

significantly associated with raised liver function tests (ALT>100, ALT>350) nor with pre-operative diagnoses of cholecystitis, pancreatitis, jaundice or cholangitis. Out of the 248 patients, 4% of patients presented with pain post operatively (N=11). <1% (N=2/248) presented with CBD stones post-operatively despite a negative IOC. No patients presented with pancreatitis or cholangitis post-operatively. In addition, out of a larger cohort of 1957 LC performed by the senior author, 4.5% of cases had CBD stones detected on IOC.

**Conclusion** The incidence of CD stones is not well reported in published literature—the data that exists is mainly following repeat cholecystectomy for PCS rather than intraoperative detection. PCS is widely reported and can cause a therapeutic and diagnostic challenge. The presence of stones in the CD or within a retained gall bladder remnant may be the cause of residual symptoms, but are difficult to diagnose. We propose that the IOC is not only a diagnostic tool for identification of CBD stones and to delineate anatomy, but also serves a therapeutic purpose, allowing “milking” of the CD to remove any stones/debris which in our cohort has resulted in low rates of post-operative pain.

**Competing interests** None declared.

#### PWE-139 OUTCOME OF LIVER RESECTION FOR NON-COLORECTAL AND NON-NEUROENDOCRINE LIVER METASTASES (NCRNNE)

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**Introduction** The liver is a frequent site for tumour metastases, and surgery for colorectal liver metastases (CRLM) is well established, with survival rates accepted to be 50% in 5 years. However, surgery for NCRNNE has been approached with caution. We aimed to report the outcomes of surgery for NCRNNE in our unit, to determine the patterns of disease presentation, recurrence and survival.

**Methods** We identified 78 patients who had liver resection from NCRNNE primary tumours from 28 December 1992 to 2 August 2011 using a prospectively maintained database; Breast (N=19), Malignant Melanoma (N=4), Renal (N=10), Anal Squamous Cell Carcinoma (N=5), Lung (N=3), Sarcoma (N=15), GIST (N=13), Squamous-other (cervix, bile duct, oropharynx) (N=6) and Gastric Adenocarcinoma (N=3). The electronic records of all these patients were then retrospectively reviewed. We obtained data on patient demographics, presentation of disease, pathological data, recurrence and survival. Data were analysed using ANOVA and Kaplan–Meier tests.

**Results** The age at diagnosis varied with tumour type; the youngest was sarcoma (46 years) and the oldest gastric (67 years). The progression to detectable liver disease was quickest with Anal Squamous Cell Carcinoma metastases (172 days), which also had a 60% recurrence rate within a mean of 192 days. Malignant Melanomas had a 100% recurrence rate, which occurred at a mean of 321 days. Breast metastases were the least likely to recur (33%) and had a long disease-free period between recurrences (468 days). The largest metastases were seen in sarcomas (67 cm) and the smallest in melanomas (28 cm). There was no significant correlation between size or number of tumours and survival. The 1- 3- and 5-year survival from the time of NCRNNE metastectomy was 88%, 56% and 47% respectively, compared with 86%, 58% and 46% after CRLM metastectomy. Malignant Melanomas and Anal Squamous Cell Carcinoma had the poorest outcome; 100% mortality at 5 years.

**Conclusion** Liver Resection is an effective treatment for metastases from NCRNNE tumours in highly selective patients. In the right

patient, surgery offers similar survival rates to resection of CRC metastases, but some tumour types do better than others, and a decision to proceed with resection should take into account the histological diagnosis, and an understanding of the behaviour of that tumour type.

**Competing interests** None declared.

#### PWE-140 PERSISTENT SYMPTOMS FOLLOWING CHOLECYSTECTOMY IS UNACCEPTABLY HIGH AND IN NEED OF FURTHER EVALUATION

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**Introduction** Up to 20% of patients undergoing cholecystectomy continue to experience symptoms. We consider such results unacceptably high and in need of further evaluation. Our aim was to identify the biliary symptoms for which cholecystectomy was carried out and then determine the prevalence and the nature of persistent symptoms following the procedure in a cohort of 500 consecutive cases.

**Methods** A validated pre-operative symptoms survey was completed at the time of listing of 500 consecutive laparoscopic cholecystectomies (LC), followed by a follow-up phone survey 12 weeks after the procedure to record the nature, severity and frequency of symptoms experienced pre- and post-operatively. A detailed clinical profiling was carried out on all patients with persistent biliary symptoms.

**Results** All patients had at least two symptoms pre-operatively and 337 (67.4%) had three or more. The most common symptoms pre-operatively were abdominal pain (93.8%), nausea (65.8%), pain related to food (54.4%) and bloating (48.6%). A total of 90 patients were symptomatic postoperatively. 81 patients (16.2%) complained of abdominal pain, while 63 (12.6%) patients also experienced associated dyspeptic symptoms. Seventy three patients (14.6%) developed one or more new symptoms post-operatively, the most common being heartburn found in 34 (6.8%) and abdominal bloating in 29 (5.8%). 60 patients underwent further investigation following LC; 36 patients went on to have a secondary diagnosis made, the most common (13/36) being hiatus hernia, seven patients were found to have a retained common bile duct stone. Overall, there was no significant difference in histology among patients post-operatively.

**Conclusion** A significant number of patients continue to experience symptoms following laparoscopic cholecystectomy. In patients where pain was the most troublesome symptom preoperatively, significant symptomatic improvement was noted. Similarly, those patients that experienced symptoms more dyspeptic in nature preoperatively were less likely to be symptom free following LC. A careful biliary history, a focused physical examination and a thorough pre-operative assessment must be carried out prior to LC to rule out conditions that masquerade as gallbladder disease.

**Competing interests** None declared.

#### PWE-141 HEPATOCELLULAR CARCINOMA AND MICROVASCULAR INVASION IN CIRRHOTIC AND NON-CIRRHOTIC LIVERS: ARE THEY DIFFERENT DISEASES?

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Hospital, Leeds, UK; <sup>2</sup>Department of Histopathology, St James's University Hospital, Leeds, UK

**Introduction** Hepatocellular carcinoma (HCC) behaves differently in cirrhotic and non-cirrhotic livers. Microvascular invasion (MVI) is a key determinant of outcome following curative treatment for HCC. Despite attempts to reach a consensus, reliably identifying microvascular invasion remains difficult. Interrogating factors influencing MVI in patients with or without cirrhosis may determine more reliably identifiable factors or surrogates for MVI and provide valuable insight into the underlying biology of HCC.

**Methods** Review of a prospective database of 229 consecutive patients undergoing hepatectomy (n=164) or transplantation (n=65) for HCC at St James's University Hospital, UK between 1998 and 2011. Diagnosis was based on published guidelines and incidental explant tumours excluded. 115, 50.2% occurred in cirrhotic compared to 114, 49.8% in non-cirrhotic livers. Clinicopathological characteristics were correlated with survival and MVI. Survival was calculated using the Kaplan–Meier method with Log-rank and Cox stepwise regression for survival comparisons. Univariate  $\chi^2$  and multivariate logistic regression were used to analyse relationships between clinicopathological variables and MVI (p<0.05 was indicative of statistical significance).

**Results** In non-cirrhotic patients recurrence independently predicted overall survival (OS) (p=0.001) while multifocal tumours (p=0.042) and viral aetiology (p=0.029) independently predicted disease free survival (DFS). In cirrhotic patients recurrence (p<0.001), MVI (p<0.001) and tumour size >5 cm (p<0.005) predicted overall survival (OS) and disease free survival (DFS) in univariate analysis. Only recurrence (p=0.001) for OS and MVI (p=0.002) and tumour size >5 cm (p=0.027) for DFS retained independence on multivariate analysis. Univariate analysis of pre-operative variables revealed MVI was significantly associated with multifocal HCC and poor differentiation in non-cirrhotic patients (p=0.04 and p=0.019), and with viral aetiology in cirrhotic patients (p=0.047).

**Conclusion** In cirrhotic patients MVI was an independent predictor of DFS while recurrence strongly determined OS. Viral aetiology was the only significant pre-operative factor associated with MVI in the explant. In non-cirrhotic patients multifocality strongly predicted DFS and was associated with MVI. We hypothesise that multifocality in non-cirrhotic HCC may actually be representative of MVI rather than multifocal de novo tumour formation. Given the challenges of robustly identifying MVI in these patients, multifocality could be an extremely useful prognosticator and histopathological indicator of MVI, which we know carries series implications for our patients.

**Competing interests** None declared.

#### PWE-142 ENDOSCOPIC STENTING FOR MALIGNANT BILIARY OBSTRUCTION: A 3-YEAR REVIEW

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**Introduction** Placement of biliary stents in malignant biliary obstruction is an area of controversy as ERCP and stent placement may cause morbidity in patients with operable disease. We review here our experience in a cohort of relevant patients.

**Methods** A 3-year database review to identify all relevant cases for case note review. Principal outcome measures were: success of stent placement; need for further endoscopic intervention; surgical resection rates and documented complications.

**Results** 124 cases were identified. 100 patients underwent ERCP; stent placement was successful at first ERCP in 82% of cases. A

further 5% were stented at a second ERCP and 10% required percutaneous drainage. Plastic biliary stents were used in most cases (75/87, 86%); remaining patients had metal stents. Of plastic stents, 31/75 (41%) required unscheduled re-intervention for stent occlusion, after a median interval of 90 days. 66 patients were referred for a surgical opinion; remaining patients had inoperable disease or comorbidity. Of the referred patients, 28 (23% of whole cohort) underwent resection surgery and of these 8/28 (29%) needed pre-operative revision of their biliary stents. The median post-operative stay was 11 days and serious complications including one death occurred in three cases (11%).

**Conclusion** In this review only 23% of patients with malignant biliary obstruction were suitable for surgical resection. However where prior plastic biliary stents were used, a high proportion required re-intervention and this practice may have contributed to post-operative complications.

**Competing interests** None declared.

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#### PWE-143 FACTORS PREDICTIVE OF SURVIVAL FOLLOWING RESECTION OF EITHER RECTAL OR COLONIC LIVER METASTASES

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**Introduction** While colonic and rectal cancers are often considered as a single disease entity there is a growing body of evidence that these are in fact separate disease processes. While a variety of factors have been identified in the literature as predictive of outcome following resection of metastatic disease from colorectal primaries it is not known if colonic liver metastases (CLM) behave differently to rectal liver metastases (RLM). The aim of this study was to determine those factors which predict long-term survival following resection of either CLM or RLM.

**Methods** We analysed a prospectively maintained Hepatobiliary database of 418 patients (with complete follow-up) who underwent liver resection for CRM between January 2000 and December 2010. The cohort was stratified according to the site of the primary tumour with rectal tumours being defined as those within 15 cm of the anal verge. Continuous variables were compared with the Mann–Whitney U test whereas categorical variables were compared with  $\chi^2$  test. Survival analysis was performed with Kaplan–Meier plots and significance assessed with log rank test. Multivariate analysis was performed using a Cox-Regression model. A p value of <0.05 was considered significant.

**Results** 55% of patients had CLM (n=227) whereas 45% had RLM (n=191) (p=0.258). Patients with CLM were less likely to have node positive primary disease (52% vs 62%; p<0.05). Overall 5-year survival was similar for both CLM and RLM (42% vs 45%; p=0.62). Following resection of CLM multivariate analysis identified a CEA  $\geq$ 200 (OR 2.39; p<0.01) and the presence of 4 or more tumours (OR 2.4; p<0.05) as independent predictors of long term survival. While there was a strong trend towards poorer 5-year overall survival in those with a resection margin <1 mm this did not reach statistical significance (p=0.383) on univariate analysis. Following resection of