Rotterdam, Netherlands (e-mail: j.w.vandenbergh@erasmusmc.nl)

Mortality in septic patients remains high and efforts to modulate the inflammatory response so far failed to improve survival. Synthetic oligopeptides related to human chorionic gonadotrophin (hCG) inhibit inflammation after hemorrhagic shock and resuscitation. We investigated whether one of these oligopeptides, namely LQGV, improves survival and reduces inflammation in a cecal ligation and puncture (CLP) model.

C57BL/6 mice were subjected to cecal ligation, followed by double puncture of the ligated cecum. The synthetic hCG-related oligopeptide LQGV was administered (5 mg/kg BW) intravenously 5 minutes preoperative and 20 minutes postoperative. Mice receiving PBS served as controls. Survival, bacteremia, and plasma cytokine levels were determined at different time-points post-CLP.

In the control group mortality was 80% at 5 days post-CLP. LQGV treatment significantly ($p < 0.05$) reduced mortality to 50%. LQGV treatment was associated with a decrease in systemic levels of IL-6, TNF- α , MCP-1 and IL-10. LQGV treatment did not affect the severity of bacteremia.

In conclusion, the hCG related peptide LQGV improves survival in the CLP model during the acute septic phase. This is associated with a reduced inflammatory response. Therefore, this peptide might have therapeutic potential in reducing the development or severity of sepsis.

O-07-3 CXCR2 regulates pulmonary infiltration of neutrophils via Mac-1 expression in abdominal sepsis

S. Zhang, M. Rahman, Y. Wang, B. Jeppsson and H. Thorlacius

Department of Surgery, Lund University, UMAS, 20502 Malmö, Sweden

Background: CXC Chemokines coordinates neutrophil trafficking to extravascular sites of inflammation. Herein, we hypothesized that CXCR2 may regulate neutrophil recruitment to the lung in abdominal sepsis.

Methods: Male C57BL/6 mice underwent cecal ligation and puncture (CLP). Animals were pretreated with a CXCR2 specific antagonist, SB225002, at 4 mg/kg. Bronchoalveolar fluid and lung tissue were harvested for analysis of leukocyte recruitment, edema formation and CXC chemokine formation. Blood was collected for flow cytometric analysis of Mac-1 expression.

Results: SB225002 decreased CLP-induced neutrophil infiltration into bronchoalveolar space by 73%. Moreover blocking CXCR2 function reduced CLP-induced lung edema formation by 88%. CLP increased Mac-1 expression on neutrophils, which was attenuated by SB225002 administration. However, formation of CXC chemokines in the lung was intact in mice pretreated with CXCR2 antagonist.

Conclusions: Our data suggest that CXCR2 signaling regulates pulmonary accumulation of neutrophils via Mac-1 expression on neutrophils in abdominal sepsis.

O-07-4 Splanchnic Th2 and Th1 cytokine redistribution in microsurgical cholestatic rats

M. Losada^a, A. Cruz^b, J. Garcia-Dominguez^c, M. A. Aller^d, C. Garcia^e, E. Vara^e and J. Arias^f

^aSurgery Unit Hospital Sureste, Camino Valdecipreste s/n, 28500 Arganda del Rey. (Madrid), Spain; ^bGeneral Unit Surgery, Hospital del Henares, Avda. Maria Curie s.n., 28822 Coslada (Madrid), Spain; ^cPlastic Surgery Unit., University Getafe Hospital., 28905 Getafe (Madrid), Spain; ^dSurgery Dpt Medicine School. UCM, Plaza Ramon y Cajal s/n, 28040 Madrid, Spain; ^eMol Biology and Biochemistry Dp, School of Medicine, UCM, 28040 Madrid, Spain; ^fSurgery Dpt. Medicine School. UCM, Plaza Ramon y Cajal s/n, 28040 Madrid, Spain (e-mail: manuellosadaruiz@hotmail.com)

Introduction: Long-term extrahepatic cholestasis induces an array of splanchnic alterations that could have an inflammatory pathophysiology.

Material and Methods: We measured serum levels of hepatobiliary injury markers and the acute phase proteins, alpha-1-Major Acid Protein (a1-MAP) and alpha-1-Acid Glycoprotein (a1-GPA), in rats six weeks after microsurgical extrahepatic cholestasis. We also assayed Th1 (TNF- α and IL-1b) and Th2 (IL-4 and IL-10) cytokine levels in liver, ileum, spleen and mesenteric lymph complex by ELISA techniques. Liver fibrosis was measured by Sirius Red stain and mast cell liver infiltration by Giemsa stain.

Results: The cholestatic-rats showed an increase ($p < 0.001$) in serum levels of bile acids, total and direct bilirubin, AST, ALT, AST/ALT index, g-GT, alkaline phosphatase, a1-MAP, a1-GPA, and LDH ($p < 0.05$). TNF- α , IL-1b, IL-4 and IL-10 increased in the ileum ($p < 0.01$) and mesenteric lymph complex ($p < 0.001$) and decreased in the liver ($p < 0.001$). A marked bile proliferation, fibrosis ($p < 0.001$) and mast cell infiltration was also shown in cholestatic-rats liver.

Conclusion: The splanchnic redistribution of cytokines, with an increase of Th1 and Th2 production in the small bowel and in the mesenteric lymph complex, supports the key role of inflammatory mechanisms in rats with biliary fibrosis.

O-07-5 Inflammation and epigenetic regulation, a novel approach

D. Power^a, J. H. Wang^b and H. P. Redmond^c

^aDepartment of Academic Surgery, Cork University Hospital, Wilton, Cork, Ireland;

^bDept of Academic Surgery, Cork University Hospital, Wilton, Cork, Ireland;

^cDepartment of Academic Surgery, Cork University Hospital, University College Cork, Wilton, Cork, Ireland (e-mail: davyppops81@hotmail.com)

Background: Inflammation and sepsis are complex responses induced chiefly via Toll-like receptors (TLRs). TLRs in turn induce thousands of genes, leading to a broad spectrum of effects. We hypothesise that, given this wide diversity, additional genetic regulation exist to control these various effects of TLR induction.

Methods: Mouse bone marrow macrophages were harvested into two groups; control and treatment, and stimulated with BLP as appropriate. RNA was extracted. DNA gels and spectrophotometry assured quality. RNA microarray analysis (Affymetrix 430 2.0 mouse genome arrays) and sub-group analysis was performed using the NCBI database.

Results: 9402 genes were significantly up- or down-regulated (a 1.5 fold change deemed significant). Two sub-classifications were identified; "Tolerisable" (coding for pro-inflammatory effects) were down regulated significantly and "Non-Tolerisable" (coding for anti-microbial effects) were significantly up-regulated. The top 100 genes of each group were further analysed.

Tolerisable (%) Non-Tolerisable (%) Sub-Classification Interferon Response 18 0 Chemotaxis/Cell Migration 6 12 Pathogen Recognition 9 20 Pro-Inflammatory Mediators 22 7 Anti-Inflammatory Mediators 6 21 Metabolic 39 40.

Conclusion: Given the vast scope, and seemingly contradictory, effects of genes induced by TLRs, these results support our hypothesis that additional regulatory mechanisms must exist.

O-07-6 The efficiency of dimethylthiourea (DMTU) therapy in acute pulmonary damage formed experimentally with smoke-inhalation in rabbits

M. Sahin^a, H. Kara^b, E. M. Kafali^b, R. Pekcici^c, S. Ozdinc^b and M. Uyar^d

^aSelcuk University, Dept. of General Surgery, 42100 Konya, Turkey; ^bSelcuk University, Meram Medical Faculty, Department of Emergency Medicine, 42100 Konya, Turkey; ^cAnkara State Hospital, Dept. of General Surgery, 06100 Ankara, Turkey; ^dSelcuk University, Meram Medical Faculty, Department of Public Health, 42100 Konya, Turkey (e-mail: drsahin@selcuk.edu.tr)

Introduction: The aim of the study is to search the effects of the therapy of dimethylthiourea (DMTU) which is an antioxidant agent in the ARDS model caused experimentally by smoke inhalation.

Materials/Methods: 24 New Zealand type female test rabbits were used with the permission approved by the ethic board of Selcuk University. They were divided into control, sham and DMTU (600 mg/kg) groups. At the 0th, 3rd and 9th hours, blood samples were obtained for arterial blood gases, NO, IL-6, hemogram and biochemical tests, and pulmonary tissue samples were taken for histopathologic tests shortly after their sacrifice at 96th hour. ANOVA variance analysis and Mann-Whitney U test were used for statistical analysis.

Results: The arterial blood pH, PO₂ and SO₂ values in DMTU group were significantly higher than those in the control and sham group ($p < 0.05$). DMTU had no positive effects on the levels of plasm NO and IL-6. There was statistically significant difference between sham, DMTU and other groups in terms of the histopathologic values ($p < 0.05$).

Conclusion: In this study, DMTU had positive effects on the arterial blood pH, pO₂ and SO₂ and pulmonary histopathology levels in the acute pulmonary damage formed experimentally. Further studies will make it possible to use dimethylthiourea (DMTU) in therapy.

O-07-7 Prevention of experimental rheumatoid arthritis with oral phosphatidylcholine supplementation

G. Eros^a, S. Ibrahim^b, N. Siebert^c, M. Boros^d and B. Vollmar^c

^aUniversity of Szeged, Pecs u. 6., H-6720 Szeged, Hungary; ^bUniversity of Rostock, Schillingallee 70, D-18057 Rostock, Germany; ^cUniversity of Rostock, Schillingallee 69a, D-18057 Rostock, Germany; ^dInstitute of Surgical Research, Hungary, Szeged, Pécsi u. 6, H-6721 Szeged, Hungary (e-mail: erosg@expur.szote.u-szeged.hu)

Introduction: Phosphatidylcholine (PC) exhibits anti-inflammatory properties in various stress conditions. We hypothesized that dietary PC may potentially decrease inflammatory activation in collagen-induced arthritis (CIA), a murine model of rheumatoid arthritis.

Methods: 50 mice were allocated into 5 groups. In groups 1–3 ($n = 10$ each), CIA was induced by administration of bovine collagen II. In group 2 the animals were fed ad libitum with PC-enriched diet as a pre-treatment, while the animals of group 3 received this nourishment as a therapy, after the onset of the symptoms. The severity of the disease, inflammation-linked hyperalgesia and microcirculatory changes of the knee joints (in vivo fluorescence microscopy) were assessed. Additionally, the mRNA expressions of cannabinoid receptors 1 and 2, TNF-alpha and endothelial (eNOS) and inducible nitric oxide synthase (iNOS) were determined, and classical histological analysis was performed.

Results: PC pretreatment reduced the CIA-induced hypersensitivity, the microcirculatory signs of inflammation, the structural damage and also decreased the expression of iNOS. Late PC therapy decreased the expression of iNOS but did not interfere with other inflammatory parameters.

Conclusions: Prophylactic dietary PC supplementation decreases the functional, microcirculatory and morphological manifestations of chronic arthritis, but the critical time for PC involvement is during the onset of disease development.

O-08 Cardiac Surgery

O-08-1 Temporary vascular occlusion during surgery of small vessels in human using the gel LeGoo™: preliminary results

O. Bouchot^a, E. Steinmetz^a, J. P. Berne^a, R. Berger^b, F. Brunotte^c and R. Brenot^a

^aHopital du Bocage, 2 Bd Mar de Lattre de Tassigny, 21000 Dijon, France; ^bDepartment of Surgery, BIDMC and Harvard Medical School, Boston, MA 02215, United States of America; ^cLE2I, UMR CNRS 5158, Université de Dijon, 21000 Dijon, France (e-mail: obouchot@free.fr)

Objective: To evaluate the feasibility of LeGoo™ for temporary occlusion of small diameter arteries in heart surgery and peripheral vascular surgeries.

Material and methods: One hundred and twenty nine arteries, in 71 patients, underwent surgery using LeGoo for temporary flow interruption. These included: 42 beating heart coronary bypasses; 9 coronary bypasses on pump (in which valve replacement necessitated use of the pump); 4 coronary bypasses on pump with beating heart (low left ejection ventricular function), 5 distal bypasses, (2 anterior tibial, 1 popliteal, 1 peroneal artery and 1 tibio-peroneal trunk) and 11 radio-cephalic AV fistulae using LeGoo for occlusion of the radial artery.

Results: In the cardiac group (55 patients), 113 coronaries anastomoses was performed using the gel LeGoo™. The average duration of occlusion was 11.8+/-3.4 minutes. Hemodynamic instability or dangerous arrhythmias were not encountered in 52 patients. In 86% of the cases the quality of bloodless field was Excellent or Good.

All vascular anastomoses ($n = 26$) were completed without difficulty using LeGoo as the sole means for obtaining flow interruption. The mean time of arteries occlusion was 14 min ± 4 min. Conclusions LeGoo provides safe, temporary flow interruption in small arteries obviating the use of vascular clamps.

O-08-2 Biodegradable small calibre polydioxanone-based vascular prostheses: potential as coronary bypass grafts

B. Walpoth^a, M. Cikirikcioglu^b, D. Mugnai^a, J. C. Tille^c, A. Kalangos^b and G. Bowlin^d

^aUniversity Hospital of Geneva, Dept. of Cardiovascular Surgery, 24, Rue Micheli du Crest, 1211 Geneva, Switzerland; ^bUniversity Hospital of Geneva, 24, Rue Micheli du Crest, 1211 Geneva, Switzerland; ^cUniversity Hospital of Geneva, Department of Pathology, 24 rue Micheli-du-Crest, 1211 Geneva, Switzerland; ^dVirginia Commonwealth University, Dept. of Biomedical Engineering, 1112 East Clay Street, VIRGINIA, AK 23298-0694, United States of America (e-mail: beat.walpoth@bcug.ch)

Introduction: Shelf-ready, synthetic small-calibre prostheses are needed for coronary artery bypass grafting. Biodegradable scaffolds resistant to degradation-induced aneurysm formation in the systemic arterial circulation have been developed for in vivo vascular tissue engineering. We evaluated patency/biocompatibility/mechanical properties (remodelling) of 3-electrospun, biodegradable random nano-fibre polymer prostheses: polydioxanone (PDO) alone; blended with: poly (lactic-acid) (PDO-PLA); with polycaprolactone (PDO-PCL).

Materials/Methods: In 30 anaesthetised Sprague-Dawley rats, 2 mm ePTFE grafts (controls; $n = 9$ /PDO; $n = 3$ /PDO-PLA; $n = 9$ /PDO-PCL; $n = 9$), were interposed in the infrarenal abdominal aorta and followed for 3, 6, 12-weeks. Digital subtraction angiography was performed for patency/stenosis/aneurysmal dilatation before euthanasia. Grafts were harvested for SEM/histology/computed morphometry to assess neointimalisation (% of the whole graft length) and intimal hyperplasia (micrometer²/micrometer).

Results: Patency rates excellent for all grafts (100%), no relevant stenoses were found. Angiography follow-up showed aneurysmal formation for all PDO-alone grafts at 3-weeks (therefore no further implantations were made) and 1/3 for PDO-PLA at 6/12 weeks. No aneurysms found for PDO-PCL grafts. All PDO-based grafts show slow degradation, significantly better neointimalisation and insignificant neointimal formation compared to ePTFE.

Conclusions: Patency of electrospun biodegradable PDO-based prostheses is excellent. Using slow, biodegrading polymer blends, e.g. PDO-PCL, can avoid aneurysm formation and the neoendothelialisation (blood compatibility) of such prostheses is significantly better compared to ePTFE. Therefore, biodegradable, electrospun PDO-based vascular prostheses may be a promising alternative as shelf-ready cardiovascular bypass grafts.

O-08-3 The arterial patch improves the reendothelialization in an animal model of open carotid endarterectomy. An incentive to use internal thoracic artery as an on-lay patch following coronary endarterectomy

E. Bezon, A. A. Khalifa, G. Le Gall, J. Mansourati and J. A. Barra
C.H.U. La Cavale Blanche, Boulevard Tanguy Prigent, 29609 Brest, France (e-mail: eric.bezon@chu-brest.fr)

Introduction: To better understand the effect of the internal thoracic artery on endothelial growth after open coronary endarterectomy, we designed an experimental test of the hypothesis that closing an endarterectomized artery by an arterial patch improves re-endothelialization.

Methods: The two carotid arteries were endarterectomized in 9 sheep and were randomly chosen for closure by native arterial femoral (ART) patch or polytetrafluoroethylene (PTFE) patch. Three animals were randomly chosen for sacrifice at 8, 15 and 21 days each. The endarterectomized segments were studied macroscopically and microscopically.

Results: The endarterectomized area covered with adhesive thrombus was more extensive in the PTFE than in the ART group ($p = 0.0117$). In the ART group, the regenerated endothelium was normal and sprouted from the edges of both the endarterectomy and the arterial patch towards the central endarterectomized area. In the PTFE group, it sprouted from the edges of the endarterectomy and never reached the central endarterectomized area, where abnormal endothelium was observed. The endarterectomized area covered with normal regenerated endothelium was more extensive in the ART than in the PTFE group at 8 days, at 15 days, and 21 days ($p < 0.001$).

Conclusions: Arterial patch closure of open-endarterectomized artery improved regenerated endothelium quality.

O-08-4 Can rupture of the aorta be predicted? A biomechanical model for the normal and degenerative aorta

C. Garcia-Montero^a, R. Burgos^a, J. Goicolea^b, C. Garcia Herrera^c, J. M. Goicolea^d, J. M. Atienza^d and G. Guinea^c

^aHospital Puerta de Hierro, Manuel de Falla 1, 28222 Madrid, Spain; ^bHospital Puerta de Hierro, Manuel de Falla 1, 28222 Madrid, Spain; ^cETSIC, U.C.M., Ciudad Universitaria, 28035 Madrid, St. Helena; ^dETSIC, U.C.M., Ciudad Universitaria, 28035 Madrid, Spain; ^eETSIC, U.C.M., Ciudad Universitaria, 28035 Madrid, Spain (e-mail: carlosruggiamontero@gmail.com)

Introduction: Albeit risk factors for Aortic rupture have been identified, we still lack a thorough understanding of the mechanical properties of the Aortic wall and, specifically, the point of rupture (PR).

Material & Methods: We developed an ex-vivo model that allows the characterization of anisotropic properties of the Ao wall throughout the stress range (up to PR) in freshly harvested specimens, both from controls -heart transplant donors (HTx)- and patients submitted to aortic valve surgery. This report focuses on the influence of age and degenerative Ao stenosis (Ao St) on mechanics of aortic PR.

Results: 29 HTx and 10 AoSt cases were studied. Strain (λ_r) and stress (σ_r) kPa at PR were determined. Age (> 35 yrs) imposed a significant decrease in λ_r (1.8 ± 0.2 versus 2.3 ± 0.2 , $p = 0.008$) and in σ_r (1315 ± 1321 versus 2033 ± 949 , $p = NS$). AoSt versus HTx samples also showed a significant decrease in both λ_r (1.5 ± 0.2 versus 2 ± 0.3 , $p < 0.05$) and σ_r (1446 ± 454 versus 1728 ± 1143 , $p = NS$). This trend was also observed for AoSt versus older HTx - λ_r (1.5 ± 0.2 versus 1.8 ± 0.3 , $p = 0.1$); or (1314 ± 1320 versus 1446 ± 453 , $p = NS$).

Conclusions: Both age and AoSt imply a decreased maximal elongation and stress needed for Ao rupture. This model also applies to other aortic diseases

O-08-5 Dynamic blood flow analysis in the thoracic ascending aorta from cine-MRI in patients with bicuspid valves

O. Bouchot^a, A. Lalande^b, M. Xavier^b, C. Billard-Philipp^b, P. Walker^b, A. Cochet^b, C. Boichot^b, E. Steinmetz^a, L. Legrand^b and F. Brunotte^b

^aHopital du Bocage, 2 Bd Mar de Lattre de Tassigny, 21000 Dijon, France; ^bLE2I, UMR CNRS 5158, Université de Dijon, 21000 Dijon, France (e-mail: obouchot@free.fr)

Aim: the comparison of aortic blood flow between patients with bicuspid valves versus healthy volunteers can be performed using a 4D-representation of aortic blood flow developed in our laboratory from multislice 2D MR data.

Methods: Images were acquired using ECG gated velocity-encoded cine-MRI on a 1.5T MR imager. A magnitude image and three phase images were generated during the cardiac cycle with a temporal resolution of 40 ms. Semi-automatic post-processing allows the construction of a 3D representation of blood flow at each moment of the cardiac cycle. The maximum 3D velocity was deduced from the results obtained on images acquired over a cardiac cycle. This protocol was applied to 7 healthy volunteers and 3 patients with bicuspid valves and dilatation of the thoracic ascending aorta, and the absolute maximum 3D velocity was recorded.

Results: Patients with bicuspid valves have a higher maximum velocity compared with healthy volunteers. The patient with aortic valve stenosis has the highest maximum velocity.

Conclusion: Our flow-sensitive 4D MRI representation allows the visualisation of various blood flow patterns and the calculation of specific parameters such as 3D maximum velocity. The maximum aortic blood flow seems to be greater in patients with bicuspid valves.

O-08-6 Is aortic valve sparing a better surgical option than mechanical valve replacement? From randomization to daily clinical practice

E. Lansac^a, I. Di Centa^b, E. Arnaud Crozat^c, F. Baud^d, D. Chatel^d, D. Blin^e, R. Hacini^e, G. Fernandez^f, O. Bouchot^g, S. Lopez^e, T. Folliguet^h, M. Debauchez^a, C. Jourdainⁱ, F. Tubach^j, J. S. Hulot^k and T. Caviaar Trialists^l

^aHopital Foch Cardiac Surgery Unit, 40 rue Worth, 92150 Suresnes, France; ^bVascular Surgery CHI Montfermeil, 10 Rue du Général Leclerc, 93370 Montfermeil, France; ^cClinique Belledone, 89 rue Gabriel Peri, 38000 Grenoble, France; ^dClinique Saint Gatien, 8 place de la cathédrale, 36000 Tours, France; ^eGrenoble University Hospital, La Tronche Cedex, 38000 La Tronche, France; ^fClinique Saint Augustin, 114 avenue d'Ares, 34074 Bordeaux, France; ^gHopital du Bocage, 2 Bd Mar de Lattre de Tassigny, 21000 Dijon, France; ^hInstitut Mutualiste Montsouris, 42 Bd Jourdan, 75014 Paris, France; ⁱDRRC Hopital Saint Louis, 1, Avenue Claude Vellefaux, 75010 Paris, France; ^jUnité de Recherche Clinique, 46 rue H. Huchard Hopital Bichat, 75018 Paris, France; ^kUnité de Recherche Clinique, 46 83 Bd de l'hopital, 75013 Paris, France (e-mail: emmanuel.lansac@bch.apbp.fr)

Introduction: Randomized controlled trials (RCTs) remain scarcely performed in cardiac surgery. We studied problems related to randomization in the multicenter RCT CAVIAAR trial (Conservative Aortic Valve surgery for aortic Insufficiency and Aneurysm of the Aortic Root).

Methods: CAVIAAR trial was designed to validate evidence that a standardized valve sparing technique (130 patients) was superior to mechanical valve replacement (130 patients). Randomization was held in operating room, after assessment of aortic valve suitability for repair. From May 2007 to 2008, 5 patients were randomized. Because of low recruitment rate, a questionnaire was mailed to the 24 participating centers.

Results: Only 11.4% of eligible patients (44) were randomized in 8 centers. Eleven patients refused to be randomized. For the remaining 28 patients, investigators were reluctant to randomize (63%) and/or preferred valve sparing (71%). Switch for a controlled open prospective trial was required by 70% of investigators. Since randomization was abandoned recruitment rate raised from 0.4 patient/months to 5.2 patients/months.

Conclusions: Randomization would have been the ideal option to define the most suitable surgical strategy for dystrophic aortic insufficiency. However, it is hardly adapted to open cardiac surgery. Switch to a controlled open trial was an effective method to significantly increase inclusion rate.

O-08-7 An expandable aortic ring: towards a physiological approach for valve sparing

E. Lansac^a, I. Di Cetta^b, F. Raoux^c, A. Pelle^d, N. Bulman Fleming^e, V. Valentini^e, A. Paolitto^e and D. Letourneur^d

^aHopital Foch Cardiac Surgery Unit, 40 rue Worth, 92150 Suresnes, France; ^bVascular Surgery CHI Montfermeil, 10 Rue du Général Leclerc, 93370 Montfermeil, France; ^cCCML Cardiologie, 133 avenue de la résistance, 92350 Le Plessis Robinson, France; ^dInserm 698, 46 rue H. Huchard CHU Bichat, 75018 Paris, France; ^eCoroneo, 9250 Avenue du Parc, Suite 514, QC H2N1Z2 Montreal, Canada (e-mail: emmanuel.lansac@bcb.apbp.fr)

Introduction: Dystrophic aortic insufficiency (AI) is characterized by dilation of the annular base and sino-tubular junction (STJ) diameters, preventing coaptation of thin and pliable cusps. An expandable aortic ring was designed to reduce root diameters, in order to increase valvular coaptation height while maintaining root dynamics. The device characteristics were tested in an ovine model.

Methods: Rings were implanted in 6 sheep at both the level of the annular base and STJ (double sub- and supra-valvular external aortic annuloplasty). Root dynamics were assessed using intracardiac echography before surgery, and at 6 months. Histological and mechanical studies were performed on explanted samples.

Results: Rings produced a significant reduction of annular base and STJ diameters. Mean coaptation height was significantly increased (2.6 ± 0.03 mm pre-operative versus 6 ± 0.09 mm ($p < 0.001$)). Mechanical testing on explanted samples revealed no significant differences in elastic modulus. Dynamics of the root were preserved. Histomorphological studies showed incorporation of the material without degradation.

Conclusion: Implantation of expandable aortic ring produces a significant annuloplasty that increases coaptation height while preserving dynamics of the aortic root. The effectiveness of the device in treating AI is currently being evaluated in the prospective CAVIAAR trial comparing conservative aortic valve surgery versus mechanical valve replacement.

O-09 Surgical Oncology

O-09-1 Molecular imaging of tumor associated angiogenesis using P1227, a novel MRI contrast agent targeting avb3 integrin

I. Debergh^a, N. Van Damme^a, P. Smeets^a, P. Demetter^a, S. Carme^b, W. Derave^c, M. Peeters^a and W. Ceelen^a

^aUniversity Hospital Ghent, De Pintelaan 185, 9000 Ghent, Belgium; ^bGuerbet, research, 00 Roissy, France; ^cUniversity Ghent, Watersportlaan 2, 9000 Ghent, Belgium (e-mail: isabelle.debergh@ugent.be)

Background: Functional imaging of tumor associated angiogenesis is a useful tool to monitor therapy response in cancer patients. The present study evaluated imaging of tumor associated angiogenesis using a molecular MRI probe targeting $\alpha v \beta 3$ integrin.

Methods: HT29 human colorectal cancers were grown in athymic mice. MRI images were obtained at baseline and at 5 up to 225 minutes after injection of P1227 or Gd-DOTA. Also Cilengitide, an $\alpha v \beta 3$ integrin blocking agent, was administered 1h before MRI imaging with P1227. Signal intensity was evaluated in the entire tumor, the tumor rim, and normal paravertebral muscle.

Results: Following injection of P1227 and Gd-DOTA, specific enhancement of the tumor rim was observed, which led to a significant increase of the rim/muscle ratio. Subsequent imaging resulted in a slowly decreasing contrast captation in the tumor rim, with at 165 minutes a normalization of the rim/muscle ratio to baseline values. After administration of Cilengitide, a clear immediate decrease of the contrast enhancement in the tumor rim was observed, leading to a significantly lower rim/muscle ratio. This might indicate specific binding of the $\alpha v \beta 3$ integrin moiety.

Conclusions: Molecular imaging using P1227 allows visualization of activated tumor associated endothelium by targeting $\alpha v \beta 3$ integrin.

O-09-2 Circulating miRNAs as minimally invasive biomarkers for breast cancer

H. Heneghan, N. Miller, A. Lowery, K. Sweeney and M. Kerin

Department of Surgery, Galway University Hospital, n/a Galway, Ireland (e-mail: belenbeneghan@hotmail.com)

Mi (cro)RNAs have recently come to the fore of translational research due to their ability to control gene expression and protein translation. Dysregulated miRNA expression in breast cancer is well documented. Due to their small size and remarkable stability, detection of miRNAs in the circulation of breast cancer patients may be prognostically informative. We aimed to determine whether oncomiric miRNAs were detectable in circulation of breast cancer patients and evaluate their potential as biomarkers for disease detection and monitoring. Breast tissue and preoperative blood ($n = 74$) was obtained from breast cancer patients, as was blood from healthy controls. MiRNA was extracted and a panel of oncogenic miRNAs quantified by RQ-PCR and qBase software. Significant differences in expression were observed for miR-21, miR-10b, and miR-155 between tumour and normal tissue. Expression of miR-21 and miR-155 was detected in serum and significantly higher in cancer patients versus controls. A significant correlation was demonstrated between miR-21 in tumour and serum ($p = 0.05$). MiRNAs are detectable in circulation of breast cancer patients, and their expression profiles differ between patients and controls. In this, lies the expectation that serum miRNAs will be identified as a novel non-invasive tool to aid in early diagnosis and monitoring of breast cancer.

O-09-3 ProCOL11A1 is an efficient marker of pancreatic cancer

C. Garcia Pravia^a, M. Garcia Ocaña^b, J. Del Amo^c, J. R. De Los Toyos^d, M. Pérez Basterrechea^e, G. Ochoa Garay^f, J. M. Garcia Garcia^g, A. Martinez^c, J. González González^h, L. Simón Buelaⁱ and L. Barneo^j

^aHospital Universitario Central, Servicio de Anatomía Patológica, 33006 Oviedo, Spain; ^bUniversidad de Oviedo, Spain, Unidad de Biotecnología, 33006 Oviedo, Spain; ^cProgenika Biopharma, S.A, Parque Tecnológico Zamudio, 48160 Derio, Vizcaya, Spain; ^dUniversidad de Oviedo, Area Inmunología, 33006 Oviedo, Spain; ^eHospital Universitario Central, Unidad medicina regenerativa, 33006 Oviedo, Spain; ^fProgenika Biopharma, S.A, Parque Tecnológico Zamudio, 48160 Derio, Vizcaya, Spain; ^gHospital Universitario Central, Servicio Anatomía Patológica, 33006 Oviedo, Spain; ^hHospital Universitario Central, Servicio Cirugía General, 33006 Oviedo, Spain; ⁱProgenika Biopharma, S.A., Parque Tecnológico Zamudio, 48160 Derio, Vizcaya, Spain; ^jHospital Universitario Central, Servicio Cirugía general, 33006 Oviedo, Spain (e-mail: cgpravia@hotmail.com)

Introduction: Chronic pancreatitis and pancreatic cancer are characterized by inflammatory events, and their clinical differentiation and pathological distinction can be difficult, particularly in core biopsy specimens. Our previous work (ESSR2006) identified changes in gene expression associated to pancreatic cancer, and found genes that could differentiate pancreatic cancer from chronic pancreatitis, in particular COL11A1.

Aims: To confirm COL11A1 as an efficient marker that distinguishes pancreatic cancer from chronic pancreatitis.

Methods: 24 cases of moderately differentiated PDAC and 16 chronic pancreatitis were studied. A polyclonal antiserum to human proCOL11A1 was generated. Immunostaining was double blind scored by two pathologists, and also quantified by means of the image analysis QWin program. Statistical analyses were performed with SPSS 13. The sensitivity and specificity of anti-proCOL11A1 were depicted as ROC curves.

Results: ProCOL11A1 immunostaining was confined to the cytoplasm of stromal fibroblasts, even in areas where tumor cells were not seen. It showed a sensitivity of 92% and a specificity of 94% in discriminating pancreatic ductal adenocarcinoma from chronic pancreatitis.

Conclusions: Anti-proCOL11A1 is an efficient immunostaining that distinguishes between chronic pancreatitis and pancreatic ductal adenocarcinoma.

O-09-4 Molecular mechanisms underlying post-operative peritoneal dissemination might differ between a laparotomy and CO2 pneumoperitoneum

S. Matsuzaki, A. S. Azuar, N. Bourdel, G. Mage and M. Canis

CHU Clermont-Ferrand, Boulevard Léon Malfreyt, 63058 Clermont-Ferrand, France (e-mail: smatsuzaki@cbu-clermontferrand.fr)

Introduction: The objective was to investigate post-operative tumor dissemination over time on both tissue and molecular levels.

Materials/Methods: On day-7 (Experiment 1) or 0 (Experiment 2), C57BJ6 mice received an intraperitoneal inoculation of a mouse ovarian cancer cell line. On day 0, mice were randomized into four groups: anesthesia alone, CO2 pneumoperitoneum at a low or high intraperitoneal pressure (IPP), or laparotomy. A laparotomy was performed to evaluate peritoneal dissemination on POD 1, 2, 7, 14 or 42. Expression levels of mRNA of selected genes were measured using real-time PCR.

Results: 1) Experiment 1: Expression levels of beta 1 integrin, cMet, uPA, uPAR and PAI-1 mRNA in the disseminated nodules in the laparotomy group were significantly increased on POD14 compared to the other groups. 2) Experiment 2: Expression levels of uPAR and cMet mRNA in pre-implanted nodules were significantly higher in the laparotomy group than in the control group on PODs 1, 2 and 7.

Conclusions: The molecular mechanisms underlying post-operative peritoneal dissemination might differ between a laparotomy and CO2 pneumoperitoneum. In addition, impact of the surgical environment on gene expression levels may depend on whether the cancer cells are dispersed during surgery, or are implanted prior to surgery.

O-09-5 Arterial ligation to reduce the progression of liver metastasis in a rat model

I. García-Alonso^a, J. J. Echevarria^b, I. Diaz^a, B. Miró^a, A. Cuéllar^a and B. Herrero^a

^aUniversity of The Basque Country, Lab. of Experimental Surgery, Fac. of Medicine, E48940 Leioa, Spain; ^bHospital of Galdakao, B° Labeaga s/n, E48960 Galdakao, Spain (e-mail: ignacio.galonso@ebu.es)

Introduction: Previous studies proved that ligating the portal branch to a liver lobe significantly increased the tumor volume.

Methods: Colon CC-531 adenocarcinoma cells were inoculated into the liver of WAG/RijCrl syngenic rats. Rats bearing well developed liver metastasis were given lipiodol either through the ileocolic vein or the hepatic artery, and a liver CT scan was performed. Groups of 10 rats were subjected to either selective ligation of the left lateral hepatic artery branch (LLHAB) or the main hepatic artery branch, and were explored 3, 6 or 14 days later.

Results: When lipiodol was given through the ileocolic vein, liver metastasis appeared as "non-perfused" parenchyma, so liver metastasis receive blood only from the arterial system. Selective ligation of the (LLHAB) induced the disappearance of the connective capsule of the liver lobe, but no significant modifications of the metastasis progression could be assessed. When the main branch of the hepatic artery was ligated, all the liver lobes appeared stuck as a unique mass; but no modification could be found in the liver parenchyma or the metastasis.

Conclusion: Blood supply to the metastasis is carried out by the arterial vascularization. However, hepatic artery ligation does not induce reduction of the tumor growth.

O-09-6 In vivo priming of migrating splenic dendritic cells with cc531 colon cancer antigen and lps - is it a method to compromise liver metastases?

S. Durowicz, W. Olszewski, M. Gewartowska, M. Stanczyk, J. Stanisławska and A. Wluka

Postgraduate Medical Centre, Department of General and Gastroenterological Surgery, 02-106 Warsaw, Poland (e-mail: wl@cmdik.pan.pl)

In vitro tumor-primed DC administered iv only in a few percent reach liver metastases and it is impossible to administer them continuously. For this reason it seems rational to create a model of vivo vaccination of spleen DC and cytotoxic T lymphocytes colonizing liver vascular bed. This can be achieved by mobilizing immunized anti-tumor spleen migrating populations.

Aim: To boost spleen splenocytes with CC531 antigen and LPS and observe their cytotoxic effect against CC531. Methods. Spleen boosted DC-enriched population was isolated, its activation by LPS, cytotoxicity against CC531 and adherence to liver CC531 metastases was measured.

Results: Immunization with CC531 cells and stimulation with LPS of splenic population containing DC, NK cells and lymphocytes activated these cells but did not increase the cytotoxicity against CC531 cells. Adhesion of splenic DC to liver CC531 metastases on cryosections was higher than to adjacent liver tissue, however, it was more expressed on tumor stromal than neoplastic cells. There were no significant differences between anti-CC531 activity of spleen DC-enriched population and liver sinusoidal washout cells (LSWC) populating liver from spleen.

Conclusions: Low level of splenocyte (CD) and LSWC reaction to tumor was observed despite of anti-tumor immunization and LPS boosting.

O-09-7 Comparison of locoregional recurrences, metastasis and survival rate between two approaches in stage I and II breast cancers

H. Mohebbi^a, S. M. Mousavi Naieni^a, B. Mofid^b and M. Mehmanna^a

^aBaqiyatallah University, Mollasadra avenue, 1435915371 Tebran, Iran; ^bshabid bebeshti university, Shobada hospital-Tajrish Square-, 1653812573 tebran, Iran (e-mail: mobebiba@yahoo.co.in)

Introduction: In patient with stage I and II breast cancer, two common approaches are used: breast conservative surgery (BCS) and modified radical mastectomy (MRM). We compared some variables between these two methods of treatment.

Materials and Methods: This study involved 242 females with clinical stage I and II breast cancer. They were divided in two groups, BCS and MRM, according to patient's preferences and facilities. Age, type of cancer, tumor size (T), lymph node involvement (N), locoregional recurrence, metastasis and survival rate were evaluated. Quantitative data analyzed by T-test and for survival, Kaplan Mayer were used.

Result: BCS and MRM were done in 109 and 133 patients respectively. The mean \pm SD age of BCS was 47.2 \pm 10.4 years and in MRM was 49.4 \pm 11.8 years. (p = 0.5). Mean size of T and number of N was significantly higher in MRM however locoregional recurrence and survival rate were no significant between two groups. Metastasis was significantly lower in BCS (p = 0.01)

Discussion: In this study, BCS dose not increase the risk of locoregional recurrent and metastasis, and the survival rate is similar to MRM thus considering the cosmetic effects and postoperative appearance BCS is a better approach.

O-10 Wound Healing

O-10-1 Effects of negative pressure on human dermal fibroblasts - an insight into the cellular response to vacuum assisted closure dressings

D. Coakley^a, F. Shaikh^a, A. Callanan^b, E. Kavanagh^a, P. Burke^a, P. Grace^a and T. McGloughlin^b

^aDepartment of Surgery, Mid-Western Regional Hospital, 061 Limerick, Ireland; ^bApplied Biomedical Engineering, University of Limerick, 061 Limerick, Ireland (e-mail: danielcoakley@gmail.com)

Introduction: Vacuum Assisted Closure dressings are an effective and widely used treatment for refractory wounds. However, the mode of action at a cellular level remains poorly understood. The aim of this study is to characterise

the behaviour of human dermal fibroblasts (HDFs) when exposed to negative pressures

Methods: A novel subatmospheric bioreactor was developed. HDFs were seeded on sheets of a xenogenic extracellular matrix, providing a realistic three-dimensional substrate. A standardised incision was made in the constructs replicating a dermal wound. These were then loaded into the bioreactor and analysed for collagen type I synthesis, cellular viability, propagation, morphology and migration. Each experiment was compared to cells grown in atmospheric pressure.

Results: Cells exposed to negative pressure had survival rates comparable to the control ($p = 0.199$). Cell proliferation and collagen production significantly increased in response to negative pressures ($P < 0.05$). Wounds at atmospheric pressure healed at day 5. Cells exposed to subatmospheric pressures healed faster; -60 mmHg at 4 days and -125 mmHg at day 3.

Conclusions: Negative pressure increases the proliferation rate and collagen synthesis of human dermal fibroblasts whilst promoting faster migration times. These results add significant insight into the mode of action VAC dressings.

O-10-2 Erythropoietin for prevention of burn wound progression

M. Tobalem^a, Y. Harder^a, F. Rezaeian^a, B. Pittet^a and R. Wettstein^b

^aPlastic & Reconstructive Surgery, Rue Micheli-du-Crest 24, 1211 Geneva, Switzerland; ^bPlastic & Reconstructive Surgery, Rue du Bugnon 21, 1011 Lausanne, Switzerland (e-mail: mickaeltobalem@hotmail.fr)

Introduction: No established method exists to prevent burn wound progression, a relevant entity that increases morbidity and changes treatment by conversion of superficial lesions that heal spontaneously to deep lesions that require surgical treatment.

Materials and Methods: The burn comb model creates 4 rectangular burned surfaces intercalated by 3 unburned zones prone to progression. 24 wistar rats were randomized to 1. Cooling with water for 20min (CW, 17°C; control); 2/3. CW combined with intraperitoneal erythropoietin once a day for 5 days starting 45min after burn injury (500UI/kg bw: EPO500 or 2500UI/kg bw: EPO2500). Planimetric burn surface progression, hematocrit and perfusion (laser-Doppler flowmetry) were measured daily, histologic analyses were performed after 1, 4, and 7 days.

Results: Burn progression occurred during the first 4 days and was significantly decreased with EPO500 but not with EPO2500 or CW ($58 \pm 6\%$ vs. $31 \pm 4\%$, respectively $30 \pm 5\%$ of interspace tissue survival; $p < 0.01$). This was paralleled by increased interspace perfusion with EPO500. EPO2500 led to a significant increase of hematocrit at day 4 ($51 \pm 1\%$ vs. $45 \pm 2\%$ of EPO500; $p < 0.05$). Histologic analysis confirmed macroscopic burn progression and surgical burn depth.

Conclusion: Erythropoietin represents a simple and promising way to prevent burn wound progression by preserving microcirculatory perfusion.

O-10-3 Risk factors for complications following reduction mammoplasty

N. Srinivasaiah^a, O. Iwuchukwu^a, P. W. Stanley^b, N. B. Hart^b, A. Platt^b and P. Drew^c

^aUniversity of Hull, Academic Surgical Unit, Castle Hill Hospital, HU16 5JQ Hull, United Kingdom; ^bDepartment of Plastic Surgery, Castle Hill Hospital, HU16 5JQ Hull, United Kingdom; ^cHull Breast Unit, Castle Hill Hospital, HU16 5JQ Hull, United Kingdom (e-mail: simba_au@yahoo.com)

Introduction: Reduction mammoplasty has been shown to benefit physical, physiological and psycho-social health. However, there are some recognised complications. It would be beneficial if one could identify and modify the factors which increase the rate of complications.

Aim: To determine the effects of resection weight, BMI, age & smoking on complication rates following reduction mammoplasty.

Methods: Data was gathered as a part of RCT examining Psycho-social & QOL benefits of reduction mammoplasty. 67 female patients were referred who underwent Inferior pedicle reduction mammoplasty. Complications were

recorded prospectively. Data gathered included resection weight, BMI, age and smoking status. Prospective records of all complications were noted. SPSS was used for purposes of statistical analysis.

Results: Of the 67 patients, 19 (27%) had complications. Higher resect weight, increased BMI and older age are associated with high rate of complications ($p < 0.001$). When comparing the current smokers with those who did not currently smoke, there was a 23% difference in the occurrence of complications. The chi squared test shows that this was a significant difference ($p = 0.037$).

Conclusion: Higher resection weight, increased BMI, older age and smoking are risk factors for complications. Patients should be adequately counselled about losing weight and stopping smoking.

O-10-4 Bioactive polypropylene mesh coated with an antibiotic-releasing polymer

G. Pascual^a, M. Fernández^b, E. Olivares^a, M. Rodríguez^a, J. San Román^b and J. Bellón^a

^aUniversity of Alcalá, CIBER-BBN, Ctra. Madrid-Barcelona, Km 33-60, 28871 Madrid, Spain; ^bCSIC.CIBER-BBN, Serrano 144, 28006 Madrid, Spain (e-mail: gemma.pascual@uab.es)

Introduction: Infection is a major possible complication of the implant of a mesh used to repair a hernial defect. This study was designed to in vitro assess a new antibiotic-releasing polymer system fixed to a polypropylene (PP) mesh.

Materials/Methods: Fragments (1 cm²) of lightweight PP were coated with a polymer (2-hydroxyethylmethacrylate, 2-acrylamide-2-methylpropanol sulphonic acid and polyethylene glycol) loaded with vancomycin. Preliminary biocompatibility assays were conducted on fibroblasts cultured for 7, 14 or 21 days in the presence of meshes coated with the vancomycin-loaded polymer. To assess antibacterial efficiency, the meshes were placed on agar plates inoculated with *Staphylococcus aureus* and/or *S. epidermidis* for 14 ($n = 15$ plates) and 30 days ($n = 15$) and then examined by scanning electron microscopy. Inhibition areas were determined morphometrically.

Results: No toxic effects of the polymer or vancomycin on the growth and proliferation rates of fibroblasts were observed. The bacterial growth inhibition halos produced around the antibiotic-loaded meshes persisted for 30 days. No bacterial adhesion to the meshes was observed.

Conclusions: The coating system proposed was biocompatible and capable of the slow release of antibiotic inhibiting bacterial adhesion to the PP mesh. (This study was supported by a grant from CIBER-BBN and MAT2008-02430)

O-10-5 Bioresorbable scaffold for skin engineering: In vivo evaluation of tissue integration and vascularization

X. Garric^a, J. P. Molès^a, D. Casellas^b, J. Coudane^a and M. Vert^a

^aIBMM UMR CNRS 5247, 15 avenue Charles Flabault, 34093 Montpellier, France; ^bGroupe Rein et Hypertension, 641 avenue doyen Gaston Giraud, 34093 Montpellier, France (e-mail: xgarric@univ-montpl.fr)

We recently developed synthetic dermal scaffolds from poly(-hydroxy-acid)s that are bioresorbable polymers which present a great variability of mechanical properties and hydrolytic degradation rates. These properties appear to be of great interest in tissue engineering, including skin reconstruction. The aim of this study was to evaluate the compatibility of a PLA50-PEO-PLA50 scaffold with vascularization and tissue integration. Polymer scaffolds were implanted in mice inguinal fold for a period of 3 months. Tissue integration and scaffold degradation were evaluated by using histological staining. The formation of a vascular network was observed after injection of an isolectin drip. Neovessels were characterized by using immuno-histologic staining. In order to determine if these neovessels were functional, vascular permeability (FITC dextran) and tissue composition (antibodies directed against CD31, α -SM actin and collagen IV) were evaluated. Data showed the formation of well-differentiated vascular network. This vascular network was organized according the scaffold organization. Arteries and veins were functional and presented no pathologic signs. As a conclusion, this work highlighted that a PLA50-PEO-PLA50 scaffold could be a support for in vivo vascularization and

tissue integration. It confirms that these scaffolds are good candidate for skin tissue engineering and especially for help to wound healing.

O-10-6 Immunohistochemical analysis of host reaction to polypropylene mesh after short term implantation in rabbit

I. Takacs^a, S. Horvath^a, A. Molnar^a, S. Gaspar^a, S. Ferencz^a, B. Balatonyi^a, A. Ferencz^a, G. Szekeres^b and G. Weber^a

^aUniversity of Pécs, Kodály Z. str.20., H-7624 Pécs, Hungary; ^bHistopathology Ltd., Akác u. 8., 7632 Pécs, Hungary (e-mail: takacsildi@yahoo.com)

Introduction: Surgical meshes used for hernia repair induce inflammation, leading to excessive scar and connective tissue formation, with clinical consequences from abdominal discomfort, and chronic pain to ileus formation. We aimed to investigate the adhesion formation in a short term model.

Materials/Methods: Polypropylene meshes (3 × 4 cm) were implanted into twenty New Zealand White rabbits for 1 and 3 weeks. 10 rabbits were sacrificed after 1, and the left after 3 weeks. All the meshes were removed in toto. The adhesion formation was scored macroscopically with the covered mesh surface, represented in percentages. Histological slides were stained with HE to detect inflammatory and foreign body reactions. Tissue proliferation, and neovascularization was detected with mouse monoclonal antibodies (Ki-67 and VEGF respectively).

Results: Aggressive adhesion formation was observed even after 1 week, with moderately decreasing tendency by the 3rd week. In most cases the cranial half of the mesh was affected. The formed neoperitoneum was visible after 3 weeks. The amount of Ki-67 positive cells showed no difference in time, while the VEGF positivity was higher on the 3rd week.

Conclusions: Pure polypropylene mesh induces adhesion formation even after a week of implantation, which can be followed with the immunohistochemical analysis.

O-10-7 Evaluation of porcine urinary bladder matrix bioscaffold for use in a novel skin substitute

D. Coakley^a, F. Shaikh^a, A. Callanan^b, E. Kavanagh^a, P. Burke^a, P. Grace^a and T. McGloughlin^b

^aDepartment of Surgery, Mid-Western Regional Hospital, 061 Limerick, Ireland; ^bApplied Biomedical Engineering, University of Limerick, 061 Limerick, Ireland (e-mail: danielcoakley@gmail.com)

Introduction: Current Skin substitutes are limited by delayed vascularisation and poor approximation of human skin histogenesis. Here we evaluate the biocompatibility of an acellular extracellular matrix (ECM) with intact epithelial basement membrane which is derived from the porcine bladder wall - Urinary Bladder Matrix (UBM).

Materials and Methods: Human dermal fibroblasts were seeded on both surfaces of UBM. The composites were analysed for cellular viability, attachment, migration, proliferation and collagen production. The cellular and matrix morphology was examined using scanning electron microscopy (SEM).

Results: Excellent cellular viability was observed. Over 90% cellular adhesion was noted on both sides. Cells revealed a time weighed increase in cell numbers, forming a fully confluent monolayer by Day 6. Cells did not penetrate the basement membrane, but did invade the opposite surface to resemble dermal architecture. Type I Collagen synthesis was supported by the material signifying de nova ECM formation.

Conclusions: We have found UBM to be a suitable substrate for the viability, adherence and propagation of dermal fibroblasts, whilst supporting the synthesis of collagen. We have also demonstrated the integrity of its basement membrane. These results suggest UBM to be suitable for use as a cultured skin equivalent in the field of wound healing.

O-11 General Topics

O-11-1 In vitro and in vivo effects of ofloxacin and amoxicillin coating on synthetic meshes for genital prolapse and abdominal hernia repair

V. Letouzey^a, J. P. Lavigne^b, X. Garric^c, L. Mamy^a, D. O'Callaghan^b and R. De Tayrac^a

^aCarêmeau University Hospital, Place du Pr R. Debré, 30029 Nîmes, France; ^bINSERM ESPRI 26, UFR de Médecine, Avenue J F Kennedy, 30908 Nîmes, France; ^cIBMM UMR CNRS 5247, 15 avenue Charles Flabault, 34093 Montpellier, France (e-mail: vincent.go@wanadoo.fr)

Introduction: Infection could be a major problem for mesh integration in vaginal prolapse or hernia surgery. Antibiotics addition to meshes accompanied by a local release may reduce bacterial mesh colonization. The aim of this study was to investigate the effect of a polymer coating containing 2 types of antibiotics (ofloxacin (OFL) or amoxicillin (AMX)) in an incisional hernia model in rat with mesh infection.

Materials and Methods: Antibiotic coatings were characterized by in vitro antibiotic release study. In vitro efficacy was evaluated by counting adherent bacteria and assessment of biofilm growth. In vivo efficacy was determined after Escherichia coli inoculation on macro porous knitted mono filament mesh without any coating (n = 21), with a polymer coating (n = 21) and with a coating containing amoxicillin (AMX) (n = 21) or ofloxacin (OFL) (n = 21). Clinical, bacteriological and histological studies were done on the skin and the mesh.

Results: There was a significant reduction of infection rates by both OFL and AMX coating mesh (no infection) compared to standard polypropylene mesh (100% infection) (P < 0.001). Clinical results were similar.

Conclusion: Both amoxicillin and ofloxacin coating meshes showed significant improvement of infection prophylaxis compared to traditional mesh and could improve infection prophylaxis in hernia and prolapse prosthetic treatment.

O-11-2 Correlation between defect healing and mesh infection in an experimental animal model

V. Letouzey^a, X. Garric^b, J. P. Lavigne^c, M. L. Mathe^d, P. Mares^a and R. De Tayrac^a

^aCarêmeau University Hospital, Place du Pr R. Debré, 30029 Nîmes, France; ^bIBMM UMR CNRS 5247, 15 avenue Charles Flabault, 34093 Montpellier, France; ^cINSERM ESPRI 26, UFR de Médecine, Avenue J F Kennedy, 30908 Nîmes, France; ^dCaremeau University Hospital, Place Pr Robert Debre, 30029 Nîmes, France (e-mail: vincent.go@wanadoo.fr)

Introduction: Synthetic meshes used in vaginal prolapse repair have more than 50% complications as vaginal mesh erosion. This study tries to test the hypothesis of a link between mesh erosion and bacterial infection.

Material and Methods: An incisional hernia model on Wistar rat, allowed us to infect polypropylene mesh used to repair parietal defect. Intra operative bacterial infection has been done with high virulence Escherichia Coli. Erosion was defined by a skin mesh extrusion. We performed bacteriological analysis to number bacteria on mesh and histological study on per prosthetic tissue. To perform quantitative analysis by fluorimetry and qualitative analysis by fluorescence microscopy, we used E. Coli expressing fluorescent protein.

Results: Skin mesh erosion rate was 70% on infected rats and 0% on non infected rats (p < .05). Middle number of bacteria, with erosion, was 1.08E9 Colony Formant Unit (CFU) and without erosion 2.5E8 CFU (p < .0061). Infection was associated to an increased inflammatory response, especially on macrophages and giant cells.

Conclusion: Intra operative mesh infection has been demonstrated to be a highly significant factor of erosion. It seems to encourage us to work on anti bacterial defence properties for synthetic mesh use in vaginal surgery.

O-11-3 surgical sealant adhesion could be improveB. Perrin^a, M. Braccini^b, M. Dupeux^c and L. Von Segesser^d^aCHUV, rue du Bugnon, 46, 1011 Lausanne, Switzerland; ^bSIMAP, Université de Grenoble, 38402 Saint Martin d'Hères, France; ^cSIMAP, université de Grenoble, 38402 Saint Martin d'Hères, France; ^dCHUV, rue du bugnon, 46, 1011 Lausanne, Switzerland (e-mail: bertrand.perrin@chuv.ch)**Introduction:** Adhesion of surgical glues is disappointing. The blister test is developed by industrial engineering and is very convenient to measure adhesion energy. We adapted it to surgical conditions. Results give important information for a better understanding of adhesion of surgical glue.**Method:** Samples are composed of two circular layers of equine pericardium glued by a surgical sealant. Comparative adhesion testing was carried out in 37 paired calf pericardium samples bonded with surgical cyanoacrylate glue, and on 4 samples with industrial cyanoacrylate glue.**Results:** Adhesion energy of surgical glues in surgical conditions is 1.16 J/m² ± 1, 69. Usual adhesion energy for a standart industrial glue is around 10 to 100 J/m². Adhesion energy of industrial glues in surgical conditions is comparable to adhesion energy obtained with surgical glues.**Discussion:** The poor mechanical behaviour of surgical glues is not due their properties but due to surgical conditions and specific nature of the biological support. To improve adhesion in the surgical field, we need to concentrate in the way to obtain a cohesive adhesion with a better cohesion between interfaces by modifying conditions of constitution of the join. The study and utilisation of the surface preparation should be applied in the surgical field.**O-11-4 Results of a phase two double-blinded randomised control trial assessing the effect of defined patient pathways on consent, anxiety and pain in patients undergoing MIRP**P. M. Neary^a, R. Sung^b, M. Corrigan^a, R. Cahill^a, M. O'Donovan^a and H. P. Redmond^a^aDepartment of Academic Surgery, Cork University Hospital, University College Cork, Wilton, Cork, Ireland; ^bJoint first author, Ireland (e-mail: peterneary@hotmail.com)**Aim:** To determine whether an interactive, individualized patient pathway, outlining each patients predicted clinical course, has a measurable effect on consent, anxiety and pain.**Methods:** An exploratory phase two trial was employed involving patients undergoing minimally invasive radioguided parathyroidectomy (MIRP). Patients were randomly assigned to placebo or study group. The placebo group was provided with basic information only. In contrast, the study group had continuous access to a personalised patient-doctor interactive website displaying a detailed informative patient timeline. Postoperatively patients completed verified assessments analysing anxiety, pain, the consent process, and patient satisfaction.**Results:** 19 patients were assigned to the placebo group while 25 were entered into the study group. In the placebo *versus* study group the mean anxiety score was 7.7/21, *versus* 6/21 (p-value = 0.13), mean pain severity score 3.02/10 *versus* 3.47/10, mean adequacy of the informed consent process 27.32/30 *versus* 27.63/30 respectively. All patients agreed that the website was useful and felt it should be available to everyone undergoing elective surgery.**Conclusion:** Phase two results indicate that educating patients through a web server may decrease anxiety levels and pain following surgery. Patients view this method of personalised access to information positively. Phase three trials are currently underway.**O-11-5 Ethics of intimate surgical examinations: teaching tomorrow's doctors - 5 years on**

J. Penneycard, R. Clancy and F. Smith

University of Bristol, University Department of Surgery, Level 7, Bristol Royal Infirmary, BS2 8HW Bristol, United Kingdom

Introduction: A previous survey, (BMJ 2003; 326:97-101), investigating teaching of rectal and vaginal examinations to medical students, suggested informed consent was not always obtained. Formative skills teaching of rectal, vaginal and breast examinations, including simulations, was instituted. Reassessment was undertaken.**Methods:** Clinical students completed an online questionnaire designed to assess: numbers of examinations performed; whether consent was obtained; knowledge of indications for examination; self-assessed competency levels.**Results:** 166 students responded, (88% in 4th/5th year of study). 65% performed 1-5 rectal examinations; 44% undertook 5-10 vaginal examinations. 36% and 32% undertook 1-5 and 5-10 breast examinations respectively. Consent was "always obtained" in 96.4% of cases (vs 86% in previous study, p = 0.001, Fisher's Exact Test); "sometimes" in 2.4%; "never" in 1.2%. 79% were "always aware of indications" for examination. Consent was obtained by the student in 84% of cases, compared to 46%, 5 years previously, reflecting change in practice.**Conclusions:** Increased medical student numbers, litigation awareness and patient turnover have reduced opportunities for medical students to practice intimate surgical examinations. Re-audit demonstrates improvements. Failure to obtain consent for intimate examinations now only occurs in 1.2% of cases, but remains of concern. New and imaginative methods for teaching vital surgical examination skills are needed.**O-11-6 Central vein port implantations via two approaches: a comparison**

H. Mohebbi, S. M. Khatami, S. A. Fanaie, J. Akhavan-Moghaddam and G. Rajabi

Baqiyatallah University, Mollasadra avenue, 1435915371 Tebran, Iran (e-mail: mobebiba@yahoo.co.in)

Introduction: Central venous catheterization is an invasive procedure. The use of implantable venous access devices and lower rates for morbidity, influence the selection of various central veins. This study compared two central veins for access: the internal jugular vein (IJV) and the subclavian vein (SCV).**Materials and Methods:** The clinical trial involved patients (total 100) randomly divided into two groups: IJV and SCV. Early and late mechanical complications, malfunction, duration of procedure and visual analog scale (VAS) were evaluated. Data were analyzed by student T-test and chi square test.**Results:** The mean (±SD) age of IJV group was 43.7 ± 16.9 yrs and SCV group 45.5 ± 19.5 yrs (p = 0.5). The mean duration of procedure was 54.6 ± 9.3 min in IJV and 45.4 ± 11.4 min in SCV (p = 0.000). VAS were 3.6 ± 1.1 and 2.4 ± 1.2, respectively in IJV and SCV groups (p = 0.2). There was no arterial puncture, hemothorax, air emboli, A-V fistula, cardiac tamponade and death observed. Overall, hematoma and wound infection were not significant between the two groups, although pneumothorax and malfunction of ports after 1 month were significantly higher in SCV group.**Conclusion:** Compared with the SVC, central vein port implantation with IJV is a better and safer approach.**O-11-7 Establishing a parathyroid service - A rapid learning curve**D. Van Dellen^a, H. Jones^b, R. Bright-Thomas^b, D. Jenkin^b, B. Wittkop^b and S. Thrush^b^aDepartment of General Surgery, Worcestershire Royal Hospital, Charles Hastings Way, WR5 1DD Worcester, United Kingdom; ^bDepartment of General Surgery, Worcestershire Royal Hos, Charles Hastings Way, WR5 1DD Worcester, United Kingdom (e-mail: davidvandellen@yahoo.com)**Introduction:** Modern hyperparathyroidism management encompasses a multidisciplinary approach involving endocrinology, nuclear medicine, radiology and surgery. This service is generally centralised to established specialist units. Within the last 3 years our Trust has initiated a new service. We examined its results and compared it to published data.**Materials/Methods:** 22 patients undergoing surgery (M = 5; F = 17; median age 58; 1 failed exploration referred to another unit) underwent pre-operative

sestambi and ultrasound scans. Results were correlated with intra-operative findings, parathyroid hormone (PTH) levels and post-operative histology.

Results: Sestambi scans had a positive predictive value (PPV) of 61% (13/21) in pre-operative localisation, whilst ultrasound had a PPV of 42% (9/21) (published PPV's 86% and 61% respectively.) 38% (8/21) had both positive sestambi and ultrasound investigations. Excision was confirmed by histological diagnosis of the adenoma and decreased PTH levels (medians 151.25 and 38.3 pg/ml pre- and post-operatively respectively; p value < 0.0001; Mann Whitney U test)

Conclusion: Despite a rapid learning curve, these results show an acceptable excision rate achieved whilst establishing a de novo service, despite slightly lower levels for concurrent localisation compared to previous data. Combined pre-operative mapping of adenomas allows accurate pre-operative localisation, allowing a safe minimally invasive approach.

O-12 Thoracic Surgery

O-12-1 Video assisted thoracoscopy (VATS) in the assessment of mediastinal or hilar lymph nodes disease

J. P. Berthet^a, C. Cosma^b, L. Canaud^a, P. Alric^a and C. H. Marty Ané^a

^aDepartment of Vascular Surgery, Hôpital Arnaud de Villeneuve, 191 av du Doyen Giraud, 34090 Montpellier, France; ^bDepartment of Vascular Surgery, 191 av du Doyen Giraud, 34090 Montpellier, France (e-mail: jp-berthet@cbu-montpellier.fr)

Discovery of mediastinal or hilar lymph nodes on CT-scan may require histopathology verification, especially in the staging of non small cell lung cancer (NSCLC). Mediastinoscopy, Transbronchic needle aspiration, TEP-scan are known to be access-limited, or associated with a poor sensitivity.

Objectives: Establish the efficiency of VATS in mediastinal and hilar node disease assessment.

Methods: The datas of all the patients who underwent VATS with lymph dissection for supra centimetric nodes noticed on CT-scan from 06-2000 to 12-2008 were retrospectively reviewed. VATS was indicated in lung cancer for diagnostic or staging (N0, N1, N2, N3); in other neoplastic process; and in incidental discovery. VATS was performed during single lung ventilation, through three 5mm-ports.

Results: 165 lymph nodes biopsy out of 135 patients were performed. The lymph nodes sites were 4R in 36 cases; 7, 8 in 52 cases; 5, 6 in 59 cases and 10, 11, 12 in 18 cases. Histopathology noticed 48 NSCC and 25 other neoplastic process. Operative mortality, morbidity, prolonged air leakage and surgical conversion with mini-thoracotomy (5 cm) were respectively 0%, 7%, 4% and 4%. Patient were released from our surgical department after a median of 3, 9 days.

Conclusion: VATS is efficient and safe in interlobar, hilar or mediastinal node verification especially in lung cancer staging.

O-12-2 Gemcitabin systemic per-operative chemotherapy (SPOC) for resectable stage I, II non-small cell lung cancer: pilot study

R. Vaillancourt, J. Bussièrès, Y. Lacasse, F. Laberge and Y. Cormier

Hôpital Laval, Laval University, 2725 Chemin Ste-Foy, QC G1V4G5 Québec, Canada (e-mail: cr.vaillancourt@videotron.ca)

Clinical and experimental data suggest that per-operative period, combined with surgically induced immunosuppression, is critical for cancer dissemination. Therefore it probably represents the optimal timing for adjuvant treatment to reduce metastatic recurrence. We present the first human pilot study of SPOC for resectable lung cancer. Sixteen patients (10 females) received the night before surgery 1g/sqM of gemcitabin. Fifteen lobectomies (3 sleeve) and one pneumonectomy were performed. Mean follow-up was 25.7 months (12 – 48). The main results are the following: no allergic reactions, 5 post-operative complications, mean chest drainage time of 5.7 days, no perioperative mortality, no thrombocytopenia and 3 grade II neutropenias. Five recurrences occurred, 3 of them retreated with curative intent. One of these 3 and 2 other patients died of recurrent cancer 20, 5 and 25 months post-op; no brain

metastases at first recurrence. We conclude that gemcitabin SPOC is most probably safe and feasible. We are planning a randomized phase II study to assess its potential benefits.

O-12-3 Clinical and pathological evaluation for malignant pulmonary tumors surgically treated after therapy for pharyngeal or laryngeal cancer

T. Sakai, T. Tsushima, D. Kimura, R. Kitagawa, R. Hatanaka, Y. Yamada and I. Fukuda

Hirosaki University, 5 Zaifu-cho, 036-8562 Hirosaki, Japan (e-mail: t-sakai@cc.hirosaki-u.ac.jp)

[Introduction]: Multiple cancer of pulmonary and laryngeal or pharyngeal cancer is wellknown. In addition, pulmonary metastasis is sometimes observed in patients with laryngeal/pharyngeal cancer.

[Materials and Methods]: Seven patients who underwent surgery for malignant pulmonary tumors after treatment for laryngeal/pharyngeal cancer were included, and evaluated clinically and pathologically.

[Results]: The mean age was 64.4-years, and all patients were male. All patients had habits of smoking. Seven patients were consisted of 4 laryngeal and 3 pharyngeal cancer. Therapy for those cancers was radiation alone in 57.1% and radiation/surgery in 42.9%. Histology was squamous cell carcinoma in 85.7%. The diagnosis of pulmonary tumors was obtained metachronously in 85.7%, and mean interval was 4.7 years. Surgical procedures for pulmonary lesions were lobectomy in 57.1% and segmentectomy/partial resection in 42.9%. Histology of 8 pulmonary lesions was 62.5% of squamous cell carcinoma, 25% of adenocarcinoma and 12.5% of large cell carcinoma. Seven lesions were diagnosed primary pulmonary cancer. Stage of 7 lesions was 57.1% of IA and 42.9% of IIA-IIIB. Postoperative complications were seen in 28.6%, and all were recovered.

[Conclusions]: Patients with laryngeal/pharyngeal cancer should be followed considering pulmonary lesions at least 5 years. Surgery for pulmonary lesions was considered safe and effective therapy without severe postoperative complications.

O-12-4 "Hemiclamshell" approach for thoracic surgery: Indications and morbidity, about 50 patients

G. Lebreton, J. M. Baste, M. Thumerel, F. Delcambre, J. F. Velly and J. Jougon

CHU de Bordeaux, Chirurgie Thoracique, Maison du Haut-Leveque, 33000 Pessac, France (e-mail: guillaumelebreton@live.fr)

Objective: This is a retrospective study to evaluate indications and outcomes of longitudinal partial sternotomy with antero-lateral thoracotomy on patients requiring this approach.

Methods: We studied retrospectively all patients who underwent an "hemiclamshell" approach in our department between July 1996 and July 2005, analyzing indications, morbidity and outcomes (at 1 month, and 1 year).

Results: 50 patients (25 men and 25 women) (mean age 52, 7 years) underwent an "hemiclamshell" incision. Indications were tumors of the apex (39%), tumors of the cervico-thoracic junction (45%), tumors of the chest wall (10%), and "bulky" tumors (6%). The one-month mortality was 6%. 2 patients suffered from a chylothorax and one a phrenic paralysis. Analgesic requirements for post-operative equals to the other thoracic surgical approach. At 1 month, 12% were in pain, and 6% at 1 year. There were a shoulder dysfunction for 10% of the patients at 1 month, and 6% at 1 year.

Conclusions: The "hemi-clamshell" incision has simple post operative, no more pain or shoulder dysfunctions than other anterior thoracic surgical approach. It's a very usefull approach for tumors of the lung apex, tumors of the cervico-thoracic junction and for "bulky" lung tumors, providing a nice exposition for mediastinal radical sampling.

O-12-5 Castleman's disease: anatomic – clinical and therapeutic forms. Serial 4 patients and literature review

M. Nguyen Van^a, F. Tronc^a, P. Jardin^b and J. P. Gamondes^a

^aDepartment of Thoracic Surgery, Cardiothoracic Hospital, 69677 Bron, France;

^bPulmonology Department, Hospital Vals d'Ardeche, 07000 Privas, France (e-mail: vanmanbnt@yahoo.com)

Objectives: Presenting anatomic-clinical and therapeutic forms of Castleman's disease through a serial of 4 patients which were in our institution and a literature review.

Methods: A retrospective review from the 1st of January 1978 to the 31st of December 2008 permitted to colligate 4 patients who suffered from Castleman's disease (thoracic localization).

Results: It is a four-patient group including two men and two women (mean age 21.5 ± 8.4 years old, with an 18-years median, range 16–34). Three patients were asymptomatic. Unicentric form was observed in all cases. Castleman's disease, with Hyaline-vascular form was confirmed in three cases. It was plasmocytary in the last case. These four patients benefited a complete surgical resection. One patient benefited preoperative-selective embolization. This one was treated by antibiotics with a view to preventing secondary infections which are caused by a Lymphocytes-CD4 decrease in postoperative time.

Conclusions: Castleman's disease is often asymptomatic in unicentric forms. Aetiology is not known. The treatment is complete surgery only in unicentric forms. The tumorous hypervascularization observed during the operation need preoperative-selective embolization to reduce haemorrhage during removal.

O-12-6 Non small cell lung carcinoma (NSCLC) with chest wall involvement: a support for aggressive surgical resection

J. P. Berthet, L. Canaud, F. Joyeux, P. Alric and C. H. Marty Ané

Department of Vascular Surgery, Hopital Arnaud de Villeneuve, 191 av du Doyen Giraud, 34090 Montpellier, France (e-mail: jp-berthet@cbu-montpellier.fr)

The aim of this study was to establish a surgical strategy and re-examine the survival in the NSCLC invading the chest wall.

Method: The prospective inclusion of 108 patients presenting a parietal NSCLC T3 was carried out between 1995 and 2005. The therapeutic strategy was homogeneous. The "En-Block" Resection (EBR) were performed in a selective way. An Extra Pleural Resection (EPR) was carried out in the absence of preoperative sign of parietal invasion or the absence of peroperative sign of invasion beyond the pleura. Immediate microscopic examination of the surgical margins consolidated these choices.

Results: The number of resected ribs was 2, 6 [1–5] and was followed by a parietal replacement in 16 cases (15%). One retains a global 5 year survival rate of 40, 6%. The 5 year survival rate of patients pN0, pN1, pN2 were respectively 46, 6%, 33, 7% and 22, 9%. The survival rate of group R0-N0 is in the EBR significantly higher ($p = 0.05$) than the survival rate of the remainder of the studied population (48, 8% versus 31, 3%).

Conclusion: The choice of the surgical strategy must be mostly preoperative. Associated peroperative criteria allowed to perform an EBR each time it is necessary to avoid a discontinuous resections.

O-12-7 The modern reconstruction of very large chest wall defect: an optimization by using the combination of STRATOS TM (Strasbourg Thorax Osteosynthesis System) and PTFE (polytetrafluoroéthylène) mesh

J. P. Berthet, F. Joyeux, L. Canaud, P. Alric and C. H. Marty Ané

Department of Vascular Surgery, Hopital Arnaud de Villeneuve, 191 av du Doyen Giraud, 34090 Montpellier, France (e-mail: jp-berthet@cbu-montpellier.fr)

The reconstruction of full thickness defects of the chest wall after resection of T3 NSCLC or primary parietal tumor is controversial and presents a complicated treatment scenario for thoracic surgeon.

Objective: To evaluate our results in prosthetic reconstruction with combination of PTFE mesh and STRATOS after chest wall resection.

Method: Between 1995 and 2006, large parietal replacement was performed in 27 cases after wide excision of primary chest wall tumour, or "EN-BLOC" resection for NSCLC invading the chest wall (16 cases). The chest wall was repaired by isolated mesh with an important morbidity (respiratory distress in 26%). Since 2006, 9 patients underwent a reconstruction of the thoracic wall using a combination of PTFE mesh and STRATOS.

Results: Of the 9 patients, 7 had R0 resection with removal of 2 to 6 ribs enlarged to the sternum in 2 cases. The reconstruction required 2 bars of STRATOS in two cases. A delayed breaking point was noticed at the joint in two patients. Anatomic and fonctionnal results after reconstruction were perfect in all but one patient who developed a respiratory failure.

Conclusion: Chest wall resection and reconstruction with PTFE and STRATOS can be performed as a safe, effective one-stage surgical procedure for major chest wall defects.

O-13 Plastic and Reconstructive Surgery

O-13-1 Pedicled supra-clavicular island flap for oral and pharyngeal reconstruction: an alternative to free forearm flap

B. Lallemand, G. Chambon, C. Reynaud, C. Alovisetti and J. G. Lallemand

CHU de Nimes, Place du Pr Robert Debré, 30029 Nimes, France (e-mail: benjamin.lallemand@chu-nimes.fr)

Introduction: Supra-clavicular island flap provides a thin hairless fasciocutaneous tissue. It has been mainly used for the reconstruction of skin defects on the face, neck or on the upper chest. We thought that this flap that shares similarities with the free forearm flap could be an alternative for oral and pharyngeal reconstruction after oncologic surgery. Objectives To present the original technique we develop to improve the viability of this controversial flap and the results we obtained when used for oral and pharyngeal reconstruction.

Method: We present 10 consecutive cases of supra-clavicular island flap performed between April 2005 and January 2008 in our French University Hospital.

Results: Seven out of 10 flaps gave excellent functional and cosmetic results similar to free forearm flap. Three flaps which initial vitality was good failed after 5 to 10 days. Three skin necrosis occurred on the donor sites due to over tensed sutures on the shoulder. For the last 2 patients we closed the donor site with skin graft on artificial dermis. Shoulder dysesthesias during feeding was described by 3 patients.

O-13-2 New horizon in skin reconstruction using an artificial dermis in a single operative procedure

S. Otman, L. Teot, S. Elbarouni and F. Lebreton

Burn centre, Lapeyronie university hospital, 34000 Montpellier, France (e-mail: samiotman@yahoo.fr)

Introduction: In the treatment of deep burns involving a large surface area surgeons are using more and more artificial dermis, this method nevertheless needs two operative interventions separated usually by an interval of 3 weeks in general.

Methods: "Matriderm" is used recently as a new dermal substitute that contains collagen and elastine in 1 mm thickness that can be immediately covered with a thin split thickness skin grafts harvested in the same operative time. During the last year we used Matriderm in 9 burnt patients in acute phase with burns involving face and hands.

Results: Clinical cases show an excellent take of the Matriderm and the thin split thickness skin graft covering it. We observed a better esthetic and trophic aspect in comparison with the traditional simple dermo-epidermic skin graft.

Conclusion: Matriderm could be a good dermal substitute that should be covered immediately with TSTSG offering a very satisfying results with a significant reduction in the number of operations to only once

O-13-3 Dual mesh-muscle pocket with/without abdominal lift for immediate implant based breast reconstruction after skin sparing mastectomy: A surgical technique to recreate ptosis

R. Wettstein^a, B. Elias^b, A. Bächle^b, G. Vlastos^c and Y. Harder^b

^aPlastic & Reconstructive Surgery, Rue du Bugnon 21, 1011 Lausanne, Switzerland;

^bPlastic & Reconstructive Surgery, Rue Micheli-du-Crest 24, 1211 Geneva, Switzerland; ^cSurgical Oncology, Rue Micheli-du-Crest 24, 1211 Geneva, Switzerland (e-mail: drwette@yahoo.com)

Introduction: Definitive implants become increasingly popular for immediate breast reconstruction (IBR) after skin sparing mastectomy (SSM). However, the amount of skin resection included in the SSM and the discrepancy between muscle pocket size and skin envelope preclude symmetric results without contralateral breast reduction. We present a modified surgical technique for IBR after SSM with definitive implants.

Materials & Methods: The subpectoral implant pocket is complemented with a polyglactin mesh. An abdominal lift is performed in selected cases to compensate for the resection of the nipple-areola complex.

Results: In 77 reconstructed breasts, the overall complication rate was 26% with surgical revision in 12% and reconstructive failure with implant removal in 8%. The abdominal lift did not influence the complication rate. The dual mesh-muscle technique rendered the use of bigger implants possible with a significant difference between the resected weight (302 ± 140 g) and the implant size (346 ± 93 g) ($p < 0.05$), which indicates that lower pole restriction can be overcome and the original volume can be reconstituted or even augmented.

Conclusions: The technique is reliable and overcomes the limitations with definitive implant-based IBR after SSM without increasing the risk for postoperative complications even if abdominal skin is recruited to compensate for the skin removed with mastectomy.

O-13-4 Experience with abdominal flap breast reconstruction in patients with multiple abdominal scars

M. Di Candia^a, F. Hsieh^b, D. Kumiponjera^a and C. Malata^c

^aPlastic Surgery Addenbrookes, Hills Road, CB2 2QQ Cambridge, United Kingdom;

^bMedical School Cambridge Unvers, Hills Road, CB2 2QQ Cambridge, United Kingdom; ^cDep. Plastic & Reconstr. Surgery, Addenbrooke's Hospital, Box 186, Hills Road, CB2 2QQ Cambridge, United Kingdom (e-mail: mdicandia@doctors.net.uk)

Introduction: Although abdominal flap breast reconstruction (AFBR) in patients with single abdominal scars is well documented, there are to date no publications specifically dealing with the influence of multiple pre-existing scars on AFBR. In our practice, abdominal scars are not considered contraindications to AFBR. We therefore reviewed our experience with this patient subgroup.

Patients and Methods: 34 patients with previous abdominal scars undergoing AFBR by a single operator (2000–2007) were retrospectively reviewed. Patients with more than one abdominal scar were studied with respect to scar types, reconstructive approach, flap outcomes and donor-site complications.

Results: 13 patients (mean age = 49 years, $r = 39$ –65) with multiple pre-existing scars (Pfannenstiel 13, midline 9, appendicectomy 4, open cholecystectomy 2, others 3) underwent 11 unilateral and 2 bilateral breast reconstructions (15 total flaps; 7 immediate and 8 delayed). All the flap transfers (10 free TRAMs, 3 DIEPs) were successful and no patients developed significant wound healing problems or late abdominal wall morbidity (average FU = 26 months).

Conclusion: Multiple pre-existing scars do not constitute absolute contraindications to AFBR. With careful pre-operative planning and appropriate reconstructive strategies, it is possible to achieve excellent functional and aesthetic results. The precautions needed to achieve this are outlined.

O-13-5 A retrospective comparison of analgesia requirements in patients undergoing free flap breast reconstruction with and without total rib preservation

Z. Mickute^a, M. Dicandia^a, M. Moses^a, A. Bailey^b and C. Malata^c

^aAddenbrooke's Hospital Cambridge, Hills Road, CB2 0QQ Cambridge, United Kingdom;

^bAddenbrooke's Hospital, Department of Anaesthetics, CB2 2QQ Cambridge, United Kingdom; ^cDep. Plastic & Reconstr. Surgery, Addenbrooke's Hospital, Box 186, Hills Road, CB2 2QQ Cambridge, United Kingdom (e-mail: zm231@cam.ac.uk)

Introduction: The technique of total rib preservation during internal mammary vessel dissection exposes the vessels within the rib interspace instead of removing a segment of the 3rd costal cartilage as has been done traditionally. This study compares these two techniques with respect to post-operative analgesia requirements, time to mobilisation and length of hospital stay.

Methods: Two matched cohorts of 20 patients (single surgeon) were identified and their notes retrospectively reviewed. Total morphine used (PCA), duration of urinary catheter (a marker of mobilization) and length of hospital stay were compared.

Results: Overall, the mean amount of morphine per kilogram required by DIEP flap patients with rib preservation was not significantly less than the amount required by patients who had reconstruction without rib preservation (0.464 mg/kg *versus* 0.499 mg/kg; $p = 0.823$). However, this tended towards significance when patients who underwent unilateral procedures alone were considered ($p = 0.148$). There was no reduction in time to mobilization or length of hospital stay.

Conclusion: This study shows that rib preservation in DIEP flap patients may reduce postoperative pain and morphine use. However this is unlikely to be clinically significant in patients who have simultaneous contralateral procedures, since this may mask the potential benefit of this technique.

O-13-6 Regulation of tissue fluid/lymph cytokines and growth factors of human keratinocyte proliferation and differentiation

A. Domaszewska-Szostek, M. Zaleska and W. Olszewski

Medical Research Centre, 5 Pawinskiego Str., 02-106 Warsaw, Poland (e-mail: wlo@cmdik.pan.pl)

Introduction: Our previous studies revealed presence of a number of growth factors and cytokines in human skin tissue fluid/lymph (TF/L) at levels higher than in serum. This prompted us to study whether TF/L may have a regulatory effect on keratinocyte (KC) growth.

Aim: To study the effect of TF/L on proliferation and differentiation of KC and their stem cell markers expression.

Material and methods: KC were isolated from lower limb skin and were cultured for 1 to 7 days in TF/L. Phenotypes were identified using antibodies against p63, CD29, Ki67 and PCNA. Blocking of cytokines with antibodies helped to estimate which cytokine stimulated KC proliferation and differentiation.

Results: KC cultured in TF/L showed higher than in controls percentage of dividing and elongated cells from basal layer as well as lower percentage of differentiated cells from upper layers. Higher percentage of p63 and CD29 positive cells was also observed. Neutralization of IL-1 β , IL-6, TNF- α , KGF caused decrease in percentage of mitotic cells. Neutralization of KGF decreased percentage of p63 and CD29 positive cells.

Conclusion: TF/L cytokines have a stimulating effect on proliferation of basal KC but not on their differentiation. KGF turned to be a strong stimulator.

O-13-7 Abdominoplasty in patients with and without pre-existing scars: A retrospective comparison of a single surgeon's experience

A. Karthikesalingam^a, H. Schumacher^a and C. Malata^b

^aPlastic Surgery Addenbrookes, Hills Road, CB2 2QQ Cambridge, United Kingdom;

^bDep. Plastic & Reconstr. Surgery, Addenbrooke's Hospital, Box 186, Hills Road, CB2 2QQ Cambridge, United Kingdom (e-mail: alankarthi@googlemail.com)

Introduction: Abdominoplasty is a common major aesthetic procedure which carries a significant risk of post-operative complications. Pre-existing abdominal wall scars are hypothesised to increase risk but there are few studies analysing this or the effect of segmental interruption to blood supply caused by scars. We attempted to quantify the effect of pre-existing scars on the incidence of complications.

Methods: All abdominoplasties under a single surgeon (2000–2007) were reviewed with respect to indications, abdominal scars, and postoperative complications. Patients with pre-existing scars were compared with “controls” (no scars).

Results: 123 abdominoplasties (97% female, median age = 40 years) were performed for abdominal laxity (46%), multiple scars (22%) and “diastasis recti” (11%). 70% (87/123) had pre-existing scars (50% multiple) in various abdominal vasculature zones. 32% were smokers and the average BMIs for the two groups were 26.1 and 28.2 kg/m². 28% developed wound complications: infection (14.6%), delayed healing (8.1%) and dehiscence (4.9%). Three hernias were recorded. There was no significant increase in complications due to scars in Zones 1–3 ($p > 0.05$, Fisher’s Exact Test).

Conclusion: Pre-existing scars did not increase complication rate in our series and therefore should not be considered an absolute contraindication to this commonly requested aesthetic procedure.

O-14 Surgical Anatomy

O-14-1 Thyroid tubercle of Zuckerkandl: myth or reality?

C. Page^a, A. Biet^a, M. Laude^b and V. Strunski^a

^aCHU Amiens – Hôpital Nord, Service d’ORL et de CCF, Place Victor Pauchet, 80000 Amiens, France; ^bLaboratoire d’anatomie, Faculté de médecine, 3 rue des Louvels, 80000 Amiens, France (e-mail: cyril_page@yahoo.fr)

Goal of the study: To highlight a poorly-known anatomical variation of the lateral lobe of the thyroid gland which can be useful in identifying the inferior laryngeal nerve during thyroid surgery.

Material and method: We performed a 5-year prospective study of 129 thyroid surgery patients. Great attention was paid to anatomical variations of the thyroid gland (the presence or absence of a distinct tubercle of Zuckerkandl), the inferior laryngeal nerve and the location of the parathyroid glands.

Results: In all, 121 right lobectomies and 124 left lobectomies were performed. 7 tubercles of Zuckerkandl were identified (5.78% of cases) and were useful in detecting the inferior laryngeal nerve (but only on the right side).

Conclusion: The tubercle of Zuckerkandl is a poorly-known and variable anatomical feature of the thyroid gland which may not, in fact, be that rare. It can be a reliable anatomical landmark for identifying the inferior laryngeal nerve during thyroid surgery. It should be included in the Nomina Anatomica as the “processus posterior glandulae thyroideae” described by Zuckerkandl.

O-14-2 Is the laparoscopic training using human anatomical material improve the laparoscopic skill ?

M. Prudhomme^a, N. Pirro^b, R. Mazars^a, M. C. Lemoine^c, C. Basurko^d, L. Grandin^d, F. Borie^c and P. Fabbro-Peray^d

^aDepartment of Anatomy, CS 83021. Avenue Kennedy., Faculté de Médecine de Nîmes, 30900 Nîmes, France; ^bDigestive Surgery, 264 rue Saint Pierre, Hôpital La Timone, 13385 Marseille, France; ^cDigestive Surgery, CHU Caremeau, Place du Pr Robert Debré, 30900 Nîmes, France; ^dMedical Information, CS 83021. Avenue Kennedy., Faculté de Médecine de Nîmes, 30900 nîmes, France (e-mail: prudhomme.michel@chu-nimes.fr)

Introduction: the aim of this study was to evaluate the impact of laparoscopic training using human anatomical material.

Materials: the data were collected at a 2 stages of 3-days course in laparoscopic training. Fifty-five participants (36 men) with limited experience in laparoscopic surgery were included. After educational interventions including anatomic lessons, material demonstrations and surgical movies the participants were enrolled to take a baseline-test. Laparoscopic skill was measured objectively

through a series of 7 tasks in an inanimate simulator. After baseline-test all participants performed surgical training using human anatomical material (baseline tasks, basics procedures, and various colorectal, gynaecologic and urologic procedures). All sessions were supervised by experts. At the end on the course, all participants were tested using the same procedure that for the baseline test.

Results: the score of all participants was significantly improved with training (baseline-test: 1041 + / – 287, final-test: 1455 + / – 248, $p < 0, 05$). The final mean score was significantly higher for all tasks excepted for task 5 (stapling of a mesh defect). The magnitude of improvement from the baseline to final-test was no different for the gender, age, laparoscopic experience.

Conclusion: The laparoscopic training using human anatomical material improve the laparoscopic skill and could be integrated in surgical education.

O-14-3 Is the number of lymph nodes correlated with mesorectal morphometry?

N. Pirro^a, R. Mazars^b, C. Pignodel^c, P. Cathala^d, P. Fabbro-Peray^d, G. Godlewski^b and M. Prudhomme^b

^aDigestive Surgery, 264 rue Saint Pierre, Hôpital La Timone, 13385 Marseille, France; ^bDepartment of Anatomy, CS 83021. Avenue Kennedy., Faculté de Médecine de Nîmes, 30900 Nîmes, France; ^cDepartment of Pathology, CHU Caremeau, Place du Professeur Robert Debre, 30029 nîmes, France; ^dMedical Information, CS 83021. Avenue Kennedy., Faculté de Médecine de Nîmes, 30900 nîmes, France (e-mail: mazars.romain@cbu-nimes.fr)

Introduction: Lymph node involvement is an essential prognostic factors of patients with rectal cancer. However the distribution of mesorectal lymph nodes is unclear. This study assessed the mesorectal lymph nodes and evaluated the correlation between the morphometry of the mesorectum and the number of rectal lymph nodes.

Methods: The mesorectums of 20 cadavers were studied. The volume and weight of the mesorectum were measured. Lymph nodes were sought by manual dissection and were submitted for histological examination. The correlation between the number of lymph nodes and the volume and weight of the mesorectum was evaluated by non parametric test. Results. The mean number of lymph nodes per specimen was 9.2 + / – 4.5. The majority of lymph nodes were small and were located in the superior and posterior parts of the mesorectum. A positive correlation was found between the number of lymph nodes and the morphometry of the mesorectum.

Conclusions: Mesorectal lymph nodes are mainly located above the peritoneal reflection within the posterior mesorectum. The correlation between the morphometry of the mesorectum and the number of mesorectal lymph nodes should be considered to determine the minimum number of mesorectal lymph nodes required for histological examination.

O-14-4 Bipartition of human articular facets: functional and evolutionary significance

F. Billmann^a and J. M. Le Minor^b

^aSt. Vincentius Kliniken, Südenstrasse, 32, 76137 Karlsruhe, Germany; ^bUniversité de Strasbourg, 4, rue Kirschleger, 67000 Strasbourg, France (e-mail: franck.billmann@wanadoo.fr)

Introduction: Among the nonmetric variants of the articular facets of the human bones, the bipartition (= double facet) is often observed. The purpose of this work was to precise the frequency of these variants and to study their functional and evolutionary significance.

Material, methods: The material consisted in isolated bones (from 100 to 600 according to the bones) (dried bones). For comparison, 256 skeletons of non-human primates were also used.

Results: The most frequent bipartitions were observed: 1) in the vertebral column for the superior facet of the atlas (20.8%); 2) in the superior limb for the fourth metacarpal – third metacarpal facet (64.5%), the trochlear notch of the ulna (54.3%), the third metacarpal – fourth metacarpal facet (51.3%), the trapezoid-capitate facet (45.8%), 3) in the inferior limb for third

metatarsal – second metatarsal facet (81.4%), the facet of the lateral cuneiform for the second metatarsal (58.7%), the anterior facet of the calcaneus for the talus (52.1%). Comparative anatomy allowed to suggest that bipartition is linked during human evolution to more important local pressure.

Conclusion: The study of bipartite facets shed new light on the links between structure and function during evolution on the biomechanics of the corresponding human joints.

O-14-5 Computer assisted dissection of the cavernous nerves in the neurovascular bundle

B. Alsaid, D. Diallo, T. Bessede, I. Karam, P. Hajj, G. Benoit and S. Droupy

EA 4122, *Medecine Faculty, 94270 Le Kremlin-Bicêtre, France (e-mail: drbayan@gmail.com)*

Objective: Classical anatomical methods failed to determine definitely the precise location of intra-pelvic innervation. We aimed to identify the distribution of nerve fibres within neurovascular bundle (NVB), by using an original method of Computer Assisted Dissection (CAD).

Materials and methods: Serially transverse sections were performed in pelvic organs specimens of 3 male adult cadavers; one specimen was obtained after nerve-sparing radical prostatectomy (RRP). Sections were treated by HES and anti-protein S100, digitized and tri-dimensionally reconstructed using WinSurf software.

Results: Some branches travel on the antero-lateral side of prostate to reach the urethral sphincter, these branches was also observed in prostatic specimens after RRP. “Cavernous nerves” and small vessels entering the urogenital diaphragm on the posterior surface of membranous urethra before reach the corpus spongiosum bulb; no clear communication with the cavernous body’s root was detected. Communicating branches’ between “cavernous nerves” and dorsal nerve of the penis were visualized on the antero-lateral side of urethral sphincter.

Conclusion: The use of CAD in adult cadaver pelvic specimen’s confirmed and clarified topographic and surgical anatomy of “cavernous nerves” in the NVB. This technique represents a great educational method for surgeons to better understand the anatomy of an inaccessible region by conventional techniques.

O-14-6 White matter and surgical approaches to the lateral ventricle

J. Peltier^a, A. Fichten^b, S. Velut^c and D. Le Gars^a

^aLaboratory of Anatomy, University of Amiens, 80036 Amiens, France; ^bDepartment of Neurosurgery, University Hospital, 80054 Amiens, France; ^cDepartment of Anatomy, University of Tours, 37000 Tours, France (e-mail: peltier.jobann@cbu-amiens.fr)

Introduction: To reach tumors of the atrium or those of the inferior horn of the lateral ventricle, surgeons must use strategies to avoid creating a neurological deficit. Various transcortical approaches can threaten optic radiations or arcuate fasciculus.

Materials and methods: 20 hemispheres (10 brains) of formalin-fixed normal adult human brains of both sexes were examined. Klingler’s fiber dissection method was applied under operating microscope

Results: The optic radiations ran within the middle temporal gyrus under the inferior longitudinal fasciculus. The arcuate fasciculus or superior longitudinal fasciculus encircled the sylvian fissure and covered the atrium.

Conclusion: Exposure of the inferior horn can be performed either through a corticectomy in the superior temporal gyrus at the level of the limen insulae or through the inferior limb of the insular sulcus. This route preserved the language area and the visual pathways. The parietal transcortical approach avoided the speech areas but can threaten the arcuate fasciculus interconnecting these area, especially in dominant hemisphere.

O-14-7 Superior approach to the inferior laryngeal nerve in thyroid surgery

C. Page^a, R. Zaatar^a, A. Biet^a, M. Laude^b and V. Strunski^a

^aCHU Amiens – Hôpital Nord, Service d’ORL et de CCF, Place Victor Pauchet, 80000 Amiens, France; ^bLaboratoire d’anatomie, Faculté de médecine, 3 rue des Louvels, 80000 Amiens, France (e-mail: cyril_page@yahoo.fr)

Goals of the study: To describe the anatomical bases of the surgical access to the higher part of the thyroid lobe, with first location of the inferior laryngeal nerve at its laryngeal penetration, to discuss the advantages and the disadvantages of this surgical technique and to pose the operational indications.

Population and method: A prospective study of surgical anatomy was performed over a period of 18 months. 25 patients with cervico-thoracic goitre underwent total thyroidectomy. The thyroid lobectomies were performed using the technique of “capsular thyroidectomy” with first location and complete dissection of the inferior laryngeal nerve. A neurostimulator was systematically used for the location of the inferior and external laryngeal nerves.

Results: The detection of the inferior laryngeal nerve was positive in 49/50 cases. The external laryngeal nerve was stimulated and respected in 12, 5% of cases. No serious complications occurred after surgery.

Conclusion: The safeguarding of the inferior laryngeal nerve is the principal and obligatory stake in thyroid surgery. Locating the inferior laryngeal nerve at the level of its laryngeal penetration at the superior pole of the thyroid region is necessary in cases of particular situations: huge cervicothoracic goitres, re-operative procedures and various anatomical variations. The use of a neurostimulator secures this technique.

O-15 Vascular Surgery

O-15-1 Pluripotent mesenchymal stem cells perfusion stabilizes already-formed aortic aneurysms in a rat model

F. Schneider^a, J. P. Dai^b, M. Gervais-Taurel^b, P. Desgranges^a, J. P. Becquemin^a and E. Allaire^a

^aHôpital Henri Mondor, 51 avenue du Mal de L de Tassigny, 94010 Créteil, France; ^buniversité Paris 12, 51 Mal de L de Tassigny, 94010 Créteil, France (e-mail: fabrice.schneider5@orange.fr)

Introduction: Aneurysms can be stabilized by Smooth Muscle Cells (SMC) intra-lumen perfusion. Platelet Derived Growth Factor-BB (PDGF-BB) induces Mesenchymal Stem Cells (MSC) differentiation into SMC. Our goal was to assess the impact of MSC perfusion with or without PDGF-BB stimulation on aneurysm growth.

Materials and methods: After bone marrow extraction and selection on plastic adhesion, MSC were stimulated or not by PDGF-BB and phenotyped. Aneurysms obtained from xenograft were perfused by 1 million of SMCs (n = 5), MSCs (n = 6), PDGF-MSCs (n = 3) and medium as controls (n = 4). Rats were sacrificed for diameter measurement and aorta harvesting for mRNA (MMP-9, TIMP-1) quantification.

Results: CSM were CD90+, CD44+, CD45– and CD11b– and strongly expressed calponin, α -actine and myosin after PDGF stimulation. MSC decreased aneurysm growth compared to SMC and control group (respectively, 6, 5% + / – 9, 7, 25, 5% + / – 17, 2 and 53, 4% + / – 14, 4; p < 0, 05) whereas PDGF-MSC increased aortic growth rate (55, 6% + / – 26, 6; p < 0, 05) and complication rate (66, 6%; p < 0, 05). Perfusion of MSC decreased expression of MMP-9 and increased TIMP1 expression compared to controls.

Conclusion: MSC stabilized aneurysm growth more efficiently than SMC, decreased proteolytic activity in the aortic wall. PDGF differentiated MSC into SMC but suppressed their stabilization ability.

O-15-2 Endovascular repair of aortic arch lesions in high-risk patients or with prior thoracic aortic repair: mid term results

L. Canaud, K. Hireche, J. P. Berthet, P. Branchereau, C. Marty-Ané and P. Alric

Department of Vascular Surgery, Hôpital Arnaud de Villeneuve, 191 av du Doyen Giraud, 34090 Montpellier, France (e-mail: ludoviccanaud@botmail.com)

The aim of this study was to assess the short- and midterm results following endovascular repair of the aortic arch in high-risk patients or with prior thoracic aortic repair. From November 1998 to November 2008, 57 thoracic stent-grafts were implanted in 44 patients (mean age 66.5 + / - 16.5 years) for endovascular arch repair (zone 0 to 2). All the patients were at high surgical risk. Endovascular repair was performed in an emergency setting in 27.3% (12). Supra-aortic debranching was performed to provide an adequate proximal aortic landing zone by cervical (28) or sternotomy approach (6). The technical success rate for aortic zone 0 (6), zone 1 (4) and zone 2 (34) was 100%, 100% and 97.7%. The 30-day mortality rate was 20.4%. The actuarial survival was 70% over a mean follow up of 29.9 months. The rate of stroke was 6.8%. Two cases (4.5%) of paraplegia were observed of whom one was reversible after cerebrospinal fluid drainage. The rate of endoleak was 15.9% (7). There were no device migration, but one stent-graft collapse occurred 20 days after surgery. Hybrid endovascular aortic arch reconstruction provide an attractive alternative for treating aortic arch lesions in high-risk patients, with acceptable primary results and encouraging midterm efficacy.

O-15-3 Endovascular repair for traumatic rupture of the aortic isthmus

P. Alric, L. Canaud, J. P. Berthet, F. Joyeux, P. Branchereau and C. Marty-Ané

Department of Vascular Surgery, Hôpital Arnaud de Villeneuve, 191 av du Doyen Giraud, 34090 Montpellier, France (e-mail: p-alric@cbru-montpellier.fr)

The aim of this study was to evaluate the short- and midterm results following endovascular repair of a traumatic rupture of the aortic isthmus. Between November 1998 and January 2007, 173 endografts have been placed in 125 patients for treatment of thoracic aortic lesions. Thirty-two patients underwent endovascular repair for acute traumatic rupture of the aortic isthmus (23 men, mean age 40, 1 ± 16, 5 years [19–78]). The median follow-up was 50, 2 ± 16, 9 months. All endografts were successfully deployed. Three patients required common iliac artery access. The morbidity rate was 12.5%: two cases of inadvertent coverage of supra-aortic trunks occurred peroperatively, a proximal type I endoleak was successfully treated by a proximal implantation of a second endograft, and one collapse of an endograft was successfully treated by open repair and explantation. No patient suffered transient or permanent paraplegia, cerebral complication, endograft migration, or secondary endoleak. The overall mortality rate was 3.1%. Short and midterm results following endovascular treatment for traumatic rupture of the aortic isthmus favor the proposition of endovascular repair as the first-line treatment in hemodynamically unstable patients.

O-15-4 Will all the thoracoabdominal aneurysms (TAA) be treated by endografts – what are the current limits?

M. Koussa^a, T. Modine^b, R. Azaoui^c, G. Fayad^d and S. Haulon^e

^ahôpital cardiologique, chirurgie cardiovasculaire, CHRU Lille, 59000 Lille, France; ^bhôpital cardiologique, CHU de Lille, service de chirurgie vasculaire, 59000 Lille, France; ^chôpital cardiologique, CHU de Lille, service de chirurgie vasculaire, 59000 Lille, France; ^dhôpital cardiologique, CHRU de Lille, service de chirurgie vasculaire, 59000 Lille, France; ^ehôpital cardiologique, CHRU Lille, 59000 Lille, France (e-mail: t-modine@yahoo.fr)

Endovascular exclusion of complex aortic aneurysms with fenestrated and branched endografts is routinely performed in several reference centres. A number of factors currently limit the indications of this new technique. Mid-term results (paraplegia and early mortality rates) of endovascular complex aortic repairs are favourable compared to open surgery in high risk patients. However, we have no long term data available to support its use in young and/or healthy patients. Late renal stenoses requiring secondary interventions have been observed following fenestrated grafting. Long term results will also be necessary to evaluate specific complications such as migration, material fatigue and component separation that can result in loss of visceral branches. – Improvement of devices, planning and delivery systems, and the experience gained from the preliminary experience have broaden the indications of endovascular exclusion

of TAAAs. However, the endovascular approach has to be considered as a complementary option but not as an alternative to open surgery. Reference centres need to master both techniques to adapt the treatment to the patient's physiology and anatomy.

O-15-5 Outcome following emergency abdominal aortic aneurysm repair; does inter-hospital transfer make a difference?

P. M. Neary, B. J. Manning, S. D. Killeen, H. P. Redmond, S. O'Neill and G. J. Fulton

Department of Academic Surgery, Cork University Hospital, University College Cork, Wilton, Cork, Ireland (e-mail: peterneary@hotmail.com)

Introduction: Abdominal aortic aneurysm (AAA) rupture is associated with high morbidity and mortality. We aimed to compare the outcome of patients undergoing emergency AAA repair who presented directly (group 1) to a tertiary referral centre (TRC) to those patients transferred (group 2) from other institutions where a vascular service was not available.

Methods: We performed a retrospective analysis on all patients who presented to the TRC with a leaking AAA between Jan 1995-Jan 2005. We documented age, sex, details of initial presentation, time from presentation to time of surgery and subsequent morbidity and mortality.

Results: In group 1 and group 2 there was 45 *versus* 33 patients, median age 69 ± 7.900 (sd) *versus* 75.1 ± 6.602 (sd) (p-value = 0.725) and 32 *versus* 28 patients undergoing surgery respectively. In group 1 and group 2 the peri-operative mortality was 59.3% *versus* 60.7%, median time to surgery 1.85 hours *versus* 5.33 hours (p-value < 0.001) and median duration of surgery 3.55 hours *versus* 3.35 hours (p-value = 0.533) respectively.

Conclusion: Mortality remains high in both groups of patients presenting with a leaking AAA. Despite a significantly longer delay to surgery in the group of patients requiring inter-hospital transfer, mortality is similar in the patients who survive transfer and the patients who present directly to a TRC.

O-15-6 Novel gene expression in abdominal aortic aneurysms

G. Chinien, P. Saha, K. Burnand, M. Waltham and A. Smith

Kings' College London, 1st Floor, North Wing, St Thomas, Hospital, Lambeth Palace Road, SE1 7EH London, United Kingdom (e-mail: prakash.1.saha@kcl.ac.uk)

Introduction: Abdominal aortic aneurysms (AAA) have a strong familial predisposition, with chromosome 19q13 identified as susceptible locus in linkage studies. The aim of this study was to identify genes that are differentially expressed between aneurysmal (AAA), atheromatous (AOD) and normal (NA) aortic tissue.

Methods: cDNA was prepared from aortic walls. The cDNA was hybridized to HU133plus 2.0 microarray that interrogates the whole human genome. Statistical analysis was then carried out. Genes with at least a twofold change and a P < 0.05 were considered significant. RT-PCR was carried out on 9 differentially expressed genes using Taqman.

Results: A total of 3320 genes and 245 genes were found to be differentially expressed when comparing AAA with NA and AAA with AOD respectively. There was a predominance of inflammatory genes. Genes with differential expression were identified on chromosome 19q13. These included CD79A and SpiB transcription factor which were upregulated in AAA. Of the nine genes confirmed on RT-PCR, eight showed similar trends to the microarray experiment.

Conclusion: This analysis has not only confirmed genes that are known to be differentially expressed but also a number of novel genes present on chromosome 19q13, which are putative biomarkers or therapeutic targets for AAA.

O-15-7 Postconditioning: reduction of inflammatory processes after operations on the abdominal aorta

A. Szijarto^a, P. Aranyi^a, E. Gyurkovics^a, Z. Turoczi^a, M. Varga^a, M. Fehervari^a, G. Lotz^b, D. Gero^c and P. Kupcsulik^a

^aSemmelweis University, 1st Department of Surgery, Ulloi ut 78, 1082 Budapest, Hungary; ^bSemmelweis University, 2nd Department of Pathology, Ulloi ut 93, 1091 Budapest, Hungary; ^cSemmelweis University, Cellscreen Applied Research Cent, Ulloi ut 93, 1093 Budapest, Hungary (e-mail: szijartoattila@gmail.com)

Introduction: Vascular surgery on the lower limb with ischaemia-reperfusion injury may give rise to a reperfusion syndrome and SIRS. This process may lead to dysfunction and morphologic alteration of distant organs. Effects of postconditioning were investigated on major vascular surgery with reperfusion-syndrome.

Material/Methods: Wistar rats underwent 180 minutes of bilateral lower limb ischaemia and 4 hours of reperfusion. Postconditioning consisted of 6 cycles of 10-second aortic occlusion/10-second declamping. After 4, 24, 72 hours of reperfusion histological samples (muscle, lung, gut), and plasma were collected for measurement of TNF-alpha level, redox homeostasis. Microcirculation was detected by laser Doppler flowmeter.

Results: Picture of the lung histology referred to ARDS, while in postconditioned group slight alterations were detected. Gut oedema reduced by postconditioning. Limb microcirculation improved in postconditioned animals (RA:56, 1% vs. 113, 6%; PM:62, 7% vs. 123, 3%, $p < 0, 05$). Muscle showed rhabdomyolysis with inflammation after 24 hours. At each time-point (4, 24, 72 hours after reperfusion) postconditioned animals showed significant reduction in local (muscle histology and microcirculation) and the systemic inflammatory response (Early stage TNF-alpha: I-R:44, $90 \pm 8, 69$; PostC:24, $66 \pm 7, 2$ pg/ml, $p < 0, 01$, antioxidant-level: I-R:47, $13 \pm 8, 4$; PostC:23, $61 \pm 17, 6 \times 106$ RLU).

Conclusion: Postconditioning proves to be capable in conferring protection against different organ injuries caused by longer circulatory occlusions during elective major vascular surgeries.

O-16 Hepatobiliary and Pancreatic Surgery

O-16-1 Intestinal ischemic preconditioning as a "remote preconditioning" to the liver; impact of the gut protection and signal cross-talk between the liver and the gut

K. Hata^a, W. Lai^b, T. Schwandt^b, S. Saitoh^a, Y. Yamamoto^c, S. Uemoto^a and R. Tolba^d

^aKyoto University, 54 Shogoin-Kawabara-cho, Sakyo-ku, 606-8507 Kyoto, Japan; ^bBonn University, Sigmund Freud Str. 25, 53105 Bonn, Germany; ^cDept. of Surgery, Akita Univ., Akita Univ. School of Medicine, 1-1-1 Honjo, Akita, 010-8543 Akita, Japan; ^dInstitute for Lab. Animal Sc., RWTH Aachen Technical University, 52074 Aachen, Germany (e-mail: khata@kuhp.kyoto-u.ac.jp)

The gut has recently been recognized as the "motor" of multiple organ failure under various critical pathologies. This study was designed to investigate whether the gut protection by preceding ischemic preconditioning (IP) to the gut could ameliorate hepatic Ischemia/Reperfusion injury. Male Wistar rats were assigned into 2 groups; group-IP or group-C. Prior to hepatic I/R, either intestinal IP, consisting of 2 cycles of 4-minute SMA clamping separated by 11-minute reperfusion (group-IP), or sham procedure (group-C) was performed. They were then exposed to 30-minute total hepatic ischemia (THI) using Pringle's maneuver, followed by reperfusion. The intestinal blood flow during THI dramatically fell down to 10% of the pre-ischemic value, showing severely disturbed gut perfusion by THI. Intestinal IP, however, resulted in significantly earlier recovery of both intestinal and hepatic blood flow ($p < 0.0001$). Consequently, transaminase releases, hepatic/ileal ATP contents, and cytokines production (TNF- α and IL-6) were all significantly improved. Histologically, mucosal villi/micro-villi formation was better preserved by intestinal IP, preventing bacterial translocation. Animal survival was also dramatically improved. Intestinal IP significantly alleviated gut hypoperfusion after THI, thus maintaining the intestinal integrity. This led to improved

hepatic perfusion, less cytokines release and less bacterial translocation, finally resulting in remarkable protection against hepatic Ischemia/Reperfusion.

O-16-2 Increased histone deacetylase 7 (HDAC7) gene expression is significantly associated with adenocarcinomas of the pancreas

M. Ouaiissi^a, I. Sielezneff^b, R. Silvestre^c, B. Sastre^a, J. P. Bernard^d, J. Simony-Lafontaine^e, L. Dahan^f, J. F. Seitz^f, E. Mas^d, D. Lombardo^d and A. Ouaiissi^g

^aAP-HM hôpital Timone, Service de Chirurgie Oncologique, 264 rue Saint Pierre, 13385 Marseille, France; ^bAP-HM hôpital Timone, Service de Chirurgie Oncologique, 264 rue Saint Pierre, 13385 Marseille, France; ^cINSERM U841-Hopital Mondor, Faculté de Médecine -, 8, rue du Général Sarrail, 94010 Creteil, France; ^dUMR 911 INSERM, 27 bd jean moulin, 13385 Marseille, France; ^eVal D'Aurrel, Service d'anatomopathologie, 34094 Montpellier, France; ^fAP-HM Hôpital Timone, Service d'oncologie digestive, 13385 Marseille, France; ^gCNRS UMR 5235, Place E. Bataillon - Bât. 24 cc, 34095 Montpellier, France (e-mail: mehd.ouaiissi@mail.ap-bm.fr)

The aim of the present study was to evaluate the expression levels of members of HDAC class I, II and III in a set of surgically resected pancreatic tissues.

Methods: Total RNA was isolated from 11 pancreatic adenocarcinomas (PA): Stage 0 (n = 1), IB (n = 1), IIB (n = 6), III (n = 1), IV (n = 2), 3 benign tumor and normal pancreatic biopsy (NP) obtained during donor liver transplantation. Quantitative reverse transcriptase polymerase chain reaction (RT-PCR) was conducted and gene expression was quantified by qPCR. Protein expression levels were analyzed by Western blot and their localization by immunohistochemistry analyses of cancer tissues sections.

Results: The expression of class I and II members of HDACs showed that all the samples from PA, CP, SC and IMPN had decreased levels of HDAC 1, -2, -3 and -4 transcripts. Remarkably, 9 of the 11 PA (81%) showed significant increase of HDAC7 mRNA levels. The Western blot analysis showed increased expression of HDAC7 protein in 9 out of 11 PA samples in agreement with the qPCR data. Most of the PA tissue sections examined showed intense labeling in the cytoplasm when reacted against antibodies to HDAC7.

Conclusions: The data showed alteration of HDACs gene expression in pancreatic cancer. Increased expression of HDAC7 discriminates PA from other pancreatic tumors.

O-16-3 Non-uniform regional liver regeneration after surgical resection is well accounted for by the flow dynamic simulation in portal branches

Y. Iimuro, A. Yada, Y. Uda, N. Uyama, Y. Asano, T. Sugimoto, S. Saito, T. Hirano, T. Okada, N. Kuroda, J. Yamanaka and J. Fujimoto

Hyogo College of Medicine, 1-1 Mukogawa-cho, 663-8501 Nishinomiya, Japan (e-mail: iimuro@hyo-med.ac.jp)

Portal blood flow has been implicated in a critical factor regulating liver regeneration. We hypothesized that changes in portal blood flow regulate the regional regeneration after surgery, and tested this hypothesis employing computational flow dynamics (CFD) simulation.

Methods: Eight patients who underwent anatomical resection for primary liver cancer were analyzed. According to preoperative MD-CT, 3-D structure of portal branches was constructed, and each segment volume was calculated using 3-D virtual hepatectomy simulation software. Same procedure was performed 2 weeks and 3 months after the operation. For the CFD analysis, mesh models of portal branches were constructed. On the CFD software, changes in flow dynamics in the remnant portal branches were simulated 2 week and 3 months after surgery.

Results: Regional regeneration volume in each segment in the remnant liver was not uniform during the 3 months, and the simulated increases in blood flow were also not uniform at 2 week and 3 month. The blood flow change in portal branches at 2 week well correlated with the regional regeneration volume at 3 months.

Conclusions: Liver regeneration after surgical resection does not uniformly occur, and the non-uniform increases in portal blood flow possibly account for the non-uniform liver regeneration.

O-16-4 Tolerance and performance of a bio-absorbable staple-line reinforcement for distal pancreatectomy in a porcine model

E. Hornez^a, B. Sastre^b, E. Garnier^c, S. Garcia^d, A. Maillet^e and S. Berdah^f

^aHLA Sainte Anne, Boulevard sainte Anne, 83000 Toulon, France; ^bAP-HM hôpital Timone, Service de Chirurgie Oncologique, 264 rue Saint Pierre, 13385 Marseille, France; ^cCERC/APHM, Bd Pierre Dramard, 13015 Marseille, France; ^dHôpital Nord, APHM, chemin des bourrelys, 13015 Marseille, France; ^eHLA Begin, av de Paris, 94160 Saint Mandé, France; ^fCERC/APHM, Bd Pierre Dramard, 13015 Marseille, France (e-mail: emmanuelhornez@free.fr)

Background: Pancreatic leak remains the most common complication after distal pancreatectomy. Appropriate closure of the pancreatic remnant is still debated. The aim of this study was to evaluate feasibility, safety and effectiveness of a bio-absorbable staple-line reinforcement after a distal pancreatectomy in a porcine model.

Methods: Twelve female pigs underwent stapled distal pancreatectomy. In group A (n = 6), standard staplers were used. In group B (n = 6) the stapling devices were buttressed with a bio-absorbable staple line reinforcement material (FOREseal, laboratoire Brothier, Nanterre, France). Operative data and perioperative complications were recorded. Necropsy studies and histopathological analysis were performed between 2 and 6 weeks.

Results: Operative time was similar in the two groups (28 min in group A versus 23, 6 in group B, ns). In group A 4 pigs needed a complementary haemostasis of the pancreatic remnant versus none in group B (p = 0, 06). The duration and volume of drainage was lower in group B even not reaching statistical significance (p =). Histopathological examination of the resection site revealed no abnormalities in group B.

Conclusion: Use of a bio-absorbable staple-line reinforcement material FOREseal for a distal pancreatectomy is safe, well tolerated and may reduce intra-operative bleeding and post-operative drainage volume.

O-16-5 Laparoscopic splenectomy is useful in patients with HCV-induced liver fibrosis accompanied by thrombocytopenia

A. Yada, Y. Iimuro, T. Okada, Y. Yoshida, K. Suzumura, N. Uyama, T. Sugimoto, S. Saito, T. Hirano, J. Yamanaka and J. Fujimoto

Hyogo College of Medicine, 1-1 Mukogawa-cho, 663-8501 Nishinomiya, Japan (e-mail: syada@hyo-med.ac.jp)

During interferon therapy against HCV infection, thrombocytopenia is a major obstacle. We have performed laparoscopic splenectomy in patients with thrombocytopenia due to HCV-induced liver fibrosis, and investigated its effect.

Methods: Twenty-five patients with thrombocytopenia due to HCV-induced liver fibrosis underwent laparoscopic splenectomy. Fifteen patients were in Child A, and 10 in Child B. Three-port method was employed for the laparoscopic splenectomy, and collateral vessels were preserved. Laparoscopic splenectomy could be completed in 92% of the patients, and rest of the patients underwent laparo-assisted splenectomy. Platelet counts, s-T.Bil, Alb, and PT activity were measured after the surgery.

Results: After the splenectomy, platelet counts gradually increased with a peak around 2 week in most of the patients, then slightly decreased by 3 month and reached plateaus. Platelet counts at 3month were significantly higher than the preoperative values ($150 \pm 50 \times 10^3/\mu\text{l}$). Serum T.Bil tended to decrease after the splenectomy, and PT activity gradually increased in all patients. Alb showed no significant change. Median hospital stay was 16 days. (11–27)

Conclusion: Attenuation of thrombocytopenia was achieved by the laparoscopic splenectomy in patients with HCV-induced liver fibrosis, accompanied by improved PT activity and s-T.Bil, suggesting usefulness of this procedure.

O-16-6 The effect of edaravone on liver damage in controlled experimental non-heart-beating donor model

M. Çetin, T. Artı, F. Mutlu and Z. Yılmaz

Erciyes School of Medicine, Erciyes School of Medicine, Dept of Surgery, 38039 Kayseri, Turkey (e-mail: dr_fmutilu@yahoo.com)

Aim: The aim of this study is to investigate the effect of edaravone on viability of hepatocytes in experimental controlled non-heart beating donor models of rats and additionally to determine the usefulness of these grafts.

Materials and Methods: This experimental study has been performed in Hakan Çetinsaya Experimental and Clinical Research Center (DEKAM) at Erciyes University Medical Faculty between Oct-Dec 2008. Fourty Wistar-Albino male rats weighing between 225 and 290 gr were used in this study. The rats were divided into five groups which included 8 rats as sham, control I, control II, study I and study II groups. No anesthetic agents were given to rats because cardiac arrest was performed. The waiting interval between cessation of cardiac activity and organ retrieval was 30 minutes. Midline laparotomy incision and total hepatectomy was performed to each rat. After dissection of vena cava and portal vein hepatic grafts were retrieved. Then a suitable catheter was inserted into the portal vein. Liver grafts were washed out with 50 ml Euro Collins solution via portal vein catheter. Liver grafts which were dissected totally had been perfused for 30 and 60 minutes with HTK solution and 0, 5 ml SF in control groups by using a circulator system. And perfused with HTK and 1 mg/kg edaravone solution in study groups by using a circulator system During this period samples were taken to asses hepatocellular injury.

Results: AST, ALT, IL-6, TNF- α levels were significantly lower and IL-10 level was significantly higher in edaravone group (p < 0.001). When PCNA labeling index was evaluated there was statistically difference between the groups (p < 0, 001). In edaravone groups amounts of bcl-2 was statistically lower when compared with the other groups (p < 0, 001).

Conclusion: Edaravone increases the viability of hepatocytes biochemically and morphologically in experimental controlled non-heart beating donor models of rats.

O-17 Orthopaedic Surgery and Traumatology

O-17-1 C-afferent innervation mediates the microcirculatory effects of limb ischemic preconditioning in rats

P. Hartmann, A. Szabó, R. Varga, Z. Zobolyák, B. Csozsz, J. Héger and M. Boros

Institute of Surgical Research, Hungary, Szeged, Pécsi u. 6, H-6721 Szeged, Hungary (e-mail: bartmann.petra@freemail.hu)

We have shown that ischemic preconditioning (IPC) decreases both the local and systemic leukocyte activation evoked by limb ischemia-reperfusion (I-R). We hypothesized that transient hypoxia activates ischemically sensitive nociceptive C fibres which in turn mediate the protective mechanisms of IPC.

Methods: In anesthetized Sprague-Dawley rats, 60-min complete limb ischemia was followed by 180 min of reperfusion. In further experiments, the CGRP agonist hCCGRP (0.3 $\mu\text{g}/\text{kg}$ iv.) or IPC (2 \times 10'ischemia/10' reperfusion) was applied prior to the I-R insult. IPC was performed in 3 subgroups where the CGRP antagonist CGRP8-37 (30 $\mu\text{g}/\text{kg}/\text{h}$), the TRPV-1 positive neuron inactivator resiniferatoxin (RTX, sc. 3 \times 15 $\mu\text{g}/\text{kg}/3$ days) or vehicle was administered (n = 6–8). Neutrophil-endothelial interactions in the tibial periosteum were investigated with intravital fluorescence microscopy.

Results: IPC or hCGRP administration prior to ischemia attenuated the leukocyte-endothelial interactions evoked by I-R, while both CGRP8-37 and RTX treatments reversed the beneficial effect of IPC during the reperfusion phase.

Conclusions: Activation of C-afferent neurons plays decisive roles in the mechanisms of microcirculatory protection provided by limb IPC. The results suggest that direct stimulation of C-afferent neurons or IPC both may effectively ameliorate the periosteal microcirculatory consequences of tourniquet ischemia in the clinical practice. (Supported by OTKA K 60752)

O-17-2 Autologous bone graft in anterior cervical decompression: a surgical legacy technique?

H. Heneghan and J. McCabe

Dept. of Trauma & Orthopaedics, Galway University Hospital, n/a Galway, Ireland (e-mail: helenheneghan@hotmail.com)

Autologous iliac crest graft has been the gold standard graft material used in cervical fusion for centuries. However its harvest has significant associated morbidity and it's continued practice warrants scrutiny, as synthetic alternatives are now available. We assessed the incidence and nature of complications associated with iliac graft harvest in the setting of ACD, and compared patient satisfaction after ACD both with and without iliac graft harvest.

Patients who underwent ACD procedures over a 48 month period (N = 53) were contacted and administered two validated questionnaires: Cervical Spine Outcomes Questionnaire and SF-36 instrument. Response rate was 96%. Primary composite endpoints included incidence of bone graft donor site morbidity, pain scores, operative duration, and quality of life scores.

Patients who underwent iliac graft harvest experienced significant donor site specific morbidity postoperatively, including significant pain at the iliac crest (90%), iliac wound infection (7%), a jejunal perforation, longer operative duration (285 minutes vs 238 minutes, $p = 0.026$), and significantly lower mental health scores on SF-36 questionnaire (54.11 vs 58.4, $p = 0.025$).

We conclude that ACD with iliac crest graft harvest is associated with significant iliac donor site morbidity. This is now avoidable by using alternatives to autologous bone without compromising clinical or technical outcome.

O-17-3 Interosseous membrane release in diaphyseal rotational malunion of the radius

B. Coulet, J. Boretto, C. Lazerges and M. Chammas

University Hospital Lapeyronie, Hand and Upper Limb surgery dep, 371, avenue du Doyen G. Giraud, 34295 Montpellier, France (e-mail: bertrand-coulet@wanadoo.fr)

Rotational malunion (RM) of the radius leads to a significant limitation in pronosupination range. The interosseous membrane (IOM) probably plays an important role in limiting this mobility. The aim of our study was to evaluate the influence of freeing the interosseous membrane on the pronosupination range, after RM in pronation of the radial diaphysis.

The study focuses on eight cadaver forearms. The ranges of motion were noted for each specimen once at the initial period, once after carrying out pronating diaphyseal osteotomy of the radius and once again after associating longitudinal section through the IOM. The osteotomy was transversal mediadiaphysary with an average pronation of $78^\circ \pm 7$, osteosynthesised by a plate.

The initial mean pronosupination range was 175° (pronation 81° - supination 94°). After RM this range decreased significantly from 126° (SD $p > 0.05$) (pronation 99° , supination 27°). By releasing the IOM this range can increase significantly from 27° to 153° (SD, $p > 0.05$) (pronation 105° supination 48°). Our study confirms the impact of RM on the pronosupination range, and shows the positive effect of releasing the IOM. Removing the IOM is a means of simplifying the biomechanics of the forearm shaft allowing greater mobility of the bone segments in relation to one another.

O-17-4 Medial patellofemoral ligament anatomy: implications for its surgical reconstruction

R. Philippot^a, M. Fessy^b and B. Moyon^b

^aCHU Saint Etienne, hopital nord, 42000 Saint Etienne, France; ^bCHU Lyon sud, chemin du grand revoyet, 69000 Lyon, France (e-mail: r_philippot@yahoo.fr)

Introduction: The purpose of the present study, based on 23 cadaveric knees, was to perform a detailed anatomical analysis of the medial patellofemoral ligament (MPFL), especially its femoral attachment, its relationships with the vastus medialis obliquus (VMO) and the medial collateral ligament (MCL), with the objective of improving its surgical reconstruction.

Method: The femoral insertion of the MPFL was defined using an orthonormal frame centred on the middle of the femoral MPFL insertion. The whole

measurements were taken using a millimetric compass with a precision of ± 1 mm.

Results: The MPFL was always observed, its length was 57.7 ± 5.8 mm, the junction between the VMO and the MPFL always present measured 25.7 ± 6.0 mm. When it comes to MPFL reconstruction, the key point is its positioning in the femoral insertion because it is this insertion that is going to restore isometry. By using the orthonormal frame it has to be positioned 10 mm behind the medial epicondyle and 10 mm distal to the adductor tubercle.

O-17-5 Exogenous selenium restores intestinal perfusion in a porcine model of cardiac tamponade

D. Ércses^a, P. Hartmann^a, G. Süveges^b, T. Zimmermann^c, J. Kaszaki^a and M. Boros^a

^aInstitute of Surgical Research, Hungary, Szeged, Pécsi u. 6, H-6721 Szeged, Hungary;

^bDepartment of Traumatology, Semmelweis u. 6., H-6720 Szeged, Hungary;

^cTechnical University of Dresden, Fetscherstrasse 74, 01307 Dresden, Germany (e-mail: ercsesdan@gmail.com)

Background: Selenium (Se) is essential for the function of redox regulator enzymes that have major roles in cardiovascular diseases with transient hypoxia, but the clinical value of Se replacement is still controversial. The aim of our study was to assess the effects of Se treatment on peripheral, splanchnic circulatory consequences of a pathophysiological condition leading to significant flow redistribution. Methods Anesthetized, thoracotomized minipigs (n = 5) were subjected to acute cardiac tamponade (PT) by intrapericardial fluid infusion; the mean arterial pressure was kept at 40 mmHg for 60 min. After removal of the pericardial fluid, macrohemodynamic changes, small intestinal pCO₂ gap (tonometric probe), blood superoxide and H₂O₂ production (chemiluminometry) were monitored for 180 min. Another group of animals (n = 5), received Se infusion (25 µg/kg/h iv) after PT induction.

Results: PT was followed by hemodynamic signs of cardiogenic shock. During resuscitation, the significantly increased intestinal pCO₂ gap, elevated H₂O₂ and superoxide producing capacity of the blood referred to prolonged mesenteric ischemia in spite of restored macrohemodynamics. In contrast, these parameters were significantly improved by Se treatment.

Conclusion: PT-caused peripheral circulatory derangement could be effectively influenced by Se treatment due to reduced free radical production and improved intestinal microperfusion.

O-17-6 The efficiency of L-Name therapy in acute pulmonary damage formed with blunt thorax trauma in rabbits

E. M. Kafali^a, S. Ozdinc^a, R. Pekcici^b, H. Kara^a, M. Sahin^c and H. Toy^d

^aSelcuk University, Meram Medical Faculty, Department of Emergency Medicine, 42100 Konya, Turkey;

^bAnkara State Hospital, Dept. of General Surgery, 06100 Ankara, Turkey;

^cSelcuk University, Dept. of General Surgery, 42100 Konya, Turkey;

^dSelcuk University, Meram Medical Faculty, Department of Pathology, 42100 Konya, Turkey (e-mail: kafali1405@hotmail.com)

Introduction: In this study, we aimed to determine the effects of L-Name therapy on the pulmonary tissue damage formed experimentally with bilateral blunt thorax trauma.

Materials/Methods: 24 New Zealand type female test rabbits were used with the permission approved by the ethic board of Selcuk University. They were divided into control, sham and L-Name (25 mg/kg/day) groups. At the 0th, 3rd and 96th hours, blood samples were obtained, and pulmonary tissue samples were taken shortly after their sacrifice at 96th hour. Kruskal-Wallis variance analysis and Chi-Square test were used for statistical analysis.

Results: L-Name therapy had positive effects on the arterial blood pH, PO₂, SO₂, HCO₃, BE values and pulmonary histopathologic values ($p < 0.05$). L-Name therapy contributed nothing to the blood biochemistry, hemogram and blood IL-6 levels ($p > 0.05$). It was determined that it had positive effects on the blood NO levels though statistically not significant ($p > 0.05$).

Conclusions: L-Name, used for the therapy of acute pulmonary damage caused by blunt thorax trauma, had positive effects on the arterial blood pH, PO₂, SO₂, HCO₃, BE values, pulmonary histopathology and wet pulmonary

weight, but negative effects on the blood SGOT level. Further studies will make the efficiency of L-Name therapy in acute pulmonary damage caused by blunt thorax trauma clearer.

O-17-7 Cell therapy application to increase the muscles functional recovery after nerve injury

B. Coulet, C. Lazerges, F. Bacou, J. P. Micallef and M. Chammas

University Hospital Lapeyronie, Hand and Upper Limb surgery dep, 371, avenue du Doyen G. Giraud, 34295 Montpellier, France (e-mail: bertrand-coulet@wanadoo.fr)

Cell therapy (CT) techniques may be used to increase the muscles functional recovery after nerve injury. We used rabbit Tibialis Anterior (TA) muscles and transferred autologous Satellite Cells (SCs) cultivated after inducing muscle regeneration by injecting cardiotoxin. Muscles were evaluated 4 and 14 months after applying CT protocol with 3 sub-groups.

- Healthy control - Pathological control: nerve sections/sutures. - Experiment: nerve sections/sutures, two months after applying CT protocol with SCs added on the left TA and induction of a regeneration cycle alone on the right-hand side. After re-innervation alone, at the 4-month evaluation, the maximum force (Fmax) of the TA represented 62% of controls. Regeneration cycle induction increased the Fmax by 16.1% ($p = 0.05$) and 25.3% ($p = 0.05$) with SC addition. At 14 months after re-innervation the Fmax represented 74% of controls and regeneration induction alone or with CT increased the Fmax by 13% and 18% ($p = 0.05$) respectively.

Similarities exist between regeneration and muscle re-innervation, with SC activation in both cases. These phenomena lead to compensatory fibre hypertrophy and an increase in the size of motor units. Over time, the advantage of inducing a regeneration cycle remains significant, however, the benefit of adding satellite cells is no longer significant.

O-18 Head and Neck Surgery

O-18-1 Recent advances in functional neurosurgery: the mri-based leksell stereotactical methodology

P. Coubes

hospital gui de chauliac, 80 avenue augustin fliche, service neurosurgery, 94295 montpellier, France (e-mail: urmae@cbu-montpellier.fr)

The definition and the subsequent development of the so-called stereotactical methodology in neurosurgery, at the beginning of the twentieth century, has allowed major therapeutical advances. Initially limited by the absence of direct imaging techniques of the brain, the neurosurgeons were constantly facing the need of reaching invisible targets in the depth of the brain, basing their quality control of the procedure on a continuous clinical monitoring of the patient. Of course, this was only possible under local anesthesia. Many refinements appeared along and among them electrophysiological recordings allowing to better define the limits of the target. Later, in the seventies, the CT scanner was a revolution in this practice, showing for the first time the brain itself. The present and the future of stereotactical neurosurgery seems now depending on Magnetic resonance imaging technical developments. The authors will report on the recent developments in the fields of epilepsy surgery, movement disorders surgery and OCD treatment (deep brain stimulation) based on a MRI based stereotactical technique performed under general anesthesia without microelectrode recordings.

O-18-2 A remote controlled spinal cord compression injury model in mice: towards real time analysis

P. Kouyoumdjian^a, N. Lonjon^b, M. Prieto^c, H. Haton^c, A. Privat^d, G. Asencio^e, M. Gaviria^c and F. Perrin^d

^aINSERM 583, UM2 & CHU Nîmes, CHU Nîmes Orthopedic dept. INM, 30029 Nîmes cedex, France; ^bDepartment of Neurosurgery UMI, 80 Avenue Augustin Fliche, 34295 Montpellier, France; ^cNeureva Inc-INM, 80 rue Augustin Fliche, 34091 Montpellier cedex 05, France; ^dInserm 583-INM, 80, av Augustin Fliche, 34091 Montpellier Cedex 05, France; ^eCHU Nîmes, CHU Nîmes Orthopedic dept., 30029 Nîmes cedex, France (e-mail: kouyoumdjian.p@wanadoo.fr)

Introduction: There is so far no efficient therapeutic approach in spinal cord injuries (SCI). This may be partially attributable, to difficulties to elaborate predictive and accurate experimental animal models.

Materials Methods: We have devised a new model of mouse spinal cord compression injury using a thread-driven olive-shaped compressive device. The nonmagnetic and remote controlled design of this model will allow completion of the lesion in an MRI 9, 4 T antenna, thus permitting further in vivo real-time MRI studies that will give insights in the characterization of early events in the spatial and temporal evolution of the SCI.

Results: We have characterized early motor, sensory and histological outcomes using three olive diameters and different compression duration. We show a gradual and reproducible functional severity that correlates with lesion extension. To further substantiate the characterization of this model, we dispensed a non-competitive NMDA antagonist and demonstrated the involvement of excitotoxicity in this model.

Conclusion: We thus demonstrate that spinal olive-compression injury in the mouse is a reproducible, well-characterized and predictable model to analyse early event following SCI. Moreover it paves the way toward in vivo studies of functional and histological outcomes following SCI in genetically engineered animals.

O-18-3 Ultrasound-guided versus free-hand fine-needle aspiration cytology (FNAC) in the diagnosis of thyroid nodules: Our experience

P. M. Neary^a, A. O'Callaghan^a, O. J. O'Connor^a, A. Shafiq^a, E. Quinn^a, J. Kelly^a, T. J. Browne^b and H. P. Redmond^a

^aDepartment of Academic Surgery, Cork University Hospital, University College Cork, Wilton, Cork, Ireland; ^bDepartment of Pathology, Cork University Hospital, University College Cork, Wilton, Cork, Ireland (e-mail: peterneary@hotmail.com)

Introduction: In the assessment of thyroid nodules FNAC is used both as a screening and diagnostic test thereby dictating the best treatment modality. In 2005, our institution began routinely utilising ultrasound guidance for all thyroid FNACs.

Methods: We retrospectively analysed patients who underwent freehand FNAC from Jan 1999-Jan 2004 and prospectively patients who underwent ultrasound-guided FNAC from Sept 2007-Sept 2008 and compared results. All patients subsequently underwent thyroidectomy and histology was compared with initial FNAC.

Results:

	Freehand	Ultrasound-guided
No. FNACs	77	45
No. adequate for analysis (%)	44 (57)	30 (67)
Mean age (years)	45.7	54.7
Sensitivity (%)	75	100
Specificity (%)	54	17
Accuracy (%)	61	63
Positive Predictive value/PPV (%)	48	60
Negative Predictive value/NPV (%)	79	100

Conclusion: Our analysis demonstrates that a positive FNAC is 12% more likely to be a true positive and a negative FNAC is 21% more likely to be a true negative with ultrasound versus freehand technique. Interestingly, our accuracy levels are only marginally improved by ultrasound-guidance. However,

considering inadequate samples were excluded from statistical analysis this figure under represents the positive impacts of ultrasound-guidance. Our analysis demonstrates that ultrasound-guided FNAC yields a 10% increase in sample adequacy. We believe that this increase as well as improved PPVs and NPVs justifies the routine introduction of ultrasound-guided FNAC.

O-18-4 Minimally-invasive video-assisted parathyroidectomy for parathyroid adenomas: gadget or progress?

E. Mas^a, C. Cartier^a, A. El Ayoubi^a, G. Mercier^b, M. Al Felasi^a, E. Jouzdani^a, M. Makeieff^a, V. Burcia^a, L. Crampette^a, B. Guerrier^a and R. Garrel^a

^aENT, Head Neck Surgery, Montpellier University Hospital, 34090 Montpellier, France; ^bStatistics Department, Montpellier University Hospital, 34090 Montpellier, France (e-mail: r-garrel@cbu-montpellier.fr)

Background: Thanks to technologic progresses, parathyroid adenoma surgery has evolved to minimally invasive approach aiming at reducing the morbidity and thus the cost while improving the patient's satisfaction. This study was designed to analyse the advantage of minimally-invasive video-assisted parathyroidectomy (MIVAP) regarding the contribution of resource sparing and the patient's satisfaction compared to traditional surgery.

Methods: About a monocentric three-year prospective study including 50 patients who underwent a targeted parathyroid adenoma surgery. A MIVAP group and an open minimally-invasive parathyroidectomy (OMIP) group were compared regarding data about surgical procedure, operating room (OR) occupation, duration of hospitalization, outcomes and patient's satisfaction query.

Results: MIVAP and OMIP obtained the same cure rate of 100% without complication except one haematoma in the OMIP group. The OR occupation was significantly higher in the MIVAP group than in the OMIP group (86.82 + / - 27.84 min. vs 71.80 + / - 33.63 min., p = 0.01). Scars were 30% shorter and hospitalisation was moderately reduced (0-19 day) in MIVAP but these differences were not significant. Patients scored "satisfied" in 22% and 13% respectively in OMIP and MIVA group and "very satisfied" in 78% and 87% with no significant difference.

Conclusions: MIVAP was as effective as OMIP but its advantage appears more to be ressource sparing than patient's satisfaction wich is anyway established.

O-18-5 Interest of sentinel node technique in the treatment of high-risk sqamous cell carcinoma of the skin

J. Yachouh^a, P. Goudot^b and L. Frison^b

^amaxillo-facial surgery unit, lapeyronie hospital, 34000 Montpellier, France; ^bmaxillo-facial surgery unit, Lapeyronie hospital, 34000 Montpellier, France (e-mail: j-yachouh@cbu-montpellier.fr)

Introduction: Lymphadenectomy is not performed routinely in the treatment of squamous cell carcinoma (SCC) of the skin because only 5% have positive nodes. Those figures are probably underestimated for high-risk SCC of the skin. The aim of this study was to validate the sentinel node protocol in the surgical treatment of those high-risk tumours.

Material and method: We used the following protocol on 20 patients. The day before surgery, a 0, 8 mCi injection of Technetium was performed in four locations around the tumour. A first evaluation of the lymphatic drainage area was done immediately with a scintigraphy. If a sentinel node was identified on the screen, it was located on the patient with a cobalt pen and was marked on the skin.

Results: We found a sentinel node in all patients but one, using a gamma camera during surgery. One was invaded by a squamous cell carcinoma on histological examination. This patient underwent a lymphadenectomy. For the patients with negative sentinel node, no lymphatic metastasis occurred with a maximal delay of 4 years.

Discussion: We report the interest of this protocol and its feasibility. A wide range study must now begin to validate this technique for high-risk SCC.

O-18-6 Results of a phase 2 trial: Can we abandon using drains following thyroid surgery? - A blinded prospective randomised clinical study

P. M. Neary^a, O. J. O'Connor^b, A. Shafiq^a, E. Quinn^a, K. Murphy^a, A. Coveney^a, B. Lawless^a, P. Hallihan^a, P. Cronin^a, P. O'Leary^a, J. Kelly^a, J. Buckley^a, R. Cahill^a, J. Barry^b and H. P. Redmond^a

^aDepartment of Academic Surgery, Cork University Hospital, University College Cork, Wilton, Cork, Ireland; ^bDepartment of Radiology, Cork University Hospital, University College Cork, Wilton, Cork, Ireland (e-mail: peterneary@hotmail.com)

Aim: To determine if routine drainage of the thyroid bed post-operatively has an impact on the rate of complications, scarring, and haematoma or seroma formation.

Methods: We conducted a randomised controlled study on patients undergoing thyroid surgery. Patients were randomly assigned to drain or non-drain group immediately prior to wound closure. Patients underwent a neck ultrasound day one and day two postoperatively. Post-operatively we evaluated pain, scar satisfaction, ultrasound findings and complications.

Results: In the drain *versus* no drain group respectively the total number of patients included was 26 and 22, mean pain score (0-10) 2.3 and 2.8 (p-value = 0.478), mean fluid accumulated (mls) on ultrasound day one 10.15 ± 6.9 (sd) *versus* 12.47 ± 10.85 (sd) (p-value = 0.311) and day two 11.58 ± 7.31 (sd) *versus* 12.32 ± 9.92 (sd) (p-value = 0.740). In our drain and no drain group the mean satisfaction with scaring (0-10) was 8.0 *versus* 9.1 (p-value = 0.063) and number of wound infections 1 *versus* 0.

Conclusion: Our results show no significant difference in seroma formation or postoperative pain. Interestingly, patients in the no drain group appear more satisfied with their scar. Initial appearances indicate we can abandon using thyroid drains in uncomplicated thyroid surgery; however, phase 3 trials are required to ensure the rare occurrence of neck haematoma is not affected before routine introduction.

O-18-7 Past, present and future for the free forearm flap in head and neck oncologic surgery

B. Lallemand, G. Chambon, C. Reynaud, C. Alovisetti and J. G. Lallemand

CHU de Nîmes, Place du Pr Robert Debré, 30029 Nîmes, France (e-mail: benjamin.lallemand@chu-nimes.fr)

Introduction: The free forearm flap is an efficient and renowned method for the reconstruction of head and neck defects after oncologic surgery that still needs improvement to become more widespread.

Objectives: To present the technique and indications of this flap in head and neck surgical oncology with special regards concerning its technical and economical limits and its possible improvements.

Method: An updated review of the surgical technique and its indications in head and neck oncology is proposed, including recent developments and perspectives. We also evaluated the cost of this procedure on 10 consecutive patients in a French University Hospital

Results: Since its first description, this flap has become well standardized for head and neck reconstruction. This effective procedure is simple but expensive and requires usually a double surgical team. The development of automated micro-sutures systems for the vessels micro-anastomosis, the upgrading of new generation vessels sealing system and the use of artificial skin for the graft of the forearm donor site would significantly improve this technique.

O-19 Organ And Cell Transplantation

O-19-1 Results of the surgery of lung and heart - lung transplantation in children

M. Nguyen Van^a, F. Tronc^a, O. Jegaden^a, J. P. Gamondes^a, F. Philit^b, J. F. Mornex^b, O. Bastien^c and F. Bellon^d

^aDepartment of Thoracic Surgery, Cardiothoracic Hospital, 69677 Bron, France; ^bPulmonology Department, Cardiothoracic Hospital, 69677 Bron, France; ^cIntensive Care Unit Department, Cardiothoracic Hospital, 69677 Bron, France; ^dPaediatric Pulmonology Department, Cardiothoracic Hospital, 69677 Bron, France (e-mail: vanmanbtt@yahoo.com)

Objectives: Presenting operative indications and the results of the surgery of lung and heart - lung transplantation in children

Methods: It is a retrospective review from the 1st January 1998 to the 31st December 2008 regarding 17 patients (1 to 17 years old) who have benefited a lung or heart-lung transplantation.

Results: 17 patients (10 men and 7 women), mean age 12.6 ± 6.4 years. Heart-lung transplantation: 13 patients (71%) and bilateral lung transplantation: 4 patients (29%). The operative indications was cystic fibrosis (11/17), lung fibrosis (3/17), primary pulmonary hypertension (2/17), and Eisenmenger Syndrome (1/17). Early death was observed in one case (5%). Post operative troubles were early rejection (6 cases), haemorrhage (3 cases), infection (3 cases), graft-dysfunction (2 cases) and tracheal stenosis (1 case), lower limbs ischemia (1 case), cerebrovascular ischemia (1 case). Whereas infection and bronchiolitis obliterans are the most common causes of death long term (11 cases). FEV1 in 1 year (71%) and 50% in 5 years. Global Kaplan Meier Survival was 73% at one year and 33% at five years.

Conclusions: Operative indication of lung and heart-lung transplantation was cystic fibrosis (11/17). Heart-lung transplantation was the most used technique (13/17).

O-19-2 Simvastatin does not prevent LFA-1-dependent acute cardiac allograft rejection in CD28-deficient mice

R. Schramm^a, R. Schmits^a, H. J. Schäfers^a and M. Menger^b

^aUniversity of Saarland, Kirrberger Str. 1, D-66421 Homburg/Saar, Germany; ^bClinical & Experimental Surgery, Kirrbergerstrasse, 68421 Homburg/Saar, Germany (e-mail: reneschramm@live.de)

Introduction: Heterotopic cardiac transplantation in mice was used to determine whether complementary immunomodulation by statins prevents LFA-1-dependent acute allograft rejection in vivo.

Materials & Methods: Hearts from BalbC mice were transplanted to the cervical vessels of either C57BL/6, CD11a^{-/-}, CD28^{-/-} or double-deficient animals lacking expression of both LFA-1 and CD28.

Results: Allografts were rejected at days 7.2 ± 0.7, 9.1 ± 0.6 and 10.3 ± 1.2 in C57BL/6, CD11a^{-/-} and CD28^{-/-} recipients. In contrast, mean allograft survival time in double-deficient animals was 27.2 ± 2.9 days, indicating that acute allograft rejection in CD28^{-/-} recipients was critically dependent on LFA-1 function. Allograft rejection was not delayed in CD28^{-/-} recipients treated daily with 1 or 40 mg/kg simvastatin, graft survival was 9.6 ± 0.2 and 10.3 ± 0.3 days in these animals. Histology revealed that all rejected allografts uniformly presented with high-grade parenchymal rejection.

Conclusions: Targeting of both LFA-1 and CD28 may provide efficient inhibition of co-stimulation and thus prolong experimental cardiac allograft survival. Simvastatin is not effective to blunt LFA-1-dependent acute cardiac allograft rejection in CD28^{-/-} mice. Thus, pharmacological antagonism of LFA-1 function by oral treatment with statin compounds has to be considered an unsatisfactory means to improve the outcome after cardiac transplantation.

O-19-3 Cardiac retransplantation. Still a valid option?

R. Burgos^a, C. Garcia-Montero^a, M. Gomez Bueno^b, J. Barceló^b, J. Segovia^b, L. A. Pulpón^b and J. Ugarte^b

^aHospital Puerta de Hierro, Manuel de Falla 1, 28222 Madrid, Spain; ^bHospital Puerta de Hierro, Manuel de Falla 1, 28222 Madrid, Spain (e-mail: rjburgoslazaro@gmail.com)

Introduction: Number of patients requiring heart retransplantation (CR) remains high. We aimed to review short- and long-term outcomes after CR.

Material & Methods: Between 1984–2007, 681 heart transplants were performed, and 23 (3.4%) were CR. Indications for CR were primary graft failure (PGF) in 3 (13%), acute rejection (AR) in 4 (17.4%), and coronary allograft vasculopathy (CAV) in 16 (69.6%).

Results: The median interval between primary transplantation and CR was 1 (0–2) days for PGF, 6 (3–16) months for AR and 10 (2–14) years for CAV group. Predictors for CR were, pre transplant inotrope requirement 39.2% vs 69.6%, mechanical circulatory support 11% vs 26% and urgent status 26.9% vs 47.6%. Early mortality after CR was significantly higher compared to transplantation (43.5% vs 17.2%, $p < 0.001$). However major differences on 30-day mortality were found depending on the indication for retransplantation (AR, PGF and CAV: 75%, 66.7% and 31%, respectively, $p < 0.001$).

1, 5, 10-year survival was 75.6%, 65.2% and 54%, respectively, for primary transplantation, and 38.6%, 33.8% and 27.1% for CR ($p < 0.001$).

Conclusion: Short- and long-term survival after retransplantation for patients with CAV was acceptable. In contrast, patients with acute graft failure due to PGF or AR don't seem appropriate candidates for CR.

O-19-4 A novel screening system for preservation solution using luciferase transgenic rats

E. Kobayashi

Jichi Medical University, 3311-1 Yakushiji, 329-0498 Shimotsuke, Japan (e-mail: eijikoba@jichi.ac.jp)

Introduction: Many types of organ preservation solution have been developed, whereas it remains unclear what kind of components in the solution should be the best for the each organs. Since ATP levels are highly correlated with tissue viability, they have been used as an indicator for development of preservation solution using our. Transgenic rat system, in which organs show 'firefly'-derived luminescent intensity depending on ATP levels.

Methods: To elucidate preservation solution objectively, we established 'tissue chip system'. Tissue slices of Tg rat organs were made by a tissue slicer and placed in a 96 well plate in the presence of tested solution. Photons from preserved tissue slices were evaluated by a luciferase assay.

Results: The liver chip system easily confirmed that UW solution kept a significant % luminescence than the others. ($p < 0.01$ v.s. HTK and EC solution). Taking advantages in this transgenic rat that every organ could give rise to emitting sufficient photons ex vivo, the tissue chip of heart, kidney, pancreas, etc. clearly estimated better preservation solution and the adequate concentration of cytoprotectants added in.

Conclusion: This novel system can compare many preservation solutions objectively and should promote the development of the best organ preservation solution.

O-19-5 Humoral immunity involvement in chronic rejection after lung transplantation

J. M. Baste^a, D. Plissonnier^b, P. Y. Litzler^c, F. Lallemand^d, J. P. Bessou^e and C. Thuillez^f

^aCHU rouen, chirurgie cardiaque, 1 rue de Germont, 76000 rouen, France; ^bInserm U644, université de Rouen, 22, boulevard Gambetta, 76183 rouen, France; ^cCHU Rouen, chirurgie cardiaque, 1 rue de Germont, 76000 rouen, France; ^dInserm U644, université de Rouen, 22, bd Gambetta, 76183 Rouen, France; ^eCHU Rouen, chirurgie cardiaque, 1 rue de germont, 76000 rouen, France; ^fInserm U644, université de Rouen, 22, Bd gambetta, 76183 rouen, France (e-mail: jean-marc.baste@cbru-rouen.fr)

Background: Up to 50% of human lung allografts develop chronic rejection presenting as obliterative bronchiolitis (OB). This complication is frequently associated with the presence of allo-antibodies, suggesting the involvement of humoral immunity. In animals, heterotopically transplanted allograft airways develop obliterative airways disease (OAD), an immunologically-mediated lesion used as a preclinical model of OB. We investigated whether transfer of allo-antibodies to recipient animals would accelerate the fibrosis process.

Methods: Tracheas from Brown Norway donor rats were transplanted intraperitoneally into Brown Norway recipients (isograft), Lewis recipients (allograft), Lewis recipients with allo-antibody transfer (allograft/transfer) and NUDE recipients. Three, 10, 21 and 30 days after transplantation, grafts were removed and analyzed histologically, with quantification of airway epithelium and intraluminal fibroproliferation.

Results: Epithelial lesions were found in all groups on day 3. On day 10, epithelial lesions were observed in the allograft groups, while fibroproliferation was beginning in the allograft/transfer group. On day 21, fibroproliferation was observed in the two allograft groups, with lumen obstruction in the allograft/transfer group. On day 30, lumen obstruction was observed in the allograft group, and ad-integrum restitution of the graft in the isograft group.

Conclusion: Allo-antibodies accelerate OAD, demonstrating the involvement of humoral immunity in chronic lung rejection.

O-19-6 Novel approach for effective isolation of mesenchymal stem cells from human umbilical cord blood

I. Hussain^a, A. Sloan^a, O. Eremin^b and M. El-Sheemy^b

^aUniversity of Lincoln, Brayford Pool, LN6 7TS Lincoln, United Kingdom; ^bLincoln County Hospital, Research and Development, LN2 5QY Lincoln, United Kingdom (e-mail: ihussain@lincoln.ac.uk)

Introduction: Human umbilical cord blood (HUCB) has been successfully used in clinical allogeneic graft transplantation of haematopoietic stem cells (HSCs). However, HUCB has been poorly characterized as a source of Mesenchymal stem cells (MSCs). The aim of this study was to establish HUCB as a source of MSCs using a novel clot spot method.

Method: HUCB was collected (n = 9) from candidates consenting women, who underwent elective caesarean section. HUCB clot was meticulously explanted in MesenCult basal medium and incubated in 5%CO₂ incubator at 37°C. Qualitative and quantitative immunophenotyping of cells was achieved using fluorescein isothiocyanate (FITC) labelled antibodies reactive with CD34, CD45, CD29, CD44, CD73 and CD105 antigen markers. MSCs were plated in neurogenic and adipogenic differentiation media. Immunocytochemistry was used for embryogenic markers SOX2, Olig4 and FABP-4 identification.

Results: MSC cultures using the clot spot method showed morphological changes inkeeping with cell lineage differentiation within two weeks of culture with a three fold increase in number, compared with other methods. Cells were negative for HSC markers (CD34, D45), but strongly positive for MSC markers CD29 (97%), CD44, CD73 (95%) and CD105 (97%). MSCs expressed the neural SOX2, Olig4 and adipogenic FABP-4 markers.

Conclusion: HUCB is a good source of MSCs for transplantation, using this novel technique.

O-19-7 Effects of thymoglobulin on ischemia reperfusion injury in clinical renal transplantation

M. Hardy^a, G. Andan^b, A. Maffei^b, M. Goldstein^c, L. Ratner^b and P. Harris^d

^aColumbia University, 177 Fort Washington Ave, New York, OK 10032, United States of America; ^bColumbia University, 622 West 168 Street, New York, NY 10032, United States of America; ^cColumbia University, 177 Fort Washington Ave, New York, NY 10032, United States of America; ^dColumbia University, 622 West 168 Street, New York, NY 10032, United States of America (e-mail: mah1@columbia.edu)

Background: Ischemia reperfusion injury (IRI), mediated in part by pro-inflammatory cytokines/adhesion molecules, is detrimental to renal allografts and may be ameliorated by Thymoglobulin (Thymo).

Objective: To determine the effects of intraoperative Thymoglobulin on intragraft and renal vein levels of adhesion molecules and pro-inflammatory cytokines.

Methods: Allograft recipients (DD and LD) were randomized to receive thymo either before (BR) or 1 hour after reperfusion (AR). In 11 (BR) and 8 (AR) patients blood was drawn from the renal vein (10min and 1hr after reperfusion) for IL6 and TNF alpha by ELISA. In 6 AR and 4 BR patients we biopsied the allograft during cold storage and 1hr after reperfusion for expression of IL6, IL8, TNF α and ICAM-1 (quantitative PCR).

Results: Levels of cytokine and adhesion molecules in renal vein and allografts were increased after reperfusion in both AR and BR patients but more so in the latter with a greater fold increase in levels of the cytokines and adhesion molecules than the AR group in renal vein and intragraft (P value > 0.05 by Student's t test) respectively.

Conclusion: Thymoglobulin alone does not attenuate IRI when given prior to reperfusion, but other IRI molecules that we did not measure may be affected.

O-20 Urology - Gynaecological and Obstetrical Surgery

O-20-1 Assessment of a neuroregenerative and endothelio-active combined strategy in prevention of post-operative erectile dysfunction on a rat-model

T. Bessedé^a, B. Alsaïd^a, L. Ferretti^b, D. Diallo^a, S. Queing^c, G. Benoit^a and S. Droupy^a

^aEA 4122, Medecine Faculty, 94270 Le Kremlin-Bicêtre, France; ^bUrological department, Pellegrin Hospital, 33000 Bordeaux, France; ^cEA 4122, Medecine Faculty, CHU de Bicêtre, 94270 Le Kremlin-Bicêtre, France (e-mail: sdroupy@aol.com)

Context: Post-Radical Prostatectomy (RP) Erectile Dysfunction (ED) results from hypoxemia of erectile tissues during a post-operative neurapraxia. The objective was to assess a strategy combining medical prevention of endothelial dysfunction and surgical support for neuroregeneration, in a rat-model of Cavernous Nerve (CN) crush-injury.

Materials & Methods: Fifty rats were distributed into five groups: Laparotomy (1), Crush + vehicle (2), Crush + Guide + vehicle (3), Crush + sildenafil (4), and Crush + Guide + sildenafil (5). CNs of animals were crushed, silicone guide was placed around CNs (groups 3 and 5). During 4 weeks, a daily sildenafil or placebo treatment was subcutaneously administered. Intracavernous pressure (ICP) and mean arterial pressure (MAP) were monitored during an electrical stimulation of left CN.

Results: ICP/MAP rates were respectively 41.8%, 20.9%, 33.9, 41.8%, and 37.9%. Difference was significant between group "Crush + Guide + Vehicle" and all other groups (p < 0.001). Adjunction of systemic daily sildenafil (group "Crush + Guide + sildenafil") completed recovery (p < 0.01), reaching a gross 81% increase of the baseline erectile function after injury.

Conclusion: Prevention of post-operative ED could be achieved with combined strategy. In human, sildenafil should be considered for association with active functional rehabilitation schedules. Guide's implantation could remain relevant in major CN injuries.

O-20-2 Penetrating injury to the retroperitoneum - have you checked the ureter?

S. Ch'Ng, L. Khan, J. Clavijo and G. Kaur

Scunthorpe General Hospital, Cliff Gardens, North Lincs, DN15 7BH Scunthorpe, United Kingdom (e-mail: gkaur@email.com)

Aims: Traumatic ureteric injuries are uncommon and frequently missed at surgery for trauma (less than 1% in all trauma cases) mainly due to ureters being well protected by surrounding structures, their small size and mobility. Delayed diagnosis results in sepsis, loss of renal function and death. Classification of ureteric injuries and their management has been well described. We present a case to emphasise this easily overlooked injury.

Methods: A young Polish patient presented with an abdominal stab. Small bowel had herniated out of the wound, hence he was taken to theatre. At

laparotomy, enterotomies in small bowel were closed and haemostasis was achieved from an omental bleed. The stab extended into left retroperitoneum causing a defect in the left psoas muscle 2.5 cm deep and 95% transection of the left ureter. The urologist repaired the ureter with watertight spatulated tension free anastomosis over JJ stent.

Results: Postoperatively the patient did well. X-ray confirmed position of stent, which was removed 3 weeks later after flexible cystoscopy.

Conclusions: High index of suspicion is required for diagnosing ureteric injuries due to the magnitude of associated injuries. Extended exploration of the retroperitoneum is mandatory in all cases of penetrating injury to this region.

O-20-3 Comparative study of tunica albuginea graft obtained with tissue engineering procedures: a new surgical approach on animal model

L. Ferretti^a, M. Giuliani^b, S. Ferlicot^c, A. Durrbach^b, G. Benoit^d and S. Droupy^d

^aUrological department, Pellegrin Hospital, 33000 Bordeaux, France; ^bInserm 542, Paul Brousse hospital, 94804 Villejuif Cedex, France; ^cPathological unit, Bicêtre University Hospital, 94275 Le Kremlin-Bicêtre, France; ^dEA 4122, Médecine Faculty, 94270 Le Kremlin-Bicêtre, France (e-mail: ludovic.ferretti@gmail.com)

The aim of the study is to engineer in vitro a new type of autologous graft that would be well integrated upon the corpus cavernosum and thus provide less recurrence due to its immunological propriety in Peyronie's disease. The objective of this study is to compare an engineered graft with autologous cells seeded on a synthetic absorbable scaffold to acellular scaffold on a rat model at 4 months of follow-up.

Thirty SD rats were divided in 3 groups of 10; first group is the control one in which resection and re-suture of the original albuginea was performed, second: resection and suture of acellular scaffold (PGA) was performed, third: resection and suture of in vitro engineered PGA-seeded graft with autologous fibroblasts. The principal objective was to compare the retraction of the grafts at 4 months in each group with variance analysis.

All grafts have been successfully performed. The analysis of the size of the graft show a significant retraction of the acellular graft ($p = 0.035$) compared to the control, and no statistical difference between the fibroblasts-seeded scaffold and the control group.

This study shows the feasibility and efficiency of fibroblasts seeded scaffold compared to acellular graft.

O-20-4 Experiments and finite element modelling of pelvic system for the study of genital prolapses

C. Rubod^a, M. Brieu^b, B. Dedet^a, G. Rao^c, N. Bhatnagar^c and M. Cosson^a

^aClinique de Gynécologie, CHRU Lille, 59000 Lille, France; ^bLaboratoire de Mécanique, Ecole Centrale de Lille, 59000 Lille, France; ^cIndian Institute of Technology, Hauz Khas, 00 New Delhi, India (e-mail: c.rubod@orange.fr)

Introduction: The treatment of genital prolapse is a challenge today. The modelling and simulation of the behavior of the pelvic system could be a major tool for specific evaluation of pelvic status and the selection of different prevention strategy and surgical treatments.

Methods: This model is based on anatomical data. The mechanical characterization of pelvic tissues involved in the prolapse process have been realised by uniaxial tension tests. Finite Element simulations are realized by developing a geometric computer aided design model of the pelvic system obtained using Magnetic Resonance Imaging and introducing boundary and loading conditions accordingly to dynamic MRI.

Results: A step-by-step approach, using hyperelastic behaviour of the soft tissues, has been developed to obtain a reasonable solution of the numerical model. A multi organ geometric model with real ligaments is thus created in order to realize finite element simulation of prolapse. This model is very important for a better understanding of the pelvic disorder as it allows

understanding more accurately the repartition of the different stress and strain in either organs or in the ligaments.

Conclusions: Simulations will help further to highlight the influence of the decrease in strength of the different tissues in the pelvic disorder.

O-20-5 Biomechanical properties of pelvic ligaments

C. Rubod^a, M. Brieu^b, B. Dedet^a and M. Cosson^a

^aClinique de Gynécologie, CHRU Lille, 59000 Lille, France; ^bLaboratoire de Mécanique, Ecole Centrale de Lille, 59000 Lille, France (e-mail: c.rubod@orange.fr)

Introduction: Pelvic ligaments have a major contribution in pelvic static. In order to develop more accurate cure of pelvic prolapse, our study aims to analyse the biomechanical properties of such ligaments, to evaluate their contributions and deduce surgical consequences.

Materials and Methods: The ligaments were collected on cadavers in agreement to ethic laws. In order to realize the measurements, standardized samples were punched out in tissue. Uni axial tension was carried out at constant deformation rate of 2.10-2 s-1 and at room temperature (20°C). The stress-stretch curves were obtained and analysed.

Results: Rupture tension tests have been carried out for 3 cadavers. Only 4 pairs of ligaments have been systematically identified and tested: utero-sacral, cardinal, round and large ligaments. Individual reproducibility was good; noticed dispersion among patients was probably linked to individual previous history. The pelvic ligaments mechanical behaviour is elastic with large deformation like pelvic soft tissue. The major contribution of utero-sacral ligaments in pelvic static has not been proved.

Conclusions: Results and analyses allowed us to confirm the validity of our protocol. Links between the pelvic static status and the mechanical properties of the tissue might have been suggested but a study on a larger population is required.

O-20-6 Using an early warning scoring system will reduce morbidity in obstetric patients

N. Pope and S. Saxena

Scunthorpe General Hospital, Cliff Gardens, North Lincs, DN15 7BH Scunthorpe, United Kingdom (e-mail: saxena@email.com)

Background: Obstetric patients have potential for unpredictable complications. Since most are fit and healthy women, there is special urgency to recognise potential morbidity early and take timely action. With the use of early warning scoring (EWS) system, we can identify complications sooner, reduce morbidity and decrease unexpected admissions to ITU.

Methods: Case notes of obstetric patients admitted to combined HDU/ITU from February 2006 to May 2008 were retrospectively reviewed and scored on specific EWS for obstetric patients, modified from 'Patient At Risk' Score validated in surgical wards. We assessed number of patients who should have triggered EWS and time to specialist input.

Results: Few documents contained record of complete sets of observations. Respiratory rate was recorded in only 6% cases. Using EWS would have allowed early recognition of potential morbidity in 50% patients. There were significant time lags between raising of concern and actual specialist input. Overall rate of admission to HDU/ITU was 0.4% of deliveries during that period.

Conclusion: The use of EWS system in all obstetric patients provides objective measure of clinical deterioration, which triggers involvement of both critical outreach and specialist obstetric teams. This will reduce unexpected admissions to HDU/ITU and decrease morbidity in this vulnerable group.

O-20-7 Anaesthetic management of brain dead for organ donation: impact on delayed graft function after kidney transplantation

L. Muller^a, C. Boutin^a, F. Vachieri-Lahaye^b, P. F. Perrigaut^b and J. Y. Lefrant^a

^aCentre hospitalier universitaire, Place du Pr Debré, 30029 Nîmes, France; ^bCentre hospitalier universitaire, 80 avenue Augustin Fliche, 34295 Montpellier, France (e-mail: laurent.muller@chu-nîmes.fr)

Background: Few data are available on anaesthetic practices during organ retrieval in brain dead donors. The aim of this study was to describe current anaesthetic management during organ donation and to assess its impact on delayed kidney graft function (DGF).

Materials and methods: In this retrospective study, every donor files were reviewed in Languedoc-Roussillon during 3 years. Donor characteristics, perioperative management, type of anaesthesia, hemodynamic parameters during organ retrieval, and impact of anaesthetic drugs on DGF were analysed.

Results: 149 files were available. There were no differences in donor characteristics on admission between the anaesthesia group (group A) and the no-anaesthesia group (group NA). During organ retrieval, 62% of donors received anaesthetics drugs. In group A, more colloids and neuromuscular blocking agents were used, maximal HR and HR at surgical incision were higher. In group NA, the MAP was more frequently maintained > 65mmHg. There were no difference in maximal MAP. Univariate analysis showed BMI and low organ retrieval as risk factors. Independent risk factors of DGF included absence of HES infusion during the preoperative period and mechanical ventilation without PEEP.

Conclusion: Two thirds of organ donors received anaesthetics drugs during organ retrieval. Use of anaesthetic agents in brain-dead donors for organ retrieval do not favourably influence DGF.

O-21 Gastrointestinal Surgery

O-21-1 Evaluation of surgical scoring systems and multi-purpose prognostic models for predicting mortality in patients undergoing gastrectomy for carcinoma

M. F. Can, G. Yagci, I. Ozerhan, E. Ozturk, A. Simsek, Y. Peker, S. Cetiner and T. Tufan

Gulhane School of Medicine, Dept of Surgery, Etilik, 06018 Ankara, Turkey (e-mail: mfcjan@superonline.com)

Introduction: This study evaluated the value of APACHE-II, APACHE-II/A (Adjusted), SAPS-II, POSSUM, P-POSSUM and O-POSSUM in predicting 30-day mortality of patients with gastric cancer undergoing resection.

Materials/Methods: Some 121 patients with gastric carcinoma for whom surgical treatment had been scheduled were prospectively included in the study. Predicted mortality rates and observed/expected mortality ratio were calculated using each model. Receiver operator characteristic (ROC) curve analysis was used to assess discriminatory power. Hosmer-Lemeshow goodness-of-fit test was used to assess model calibration.

Results: The overall 30-day mortality rate was 5.8% (n = 7). Predicted mortality rates generated by APACHE-II, APACHE-II/A, SAPS-II, POSSUM, P-POSSUM and O-POSSUM were 11%, 7.3%, 3.2%, 8.5%, 2.7% and 11.7%, respectively. Areas under the ROC curve (in the same order as above) were 0.782, 0.799, 0.867, 0.608, 0.578 and 0.839. All of the scoring systems evaluated showed good calibration ($\chi^2 = 10.164$ for APACHE-II, 10.437 for APACHE-II/A, 8.886 for SAPS-II, 9.604 for POSSUM, 10.991 for P-POSSUM, and 8.992 for O-POSSUM).

Conclusions: SAPS-II and O-POSSUM prognostic models achieved better discrimination than the other equations. SAPS-II was found also to have a more accurate predicted mortality rate. If confirmed by larger studies, this severity score can be used for risk-adjusted audit in patients with gastric carcinoma undergoing surgery.

O-21-2 Surgical risk stratification in complex colorectal patients

P. Vasas, R. Cohen, M. Grocott and A. Windsor

University College London, 235 Euston Road, NW1 2BU London, United Kingdom (e-mail: vasasdr@gmail.com)

Introduction: Each year 20000 UK patients die within 30 days of surgery and the majority of these deaths occur in elderly with significant cardiopulmonary co morbidities. Preoperative identification of high-risk patients should be a priority. In this study we aimed to examine the efficacy of cardio-pulmonary exercise (CPX) testing as a method of determining cardiopulmonary reserve, thus allowing us to triage patients to the appropriate level of postoperative care (Ward, HDU, ITU).

Method: From 1 May 2007 till 30 Aug 2008 252 consecutive patients were involved in our prospective study. All patients had CPX testing attempted prior to surgery. In addition, all patients had colorectal-POSSUM scores measured to calculate expected morbidity and mortality data as a benchmark. The primary outcome measure was mortality, with secondary measures morbidity, return of gastrointestinal function, hospital stay, and readmission.

Results: The mean colorectal-POSSUM score was 15.55, the mean anaerobic threshold was 13.95 ml/kg/min, (11 ml/kg/min being the reference level). The observed mortality was 1.59%; the relative risk to develop cardiopulmonary complication was 13.5% in the high risk groups, compared to 2.5% in the low risk group.

Conclusion: CPX appears to allow appropriate triage of complex colorectal patients, thus reducing their expected morbidity and mortality.

O-21-3 Change patterns in acute appendicitis throughout 25 interval years

N. Gutierrez Corral^a, Y. Díaz Solís^a, L. Fernández Suárez^a, C. Cebrian Muñios^b, R. D. Arias Pacheco^a, M. Moreno Gijón^a, L. Solar Garcia^a, J. Rodicio Miravalles^c, J. González González^a and L. Barneo^d

^aHospital Universitario Central, Servicio Cirugía General, 33006 Oviedo, Spain;

^bHospital Universitario Central, Servicio Cirugía Infantil, 33006 Oviedo, Spain;

^cHospital Alvarez Buylla, Servicio Cirugía General, 33616 Mieres, Spain; ^dHospital

Universitario Central, Servicio Cirugía general, 33006 Oviedo, Spain (e-mail: ngoorral@hotmail.com)

Introduction: Hypotheses: changes in the surgical training, hospital care, and the introduction of new technologies in the last 25 years could result in an improvement in the management of the appendicitis.

Methods: Descriptive and analytic study of 697 patients appendectomized in 1978, and 347 in 2004 in an Third Level Hospital. Endpoints: mortality, morbidity, and length hospital stay in the two periods. A total of 43 patient data (sociodemographic, signs, symptoms, comorbidity, laboratory, time intervals, surgical and pathologic findings, complications...) and 11 treatment variables (surgeons, type of surgery, antibiotic therapies...) were collected in a protocol "ad hoc". Analysis with SPSS 13: ANOVA/Chi-square test, logistic regression, ROC curves.

Results: Protocol quality: data collection rate, > 70%. Global characteristics: men 56%, mean age 28 yrs (2-93), comorbidity 23%, postoperative complications 35%, mortality 1, 2% (13 deaths). Surgical findings: normal appendix 21, 2%, rupture 25, 5%. There were differences between the 2 periods: less morbidity/mortality, shorter hospital stay, less negative appendicitis but more evolved appendicitis in the modern period. ROC curves are depicted in relation to diagnosis and complications.

Conclusion: The general outcome of acute appendicitis is better in the modern period with the introduction of ECO/TC and modifications in the care of the patients

O-21-4 Direct action of prostaglandin F2 α on human colonic mucosa and its potential role in carcinogenesis

D. Collins^a, A. Hogan^a, A. Baird^b and D. Winter^a

^aSt Vincent's University Hospital, Elm Park, Dublin 4, D4 Dublin, Ireland;

^bUniversity College Dublin, College of Life Sciences, Belfield, Dublin 4., D4 Dublin, Ireland (e-mail: danielcollo@gmail.com)

Prostanoids mediate varied functions from growth regulation to inflammation in the human colon. Inhibition of COX-2 mediated prostaglandin production by aspirin and other NSAIDs has shown promise in colorectal cancer. Previous studies demonstrate that PGF2 α promotes tumour progression and metastasis however a direct effect on colonic tissue has never been shown. The aim of this study was to investigate the effects of PGF2 α on human mucosal epithelial function in vitro.

Normal human colon obtained from the resection margins of colorectal cancer specimens was mounted in Ussing chambers. Tissues were voltage clamped and exposed to increasing concentrations of PGF2 α (range 1nM to 10 μ M). Responses to carbachol were used to confirm functional integrity of tissues. Institutional ethical approval was granted for this study.

PGF2 α produced a concentration dependant increase in short circuit current (SCC). (mean Δ SCC = 23.4 \pm 5.2 μ Ω/cm² n = 6, p < 0.05, 95%CI). Physiological and pharmacological manipulation revealed this to be due to cyclic AMP mediated chloride secretion.

This study demonstrates a previously unrecognised effect of PGF2 α at a tissue level. Direct activation of adenyl cyclase by PGF2 α represents one mechanism by which prostaglandins modulate colonic function. This has implications for the regulation of ion transport, mitogenesis and apoptosis.

O-21-5 Who gets it right? A comparison of diagnostic accuracy of general practice and accident and emergency referrals to a general surgery unit

D. Van Dellen, K. Beswick, T. Adizie and C. Robertson

Department of General Surgery, Worcestershire Royal Hospital, Charles Hastings Way, WR5 1 DD Worcester, United Kingdom (e-mail: davidvandellen@yahoo.com)

Introduction: Emergency admissions to a surgical unit are determined by the quality of both General Practitioner (GP) and Accident and Emergency (A&E) referrals. Recent changes within the NHS may have had a detrimental effect on these referral patterns.

Materials/Methods: 100 consecutive referrals (50 A&E, 50 GP) for acute abdominal pain were assessed for both accuracy of diagnosis and completeness of evaluation. These were compared with the initial diagnosis of the surgical team, as well as final diagnosis.

Results: Clinical evaluation, consisting of full history, examination, routine observations and urinalysis, was performed in 57% of GP and 34% of A&E referrals. The initial diagnosis of the referring clinician and admitting surgeon concurred in 64% (GP) and 30% (A&E) of cases. The initial diagnosis correlated with the final diagnosis in 56% (GP) and 42% (A&E) of cases. This compared to an initial diagnostic accuracy by the surgeons of 72% (p values 0.09 and 0.002 respectively; Mann Whitney U test).

Conclusions: Diagnostic accuracy and appropriate patient triage may be improved by more rigorous assessment, particularly in the A&E department. Inappropriate emergency referrals result in unnecessary and costly admission and occur largely due to unperformed investigations.

O-21-6 Investigation of the nerve supply to the external anal sphincter (EAS) in the female rat

C. Peirce^a, L. Alexander^a, M. Buffini^a, C. O'Herlihy^b, P. O'Connell^c and J. Jones^a

^aMedicine and Medical Science, University College Dublin, Belfield, Dublin 4 Dublin, Ireland;

^bNational Maternity Hospital, Holles Street, Dublin 2 Dublin, Ireland;

^cProfessorial Surgical Unit, St.Vincent's University Hospital, Elm Park, Dublin 4 Dublin, Ireland (e-mail: colin.peirce@ucd.ie)

Introduction: To determine: a) whether the inferior rectal nerve (IRN) contains motor and sensory fibres, b) spinal EAS motoneuron location and c) EAS motor unit size.

Methods: Eighteen female virgin Wistar rats were used; 7 underwent bilateral IRN section and fluorogold dipping. After 5 days, animals were perfused with fixative. Dorsal root ganglia (DRG) L5-S2 and corresponding spinal cord levels were harvested. Specimens were sectioned and analysed microscopically. Retrograde labelling of spinal cord motoneurons (Onuf's nucleus) were mapped. DRG were reacted for activating transcription factor 3 (ATF3), a marker of nerve injury. DRG sensory neurons labelled with fluorogold and ATF3 were analysed. In 11 animals EAS volume and motor unit size were determined using stereological methods.

Results: Onuf's nuclei contained 30 \pm 9 motoneurons at spinal cord level L6. Double labelled DRG sensory neurons (L6-S2) were smaller in diameter than motoneurons (p < 0.0001). EAS volume was 4.85 \pm 0.19 mm³, containing 488 muscle fibres. Estimated motor unit size was 33.

Conclusions: IRN is a mixed nerve supplying EAS which is under fine neuronal control. It can be manipulated in animal models of neuropathic faecal incontinence making it suitable to elucidate how sacral neuromodulation works. ATF3 nuclear staining allows study of nerve injury.

O-21-7 Atrophy of the sphincters of continence in an animal model

C. Peirce^a, M. Banahan^a, M. Buffini^a, C. O'Herlihy^b, P. O'Connell^c and J. Jones^a

^aMedicine and Medical Science, University College Dublin, Belfield, Dublin 4 Dublin, Ireland;

^bNational Maternity Hospital, Holles Street, Dublin 2 Dublin, Ireland;

^cProfessorial Surgical Unit, St.Vincent's University Hospital, Elm Park, Dublin 4 Dublin, Ireland (e-mail: colin.peirce@ucd.ie)

Introduction: To determine the extent of sphincter injury in an animal model of neuropathic faecal incontinence mimicking human obstetric injury.

Methods: Sixteen female virgin Wistar rats were assigned equally to 2 groups: unoperated controls and retrouterine balloon compression animals studied 4 weeks following injury. In all animals anal and urethral canals were dissected, snap frozen and sectioned (100 μ m thickness). Histochemistry for succinate dehydrogenase differentiated striated and smooth muscle. Complete length of external anal sphincter (EAS), internal anal sphincter (IAS) and external urethral sphincter (EUS) were sampled and total mass of each calculated by adding all individual slice masses.

Results: All sphincters atrophied in balloon compression animals: EAS by 31% (p = 0.001), IAS by 32% (p = 0.01) and EUS by 23% (p = 0.05). Magnitude of EAS atrophy did not differ from that reported previously. Animals gained weight over the 4 weeks following surgery. Neither EAS nor EUS shortened in operated animals versus controls (p = 0.1, p = 0.08 respectively).

Conclusions: This model of childbirth injury to the motor pudendal nerve is reproducible and imparts damage to both striated and smooth sphincters of continence following a 1 hour balloon inflation period. It may be used to study the poorly understood pathophysiology of both faecal and urinary incontinence.

O-22 Infection

O-22-1 Silver-coated polypropylene implants and periprosthetic infection in a rat model of incisional hernia with bacterial inoculation

W. Badiou^a, J. P. Lavigne^b, P. J. Bousquet^c, D. O'Callaghan^b and R. De Tayrac^c

^aHôpital Paule de Viguier, 330, avenue de Grande-Bretagne, 31059 Toulouse, France;

^bINSERM ESPRI 26, UFR de Médecine, Avenue JF Kennedy, 30908 Nîmes, France;

^cCarêmeau University Hospital, Place du Pr R. Debré, 30029 Nîmes, France (e-mail: w.badiou@gmail.com)

Introduction: To determine the effect of silver coating of polypropylene implants on infection in hernia surgery.

Materials/Methods: Silver-coated and non-silver-coated large-pore monofilament polypropylene mesh implants were compared with and without infection

(4 groups). The implants were inserted in the abdominal wall of female Wistar rats. An *E. coli* strain was inoculated intraoperatively in the 2 infected groups. The implants were removed and clinical, bacteriological and histological analysis performed at 2, 15 and 30 days postoperatively.

Results: 84 rats were studied in 4 groups of 21. All inoculated rats in the non-silver-coated polypropylene group presented periprosthetic *E. coli* infection, compared with only 5 inoculated rats in the silver-coated polypropylene group ($p < 0.0001$). Quantitatively, infection was 3×10^8 and 10^2 in the infected polypropylene group and the infected silver-coated polypropylene group, respectively ($p < 0.001$). Infection increased over time in the non-silver-coated polypropylene group (9×10^6 , 7.6×10^8 and 4.5×10^{10} at D2, D15 and D30, respectively). Erosion was significantly higher in the infected and non-infected silver-coated polypropylene groups ($p < 0.01$). There was no histological difference between the 4 groups.

Conclusions: Silver-coated implants are effective against bacterial infection, with good histological tolerance but delayed healing.

O-22-2 Superantigens prime human monocytes and peripheral blood mononuclear cells to bacterial lipoprotein and low-dose endotoxin challenges

D. Kearney^a, J. H. Wang^a and H. P. Redmond^b

^aDept of Academic Surgery, Cork University Hospital, Wilton, Cork, Ireland;

^bDepartment of Academic Surgery, Cork University Hospital, University College Cork, Wilton, Cork, Ireland (e-mail: dkearnage@gmail.com)

Introduction: Superantigens are bacterial exotoxins and are potent inducers of septic shock. They also potentiate the effects of endotoxin, a TLR4 ligand. The aims of this study were to investigate whether superantigens potentiate the effects of the TLR2 ligand Bacterial-Lipoprotein (BLP), and to analyze the early effects of endotoxin challenges on superantigen primed human monocytes and PBMC (peripheral blood mononuclear cells).

Materials/Methods: PBMC and monocytes were isolated from healthy volunteers. Cells were sequentially exposed to staphylococcal enterotoxin B (SEB) and then BLP or endotoxin. Subsequently, cells were exposed to SEB and endotoxin over various time points to establish the optimal duration of SEB priming and endotoxin challenge. Pro-inflammatory cytokine levels were measured.

Results: SEB primed PBMC to subsequent BLP challenges at concentrations between 100 pg/ml and 100ng/ml. The maximal effect compared to control was seen at 10ng/ml (TNF- α 2198 pg/ml vs. 1068 pg/ml, 1130 pg/ml difference, $p < 0.001$). SEB significantly primed PBMC to endotoxin at concentrations between 10 pg/ml and 1ng/ml, with the optimal effect occurring between 10 pg/ml and 100 pg/ml. These effects were also seen in isolated monocytes.

Conclusion: Superantigens prime PBMC and monocytes to BLP stimulation and very low doses of endotoxin. This synergy may explain the massive pro-inflammatory cytokine release in superantigen-induced septic shock.

O-22-3 Correlation between contraction and infection of implanted synthetic meshes, using an animal model of mesh infection

L. Mamy^a, V. Letouzey^a, X. Garric^b, J. P. Lavigne^c, P. Mares^a and R. De Tayrac^a

^aCarêmeau University Hospital, Place du Pr R. Debré, 30029 Nîmes, France;

^bIBMM UMR CNRS 5247, 15 avenue Charles Flabault, 34093 Montpellier, France;

^cINSERM ESPRI 26, UFR de Médecine, Avenue J F Kennedy, 30908 Nîmes, France (e-mail: dochmy@hotmail.com)

Introduction: Genital prolapse surgical treatment using synthetic mesh is restricted by complications such as infection and contraction. The aim of the present study was to highlight the link between mesh infection and contraction in an animal validated model of meshes infection.

Materials/Methods: Twenty eight Wistar rats were implanted with synthetic meshes, either non absorbable (Polypropylen (PP), $n = 14$), and absorbable (poly (lactic-acid)94 (PLA94), $n = 14$), using a validated incisional abdominal hernia model. Fourteen meshes were infected intraoperatively ($n = 7$ PLA94

and $n = 7$ PP meshes) with 10^6 CFU *Escherichia coli*, versus 14 non infected meshes ($n = 7$ PLA94 and $n = 7$ PP meshes) (control groups). Contactation was evaluated by a reproducible numerical analysis of mesh area and completed by bacteriological and histological analysis after explantation at day 30.

Results: Non infected synthetic meshes were less likely to contract than infected meshes, for both non absorbable (5% versus 21.56%, $p < .05$) and absorbable meshes (2.4% versus 10.98% $p < .05$). Shrinkage was less detected on PLA94 versus PP meshes when infected (10.98% versus 21.56%, $p < .05$). Both bacteriological and histological study were consistent with the numerical analysis.

Conclusions: The link between infection and contraction was established in our model. Absorbable meshes or meshes with anti bacterial properties should be less exposed to infection and contraction.

O-22-4 Use of bedside alcohol gel in surgical wards -prevention or source of hospital acquired infection?

S. Zaman, D. Santosh, M. Heng and G. Kaur

Scunthorpe General Hospital, Cliff Gardens, North Lincs, DN15 7BH Scunthorpe, United Kingdom (e-mail: gkaur@email.com)

Aims: Alcohol gel is provided in a bottle on every patient's bed within and outside every surgical ward. Staff are encouraged to apply gel to their hands before and after every patient contact. The public is requested to use the bottles prior to entering and leaving the wards. We considered whether the bottles themselves might be a potential source of hospital-acquired infection.

Methods: On a single day, 30 sets of swabs were taken from random alcohol gel bottles on our surgical wards. Swabs were taken from bottle top, from nozzle and from alcohol gel itself. These swabs were sent to microbiology department for standard microscopy culture and sensitivity.

Results: One of the nozzle swabs tested positive for Methicillin resistant staphylococcus aureus (MRSA). No other sample demonstrated any growth after 72 hours incubation.

Conclusions: Though this is a small spot-test study, it emphasises the fact that alcohol gel, rather than reducing the rate of hospital acquired infection, may in fact be a potential source of contamination, particularly likely where staff uses alcohol gel as an alternative to hand washing. This is also relevant in outpatient setting. Further education of staff as well as a repeated cycle of random testing is required.

O-22-5 Epidemiology and prevalence of methicillin - resistant staphylococcus aureus and staphylococcus epidermidis in patients with diabetic foot ulcers: focus on the differences between species isolated

H. Galkowska^a, A. Podbielska^a, W. Olszewski^b, E. Stelmach^a, M. Luczak^c, G. Rosinski^d and W. Karnafel^d

^aMedical Research Centre, 5 Pawinski Str., 02-106 Warsaw, Poland; ^bMedical

Research Centre, 5 Pawinskiego Str., 02-106 Warsaw, Poland; ^cDep of Med

Microbiology, Banacha 1A Str., 02-097 Warsaw, Poland; ^dDep Gastro & Metab Diseases, Banacha 1A Str., 02-097 Warsaw, Poland (e-mail: wlo@cmdik.pan.pl)

We have examined whether foot ischemia or neuropathy with diabetic foot ulcer (DFU) promote selection of staphylococci species, evaluated frequency of MRSA and MRSE among strains yielded from patients with DFU and assessed multidrug resistance of isolates. Patients with DFU and foot osteomyelitis were divided into ischemic foot ulcer (IFU, $n = 21$) and neuropathic foot ulcer (NFU, $n = 29$) group according to peripheral sensory neuropathy and arterial perfusion assessment.

Results: Frequency of *S. epidermidis* yielded from curettage of IFU was higher compared with NFU ($p < 0.05$). *S. epidermidis* was also more frequently isolated from the toe web surface of patients with IFU compared with NFU (55% vs. 17.9%, respectively) and healthy volunteers (HV, $n = 20$) (17.6%, $p < 0.05$). These mostly MRSE strains (83.3 to 100%) originated from DFU patients were multidrug resistant (88.8%). Also, most of MRSA isolates were multidrug resistant (70.3%). Higher rates of MSSA from DFU patients were resistant to antimicrobials compared with MSSA from HV. This is the first

report indicating that diabetic patients with IFU differ in higher frequency of S.epidermidis infection of ulcer and skin colonization compared with NFU patients. We suggest that IFU should be defined as separate disease state of DFU and S.epidermidis should be appreciated as nosocomial pathogen.

O-22-6 Analysis of surgical site infection in patients with colorectal cancer stratified by age

L. Degrade, S. Poli, F. Bagnariol, F. Romano, C. Nobili, C. Franciosi, R. Caprotti and F. Uggeri

San Gerardo Hospital, via donizetti 106, 2052 monza, Italy

Surgical site infection (SSI) increase hospital stay, morbidity and mortality. We compare the incidence and characteristics of surgical site infections between young (under 70 years) and old (over 70 years) patients undergoing colorectal resection. 264 patients (143 men and 121 women) were divided in two groups: under 70 (group A: 144 pts) or over 70 (group B: 120 pts). We analyzed age, gender; body mass index; diagnosis; type and timing of surgical procedure; creation of ostomy; ASA score; surgical contamination wound class; number, type and side of SSI. The groups are comparable for surgical procedure, diagnosis, time to surgery, surgical contamination wound class and BMI. Higher ASA score, Higher comorbidities, longer hospital stay and creation of ostomy were in group B. No significant difference in incidence of SSI between two groups (11% versus 16%), in postoperative day of SSI diagnosis and in SSI days length. No statistical difference between colon and rectal surgery about incidence of SSI Even if two groups defer about ASA score, prevalence of comorbidities, longer hospital stay and creation of ostomy there is not a significant difference in incidence of SSI. Not even considering different site of surgery.

O-22-7 Surgical site infection in clean - contaminated wounds with two methods of skin closure

H. Mohebbi, S. M. Mousavi-Nacini, S. Mehrvarz and B. Abedian

Baqiyatallah University, Mollasadra avenue, 1435915371 Tebran, Iran (e-mail: mohebbiha@yahoo.co.in)

Introduction: In clean - contaminated wounds (CCW) suitable method of skin closure is a matter of choice. In this study we compared postoperative surgical site infection (SSI) in CCW closed two different methods of skin closure.

Methods and materials: The patients (total, 200) admitted for urgent or elective operations with CCW were randomly divided into two groups (n = 100 each group) according to method of skin closure: Simple nonabsorbable interrupted (SI) sutures and Continuous absorbable subcuticular (CS) closure. SSI was evaluated at the end of first week and first month after operation. To analyze quantitative data, t-test and for qualitative data, chi square test was used.

Results: The mean±SD age of the patients was 36.4±17.7 year and 127 patients (63.5%) were male. Age, gender, BMI, general condition, level of hemoglobin, controlled diabetic cases and types of operations were not significantly different between SI and CS groups. There were 8 cases of overall SSIs (4%) (5 in the SI and 3 in the CS group) without significant difference (p = 0.4).

Discussion: There was no significant difference between the two methods used for skin closure. However, considering the cosmetic effects and less postoperative pain, Continuous absorbable subcuticular closure is recommended for CCW.

O-23 Cardiac Surgery

O-23-1 Off-label use of recombinant activated factor VII for intractable haemorrhage after cardiovascular surgery: an observational study of practices in French cardiac centres between 2005 and 2007

M. Durand^a, M. Hacquard^a, T. Lecompte^a, O. Bastien^b, C. Beaufreton^c, Y. Blanloeil^d, S. Boini^a, S. Briançon^a, B. Jude^e, A. Pavie^f and J. P. Carreaux^a

^aCHU Nancy, 5, allée du Morvan, 54500 Vandœuvre les Nancy, France; ^bService de réanimation, Groupement Hospitalier Est, 28, Avenue Du Doyen Jean Lépine, 69677 Bron, France; ^cCHU Angers, 4, rue Larray, 49933 Angers, France; ^dCHU Nantes, Place Alexis Ricordeau, 44093 Nantes, France; ^eCHU Lille, Hopital Cardiologique, 59000 Lille, France; ^fHôpital de la Pitié-Salpêtrière, 52, Bd Vincent Auriol, 75013 Paris, France (e-mail: durandmarion@hotmail.com)

Introduction: Our aim was to describe French practices regarding rFVIIa use in cardiovascular surgery for intractable bleeding.

Materiel: A request form was sent to French cardiovascular centres to collect observations of rFVIIa use for haemorrhage control in cardiovascular surgery.

Results: From January 2005 to October 2007, 109 patients among which 37 with mechanical assisting devices received single (76%) or double (24%) rFVIIa injections. Patients were treated in the operating room (49%) or in the ICU (51%). Bleeding stopped in 43% of cases (dose 81 ± 31µg/kg), decreased in 37% (71 ± 24µg/kg), and continued in 20% of cases (64 ± 23µg/kg), with a significant correlation between rFVIIa dose and bleeding improvement (p = 0.044). The number of transfused products was 25 (2-90) before and 6 (0-48) after rFVIIa injection (p < 0.001). Hourly bleeding of patients treated in ICU (n = 34) decreased from 365 ± 212 mL/h to 115 ± 106 mL/h (p < 0.001). Thrombotic events occurred in 24% of patients. Survival rate at 28 days was 60%.

Discussion: Administration of rFVIIa was associated with bleeding control in greater part of patients even in case of mechanical circulatory assisting device.

O-23-2 Coronarie artery fistula associated with valvular heart disease: surgical management and literature review

T. Gandet^a, R. Demaria^b, J. M. Frapier^b and B. Albat^b

^adepartement of cardiac surgery, hopital arnaud de villeneuve, 34090 montpellier, France; ^bDepartment of Cardiac Surgery, Hopital Arnaud de Villeneuve, 191 Av Doyen Giraud, 34090 Montpellier, France (e-mail: tomagandet@hotmail.com)

Introduction: Coronary artery fistula (CAF) is a rare congenital anomaly of the coronary arteries in witch abnormal connections are present between the coronary artery branch and the cardiac chamber or a major vessel. Here we report CAF arising from a single coronary artery in a patient with mitral stenosis, aortic and tricuspid regurgitation, rare coincidence in literature.

Methods: A fifty year old women underwent a coronary angiogram prior to surgery. The left coronary angiogram showed a CAF between the left main and the left atria. Surgical correction was performed by superior septal approach and aortotomy. A mitral and aortic valve prothesis were inserted, tricuspid annuloplasty was realized and the fistula was closed from within the left atria. A literature review from Pubmed was performed from 1980 to 2009.

Results: Surgical follow up was satisfactory. A coronary computed tomography demonstrated occlusion of CAF from left main.

Conclusion: CAF is a rare congenital anomaly, the knowledge of the pathology is important for optimal treatment.

O-23-3 Experimental animal model of systolic and diastolic right ventricular failure (SDRVF)

F. Roubertie^a, L. Labrousse^b, J. B. Thambo^c, P. Bordachar^d, M. N. Laborde^b and X. Roques^b

^ahopital baut lèveque, avenue du magellan, 33600 Pessac, France; ^bhôpital baut lèveque, avenue du Magellan, 33600 Pessac, France; ^chôpital baut lèveque, avenue du magellan, 33600 Pessac, France; ^dhôpital baut lèveque, avenue du Magellan, 33600 Pessac, France (e-mail: rouberf@yahoo.fr)

Introduction: Management of SDRVF after certain congenital heart procedures is not well defined, we have produced and evaluated an animal experimental model of RVF to analyse the different therapeutic possibilities.

Materials/Methods: Between July 2006 and December 2007, 10 piglets, average weight 5.5 kg and mean age 10 days underwent a left lateral thoracotomy. Procedures included a lesion to the pulmonary valve to achieve pulmonary regurgitation, banding of the pulmonary artery, and enlargement of the infundibulum with a patch.

Results: All 10 piglets survived the operation. 4/10 received median sternotomy for placement of epicardial electrodes at mean age 5.5 months and mean weight 44 kg. All 4 piglets received an epicardial echocardiogram to analyse the function of both right and left ventricles and to quantify pulmonary regurgitation and stenosis. Continuous hemodynamic monitoring of dp/dt of the 2 ventricles allowed evaluation of different electrostimulation sites.

Conclusion: The experimental animal model of SDRVF which we have used is feasible and reliable. Preliminary therapeutic evaluation by electrostimulation of SDRVF is in progress. It is possible that other therapeutic strategies (medical or other) may be analysed with this model.

O-23-4 Stress hyperglycemia impaires platelet inhibition by aspirin measured by thromboelastography and VerifyNow®

A. Le Guyader^a, G. Davis-Gorman^b, N. Seaver^b, J. Copeland^c and P. McDonagh^b

^aHôpital Universitaire Dupuytren, Chirurgie Cardiovasculaire, Université de Limoges, 87042 Limoges, France; ^bHealth Sciences Center, University of Arizona, Tucson, AZ 87042, United States of America; ^cUniversity Medical Center, Cardiac Surgery Department, Tucson, AZ 87042, United States of America (e-mail: alexandre.leGuyader@unilim.fr)

Objectives: Increased aspirin resistance has been described in patients with type 2 diabetes contributing to an increase in thrombotic events. We examined if acute exposure to increased plasma glucose impaired the inhibitory effects of ASA on platelet activation.

Methods: Whole blood samples from 10 volunteers were incubated with different glucose concentrations (100 and 300 mg/dl) followed by incubation with aspirin (325 mg/d). Inhibition of platelet aggregation was measured using Platelet Mapping Assay for Thromboelastography (TEG) and a point-of-care whole blood platelet aggregometry (VerifyNow® System).

Results: At physiological glucose concentration, in vitro platelet inhibition was effective with 325 mg/d of aspirin. A $82.0 \pm 4.4\%$ of platelet inhibition was measured using TEG and a 100% of inhibition of platelet aggregation was found using VerifyNow® (Aspirin Reaction Units 487.9 ± 17.3). Glucose at 300 mg/dl impaired the inhibitory effect of 325 mg/d of aspirin. Platelet inhibition was decreased to $65.4 \pm 7.4\%$ using TEG ($p = 0.02$) and platelet inhibition was abnormally increased to 551.1 ± 17.3 ARU using VerifyNow® ($p = 0.01$). A correlation was only found between the two measurements in hyperglycemia conditions ($R^2 = 0.68$).

Conclusions: In vitro stress hyperglycemia significantly impaired the inhibitory effects of aspirin on human platelet using Thromboelastography and VerifyNow®.

O-23-5 Operate or not operate: surgical or percutaneous treatment of high risk patient with aortic valve stenosis

M. Cikirikcioglu, M. Roffi, C. Ellenberger, E. Pektok, P. F. Keller, P. Myers, T. Theologou, F. Mach, M. Licker and A. Kalangos
University Hospital of Geneva, 24, Rue Micheli du Crest, 1211 Geneva, Switzerland (e-mail: mustafa.cikirikcioglu@hcuge.ch)

Aim: Surgical treatment is gold standart for the treatment of severe aortic valve stenosis. Percutaneous aortic valve replacement (PAVR) is an emerging alternative for high risk or inoperable patients. The aim of this report is to share the preoperative assessment concept and early results of our working group on high risk patients with aortic valve stenosis.

Method: Since June 2008, nine patients (83 ± 4 years) were assessed by our working group. The main reasons for considering a patient as a candidate for

PAVR were an age older than 80 years, a logistic EuroSCORE 20% and/or poor general condition.

Results: The mean Euro-and STS-scores for hospital mortality were 28 ± 18 and $9.2 \pm 7.1\%$. Three patients were selected for surgical and 6 patients for PAVR. Two patients in the surgical group had a logistic EuroSCORE higher and 3 patients in percutaneous group had a score lower than 20%. There were no hospital mortality. During a mean follow-up of 97 ± 55 days, one patient of the PAVR group died 108 days after the procedure, because of aspiration secondary pneumonia.

Conclusion: Our initial experience suggests that both surgical and PAVR had acceptable morbidity and mortality in high risk, selected patients. Our results underscore the weaknesses of current scoring systems and the importance of a multidisciplinary approach for patient selection, treatment and follow-up.

O-23-6 Percutaneous atrioseptostomy: a tool for a rare life-threatening complication after left pneumonectomy

T. D Annoville^a, L. Canaud^a, C. Marty-Ané^a, P. Alric^a, C. Sportouch^b, J. M. Frapier^c and J. P. Berthet^a

^aDepartment of Vascular Surgery, Hopital Arnaud de Villeneuve, 191 av du Doyen Giraud, 34090 Montpellier, France; ^bDepartment of Cardiology, Hopital Arnaud de Villeneuve, 191 Av Doyen Giraud, 34090 Montpellier, France; ^cDepartment of Cardiac Surgery, Hopital Arnaud de Villeneuve, 191 Av Doyen Giraud, 34090 Montpellier, France (e-mail: tomadano1@botmail.fr)

Introduction: Postoperative discovery of isolated contralateral partial anomalous pulmonary venous return (PAPVR) after pulmonary resection may be lethal. We report a case of a right cardiac failure after left pneumonectomy due to an isolated contralateral PAPVR successfully treated by percutaneous atrioseptostomy.

Methods: A 56-year-old woman affected by non small cell lung carcinoma involving the left main pulmonary artery underwent left pneumonectomy. Three hours later, massive right cardiac failure appeared due to an undetected isolated PAPVR concerning the right upper pulmonary vein in the superior vena cava. As the patient was unable to undergo conventional cardiac surgery immediately, a less invasive technique was proposed using percutaneous atrioseptostomy.

Results: Systemic blood pressure and global cardiac output increased quickly. An echocardiography performed at three months showed a moderate distention of the right atrium (29 mm3) and an atrial defect of 15 mm, with right-to-left massive shunting of the contrast product during systole, without pulmonary artery hypertension (33 mmHg).

Conclusion: This minimally invasive procedure may be useful in weak patients for postoperative acute heart failure due to undetected PAPVR, and conventional surgery can be performed secondarily if required. However, PAPVR should be detected by the thoracic surgeon before pneumonectomy and conventional surgery remains the gold standard.

O-23-7 In vitro and in vivo testing of transit-time flow meters for the assessment of intraoperative cardiac output

B. Walpoth^a, E. Pektok^b, S. Osorio-Da Cruz^a, M. Cikirikcioglu^b, T. Tatar^a, J. Reuse^a, G. Richard^a, R. Deschenaux^a, E. Lozano^a, B. Nowicki^a and A. Kalangos^b

^aUniversity Hospital of Geneva, Dept. of Cardiovascular Surgery, 24, Rue Micheli du Crest, 1211 Geneva, Switzerland; ^bUniversity Hospital of Geneva, 24, Rue Micheli du Crest, 1211 Geneva, Switzerland (e-mail: beat.walpoth@hcuge.ch)

Introduction: Continuous cardiac output monitoring is desired during cardiac surgery, especially in off-pump procedures. This can be done by the invasive, costly thermo-dilution technique. We assessed feasibility/efficacy of newly-designed transit-time flow probes for intraoperative cardiac output measurements.

Materials/Methods: In vitro: Measurements ($n = 150$) were performed using artificial circuits (pulsatile or non-pulsatile flow) filled with blood (Hct 24%); measurements were performed using two transit-time devices (Medi-Stim-Norway/Transonic-USA) on freshly excised porcine aorta (diameter=20mm). Flow was increased step-wise from 1-8L. Time-collected flow served as control.

In vivo: Repeated cardiac output measurements ($n = 90$) were performed on the ascending aorta (5 anaesthetised open-chest pigs -72 kg) using the same measuring devices. Continuous thermo-dilution measurements (Vigilance) served as control.

Results: *In vitro:* Correlations in excess of 0.95 were found for both devices compared to time-collected flow; no significant difference between the two devices was found. *In vivo:* Placement of probes was easy; measurements were readily obtained. Measured mean cardiac output values: $6.4\text{L}/\text{min} \pm 1.5$ for Medi-Stim/ 5.8 ± 0.8 for Transonic, compared to 6.2 ± 0.8 for Vigilance (control).

Conclusions: The two tested flow meters showed a good correlation to time-collected flow *in vitro* and were able to measure cardiac output continuously intraoperatively with good and reproducible results. Thus, this technique may be less invasive, cheaper than thermo-dilution techniques and provides mutual surgeon/patient benefit for continuous cardiac output monitoring.

O-24 Surgical Oncology

O-24-1 A new surgical technique (LYMPHA) for primary prevention of arm lymphoedema following axillary dissection for breast cancer

C. Campisi and F. Boccardo

Dpt. Surgery - Lymphatic Surg., University of Genoa, S.Martino Hospital, 16132 Genoa, Italy (e-mail: francesco.boccardo@unige.it)

Introduction: The purpose of this manuscript is to assess the efficacy of direct lymphatic-venous microsurgery (LYMPHA - Lymphoedema Microsurgical Preventive Healing Approach) in the prevention of lymphoedema following axillary dissection for breast cancer.

Methods: Twenty-two patients with operable breast cancer requiring an axillary dissection underwent surgery, carrying out lymphatic-venous anastomoses (LVA) between arm lymphatics identified by injecting blue dye in the arm and an axillary vein branch simultaneously. The follow-up after 6, 12 and 18 months from the operation included circumferential measurements in all cases and lymphangioscintigraphy in 20 patients out of 22 cases.

Results: Blue nodes in relation to lymphatic arm drainage were identified in 21/22 patients. All blue nodes were resected and 2–4 main afferent lymphatics from the arm could be prepared and used for anastomoses. LVA allowed to prevent lymphoedema in all cases. Lymphangioscintigraphy demonstrated the patency of microvascular anastomoses.

Conclusions: Disruption of the blue nodes and closure of arm lymphatics can explain the significantly high risk of lymphoedema after axillary dissection. The use of multiple lymphatic-venous anastomoses between arm lymphatics and a secondary branch of axillary vein (LYMPHA technique) helps to solve the problem of preventing secondary arm lymphoedema maintaining the oncological radicality.

O-24-2 Taurolidine, a novel anti-neoplastic agent, induces apoptosis in anaplastic thyroid cancer

R. Wormald^a, J. H. Wang^b and H. P. Redmond^c

^aDepartment of Academic Surgery, Cork University Hospital, Wilton, c1 Cork, Ireland; ^bDept of Academic Surgery, Cork University Hospital, Wilton, Cork, Ireland; ^cDepartment of Academic Surgery, Cork University Hospital, University College Cork, Wilton, Cork, Ireland (e-mail: r_wormald@yahoo.com)

Background: Anaplastic thyroid cancer is a rare but extremely aggressive form of thyroid cancer characterised by having no effective treatment options and an extremely poor prognosis. Taurolidine, a derivative of the amino acid taurine, has demonstrated novel anti-neoplastic properties against several tumour types including malignant melanoma, prostate carcinoma and glioblastoma. The aim of this study was to explore the effects of taurolidine on anaplastic thyroid cancer.

Methods: Human anaplastic thyroid cancer cell lines (Cal62, FRO81-2, BHT101) were treated with taurolidine (0–400 μM) for 12, 24 and 48 hours. Cell death and the effects on the cell cycle were assessed by flow cytometry. Cellular proliferation was assessed with BrdU assay.

Results: Incubation with taurolidine (50 μM) for 24 hours resulted in over 60% reduction in cellular proliferation ($p < 0.05$). Taurolidine (50 μM) resulted in 16% apoptosis at 48 hours and 35% apoptosis at 72 hours, compared with less than 2% in the control group ($p < 0.05$). FACScan analysis revealed cell cycle arrest at the M-phase in the taurolidine treated cells.

Conclusions: Taurolidine has significant anti-tumour activity against anaplastic thyroid cancer cell lines and therefore is a potential chemotherapeutic agent for this aggressive disease.

O-24-3 Construction of a tissue microarray to validate novel biomarkers in malignant melanoma

I. Murphy^a, M. Rafferty^a, W. Gallagher^a and E. McDermott^b

^aUniversity College Dublin, Belfield, Dublin 4, n/a Dublin, Ireland; ^bSt. Vincents University Hospital, Elm Park, Dublin 4, na Dublin, Ireland (e-mail: iangmurphy@gmail.com)

Introduction: Malignant Melanoma is increasing in incidence in western societies. Surgery remains the mainstay of therapy. The treatment of intermediate grade tumours remains controversial, and current adjuvant therapies have so far shown ambiguous results. The explosion in genomic markers has elucidated many potential prognostic markers and therapeutic targets. These markers need to be validated in proteins before advancing to the clinical setting. This will permit the individualisation of therapy and augment the adjuvant therapy currently available.

Aim: Our aim was to construct a microarray of cutaneous melanoma, obtain clinical, pathological and survival data pertaining to these samples, and correlate these to evaluate a prospective protein biomarker. The specific marker examined was Replication Factor- C4, a nuclear protein involved in DNA replication and repair. In previous genomic studies the RFC4 was found to be upregulated in advanced melanomas.

Results: A tissue microarray was constructed of 230 samples and validated using established clinicopathological factors. RFC4 antibody was validated using western blotting and cell-line pellet arrays, and the antibody was used to stain the TMA. Our data shows that the presence of a high level of RFC4 protein was found associated with metastasis in melanoma, and was found to be significantly associated ($p = 0.005$) with decreased overall and disease-free survival.

O-24-4 Importance of mammography in detection of breast cancer at an earlier stage

E. Kurt^a, B. Kavlakoglu^b and S. Oral^c

^aAnkara Oncology Hospital, 3rd General Surgery Clinics, Yenimahalle, 06610 Ankara, Turkey; ^bAnkara Oncology Hospital, Birlik Mab 5. Cad No:68/4, 06450 Ankara, Turkey; ^cAnkara Oncology Hospital, Ankara Oncology Hospital, 06610 Ankara, Turkey (e-mail: biz.2006@hotmail.com)

From August 2006 to June 2007, 233 patients underwent 242 wire localized breast biopsies. Biopsies were done to nonpalpal lesions after sonographically or mammographically guided wire localization.

9 patients had 2 simultaneous localizations: 4 to ipsilateral breast, 5 to contralateral breast. 191 localizations were guided sonographically and 51 mammographically.

Mean patient age at biopsy was 48, 2 years, while malignancy detected 57 patients' mean age was 51.5 years. Microcalcifications were the most detected lesion mammographically and mass, ultrasonographically. Malignancy was diagnosed in 59 biopsies (24.4%) and high risk lesion in 11 (4.5%). There were 19 in situ and 40 invasive tumors.

Malign lesions were masses the most (57.6%) in imaging, invasive tumors were masses (67.5%) also, but in situ tumors were microcalcifications (63.2%). If imaging presentation was microcalcification, malignancy or high risk lesion detection rate was 46.1% and for mass, the rate was 22.4%.

This study shows, since microcalcifications' detection rate of malign or high risk lesion was almost half of all microcalcifications (46.1%), and in situ tumors were seen the most as microcalcifications (63.2%) and microcalcifications are found best via mammography, how important the mammography is in diagnosing breast cancer at an earlier stage.

O-24-5 ATRA blockage of cancer cells' proliferation in vitro depends on the continuous presence of the drug

I. Diaz, T. Palomares, H. Marin, A. Alonso-Varona, B. Herrero and I. Garcia-Alonso

University of The Basque Country, Lab. of Experimental Surgery, Fac. of Medicine, E48940 Leioa, Spain (e-mail: h_marinortega@hotmail.com)

Introduction: We have showed that All-Trans-Retinoic Acid (ATRA) delays cancer progression in vivo, and decreases cell proliferation in vitro. Here in, we study how permanent its effect can be in vitro.

Methods: Proliferation of CC-531 colon adenocarcinoma cells has been assessed quantifying cell numbers in 96-well plates at 24, 48 and 72 h. First, the effect of 14 different concentrations of ATRA were tested. Secondly, cells which had been cultured in flasks with ATRA (0.05, 10 or 15 μM) for 3 or 6 days, were seeded in 96-well plates and let adjust to the new environment for 24 hours; next the same different concentrations of ATRA were added and the proliferation measured.

Results: Very low concentrations (0.005 and 0.01 μM) of ATRA increased cell proliferation. Concentrations above 5 microM induced a dose dependent decrease of cell proliferation. Cells cultured with ATRA for 3 or 6 days, showed a normal growth after removing the drug. Pretreatment with ATRA neither increased the sensitivity of the cells to the second exposure to the drug.

Conclusion: The effect of ATRA treatment in vitro is limited to the actual presence of the drug in the medium, and its effects disappear in 24 hours.

O-24-6 The role of NADPH oxidase (Nox) complex in activating the PI3K/Akt pathway in recurrent breast tumours

O. Al-Sahaf^a, C. Pettigrew^b, J. H. Wang^c, T. Cotter^b and H. P. Redmond^d

^aUniversity college cork, Department of surgery, Cork university hospital wilton, 00353 Cork, Ireland; ^buniversity college cork, Department of biochemistry, university college cork, 00353 Cork, Ireland; ^cDept of Academic Surgery, Cork University Hospital, Wilton, Cork, Ireland; ^dDepartment of Academic Surgery, Cork University Hospital, University College Cork, Wilton, Cork, Ireland (e-mail: usama_sahaf70@hotmail.com)

Introduction: Surgery is the principal treatment of breast cancer, However 22% of patients who have breast conserving surgery suffer local recurrence, 57–88% of those recurrences occur at the site of primary tumour probably due to residual tumour cells. We have previously shown increased levels of Akt in recurrent tumours reducing apoptosis. Our hypothesis was that reactive oxygen species (ROS) driven by NADPH oxidase enzymes inactivates specific phosphatases, increasing in flux through the PI3K/AKT pathway and a reduction in apoptosis in recurrent tumours.

Methods: Flank tumours generated by inoculation of 4T1-GFP cells in BALB/c female mice. Near maximal excision of primary tumour was performed, tumours were converted into a single cell suspension, and hydrogen peroxide (H₂O₂) production was measured with DCF and DHE probes.

Results: Recurrent tumours grew faster than primary counterparts (mean volume 130 mm³ vs. 90 mm³); H₂O₂ production in primary and recurrent tumours measured with DCF (44 \pm 4.9 vs. 58 \pm 5.5) and with DHR (21.8 \pm 2.9 vs. 33.3 \pm 4.9) respectively.

Conclusion: The increased generation of ROS in recurrent tumours could explain the accelerated growth by inhibiting certain phosphatases and transmitting survival signals through the Akt pathway reducing apoptosis.

O-24-7 MMP1 is a HNSCC tumor marker potentially useful for the assessment of surgical margin quality and lymph node invasion

B. Lallemand, G. Chambon, C. Reynaud, C. Aloviseti, J. P. Brouillet and J. G. Lallemand

CHU de Nîmes, Place du Pr Robert Debré, 30029 Nîmes, France (e-mail: benjamin.lallemand@chu-nimes.fr)

Introduction: The detection of residual microscopic cancer cells is an ongoing challenge to guide surgical resection limits and to select patients eligible for

post-operative treatments. As pathological analyses are not reliable to identify small tumor clusters, alternative methods are required such as tumour marker detection. MMP1 is a potential marker in HNSCC that we identified by analysing 23 published transcriptome studies.

Objective: To validate the dysregulation of MMP1 in HNSCC and to test its ability to discriminate tumour tissue from normal mucosa.

Methods: The expression level of MMP1 was assessed by RT-qPCR in tumour and normal matched mucosa from 46 patients with primary HNSCC and by immunohistochemistry.

Results: MMP1 is up-regulated in HNSCC. This remarkable diagnosis markers has ROC AUC > 0.95 with 93.5% sensitivity and 97.8% specificity. No clinically relevant correlation was found between MMP1 expression in tumour and T stage, N stage, tumour grade, global survival or disease free survival.

Conclusions: MMP1 is a promising HNSCC tumour maker that should be tested at the protein and mRNA level to guide resection limits and post-operative treatments indications complementary to pathological analyses.

O-25 Hepatobiliary and Pancreatic Surgery

O-25-1 Dai-kenchu-to attenuates rat sinusoidal obstruction syndrome by inhibiting the accumulation of neutrophils in the liver

M. Narita, E. Hatano, N. Tamaki, A. Yanagida, H. Nagata, H. Asechi, Y. Takada, I. Ikai and S. Uemoto

Kyoto University, 54 Sogoin-kawabara-cho, Sakyo-ku, 606-8507 Kyoto, Japan (e-mail: narinari@kubp.kyoto-u.ac.jp)

Introduction: Sinusoidal obstruction syndrome (SOS) is drug-induced liver injury that occurs in patients who receive oxaliplatin-contained chemotherapy. The aim of study was to investigate the pharmacological treatment of SOS using a traditional Japanese medicine, Dai-kenchu-to (DKT).

Methods: Male Sprague-Dawley rats were treated with monocrotaline (MCT) to induce SOS. The rats were divided into three groups (Control, MCT, and MCT+DKT). In MCT+DKT group, DKT was gavaged at 12 h after MCT treatment and given at every 12 h until the end of the protocol. At 48 h after MCT treatment, blood and liver samples were collected.

Results: In MCT+DKT group, the macroscopic and histological findings revealed liver congestion, sinusoidal alteration and the destruction of sinusoidal lining, which were comparable with those of MCT group. However, the area of hepatic necrosis and serum AST levels significantly decreased in MCT+DKT group compared with those of MCT group. Treatment with DKT resulted in the reduction of neutrophil accumulation, myeloperoxidase activity and the expression of CINC and ICAM-1 mRNA in the liver compared with those of MCT group.

Conclusions: DKT attenuates MCT-induced liver injury by preventing neutrophil-induced liver injury through blockage of upregulation of CINC and ICAM-1 mRNA level.

O-25-2 Novel approach to identify the interaction between Kupffer cells and leukocytes in ischemia reperfusion liver injury

S. Pak, T. Kondo, Y. Nakano, S. Murata, K. Fukunaga and N. Ohkohchi

Dep. of Surgery, Univ. of Tsukuba, 1-1-1 Tennodai, 3058576 Tsukuba, Japan (e-mail: c0830445@md.tsukuba.ac.jp)

Introduction: Ischemia/reperfusion (I/R) leads to liver failure through the activation of Kupffer cells (KCs) and leukocytes. However, the interaction between KCs and leukocytes has not been well studied in vivo so far. The aim of this study was to clarify the correlation between these cells using intravital microscopy (IVM).

Materials and methods: SD rats were divided into two groups: no-ischemia group, and ischemia group. Fluorescent-liposomes were prepared by encapsulation of NBD-C12-HPC. Liposomes were injected intra-artery at 2 hours before operation. Leukocytes were stained in vivo by means of rhodamin-6G. After the induction of 20 min ischemia, KCs and leukocytes were observed using IVM for 120 min.

Results: KCs were clearly detected by means of fluorescent-liposomes in vivo. In the no-ischemia group, the number of KCs per acini was 18.2 ± 6 , and they were distributed in Zone 1 (peri-portal area). In the ischemia group, the number of the sticking leukocytes was 10 ± 0.5 /acini. Approximately 60% of sticking leukocytes was attached to KCs.

Conclusion: We demonstrated in vivo kinetics of KCs and leukocytes after I/R, for the first time. The attachment of leukocytes to KCs may play a key role in I/R.

O-25-3 Alterations of the hemodynamic parameters in a surgical swine model of acute liver failure

G. Defterevas^a, K. Nastos^a, A. Papalois^b, N. Papoutsidakis^a, K. Kalimeris^c, A. Mikrova^a, T. Nomikos^d, G. Kostopanagiotou^c, N. Arkadopoulos^a and V. Smyrniotis^a

^aAretaicion Hospital, Surgical Dpt, Vassilisis Sofias 76, 11528 Athens, Greece; ^bExperimental-Research Unit ELPEN, Marathonos Ave. 115, Pikermi, 152 35 Athens, Greece; ^cAttikon Hospital, Anesth. Dpt, Chaidari, 12462 Athens, Greece; ^dHarokopion University, Nutrition, Thiseos 263, Kallithea, 133 45 Athens, Greece (e-mail: geodef78@hotmail.com)

Introduction: The early phase of acute liver failure (ALF) is characterized by the presence of a hyperdynamic circulation. We evaluated the haemodynamic disturbances in systemic and portal circulation in a novel surgical porcine ALF model.

Methods-Materials: Landrace pigs (25–30kg) were randomly allocated in two groups; six of them constituted the experimental group, in which ALF was induced (ALF group) by combining 70%–75% hepatectomy and superimposed hepatic ischemia-reperfusion injury and the rest were included in the control group (sham-operated, n = 6)

Results (means \pm SD): In the ALF group, cardiac output increased (p = 0.02), while mean arterial pressure (p = 0.001) and systemic vascular resistance decreased (p = 0.014) by the end of the experimental period. ALF pigs developed pulmonary hypertension with increased mean pulmonary artery pressure (p = 0.003) and pulmonary vascular resistance (p = 0.016). Levels of systemic endotoxin and nitric oxide metabolites were elevated 12 hours after liver reperfusion. Portal pressure was significantly augmented in the ALF group by the same time point (p = 0.003).

Conclusion: The circulatory derangements observed in ALF are consequent upon liver dysfunction. The existence of a reproducible animal model of ALF enables the study of those derangements and the experimental testing of liver support devices that would ameliorate the hepatic function and the hemodynamic disturbance.

O-25-4 Influence of two intraoperative fluid regimens on postoperative organ dysfunction in major abdominal surgery

E. Futier^a, J. M. Constantin^a, A. Petit^b, R. Flamein^b, J. Chipponi^b, S. Jaber^c and J. E. Bazin^a

^aDepartment of Anesthesiology, Hotel-Dieu Hospital, 63000 Clermont-Ferrand, France; ^bDepartment of Digestive Surgery, Hotel-Dieu Hospital, 63000 Clermont-Ferrand, France; ^cDepartment of Anesthesiology, SAR B, 34000 Montpellier, France (e-mail: apetit@chu-clermontferrand.fr)

Introduction: Postoperative organ failure severely affects the prognosis of surgical patients. Despite several trials evaluating restrictive or liberal fluid regimens, the ideal fluid replacement strategy remains controversial. Owing to the risk of tissue altered perfusion, a key trigger of organ dysfunction, we investigated the effects of two intraoperative fluid regimens using a goal-directed approach on hypovolemia and postoperative organ dysfunction.

Material/Methods: Seventy patients undergoing major abdominal surgery were randomized to 6 ml/kg/h (restrictive-group, n = 36) or 12 ml/kg/h (liberal-group, n = 34) of crystalloid. In both groups, hypovolemia was corrected using an esophageal Doppler-guided fluid substitution. Oxygen delivery (DO_{2i}), central venous oxygen saturation (ScvO₂) and postoperative organ failures were recorded in all patients.

Results: Hypovolemia was significantly increased in the restrictive group compared with the liberal group (p < 0.01). Overall complications, including postoperative anastomotic leak and sepsis, were higher in the restrictive group (all p < 0.05). Perioperative mean ScvO₂ (p = 0.02) and min ScvO₂ (p = 0.04) were significantly lower in the restrictive group. Multivariate analysis showed that both hypovolemia and min ScvO₂ were independently associated with sepsis and anastomotic leak.

Conclusion: Even using a goal-directed fluid substitution, intraoperative fluid restriction increases the incidence of hypovolemia leading to postoperative organ dysfunction. Intraoperative fluid restriction should therefore be promoted with caution.

O-25-5 TISS-28 score may predict operative mortality and length of intensive care stay in patients undergoing major abdominal surgery

M. F. Can, O. Kizilca, S. Ata, B. Gencer, O. Menten, G. Yagci and T. Tufan

Gulhane School of Medicine, Dept of Surgery, Etlik, 06018 Ankara, Turkey (e-mail: mfcansuperonline.com)

Introduction: This study assessed the value of TISS-28 (Therapeutic intervention scoring system) in predicting mortality and length of surgical intensive care unit (sICU) and hospital stay in patients undergoing major abdominal surgery.

Materials/Methods: Seventy patients who stayed in sICU at least three days following undergoing major abdominal operation were included. TISS-28 scores for their first (TISS28-1) and third (TISS28-3) days in sICU were calculated using a software. Nursing times related to patient care, length of sICU and hospital stay were recorded. Receiver Operator Characteristic (ROC) curves were generated to determine discriminating power of the score. Spearman's rho test was used to calculate possible correlation between patient scores and the length of sICU and hospital stay.

Results: The overall 30-day mortality rate was 14.3% (n = 10). Length of sICU and hospital stay were 4.7 ± 3.5 (3–26) [mean \pm SD (range)] and 21 ± 16.4 (4–81) days, respectively. Areas under the ROC curve were 0.712 for TISS28-1 (p = 0.032) (CI:95%) and 0.866 for TISS28-3 (p < 0.001). There was a good correlation of TISS28-3 score with the length of sICU stay.

Conclusions: The results of the study suggest that TISS-28 score can be used for risk-adjusted audit and for the prediction of mortality rate and length of sICU stay in patients undergoing major abdominal surgery.

O-25-6 A 3D reconstruction of pancreas development in the human embryos during embryonic period. (Carnegie stages 15 to 23)

G. Godlewski^a, M. Radi^b, R. Cristol^b, V. Baecker^c, P. Travo^c, M. Prudhomme^a, J. Gaubert^b and D. Prat^b

^aDepartment of Anatomy, CS 83021. Avenue Kennedy., Faculté de Médecine de Nîmes, 30900 Nîmes, France; ^bDepartment of Anatomy, CS 83021. Avenue Kennedy, Faculté de Médecine de Nîmes, 30900 Nîmes, France; ^cMontpellier ROI Imaging, Route de Mende, 34000 Montpellier, France (e-mail: godlewski.guilhem@chu-nimes.fr)

Aim: The goal of this paper was to perform a 3D reconstruction of dorsal and ventral pancreatic buds, in human embryos, stage 23.

Method: The early development of the pancreas is studied by tissue observation and reconstruction by computer assisted method, using a light micrograph images from consecutive serial sagittal sections. Ten embryos, Carnegie stages 15 to 23, CRL 7–27 mm, are fixed, deshydrated embedded in paraffin, and stained by HE or Heidenhain'Azan. The images were digitalized Camera. The serial views were aligned automatically by software and manually. The data were analysed following segmentation and threshold.

Results: The two buds were identified at stage 15. In stage 16, both pancreatic buds were in final position, and begin to merge in stage 17. From stage 18 to 23, surrounding connective tissue differentiated. In the stage 23, the morphology of the pancreas was definitive. The superior portion of the anterior face of the pancreas head arose from dorsal bud. The rest of the head including the uncinate process emanated from ventral bud.

Conclusion: The 3D reconstruction of human pancreas visualizes the relationships between the two pancreatic buds. This explains the disposition and the modality of the components fusion. This embryologic development permits a better understanding of congenital abnormalities.

O-25-7 Laparoscopic mouse model with controlled respiratory support

S. Matsuzaki, N. Bourdel, A. S. Azuar, G. Mage and M. Canis
CHU Clermont-Ferrand, Boulevard Léon Malfreyt, 63058 Clermont-Ferrand, France smatsuzaki@cbu-clermontferrand.fr

Introduction: A serious limitation of many of the laparoscopic experiments performed in rodent models is the lack of attention paid to confounding factors, including whether or not controlled respiratory support (CRS) was used, and what peritoneal insufflation pressures were used. The objective was to evaluate the impact of CRS and intraperitoneal pressure (IPP) on peritoneal tissue oxygen tension (PitO₂) and post-operative peritoneal dissemination.

Materials/Methods: The PitO₂ was measured using polarographic oxygen electrode (Experiment 1) or mouse ovarian cancer cells were injected intraperitoneally just prior to surgery (Experiment 2) for both CRS and no CRS under various conditions including anesthesia alone, during a CO₂ pneumoperitoneum at both low and high intraperitoneal pressure (IPP), and laparotomy. CRS was enabled by videoendoscopic endotracheal intubation and mechanical ventilation.

Results: 1) Experiment 1: The highest PitO₂ levels were seen in ventilated mice subjected to a CO₂ pneumoperitoneum at a low IPP. 2) Experiment 2: Postoperative peritoneal dissemination was not promoted by a CO₂ pneumoperitoneum with a low IPP in a mouse model with CRS.

Conclusion: Both the use of an IPP in proportion to the animal's size and mechanical ventilation, are necessary to obtain findings that could possibly be generalized to human clinical setting.

O-26 Inflammation

O-26-1 Early changes in cerebral vascular reactivity and inflammatory response after cardiopulmonary bypass in a rat model

T. Modine^a, R. Azaoui^b, T. Ouk^a, R. Bordet^c and T. Gourlay^d
^ahopital cardiologique, CHU de Lille, service de chirurgie vasculaire, 59000 Lille, France; ^bhopital cardiologique, CHU de Lille, service de chirurgie vasculaire, 59000 Lille, France; ^cCHRU de Lille, EA 1046, 59000 Lille, France; ^dstartblyde university, glasgow, G4 ONW glasgow, United Kingdom (e-mail: t1modine@yahoo.fr)

Inflammatory stimuli associated with cardiopulmonary bypass could potentially impair cerebrovascular function. Therefore we studied cerebrovascular response to endothelium-dependent vasodilator, acetylcholine, sodium nitroprusside, and serotonin, in a rat model of CPB. After caudal and right atrium cannulation a partial 30 and 60 minutes CPB were performed with hemodynamics and blood gas parameters monitoring. Middle cerebral artery was harvested and placed in a arteriograph in order to assess the endothelium and vascular smooth muscle cells response. Systemic inflammation was evaluated by measuring plasma concentrations of TNF and was assessed by immunohistochemistry staining of ICAM-1. Acetylcholine application caused a dose-dependent increase in arteriolar diameter in the control groups that was absent in animals undergoing cardiopulmonary bypass and that even 30 minutes after the onset of cardiopulmonary bypass. The one hour cardiopulmonary bypass group has the same vasomotricity profile. In all the groups, cardiopulmonary bypass did not alter the vasodilation in response to sodium nitroprusside. Furthermore, the contractile response to serotonin was fully expressed after cardiopulmonary bypass and that in all the groups. CPB also led to early and marked release of TNF and over expression of ICAM-1. Cerebrovascular impairment appears early after cardiopulmonary bypass onset. The specific loss of acetylcholine-induced vasodilation suggests endothelial cell dysfunction rather than impaired ability of vascular smooth muscle.

O-26-2 Can acetylsalicylic acid prevent the development of intra-abdominal adhesions?

M. Cainzos^a, J. Rodriguez-Couso^b, M. J. Ladra^c, N. Blanco-Casais^c and M. Rial-Munin^c

^aHospital Clinico Universitario, Vidan s/n, 15706 Santiago de Compostela, Spain;

^bHospital Clinico Universitario, Vidan s/n, 15706 Santiago de Compostela, Spain;

^cHospital Clinico Universitario, Vidan s/n, 15706 Santiago de Compostela, Spain (e-mail: miguelangelcainzos@usc.es)

Aim: The aim of this study was to assess the efficacy of acetylsalicylic acid (ASA) as a means to prevent post-operative intra-abdominal adhesions.

Material and Methods: Forty-five female pigs were used and were divided in three groups: Group I (Control Group) constituted 12 pigs on which a laparotomic cholecystectomy was performed. After 30 days, a laparotomy was carried out so that the development of intra-abdominal adhesions could be assessed. A dose of 150 mgs of ASA was administered orally 7 hours before the operation in 16 pigs that made up Group II. In Group III (17 pigs) the same dose of ASA was administered before the operation but this dose was repeated daily during the first 5 days of the post-operative period. A laparotomic cholecystectomy was also made in Groups II and III and the abdominal cavity was inspected 30 days after the operation.

Results: Forty animals were valid for the study: 10 in Group I and 15 in each of the Groups II and III. All the animals in the three groups developed intra-abdominal adhesions during the 30 day period after cholecystectomy.

Conclusions: Acetylsalicylic acid did not prevent the development of intra-abdominal adhesions after laparotomic cholecystectomy in any animal.

O-26-3 Tissue fluid cytokines- a neglected source of damaged tissue healing regulators

M. Zaleska^a, W. Olszewski^a, M. Cakala^a, G. Ambujam^b and P. Jain^c

^aMedical Research Centre, 5 Pawlinskiego Str., 02-106 Warsaw, Poland; ^bThanjavur Medical College, Tamil Nadu, 613-004 Thanjavur, India; ^cBanaras Hindu University, 2-BBrij Enclave, Uttar Pradesh, 221-005 Varanasi, India (e-mail: wlo@cmdik.pan.pl)

Lymphocytes (Lc) and progenitors of macrophages (M) and dendritic cells (DC) extravasate at site of injury. The process of extravasation and directional migration is mediated by cytokines present in tissue fluid/L (TF/L).

Aim: To measure concentration of immune cell attracting cytokines in lower limb TF/L of patients with tissue inflammation.

Material and methods: Sixty patients with inflammatory and lymphostatic changes in soft tissues of lower limbs were selected. TF/L was collected from site of tissue incision.

Results: CCL27 responsible for chemoattraction of Lc reached 732 pg/ml in TF/L and 285 pg/ml in serum (S), CCL21 240 pg/ml in TF/L and 76 pg/ml in S, MCP1 537 pg/ml in TF/L and 312 pg/ml in S and MIP1 88 pg/ml in TF/L and 71 pg/ml in S. Group 3. CCL27 reached 505 pg/ml in L and 285 pg/ml in S. In normal TF/L CCL27 reached 181 pg/ml in L and 621 pg/ml in S, CCL21 1173 pg/ml in TF/L and 175 pg/ml in S, MCP1 270 pg/ml in TF/L and 274 pg/ml in S, MIP1 64 pg/ml in TF/L and 10 pg/ml in S.

Conclusions: High levels of immune cell-attracting cytokines were found in inflammatory TF/L. We speculate that lack or decreased production of these cytokines may be responsible for impaired Lc, M and DC traffic from blood to non-healing wounds.

O-26-4 Prevention of adhesion reformation by laparoscopic adhesiolysis in a novel animal model

V. Gomez-Gil, N. Garcia-Honduvilla, M. Rodriguez, J. Bujan and J. Bellón

University of Alcalá. CIBER-BBN, Ctra. Madrid-Barcelona, Km 33-60, 28871 Madrid, Spain (e-mail: veronicaggil@gmail.com)

Introduction: Adhesions that form in the peritoneal cavity following surgery are a major cause of intestinal obstruction and pain. By sequential laparoscopy,

this study examines adhesion formation and the efficiency of adhesiolysis in preventing adhesion reformation.

Materials/Methods: Adhesions to polypropylene meshes implanted through a midline incision over the parietal peritoneum and fixed using 6 transmural polypropylene sutures in rabbits (controls, $n = 8$) were laparoscopically examined 3, 7, 14 and 90 days after surgery. In a second group of animals ($n = 8$), adhesiolysis was performed 3 days after mesh placement.

Results: The two groups showed similar adhesion percentages 3 days after surgery. Adhesions were mostly loose, comprising highly vascularized omental tissue. In controls, adhesions appearing at 3 days postimplant stabilized during the first week with no subsequent changes observed laparoscopically. In the experimental group, no adhesions reformed after adhesiolysis. Adhesion scores differed significantly between the two groups at 7, 14 and 90 days postimplant. At 90 days postsurgery, resection areas were lined by a stable layer of mesothelial cells and showed a high degree of neoangiogenesis.

Conclusions: a) Adhesion formation stabilized between 3 and 7 days; b) adhesion tissue removal during the critical period of adhesion formation impairs mid- and long-term adhesion reformation.

O-26-5 The mitogenic effect of platelet rich plasma (PRP) concentrate on human epidermal keratinocyte (HEK) and dermal fibroblast (HDF) may have implications for cutaneous wound healing

A. Akingboye^a, H. Navsaria^a and C. Kyriakides^b

^aQueen Mary University of London, Institute of Cell and Molecular Science, E1 2AT London, United Kingdom; ^bBarts and The London Hospitals, Department of Vascular, and Endovascular Surgery, E1 1BB London, United Kingdom (e-mail: a.a.akingboye@qmul.ac.uk)

Introduction: PRP contains growth factors with possible modulatory role on tissue regeneration. We aimed at evaluating the effects of PRP on HEK and HDF as model to delineate its regenerative properties.

Material & Methods: Post-thrombin activated supernatants from PRP and platelet poor plasma (PPP) were isolated from human blood. Increasing concentrations of the supernatants were exposed to HEK, HDF and Neb-1 cell line in tissue culture. Subsequently, proliferative and migratory responses were elucidated using alamar-blue, scratch and trans-well assays respectively.

Results: All cell types demonstrated an increased proliferation and migration on exposure to both PRP and PPP. However, after adjusting for the cell types, repeated measures of analysis for proliferation showed P value of > 0.5 . Treatment with 25% PRP showed a notable effect on fibroblast trans-well migration assay but not significant on univariate analysis (P value of 0.1466). We observed a consistent stimulatory effect with increasing PRP concentration on scratch assay with HEK and Neb-1 cell, but not significant on ANOVA (P values of 0.89 and 0.799 respectively).

Conclusion: Although, the demonstrated biological effect failed to reach statistical significance, we believe a larger number of experimental repeats may emphasise the potential implications of PRP in accelerating cutaneous wound healing

O-26-6 Autologous derived platelet rich plasma gel (APG); may hold the key to improving the clinical outcome of difficult to treat Diabetic foot ulcers

A. Akingboye^a, H. Navsaria^a and C. Kyriakides^b

^aQueen Mary University of London, Institute of Cell and Molecular Science, E1 2AT London, United Kingdom; ^bBarts and The London Hospitals, Department of Vascular, and Endovascular Surgery, E1 1BB London, United Kingdom (e-mail: a.a.akingboye@qmul.ac.uk)

Introduction: APG contains growth factors thought to facilitate tissue repair. The study aimed at evaluating the effect of topical application of APG on re-epithelisation of chronic diabetic ulcers.

Materials&Methods: Fourteen consecutive patients recruited into the study were analysed. APG was isolated from the individualised whole blood samples. Topical application of APG followed routine surgical debridement.

Subsequently, serial wound healing parameters and other patients' biomedical profiles were recorded. Average follow-up period was for 16 weeks.

Results: Thirteen males and a female participated, with mean age of 54.1 years. Ulcer duration varied between 8 weeks and 4 years. Eight hallux chronic neuropathic ulcers (HCN), 3 transmetatarsal amputated neuropathic ulcers (TAN), 2 hallux plantar ulcers and a chronic neuroischaemic ulcer of the 4th and 5th toe were assessed for re-epithelisation. Ulcers that were not improving after 4 weeks had alternate treatment. Two TANs underwent below knee amputation, 3 HCNs had lower limb revascularisation and vacuum assisted closure (VAC), while another 3 had (VAC) application. Furthermore, 2 HCN and a TAN ulcer showed total re-epithelisation. The remaining ulcers are currently being followed up.

Conclusions: Successful re-epithelisation observed might be attributed to APG, which may have therapeutic implication in treating chronic diabetic foot ulcers.

O-26-7 Inhibition of Rho-kinase signalling ameliorates radiation-induced enteropathy

A. Mihaescu, S. Santen, B. Jeppsson and H. Thorlacius

Department of Surgery, Lund University, UMAS, 20502 Malmö, Sweden (e-mail: andrada.mihaescu@med.lu.se)

Background: Radiotherapy is important in the management of pelvic tumors; however, intestinal damage constitutes a dose-limiting factor in cancer treatment. Microvascular injury and epithelial barrier dysfunction are considered to be rate-limiting aspects in radiation enteropathy. The aim of this study was to define the role of Rho-kinase signaling in radiation-induced enteritis.

Methods: The specific Rho-kinase inhibitor Y-27632 (0–10 mg/kg) or vehicle was given to C57BL/6J mice prior irradiation with 20 Gray. Leukocyte- and platelet-endothelium interactions in the colonic microcirculation were determined by use of intravital microscopy. Levels of myeloperoxidase (MPO), CXC chemokines (MIP-2 and KC) and FITC-albumin leakage were quantified 16 hours after radiation.

Results: Radiation induced a clear-cut increase in leukocyte and platelet recruitment as well as in MPO activity, CXC chemokines production and intestinal leakage. Administration of Y-27632 reduced radiation-induced leukocyte rolling and adhesion by 42% respectively 94% and platelet rolling and adhesion by 62% respectively 83%. Moreover, inhibition of Rho-kinase signaling decreased intestinal leakage and MPO activity by 66% and formation of CXC chemokines by more than 55%.

Conclusions: Rho-kinase signaling constitutes an important signaling pathway in radiation-induced enteritis. Thus, we conclude that targeting Rho-kinase activity may be a useful strategy to protect against radiation-induced tissue injury.

O-27 Vascular Surgery

O-27-1 A randomised trial of EVLT versus surgery for varicose veins - Interim analysis

D. Carradice^a, J. Hatfield^a and I. Chetter^b

^aAcademic Vascular Surgical Unit, Hull Royal Infirmary, Anlaby Rd, HU3 2JZ Hull, United Kingdom; ^bAcademic Vascular Unit, Vascular Laboratory, Alderson House, HRI, HU3 2JZ HULL, United Kingdom (e-mail: dan1@doctors.org.uk)

Introduction: We performed a randomised trial of endovenous laser therapy (EVLT) versus surgery in the management of varicose veins, aiming to assess clinical efficacy and in depth quality of life (QoL) changes up to 2 years.

Method: 267 patients were randomised to surgery ($n = 132$) and EVLT ($n = 135$). Assessments were performed at 1, 6 and 12 weeks, 1 and 2 years. Outcome measures included: Venous Clinical Severity Score (VCSS), Aberdeen Varicose Vein Questionnaire (AVVQ), Short Form-36 (SF36), EuroQuol (EQ5D), postoperative pain scores and time to return to normal activity and work.

Results: Statistically significant improvements ($p < 0.05$) were observed following both interventions in VCSS, AVVQ, SF36 and EQ5D and sustained up to 2 years. SF36 physical function at 1 week demonstrated less deterioration following EVLT median 90 (IQR:70–95) than following surgery 80 (65–90)

($p = 0.016$). Other improvements in QoL were equal between the 2 groups. EVLT resulted in reduced postoperative pain scores compared to surgery ($p = 0.001$). The reduction in pain and preservation of physical function with EVLT resulted in an earlier return to normal activity 4 days (2–14) *Versus* 21 (14–30) and work 4 days (2–14) *Versus* 14 (10–28) ($p < 0.001$).

Conclusion: This is the 1st large RCT to demonstrate the early benefits of EVLT and long term efficacy equivalent to surgery.

O-27-2 Comparing the endothelialisation of synthetic and biological vascular grafts under shear stress

D. Coakley^a, F. Shaikh^a, A. Callanan^b, E. Kavanagh^a, P. Burke^a, P. Grace^a and T. McGloughlin^b

^aDepartment of Surgery, Mid-Western Regional Hospital, 061 Limerick, Ireland;

^bApplied Biomedical Engineering, University of Limerick, 061 Limerick, Ireland (e-mail: danielcoakley@gmail.com)

Introduction: The endothelialisation of synthetic grafts has many limitations due to their poor biocompatibility properties. Here we compare the endothelialisation under static and shear stress environments of synthetic grafts with emerging biological vascular graft materials.

Methods: A novel shear stress bioreactor was developed. Human Aortic Endothelial cells were seeded onto luminal surface of 6 mm diameter grafts of acellular extracellular matrix of the porcine urinary bladder wall and small intestine submucosa and compared with synthetic grafts of Dacron and ePTFE. Cellular viability, attachment, phenotype, proliferation and morphology were analysed.

Results: Cellular seeding efficacies and resistance to shear stress on both biological grafts were statistically superior to synthetic grafts regardless of incubation time or cell density ($p < 0.05$). HAEC's were able to grow to single-layer confluence on both biological grafts by day 9, cells grown on synthetic grafts exhibited significantly slower proliferation times and failed to reach confluency during the study. Immunofluorescence analysis verified the presence of von Willebrand factor on all substrates, confirming the endothelial character of the cells.

Conclusion: ECM bioscaffolds offer superior biocompatibility properties and resistance to shear stress compared to synthetic analogues. These properties make ECM grafts promising substrates in the field of vascular graft tissue engineering.

O-27-3 Influence of stent-graft oversizing on fixation in angulated necks during thoracic endovascular aortic repair: an experimental study

L. Canaud^a, P. Alric^a, L. Martrille^b, C. Marty-Ané^a and J. P. Berthet^a

^aDepartment of Vascular Surgery, Hopital Arnaud de Villeneuve, 191 av du Doyen Giraud, 34090 Montpellier, France; ^bLegal medicine, Hopital Lapeyronie, 191 av du Doyen Giraud, 34090 Montpellier, France (e-mail: ludovicanaud@botmail.com)

Background: To determine the influence of stent-graft oversizing in angulated necks during thoracic endovascular aortic repair.

Methods: A bench test model with pulsatile flow simulating an aortic arch (angulation 100°), was devised to assess stent-graft anchorage as a function of oversizing (4, 8% to 36, 8%). Experiments were performed using 15 human thoracic cadaveric aortas. Four commercial stent-grafts were used: TAG; Zenith; Valiant and Relay. The gap between the stent-graft and the aortic wall was measured as function of stent-graft oversizing during static and dynamic tests.

Results: Lack of the "body" apposition was observed with Zenith device. Lack of the proximal anchorage system apposition was observed with Relay and with TAG. With the Valiant device, the prosthesis "body" and bare spring were always in contact with the aortic wall. The increase of stent-graft oversizing increased the lack of device wall apposition when the device was not apposed to the aortic wall.

Conclusion: In case of an angulated proximal neck, the poor conformability of most of available thoracic stent-grafts may lead to a lack of apposition of device. In this situation, of the increase of stent-graft oversizing, instead

of improving proximal fixation, increases the gap and therefore decreases stent-graft anchorage.

O-27-4 A novel method for long term preservation of arteries - immersion in anhydric sodium chloride

M. Gewartowska, M. Maksymowicz, H. Dolezyczek, M. Frontczak-Baniewicz and W. Olszewski

Medical Research Centre, 5 Parwiskiego Str., 02-106 Warsaw, Poland (e-mail: wlo@cmdik.pan.pl)

Arterial allografts have been largely replaced by artificial grafts. However, in case of infection at the site of teflon implantation or a-v fistula for hemodialysis allografts become grafts of choice. A method for long-term preservation of arterial allografts is desperately needed.

Aim: To establish a method of successful preservation of arteries for months with unchanged morphology and low allogeneic reactivity.

Methods: Fragments of rat aorta were preserved in anhydric NaCl powder and stored 4°C for 12 months and transplanted for 10–12 months.

Results: Aorta-aorta and aorta-ivc grafts pulsated 12 months after transplantation. H/E and trichrome staining showed preserved anatomical structure. There was not thrombosis, only some thickening of neo-intima. No differences between preserved transplanted and control syngeneic aortae stained for CD 31, CD 54, RECA-1 were observed. Electron microscopy revealed normal structure of elastin fibers, appearance of fibroblasts between elastin bundles and single endothelial-like cells. There was only slight infiltration of ED1, OX 6 and W3/13 cells around the allograft.

Conclusions: Transplanted aortae patent for 12 months and with perfectly preserved anatomical and molecular structure make preservation in pulverized NaCl a novel method for use as av shunts and in infected ischemic areas.

O-27-5 Surgical bleeding control by vacuum devices

D. Blin, P. Porcu and A. Moreau-Gaudry

Grenoble University Hospital, L a Tronche Cedex, 38000 La Tronche, France (e-mail: dblin@chu-grenoble.fr)

Introduction: Hemorrhage account for half of all deaths on the battlefield and bleeding represents the second cause of civilian trauma deaths We present a new concept of surgical bleeding control by applying vacuum devices

Materials and methods: Efficiency of different suction cups has been tested on 104 wounds; cardiac (RA, RV, LV, aorta and PA), vascular, hepatic, splenic and muscular (20 sheeps and 4 pigs). Design of devices has been improved after each experimental series. Vacuum was created either by a pump used for beating heart surgery or by a vacuum bottle.

Results: In every cases we stopped the bleeding by one of the different cups. After 60 minutes, most of the cups can be removed with a dry wound. In one case, the cups where applied on RA, RV, LV and PA, during 2 hours and removed with no suture and no glue. At three months all the wounds where healed.

Conclusion: This technique, will allow to control most of the critical bleedings, giving time to the surgeon to go on the main surgical act or to be in the best conditions for achieve the haemostasis (ordering blood, call a senior or a specialist, ..).

O-27-6 A new sutureless technique for end-to-end and end-to-side arterial and prosthetic anastomosis

C. Sessa^a, P. Porcu^a, G. Careddu^b, M. L. Manunta^b, G. Masala^b, J. L. Magne^c, P. Cinquin^d and E. Sanna Passino^b

^aDepartment of vascular surgery, CHU de Grenoble, 38043 Grenoble, France; ^bClinica Veterinaria di Sassari, via vienna, 2, 07100 Sassari, Italy; ^cDepartement of vascular surgery, CHU de Grenoble, 38043 Grenoble, France; ^dLaboratoire TIMC-IMAG Grenoble, Chru de Grenoble, 38043 Grenoble, France (e-mail: csesa@chu-grenoble.fr)

Introduction: We report a new sutureless anastomosis with stents and grafts currently used in vascular surgery.

Methods and techniques: End-to-end or end-to-side anastomosis using balloon or self-expanding stents were used in 32 sheep. The graft was placed outside the artery and a stent was deployed and fixed with banding silk threads. Clamping time, blood loss and anastomosis patency were studied.

Results: In aortic group (10), all the anastomoses were end-to-end and sutureless in 5 cases. No thrombosis was observed at time of animal sacrifice. In carotid group (22), bypasses were done with balloon (22) and self-expanding (18) stents. Forty anastomoses were sutureless including 34 end-to-end and 6 end-to-side. Mean clamping time: 13 min (11–16 min) *versus* 19 min (17–22 min); blood loss: 0 ml *versus* 57 ml (47–80 ml) respectively for traditional and sutureless anastomosis. All the balloon-expandable stent (22) thrombosed, due to external compression of the neck against the feeding trough. All 6 self-expanding stents were patent.

Conclusion: Despite a high rate of thrombosis with balloon-expandable stents, sutureless anastomosis technique is effective with a shorter completion time and less bleeding compared to traditional anastomosis. Further device evaluation and improvements are needed to combine laparoscopic and endovascular techniques.

O-27-7 Postconditioning in major vascular surgery - Prevention of renal failure

P. Aranyi^a, A. Szijarto^a, E. Gyurkovics^a, R. Stangl^a, P. Onody^a, J. Tamas^a, G. Lotz^b, D. Gero^c and P. Kupcsulik^a

^aSemmelweis University, 1st Department of Surgery, Ulloi ut 78, 1082 Budapest, Hungary; ^bSemmelweis University, 2nd Department of Pathology, Ulloi ut 93, 1091 Budapest, Hungary; ^cSemmelweis University, Cellscreen Applied Research Cent, Ulloi ut 93, 1093 Budapest, Hungary (e-mail: aranyi.p@gmail.com)

Introduction: During vascular surgeries on abdominal aorta, the lower extremities suffer ischaemia-reperfusion injury which can lead to rhabdomyolysis. A severe complication is the myoneuropathic metabolic syndrome with acute renal failure.

Aim of study: to investigate postconditioning in major vascular surgery as renal failure prevention.

Materials/Methods: Wistar rats underwent 180 minutes of bilateral lower limb ischaemia and 4 hours of reperfusion. Postconditioning consisted of 6 cycles of 10-second aortic occlusion/10-second declamping. Microcirculation was detected with laser Doppler flowmeter. After 4, 24, 72 hours of reperfusion serum, urine, and histological samples were collected.

Results: 4 hours after reperfusion no significant histological alterations were detected in the muscle, while control animals showed rhabdomyolysis with inflammation 24 hours postoperatively. CK, LDH, AST levels increased in the acute phase but improved in the 24th and 72nd postoperative hours. Postconditioning improved early microcirculation after revascularisation. Kidney histology and laboratory tests showed definite signs of acute tubular injury in control animals. In early stage serum creatinine (2, 81 ± 0, 38 *versus* 3, 86 ± 1, 36 mmol/l); seBUN/creatinin (0, 036 *versus* 0, 056); FENa (2, 566% *versus* 1, 001%) showed significantly ($p < 0, 05$) less impaired tubular function in the postconditioned group.

Conclusion: Postconditioning can reduce the skeletal reperfusion injury and reduce the prevalence and degree of renal failure.

O-28 Gastrointestinal Surgery

O-28-1 A new rat model of intestinal perfusion for the study of intestinal transport

F. Neri^a, M. Montagnani^b, M. Tsivian^a, L. Puviani^a, I. Mantovani^b, P. Nanni^c, A. Marangoni^d, M. Pariali^c, P. Simoni^b, R. Fato^f, C. Bergamini^f, S. Leonil^f, G. Lenaz^f, B. Nardo^a, E. Roda^f and R. Aldini^g

^aGeneral Surgery and Transplants, V. Massarenti 9, S. Orsola Hosp., 40100 Bologna, Italy; ^bGastroenterology, V. Massarenti 9, S. Orsola Hosp, 40100 Bologna, Italy; ^cPharmaceutical Sciences, V. Massarenti 9, S. Orsola Hosp., 40100 Bologna, Italy; ^dDMSS Dept., V. Massarenti 9, S. Orsola Hosp., 40100 Bologna, Italy; ^eBiomedical Researches, V. Massarenti 9, S. Orsola Hosp., 40100 Bologna, Italy; ^fDept. of Biochemistry, V. Massarenti 9, S. Orsola Hosp., 40100 Bologna, Italy; ^gDept. of SMETEC, V. Massarenti 9, S. Orsola Hosp., 40100 Bologna, Italy (e-mail: fnavia_neri84@hotmail.it)

Introduction: Because of the increasing importance of intestinal signaling activity in pharmacological studies we developed a new simple method to investigate the intestinal transport by means of a mesenteric perfusion system in rats.

Materials and Methods: The abdominal aorta was infused with Krebs-Ringer solution and the effluent from the portal vein was collected. The terminal ileum was infused with tauroursodeoxycholate (TUDCA) and its absorption was assessed by its recovery in the portal vein. Oxygen consumption of isolated enterocytes and intestinal histology were also evaluated. A perfusate sample was submitted to SDS-Page gel electrophoresis followed by Western blot analysis for identification of Fibroblast Growth Factor 15 (FGF15), a signalling protein of ileal synthesis.

Results: The intestinal preparation proved to be stable for at least one hour. The intestinal morphology and cell respiration of isolated enterocytes were not affected by the organ perfusion. The Western blot analysis detected a band corresponding to the molecular weight of FGF15.

Conclusions: The method proved to be useful and reliable for studying the absorption of a pharmacological substance as TUDCA and possibly for the identification in the portal circulation of different substances derived from enterocytes in response to absorbed molecules.

O-28-2 How to set up and establish a colorectal surgery 'wet lab' training programme

B. Kumar and G. Kaur

Scunthorpe General Hospital, Cliff Gardens, North Lincs, DN15 7BH Scunthorpe, United Kingdom (e-mail: gkaur@email.com)

Aim: Drastic reduction of training hours (European Working Time Directive) threatens training opportunities for UK surgical trainees. As one measure to counter this, we successfully set up a regular 'wet lab' (WL) colorectal training programme in our hospital.

Methods: We describe process of setting up WL, obtaining sponsorship, acquisition of resources and equipment, cost analysis and negotiations with our hospital Trust and industry partners.

Results: Sponsorship was organised through negotiations with industry partners. A one-day training programme was formulated by liaison with trainees. In our centre we have a clinical skills laboratory, purpose built for such activities. Theatres provided some equipment; rest through industry contacts. A healthy working relationship with industry partners promotes quality of workshop; also their input into surgical techniques can be highly beneficial. Consultant support was vital, especially on the day. Postgraduate centre promoted the workshop and provided accreditation towards Continuing Medical Education (CME) points.

Conclusion: Our model of WL based training proved to be effective and popular amongst trainers and trainees and is now regular six monthly event. We believe that WL based training should be mandatory set up for all colorectal/general surgery training programmes, especially in the current climate of reduced surgical training hours.

O-28-3 Remote reperfusion of different interval of ischemic preconditioning on small bowel ischemia-reperfusion injury model

M. Abrahão^a, M. Koike^b, D. Jácome^c, R. Morello^a, J. Martins^a, A. Medeiros^c and E. Montero^a

^aUniversidade Federal de São Paulo, Rua Botucatu, 740, 04023-900 São Paulo, Brazil; ^bUniversidade Cidade de São Paulo, Rua Cesário Galeno, 448/475, 03071-000 São Paulo, Brazil; ^cUnivers. Fed. Rio Grande do Norte, Campus Universitário Lagoa Nova, 59072-970 Natal, Brazil (e-mail: edna.montero@gmail.com)

The aim was evaluate remote reperfusion of different interval cycle of IPC in small bowel IR injury. Male EPM-1 Wistar rats were randomized into 6 groups (n = 6, each): IR (50 min of intestinal ischemia and 30 minutes of reperfusion) and animals submitted to one cycle of IPC according duration of ischemic event in IPC before IR protocol, 2 min (IPC-2), 5 min (IPC-5), 10 min (IPC-10), 15 min (IPC-15) and Sham (sham operated rats observed for 80 min). Animals were heparanized and anesthetized with cetamine and xylazine (90 and 20 mg/kg) intramuscularly. Lung samples were embedded in paraffin, HE sections were photographed under light microscopy (1000x) and analyzed using Image J program. Macrophage and Neutrophil infiltration and total cell count within lung septum were evaluated, and normalized by alveolar septum length. P level was $p < 0.05$, data displayed in mean \pm sd. Macrophage infiltration and total cell count were reduced in IPC-2 when compared to IR group (Macrophage: IPC-2 = 0.65 ± 0.12 , IPC-5 = 1.15 ± 0.19 , IPC-10 = 1.19 ± 0.18 , IPC-15 = 1.25 ± 0.05 versus IR = 1.67 ± 0.30 cells/ μ m; Total cell count: IPC-2 = 6.29 ± 0.16 , IPC-5 = 8.15 ± 0.76 , IPC-10 = 6.94 ± 0.53 , IPC-15 = 9.08 ± 0.13 versus IR = 8.97 ± 0.76 cells/ μ m). Neutrophil was similar among groups. Data showed important remote reperfusion and two minutes of IPC before IR intestinal injury had a protective effect on lung inflammatory infiltration.

O-28-4 Robot-assisted colorectal surgery

P. Vlcek^a, I. Capov^a, S. Chalupnik^a, J. Korbicka^a, V. Jedlicka^a, J. Dolezel^a, L. Veverkova^a, P. Vlckova^b, J. Dolina^c and D. Bartusek^d

^aIst.dept. of Surgery, Univ.Hosp, Pekarska Street 53, 65691 Brno, Czech Republic; ^bDept. of Gastroenterology, Jihlavská Street 100, 600 00 Brno, Czech Republic; ^cDept. of Gastroenterology, Jihlavská 100, 60000 Brno, Czech Republic; ^dDept. of Radiology, Jihlavská Street 100, 60000 Brno, Czech Republic (e-mail: petr.vlcek@fnusa.cz)

Introduction: Robotic assistance provides a number of potential benefits for laparoscopic surgery by addressing several inherent limitations. The aim of this study was to compare the traditional laparoscopic approach and robotic techniques in the treatment of colorectal diseases.

Materials/Methods: The study compares a consecutive series of patients treated surgically for colorectal disease from May 2006 to December 2008 with the da Vinci robotic system (Intuitive Surgical) and a matched number of patients who underwent conventional laparoscopy during the same time interval. The factors analyzed were the time required to prepare the patient and the room, total time of surgery, number of lymph nodes retrieved, blood loss, complications, and postoperative results.

Results: We prospectively followed 65 patients who underwent robotic-assisted laparoscopic colorectal surgery using da Vinci robotic System/Intuitive Surgical/. Surgical outcomes were compared with those of 65 consecutive patients who underwent laparoscopic colorectal surgery in the same institution for similar indications prior to the start of robotic-assisted surgery.

Conclusions: Robot-assisted surgery proved to be as safe and effective as laparoscopic techniques in the treatment of colorectal diseases.

O-28-5 Perineal reconstruction following cancer resection

H. John^a, Z. Mickute^b, M. Dicandia^b, A. Durrani^a, C. Malata^c and J. Simcock^a

^aCambridge University Hospital, Addenbrookes Hospital, Hills Road, Cambridge, CB2 0QQ Cambridge, United Kingdom; ^bAdenbrooke's Hospital Cambridge, Hills Road, CB2 0QQ Cambridge, United Kingdom; ^cDep. Plastic & Reconstr. Surgery, Addenbrooke's Hospital, Box 186, Hills Road, CB2 2QQ Cambridge, United Kingdom (e-mail: zm231@cam.ac.uk)

Introduction: Limits of operable pelvic malignancies are constantly being changed and extensive tumour resection is performed more frequently, but available methods of reconstruction are associated with high complication rates.

Materials and methods: A retrospective analysis of resection defect, reconstructive technique and postoperative outcomes of such patients (2001–2008) was performed.

Results: 30 patients (23 women, 7 men, age range 34–87years) presented with primary or recurrent malignancy and 24 (80%) had preoperative radiotherapy. Pedicled rectus abdominis, gluteal fold, gracilis and tensor fascia lata flaps were used to reconstruct the perineum. Time for wound healing ranged from 10 to 300 days. 12 patients (40%) had prolonged hospital stay (> 14 days) with complications requiring further surgery. 11 patients (36%) died of metastasis-related complications.

Conclusion: Due to centralisation of recurrent cancer services, increasingly complex cases are being encountered. As free flaps are not ideal at this site, the plastic surgeon needs to be versatile and possess a wide repertoire of reconstructive surgical techniques.

O-28-6 Rectal irrigation in the treatment of disorders of faecal continence - A prospective review

N. Srinivasaiah, J. Marshall, A. Gardiner and G. Duthie

University of Hull, Academic Surgical Unit, Castle Hill Hospital, HU16 5JQ Hull, United Kingdom (e-mail: simba_anu@yahoo.com)

Introduction: Rectal Irrigation (RI) has been used in faecal continence disorders to relieve symptoms and improve quality of life (QOL). We aimed to evaluate the efficacy and acceptability of RI using health outcome measures.

Patients and methods: Review of prospective database of patients who had RI between 2002 and 2005. Symptom quantification determined efficacy of RI using general standardized questionnaires (GSQ). The acceptability of RI was determined using SF-36 and FIQL.

Results: 175 patients' data is used. 111 cases were successful and 64 failed. Analysis is done only for the successful ones. Pre RI, the number of patients who completed GSQ, SF-36 and FIQL were 72, 71 and 32 respectively. Of these only 43, 43 and 22 completed the GSQ, SF-36 and FIQL post RI respectively. GSQ analysis showed significant improvement in symptoms of straining, incomplete emptying, wind leakage and urinary leak (95% CI) pre and post RI. SF-36 demonstrated significant difference in Physical Functioning (PF), Social Functioning (SF) and General Health (GH), pre and post RI (95% CI). FIQL analysis showed no statistically significant difference in the QOL post RI.

Conclusion: In patients with faecal continence disorders, RI can offer symptomatic improvement. Most patients find the treatment acceptable.

O-28-7 Phytoestrogens exert a direct effect on human colon

A. Hogan^a, D. Collins^a, A. Baird^b and D. Winter^a

^aSt Vincent's University Hospital, Elm Park, Dublin 4, D4 Dublin, Ireland; ^bUniversity College Dublin, College of Life Sciences, Belfield, Dublin 4., D4 Dublin, Ireland (e-mail: aislingbogan@yahoo.com)

Introduction: Epidemiological studies correlate consumption of dietary phytoestrogens, primarily genistein (4', 5, 7-trihydroxyisoflavone) and daidzein (4', 7-dihydroxyisoflavone), with beneficial effects on colon, breast and prostate

cancers. Genomic and non-genomic mechanisms are responsible for their anti-carcinogenic effects. This has been shown at cell level only. Actions on human colon were assumed to be passive and remote. No direct effect on colonic smooth muscle has been described and no mechanism for anti-tumour activity established.

Materials and Methods: Histologically normal colon was obtained from the proximal resection margin of carcinoma specimens. Circular smooth muscle was microdissected and suspended under 1g tension in organ baths containing oxygenated Krebs solution. After equilibration, tissues were exposed to phytoestrogens genistein (n = 8) or daidzein (n = 8). The cholinergic agonist carbachol was used to induce contractile activity. This was recorded isometrically. Institutional research board approval was granted.

Results: Phytoestrogens inhibit carbachol-induced colonic contractility (mean difference 49% + / - 5.05%; n = 8; p < 0.002; CI 95%). In keeping with a non-genomic, rapid onset direct action, the effect was within minutes and similar to the previously described action of 17 β oestradiol.

Conclusion: The present data set provides the first description of a direct effect of genistein and daidzein on human colonic smooth muscle. This may play a role in anti-tumorigenesis.

O-29 Organ and Cell Transplantation

O-29-1 Improved preservation and microcirculation with POLYSOL after small-for-size liver transplantation in rats

S. Yagi^a, B. Liu^a, B. Doorschodt^b, T. Hori^c, Y. Ogura^c, S. Uemoto^c and R. Tolba^d

^aRWTH-Aachen University, Pauwels Str. 30, 52074 Aachen, Germany; ^bUniversity of Amsterdam, Meibergdreef 9, 1105 AZ Amsterdam, Netherlands; ^cKyoto University, 54 Kawara-cho, Shogoin, Sakyo-ku, 606-8507 Kyoto, Japan; ^dInstitute for Lab. Animal Sc., RWTH Aachen Technical University, 52074 Aachen, Germany (e-mail: shintaro@kubp.kyoto-u.ac.jp)

Introduction: The prognosis for recipients of transplanted small-for-size grafts (SFSG) is poor in Living-Donor Liver Transplantation. Because new preservation solutions have not been able to improve the SFSG, we aimed to compare POLYSOL, a recently developed low viscosity preservation solution, and the HTK for cold static storage of SFSG in this study.

Materials/Methods: SFSG orthotopic liver transplantations with ca. 30% of graft volume compared to recipient liver were performed in Lewis rats. The graft livers were flushed with either HTK or POLYSOL (n = 25, respectively) and stored in the respective solution for 3 hours at 5°C. We assessed portal venous pressure and flow, microcirculation of the graft, biochemical analyses of plasma, and liver graft weight at 1, 3, 24, and 168 hours after portal reperfusion.

Results (HTKvs.POLYSOL; Mean \pm SD): Graft weight (4.0 \pm 0.2 *versus* 4.3 \pm 0.3g; p = 0.038) and portal venous flow (16.8 \pm 2.2 *versus* 21.6 \pm 2.1 ml/min; p = 0.005) at 24 hours after reperfusion was significantly higher in POLYSOL. Microcirculation (Laser Doppler) at 1 hour was significantly improved with POLYSOL (383 \pm 63 *versus* 532 \pm 64 Flux; p = 0.045). ALT (160 \pm 36 *versus* 79 \pm 12 U/L; p = 0.002) and LDH (2238 \pm 688 *versus* 1223 \pm 356 U/L; p = 0.019) at 1 hour after reperfusion were lower in POLYSOL.

Conclusions: This study showed that POLYSOL resulted in improved microcirculation and thus preservation quality of SFSG compared to the HTK solution.

O-29-2 Evidence of islet survival and revascularization following intramuscular autotransplantation in the minipig

A. Sterkers^a, T. Hubert^a, R. Caiazzo^a, V. Gmyr^b, N. Delalleau^a, J. Kerr-Conte^b and F. Pattou^a

^aLille University Hospital INSERM, 2, Avenue Oscar Lambret, 59000 Lille, France; ^bUniversity of Lille 2 INSERMU859, 2, Avenue Oscar Lambret, 59000 Lille, France (e-mail: adriensterkers@yahoo.fr)

Background: The intrahepatic environment does not seem favourable for long term islet survival. Intra muscular islet transplantation (IMIT) offers attractive prospects for its simplicity and an easier access to the graft.

Methods: Standardized autologous islet grafts (unpurified/n = 16 or purified/n = 42) were implanted in the gracilis muscle (direct surgical access/n = 14 or intramuscular injection/n = 4) of adults minipigs (n = 13). Transplanted sites were explanted at 15 and 30 days after IMIT and analyzed by immunochemistry for cell composition, revascularization and hypoxia. We studied the influence of graft technique and purity of the preparation islet survival.

Results: Immunostaining confirmed the presence of alpha and beta cells 15 and 30 days after the grafts. Injection route transplantation and purification significantly influenced islet survival (p < 0.001 and p < 0.01 respectively). Intramuscular injection of purified islets allowed the survival of large intact islets at 30 days in 7/9 cases. Islet revascularisation increased at day 30. Small beta cell clusters showed little sign of revascularisation and increased accumulation of hypoxia marker.

Conclusion: We confirmed the engraftment and revascularization of intact islets expressing both insulin and glucagon for a least one month in the minipig following intramuscular injection of purified islet preparations.

O-29-3 Vascularized bone marrow transplantation: an alternative to conventional cellular bone marrow transplantation

D. Zamfirescu^a, I. Lascar^a, I. Zegrea^b, M. Popescu^a and M. Lanzetta^c

^aCarol Davila Medical University, Calea Floreasca nr 8, Sect 1, 030045 Bucharest, Romania; ^bCarol Davila Medical University, Calea Floreasca nr 8, Sect 1, 030045 Bucharest, Romania; ^cCarol Davila Medical University, Calea Floreasca nr 8, Sect 1, 030045 Milan, Italy (e-mail: dragoszamfirescu@gmail.com)

Background: Vascularized bone marrow transplantation (VBMT), in comparison with conventional marrow transplants, has the advantage of providing a microenvironment and immediate engraftment of both mature and progenitor hemopoietic cells at the time of transplantation in the absence of immunomodulation or irradiation. The aim of the study was to follow the development of microchimerism after allogeneic VBMT *versus* conventional BMT.

Methods: In one group a VBMT model consisted of a donor Brown Norway (BN) rat hind limb heterotopic transplanted on recipient Lewis rats was used. An intravenous infusion of donor bone marrow cells in suspension equivalent to that grafted in the vascularized femur limb was administered i.v. on recipient rats in the second group. Cellular microchimerism was investigated in recipients of VBMT *versus* BMT.

Results: Donor-derived cells could be detected in VBMT recipients at 30 and 60 days but not in recipients of i.v. suspension BMC grafting.

Conclusions: VBMT provides a theoretical alternative to conventional cellular bone marrow transplantation by addressing crucial clinical problems such as failure of engraftment or graft *versus* host disease. It may be possible to develop a new approach for bone marrow transplantation based primarily on a microsurgical procedure (transplantation of vascularized bone marrow flaps).

O-29-4 Mandibular dental implants in children with anhidrotic ectodermal dysplasia: a case report

N. Escudero-Papot^a, O. Romieu^a, G. Romieu^a and J. H. Torres^b

^aUniv Montpellier 1, Odontologie, 545, Av du Prof J.L. Viala, 34 193 Montpellier, France; ^bCHU de Montpellier, Odontologie, 545, Av du Prof J.L. Viala, 34 193 Montpellier, France (e-mail: olivier@romieu.info)

Introduction: Anhidrotic Ectodermal Dysplasia (AED) linked to the X chromosome is the most frequent form of ectodermal dysplasia (Christ Siemens Touraine syndrome). This pathology affects 1 child over 100 000 and cause hypohidrosis, hypotrichosis, hypodontia or oligodontia and more rarely anodontia. Conventional prosthesis with removable denture fulfils neither functional nor aesthetic rehabilitation. The surgical placement of 2 dental implants in the lower jaw increases the prostheses retention. Since June 2007, the French social insurance refunds this rehabilitation.

Materials/Methods: A total removable full denture is realised for the mandible for a 10 years old boy with mandibular anodontia. Then 2 conic textured implants with tapered conical connector and platform switching connexion

(3.5 mm diameter and 9.5 mm long) are placed in the mandibular symphysis under general anaesthesia.

Results: After 3 months, implants are uncovered and connected to the denture. Precision attachments placed in the denture base increase stability and even more retention.

Conclusions: This recent experimentation is still going on and we have to determine if this treatment can durably improve the comfort and the quality of life of children with AED. The main question that has to be elucidated is the prognosis of this treatment during the child's growth.

O-29-5 Comparison cuff and total suture methods of vascular reconstruction in arterIALIZED liver transplantation in mice

Y. Tian^a, J. Graff^b, W. Moritz^c and P. A. Clavien^c

^aClinic for Visceral & Transplant, Rämistrasse 100, 8091 Zürich, Switzerland; ^bUniversity of Rostock, Schillingallee 69a, D-18057 Rostock, Germany; ^cVisceral Surgery and Transplants, Ramistrasse 100, 8091 Zurich, Switzerland (e-mail: yinghua.tian@usz.ch)

Liver transplantation in mice is a powerful tool in research. The cuff technique is the favourite method in this model to reduce anhepatic time. However, this method is not physiologically relevant; therefore, we developed an arterIALIZED liver transplantation in mice model with total suture method, and compared this method with cuff technique. 12 using suture method and 10 with cuff technique arterIALIZED liver transplantation in mice were performed. The mean anhepatic times were 25 ± 2.6 minutes in suture group and 15 ± 2 minutes for cuff group. 30 days survival rate was 91.7% in suture group and 90% in cuff group. AST was 106 U/l in suture group and 142.4 U/l for cuff group. Histology showed normal liver architectures in the recipient mice of suture group 30 days after transplantation; the cuff group showed similar results except few slides with very mild hepatic injured.

Conclusion: ArterIALIZED liver transplantation in mice with total suture method is feasible. This is a physiological model that suit to long term survived experiment. However, cuff technique is shortened the warm ischemia time and has no statistically different with the suture method until 30 days survival period. It's a good model for the shorter survival period experiment.

O-29-6 About a dental transplantation of two ectopic teeth in adjacent position in a post-grafted labio-palatine facial slit

C. Favre De Thierrens^a, O. Romieu^b, G. Romieu^b and B. Levallois^a

^aCHU de Montpellier, Odontologie, 545, Av du Prof J.L. Viala, 34 193 Montpellier, France; ^bUniv Montpellier 1, Odontologie, 545, Av du Prof J.L. Viala, 34 193 Montpellier, France (e-mail: cfavredethierrens@hotmail.fr)

Introduction: Transplantation allows to replace included teeth on the arcade and to bring osteogenic potential in the cleft; in order to compensate or at least to stabilize the rapid osteolysis of the previously grafted alveolar bone.

Materials methods: A 15 year old girl operated on a left cleft lip and palate was addressed to the dental team during her orthodontic treatment to transplant ectopic teeth in the cleft palate. Radiographic examinations reveal large zones with lack of bone. The flap is sutured on a membrane of Platelet-Rich Fibrin (PRF). A semi-rigid orthodontic setting maintains the teeth to prevent risk of ankylosis. Endodontic treatment with calcium hydroxide was intended at 2 weeks post-operative to prevent root resorption.

Results: The mucous cicatrization was achieved in 8 days and the osseous cicatrization started at J30. At 6 months, cicatrization and consolidation were obtained with the absence of unfavourable clinical or radiological signs and then orthodontic treatment was started again. After 2 years no unfavourable clinical or radiographic signs were observed.

Conclusions: Even if we continue to evaluate transplantation of teeth on site of facial slit, to determine the advantage/risk of this treatment. Actually, the treatment fully satisfied odontologists, maxillofacial surgeons and patient.

O-29-7 Improved physiological properties of small pancreatic pseudoislets

G. Cavallari^a, R. Zuellig^b, F. Neri^a, B. Nardo^a, M. Weber^c, P. A. Clavien^c, R. Lehmann^b and W. Moritz^c

^aGeneral Surgery and Transplants, V. Massarenti 9, S. Orsola Hosp., 40100 Bologna, Italy; ^bDiv. Endocrinology and Diabetes, Ramistrasse 100, 8091 Zurich, Switzerland; ^cVisceral Surgery and Transplants, Ramistrasse 100, 8091 Zurich, Switzerland (e-mail: giuseppe.cavallari3@unibo.it)

Introduction: Recently a negative relationship of graft function and islet size in islet transplantation was reported, demonstrating that small islets are superior to large islets in terms of function and survival. Considering that islets can be dissociated into single cells and reaggregated into so called "pseudoislets", the aim of our study was develop a technique that enables to obtain pseudoislets of defined, preferably small, dimensions and to evaluate their physiological properties.

Materials/methods: Isolated islets from human pancreas were dissociated into single cells by trypsin treatment and incubated for 6–14 days in hanging drop cultures. Newly formed pseudoislets were analyzed for morphology and function.

Results: Cellular composition and architecture of pseudoislets were similar to native pancreatic islets. Glucose stimulated insulin secretion of small pseudoislets, composed of 250 islet cells, was increased 2.5-fold ($p < 0.001$) when compared to native counterparts and cellular insulin content was inversely correlated to islet size. Small pseudoislets revealed a restored 1st phase insulin secretion which was not observed in intact islets.

Conclusion: With the hanging drop culture method human pseudoislets of improved biological function can be generated. Thus, transplantation of small pseudoislets represents an attractive strategy to improve graft function in islet replacement therapy.

O-30 General Topics

O-30-1 Positive end-expiratory pressure improves functional residual capacity and respiratory mechanics after induction of general anesthesia

E. Futier^a, J. M. Constantin^a, A. Petit^a, B. Jung^b, S. Jaber^b and J. E. Bazin^a

^aDepartment of Anesthesiology, Hotel-Dieu Hospital, 63000 Clermont-Ferrand, France; ^bDepartment of Anesthesiology, SAR B, 34000 Montpellier, France (e-mail: apetit@cbu-clermontferrand.fr)

Introduction: The application of positive end-expiratory pressure (PEEP) during general anesthesia remains controversial. We analyzed the effects of PEEP on functional residual capacity (FRC), and respiratory mechanics in patients after induction of general anesthesia.

Materials/Methods: Forty patients (non-obese patients, $n = 20$ and obese patients, $n = 20$) were prospectively included. After induction of anesthesia, PEEP was adjusted in a stepwise fashion (zero end-expiratory pressure (ZEEP), PEEP+5cmH₂O and PEEP+10cmH₂O). Respiratory settings were kept constant throughout. At each step, we measured FRC (nitrogen washout/washin method), elastance of the respiratory system, gas exchange and dead-space fraction.

Results: After intubation FRC was reduced by 39% in non-obese patients and 49% in obese patients in ZEEP (both $p < 0.05$), as well as the PaO₂/FiO₂ ratio ($p < 0.05$). In non-obese patients, compared with ZEEP, both PEEP+5 and PEEP+10 improved FRC (respectively +15% and +40%, $p < 0.01$) and elastance (–14%, $p < 0.05$). In obese patients, increasing PEEP to 10 cmH₂O improved FRC (+49% versus ZEEP and +30% versus PEEP+5, $p < 0.01$), elastance and dead-space fraction. A significant correlation was found between improvement of FRC and elastance ($r^2 = 0.46$, $p = 0.003$), but not with oxygenation.

Conclusion: In non-obese patients, a PEEP of 5 to 10 cmH₂O improved FRC and respiratory function, without overdistension. In obese patients, applying 10 cmH₂O of PEEP improved respiratory mechanics but was insufficient to

maximize FRC. Even in healthy lungs, PEEP is essential to counteract general anesthesia-induced FRC decrease.

O-30-2 Effect of hypoxia on the paracellular pathway of human colon in vitro

D. Collins^a, A. Hogan^a, R. Kennelly^a, A. Baird^b and D. Winter^a

^aSt Vincent's University Hospital, Elm Park, Dublin 4, D4 Dublin, Ireland;

^bUniversity College Dublin, College of Life Sciences, Belfield, Dublin 4., D4 Dublin, Ireland (e-mail: danielcol@gmail.com)

Intestinal ischemia/reperfusion injury is associated with bacterial translocation and a subsequent systemic inflammatory response. The mechanisms underlying this process are poorly defined. Possible routes for transmucosal passage of bacteria include transcellular and paracellular channels. The aim of this study was to investigate the effects of hypoxia/reoxygenation on paracellular permeability of isolated human colonic mucosa in vitro. Normal colonic mucosa from resected colorectal cancer specimens were mounted in Ussing chambers. "Hypoxia" was induced by switching from carbogen to nitrogen perfusion. Baseline electrophysiological parameters including short circuit current (SCC) and potential difference (PD) were measured at regular intervals. Permeability was assessed by calculating transepithelial electrical resistance (TER) and macromolecular paracellular transfer was determined by radiolabelled [(14)-C]-mannitol flux coefficients. 30 mins of hypoxia resulted in a decrease in SCC from $73.5 \pm 9.1 \mu\text{A}/\text{cm}^2$ to $15.9 \pm 2.5 \mu\text{A}/\text{cm}^2$, ($n = 5$, $p < 0.03$, 95%CI). In keeping with a hypoxic insult, responses to cAMP mediated secretion were reduced to 5% of control ($n = 3$, $p < 0.01$, 95%CI) however responses to the cholinergic agonist carbachol were preserved. TER decreased to 70% of baseline values during reoxygenation ($n = 5$, $p < 0.03$) but this was not associated with altered permeability. Acute hypoxia/reoxygenation can modulate the secretory capacity of human colon however; paracellular permeability was not increased.

O-30-3 Efficacy and safety of rFVIIa in an acute arterial bleeding model in healthy rabbit: a blind study

M. Durand^a, A. Godier^b, V. Notet^c, M. Hacquard^a, O. Collignon^c, G. Corbonnois^a, F. Plénat^a, J. P. Carteaux^a and T. Lecompte^a

^aCHU Nancy, 5, allée du Morvan, 54500 Vandoeuvre les Nancy, France;

^bHôtel Dieu, Place du Parvis de Notre-Dame, 75001 Paris, France; ^cGenclis, 15, rue du bois de la Champelle, 54500 Vandoeuvre les Nancy, France (e-mail: durandmarion@botmail.com)

Introduction: Recombinant activated factor VII (rFVIIa) use for intractable bleeding is still debated. Our aim was to evaluate its efficacy and safety to control an acute arterial wound in rabbit.

Materiel/Method: An original model was elaborated in healthy rabbits. Five minutes after a reproducible and systematized wound of the right carotid, 60 rabbits were randomly assigned to receive vehicle, 80 $\mu\text{g}/\text{kg}$ or 200 $\mu\text{g}/\text{kg}$ of rFVIIa. The efficacy was assessed by the length of bleeding and the blood mass lost. The safety was assessed by macroscopic and microscopic analysis of liver and kidney vascularisation.

Results: Length of bleeding and blood mass lost were statistically reduced after rFVIIa injection in the two treated groups *versus* vehicle but no significant difference was found between the 80 and 200 $\mu\text{g}/\text{kg}$ doses (vehicle: 56 min [7, 60] and 22, 5 g [1, 58], 80 $\mu\text{g}/\text{kg}$: 15 min [5, 60] and 12 g [0, 36], 200 $\mu\text{g}/\text{kg}$: 10 min [5, 60] and 5 g [0, 31]). No macroscopic or microscopic thrombosis was noted in the three groups.

Discussion: In this randomized blind animal study, rFVIIa was efficient and safe to control an acute arterial bleeding wound at the dose of 80 and 200 $\mu\text{g}/\text{kg}$.

O-30-4 Frozen elephant trunk technique with a standard endovascular device

M. Vola^a, J. F. Fuzellier^b, J. P. Favre^b, E. Flesher^c, J. N. Albertini^b and X. Barral^b

^aCardiovascular Unit, St-Etienne University Hospital, 42270 ST-Etienne, France;

^bCardiovascular Unit, St-Etienne University Hospital, 42270 St-Etienne, France;

^cThoracic and Cardiovascular unit, CHU Pontchaillou, 35000 Rennes, France

Introduction: one step aortic arch surgery and descending aorta endografting (the frozen elephant trunk technique) requires specially designed antegrade endovascular devices. In selected patients, treatment of aortic arch may be completed by thoracic descending aorta endografting with transfemoral standard devices.

Methods: The patient is a 68 aged male with an aortic arch aneurysm extended to the medial thoracic descending aorta. After cooling at 25°, under selective cerebral perfusion, femoral circulation was arrested, a 26 Dacron tube was sutured to the distal aortic arch and through femoral access, without fluoroscopy, a 28X20 mm Medtronic Talent Endograft was deployed into the distal part of the Dacron and in the descending thoracic aorta. The deployment into the Dacron could be checked with direct palpation of the prosthesis.

Results: Post operative CT scan showed no endoleaks and the post operative hospitalisation was uneventful.

Conclusion: in selected cases, open repair of aortic arch aneurysm extended to the thoracic aorta may be safely associated with retrograde endografting with standard endoprosthesis.

O-30-5 Flow-activated cell-sorting of primary and metastatic tumour cells expressing green fluorescence protein for gene expression microarray analysis

O. Al-Sahaf^a, C. Pettigrew^b, J. H. Wang^c, T. Cotter^b and H. P. Redmond^d

^aUniversity college cork, Department of surgery, Cork university hospital wilton, 00353 cork, Ireland; ^buniversity college cork, Department of biochemistry, university college cork, 00353 cork, Ireland; ^cDept of Academic Surgery, Cork University Hospital, Wilton, Cork, Ireland; ^dDepartment of Academic Surgery, Cork University Hospital, University College Cork, Wilton, Cork, Ireland (e-mail: usama_sabaf70@hotmail.com)

Introduction: Gene microarray has enhanced the search for genetic regulators of metastases, in order to predict outcome. However, results of microarray data are affected by heterogeneity of tumour cell populations, with parenchyma being the main component contaminating gene expression profiles of tumours. To solve this problem we describe a new method to produce pure tumour cell populations for gene microarray analysis and other molecular studies.

Aims: To evaluate the utility of flow-activated cell-sorting (FACS) for the purification of tumour cells expressing green fluorescence protein (GFP) in a murine tumour model.

Methods: Tumours were generated by inoculation of 4T1-GFP cells into mammary pad of Balb/c mice; complete excision was performed when tumour size reached 150 mm³. Tumours were converted to single-cell suspension by mechanical dissociation and enzymatic digestion, and sorted using flow FACS with gates set at FL1.

Results: By using FACS, we were able to purify solid tumour cells expressing GFP, achieving a consistent purity above 80%. Moreover, the process of cell sorting didn't affect the quality of attained RNA.

Conclusion: FACS is a viable method to purify tumour samples producing a homogenous population, thus improving the quality of microarray study.

O-30-6 Midterm results after coronary artery reconstruction on diffusely coronary artery disease

E. Bezon, J. N. Choplain, G. Gueret, A. A. Khalifa and J. A. Barra

C.H.U. La Cavale Blanche, Boulevard Tanguy Prigent, 29609 Brest, France (e-mail: eric.bezon@chu-brest.fr)

Introduction: The coronary artery reconstruction is indicated in extensive coronary disease. A long arteriotomy, internal thoracic artery graft, and exclusion of atheromatous plaques from the coronary lumen are the bases of the technique. The aim of this study is to assess its mid-term results.

Methods: All the 235 patients who underwent coronary artery reconstruction between 1995 and 1998 were included. The mean age was 62 ± 10 years. Two hundred and eighty three coronary artery reconstructions were performed within 519 coronary bypass grafts. The mean length of the coronary artery reconstruction was 4 ± 2 cm. Hospital mortality was 2.5%.

Result: The mean follow-up was 73 ± 20 months. The actuarial survival was 89.3% after 7 years. The independent predictors of reduced survival were atrial fibrillation, left ventricular ejection fraction less than 50%, length of coronary artery reconstruction more than 5 cm on the left anterior descending artery. At the end point study, 90% of patients were free of angina and 10% in NYHA angina class II.

Conclusion: Mid-term results of coronary artery reconstruction are similar with those known for coronary artery bypass graft on non-diffusely diseased coronary artery whereas it is indicated for patients with much more severe lesions.

Most published studies on infections and genetic polymorphisms are dealing with sepsis.

Aim: We studied polymorphisms of selected allele of cytokines and TLRs at 9 polymorphic sites in patients with sepsis, acute tissue infections and prolonged wound suppuration as we hypothesize with same genetic predilection.

Results: 1) in entire group of patients with systemic and local infections, higher frequency of TNF α G308A GG, TNF β G525A mutated homozygote AA, and CCR2 G190A mutated homozygote AA than in controls (all $p < 0.0001$) was found. At TGF β G25C site there was a low expression of GG compared with controls ($p < 0.001$). 2) comparison of sepsis, acute tissue infections and delayed infected wound revealed more of CD14 C-159T CT, TLR1, 2 C2259A GA and C2029T CT in sepsis than other infections but differences were not significant. There was lack of differences in subgroups in expression of TNF α G308A GG, TNF β G525A heterozygote GA, CCR2 G190A AA, TLR4 1 A1036G AA and TLR4 2 C1336T CC.

Conclusions: Polymorphism of TNF α and β , CD14, TLR2, 1, CCR2 and TGF β genes at certain mutation points may be predisposing to surgical type of infections. No significant differences in investigated polymorphisms were found between sepsis, acute local tissue infections and delayed infected wound healing.

O-30-7 Predilection to sepsis, acute tissue infections and delayed infected wound healing may depend on the same genetic polymorphisms at TNF α G308A, TNF β G252A, CCR2 G190A, CD14 C159T, TLR2

M. Durlik^a, W. Olszewski^a, J. Rutkowska^a, B. Interewicz^a, K. Stepien^b, Z. Czapnik^a and M. Zagozda^a

^aMedical Research Centre, 5 Pawlinskiego Str., 02-106 Warsaw, Poland;

^bCentral Clinical Hospital, Woloska 137, 02-507 Warsaw, Poland (e-mail: mdurlik.post@bome.pl)

Poster Session I

P1a - Anaesthesiology and post-surgical Resuscitation

P1b - Cardiac surgery

P1c - Gastrointestinal surgery

P1d - Hepatobiliary and pancreatic surgery

P1e - Infection

P1f - Inflammation

P1g - Methodology in surgical research

P1a - Anaesthesiology and post-surgical Resuscitation

P1a-1 Effects of high tidal volume ventilation on cardiac output

V. Grosomanidis^a, G. Metaxas^b, K. Kotzampassi^c, P. Kazamias^d, B. Fyntanidou^d and E. Eleftheriadis^e

^aUniversity of Thessaloniki, Department of Anaesthesiology, GR-54006 Thessaloniki, Greece; ^bUniversity of Thessaloniki, Dept of surgery, GR-54006 Thessaloniki, Greece;

^cUniversity of Thessaloniki, Agiou Dimitriou 45, GR-54632 Thessaloniki, Greece;

^dUniversity of Thessaloniki, Dept of Anaesthesiology, GR-54006 Thessaloniki, Greece;

^eUniversity of Thessaloniki, Dept of Surgery, GR-54006 Thessaloniki, Greece (e-mail: kakotbe@yaboo.com)

Introduction: High tidal volume [VT] ventilation represents an alveolar recruitment maneuver which is considered to be an effective method for the management of perioperative hypoxia. The aim of this experimental study was to evaluate the effects of high VT ventilation on airway pressure and the sequential alterations in cardiac output.

Materials/Methods: Ten anaesthetized - mechanically ventilated swine were randomly assigned into two groups. Group A animals were ventilated at high VT [30mL/Kg], whereas group B received low VT ventilation [10mL/Kg]. Alterations in peak inspiratory pressure [PIP] and cardiac output [CO] were recorded every 30min over a period of 4h.

Results: No significant alterations were recorded in group B [PIP 22cmH₂O versus 23cmH₂O; CO 4.8L/min versus 4.58L/min]. On the contrary, a statistically significant increase in PIP [23cmH₂O versus 55cmH₂O, $p < 0.01$] was found in group A, resulting in a dramatic decrease of CO [5.36L/min versus 3.5L/min, $p < 0.01$]. CO values returned to normal after reducing VT from 30mL/Kg to 10mL/Kg.

Conclusions: High VT ventilation seems to be associated with remarkable increase in PIP, lung hyperdistention, as well as significant decrease in CO, which does not respond to fluid administration, but is improved after the termination/interruption of high VT ventilation.

P1a-2 Early haemodynamic effects after gelatin infusion

V. Grosomanidis^a, K. Kotzampassi^b, N. Kteniadakis^a, M. Filippidou^a, B. Fyntanidou^a and C. Skourtis^a

^aUniversity of Thessaloniki, Department of Anaesthesiology, GR-54006 Thessaloniki, Greece; ^bUniversity of Thessaloniki, Department of Surgery, GR-54006 Thessaloniki, Greece (e-mail: kakotbe@yaboo.com)

Introduction: The aim of this study was to evaluate the early haemodynamic effects of rapid infusion of a 3.5 urea-linked gelatin-GEL [Haemaccel].

Material/Methods: Thirty ASA II-III patients [M/F: 25/5, aged: 64.9 ± 7.2, BMI: 25.8 ± 4.5] subjected to elective abdominal surgery. After induction to anaesthesia and volume replacement of preoperative fluid deficits, 500mL of Haemaccel were infused. The monitoring included ECG, invasive arterial pressure measurement and Cardiac Output by an esophageal Doppler. Heart Rate, Systemic Arterial Pressure, Cardiac Output, Stroke Volume, Peak Velocity, Mean Acceleration and corrected Flow Times were recorded before

starting [T-basic], at the end of the infusion [T0], and subsequently every 5min over a period of 60min [T5-T60].

Results: There were no statistically significant alterations in any of the recorded parameters. HR [61 versus 61.9 versus 59.6], Systolic arterial pressure [117.8 versus 117.6 versus 120.2], CO [4.17 versus 4.18 versus 4.28], SV [66.6 versus 66.8 versus 67.7], PV [46.4 versus 46.8 versus 46.3], MA [4.97 versus 4.8 versus 4.66] and FTc [0.359 versus 0.357 versus 0.360] at T-basic, T0 and T60, respectively.

Conclusions: In the present study GEL infusion does not exhibit any haemodynamic effect in the normovolemic patients studied.

P1b - Cardiac surgery

P1b-3 Relationship between metabolic syndrome and aortic valve calcification

D. Mohty^a, P. Pibarot^b, A. Audet^c, A. Charest^d, N. Côté^c and P. Mathieu^f

^aCHU Trousseau, Avenue de la république, 37000 Tours cedex, France; ^bHôpital Laval, 2725 Chemin Ste foy, QC G1V4G5 Quebec, Canada; ^cHôpital Laval, centre de recherche, 2725 chemin ste foy, QC G1V4G5 Quebec, Canada; ^dHôpital Laval, 2725 chemin sainte foy, QC G1V4G5 Quebec, Canada; ^eHôpital Laval, centre de recherche, 2725 Chemin ste foy, QC G1V4G5 Quebec, Canada; ^fHôpital Laval, 2725 chemin ste foy, QC G1V4G5 Quebec, Canada (e-mail: dania.mohty@univ-tours.fr)

Background: Aortic stenosis (AS) is the most prevalent valve disease in western world.its pathophysiologic mechanisms are similar to atherosclerosis. The metabolic syndrome (MS)is associated with atherosclerosis. The aim of this study was to investigate the relationship between the MS and aortic valve (AV) calcification and stenosis progression.

Methods and results: 177 consecutive patients underwent AV replacement at our center for AS (AV area: 0.71 ± 0.75, range 0.4–1.4 cm²). 25% had the MS as defined by the NCEP ATPIII criteria. AVs explanted at the time of surgery were collected for quantitative measurement of valvular calcium content and the fibro-calcific remodelling by histological analysis. Hemodynamic progression of the AS was assessed preoperatively by the annualized changes in AV area obtained in a subset of 60 patients in whom 2 echocardiograms were available. Patients with MS had similar disease severity assessed by preoperative AV area. However, the stenosis progression rate was 2-fold faster in patients with MS than those without MS: (-0.21 ± 0.16 versus -0.11 ± 0.15 cm²/yr; $p = 0.02$). The valve calcium content (72 ± 38 versus 56 ± 34 mg/gw; $p = 0.02$)was higher in MS patients respectively. By multivariate analysis, MS remained significantly associated with calcium content ($p = 0.001$).

Conclusion: MS is associated with faster stenosis progression and more extensive valvular calcification in the late stage of the disease.

P1b-4 Virtual angiography in type A dissection: 3D reconstruction of false and true lumen with primary entry tear in ascending aorta

B. Miguel^a, L. Sarry^b, P. Motreff^c, L. Boyer^d, L. Camilleri^e, P. Haigrong^f, C. De Riberolles^e and J. Y. Boire^b

^aCardiovascular Surgery, G. Montpied University Hospital, 63000 Clermont-ferrand, France; ^bERIM, Faculté de Médecine, 63000 Clermont-Ferrand, France; ^cCardiology Department, G. Montpied University Hospital, 63000 Clermont-ferrand, France; ^dInterventional Radiology, G. Montpied University Hospital, 63000 Clermont-ferrand, France; ^eCardiovascular Surgery, G. Montpied University Hospital, 63000 Clermont-Ferrand, France; ^fLTSI, INSERM U642, 263 avenue G. Leclerc, 35042 Rennes, France (e-mail: bmiguel@cbu-clermontferrand.fr)

Recent advances in medical imaging and minimal access surgical procedures have opened new concepts in computer aided diagnosis and interventional planning. The potential of virtual angiography in three dimensional (3D) imaging led us to test it in aortic dissection. This study presents a 3D shape preoperative reconstruction with simultaneous virtual angiography in false and true lumen of ten patients with an acute Stanford type A aortic dissection. The usual preoperative imaging system is the helical computed tomography (CT) scanner.

The objective was the 3D visualization of the ascending aorta primary entry tear. The results of virtual angiography reconstruction from patient preoperative CT-data compared with real anatomical structures observed during surgery are reported. In conclusion, virtual angiography has applicative potential in the treatment of type A aortic dissection, notably for the planning of futures endovascular interventions.

P1b-5 Experimental total cavopulmonary connection in a swine model without extracorporeal circulation. A feasibility study

M. Kanakis^a, F. Mitropoulos^b, M. Katsimpoulas^a, D. Angouras^a, C. Dimitriou^a, N. Kostomitsopoulos^a, C. Anagnostopoulos^a and P. Karayannacos^a

^aB.R.F.A.A., 4 Soranou Ephesus Street, 11527 Athens, Greece; ^bOnassis Cardiac Surgery Centre, Monastirion 8, Thracomacedones, 13676 Athens, Greece (e-mail: mkatsiboulas@bioacademy.gr)

Introduction: Our study examines the feasibility of total cavopulmonary connection (TCPC) without the use of cardiopulmonary bypass (CPB) or other means of temporary bypass on a swine model.

Methods: Nine open-chest anesthetized animals were studied (mean weight 43kg, mean age 4.5months). After pilot studies in 2 animals, 7 underwent successful TCPC with the use of an appropriate Y-shaped conduit (vascular graft) connecting the superior and inferior caval veins (end to end anastomosis) to the pulmonary trunk (end to side anastomosis). Decompression of the right ventricle was achieved using a roller pump. During the procedure full hemodynamic, electrocardiographic and respiratory parameters were recorded.

Results: During the establishment of TCPC the animals needed significant volume loading. Two animals needed inotropic support. Hemodynamic stability was sustained after TCPC establishment. After completion of TCPC, hemodynamic measurement consisted in decreased mean arterial pressure ($P < 0.001$), mean pulmonary artery pressure ($P < 0.001$), heart rate ($P < 0.01$) and cardiac output ($P < 0.0001$). In addition, the inferior vena caval pressure ($P < 0.01$) and the pulmonary vascular resistance ($P < 0.05$) were also increased.

Conclusions: In a swine model, the establishment of beating heart TCPC without the use of CPB or other means of temporary bypass although technically demanding, is feasible.

P1b-6 Neutrophil activation is attenuated during cardiopulmonary bypass in the new millennium

A. Le Guyader^a, G. Davis-Gorman^b, R. Watanabe^b, J. Duffy^c, L. Gatewood^c, P. Lichtenthal^c, J. Copeland^c and P. McDonagh^b

^aHôpital Universitaire Dupuytren, Chirurgie Cardiovasculaire, Université de Limoges, 87042 Limoges, France; ^bHealth Sciences Center, University of Arizona, Tucson, AZ 87042, United States of America; ^cUniversity Medical Center, Cardiac Surgery Department, Tucson, AZ 87042, United States of America (e-mail: alexandre.le-guyader@unilim.fr)

Objectives: A systemic inflammatory response (SIR) is associated with on-pump cardiac surgery. Medical management of coronary artery disease and improved biocompatible extra-corporeal circuits are known to attenuate SIR. With these medical improvements does healthcare delivery in the new millennium affect CPB-induced inflammation? To address this question, we compared cardiopulmonary bypass (CPB) induced PMN activation in two elective CABG studies.

Methods: A pilot study (1996–1997, 13 patients) was compared to a prospective, randomized study (2002–2004, 41 patients). PMN CD11b expression and PMN Reactive Oxygen Species (ROS) production were measured in whole blood before, during and after elective on-pump CABG surgery.

Results: A significant acute PMN activation was observed during surgery in the pilot study (intra-op PMN CD11b expression 2.5 times greater, $p < 0.001$ and PMN ROS 8 times greater than pre-op, $p < 0.001$). In contrast, neither PMN CD11b nor PMN ROS increased in the contemporary study. A much larger proportion of patients used statins and ACE inhibitors in the contemporary study.

Conclusions: A significant CPB-induced PMN activation occurred in the earlier pilot study, but not in the contemporary study. We speculate that improvement in patient management, particularly with regard to pre-op medications, may blunt the inflammatory response induced by CPB.

P1c - Gastrointestinal surgery

P1c-7 Differential Scanning Calorimetry, as a new method to measure the structural injury in intestinal ischemia models

A. Ferencz^a, K. Nedvig^b and D. Lorinczy^c

^aDep of Surgical Research Techn, Kodaly Z. str.20., H-7624 Pecs, Hungary;

^bDep of Surgical Research Techn, Kodaly Z. Street 20, H-7624 Pecs, Hungary;

^cInstitute of Biophysics, Szigeti Street 12., H-7624 Pecs, Hungary (e-mail: andrea.ferencz@aok.pte.hu)

Beyond conventional histology, this study examined structural changes of intestinal tissue following warm and cold ischemia by Differential Scanning Calorimetry (DSC). Warm (GI: 1-hour, GII: 3-hours) and cold ischemia with preservation in University of Wisconsin solution (GIII: 1-hour, GIV: 3-hours) were produced in Wistar rats ($n = 20$). Conventional histology was made on hematoxylin/eosin-stained sections. Thermal consequences of changes of mucosa, muscular layer and total intestinal wall were detected by DSC. Histological findings in GI showed minor clefting with the villus epithelium, and in GII severe destruction characterized in mucosal thickness, denudation of villi and lesion in crypts. Cold preservation diminished the structural injury in GIII-GIV. According to DSC data, in GI the transition temperature (T_m) stained in control level in mucosa, but the calorimetric enthalpy decreased by 30%. In GII it was half of the control one. In GIII-GIV T_m significantly decreased in mucosa ($p < 0.05$), but unchanged in muscle and in the total intestinal wall. Calorimetric enthalpy decreased less than in GI or GII. In present work DSC showed more exact results about bowel structural changes than conventional histology following ischemia. This thermodynamic method provides basis for further investigation in different bowel stress models. (Supported by Bolyai Scholarship of MTA)

P1c-8 Changes of oxidative stress during experimental transvaginal NOTES cholecystectomy

A. Ferencz^a, S. Javor^b, B. Balatonyi^b, S. Horvath^b, I. Takacs^b, S. Ferencz^b, E. Roth^a and G. Weber^a

^aUniversity of Pecs, Kodaly Z Street 20, H-7624 Pecs, Hungary; ^bUniversity of Pécs, Kodaly Z. str.20., H-7624 Pecs, Hungary (e-mail: andrea.ferencz@aok.pte.hu)

Natural orifice transluminal endoscopic surgery (NOTES) is considered the new frontier for minimally invasive surgery. This work examined the oxidative stress parameters during transvaginal NOTES cholecystectomy in animal model. Transvaginal NOTES cholecystectomy was performed with rigid instruments on 6 domestic pigs. Peripheral blood samples were collected before operation (control), on the 1st, 3rd, and 7th postop days (POD). To monitor oxidative stress we determined malondialdehyde (MDA), reduced glutathione (GSH) and SH groups concentrations, and the activity of superoxide dismutase (SOD) by spectrophotometry. Our results showed, that lipidperoxidation marker, MDA concentration remained on the control level ($80.06 \pm 5, 6$ nmol/ml). SH-groups and GSH concentration slightly elevated on the 1st POD ($165.8 \pm 7, 9$ and $778 \pm 10, 9$ nmol/ml) and they decreased back to the control value ($117 \pm 10, 2$ and $614 \pm 8, 9$ nmol/ml) on the 3rd POD. Endogenous antioxidant SOD activity increased on the 1st POD ($851, 6 \pm 15, 2$ IU/l), and after it its activity normalised on the 7th POD ($623 \pm 5, 9$ IU/l). These changes were slightly, significantly differences were not founded compare to controls. NOTES cholecystectomy causing minimal surgical trauma less invasive than open or laparoscopic cholecystectomy, whereof data have been published previously in the literature by our group. However, further studies are needed to approve our results of an initial evaluation.

P1c-9 Liver enzyme and total bilirubin alterations after open, laparoscopic and transvaginal cholecystectomy (NOTES)

S. Javor^a, S. Horvath^a, B. Balatonyi^a, S. Ferencz^a, A. Ferencz^b, E. Roth^a and G. Weber^a

^aUniversity of Pécs, Kodaly Z. str.20., H-7624 Pécs, Hungary; ^bDep of Surgical Research Techn, Kodaly Z. str.20., H-7624 Pécs, Hungary (e-mail: javor_szaniszo@rvn.hu)

Introduction: Natural Orifice Transluminal Endoscopic Surgery (NOTES) can be considered as a new generation of abdominal surgery. It means a method directed through natural orifices, and abdominal surgery operated by transluminal endoscopic techniques to reach diagnostic and therapeutic goals.

Materials/Methods: In 12 pigs cholecystectomy was performed. Animals were randomized into three groups: group I (n = 4): open cholecystectomy (OC), group II (n = 4): laparoscopic cholecystectomy (LC), group III (n = 4): transvaginal cholecystectomy (NOTES). Blood samples were taken preoperatively and after operations and on the first, third, seventh postoperative day (POD) for biochemical tests. The concentration of liver enzymes activities (aspartate aminotransferase (AST), alanine aminotransferase (ALT), gamma-glutamyl-transferase (GGT), lactate dehydrogenase (LDH), alkaline phosphatase (ALP)) and total bilirubin concentration was measured.

Results: Analyses revealed significant increases of AST, ALT and LDH levels in all groups (OC, LC, NOTES) on first POD, which decreased on third POD. GGT and total bilirubin levels decreased, but there was no difference between pre- and postoperative ALP levels. After transvaginal cholecystectomy seen mildest increase of AST, ALT and LDH levels.

Conclusions: In case of cholecystectomy the transvaginal approach can reduce liver trauma significantly, but further examinations are needed.

P1c-10 Effects of sildenafil citrate on normal colon anastomosis in the rat model

S. Erkan^a, R. Pekcici^b, B. Kavlakoglu^c, O. Guler^a, N. Dindar^a and H. Ustun^a

^aAnkara Training Hospital, Ankara Training Hospital, 06340 Ankara, Turkey; ^bAnkara Training Hospital, Ankara Training Hospital, 06400 Ankara, Turkey; ^cAnkara Oncology Hospital, Ankara Oncology Hospital, General Surgery Department, 06610 Ankara, Turkey (e-mail: pekicici@yaboo.com)

Introduction: This study was to examine the effects of sildenafil citrate on colon anastomosis in the rat model by measuring the levels of perianastomotic tissue hydroxyproline (HYP), anastomotic burst pressures (BP) and histopathologic scores (HS).

Materials/Methods: In this study 24 rats were divided into four groups and colonic anastomosis were performed. Group1 = anastomosis+killed on third day; group2 = anastomosis+sildenafil+killed on third day; group3 = anastomosis+killed on seventh day; group4 = anastomosis+sildenafil+killed on seventh day. Orally 10 mg/kg per day of sildenafil citrate therapy were applied in group 2 and group 4 before operation for 7 days. Six rats of group 1 and 2 were killed on postoperative days 3, and six rats of group 3 and 4 were killed on days 7. Perianastomotic tissue HYP, BP and HS were measured. Significance of factors were estimated.

Results: Sildenafil citrate therapy was resulted in vasodilation. Thus anastomotic tissue healing was better. Group 2&4 have significantly higher tissue BP levels than group 1&3 (p < 0.05). However increasing of HYP levels were not statistically significant (p = 0.081). HS were better in groups 2&4 than 1&3 but statistically insignificant.

Conclusions: Sildenafil citrate may affect positive effects on anastomotic healing. However, functional implication of this agent further needs to be elucidated.

P1c-11 The importance of pre-compression time for the secure staple formation "B-shape" in anastomosis using stapling technique

S. Nakayama^a, K. Hida^a, A. Itami^b, H. Kubo^a and Y. Sakai^a

^aKyoto University, 54-Shogoin-Kawara-cho, Sakyo-ku, 606-8507 Kyoto, Japan; ^bKyoto University, 54-shogoin kawara-cho, sakyoku, kyoto, 606-8507 kyoto, Japan (e-mail: nashinya@kubp.kyoto-u.ac.jp)

Backgrounds: Although forming a perfectly aligned B-shape in stapled anastomosis is important, we occasionally experience stapling failure especially in thick rectum tissue. Then, it is recommended to keep the jaws of the stapling device closed for a while in firing across thick tissue. Here, we examined whether this maneuver is associated with B-shape formation using animal models.

Materials/Methods: Six porcine stomachs were used and a 45-mm linear stapler with a blue cartridge was evaluated. Tissue compression time before firing was planned as 0, 1 or 5 minutes. The shape of each staple was classified into "good" and "bad" after tissue dissolution. The height of the staples was measured individually. In statistical analysis, Chi square test and student's t-test were used.

Results: The numbers of the staples in each group were 251 (0-minute), 261 (1-minute), and 256 (5-minute). The rate of good shape was significantly higher in 5-minute group than in 1-minute and 0-minute groups (5 versus 1 minute; p < 0.001, 1 versus 0 minute; p = 0.002). Similarly, the mean height of the staples of 5-minute group was significantly lower than the other groups.

Conclusion: Longer pre-compression time is important for the more accurate B-shape formation in stapled anastomosis.

P1c-12 The intraperitoneal adhesion density in different anastomotic techniques - an experimental study

A. Krasniqi^a, L. Gashi-Luci^b, S. Krasniqi^c, M. Jakupi^b, S. Hashani^d and I. Dreshaj^e

^aUniversity Clinical Centre, Faculty of Medicine, 10000 Prishtina, Kosovo, Yugoslavia; ^bInstitute of Pathology, Faculty of Medicine, 10000 Prishtina, Kosovo, Yugoslavia; ^cInstitute of Public Health, Faculty of Medicine, 10000 Prishtina, Kosovo, Yugoslavia; ^dUniversity Clinical Centre, Faculty of Medicine, 10000 Prishtina, Yugoslavia; ^eCWRU Hospitals, 11100 Euclid Avenue, Cleveland, OH 441006, United States of America (e-mail: dr_krasniqi2001@yaboo.com)

Introduction: The adhesion formation represents an important clinical challenge in abdominal surgery. The development of adhesions has been reported more often after intestinal anastomosis.

Purpose: To compare the intraperitoneal adhesion density in different anastomotic techniques in the colon of the rat.

Material and methods: The study was done on Sprague Dawley rats. Animals were divided into five groups. Four experimental groups consisted of 21 animals each, and the fifth sham group contained 10 animals. By 7 animals of each group were sacrificed on the 4th and the rest of 14 animals on the 7th postoperative day. In all groups the resected part of the colon was anastomosed using Czerny-Lembert, Halsted, Gambee and Gambee-Halsted technique. The adhesion density was evaluate according to Knightly score.

Results: The average grade of the intraperitoneal adhesion density on the 4th and the 7th postoperative day was higher in the double layer anastomosis group compare to other three single layer groups. The adhesion density in the sham group was significantly lower.

Conclusion: There was no a significant difference in the adhesion development depending on the type of anastomosis neither on the day of animal sacrifice. Adhesion density was significantly lower in the sham group (p < 0.001).

P1c-13 Comparison of efficiency of laparoscopic procedures in GERD and Barrett's esophagus (short term functional and histological results)

Z. Simonka, A. Paszt, S. Abraham, T. Geczi, I. Toth, Z. Horvath, I. Petho, L. Tiszlavicz, I. Nemeth, F. Izbeki, A. Rosztoczy, T. Wittmann and G. Lazar

University of Szeged, Pecs u. 6., H-6720 Szeged, Hungary (e-mail: simike@botmail.com)

Introduction: We compared a group of gastroesophageal reflux disease (GERD) patients with a group of Barrett's esophagus patients in order to identify the risk factors of Barrett's esophagus, and to determine the efficiency of surgery.

Patients/methods: Between 2001 and 2006 laparoscopic Nissen fundoplication was performed in 139 cases of GERD (Group I) and in 50 cases of Barrett's esophagus (Group II). The patients underwent control examinations 4 months later. Comprehensive medical examinations (endoscopy, histology, pH-metry, manometry and Bilitec) were performed on 37 patients in Group I, and on 32 patients in Group II.

Results: The DeMeester score was higher among the patients in Group II (12.1 *versus* 24.2), and biliary reflux was measured more frequently. There was no significant difference between the sphincter pressure of the lower esophagus in Group I and II. The postoperative examinations confirmed a sphincter pressure increase in the lower esophagus (16 Hgmm *versus* 18 Hgmm), and a decrease in acid (DeMeester score 1.3 *versus* 1.8) and biliary reflux in both groups.

Conclusions: More severe acid reflux and more frequent biliary reflux were observed in patients with Barrett's esophagus than in those with GERD. This work was supported by the Hung. Nat. Sci. Found. (OTKA73141).

P1c-14 Gastrectomy for elder patients with gastric cancer

T. Shinbo, K. Hirayama, Y. Nakajima, K. Saitoh, R. Saitoh and T. Shimada

Hiraka General Hospital, Maegoh Aza Yatsukuchi 3-1, 013 8610 Yokote Akita, Japan (e-mail: bnhn.mbjz@gmail.com)

Introduction: Elder patients have been increasing in number in our country. It is one of the issues how to operate elder patients.

Patients and methods: The patients had gastrectomy for gastric cancer last three years. We investigated characteristics of elder patients (80 years old or more) in contrast to younger patients (less than 80 years).

Results: In the total of 175 patients, 20 (11.4%) were elder group. Mean BMI in elder and younger group was 20.9 and 22.5 ($p < 0.01$), serum albumin was 3.66 and 4.63 ($p < 0.001$) and period of symptom was 1.81 and 3.55 month ($p < 0.001$). There was no obvious difference in cancer histology, lymph node metastasis, cancer stage and method of gastrectomy. Operation time was 222 min and 250 min ($p = 0.0462$) and the number of dissected lymph nodes was 11.9 and 19.7 ($p < 0.001$). There was no obvious difference in postoperative hospital stay and SSI. But incidence of infectious disease was 8 (60.0%) and 25 (16.1%) ($p = 0.0102$), and hospital death was 3 (15.0%) and 2 (1.31%) ($p < 0.001$).

Conclusions: We intended to perform the operation with less lymph node dissection and shorter operation time in elder patients. But infection was more common and mortality was higher in these patients. The consensus for elder cases would be needed.

P1c-15 Pre and postoperative values of antioxidative enzymes in colorectal cancer patients

I. Stipancic and V. Ratkajec

Clinical Hospital Dubrava, Avenue Gojka Suska 6, 10000 Zagreb, Croatia (e-mail: igors@kdb.hr)

Introduction: It is controversial whether a reduced activity of the glutathione peroxidase (GSH Px) and superoxide dismutase (SOD) in blood is associated with an increased risk and poor prognosis in cancer patients. This prospective trial evaluates changes in antioxidative enzymes in patients with colorectal carcinoma before and after radical surgery.

Methods: In 20 patients with colorectal cancer SOD and GSH Px in sera were measured preoperatively and compared with healthy volunteers' values. Postoperative changes have been obtained on the 1st, 3rd, 7th and 30th postoperative day after surgery.

Results: In colorectal cancer patients preoperative values of GSH Px and SOD have been significantly decreased comparing with healthy subjects. In

all postoperative measured days there were increased values of antioxidative enzymes but significantly only on the 3rd day for SOD ($p = 0.039$), and on the 7th day for GSH Px ($p = 0.035$).

Conclusion: Low preoperative antioxidative enzymes values could be the result of tumor induced oxidative stress. Removal of the tumor, as well as systemic response to surgery could cause increased antioxidant enzymes activity.

P1c-16 Gender difference and future of gastric cancer

Y. Nakajima, K. Hirayama, K. Saitoh, S. Tsukamoto, Y. Enomoto and T. Shinbo

Hiraka General Hospital, Maegoh Aza Yatsukuchi 3-1, 013 8610 Yokote Akita, Japan (e-mail: yokotenoringo@cronos.ocn.ne.jp)

Introduction: Some habit, drinking or smoking, seems to be spreading in women. What is expected in gastric cancer in the future?

Patients and Methods: The patients had gastrectomy for gastric cancer last three years. We investigated gender differences in these patients.

Results: The total of 175 patients (113 men and 62 women) had gastrectomy. Male/Female ratio was 1.84. There was no obvious gender difference on age, BMI and serum protein except hemoglobin concentration (13.3 in men and 11.5 in female, $p = 0.0265$). Cancer at oral side was 69.9% in men and 53.2% in women ($p = 0.0435$). There was no obvious difference in cancer histology, lymph node metastasis and cancer stage. Total gastrectomy was 41.6% in men and 27.4% in women ($p = 0.0626$) and operation time was 257min in men and 228min in women ($p = 0.0147$). There was no obvious difference in lymph node dissection and blood loss. SSI was diagnosed 18 (15.9%) in men and 3 (4.84%) in women ($p = 0.0596$). Hospital death was 3 (2.66%) in men and 1 (1.61%) in women (NS).

Conclusions: According to the disappearance of the life style in gender, man type gastric cancer can be increasing in number. Social method thought to be needed to avoid total gastrectomy and SSI.

P1c-17 The impact of surgery on neutrophil activity in patients with primary colonic malignancy - pilot study

V. Ratkajec and I. Stipancic

Clinical Hospital Dubrava, Avenue Gojka Suska 6, 10000 Zagreb, Croatia (e-mail: vratkajec@kdb.hr)

Introduction: Neutrophils produce free radicals and proteases and there are evidences that they could cause tumour cytolysis, support tumour cell invasion as well as promote tumour growth and metastasis. In cancer patients, perioperative and postoperative immunosuppression could accelerate the tumour growth and metastasis of residual tumour cells, thus adversely affecting the prognosis. Aims of our research are to determine and compare neutrophil activity in patients with colon cancer and healthy volunteers, to determine an effect of surgery on neutrophil activity and to elucidate the relationship between neutrophil activity and clinicopathologic status of disease.

Methods: Respiratory burst neutrophil production was determined quantitatively by flow cytometry (Bursttest) in 15 patients with histologically proven colon cancer submitted to elective radical surgery and compared to 15 healthy volunteers.

Results: Postoperative values of mean fluorescence intensity (MFI) of neutrophils having produced reactive oxygen metabolites were higher than preoperative values. When compared to healthy controls preoperative values were higher in patients with colorectal cancer.

Conclusion: If the number of neutrophils in peripheral blood mirrors the situation in the tumor tissue, these data could support the investigation of neutrophil-targeted therapies in anti-cancer strategy.

P1c-18 Lymphangiogenesis in GIST

Y. Fujii, K. Okoshi, H. Kubo and Y. Sakai

Kyoto University, Shogoinkarabara-cho 54, Sakyo-ku, 6068507 Kyoto, Japan (e-mail: y.fujii@at8.ecs.kyoto-u.ac.jp)

Gastrointestinal stromal tumor (GIST) is the most common mesenchymal tumor of the gastrointestinal tract, and GISTs metastasize into liver, peritoneum, and so on. The mechanism of the peritoneal metastasis is yet unknown. To investigate whether lymphangiogenesis in GISTs is involved in the metastasis, we evaluate the lymphangiogenesis in the specimens of GISTs.

Methods: We carried out immunostaining for lymphatic marker, podoplanin and for lymphangiogenic factor, VEGF-C, using the samples of GIST (n = 26).

Results: We found that the density of lymphatic vessels in a field ranged from 4 to 50. The expression of VEGF-C by tumors; 9 cases were wholly, 5 were partially stained and 11 were not stained. These results suggest that GISTs have the possibility to induce lymphangiogenesis and subsequent peritoneal metastasis, although the correlation between the level of lymphangiogenesis and the metastasis has not been disclosed because of fewer samples with the metastasis. Further studies using the animal model remains to be performed.

P1c-19 Does ABO blood group influence the prognosis of colorectal cancer patients treated with laparoscopic surgery?

K. Hida^a, T. Yamaguchi^b, H. Hata^b, H. Kuroyanagi^c, S. Nakayama^a, S. Nagayama^a, H. Kubo^a, K. Koizumi^b and Y. Sakai^a

^aKyoto University, 54-Shogoin-Kawara-cho, Sakyo-ku, 606-8507 Kyoto, Japan;

^bKyoto Medical Center, Fushimi-ku, Fukakusa, 612-8555 Kyoto, Japan;

^cCancer Institute Hospital, Koto-ku, Ariake, 135-8550 Tokyo, Japan (e-mail: hidakoya@kubp.kyoto-u.ac.jp)

Background: ABO and Rhesus blood groups have been reported to be associated with tumor stage in several cancers, including colorectal cancer. But the correlation between ABO blood type and colorectal cancer prognosis is still unclear.

Method: We collected the data of colorectal cancer patients who underwent laparoscopic surgery from 1998 to 2005 at Kyoto Medical Center. The outcome data was planned to be collected prospectively (February, 2009). Blood group and other clinicopathological factors will be analyzed for association with overall survival. The log-rank test and Cox proportional hazards models were designed to be used for statistical analysis.

Result: A total of 401 patients were enrolled in this study. Among them, there were only 3 patients (<1%) with Rh-blood group. The proportions of ABO blood groups and Rh blood groups in this study (A; 42.1%, B; 19.2%, O; 30.4%, AB; 8.2%) were similar to those in the Japanese population. The survival curve in each group was planned to be shown.

Conclusions: This study was designed to evaluate the relationship between blood group and prognosis in colorectal cancer patients treated with laparoscopic surgery.

P1c-20 Successful treatment of a local recurrent duodenal gastrointestinal stromal tumor with hepatic metastasis: report of a case

K. Kojima, M. Fujisawa, T. Kitabatake and M. Machida

Juntendo University Nerima Hosp., 3-1-10, Takanodai, Nerima-Ku, 177-8521 Tokyo, Japan (e-mail: jg6k-kjm@asabi-net.or.jp)

Background: Duodenal gastrointestinal stromal tumors (GIST), which are rare, comprise 3%–5% of all gastrointestinal stromal tumors.

Methods: A 70-year-old woman was admitted to our department for the bleeding from a recurrent duodenal GIST. It was initially resected 2.5 years before with limited excision. Preoperatively she was treated by imatinib 400 mg daily in a dosage for 4 weeks to reduce a tumor size. At laparotomy a duodenal tumor which is a 7.5cm in diameter was found displacing the head of the pancreas. A 2 cm in diameter lesion in the segment V of the liver was also noted. Pancreaticoduodenectomy for the duodenal GIST and RFA therapy for the hepatic metastasis were performed.

Results: Histological examination revealed a degenerated GIST of the duodenum with low grade malignancy, c-kit (+), CD34 (–). The patient has continued imatinib therapy. A follow-up of 20 months showed that the patient is well and there is no evidence of recurrent diseases.

Conclusions: The duodenal GIST is usually slow growing, and may be amenable to curative surgery, even after a recurrence. RFA therapy for the localized small liver metastasis is curative when feasible, combined surgical resection is an efficacious treatment for patients with metastatic duodenal GIST.

P1c-21 Correlation of serum C-reactive protein with macroscopic and histopathology findings in acute appendicitis

S. Xharra^a, L. Gashi-Luci^b, K. Xharra^a, S. Hashani^c, A. Hamza^d and A. Krasniqi^e

^aUniversity Clin. Centre, Ulpiana D9/7-10, 10000 Prishtina, Yugoslavia; ^bInstitute of Pathology, Faculty of Medicine, 10000 Prishtina, Kosovo, Yugoslavia; ^cUniversity Clinical Centre, Faculty of Medicine, 10000 Prishtina, Yugoslavia; ^dUniversity Clin. Centre, Fakulteti Mjekesise, 10000 Prishtina, Yugoslavia; ^eUniversity Clinical Centre, Faculty of Medicine, 10000 Prishtina, Kosovo, Yugoslavia (e-mail: saxharra@gmail.com)

Background: Accurate diagnosis of the acute appendicitis is based on careful history, clinical evaluation, physical examination and laboratory investigation. This study was designed to analyze the accuracy of C-reactive protein (CRP) in the diagnosis of acute appendicitis and to compare it with the intraoperative and histopathologic findings.

Material and Methods: In this prospective study, blood for the White blood count (WBC) and measurement of CRP was randomly collected from 85 patients just before appendectomy. The histopathology of the 85 appendixes was grouped into positive (acute appendicitis) and negative (normal appendix). WBC, CRP and the histopathology findings were correlated.

Results: Out of a total of 85 patients, histopathologic findings confirmed acute appendicitis in 73 (85.9%). Mean serum CRP value was 4 (range, 0–24) mg/l in patients with normal appendix, 73.18 (range, 12–192) mg/l in non perforated appendicitis, and 118 (range, 24–192) mg/l in perforated appendicitis. In the present study positive predictive value of CRP was 97.3%, specificity 80%, sensitivity 96% and accuracy 72.3%

Conclusion: Raised value of CRP was directly related to the severity of inflammation. Taken in conjunction with WBC the diagnostic accuracy became more reliable. CRP monitoring enhances the diagnostic accuracy of acute appendicitis.

P1d - Hepatobiliary and pancreatic surgery

P1d-22 Preoperative enteral immunonutrition possesses antiapoptotic properties

R. Słotwiński^a, W. Olszewski^b, G. Lech^c, M. Słodkowski^c, M. Zaleska^b, S. Kedziora^d, S. Słotwińska^e, Z. Wójcik^e and W. Krasnodebski^c

^aMedical Research Center, 5 Pawińskiego Str., 02-106 Warsaw, Poland; ^bMedical Research Centre, 5 Pawińskiego Str., 02-106 Warsaw, Poland; ^cMedical University of Warsaw, 61_wirki i Wigury Str., 02-091 Warsaw, Poland; ^dMedical University of Warsaw, 3 Pawińskiego Str., 02-106 Warsaw, Poland; ^eMedical University of Warsaw, 18 Miodowa Str., 00-246 Warsaw, Poland (e-mail: robert_slotwinski@yahoo.com)

Extensive tissue trauma and malnutrition results in disorders of programmed cell death influencing the patients susceptibility to infections. The purpose of our study was to assess the effect of pancreatic cancer surgery and immunonutrition on the apoptotic signaling pathways.

Material and methods: The randomized studies were performed in 88 patients after pancreatic cancer resection with preoperative standard or enteral immunonutrition. Lymphocytes expressions of Bcl-2, Bax, caspase 3, 6, 9, NFκB, PARP1/89kDa, TNFR1/CD120a and CD95/Fas were assessed by Western-blot and flow cytometry.

Results: Before and after surgery the expression of Bcl-2, Bax, NFκB, PARP1 was significantly lower and expression of caspases, TNFR1 as well as percentage of CD95 cells significantly higher as compared with control

group. Caspase 3 expression was significantly higher as compared with NFkB, PARP1 and TNFR1. In comparison to the standard nutrition preoperative immunonutrition increased Bcl-2 and NFkB expressions and decreased caspases and PARP1 expressions. In addition, we found a significant down-regulation of Bcl-2 expression after surgery, but insignificant in patients with preoperative immunonutrition.

Conclusion: Preoperative enteral immunonutrition has an modulative effect on apoptotic signaling pathways after pancreas resection and possesses antiapoptotic properties. This modulatory effect of glutamine and omega-3 fatty acids has no influence on patients outcome.

P1d-23 A case comparison study on laparoscopic major liver resections

F. Fama, A. Piquard, C. Linard, A. Cogliandolo, M. A. Gioffre-Florio and O. Saint-Marc

Centre Hospitalier Régional, Avenue de l'Hôpital, 14, 45000 Orleans, France (e-mail: famafausto@yahoo.it)

Introduction: It is not clearly stated yet why a laparoscopic liver resection must be preferred to a laparotomic one.

Patients and Methods: A case comparison analysis of 6 major laparoscopic hepatectomies for benign liver disease (2 left and 4 right) carried out in a regional hospital, was done. A comparison of the surgical outcomes was accomplished along with a comparison of liver function parameters (transaminases, total bilirubin, prothrombin activity), at a mean postoperative follow-up of 2.5 days.

Results: Laparoscopic and laparotomic minor liver resections obtained similar results with the exception of mean operative time which resulted significantly longer in laparoscopic procedures as was mean hospitalization time in laparotomic procedures. In addition, outcomes related to operative bleeding seemed to favour laparoscopy. Major laparoscopic liver resections did not show any increase of operative risks nor worsening of postoperative outcomes compared to laparotomic major procedures. Postoperative liver function was not impaired differently in the two groups of patients in the early postoperative period.

Conclusion: Minor liver resections via laparoscopy can have operative results slightly better than via laparotomy. Major liver resections via laparoscopy, in patients with benign diseases and without liver cirrhosis can share the same advantages when compared to the conventional approaches.

P1d-24 Efficacy of adjuvant chemotherapy with gemcitabine after curative resection of pancreatic cancer

N. Oshima^a, M. Wada^b, T. Kajiwara^b and R. Hosotani^b

^aKyoto University, Shogoinkawabara-cho 54, Sakyo-ku, 6068507 Kyoto, Japan;

^bMedical Center General Hospital, 4-6 Minatojimanakamachi, Chuo-ku, 6500046 Kobe, Japan (e-mail: noshima@kubp.kyoto-u.ac.jp)

Introduction: Pancreatic cancer (PC) has a dismal prognosis even after curative resection. Efficacy of adjuvant chemotherapy with gemcitabine in resectable PC is still under discussion. We undertook an observational study to clarify whether adjuvant chemotherapy with gemcitabine improve overall survival (OS) in patients undergoing curative resection for PC.

Methods: Subject were 213 patients undergoing curative resection for histologically verified PC from August 1981 to March 2007. Of these, 133 without adjuvant chemotherapy were assigned to a control group (C) and 80 underwent adjuvant chemotherapy with gemcitabine in a gemcitabine group (G) (intention-to-treat). Survival was analyzed, and the two groups compared.

Results: Median survival was 21.1 months in G and 12.2 months in C. OS differed significantly between groups ($p = 0.029$, log-rank, HR: 0.785, 95%CI: 0.642–0.949), and the survival curve was significantly better in G than in C in a subgroup of patients who showed unfavorable factors, i.e., microscopic residual tumor (R1), lymph node metastasis, portal vein invasion, extrapancreatic nerve plexus invasion, and tumor of the pancreatic head. OS for patients undergoing adjuvant chemotherapy for longer than 3 months ($n = 47$) was significantly better than for those undergoing less than 3 months ($n = 20$).

Conclusions: Adjuvant chemotherapy with gemcitabine significantly prolonged OS in patients undergoing curative resection for PC.

P1d-25 Prostaglandin I2: a main mediator of the vasodilatory aortic response in chronic portal hypertensive rats

A. Cruz^a, M. Losada^b, J. Blanco-Rivero^c, M. A. Aller^d, M. P. Nava^e, M. Ferrer^f, G. Balfagón^g and J. Arias^h

^aHospital del Henares, Avda. de Marie Curie s.n., 28822 Coslada (Madrid), Spain;

^bHospital del Sureste, Camino Valdecipreste s.n., 28500 Arganda del Rey (Madrid), Spain;

^cDepartment of Physiology, School of Medicine, UAM, 28004 Madrid, Spain;

^dSurgery Dept., School of Medicine, UCM, 28040 Madrid, Spain; ^ePhysiology Dept., Biological School, UCM, 28040 Madrid, Spain; ^fPhysiology Dept., Medical School, UAM, 28040 Madrid, Spain; ^gPhysiology Dept., Medical School, UAM, 28004 Madrid, Spain; ^hSurgery Dept., School of Medicine, UCM, 28040 Madrid, Spain

(e-mail: maaller@med.ucm.es)

Introduction: Portal hypertension produces a splanchnic systemic and vascular response. This study was designed to evaluate the effect of long-term portal hypertension in the vasomotor response to vasoconstrictor noradrenaline and the vasodilator response to acetylcholine, as well as the mechanisms involved.

Methods: The animals were randomly divided into: sham-operated rats ($n = 7$) and rats with prehepatic portal hypertension by triple partial portal vein ligation ($n = 8$). Vascular reactivity were assayed in aortic rings from both groups to measure the effect of nitric oxide and prostanoids on vasodilator response elicited by acetylcholine. Nitric oxide, thromboxane B2 and 6-keto prostaglandin F1a levels were also measured 22 months after the intervention.

Results: Noradrenaline response was similar in both groups of rats. Acetylcholine vasodilator response was higher in portal hypertensive rats. Thromboxane A2 and nitric oxide release and sensitivity were similar in both groups of rats. Prostaglandin I2 release was not modified by portal hypertension, but it induces a higher vasodilator response in portal hypertensive rats.

Conclusion: The increased vasodilation to acetylcholine is maintained in long-term portal hypertension through an increased vasodilator response to PGI2. All these results indicate that in long-term portal hypertensive-rats the mechanisms through which the vasodilator response to acetylcholine change in relation to those present in the short-term.

P1d-26 Brain oxidative metabolism in basal conditions and after a memory task in cirrhotic rats with hepatic encephalopathy

M. Losada^a, A. Cruz^b, M. Mendez^c, M. Mendez-Lopez^c, L. Lopez^c, M. A. Aller^d, J. Arias^e and J. L. Arias^f

^aSurgery Unit Hospital Sureste, Camino Valdecipreste s/n, 28500 Arganda del Rey (Madrid), Spain; ^bGeneral Unit Surgery, Hospital del Henares, Avda. Maria Curie s.n., 28822 Coslada (Madrid), Spain; ^cNeurosciences Unit, Oviedo Univ., Plaza de Feijoo sn, 33003 Oviedo (Asturias), Spain; ^dSurgery Dpt Medicine School, UCM, Plaza Ramon y Cajal s/n, 28040 Madrid, Spain; ^eSurgery Dpt. Medicine School, UCM, Plaza Ramon y Cajal s/n, 28040 Madrid, Spain; ^fNeurosciences Unit, Oviedo Univ, Plaza de Feijoo sn, 33003 Oviedo, Spain (e-mail: manuillosadaruz@hotmail.com)

^aSurgery Unit Hospital Sureste, Camino Valdecipreste s/n, 28500 Arganda del Rey (Madrid), Spain; ^bGeneral Unit Surgery, Hospital del Henares, Avda. Maria Curie s.n., 28822 Coslada (Madrid), Spain; ^cNeurosciences Unit, Oviedo Univ., Plaza de Feijoo sn, 33003 Oviedo (Asturias), Spain; ^dSurgery Dpt Medicine School, UCM, Plaza Ramon y Cajal s/n, 28040 Madrid, Spain; ^eSurgery Dpt. Medicine School, UCM, Plaza Ramon y Cajal s/n, 28040 Madrid, Spain; ^fNeurosciences Unit, Oviedo Univ, Plaza de Feijoo sn, 33003 Oviedo, Spain (e-mail: manuillosadaruz@hotmail.com)

Introduction: Hepatic encephalopathy (HE) frequently develop memory alterations. We have studied the brain oxidative metabolism and its modification after spatial working memory task in rats with thioacetamide-cirrhosis.

Methods: 32 male Wistar rats: control ($n = 16$) and cirrhotic ($n = 16$), by thioacetamide administration (TAA) in drinking water for 12 weeks. Control rats received tap water during 12 weeks. Spatial working memory was evaluated in the Morris Water Maze. Quantitative cytochrome oxidase (COx) histochemistry by densitometric analysis was assessed in different brain areas.

Results: Basal COx activity was different in cirrhotic rats in hippocampal and thalamic regions ($p < 0.05$). In cirrhotic rats basal COx activity increased in the CA1 and CA3 hippocampus areas and reduced ($p < 0.05$) in the anterodorsal and anteroventral thalamic nuclei. Spatial working memory was impaired in cirrhotic animals. TAA-rats showed absence of metabolic activation of the CA3 hippocampal subfield and the lateral mammillary nucleus, as well as disturbance

of COx activity in the medial mammillary nucleus and the anteroventral thalamus ($p < 0.05$).

Conclusion: These findings suggest that cirrhotic rats suffer spatial working memory deficits that could be related to the metabolic activity impairments of neural regions thought to be involved in the processing of spatial memories.

P1d-27 Clinical effectiveness of SF in the liver surgery

M. Hatano, F. Kushihata, E. Ito, E. Yamamoto, Y. Ono, J. Watanabe, S. Yagi, Y. Kojima, T. Toyama, T. Yasugi, K. Honda and N. Kobayashi

1st Surgery, Ehime university, Shitsukawa Toon Ehime, 791-0295 Toon, Japan (e-mail: kusbi@m.ehime-u.ac.jp)

Introduction: SF (Soluble Factor) is a quantity of 3 body of the fibrin monomer origin. As clinical significance of SF, a thrombosis marker but the clinical significance in the liver surgery is not clear. Here we examined changes of SF in hepatectomy.

Materials/Methods: 23 liver surgery examples (including from Denver shunt to hepatic failure after hepatectomy and liver dysfunction due to excessive hepatectomy) were employed. We measured it by latex method and examined a correlation with clinical courses with other solidification fibrinolysis molecular markers.

Results: In lethal cases, high value SF (more than 15 $\mu\text{g/mL}$) was detected on early stage of DIC onset with the protraction of an excessive high value (more than 60). 2. In the Denver shunt case excessive high value of SF (more than 80) was confirmed on POD 1 and restored immediately. The fibrinolytic marker was about 1 day late and almost similar change in the SF.

Conclusions: High SF value can be a predictor of postoperative liver dysfunction

P1d-28 Case of a pancreaticopleural fistula successfully treated with ERCP and sphincterotomy

C. Chia^a, W. K. Wong^b and Y. C. Goh^a

^aSingapore General Hospital, Department of General Surgery, Block 6 Level 7, Outram Road, 169608 Singapore, Singapore; ^bSingapore General Hospital, Department of General Surgery, Outram Road, S169608 Singapore, Singapore (e-mail: clamchia@gmail.com)

Internal pancreatic fistulas are a rare but well described complication of pancreatitis. Pancreatico-pleural fistulas are a result of pancreatic duct disruption of pancreatic pseudocyst extension into the pleural cavity. It usually presents as a large recurrent pleural effusion on either side but they have been more commonly reported on the left. The incidence in chronic pancreatitis has been reported at 0.4–4.5%. We report a case of a 39 year old male who presented with recurrent large left pleural effusions which were drained. A pancreatico-pleural fistula was subsequently shown on ERCP and he was successfully treated with sphincterotomy. We discuss the pathophysiology and features of these fistulas as well as diagnostic tools and management. ERCP has been used as a diagnostic tool but has recently been gaining popularity as a therapeutic measure. It is a preferable option to surgery in less complicated cases. Pancreatic duct stenting during ERCP is an option but sphincterotomy should be preformed as well. We review the literature for cases managed with sphincterotomy solely.

P1d-29 Pancreaticoduodenectomy for periampullary adenocarcinoma: With or without vessels resection?

N. Vladov^a, E. Belokonski^a and K. Kjossev^b

^aMilitary Medical Academy, P.O.Box 159, 3 G. Sofijski Blvd., 1606 Sofia, Bulgaria; ^bMilitary Medical Academy, P.O.Box 159, 3, G. Sofijski Blvd, 1606 Sofia, Bulgaria (e-mail: ebelokonski@yahoo.com)

Background: This retrospective, single-institution trial was designed to evaluate the end points of mortality, morbidity, and survival in patients undergoing extended pancreaticoduodenectomy without vessels resection

versus the same procedure with vascular reconstruction for periampullary adenocarcinoma.

Materials and Methods: Between January 2003 through July 2008, 106 inpatients with periampullary cancer received pancreaticoduodenectomy with or without resection of the vessels. The population consists of 67 male and 36 female, mean aged 58, 21 years. The total of 26 patients underwent superior mesenteric vein and/or portal vein reconstruction, where prosthesis replacement was used in 5 instances.

Results: Twenty-two patients (20, 7%) required 1 to 3 reoperations during their index admission. The indications for reoperation including hemorrhage in 14 patients (43, 6%), pancreatic leak in 7 patients (21, 8%), intra-abdominal abscess in 4 patients (12, 5%), and fascial dehiscence in 1 patients (3, 1%). No postoperative complications were observed in 66 patients (62, 3%), whereas 40 patients (37, 7%) had 1 or more postoperative complications. Seven deaths occurred in-hospital or within 30 days of operation, for an operative mortality rate of 6, 6%. Overall survival rate was 16, 2 months.

Conclusions: We concluded that extended pancreaticoduodenectomy with vessels reconstruction can be sufficient alternative in the aspect of postoperative morbidity and nutritional support.

P1d-30 TN (R)C points system for cystic echinococcosis: clinical evaluating and monitoring of the disease

K. Kjossev^a, E. Belokonski^b and N. Vladov^b

^aMilitary Medical Academy, P.O.Box 159, 3, G. Sofijski Blvd, 1606 Sofia, Bulgaria; ^bMilitary Medical Academy, P.O.Box 159, 3 G. Sofijski Blvd., 1606 Sofia, Bulgaria (e-mail: kirien@abv.bg)

Introduction: The 2003 revision of the WHO-IWGE significantly improved the original 1997 formulation. The WHO system successfully assigns a grade representing the overall biological potential of hydatid cyst. Unfortunately the classification describes only single cyst. This makes it potentially applicable in 85–90% of the patients who, in fact, show single organ involvement, and harbor solitary cysts in 70% of the cases.

Methods: Here is presented TN (R)C classification as a scoring points-system for clinical assessment of CE. Based on currently used WHO-IWGE classification and adopted TN (R)C classification, this concept provides an opportunity to grade the cyst and the actual stage of the disease.

Results: According this system, the cystic lesions received 1 to 9 points and are divided into three grades for both non-recurrent and recurrent groups. All hydatid lesions start as purely cystic structures of Grade I. During the life cycle of parasite CE may become of Grade II or Grade III. The goal of therapy is to label the hydatid cyst of 0 or 1 points.

Conclusion: This system provides clinical assessment of the cyst as a basis of subsequent staging of the disease and comparison of surgical results. Further investigation and prospective trials are definitely needed.

P1d-31 The role of ischemia modified albumin in evaluation of splanchnic ischemia during laparoscopic cholecystectomy

H. Koksala^a, S. Kurban^b and M. Sahin^b

^aKonya Numune Hospital, Dept. of General Surgery, 42100 Konya, Turkey; ^bSelcuk University, Dept. of Biochemistry, 42100 Konya, Turkey; ^cSelcuk University, Dept. of General Surgery, 42100 Konya, Turkey (e-mail: drsahin@selcuk.edu.tr)

Introduction: Elevation of intraabdominal pressure by means of gas insufflation produces hemodynamic disturbances in the peritoneal viscera, leading to splanchnic ischemia is known. Recently, ischemia modified albumin (IMA) has been used determined ischemia conditions such as myocardial ischemia, skeletal muscle ischemia, pulmonary embolism and stroke. The purpose of this clinical investigation is to determine the role of IMA in evaluation of splanchnic ischemia during laparoscopic cholecystectomy.

Materials-Methods: Twenty two patients (F/M, 21/1) performed laparoscopic cholecystectomy (Group I) and 10 patients (F/M, 7/3) performed different surgical procedures underwent general anaesthesia (Group II) were instituted in this study. No patient had cardiovascular disease. Blood samples for IMA were collected at preoperative and peroperative periods.

Results: In Group I, the preoperative and peroperative IMA levels were 0.597 ± 0.163 absorbance units (ABSU) and 0.743 ± 0.179 ABSU, respectively. The peroperative IMA levels were higher than the preoperative ($p = 0.025$). In Group II, the preoperative and peroperative IMA levels were 0.434 ± 0.129 ABSU and 0.529 ± 0.155 ABSU, respectively. This difference was not significant, statistically ($p = 0.22$). The peroperative IMA levels of Group I were higher than Group II ($p = 0.003$).

Conclusions: IMA, a new sensitive marker for ischemia, can be helpful for determine splanchnic ischemia.

P1d-32 Surgical treatment of hepatic hydatid cyst: cysto-jejunostomy by stapling

M. Sahin^a, H. Koksall^b, H. Yilmaz^c and M. Cakir^a

^aSelcuk University, Dept. of General Surgery, 42100 Konya, Turkey; ^bKonya Numune Hospital, Dept. of General Surgery, 42100 Konya, Turkey; ^cOzel Konya Hospital, Dept. of General Surgery, 42100 Konya, Turkey (e-mail: drsabin@selcuk.edu.tr)

Choice of surgical treatment of hepatic hydatidosis (HH) depends on communication between the cyst and the bile ducts. However the ideal operation is still controversial. Herein, we reported partial cystectomy plus cystojejunostomy by stapler in a case with HH. A 36-year-old woman with HH was operated. The abdominal cavity was explored by a mercedes-type incision. A hydatid cyst located on the anterior superior of the right lobe just near the falciform ligament was seen. Partially cystectomy was performed. The cavity of the second cyst located on the posterolateral of the first one was opened more widely and large communications with the biliary tract were seen, so Roux-en-Y cystojejunostomy was decided. Forty cm away from the Trietz ligament, efferent loop was prepared and anvil of the circular stapler was placed. Stapler itself was placed from the anterior superior of the right lobe through both hepatic parenchyma and cyst wall. Cystojejunostomy was performed from the bottom of the cyst beside the left side of the hilar region by protecting left hepatic artery. Thirty cm away from the cystojejunostomy, jejunojunctionostomy was performed. In HH cases with communication between the cyst and bile ducts, partial cystectomy plus cystojejunostomy by stapler may be good choice.

P1d-33 Devices for the prevention of pancreatic fistula following distal pancreatectomy

J. Watanabe, F. Kushihata, E. Ito, M. Shirai, M. Hatano, E. Yamamoto, S. Yagi, Y. Kojima, T. Toyama, T. Yasugi, K. Honda and N. Kobayashi
1st Surgery, Ehime university, Shitsukawa Toon Ehime, 791-0295 Toon, Japan (e-mail: watanajo@m.ehime-u.ac.jp)

Introduction: Pancreatic fistula is one of the most common complications following distal pancreatectomy. Several surgical techniques and instruments have been advocated to prevent pancreatic fistula.

Patients and Methods: 23 cases of distal pancreatectomy were performed from April 2000 to December 2008 in our hospital. We compare conventional technique with our new stapling technique for pancreatic fistula. We evaluated the pancreatic fistula according to the international study group definition.

Results: Our conventional technique was the closer of the pancreatic stump with mattress sutures after ligation of the main pancreatic duct. In our new procedure, at first we carefully prepare to keep the anterior capsula of pancreas intact. We insert the cartridge side of an automatic stapler on the dorsal surface of the pancreas to close the main pancreatic duct in the dorsal side surely. We slowly apply the stapler in about 10 minutes and gradually crush the pancreatic parenchyma. We choose various cartridges depending on the pancreatic thickness and consistency. We performed 9 cases by conventional method and 14 cases by new staple technique. The postoperative pancreatic fistula was present in 44.4% of the patients in conventional group, while 21.4% in automatic suture group.

Conclusions: Our new procedure using an automatic staple instrument may prevent pancreatic fistula in distal pancreatectomy.

P1d-34 The utility and a pitfall of FDG-PET in a diagnosis of advanced and recurrent biliary tract cancer

F. Kushihata, E. Ito, M. Shirai, M. Hatano, E. Yamamoto, Y. Ono, J. Watanabe, S. Yagi, Y. Kojima, T. Toyama, T. Yasugi, K. Honda and N. Kobayashi

1st Surgery, Ehime university, Shitsukawa Toon Ehime, 791-0295 Toon, Japan (e-mail: kusbi@m.ehime-u.ac.jp)

Introduction: We aimed to assess a utility and a pitfall of FDG-PET as a diagnosis and functional image for advanced and recurrent biliary tract cancer.

Materials/Methods: In the biliary tract cancer which we experienced, it is an object in FDG-PET enforcement 21 examples (portal cholangiocarcinoma 6 examples, cholangiocarcinoma 8 examples, gallbladder cancer 6 examples, cancer of papilla Vater one example) as well as MDCT/US inspection. 1. We examine sensitivity and specificity of FDG-PET in the primary focus as well as metastasis one. 2. We examine and weigh degree of integration in the before and after therapy of the recurrence symptom example against therapy effect after excision.

Results: It is positive in all of primary focus and metastasis cases in the gallbladder cancer. It is positive in negative, metastasis focus all cases in primary focus 2 examples in the cholangiocarcinoma. We are negative in mucin producing cholangiocarcinoma, the PSC (primary sclerosing cholangitis) merger cholangiocarcinoma. In the recurrent cases, FDG-PET is effective for local recurrence/dissemination and the detection of the metastasis.

Conclusions: When using FDG-PET for biliary tract cancer, we should take an effect of inflammation into consideration about primary focus, metastasis and a judgment of an effect of therapy.

P1d-35 The influence of adenosine A2 receptor antagonist on oxygen free radicals and apoptosis during ischemia reperfusion injury in rat pancreas

S. Song and Y. Liu

Department of General Surgery, First University Hospital, China Medical University, 110001 Shenyang, China (e-mail: songsw10@hotmail.com)

Objective: To investigate the role of adenosine A2 receptor antagonist in protection from the production of oxygen free radicals and induction of apoptosis during ischemia and reperfusion injury in rat pancreas.

Methods: After 30 min clamping of subsplenic artery, normal saline (2ml/kg body weight) or A2 receptor antagonist CGS21680 (300 µg/kg body weight) was injected via dorsal penis vein, after 15min, 30min and 60 min reperfusion, the change of lipoperoxides (LPO), apoptosis and morphological in pancreas tissue were examined.

Results: Compared to the sham operation and experiment group, LPO and apoptosis increased significantly ($P < 0.05$ or $P < 0.01$) in control group, and the damage of pancreas was more serious.

Conclusion: adenosine A2 receptor antagonist can attenuate postischemic production of oxygen free radicals and induction of apoptosis in pancreas tissue, thereby minimized the ischemia reperfusion injury.

P1e - Infection

P1e-36 Usefulness of Vicryl plus sutures in preventing surgical site infection in sinus Pilonidal

S. A. Fanaei^a and S. A. Ziaee^b

^aBaqiyatallah Uni Med Science, vanak Sq. Molasadra Str., Baqiyatallah University, 1987964555 Tebran, Iran; ^bKerman Uni of Med Science, n = 24, Zarifnia Alley, Pesyan Str., Zaferanieh, 1987964555 Tebran, Iran

Introduction: Objective: To assess two techniques of primary closure after excision of Pilonidal sinus Design: Prospective randomized study.

Setting: Department of Surgery, Baqiyatallah University of Medical Science
Methods/Material: Subjects 245 patients with chronic Pilonidal sinus disease, 135 treated by Vicryl plus, and 110 by Vicryl.

Main Outcome: Infection and recurrence.

Results: There were no significant differences among the three groups with respect to age, sex distribution, frequency of recurrent disease, or follow-up periods ($P > 0.05$ for all comparisons). Significant disadvantage regarding postoperative infection rate, were noted for Vicryl, compared with Vicryl suturing following 1 week and 3 month after the procedure (19.09%, 12.72% versus 5.18%, 2.28% consecutively). Following a median follow-up period of 12 month, 6 recurrences (5.45%) developed in the Vicryl group, 2 (1.48%) in the Vicryl plus group.

Conclusion: Closure after excision of Pilonidal sinus with Vicryl plus is successful in the management of Pilonidal sinus and is superior to primary closure by Vicryl.

P11-67 Burn trauma induces early high mobility group box protein 1 (HMGB1) release in patients

J. Lantos^a, E. Roth^a, G. Weber^b, V. Földi^c and C. Csontos^c

^aUniversity of Pécs, Kodály Z. str. 20., H-7624 Pécs, Hungary; ^bUniversity of Pécs, Kodály Z. str. 20., H-7624 Pécs, Hungary; ^cUniversity of Pécs, Ifjúság str. 13., H-7624 Pécs, Hungary (e-mail: janos.lantos@aok.pte.hu)

Introduction: HMGB1 is a nuclear protein actively released from monocytes and macrophages or passively from necrotic or damaged cells. Experimental data suggest that burn injury is accompanied by plasma HMGB1 elevation, but there are only few data about its dynamism in patients. Our study aimed to follow up the time course and the prognostic value of plasma HMGB1 concentration in patients with severe burn injury.

Patients/methods: Twenty-six patients were involved in the study (21 males, 5 females, mean age: 48 ± 19 years). Blood samples were taken on admission and on the following 5 days. Concentration of plasma HMGB1 was measured by ELISA Kit (Shino-Test Corporation, Japan).

Results: HMGB1 concentration was elevated on admission with significant difference ($p = 0.0025$) between survivors (7.9 ± 1.9 ng/ml) and non-survivors (26.9 ± 5.4 ng/ml). Following this it gradually decreased. A positive correlation ($r = 0.748$, $p < 0.0001$) was found between burned body surface and HMGB1 level on admission. ROC analysis showed that at a level of 16 ng/ml HMGB1 predicted the lethality with 75.0% sensitivity and 85.7% specificity.

Conclusion: Burn trauma induces a very early HMGB1 release caused rather by necrosis than inflammation. HMGB1 correlates well with the extent of burn injury and has prognostic value. Supported by OTKA T060227.

P11-38 Clinical significance of EXDP in surgical SIRS

E. Ito, F. Kushihata, M. Hatano, E. Yamamoto, Y. Ono, J. Watanabe, S. Yagi, Y. Kojima, T. Toyama, T. Yasugi, K. Honda and N. Kobayashi
1st Surgery, Ehime university, Shitsukawa Toon Ehime, 791-0295 Toon, Japan (e-mail: kushi@m.ehime-u.ac.jp)

Introduction: The fibrin decomposition products (EXDP) rise in systemic inflammatory reaction syndrome (SIRS) and positive correlation have been pointed out. However it's biological mechanism and value is not clear. Here we examined clinical significance of EXDP in SIRS.

Materials/Methods: 36 cases diagnosed as SIRS according to the criteria of ACCP (American College of Chest Physicians) were examined about the correlation with the clinical course. EXDP assay, which measured by latex method, was performed for peritonitis, postoperative state (esophagectomy, hepatectomy, Denver shunt), advanced digestive cancer (pancreatic cancer, colon cancer). We performed comparison with the other solidification fibrinolysis molecular marker.

Results: 1. In the no eventful course we took the high value in order of TAT (Thrombin antithrombin), SF (soluble factor), and EXDP from POD1 and restored it in a preoperative value in about POD 7. As for the peak value, we were various without surgical stress (bleeding, operation time) and correlation. 2. In the critical case, high value of EXDP and SF was detected on early stage of DIC onset although it was restored immediately in a previous normal range.

Conclusions: EXDP in SIRS relates to a critical condition, and may be a prognostic factor.

P11-39 The effects of Kupffer cell blockade on hepatic and renal expression of heme oxygenase genes after biliary obstruction combined with sepsis

S. Ábrahám^a, E. Hermes^b, A. Szabó^c, Z. Jancsó^b, G. Lázár^d and G. J. Lázár^e

^aDepartment of Surgery, Pécsi u. 6., H-6720 Szeged, Hungary; ^bDept. of Biochem. and Mol. Biol., Közép fasor 52., H-6726 Szeged, Hungary; ^cInstitute of Surgical Research, Hungary, Szeged, Pécsi u. 6, H-6721 Szeged, Hungary; ^dInstitute of Pathophysiology, Semmelweis u. 1., H-6720 Szeged, Hungary; ^eDepartment of Surgery, Pécsi u. 6., H-6720 Szeged, Hungary (e-mail: szabolcs_abraham@freemail.hu)

Introduction: Macrophages are major sources of heme oxygenases (HOs), which have been shown to exert antioxidative and anti-inflammatory functions in many pathologies. In this study we have followed the renal and liver expression of two HO genes in response to bile duct ligation (BDL) combined with endotoxemia (ETX) with or without Kupffer cell blockade.

Methods: The expression of HO-1 and HO-2 were assessed by RT-PCR in liver and kidney biopsies in rats subjected to 3-days biliary obstruction (BDL), BDL combined with ETX (BDL+ETX, 1 mg/kg, $t = -2$ h) and sham operation (SH); in the presence or absence of gadolinium chloride pretreatment (GdCl₃, 10 mg/kg iv, $t = -24$ h). Serum levels of IL-6, TNF- α were also assessed.

Results: In SH animals HO-1 expression in the liver was 10 times higher than in the kidney. In the liver, BDL and BDL+ETX treatments increased HO-1 expression together with a rise in serum IL-6 and TNF- α levels. However, in the kidney HO-1 expression increased only after BDL+ETX treatment. GdCl₃ ameliorated the BDL+ETX-induced HO-1 expression in both organs and also reduced the serum TNF- α level.

Conclusion: HO-1 expression correlates with the severity of inflammatory reactions and cytokine releases after BDL and ETX. These responses can be ameliorated significantly by GdCl₃.

P11-40 Comparison of the maxilla and mandible displacement in distraction osteogenesis

G. Captier, M. Bigorre, C. Baumler, C. Herlin and A. Largey

CHRU Montpellier, Hôpital Lapeyronie, 34069 Montpellier, France (e-mail: g-captier@chu-montpellier.fr)

Subject: The anatomy of the maxilla and mandible are different to the long bone as the femur so the choose of the vector is more difficult. We report our experience of the DO and discussed the bone displacement.

Material and Method: Since 1997 DO was perform in 43 maxilla and 24 mandibles. Clinical and radiological review was done in each case to evaluate the bone displacement.

Results: The maxilla displacement was done forward by rigid external device in 34 cases and transversally by transpalatal intraoral device in nine cases. In each case a Lefort I osteotomy was performed. The mandible DO was done between the ramus and the corpus. The displacement was always in the three planes and tended to increase the angle.

Conclusion: The displacement of the maxilla is mainly a translation in the axial plane with two main vectors, forward or transversally, parallel to the osteotomy and the rotational component must be controlled. The main vector of the displacement of the mandible is an oblique sagittal plane, forward and downward, perpendicular to the osteotomy. The downward displacement of the ramus must be controlled with an anterior rotation of the corpus.

P1g - Methodology in surgical research

P1g-41 Intraoperative monitorization of IPTH in primary hyperparathyroidism (HPT)

A. Gómez Palacios^a, B. Barrios^b, J. Gómez Zabala^b, A. Expósito^b, B. Roca^b, M. Martínez^b, N. Egaña^b and J. Méndez Martín^c

^aHospital de Basurto., Av. Montevideo nº 18, Facultad de Medicina (UPV), 48013 Bilbao, Spain; ^bHospital de Basurto, Av. Montevideo nº 18, 48013 Bilbao, Spain; ^cHospital de Basurto., Av. Montevideo nº 18, Facultad de Medicina (UPV), 48013 Bilbao, Spain (e-mail: angel.gomezpalacios@osakidetza.net)

Introduction: Our study seeks: To evaluate how effective measuring intraoperative iPTH can be a marker of a cure in HPT. Establish the number of blood samples needed. To define what we understand as a basic sample.

Methods: We took five blood iPTH measurements intraoperatively on 50 patients with primary

HPT: three different baseline measurements, with and without bilateral cervical massage, and two more 10 and 25 minutes once the lesion was removed. A > 50% reduction in the iPTH value between post-resection samples and the base sample was accepted as a diagnostic and therapeutic criteria, and normalization of the calcemia as a cure criterion.

Results: Whenever the cause of the HPT was removed, there was statistically significant lowering of iPTH 10 and 25 minutes after surgery. The lowered iPTH had a cure prediction value. The postoperative calcemia figures returned to normal when the gradient was > 50. Cervical manipulation did not cause a rise in the baseline iPTH figures. Only two iPTH samples were needed: the baseline sample and the one removed 10 minutes after resection.

Conclusions: Intra-operative PTHi monitorization, with a gradient of > 50, is indicator of recovery. Only two PTHi samples are necessary. We define like basic sample the preoperative.

Introduction: Axillary surgery for breast cancer cause a significant amount of upper limb morbidity. The aim of this study is to evaluate the effects of axillary clearance/sentinel lymph node biopsy on the activities of daily living and the incidence of lymphoedema and upper limb morbidity objectively.

Methods: A 2 year prospective follow up of 13 patients who underwent axillary clearance/sentinel lymph node biopsy for breast cancer was carried out to evaluate the effects of axillary surgery on upper limb morbidity and activities of daily living. Preoperatively, patients were evaluated with a detailed questionnaire on activities of daily living, volume and range of movement of their upper limbs. After surgery, patients were similarly evaluated at 6 monthly intervals up to a period of 2 years.

Results: The effects of axillary clearance/sentinel lymph node biopsy on activities of daily living, range of movement of the upper limbs, symptoms of arm swelling and incidence of lymphoedema was analysed comparing pre op with post op measurements.

Conclusion: Axillary clearance/sentinel lymph node biopsy can affect shoulder movement and upper limb volumes as well as the activities of daily living. We describe a systematic method of measuring the morbidity of axillary clearance/sentinel lymph node biopsy objectively.

P1g-42 A prospective study of the upper limb morbidity following axillary surgery for breast cancer

C.A.J. Ong, R. Wijaya, H. Hosain and W. S. Yong

Singapore General Hospital, Outram Road, 169608 Singapore, Singapore (e-mail: jobnnyongsgb@yahoo.com.sg)

Poster Session II

- P2a - Miscellaneous - General topics
 P2b - Neurosurgery
 P2c - Organ and cell Transplantation
 P2d - Orthopaedic surgery and Traumatology
 P2e - Oto rhino laryngology, Stomatology and Ophtalmology
 P2f - Plastic and reconstructive surgery
 P2g - Robotics in surgery
 P2h - Surgical Anatomy
 P2i - Thoracic surgery
 P2j - Vascular surgery
 P2k - Wound healing

P2a - Miscellaneous - General topics

P2a-43 Antioxidant effect of N-acetylcysteine in liver ischemia-reperfusion injury following hemorrhagic shock

R. Camelo^a, A. Portella^b, M. Koike^c, L. Poli-De-Figueiredo^d and E. Montero^a

^a Universidade Federal de São Paulo, Rua Botucatu, 740, 04023-900 São Paulo, Brazil; ^b Fund Univ Federal do Rio Grande, Rua Eng. Alfredo Huch, 475, 96201-900 Rio Grande, Brazil; ^c Universidade Cidade de São Paulo, Rua Cesário Galeno, 448/475, 03071-000 São Paulo, Brazil; ^d Universidade de São Paulo, Rua Doutor Arnaldo, 455-4andar, 01246-903 São Paulo, Brazil (e-mail: edna.montero@gmail.com)

Introduction: Hemorrhagic shock (HS) is the main cause of early death in trauma and saline treatment has been pointed as an important factor leading to multiple organ dysfunction. N-acetylcysteine (NAC) is an antioxidant able to modulate the inflammation after ischemia-reperfusion. The aim of this study was to evaluate NAC effects on liver during resuscitation of HS.

Methods: Adult Wistar rats underwent HS (mean arterial pressure of 35 mmHg) followed by resuscitation with RL solution and blood (HSG group, n = 10), or the same procedure plus 2-doses of NAC 150 mg/kg, (HNG group, n = 10), and control group (CG group, n = 6).

Results: NAC did not affect arterial blood pressure. Hepatocyte necrosis was lower in CG (4.8 ± 0.6%), intermediate in HNG (9.7 ± 0.9%) and more frequent in HSG (16.4 ± 0.8%; p < 0.001). AST and ALT levels were similar between CG (255 ± 17U/L and 56 ± 7U/L, respectively) and HNG (209 ± 19U/L and 111 ± 13U/L, respectively), but higher in HSG (792 ± 102U/L and 525 ± 89U/L, respectively; p < 0.001 for both parameters). TBARS were similar between CG (70.3 ± 4.2 μmol/g) and HNG (66.8 ± 5.1 μmol/g), but higher in HSG (85.6 ± 3.3 μmol/g; p = 0.016). GSSG were different only between CG (0.23 ± 0.12 μg/g) and HSG (0.06 ± 0.01 μg/g; p = 0.025).

Conclusions: NAC could prevent liver cellular damage probably due to its antioxidative effect, even without modifying the arterial blood pressure.

P2a-44 Regulated factors related to duration of hospital stays in gastrointestinal cancer surgery

K. Ashikawa, H. Komoriyama and O. Takehito

St. Marianna Medical University, 1197-1, Yazasbi-cho, Asahi-ku, Yokohama-city, Kanagawa-ken, 241-0811 Yokohama, Japan (e-mail: ashikawa@marianna-u.ac.jp)

Introduction: Regulated factors related to duration of hospital stays in gastrointestinal cancer surgery were examined retrospectively.

Material/Methods: Subjects were totally 112 cases who had undergone gastrectomy for gastric cancer (35 cases) and colectomy for colon cancer (77 cases) at our department of surgery between January, 2007 to March, 2008.

They were classified duration of hospital stays based on ICD-10. Relationship of the length of hospital stay and those object patient's disease, past history of other disease, age, body mass index (BMI), serum albumin level, hemoglobin value, stage of disease, use of central venous catheter (CV), total meal intake situation after the operation were investigated.

Results: The mean length of the hospital stay was 25.5 ± 13.6 days (median 21 days, range 9–69 days). From this research, a long term-factors of hospital stays are serum albumin, hemoglobin, and progressed stage IV cancer became clear.

Conclusions: Low serum albumin is one of the nutritional index and progressed gastrointestinal patients are often low nutritional state. It is preferable that these factors are noted and appropriate nutrition management is executed for shortening days of hospital stay.

P2a-45 Evaluating the effectiveness of the Mini-CEX in the modern NHS -trainees' perspective

I. Arshad

Nottingham University, Medical Education Department, NG7 2UH Nottingham, United Kingdom (e-mail: ilyasarsbad@gmail.com)

Introduction: To evaluate the effectiveness of the Mini-CEX as a Work Place Based Assessment (WBPA) tool in the modern NHS.

Methods: Trainees were involved in a structured focus group interview. Once analysed, a questionnaire was constructed to evaluate the effectiveness of the Mini-CEX. Main outcome included whether the Mini-CEX was being used as intended. Results were statistically analysed.

Results: In our sample, 70% of Educational Supervisors do not carry out the Mini-CEX as it is intended to be carried out. Of the Mini-CEX's that are reported to be carried out as intended, on further examination 48% of these are not carried out as intended. 64% of trainees are not observed for 15–20 minutes. 56% of trainees do not receive 5–10 minutes of feedback. 88% of trainees do not believe that all Mini-CEX trainers are trained in their use. 88% of Mini-CEXs are carried out retrospectively and similarly to the Case Based Discussion (CBD). The reliability of the questionnaire used was 0.633 (95% CI 0.465–0.766).

Conclusions: The majority of Mini-CEXs are not carried out as intended and as such lose their educational and training value. The Mini-CEX is in need of modification if it's continued to be used.

P2a-46 Preoperative calorie restriction is feasible in a clinical setting

T. Van Ginhoven, M. Timmermans, M. Verweij, J. Mitchell,

J. Hoijmakers, R. Bruin and J. Ijzermans

Erasmus MC, dr. Molewaterplein 50, 3015 GE Rotterdam, Netherlands (e-mail: t.vanginhoven@erasmusmc.nl)

Introduction: Calorie restriction (CR), a reduction in energy intake without malnutrition, is a non-invasive intervention that increases lifespan in animals and stress resistance to different challenges. We hypothesized that short-term CR is able to confer protection against surgical stress and therefore investigated the feasibility of short-term preoperative CR.

Materials and methods: Thirty people participating in a live kidney donation program were included. The average daily calorie intake for each participant was estimated using food record forms. Calorie intake was reduced by 30% four, three and two days before the operation, and breakfast only on the day before surgery followed by 24 hours water-only fasting.

Results: Sixteen of the seventeen people adhered rigorously to their prescribed diets. The control group consumed the same amount of calories per day during the observation period and preoperatively. None indicated that they would refuse participation in a similar study in the future. Postoperative well-being and appetite were not influenced by the diet.

Conclusion: A short-term preoperative CR regimen is feasible in the clinical situation, and does not negatively influence post-operative well-being. Therefore preoperative CR may be explored for its ability to protect against surgical stress.

P2b - Neurosurgery

P2b-47 Localization of the temporal transverse gyrus of Heschl on neuronavigation MRI for cortical stimulation in chronic tinnitus

E. Simon^a, X. Perrot^b, M. Linné^a, F. Cotton^c, L. Collet^b, M. Sindou^a and P. Mertens^a

^aDepartment of Neurosurgery, Hôpital Neurologique, 69003 Lyon, France; ^bDepartment of Audiology, Centre Hospitalier Lyon-Sud, 69495 Pierre-Bénite, France; ^cDepartment of Radiology, Centre Hospitalier Lyon-Sud, 69495 Pierre-Bénite, France (e-mail: emile.simon@chu-lyon.fr)

Introduction: Subjective tinnitus can be considered as auditory phantom phenomena related to a reorganization of the auditory cortex. Recent studies show that magnetic or electrical stimulations of the cortex could alleviate some tinnitus. The objective of this work is to specify the landmarks that can be used on imaging to locate the target of this stimulation.

Material & methods: Sixty patients with chronic unilateral tinnitus participated in this study. A brain anatomical 3D T1 MRI was done. The MRIs were reformatted in a Talairach space, then the following steps were conducted: morphometry; location of the target of stimulation (junction internal third - medium third of the first gyrus of Heschl) relative to the external and cortical landmarks; coordinates of the target in the AC-PC plane. Since the procedure was done manually, the inter-observer variability was calculated for two independent observers.

Results: The morphological data, the average coordinates of the target point of stimulation after normalization and the distances from the cortical and external landmarks will be presented.

Conclusions: The choice of the stimulation target was in the middle of the primary auditory cortex as defined by electrophysiological and cytoarchitectonic data. The MRI gives a reliable identification of this target.

P2c - Organ and cell Transplantation

P2c-48 Development of a bioengineered human connective tissue substitute for use in abdominal surgery

E. Garcia-Abril^a, M. López-Cantarero^b, A. Montalvo^c, R. Nieto-Aguilar^c, M. Alaminos^d and A. Campos^e

^aUniversity Hospital San Cecilio, Dept. of Surgery, Avenida Doctor Olóriz, 16, 18012 Granada, Spain; ^bUniversity Hospital San Cecilio, Avenida Doctor Olóriz, 16, 18012 Granada, Spain; ^cUniversity of Granada, Avda. de Madrid nº 11, 18071 Granada, Spain; ^dUniversity of Granada, Histology, Avenida de Madrid 11, 18071 Granada, Spain; ^eUniversity of Granada, Histology, Avda. de Madrid nº 11, 18071 Granada, Spain (e-mail: edugarabril@accirujanos.es)

Introduction: Reconstruction of large abdominal wall defects is often challenging, especially in cases with infection, suture dehiscence or extensive tissue loss. In this work, we developed a new model of abdominal wall tissue substitute generated in the laboratory by tissue engineering.

Materials/Methods: Human fibroblasts were isolated from biopsies of healthy donors submitted to minor surgery under local anesthesia, using enzymatic methods. Once the cell cultures reached confluence, an artificial substitute of the connective tissue was developed by using a fibrin-agarose scaffold with the human fibroblasts subcultured within. Histological analysis was carried out by light microscopy, and detection of the expression of collagen types I, III and IV was performed by immunohistochemistry.

Results: Histological analysis of the human tissue substitutes revealed that the structure of these tissues was partially equivalent to that of the native tissues. The artificial tissues expressed high amounts of collagens I, III and IV starting from day 7 of maturation ex vivo, with the progressive substitution of the fibrin lattice by collagen fibers.

Conclusions: These results suggest that our model of artificial connective tissue show several similarities with native human tissues and could eventually be used for clinical purposes. Supported by SAS P1132/2007 and P06-CTS-02191.

P2c-49 Ex-vivo cultivation of viable epithelial and stromal urethral cells for use in tissue engineering

E. García-Abril^a, F. Valle^b, C. Marañes^c, F. Martín-Cano^c, A. Zuluaga^b, M. Alaminos^d, R. Fernández-Valadés^c and A. Campos^e

^aUniversity Hospital San Cecilio, Dept. of Surgery, Avenida Doctor Olóriz, 16, 18012 Granada, Spain; ^bUniversity Hospital San Cecilio, Urology, Avenida Doctor Olóriz, 16, 18012 Granada, Spain; ^cHospital Virgen de las Nieves, Pediatric Surgery, Avd. Fuerzas Armadas S/N, 18071 Granada, Spain; ^dUniversity of Granada, Histology, Avenida de Madrid 11, 18071 Granada, Spain; ^eUniversity of Granada, Histology, Avda. de Madrid nº 11, 18071 Granada, Spain (e-mail: edugarabril@accirujanos.es)

Introduction: Congenital or acquired diseases of the urethra are usually managed by using autologous tissue grafts. However, the reparation of large stenosis or malformations is highly dependent on the accessibility of healthy tissues available for grafting. Therefore, new sources of urethral tissue for clinical use are in need.

Materials/methods: Ten urethral biopsies were obtained from laboratory rats. To isolate the urethral epithelial cells, the biopsies were treated with dispase-II, whereas the stromal cells were obtained by collagenase-I digestion. Stromal cells were cultured in DMEM culture medium and epithelial cells were cultured in media supplemented with several growth factors.

Results: Stromal cells showed adhesion to the culture flasks after 24 h and exhibited a very fast growth ex vivo, reaching confluence in 8 days. Urethral epithelial cells proliferated at a lower rate, with the formation of small island colonies that tended to expand throughout the culture flask from the day 12th of culture.

Conclusions: These results suggest that establishment of both epithelial and stromal urethral cell cultures is possible in laboratory. The potential utility of these cultures is unlimited, from tissue engineering to the possibility of carrying out different pharmacological and genetic assays on cultured cells. Supported by FIS PI07/331.

P2c-50 Biomechanical properties of an artificial abdominal wall substitute developed by tissue engineering

E. García-Abril^a, A. I. Gómez -Sotelo^b, M. López-Cantarero^b, I. Garzón^c, D. Serrato^c, A. Campos^d and M. Alaminos^e

^aUniversity Hospital San Cecilio, Dept. of Surgery, Avenida Doctor Olóriz, 16, 18012 Granada, Spain; ^bUniversity Hospital San Cecilio, Avenida Doctor Olóriz, 16, 18012 Granada, Spain; ^cUniversity of Granada, Avda. de Madrid nº 11, 18071 Granada, Spain; ^dUniversity of Granada, Histology, Avda. de Madrid nº 11, 18071 Granada, Spain; ^eUniversity of Granada, Histology, Avenida de Madrid 11, 18071 Granada, Spain (e-mail: edugarabril@accirujanos.es)

Introduction: Tissue engineering could represent an advance in the field of the reconstructive surgery. In this work, we have developed different abdominal wall substitutes by tissue engineering using fibrin and agarose as biomaterials.

Materials and methods: Human fibroblasts were isolated and cultured from biopsies of the abdominal wall aponeurosis using enzymatic methods. Once confluent, fibroblasts cultures were used for the development of different abdominal wall substitutes with similar thickness with the human fibroblasts subcultured within: 1. Fibrin-agarose scaffolds. 2. Polyglactin 910 mesh embedded in fibrin-agarose scaffolds. 3. Polypropylene-Polyglactin 910 mesh embedded in fibrin-agarose scaffolds. 4. Polypropylene mesh embedded in fibrin-agarose scaffolds. After 21 days in culture, the thickness and stiffness of each abdominal wall substitute were determined.

Results: The results show that the highest thickness corresponded to Polyglactin 910 substitutes (4.3 mm), whereas the lowest was found in Polypropylene constructs (2.1 mm). The use of non-absorbable materials improved the stiffness and suturability of the abdominal wall substitutes.

Conclusion: The methods described in this work allowed us to generate efficient substitutes of the abdominal wall by tissue engineering, suggesting that polyglactin 910 scaffolds show the best biomechanical properties for clinical use. Supported by SAS P1132/2007 and P06-CTS-02191.

P2c-51 Attenuation of liver ischemia and reperfusion injury due to oxygen free radicals and apoptosis by pretreatment with Calcitonin gene related peptide

S. Song, K. Guo and Y. Liu

Department of General Surgery, First University Hospital, China Medical University, 110001 Shenyang, China (e-mail: songsw10@hotmail.com)

Introduction: Our objective was to investigate the protective effect of exogenous Calcitonin gene related peptide in attenuation of liver ischemia reperfusion injury due to oxygen free radicals and apoptosis.

Materials/Methods: Rat livers were harvested and perfused via the portal vein with 60 ml of 4°C HTK solution from control group or perfused with HTK solution containing Calcitonin gene related peptide (3 µg/10g body weight) from experiment group. After 24 hours cold storage the liver functional integrity was evaluated by isolated reperfusion.

Results: Compared to the control livers, CGRP treated livers were characterized by a significantly decreased alanine aminotransferase and glutamate-lactate dehydrogenase leakage during reperfusion and portal venous pressure (2.0 ± 0.3 versus 4.0 ± 0.4 mmHg; $P < 0.01$). Bile production (8.56 ± 0.76 versus 3.34 ± 0.68 µl/g/45min; $P < 0.01$), oxygen consumption (5.14 ± 0.4 versus 2.57 ± 0.2 ; $P < 0.01$) and the total adenine nucleotides (11.1 ± 0.71 versus 7.02 ± 0.53 µmol/g; $P < 0.01$) upon reperfusion were significantly increased. The percentage of TUNEL positive cells (4.1 ± 0.67 versus 8.0 ± 1.27 ; $P < 0.05$), Perfusate levels of low molecular weight histone-associated DNA fragments (0.36 ± 0.04 versus 0.53 ± 0.06 AU; $P < 0.05$) and lipoperoxides (0.12 ± 0.02 versus 0.36 ± 0.04 nmol/g; $P < 0.01$) were also decreased significantly, coupled with strong 5'-nucleotidase and LDH activity staining.

Conclusion: CGRP can ameliorate the liver ischemia reperfusion injury due to oxygen and apoptosis.

P2c-52 Expression and induction of cytochrome P450 activity in cryopreserved porcine hepatocytes

R. Cursio^a, E. Baldini^a, G. Desousa^b, A. Margara^a, J. Honiger^c, M. C. Saint-Paul^d, P. Bayer^a, V. Raimondi^a, R. Rahmani^b, J. Mouiel^a and J. Gugenheim^a

^aLab. de Recherches Chirurgicales, Univ. de Nice Sophia Antipolis, 06107 Nice, France; ^bLab. Pharma-Toxicologie, INRA, 06903 Antibes, France; ^cINSERM U420, Univ. Paris V, 75008 Paris, France; ^dService d'Anatomo-Pathologie, Univ. de Nice Sophia Antipolis, 06107 Nice, France (e-mail: cursio@unice.fr)

Introduction: Cryopreservation of porcine hepatocytes for their use in bioartificial liver devices may result in reduced cytochrome P450 (CYP) enzyme activity. The aim of this study was to assess cytochrome P450 enzyme activity and the effects of its induction in long-term cryopreserved porcine hepatocytes.

Materials/Methods: Isolated porcine hepatocytes were cryopreserved for 1 month, thawed and cultured for 3 days. During medium culture, hepatocytes were exposed to different cytochrome P450 inducers. Cytochrome P450 enzyme activities were determined by immunoblotting and EROD assay.

Results: CYP1A2 protein levels were significantly increased when exposed to 3-methylcholantrene compared to other cytochrome P450 inducers. CYP2E1 protein levels were constantly detected in cryopreserved porcine hepatocytes. CYP inducers did not modify CYP2E1 protein levels, whereas CYP3A4 protein levels were significantly increased by rifampicin and phenobarbital. EROD activity was significantly increased by phenobarbital and 3-methylcholantrene compared to other cytochrome P450 inducers.

Conclusions: Long-term cryopreserved porcine hepatocytes do maintain cytochrome P450 activity and exposition to several cytochrome P450 inducers does increase this activity.

P2c-53 Changes of oxidative stress on skin cancer-screened patients following solid organ transplantation

T. Fekecs^a, Z. Kadar^a, B. Csete^a, Z. Battyani^a, K. Kalmar-Nagy^b, P. Szakaly^b, P. Horváth Örs^c, E. Roth^a, G. Weber^a and A. Ferencz^d

^aUniversity of Pécs, Kodály Z Street 20, H-7624 Pécs, Hungary; ^bUniversity of Pécs, Ifjuság Street 13, H-7624 Pécs, Hungary; ^cUniversity of Pécs, Ifjuság u.13, 7624 Pécs, Hungary; ^dUniversity of Pécs, Kodály Z. str.20., H-7624 Pécs, Hungary (e-mail: andrea.ferencz@aok.pte.hu)

Transplant patients are at high risk of developing nonmelanoma skin cancer (NMSC). Ultraviolet radiation can generate oxygen free radicals (OFRs) leading to oxidative stress and carcinogenesis mainly under immunosuppression. In this study we examined changes of oxidative stress parameters on transplanted patients with or without NMSC. 116 adult, white skin-typed transplanted (kidney, simultaneous pancreas-kidney) patients have been involved. Dermatology follow-up have resulted 16 NMSC (13.8%). To monitor oxidative stress peripheral blood samples were collected to measure malondialdehyde (MDA), reduced glutathione (GSH), SH-groups, OFRs, and the activity of myeloperoxidase (MPO), superoxide dismutase (SOD) and catalase (CAT) by spectrophotometry. Our results showed, that patients without NMSC MDA concentration significantly elevated compare to healthy controls ($p < 0.05$). GSH level remained in the normal range, but SH-groups are significantly increased ($66.68 \pm 5, 8$ versus 40 nmol/ml). Total production of OFRs, CAT and MPO activity were in normal level. However, SOD activity elevated significantly (877 ± 25.9 versus 500 IU/ml). These markers changed on the same tendency in patients with NMSC. Preliminary research indicate that, exists an imbalance between pro- and antioxidant status on transplanted patients. According to examined parameters significant difference were not found in patients with or without NMSC. Thus, further studies are needed to elucidate these problems.

P2c-54 Incidence of non-melanoma skin cancer following human solid organ transplantation

T. Fekecs^a, Z. Kadar^a, B. Csete^a, Z. Battyani^a, K. Kalmar-Nagy^b, P. Szakaly^b, P. Horváth Örs^c, E. Roth^a, G. Weber^a and A. Ferencz^d

^aUniversity of Pécs, Kodály Z Street 20, H-7624 Pécs, Hungary; ^bUniversity of Pécs, Ifjuság Street 13, H-7624 Pécs, Hungary; ^cUniversity of Pécs, Ifjuság u.13, 7624 Pécs, Hungary; ^dUniversity of Pécs, Kodály Z. str.20., H-7624 Pécs, Hungary (e-mail: andrea.ferencz@aok.pte.hu)

Increasing evidence, that nonmelanoma skin cancers (NMSC) are the most frequent tumours in transplanted patients. The present study aimed to set going first Hungarian dermatological screening program to establish the incidence of NMSC after organ transplantations. 116 adult, white skin-typed transplanted (kidney, simultaneous pancreas-kidney) patients (70 male, 46 female; median age: 49.3 years) have been involved from September of 2008 on the Surgical Clinic of Pécs University. All patients were examined by one dermatologist for NMSC by a full skin examination, and they filled a standardized questionnaire. Screening resulted 16 NMSC (13.8%, median age: 60 years, male/female = 1 : 1) with a median duration since transplantation of 4.1 years. Histology showed 13 basal cell carcinoma (BBC), 3 squamous cell carcinoma (SCC), and the ratio of BBC/SCC was 4:1. Incidence of NMSC was significantly higher on patients using cyclosporine as immunosuppressant (16 versus 1, $p < 0.05$), who had more than 2 sunburn prior to transplantation (11 versus 5), or had outdoor workplace (16 versus 1). These data indicate the relevance of skin cancer surveillance for transplant recipients and the closed-cooperation between Transplantation and Dermatological Centres. Our results correspond with the international statistics, excepting BBC/SCC ratio. So, further studies are needed to elucidate this difference.

P2c-55 The indicative force of erythrocyte aggregation changes in comparison of splenectomy and spleen autotransplantation in beagle dogs

F. Kiss^a, N. Nemeth^a, E. Sajtos^a, E. Brath^a, T. Hever^a, L. Matyas^a, O. Baskurt^b, I. Furka^a and I. Miko^a

^aDept. of Op. Tech. Surg. Res., University of Debrecen, Nagyerdei krt 98., 4032 Debrecen, Hungary; ^bDepartment of Physiology, Akdeniz University, Dumlupinar Blv., 07070 Antalya, Turkey (e-mail: ferenc_k@yahoo.com)

Introduction: Using "Furka's spleen-chip" autotransplantation technique, besides comprehensive hematological, hemostaseological, immunological, functional imaging and histological examinations, we focused on erythrocyte aggregation and its influencing factors regarding to asplenic or hyposplenic conditions.

Materials/Methods: 16 healthy beagle dogs were equally divided into 4 experimental groups: "SE"-splenectomy, "AU5" and "AU10"-autotransplantation with 5 or 10 spleen chips by Furka-method after splenectomy, "SH"-sham-operated control. Blood sampling for current investigation occurred on the 12th-18th-20th and 24th postoperative month. Aggregation properties of erythrocytes in native samples and of density separated "young" and "old" erythrocytes (Myrenne MA-1 aggregometer), fibrinogen concentration (Sysmex CA-500 coagulometer) and erythrocyte sedimentation rate (ESR) were determined.

Results: SE group showed an elevated ratio of "old" and "young" erythrocyte aggregation index on the 20th and 24th postoperative months (1.5 and 2.16, respectively) comparing to the AU (1.14 and 1.05) and SH groups (1.2 and 1.27). In SE group fibrinogen concentration was mildly higher and ESR almost doubled *versus* control.

Conclusions: The greater the difference of "young" and "old" erythrocytes, the more decreased the splenic filtration function. Consequently, comparison of aggregation properties of "young" and "old" erythrocytes may give important information about the function of the spleen. Grants: OTKA-T-049331, ETT-387/2006, BILAT-TR03/2006.

P2d - Orthopaedic surgery and Traumatology

P2d-56 Soft tissue wounds evoke reaction of the lymphatic system -does it correlate with healing?

W. Olszewski^a, J. Cwikla^b, M. Cakala^a and M. Durlik^a

^aMedical Research Centre, 5 Pawinskiego Str., 02-106 Warsaw, Poland; ^bCentral Clinical Hospital, 137 Woloska Str., 02-507 Warsaw, Poland (e-mail: wlo@cmdik.pan.pl)

Introduction: Wound and fracture healing until recently seemed to be a local tissue process. Advances in visualizing the lymphatic network and nodes have shown that it is a systemic event as each type of tissue damage is reflected in lymphatics draining the site of injury and in organized lymphoid tissue.

Aim: Lymphoscintigraphic evaluation of changes in lymphatics and nodes in external and internal wounds of lower limbs.

Material & methods: Patient groups: 1. Closed 2 fractures, 2. traumatic wounds and ulcers of soft tissues. Lymphoscintigraphy was performed with 99mTc Nannocol (3mCi). The inguinal (lymph nodes), thigh (lymphatics) and calf (lymphatics) areas were evaluated.

Results: There were 30 males and 50 females. Duration of edema was 133 ± 123 months. Group 1 was characterized by enlarged nodes and dilated lymphatics. The node ratio values were 1.569, of thigh 1.42 and of calf 2.2. Group 2 was characterized by enlarged nodes with ratio 1.18, thigh 2.84 and calf 1.9. Generally, with longer duration of edema more advances destructive changes with decreasing ratio were seen in inguinal nodes and subsequently dilatation of peripheral lymphatics.

Conclusions: Lymphoscintigraphic imaging after lower limb tissues and bones injuries is helpful in evaluating systemic reaction to local injury, especially in non-healing wounds.

P2e - Oto rhino laryngology, Stomatology and Ophthalmology

P2e-57 Head and neck cancer tissue bank and clinical database as a basis for collaborative research

A. Ovari^a, P. Vasas^b and G. Repassy^a

^aDepartment of Oto-Rhino-Laryngol, Semmelweis University, Szigony u. 36., 1083 Budapest, Hungary; ^bUniversity College London, 235 Euston Road, NW1 2BU London, United Kingdom (e-mail: vasasdr@gmail.com)

Introduction: In the era of genetic and epigenetic research there is a wide need for precisely planned and organised tissue banks with relevant clinical database. It is important that different research centres collaborate and share with each other their tissue samples and datasets. Collaboration dramatically increases the impact of statistical measurements, and saves money and time. The network of tissue banks (biobanks) facilitates various researchers to exchange ideas, tumour specimens and promote collaboration between units.

Materials/methods: In the common areas of the upper aero-digestive tract (mouth, throat, larynx) squamous cell carcinoma (HNSCC) is the predominant diagnosis. At the Department of Oto-Rhino-Laryngology, Head and Neck Surgery, Semmelweis University, Budapest, Hungary we established a HNSCC tissue bank in 2007. By collaboration with other departments there are 57 patient's tumour samples stored in the bank, with an up-to-date clinical database. These patients underwent surgical or combined therapy and were previously untreated at the time of sampling. Our biobank can be searched at www.biobank.hu. and HNSCC tissue samples are available for collaborative genetic, epigenetic or proteomic research.

Conclusions: Research projects and collaboration based on tissue bank samples with clinical databases can lead to new drug targets, personalised therapy, and prediction and prevention of HNSCC.

P2e-58 Effect of surface coating on short term osseointegration of dental implants: a histological study in dog

C. Taleb Bendiab^a, L. Khaldi^a, J. Victoria Herrera^b, H. Tournier^a, C. Laroque^c, J. H. Torres^a and F. Cuisinier^a

^aLabo BioSané-Nanoscience EA-4203, 545, Ave Prof. VIOLA, 34193 Montpellier, France; ^bSan Luis Potosi University, Av. Manuel NAVA #2, 78000 San Luis Potosi, Mexico; ^cIRCM, CRLC Val d'Aurelle-Paul Lamarque, 34298 Montpellier, France (e-mail: cbakib_taleb_bendiab@yahoo.fr)

Introduction: Inorganic-Organic NanoComposites (IONC) formed by sequential adsorption have been evaluated as coatings for titanium dental implant in an animal (rabbit) study. Biochemical investigations showed that alpha-casein is a very interesting and promising component to improve IONC properties, such as osseointegration speed enhancement. Here we evaluate the physicochemical and biological properties of IONC containing alpha-casein in a histological dog-model study.

Material & Methods: Sixteen Ankylos titanium implants (Dentply Friadent, Germany) divided in 3 groups (6 treated with the casein-PLL-ACP coating, 6 with the PGA-PLL-ACP coating, and 4 without coating) were inserted within the jaws of two Creole dogs. After two different healing periods the animals were euthanized. Non decalcified transverse sections were analysed by light microscopy and observed by scanning electron microscopy.

Results: Both healing periods were complication-free. After healing, all implants were tightly anchored in the jaws. None of the radiographs showed signs of peri-implant radiolucency. All 16 implants achieved osseointegration demonstrating direct bone contact.

Conclusion: Coatings of titanium Ankylos implants by IONC allows osseointegration of the implants in dog with the same success as observed for rabbits confirming the great potential of this method. Results have to be validated in human clinical study.

P2f - Plastic and reconstructive surgery

P2f-59 Internal mammary vessel exposure with total rib preservation during free flap breast reconstruction - Technique and pitfalls

M. Dicandia^a, M. Moses^a, Z. Mickute^a and C. Malata^b

^aAdenbrooke's Hospital Cambridge, Hills Road, CB2 0QQ Cambridge, United Kingdom; ^bDep. Plastic & Reconstr. Surgery, Addenbrooke's Hospital, Box 186, Hills Road, CB2 2QQ Cambridge, United Kingdom (e-mail: mdicandia@doctors.net.uk)

Introduction: The internal mammary vessels are increasingly the recipients for free flap breast reconstruction. Access traditionally entails removing a segment of the 3rd costal cartilage. Despite excellent exposure, some authors have reported localised tenderness as well as a thoracic contour deformity. We introduced this technique after specific request by a patient, and have used it for all subsequent reconstructions.

Methods: Patients who underwent breast reconstruction with rib preservation were identified prospectively. Measurements were taken intraoperatively to assess the space available for microvascular anastomosis. Operative details and flap outcomes were compared with a cohort of earlier patients.

Key Results: A single surgeon performed 20 free flap breast reconstructions in 16 patients (18 DIEPS, 2 TRAMs). In the first 4 patients the interspace between the 3rd and 4th ribs was used; subsequently that between the 2nd and 3rd ribs. There was no significant difference in mean ischaemia or operative times. The average distance between adjacent ribs was 21.2 mm (13 to 25mm). All flaps were successful.

Conclusions: Rib preservation is a viable and reliable option for microvascular breast reconstruction. It does not increase operative time and reduces recipient site morbidity. There is a learning curve and care has to be taken to avoid possible pitfalls.

P2f-60 Internal mammary lymph node biopsy in microvascular free flap breast reconstruction: a useful technique?

J. Yu^a, M. Absar^b, E. Provenzano^c and C. Malata^a

^aDep. Plastic & Reconstr. Surgery, Addenbrooke's Hospital, Box 186, Hills Road, CB2 2QQ Cambridge, United Kingdom; ^bCambridge Breast Unit, Addenbrooke's Hospital, Hills Road, CB2 2QQ Cambridge, United Kingdom; ^cDepartment of Histopathology, Addenbrooke's Hospital, Hills Road, CB2 2QQ Cambridge, United Kingdom (e-mail: jtsy2@cam.ac.uk)

Introduction: During internal mammary vessel preparation for free flap breast reconstruction (FFBR), internal mammary lymph nodes (IMLN) are occasionally encountered. This provides an opportunity for their excisional biopsy, a procedure which is otherwise difficult to perform due to their location.

Methods: Patients who had biopsies of suspicious IMLNs during FFBR (1998–2008) were retrospectively reviewed for tumour characteristics, surgical details and pre and post-reconstruction treatment. Their slides were then independently reviewed by a pathologist to verify the original histological findings.

Results: 36 patients (median age = 47.6 years, range = 33–70) had 39 suspicious IMLNs biopsied. Six LNs (15%) in 5 patients (four immediate, one delayed reconstruction) contained metastasis of invasive ductal (4) and lobular (1) carcinoma. The disease was upstaged in all patients necessitating additional radiotherapy (4 patients) or chemotherapy (5 patients). Three patients (60%) died after a median survival from reconstruction of 33 months (range = 23–35) versus 0/31 in the negative biopsy group.

Conclusions: Enlarged/obvious IMLNs discovered during FFBR may contain metastases and therefore upstage disease and significantly alter patient management. We therefore recommend routine biopsy of any encountered LNs to avoid oncologically disadvantaging the patient. We also propose intraoperative blue dye SLNBx for patients undergoing immediate FFBR to facilitate identification of occult IMLN metastases.

P2f-61 Use of topical vasodilators in microvascular surgery in UK plastic surgery departments

J. Yu, A. Patel and C. Malata

^dDep. Plastic & Reconstr. Surgery, Addenbrooke's Hospital, Box 186, Hills Road, CB2 2QQ Cambridge, United Kingdom (e-mail: jtsy2@cam.ac.uk)

Introduction: Topical vasodilators are widely used in microvascular surgery to minimise vasospasm, dilate vessels, and facilitate microvascular anastomoses. The aim of our study was to survey the use of topical vasodilators in the UK, as there is a paucity of information in the Plastic Surgical literature on this topic.

Methods: Email questionnaires were sent to 281 Consultant Plastic Surgeons in the UK and Ireland (as listed in the BAPRAS Members & Associates 2008 Booklet) asking specific questions regarding vasodilator usage.

Results: The questionnaire response rate was only 30% but this represented 35 out of 49 'Main' Plastic Surgery Units. Almost all (94%) respondents used vasodilators with 58% during all procedures. The most commonly used agents were papaverine (52%), verapamil (47%), and local anaesthetics (27%). Nearly all (98.7%) users applied the vasodilator topically, whereas 18% used it intraluminally. The main stated reasons for their use were largely empirical (41.8%), habit (20.9%) and "that it works" (16.4%).

Conclusions: The use of topical vasodilators in microvascular surgery in the UK is widespread, although there is little evidence base for this. Use is largely based on history and habit. Future clinical and experimental studies are needed to establish a scientific basis for this practice.

P2f-62 Mesh implantation is better than suture repair even in small abdominal wall hernias. (randomized, prospective, multicenter clinical trial)

S. Horvath^a, J. Baracs^b, I. Takacs^a, P. Horváth Örs^c and G. Weber^a

^aUniversity of Pécs, Kodály Z. str. 20., H-7624 Pécs, Hungary; ^bSurgical Dept. Univ. of Pécs, 13 Ifjuság str., 7624 Pécs, Hungary; ^cUniversity of Pécs, Ifjuság u.13, 7624 Pécs, Hungary (e-mail: szabiborvath@gmail.com)

Background: Abdominal wall hernia is the most common complication after abdominal surgery. The usage of surgical meshes in small hernia reconstruction is controversial. The aim of this study was to compare long-term results of mesh-performed and suture repair of open abdominal wall reconstruction.

Methods: A five-year randomised, multicenter, internet-based, clinical trial has been started in 2002. During the inclusion period 364 patients were enrolled with small abdominal wall hernia (size of hernia is between 5–25 cm²). Suture repair was performed in 184, and sublay mesh repair in 180 cases.

Results: The recurrence rate was 27, 17% (50 cases out of 184) in the suture repaired group of small abdominal wall hernias, while only 8, 33% (15 cases out of 180) was in the mesh repaired group after 5 years follow up period.

Conclusions: Reconstruction with mesh provides better results than suture repair even in small abdominal wall hernias.

P2g - Robotics in surgery

P2g-63 Robot-assisted mediastinal lymphadenectomy

J. Dolezel, V. Jedlicka, P. Vlcek and I. Capov

1st.dept. of Surgery, Univ.Hosp, Pekarska Street 53, 65691 Brno, Czech Republic (e-mail: jan.dolezel@fnusa.cz)

Object: Aim of this work is evaluation of technical aspects of mediastinal lymphadenectomy assisted by robotic system da Vinci as the part of lung lobectomy. The lymphadenectomy of subcarinal and hilar lymphnodes is consider as very difficult by VATS.

Method: We evaluate the advantages of robotic system by mediastinal lymphadenectomy in 7 robot assisted lung lobectomy-5x left and 2x right. Lobe specific lymphadenectomy was made five times, the systematic sampling was made twice on the right side. The subcarinal was always harvested. The forceps-cadier, harmonic skalpel and robotic scissors in combination with 3D view were used to safe preparation of lymphnodes close to pulmonary vein and artery.

Consequently the “endowrist” scissors was used for dividing subcarinal node from bronchial wall. The nodal vessels were divided with harmonic scalpel or clip.

Results: The mean of harvested mediastinal lymphonodes was ten. There wasn't any metastasis in all harvested vessels. The mean of first postoperative day drain secretion was 380ml. Nobody took transfusion.

Conclusion: Robotic system da Vinci makes similar maneuverability with lymphonode and view possible like in “open” surgery. Robot-assisted mediastinal lymphadenectomy seems to be easier in comparison with VATS lymphadenectomy especially in subcarinal and hilar space.

P2h - Surgical Anatomy

P2h-64 Non-recurrent recurrent laryngeal nerve related to thyroid surgery

C. Page^a, P. Monet^b, B. Bonnaire^b, M. Laude^c and V. Strunski^a

^aCHU Amiens - Hopital Nord, Service d'ORL et de CCF, Place Victor Paubet, 80000 Amiens, France; ^bCHU AMIENS - Hopital Nord, Service d'imagerie médicale, Place Victore Paubet, 80000 Amiens, France; ^cLaboratoire d'anatomie, Faculté de médecine, 3 rue des Louvels, 80000 Amiens, France (e-mail: cyril_page@yaboo.fr)

Purpose of the study: To highlight a rare anatomic variation involving the inferior laryngeal nerve and emphasize its implications for thyroid surgery.

Material and method: 993 patients underwent thyroid surgery over a period of 13 years. 1, 557 inferior laryngeal nerves (887 on the right side) were exposed.

Results: 3 non-recurrent inferior laryngeal nerves were found on the right side associated with a retro-oesophageal subclavian artery. One case was suspected before surgery.

Discussion: Several variations in the path and branches of the inferior laryngeal nerve have been reported in the literature. The frequency of occurrence of a non-recurrent inferior laryngeal nerve is about 1% concerning patients who underwent thyroid surgery. However, this variation might be more frequent in the general population.

Conclusion: The inferior laryngeal nerve must be carefully dissected and totally exposed during thyroid surgery procedures in order to best preserve its function. More, the thyroid surgeon must be aware of the existence of anatomic variations, particularly the non-recurrent inferior laryngeal nerve.

P2h-65 Anatomy of the aortic root - a guide to aortic valve sparring procedures

V. Costache^a, S. Marchal^a, T. Parpaix^a, L. Boudoux^a, G. Gaudreau^b, D. Martu^c, E. Dumont^d, V. Bach^a and O. Chavanon^a

^aCHU GRENOBLE, BP 217, 38043 GRENOBLE CEDEX 09, France; ^bLaval Cardiology Institute, 3772 Chemin Sainte Foy, QC G1X4J8 QUEBEC, Canada; ^cUniversity of Medicine Iasi, 1, University street, 6600 Iasi, Romania; ^dLaval Cardiology Institute, 3772 Chemin Sainte Foy, QC G1X4J8 Quebec, Canada (e-mail: vcostache@chu-grenoble.fr)

Introduction: The aortic root is often the site where various life-threatening conditions as dissections or aneurysms occur. The aim of our study was to perform a detailed anatomical study of the aortic root and to assess the morphologic consequences on the aortic valve of a subvalvular prosthetic ring.

Methods: We examined 11 adult cadavers with ages between 56 and 89 years. We measured the distances between each commissure and calculated the surface of the aortic valve opening (σ) and the surface of the aortic opening at this level (S). A PTFE ring was then placed in subvalvular position and tightened around the aortic root; we stopped the procedure as soon as aortic root morphology was lost.

Results: Normal aortic root has a 29, 09 mm (SD \pm 3, 08 mm) aortic trunk mean diameter, a 25, 90 mm (\pm 2, 59mm) Sino-Tubular-Junction one, a 30, 45 mm (\pm 2, 42 mm) sinus of Valsalva and 25, 80 mm (\pm 4, 26 mm) aortic annulus. When performed, ring correction produces a loss of surface of 17, 8% (\pm 8, 7).

Conclusion: this anatomic study offers aid to minimize or avoid clinical complications in patients who undergo an aortic valve sparring procedure or any other type of surgery of the aortic root.

P2h-66 Sentinel lymph node biopsy for breast cancer: How many nodes to stop at? Our experience at a tertiary centre in Singapore

J. Pang, W. S. Yong, C. Y. Wong, G. H. Ho and G. Chan

Singapore General Hospital, Outram Road, 169608 Singapore, Singapore (e-mail: jinniepang@yaboo.com)

Goals: Sentinel lymph node biopsy (SLN) using blue dye and radioisotope is a widely used tool in the staging of breast cancer. However, multiple SLNs are frequently found. We sought to determine if there is safe number of SLNs at which to stop the procedure without affecting accuracy.

Methods: We reviewed the records of 182 patients who underwent successful SLN biopsy using radioisotope and/or blue dye in SGH. SLNs with counts more than 10% of the background axilla count, with retention of blue dye or SLNs that were enlarged were removed and the order of removal recorded. All SLN sites removed were categorized as a dye success, an isotope success or both. The count for each SLN site (if applicable) was recorded.

Results: Seventy nine percent of the patients who underwent SLN biopsy (144) had multiple SLNs. The mean number of SLNs removed per patient was 2.4. Twenty six percent of the patients (48) were node-positive. Eighty five percent of node-positive patients (41) had multiple SLNs. Eighty eight percent of the node-positive patients were identified within the first 2 sites while 97.5% and 100% were identified by the 3rd and 4th site respectively.

Conclusion: Seventy nine percent of patients undergoing SLN biopsy for breast cancer have multiple SLNs. Positive nodes were detected within the first 3 sites removed in 97.5% of node-positive patients. Terminating the procedure at the 3rd SLN site may help in lowering morbidity and costs without compromising accuracy.

P2h-67 Prox1 is one of the target genes of IFN-g and Prox1 knockdown inhibits IFN-g – induced apoptosis in esophageal squamous cell carcinoma cells

M. Akagami^a, G. Watnabe^a, H. Takagi^a, Y. Shimada^b, A. Itami^a, K. Kawada^c, S. Nagayama^c, H. Kubo^c and Y. Sakai^c

^aKyoto University, 54-shogoin kawara-cho, sakyō-ku, kyoto, 606-8507 kyoto, Japan; ^bToyama University, 2630 sugitani toyama, 930-0194 toyama, Japan; ^cKyoto University, 54-Shogoin-Kawara-cho, Sakyō-ku, 606-8507 Kyoto, Japan (e-mail: redga3ma@hotmail.com)

IFN-g is known to have anticancer activity, but the underlying molecular mechanism remains unknown. The transcriptional factor STAT1 is one of the downstream IFN-g receptors. The homeobox gene Prox1 is one of the target genes of RNA editing. We previously reported that RNA editing occurs in esophageal cancer cell lines with the highest frequency among the several other cancer cell lines examined, suggesting that Prox1 may function as an anti-oncogene in esophageal cancer cells. Now, we assessed correlations between IFN-g signaling and Prox1 and to examine the roles of Prox1 in IFN-g induced apoptosis. First, we reconfirmed that IFN-g induced apoptosis in esophagus cancer cells, and that Prox1 mRNA increased with IFN-g stimulation. These reactions were inhibited in cells in which STAT1 dominant negative genes had been introduced, suggesting that Prox1 is a target gene of IFN-g-STAT1 pathway. We analyzed Prox1 function in IFN-g-induced apoptosis, using Prox1 knockdown cells by the siRNA technique. We found that IFN-g induced apoptosis was inhibited in Prox1 knockdown cells. Our findings suggest that Prox1 plays an important role in the IFN-g-induced apoptosis of esophageal cancer cells. Our results will provide a basis for the development of new cytokine therapies.

P2h-68 Resection of liver metastases from colorectal cancer: experience of single institution

B. Kavlakoglu^a, I. Ustun^b, O. Oksuz^b and S. Oral^b

^aAnkara Oncology Hospital, Birlik Mah 5. Cad No:68/4, 06450 Ankara, Turkey;

^bAnkara Oncology Hospital, Ankara Oncology Hospital, 06610 Ankara, Turkey (e-mail: sanselaksu@hotmail.com)

Introduction: This study was undertaken to determine the value of liver resection for metastases of colorectal cancer.

Materials/Methods: From 2004 through 2007, 42 patients were operated. Hepatic resections were performed for liver metastases from colorectal cancer. Dukes stage, resection type and number of metastasis, tumor size, resection margin, type of metastasis, sex, age, chemotherapy protocol for three years were analysed. Significance of factors that effect on cumulative survival rates were estimated using the Kaplan-Meier method.

Results: Early postoperative mortality and morbidity rate was 0% and 7, 14% respectively. Fourteen cases died during the postoperative period of 3 to 61 months (mean, 20, 04 ± 10, 38). Three-year survival rate was 52, 8%. Recurrence in the liver was observed in 11 patients (26%) after the liver resection. Two cases were reoperated for recurrence. Tumor size, number of metastases, resection margin status and type of resection were significantly correlated with the three-year survival rate ($p < 0.05$). Sex, age, Dukes stage, type of metastasis, recurrence and chemotherapy protocol could not predict long-term prognosis ($p > 0.05$).

Conclusions: Prognostic factors on long-term survival were the tumor size, free resection margin, resection type and the number of tumors. Radical resection is the only treatment that can demonstrate long-term survival for patients.

P2h-69 Prognostic factors of stage III-B breast cancer after downstaging and modified radical mastectomy

B. Kavlakoglu^a, S. Akkucuk^b and S. Oral^b

^aAnkara Oncology Hospital, Birlik Mah 5. Cad No:68/4, 06450 Ankara, Turkey;

^bAnkara Oncology Hospital, Ankara Oncology Hospital, 06610 Ankara, Turkey (e-mail: sanselaksu@hotmail.com)

Introduction: The purpose of this study was to determine the prognostic information from mastectomy and axillary node dissection in patients with stage III-B breast cancer after down staging.

Materials and methods: Mastectomy and axillary dissection was performed for 97 patients with stage III-B breast cancer after downstaging. Estrogen receptor status, histologic type, median number of axillary lymph nodes, median number of positive axillary lymph nodes, positive lymph nodes/total lymph nodes ratio were analysed. Overall survival and disease free survival were determined for five years. Survival was calculated using the Cox regression method.

Results: Median number of total axillary lymph nodes was 20, 2; median number of metastatic axillary lymph nodes was 8, 9; positive lymph nodes/total lymph nodes ratio was 0, 44. Among the 80 patients (except 17 unknown receptor status) 35% were found to have estrogen receptor positive and 86 cases (88, 7) were invasive ductal cancer on pathologic examination of the axillary contents. Five year overall survival and disease free survival rates were % 38, 7 and % 28 respectively.

Conclusion: Estrogen receptor status, ratio of positive axillary lymph nodes and inflammatory breast cancer effects 5 year survival rates after total mastectomy and axillary dissection.

P2h-70 Hepatic stellate cells promote the liver metastasis of colon cancer cells by the action of SDF-1/CXCR4 axis

R. Matsusue, H. Kubo, S. Hisamori, K. Kawada, S. Nagayama and Y. Sakai

Kyoto University, 54-Shogoin-Kawara-cho, Sakyo-ku, 606-8507 Kyoto, Japan (e-mail: tpbrd840@ybb.ne.jp)

It has been determined that the chemokine receptor CXCR4 and its ligand SDF-1 regulates several key processes in various cancers. The function and mechanism of CXCR4/SDF-1 system in metastasis of colorectal cancer are controversial. Now, we have further characterized their roles in liver metastasis of colorectal cancer. The metastatic site in the liver have been revealed to be composed of much more CXCR4 positive cells compared with the primary sites by the measurement of the immunostained cell population. To understand the role of CXCR4 in the biology of colon cancer, we examined the effect of SDF-1 in vitro. The biological function of CXCR4 on HCT-116 cells related to invasion and anti-apoptosis not proliferation. In mouse experiment of liver metastasis, intraperitoneal administration of the selective CXCR4 inhibitor AMD3100 effectively blocked the enhanced metastatic potential of HCT-116 cells. Next, we found that hepatic stellate cells secreted SDF-1 in liver by ELISA. Furthermore, we indicated that there was direct interaction between HCT-116 cells and hepatic stellate cells in vivo. These results suggest that CXCR4/SDF-1 axis plays important role on liver metastasis of colon cancer cells and provide preclinical evidence that blockade of the axis is a target for antimetastatic therapy.

P2h-71 N2 Lymph node metastasis in nonpalpable breast cancer

E. Kurt^a, B. Kavlakoglu^b and S. Oral^c

^aAnkara Oncology Hospital, 3rd General Surgery Clinics, Yenimaballe, 06610 Ankara, Turkey; ^bAnkara Oncology Hospital, Birlik Mah 5. Cad No:68/4, 06450 Ankara, Turkey; ^cAnkara Oncology Hospital, Ankara Oncology Hospital, 06610 Ankara, Turkey (e-mail: biz.2006@hotmail.com)

From August 2006 to June 2007, 233 patients underwent 242 wire localized breast biopsies. Biopsies were done after sonographically or mammographically guided wire localization.

9 patients had 2 simultaneous localizations: 4 to ipsilateral breast, 5 to contralateral breast. 191 localizations were guided sonographically and 51 mammographically. Of 242 lesions, 237 were excised completely, 1 partially and 4 not excised at all (success rate 97.9%).

Mean patient age at biopsy was 48, 2 years, while malignancy detected 57 patients' mean age was 51.5 years. Malignancy was diagnosed in 59 biopsies (24.4%). There were 19 in situ and 40 invasive tumors.

33 invasive tumor underwent axillary dissection with mastectomy or lumpectomy. 18 patients had no metastatic lymph node (MLN) (54, 5%), 7 had 1-3 MLN (21.2%), 1 had more than 10 (3.0%), and 7 had N2 lymph nodes (21.2%). Mean tumor size in lymph node negative patients was 1.8cm and in N2 group 1.9cm.

This study shows, although breast tumor is small (< 2cm, T1) and nonpalpable, tumor can react aggressively as seen with N2 lymph nodes. So while planning treatment, tumor characteristics other than size should be considered too.

P2h-72 The isolation and characterization of tumorigenic esophageal cancer cells

Y. Mizuno, H. Kubo and Y. Sakai

Kyoto University, Shogoinkawara-cho 54, Sakyo-ku, 6068507 Kyoto, Japan (e-mail: mizunoy3000@yaboo.co.jp)

Introduction: Esophageal cancer has a poor prognosis because of extensive spread to lymph nodes, even in early disease. The isolation and characterization of tumorigenic esophageal cancer cells may help to devise novel diagnostic and therapeutic procedures. Although there is increasing evidence that a rare population of undifferentiated cells is responsible for tumor formation and maintenance, this has not been explored for esophageal cancer. Recently podoplanin was reported to be a novel marker of tumor-initiating cells in human squamous cell carcinoma A431.

Materials/Methods: We used human SCC cell line, KYSE2270, which was made from human esophageal cancer. And We used the podoplanin which was home-made monoclonal antibody, clone 7B10. The specificity and sensitivity of 7B10 were higher than commercially available D2-40.

Results: We show that tumorigenic cells in esophageal cancer, KYSE2270, are included in the high-density podoplanin population, which accounts for

about 20.6%. Podoplanin+ cells have higher colony formation efficiency and tumorigenicity than podoplanin- cells. And subcutaneous injection of colon cancer podoplanin+ cells readily reproduced the original tumour in NOD mice, whereas podoplanin- cells did not form tumours.

Conclusions: Podoplanin may be a novel maker to enrich tumor-initiating cells with stem-cell like properties from esophageal SCC cell line KYSE2270.

P2h-73 Retroperitoneal leiomyosarcomas: an asian experience

S. Y. Lee, B. Goh, M. H. Chew, L. Ooi, W. K. Wong and K. C. Soo

Singapore General Hospital, Department of General Surgery, Outram Road, S169608 Singapore, Singapore (e-mail: seryee54@yahoo.co.uk)

Introduction: The study was conducted to evaluate the clinical results of resection for retroperitoneal leiomyosarcomas in a single institution and identify any prognostic factors. Soft tissue sarcomas are rare and account for less than 1% of all malignancies. Leiomyosarcoma, a rare malignancy of smooth muscle, is the most common subtype of retroperitoneal sarcoma after liposarcoma and fibrosarcoma.

Material and Methods: A retrospective review of departmental records was used to identify 14 patients with primary retroperitoneal leiomyosarcomas treated between 1990 and 2005.

Results: Fourteen patients with primary retroperitoneal leiomyosarcomas operated on for curative intent (6 Males, 8 Females; mean age: 42.4 years, range: 14–58) were evaluated. The median tumor burden was 36 cm (20–45cm). Median follow-up time was 69 months. There was no peri-operative mortality and morbidity occurred in 2 (14.3%) patients. Surgical margins were involved in 2 (14.3%) patients. Resection of contiguous organs was required in 9 (64.3%) to achieve gross surgical margins. Seven out of the 14 (50%) of the patients had recurrence of the tumor.

Conclusion: An aggressive surgical approach in retroperitoneal leiomyosarcomas is associated with long-term survival. Local control continues to be a significant problem. However as new surgical options are limited, further outcome improvement requires novel adjuvant therapies.

P2i - Thoracic surgery

P2i-74 Prognostic significance of intraoperative pleural lavage cytology in patient with non-small cell lung cancer

H. Oishi, Y. Saito, T. Hasumi and J. Abe

Sendai Medical Center, 2-8-8, Miyagino, Miyagino-ku, 983-8520 Sendai, Japan (e-mail: bigstone@idac.toboku.ac.jp)

Introduction: Prognostic significance of intraoperative pleural lavage cytology (PLC) in patient with non-small cell lung cancer has not been completely understood.

Methods: We retrospectively examined the medical records of 201 non-small cell lung cancer patients undergoing intraoperative PLC. Recurrence patterns and prognosis in patients with positive PLC were analyzed.

Results: Fourteen (7.0%) of 201 patients had positive PLC findings. Twenty seven patients (2 patients PLC positive, 25 patients PLC negative) who underwent limited surgery due to complication were excluded from the further investigation. Some form of recurrence was observed in 33 (20.4%) of 162 patients with negative PLC, and in 8 (66.7%) of 12 patients with positive PLC ($p < 0.05$). The local recurrence was observed in 13 (39.4%) of 33 patients who have recurrence with negative PLC and was observed in 4 (25%) of 8 patients who have recurrence with positive PLC ($p = 0.45$). The survival rate of patients with positive PLC was significantly worse than patients with negative PLC ($p < 0.05$). In the multivariate analysis demonstrated PLC was independent prognostic factor.

Conclusion: PLC is an easy procedure and is an important prognostic factor, and should be routinely performed in the non-small cell lung cancer operation.

P2i-75 Reduction of mitochondrial biogenesis in bronchopulmonary tumors

N. Bellance^a, J. M. Baste^b, G. Benard^c, H. Bégueret^d, J. F. Velly^b and R. Rossignol^e

^aInserm U688 Physiopath. mitochond, Univers. Victor Segalen, 33076 bordeaux, France; ^bCHU de Bordeaux, Chirurgie Thoracique, Maison du Haut-Leveque, 33000 Pessac, France; ^cInserm U688, Université victor segalen, 33076 bordeaux, France; ^dService anatomopathologie, Maison du Haut Lévêque, 33600 Pessac, France; ^eInserm U688, Université Victor segalen, 33076 bordeaux, France (e-mail: jmb33@carmail.com)

Background: Most cancer cells present abnormal bioenergetic properties characterized by a predominant production of ATP by aerobic glycolysis rather than mitochondrial oxidative phosphorylation (OXPHOS). Yet, little is known on the metabolic remodeling of lung tumors and its interaction with carcinogenesis. Herein, we determined the bioenergetic profiles of human lung tumors.

Methods: Excised lung from 9 patients was dissected in three parts: tumor center (quiescent necrotic), periphery (malignant) and surrounding healthy tissue. On each part we determined the following mitochondrial features: respiratory rate and coupling ratio (high resolution respirometry), expression level of energy proteins (westernblot) and ultrastructure (EM).

Results: In all tumor sample assayed we observed a significant deregulation of mitochondrial biogenesis and subsequent respiratory capacity, along with the presence of structural alterations (as compared to non-cancer tissue). In 4 patients there was a strong reduction of mitochondrial capacity ($45 \pm 15\%$ of control) while in 5 patients it was dramatically increased ($310 \pm 38\%$ of control).

Conclusion: Our data give a better characterization of lung cancer cells' metabolic alterations which are essential for growth and survival. They designate two populations of patients with opposite deregulation of mitochondrial function and composition.

P2j - Vascular surgery

P2j-76 Does selenite inhibit the formation of peroxynitrite from NO in vascular surgery? A new approach for therapy?

T. Zimmermann, J. Pyrc and S. Kersting

Technical University of Dresden, Fetscherstrasse 74, 01307 Dresden, Germany (e-mail: tbomas.zimmermann@uniklinikum-dresden.de)

The authors examined the oxidative stress in ischemia and reperfusion in 41 patients undergoing vascular surgery. Patients were divided in two groups according to the extent of the operation. Blood sampling to determine the oxidative load was performed pre-, intra- and directly postoperatively, and daily in the first week after surgery. The concentration of free oxygen radicals (H_2O_2 , O_2^-), NO formation in the blood, peroxidated LDL were determined. Reperfusion displays a biphasic course. Both peaks are characterized by a maximal formation of free oxygen radicals which continuously rise until the 7th postoperative day. The formation of NO correlates inversely with the formation of oxygen radicals and thus indirectly characterizes the formation of peroxynitrite from NO and oxygen radicals. This leads to a rise in lipid peroxidation, which promotes the development of atherosclerotic lesions. By targeted disruption of the formation of free oxygen radicals, the formation of NO can be facilitated and the formation of peroxynitrite can be inhibited. To inactivate the reactive oxygen species sodium selenite can be used. It effectively eliminates superoxide anions and thus can prevent the inactivation of NO. Selenite should not only be given intraoperatively but also postoperatively until the 7th postoperative day and possibly even longer.

P2j-77 Correlation of blood Platelet function, soluble Receptor Activator of Nuclear Factor KB Ligand (sRANKL) and Nitrous-oxide (NO) level with progression of vascular illness on lower limb amputees

S. Ferencz^a, M. Kurthy^a, K. Boddi^b, I. Takacs^a, S. Horvath^a, S. Javor^a, B. Balatonyi^a, Z. Szabo^b, A. Ferencz^c, E. Roth^a and G. Weber^a

^aUniversity of Pécs, Kodaly Z. str.20., H-7624 Pecs, Hungary; ^bUniversity of Pécs, Szigeti str. 12, H-7624 Pecs, Hungary; ^cDep of Surgical Research Techn, Kodaly Z. str.20., H-7624 Pecs, Hungary (e-mail: sandor.ferencz@gmail.com)

Introduction: The aim of our study was to investigate the relationship between inflammation, NO-derived relaxation, thrombocyte function and progression of peripheral vascular disease (PVD).

Materials and Methods: Blood samples of lower limb amputees with PVD (n = 42) were analyzed and compared with healthy control (n = 15). Serum sRANKL level was measured using ELISA kit, plasma NO level using HPLC. ADP, Collagen and Adrenaline induced thrombocyte aggregation in whole blood and Platelet Rich Plasma (PRP) was measured. Data were compared with changes in patient's clinical status.

Results: PVD patients' thrombocyte aggregation in whole blood and PRP was higher than control after ADP and Collagen induction. Analyzing plasma NO level vascular illness' nitrite and NO concentration were half as big again control. Measuring sRANKL level there was no significant difference between PVD and control data. During exam period 19 patient's clinical state worsened (11 amputations, 7 patients died), their data showed higher thrombocyte aggregation in comparison with controls and other PVD data.

Conclusion: Our examinations proved that PVD is attended with elevated and slightly therapy-resistant hyperaggregability of thrombocytes (with slight decrease in thrombocyte amount), which also follow the progression of PVD. Lower level of NO in PVD blood might suppose decreased vascular relaxation.

P2j-78 Reducing oxidative stress and leukocyte activation in reperfusion injury with controlled reperfusion

B. Balatonyi, I. Takacs, S. Horvath, S. Ferencz, A. Ferencz, M. Kurthy, L. Sinay, E. Roth, G. Weber and G. Jancso

University of Pécs, Kodaly Z. str.20., H-7624 Pecs, Hungary (e-mail: balatonyibori@gmail.com)

Introduction: Reperfusion of the limbs after acute and persistent ischaemia is associated with high rates of morbidity and mortality despite complete revascularisation. In our study we aimed to confirm in an animal model that controlled reperfusion (CI) can reduce oxidative stress and leukocyte activation in reperfusion injury.

Materials and methods: We used 6 yorkshire pigs divided in two groups. Four-hour-long occlusion was performed on infrarenal aorta. After that in group I. clamp was removed, in group II. CI was performed with 30-minute infusion of a crystalloid reperfusion solution mixed with oxygenated blood. Following this procedure normal reperfusion was restored. Venal blood samples were collected before occlusion, in ischaemic period, and after reperfusion in the 10th min, in the 2nd and 24th hours, and on 7th day. We monitored superoxide-dismutase activity, reduced glutathion and malonaldehyde concentration, quantity of free radical production, and the expression of surface adhesion molecules with flowcytometry.

Results: The lipidperoxidation, the speed and rate of free radical production of leukocytes ($p < 0, 05$), the CD11a and CD18 expression of the granulocytes ($p < 0, 05$) were significantly lower in CI group.

Conclusion: The results from this study suggest that the results of conventional embolectomy for acute, severe lower-limb ischemia can be improved by CI.

P2j-79 Acute arterial ischemia in cancer patients - Surgical outcome

J. Tsang, P. Naughton, L. Kelly, D. Moneley, C. Kelly and A. Leahy

Department of Vascular Surgery, Beaumont Hospital, Beaumont Rd, D9 Dublin, Ireland (e-mail: julianst@yaboo.com)

Introduction: Cancer patients have an increased risk of venous thromboembolism. In addition, certain chemotherapeutic agents are associated with thrombosis. Cases of acute arterial ischaemia in cancer patients are rare. The aim of this study is to examine surgical outcome following arterial events in cancer patients.

Methods: Patients were identified who underwent surgery for acute arterial ischaemia with co-existing malignancy over a 10-year period. Patient demographics, cancer type, chemotherapy, site of thromboembolism, treatment and outcome were analysed.

Results: 419 patients underwent surgery for acute ischaemia, 16 (3.8%) of these had a history of cancer. Commonest cancers were the urogenital tract (n = 5) and lungs (n = 5). Eight patients (50%) had recent cancer, 4 (25%) of these were incidental findings. Four patients (25%) developed acute ischemia during chemotherapy. The superficial femoral artery was the commonest site of occlusion. All patients underwent thromboembolectomy but 2 subsequently required a bypass procedure. Six patients had limb loss. In-patient mortality was 12%. Histology revealed all occlusions were due to thromboembolism, no tumour cells identified.

Conclusion: Cancer and chemotherapy can predispose patients to acute arterial ischemia. A high index of suspicion, early diagnosis and management are essential to limb salvage and patient survival. Screening for occult malignancy could be beneficial in high risk cancer patients.

P2j-80 Claudicants are at risk of balance problems and falling

K. Mockford^a, F. Mazari^a, A. Jordan^b, N. Vanicek^b, I. Chetter^a and P. Coughlin^a

^aAcademic Vascular Unit, Vascular Laboratory, Alderson House, HRI, HU3 2JZ Hull, United Kingdom; ^bDpt of Sport, Health & Exercise, University of Hull, Cottingham Road, HU6 7RX Hull, United Kingdom (e-mail: katherinemockford@hotmail.com)

Introduction: Impaired balance is a recognised risk factor for falling, particularly among elderly populations and intermittent claudication is increasingly common with advancing age. The aim of this study was to assess the incidence and aetiology of impaired balance in claudicants and to assess patients' fear of falling.

Methods: Sixty eight claudicants (50 men), median age of 71 (IQR 66–76) years, underwent objective balance assessment, using the Sensory Organization Test (SOT).

Results: Overall 29 (43%) claudicants demonstrated abnormal balance using the composite equilibrium SOT score. Vestibular dysfunction occurred in 50% of all claudicants. Abnormalities in other sensory domains were less common (somatosensory, 20%, visual function, 25%, and preferential reliance on inaccurate visual cues, 22%). Patients with abnormal SOT scores were more likely to have a history of falling (odds ratio 9.4), however no correlation between fear of falling and composite SOT score was found (Spearman rank correlation $r = -0.196$, $p = 0.117$).

Conclusions: Impaired balance is very common in claudicants and may predispose to a high incidence of falls. Claudicants with abnormal balance are more likely to have a history of falls but not a fear of falling, thus potentially rendering these patients at greater risk.

P2j-81 Hemodynamic, microcirculatory, hemorheologic and histological analyses of artificial arterio-venous shunts in rats

T. Hever^a, N. Nemeth^a, E. Brath^a, F. Kiss^a, E. Sajtos^a, L. Matyas^a, J. Szaszko^b, B. Peit^b, L. Toth^c, Z. Csiki^d, I. Miko^a and I. Furka^a

^aDept. of Op. Tech. Surg. Res., University of Debrecen, Nagyerdei krt 98., 4032 Debrecen, Hungary; ^bDept. of Pharmacology, University of Debrecen, Nagyerdei krt 98., 4032 Debrecen, Hungary; ^cDepartment of Pathology, University of Debrecen, Nagyerdei krt 98., 4032 Debrecen, Hungary; ^d3rd Department of Medicine, University of Debrecen, Nagyerdei krt 98., 4032 Debrecen, Hungary (e-mail: timibevever@gmail.com)

Introduction: After analysing 294 human Cimino-fistula cases, we concluded that in artificial arterio-venous (AV) shunt operations convenient geometry

strongly determines the surgical safety. This experiment was conducted to explore further the local and systemic circulatory effect of AV shunts.

Materials/Methods: End-to-side anastomoses were made in 18 anesthetized CD outbred rats (362.39 ± 61.35 g) between the left femoral artery and saphenous vein. 8 weeks later the animals were re-operated to make hemodynamical (Transonic-T206) and microcirculatory measurements (Perimed/Periscan-PIMII), as well as hemorheological examinations: erythrocyte deformability (Rheoscan-D ektacytometer), erythrocyte aggregation (Myrenne/MA-1 aggregometer) both in arterial and venous blood of control and shunt sides, and histological analyses.

Results: There wasn't visible difference between the intact and operated limb motion and paw colour. Extremity skin's microcirculation showed better results in case of well permeable shunts. Arterio-venous blood flow rate difference was 1.66 on intact, and 1.08 on the shunt side. There wasn't significant difference in micro-hemorheological parameters of arterial and venous blood, however, erythrocyte deformability worsened on shunt sides.

Conclusions: This model seems to be suitable for further functional and morphological examinations of arterio-venous shunts and to evaluate comparative investigations for different access-angles, examining turbulent blood flow, neointima formation and arterialisations. Grants: OTKA-T-067779, OTKA-F-68323, BILAT-TR03/2006.

P2k - Wound healing

P2k-82 In vitro behaviour of several collagen-based meshes in a setting of bacterial contamination

G. Pascual, R. Garcia-Pumarino, M. Rodriguez, N. Garcia-Hondulliva, V. Gómez-Gil and J. Bellón

University of Alcalá. CIBER-BBN, Ctra. Madrid-Barcelona, Km 33-60, 28871 Madrid, Spain (e-mail: gemma.pascual@uab.es)

Introduction: Among the applications of a bioprosthesis, or collagen mesh, is the repair of an abdominal wall defect in a setting of infection. This study examines the in vitro behaviour of *Staphylococcus aureus* (Sa) and *Staphylococcus epidermidis* (Se) when placed in contact with a bioprosthesis.

Materials/Methods: Fragments (1 cm²) of meshes of porcine (Permacol®/Surgisis®) or human (Alloderm®) origin along with a polytetrafluoroethylene mesh (PTFE) as control were placed in the four quadrants of blood agar plates inoculated with each of the microorganisms. After 14 (n = 15 plates) or 30 days (n = 15), the plates were examined by light and scanning electron microscopy and the extent of bacterial ingrowth assessed morphometrically.

Results: The collagen meshes showed greater bacterial loads than the PTFE controls, significantly so for Surgisis® and Alloderm® versus PTFE. The ingrowth capacity of Sa was greater than Se. Bacterial infiltration of Permacol® was restricted to the outer third of the biomaterial. Microbial counts for each material at 14 and 30 days failed to differ significantly.

Conclusions: Bacterial ingrowth into collagen meshes is related to their structure. Thus, meshes with overlapping collagen bundles (Surgisis®, Alloderm®) allow for greater penetration by colonizing microorganisms than more compact meshes (Permacol®).

(Supported by a grant from Fundación Mutua Madrileña (FMM2008)).

P2k-83 Effects of ranitidine on colonic and fascial wound healing in rats

R. Pekcici^a, B. Kavlakoglu^c, E. Kafali^c and E. Kuterdem^d

^aAnkara Training Hospital, Ankara Training Hospital, 06400 Ankara, Turkey;

^bAnkara Oncology Hospital, Birlık Mah 5. Cad No:68/4, 06450 Ankara, Turkey;

^cSelçuk University, Faculty of Medicine, Department of Emergency Medicine, 42040 Konya, Turkey;

^dAnkara University, Faculty of Medicine, Department of General Surgery, 06109 Ankara, Turkey (e-mail: pekcici@yahoo.com)

Purpose: Histamine has an important role in wound healing. Ranitidine is an antagonist of histamine H₂ receptors. It is a widely used drug postoperatively to prevent stress ulcers. We investigated possible effects of ranitidine on colonic anastomosis and on skin wounds together.

Method: 41 Wistar type male rats divided as study and control groups. Ranitidine was given in the 10 mg/kg/day im dose till sacrifice. Rats were sacrificed on the 3rd and 7th days. Colonic bursting pressure, fascial breaking pressure, tissue hydroxyproline levels were measured and histopathologic analyses were done.

Results: On the 3rd day, hydroxyproline levels were sparse. On the 7th day, hydroxyproline levels increased together with mechanical strength. Tissue hydroxyproline levels and mechanical strength parameters showed no difference between the groups on the 7th day. Ranitidine was shown to increase inflammation on the 3rd day on histopathologic analyses. But wound healing was improved on the 7th day for all groups.

Conclusion: Different from other studies, possible effects of ranitidine on both colonic anastomosis and fascial wound healing were analysed together. Although ranitidine has some inflammatory effects on the early healing period it has not any negative effect on wound healing neither on colonic anastomosis nor on fascial wounds.

P2k-84 Compression therapy of swollen lower limbs-tissue fluid hydraulics, clinical effects

W. Olszewski^a, M. Zaleska^a, M. Cakala^a, G. Ambujam^b and P. Jain^c

^aMedical Research Centre, 5 Pawlinskiego Str., 02-106 Warsaw, Poland; ^bThanjavur Medical College, Tamil Nadu, 613-004 Thanjavur, India; ^cBanaras Hindu University, 2-BBrij Enclave; Uttar Pradesh, 221-005 Varanasi, India (e-mail: wlo@cmdik.pan.pl)

Introduction: Removal of edema tissue fluid (TF) from injured tissue is indispensable for healing, irrespective whether it is an open or closed wound.

Aim: To apply mechanical compression enabling TF to overcome tissue resistance and be transferred to non-swollen regions.

Methods: We studied hydraulics of tissue fluid in swollen lower limb (lymphedema, venous insufficiency with ulcers, posttraumatic hematoma) using sequential pump with no deflation of distal segments, wick-in-needle pressure, plethysmography and tonometry.

Results: Minimum TF pressures enabling its flow ranged between 25 and 30 mmHg. To reach this level, in ulcers in lymphedema and postthrombotic syndrome with fibrotic skin, pressures in sleeve should be raised above 120 mmHg. Tonometry measuring skin rigidity skin helps to choose proper inflation pressures. Comparing the TF flow dynamics during manual and mechanical sequential massage, efficacy of the latter was evidently higher. There was lack of TF back-flow and centripetal movement of TF was fast. Moreover, hand applied pressure could not be standardized.

Conclusions: In 8 lymphedema stage III/IV patients with ulcers recently treated with inflation pressure 120mmHg, no distal deflation, 6 months, 1 hour a day, a decrease in calf girth by 5–7 cm was obtained and no debulking surgery was needed.