obese patients have increased morbidity in terms of septic complications following liver transplantation, with consequent increased length of intensive care and hospital stay. Identifying these patients early and introduction of measures to reduce BMI should be considered to improve outcomes following liver transplantation.

Competing interests None declared.

OC-059 AN EXPERIMENTAL STUDY TO DETERMINE THE PATHOGENESIS OF OXALIPLATIN INDUCED SINUSOIDAL OBSTRUCTION SYNDROME

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Introduction Sinusoidal obstruction syndrome (SOS) following Oxaliplatin based chemotherapy is a cause for major concern when undertaking liver resection for colorectal liver metastases. To date no relevant experimental models of Oxaliplatin induced SOS have been described. The aim of this project was to establish such a model which could be utilised to identify potential therapeutic strategies to prevent the development of SOS.
Methods C57Bl/6 mice were treated with intra-peritoneal FOLFOX (n=10), or vehicle (n=10), weekly for 5 weeks and culled 1 week following final treatment. Representative biopsies of the liver and spleen were fixed in formalin and paraffin embedded for histological analysis. RNA and protein were extracted from snap frozen biopsies of the liver and subject to biochemical, analysis by qRT-PCR and western blot respectively, for markers of matrix remodelling, vascular dysfunction/endothelial damage, DNA damage and cellular proliferation. Serum was separated from whole blood and markers of liver injury (ie, ALT, AST and Alk Phos) were also measured. Statistical significance was assessed with Mann–Whitney U Test.
Results FOLFOX treatment was associated with the development of sinusoidal dilatation and peri-venular hepatocyte atrophy on H&E stained sections of the liver in keeping with SOS. This was associated with an elevated serum ALT and AST ($p<0.05$). Immunohistochemistry for γH2AX demonstrated the presence of DNA damage in the sinusoidal endothelium. In the liver of FOLFOX treated animals there was up-regulation of key genes associated with matrix remodelling such as MMP9 ($p<0.001$), MMP2 ($p<0.001$), Pro-Collagen I ($p<0.001$) and TGFβ ($p<0.001$). There was evidence of endothelial damage and a subsequent pro-thrombotic state with up-regulation of PAI-1 ($p<0.001$), vWF ($p<0.01$) and Factor X ($p<0.001$).
Conclusion We have developed the first reproducible model of chemotherapy induced SOS that reflects the pathogenesis of this disease process in patients. Through analysis of this model we have gained insights into the molecular changes that underpin the development of SOS and are now able to test potential therapeutic strategies to prevent it.

Competing interests None declared.

OC-060 SURVIVAL AFTER DOWNSTAGING CHEMOTHERAPY FOR INITIALLY UN-RESECTABLE COLORECTAL LIVER METASTASES: EXPERIENCE FROM A UK RESECTION CENTRE

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Introduction Liver metastases occur in ~50% of patients with colorectal cancer. Only 20% of patients present with disease that is suitable for resection, the only hope of cure. In selected patients, chemotherapy may downstage inoperable liver-limited disease such that potentially curative resection becomes feasible.
Methods All patients referred to the regional Multi-Disciplinary Team (October 2001–June 2008) were considered for downstaging chemotherapy if they had inoperable liver-limited disease and were fit enough for resection. Two-weekly FOLFOX chemotherapy was administered and response assessed by 3 monthly CT scan. Disease having a partial response but remaining unresectable received further chemotherapy and reassessment by CT. Patients in whom R0 resection was thought feasible were offered surgery. Morbidity and mortality data were collected. Mortality was cross-referenced with the Cancer Registry. Overall (OS), post-operative (POS) and disease free survival (DFS) were calculated using SPSS (medians/range/Kaplan–Meier survival curves). OS was calculated from the onset of chemotherapy and based on intention to treat. Additional univariate analysis has been performed.
Results 104 patients commenced downstaging chemotherapy (median six cycles): one died after the 3rd cycle (cardiac), 28 had no response, 56 had a degree of response and 19 had near complete regression. Eventually, 56 patients remained unresectable and 47 had a disease response deemed resectable and were offered surgery. Of these 47 patients, seven declined or became unfit for surgery and 40 proceeded to an operation, of which 36 underwent resection. In four, liver resection was abandoned due to additional disease found at surgery. Peri-operative morbidity was 63% and 30-day mortality was zero. Mortality of patients receiving only chemotherapy was 100% and median OS 14 months (range 3–64 months) compared to a median OS for the 40 patients undergoing laparotomy of 39 months (10–98) with an estimated 20% 5-year survival rate. The 10 surviving patients (25%) have been followed up for a median of 63.5 months (36–90). 7/36 patients (19.4%) remain disease free with median OS 85 months (40–98). 29/36 patients (80.6%) have recurred, all within 24 months of surgery (median DFS 7 months) but with median OS 35 months (10–73) and 4/29 (14%) surviving >5 years.
Conclusion Liver resection after downstaging chemotherapy is safe, feasible and improves median survival. 80% of patients had recurring disease, all within 2 years, however a significant survival benefit occurred in this group compared to patients who could not be offered surgery. The proportion of patients remaining disease free (19.4%) is lower than would be expected in a group with initially resectable disease.

Competing interests None declared.

OC-061 GASTRIC ELECTRICAL STIMULATION FOR INTRACTABLE GASTROPARESIS

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Introduction Severe, drug-unresponsive gastroparesis is a debilitating condition. Treatment with gastric electrical stimulation using Enterra® was granted humanitarian device exemption status by the FDA in 2000. The largest case-series (N=221) reports that 54% of patients had >50% symptom-reduction with Enterra.[1] We audited outcomes from Enterra therapy, with routine use of a trial of temporary stimulation to refine patient selection.
Methods Patients considered for Enterra during 2008–2011 were identified from a prospectively maintained database. Patients had been previously extensively investigated and treated for gastroparesis; 48% were referred by gastroenterologists and 37% by upper GI surgeons. Gastric emptying was assessed by scintigraphy in all

cases. Candidates for Enterra had a 2-week trial of temporary stimulation, via a trans-nasal electrode that was endoscopically implanted into the gastric submucosa. Only those with good response proceeded to laparoscopic implantation of a permanent Enterra device. 50% or greater symptom-reduction was classified as a good response.

Results There were 71 patients (51 women, 72%), with median age 42 years (range, 14–69). The aetiology of gastroparesis was idiopathic (43 patients, 61%), diabetes (15, 21%) or post-surgical (13, 18%). At presentation, oral nutrition was supplemented by nasojejunal tube feeding in seven patients, surgical jejunostomy in eight or parenterally in one (total, 16 patients; 22%). Previous intervention included endoscopic injection of Botulinum toxin (Botox) into the pylorus in 16 patients (22%), pyloroplasty in two, distal gastrectomy in one and gastrojejunostomy in one. It was decided to directly proceed with permanent Enterra in four patients. Of the remaining, 51 patients have currently completed a trial of temporary stimulation; 39 (77%) had a good response and were selected for permanent Enterrra, which has been completed in 35 patients. Outcome data are currently available for 31 patients (idiopathic, 21 patients; diabetes, three; post-surgical, seven), with median follow-up period of 10 months (1–28). 22 patients (71%) had a good response to permanent Enterra; these included 14 (68%) with idiopathic, 5 (71%) with post-surgical and all three with diabetic gastroparesis.

Conclusion 71% of well-selected patients with intractable gastroparesis had good response to permanent gastric electrical stimulation with Enterra at follow-up up to 2 years. These data compare advantageously with reported data (>50% symptom-reduction in 54%)[1] and support the inclusion of a trial of temporary stimulation in the selection algorithm for permanent Enterra therapy.

Competing interests None declared.

REFERENCE

1. **McCallum**, *et al.* Gastric electrical stimulation improves outcomes of patients with gastroparesis for up to 10 years. *Clin Gastroenterol Hepatol* 2011;**9**:314–19.

OC-062 A COMPARATIVE STUDY OF LAPAROSCOPIC VS OPEN CYSTGASTROSTOMY FOR PANCREATIC PSEUDOCYSTS

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Introduction While large and persistent pancreatic pseudocysts are amenable to internal drainage by laparoscopic techniques, the benefits of this minimally invasive approach remain to be demonstrated. The aim of this study was to compare the open and laparoscopic approaches for internal drainage of large and persistent pancreatic pseudocysts.

Methods Patients who underwent cystgastrostomy were selected, and the demographic features, clinical characteristics and outcomes of those who had the surgery performed laparoscopically were compared to those who had open surgery. The two approaches were compared on an intention-to-treat basis. Data shown represent medians.

Results Between 1997 and 2010, 42 patients (15 female and 27 male) underwent 45 surgical internal drainage procedures for pancreatic pseudocysts (36 laparoscopic with two conversions to open surgery, and nine open). The laparoscopic and open groups were comparable for age (56 vs 53 years, p=0.448), sex distribution, and size of pseudocyst (12 vs 13 cm, p=0.305). The two approaches had comparable operating times (90 vs 75 min, p=0.630) but laparoscopic surgery carried a significantly lower risk of postoperative morbidity (5.8% vs 54.5%, p=0.001) and shorter postoperative hospital stay (2 vs 10.5 days, p<0.001). Laparoscopic surgery was also associated with a more rapid resumption of dietary intake (median 4 vs 6 days, p=0.065). There was one death in the open group (11.1%) but none in the laparoscopic group.

Conclusion The laparoscopic approach to cystgastrostomy for large and persistent retrogastric pancreatic pseudocysts is associated with a smoother and more rapid recovery and a shorter hospital stay compared with open surgery.

Competing interests None declared.

BASL free paper session

OC-063 THE SEVERITY OF HEPATIC ISCHAEMIA-REPERFUSION INJURY IS ASSOCIATED WITH ACUTE KIDNEY INJURY FOLLOWING DONATION AFTER BRAIN DEATH LIVER TRANSPLANTATION

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Introduction Donation after Cardiac Death liver transplant recipients have an increased frequency of acute kidney injury (AKI) during the immediate post-operative period and in these patients peak peri-operative aspartate amino-transferase (AST), a surrogate marker of hepatic ischaemia-reperfusion injury (IRI), is the only variable associated with renal dysfunction (Leithead *et al Am J Transplant* 2012). This suggests that hepatic IRI may play a critical role in the pathogenesis of AKI after liver transplantation. The aim of this study was to determine if graft injury is also associated with renal dysfunction following Donation after Brain Death (DBD) liver transplantation.

Methods Single-centre study of 290 patients who underwent first whole DBD liver transplantation for chronic liver disease 01/2007–06/2011. Peak peri-operative serum AST was recorded as a marker of hepatic IRI. AKI was defined according to the RIFLE criteria: peak serum creatinine ≥2 times baseline.

Results The median peak peri-operative AST was 1307 U/l. Peak AST correlated well with the histological grading of IRI on "time zero" allograft biopsy (p=0.007). The median peak peri-operative creatinine was 125 (IQR 91–191) μmol/l. The median percentage change in creatinine from baseline was +49 (IQR 12–119). 36.9% of patients developed AKI, of whom 58.9% required renal replacement therapy. Patient survival was reduced in the AKI group (AKI, 82.8%; no AKI, 95.5%, estimated 1-year survival; log rank p=0.001). On univariate analysis peak AST correlated with both peak creatinine (r=0.259, p<0.001) and peak change in creatinine from baseline (r=0.309, p<0.001). Median peak AST was higher in AKI patients (1755 vs 1158 U/l; p<0.001). The incidence of AKI was 25.7%, 41.0% and 75.0% for patients with a peak AST of <1500, 1500–3000 and ≥3000 U/l, respectively (p<0.001). On multiple logistic regression analysis the variables associated with AKI were black ethnicity (p=0.043), pre-transplant MELD (p=0.047), pre-transplant refractory ascites (p=0.047), intra-operative red cell concentrate requirements (p<0.001), peri-operative sepsis (p<0.001) and peak peri-operative AST (p<0.001).

Conclusion Hepatic IRI demonstrates a strong relationship with peri-operative AKI in DBD liver transplant recipients. Hepatic IRI may therefore play an important and modifiable role in the pathogenesis of renal dysfunction in this setting.

Competing interests None declared.