

for dLC), the difference in net monetary benefit was around £700 per patient in favour eLC pathway. In a hospital conducting around 200 cholecystectomies per year on patients for acute biliary disease in the NHS, this could translate to a cost saving of over £140 000 per year.

**Competing interests** None declared.

# OC-131 **PATTERN OF RECURRENCE FOLLOWING NON-ANATOMICAL RESECTION FOR COLORECTAL LIVER METASTASIS**

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**Introduction** Non-anatomical resection (NAR) for colorectal liver metastasis (CRLM) has become more common in an attempt to preserve liver parenchyma. Pattern of recurrence (POR) following NAR has been reported previously, but there has been no detail on the hepatic recurrences with respect to previous NAR. We aim to investigate pattern of hepatic recurrence in patients who underwent NAR for CRLM, especially looking at the recurrences in the context of previous resected segment.

**Methods** 1580 CRLM resection were performed in our centre between 1993 and 2010. 591 (37.4%) were NAR and 989 (62.6%) were AR. Patients who underwent simultaneous Anatomical Resection (AR) were excluded (95 out of 591). All NAR were grouped as either unilobar or bilobar metastatectomy and POR studied in relation to previous resected segment.

**Results** 495 NAR were included. There were 291 recurrences (58.7%). 188 were hepatic (37.9%) and 103 extra-hepatic (20.8%). In 11 patients with hepatic recurrence, data were not available for recurrence segment and therefore excluded from POR analysis. The POR following unilobar metastatectomy (n=127): same segment (n=32, 25.2%), same sector (n=9, 7.1%), ipsilateral hemi-liver (n=48, 37.8%), contralateral hemi-liver (n=15, 11.8%) and bilobar (n=23, 18.1%). The POR following bilobar metastatectomy (n=50): same segment (n=1, 2%), hemi-liver with equal number of segments resected previously (n=15, 30%), hemi-liver with lesser involved segments previously (n=7, 14%), hemi-liver with more segment involved previously (n=10, 20.0%) and bilobar (n=17, 34.0%).

**Conclusion** This retrospective study shows that following unilobar CRLM resections, 70.0% recur in the ipsilateral hemi-liver. In bilobar resections, 22.0% recur in the same segment or hemi-liver with previous multiple resections. Our data supports a more aggressive approach for unilobar disease. Further studies need to be done on pattern of recurrences in patients undergoing parenchyma preserving surgery to develop best surgical strategies.

**Competing interests** None declared.

# OC-132 **CARDIOPULMONARY EXERCISE TESTING INCREASES HEPATECTOMY RATE IN THE ELDERLY**

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**Introduction** Hepatectomy offers the only possibility of cure to patients with colorectal liver metastases (CRLM) and although 50%

of CRLM patients are >70, only 25% of those undergoing hepatectomy are >70.<sup>1</sup> This is likely to be due to the higher perioperative mortality. Cardiopulmonary exercise testing (CPET) can identify patients at higher operative risk.<sup>2</sup> We introduced CPET on 1 October 2009. This study assesses its effect on patient selection and outcome.

**Methods** After 1 October 2009 all patients undergoing resection of CRLM meeting one of the following criteria underwent CPET. Criteria

1. Planned extended right/or extended left resection
2. Over 65
3. Significant comorbidities

Data were collected prospectively. Group (A) 1 October 2009–21 February 2011 was compared to a published historical series 1 August 1990 to 1 April 2007 (Group B). We also compared our results to a recently published series from LiverMetSurvey (LMS).<sup>1</sup>

**Results** Group A 155 patients, Group B 654 patients. In Group A 64 (41%) patients were 70+, Group B 181 (28%) patients (p<0.0001). Within the over 70's groups there was no difference in male:female ratio or postoperative complications, but there was an increased use of neoadjuvant chemotherapy in Group A 26 patients (40%) vs 34 patients (19%) Group B (p=0.001). In hospital mortality was 1.6% (1 patient) Group A vs 4.9% (9 patients) group B (p=0.46). Comparing Group A to LMS data<sup>1</sup> from 1/1986 to 6/2007 (7764 resections). Group A 41% aged 70+ vs 21% LMS (p<0.01). No significant difference in neoadjuvant chemotherapy use (Group A 41% vs LMS 34%) (p=0.22), or 60 day mortality (Group A—1 patient (1.6%) vs 62 (3.8%) LMS) (p=0.51).

**Conclusion** CPET enabled accurate preoperative fitness assessment and led to a significant increase in the number of patients over the age of 70 proceeding to surgery. There is a trend towards lower mortality possibly due to better preoperative assessment. We believe that the number of hepatectomies undertaken for CRLM in patients aged over 70 would rise if CPET were introduced as a standard preoperative assessment tool.

**Competing interests** None declared.

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# OC-133 **ARTERY FIRST PPPD—CLINICAL OUTCOME AND STAGING USING A STANDARDISED PATHOLOGY PROTOCOL**

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**Introduction** With increased numbers of borderline locally advanced patients undergoing resection due to the acceptance of portal vein (PV) resection, early dissection of the superior mesenteric artery (SMA) allows definitive assessment of the tumour/SMA relationship and improved control when PV resection is required.

**Methods** The lymph node yield, resection margins, morbidity and mortality data were compared between patients undergoing Artery first technique of pancreaticoduodenectomy (January 2009–December 2010) and previous resections (January 2000–December 2008).

**Results** 42 resections were carried out using the artery first technique were age, sex and pathology matched with 182 previous

resections. Although higher, the increase in the overall R0 resection margins (28.6% vs 36.3%,  $p=0.375$ ) and the posterior resection margins (42.9% vs 36.3%,  $p=0.481$ ) didn't meet significance. The mean lymph node yield was significantly increased (19 vs 27,  $p<0.05$ ) but there was no significant difference in the post-operative morbidity and mortality rates between the two groups. The actuarial 1 and 2 year survival was 72% and 49.4% for earlier resections and 71.8% and 56.8% for Artery first PPPD respectively. The 1 and 2 year disease free survival was 65.2% and 47% for earlier resections and 67.6% and 64.4% for Artery first PPPD.

**Conclusion** Artery first resection enhances the clearance at the SMA (a common site for R1 resection) with increased lymph node yield. The 2-year follow-up with Artery first PPPD shows a trend towards improving overall and disease free survival.

**Competing interests** None declared.

### OC-134 INTRA-ABDOMINAL METASTATIC NEUROENDOCRINE TUMOURS: HOW FEASIBLE IS THE LAPAROSCOPIC APPROACH TO LIVER RESECTIONS?

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**Introduction** Approach to liver metastases in neuroendocrine tumours (NETs) significantly impacts on 5-year survival. A symptom based approach yields 5-year survival of 30% compared to >60% with multi-modal cytoreduction.<sup>1</sup> At our NET tertiary referral centre patients are managed in line with the European Neuroendocrine Tumour Society guidelines,<sup>2</sup> but with greater emphasis on multimodal cytoreduction for patients with unfavourable patterns of metastatic disease. We currently perform 60% of liver resections laparoscopically: over 300 procedures from 2003 to 2011. No existing study describes laparoscopic liver resections in patients with NETs. This study evaluates the feasibility and efficacy of the laparoscopic approach to liver resections in NETs in our tertiary referral unit.

**Methods** All patients assessed for intra-abdominal NETs from April 2005 to January 2012 were prospectively registered on a database. Patients undergoing laparoscopic liver resection were identified. Demographic, peri-operative and survival data were analysed using SPSS V.12.0. Severity of operative and post-operative morbidity was graded using the Clavien system.

**Results** The NET MDT assessed 239 patients. 99 patients had liver metastases; 58 underwent liver resection. 29 laparoscopic liver resections were performed on 27 patients (12F:15M), median age 63 (41–78). 11 major; eight minor and 10 multiple resections were performed. Intent of resection was curative ( $n=4$ ), cytoreductive ( $n=19$ ) or diagnostic/staging ( $n=6$ ). Peri-operative mortality was 0% with no cases of carcinoid crisis, bile leak or port site metastases. Metastatic resections with no primary resection ( $n=27$ ) had a complication rate of 11% ( $n=3$ ) with no complication greater than grade IIIa. Median post-operative stay was 4 days (0–12). 24 patients are alive after median 32 months (9–64) follow-up post diagnosis and median 21 months (7–62) follow-up post surgery. 3 patients died of recurrence after median 25 months (20–30) follow-up post diagnosis and 20 months (16–25) follow-up post surgery.

**Conclusion** This is the first series to demonstrate laparoscopic liver resection for metastatic NETs can be performed with low morbidity and mortality by experienced surgeons in a tertiary referral unit.

**Competing interests** None declared.

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### OC-135 LIVER RESECTION FOR COLORECTAL METASTASES: IS THERE VARIATION IN REFERRAL PRACTICE BETWEEN COLORECTAL MDTs IN A CANCER NETWORK? A PROSPECTIVE STUDY

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**Introduction** Half of all patients with colorectal cancer (CRC) develop liver metastases (LM). Liver resection offers the greatest survival benefit in suitable patients with 5- and 10-year survival rates of 30%–58% and 25% respectively. There remains great variability in access to liver resection in the UK. We sought to investigate this within a cancer network known to already have a high rate of resection of CRCLM.

**Methods** A prospective study of all patients presenting with new CRCLM in a cancer network was undertaken over a 12-month period. A study proforma was approved by the network to assess management decisions for all patients with CRCLM discussed at the seven CRC multidisciplinary team (MDT) meetings. Data were retrospectively collected on patients with CRCLM who did not have the proforma completed. Outcomes for all patients referred to the tertiary liver MDT were recorded and collated. Subsequently radiology of patients deemed inoperable at the CRC MDTs was reviewed by the liver MDT.

**Results** In total 631 patients with new CRCLM were assessed at CRC MDT meetings. Study forms were completed for 241 (38%). 66% had synchronous disease and 42% unilobar disease. In all, 27% of patients were referred to the liver MDT for consideration of resection while 17% were deemed unfit, 2% refused referral, 17% gave no reason and 64% were thought inoperable. In the liver MDT, 142 new patients were discussed from this network. 74% of patients reviewed were deemed suitable for further curative treatment; 52% resected and 22% neoadjuvant chemotherapy with a view to resection with a further 1% receiving ablation. Radiology for the patients considered fit but inoperable at CRC MDTs was retrospectively reviewed by a hepatobiliary radiologist and Liver surgeon and demonstrated a further 29% of patients were deemed operable and 15% of patients had equivocal imaging and warranted further investigation. Applied across the cancer network, this suggests that if all suitable patients were referred to the liver MDT, referral rates would increase by 142%.

**Conclusion** Despite increased resection rates for CRCLM in the last decade, this prospective study shows a significant number of patients with potentially resectable disease are still not assessed in a specialist MDT. Improved referral rates may improve resection rates and improve overall outcomes for CRC patients. Extrapolation of these figures across the UK suggests improvements in referral practice of patients with CRCLM without any change in resection practice or post-resection outcomes could increase the number of patients with CRC in the UK alive at 5 years by 5%.

**Competing interests** None declared.