Conclusions: Mortality has decreased with the introduction of non-operative management strategies and damage control techniques. Mortality for low-grade (grades I, II, III) injuries is rare, but for high-grade injuries ranges from 10 to 30% (grades IV, V, VI).

EP01E-071
BILIOVASCULAR COMPLICATIONS OF MAJOR LIVER TRAUMA
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Introduction: Biliovascular complications are expected in high grade liver injury. Present study is planned to evaluate incidence, management, outcome of biliovascular complications arising as result of major hepatic trauma.

Methods: 56 patients with grade III or more liver injury were studied prospectively from July 2013-Dec 2014 at PGIMER; Chd. Patients surviving over 24 hours were included. Biliary and vascular complications were evaluated with CT/HIDA and CT angio respectively. Interventions required to manage complications were analyzed and patients were followed up to 6 weeks.

Results: Grade 3 (n=29), grade 4 (n=17) and grade 5 (n=10), 17(30.35%) patients developed biliovascular complications. Biliary complications (n=5), intraabdominal collections (n=1), ascites (n=2), biliary peritonitis (n=1), biliary leak from intraabdominal drains left after laparotomy (n=1), ERCP with biliary stenting (n=2), surgical intervention for biliary peritonitis (n=1). ERCP failed in (n=1), later operated for biliary stricture. Arterial complications (n=8), venous complications (n=9) were seen in 14 patients. AE alone (n=5), operated for rebled after AE (n=1), surgery for hemodynamic instability, later with AE (n=2). Venous injuries were managed conservatively. Operative intervention, grade, size of hematoma, delayed CECT and blood transfusion requirement were statistically significant in detecting biliovascular complications. 7 (12.5%) deaths, 2 hepatic-related mortalities occured due to uncontrolled bleed.

Conclusion: High grade liver injury will have high incidence of developing biliovascular complications which needs multimodality treatment strategies. CECT in patients with clinical evidence of biliary complications and vascular complications is effective screening tool. ERCP and angioembolisation role in management of high grade liver injuries is safe and effective.

EP01E-072
ECTOTIC FAT IN SKELETAL MUSCLE AND LIVER IS ASSOCIATED WITH SHORTER SURVIVAL IN PATIENTS WITH COLORECTAL LIVER METASTASES
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Introduction: Whereas high adipose tissue mass is associated with longer survival in patients with cancer (cachexia), ectopic fat in muscle and liver appears to be related to poor survival. Using multiple computed tomography scans (CT-scans) over time and liver biopsies, we assessed the relationship between survival and liver steatosis as well as preoperative changes in muscle fat content and body composition in patients with colorectal liver metastases.

Methods: Patients with two preoperative CT-scans were selected from a cohort of 289 patients with colorectal liver metastases undergoing partial hepatectomy. Scans were analysed using a single CT-slice at the L3 level to assess adipose tissue and skeletal muscle mass. Muscle fat content was assessed by calculating average Hounsfield units of muscle tissue (radiation attenuation). Liver biopsies were histologically scored for steatosis using the SAF-score.

Results: 137 patients had two available preoperative CT-scans with a mean interval of 3.2 months. In multivariate cox-regression analysis, reduction in muscle radiation attenuation, reflecting fat accumulation, was associated with shorter disease-free survival (HR 1.98, 95%-CI:1.20-3.28; p<0.01) and shorter overall survival (HR 1.79, 95%-CI:1.12-2.86; p=0.01). Liver steatosis was also associated with shorter overall survival (HR 1.77, 95%-CI:1.07-2.90; p=0.03). In contrast, high baseline total adipose tissue mass was related to increased disease-free survival (HR 0.60, 95%-CI:0.45-0.80; p<0.01) and overall survival (HR 0.75, 95%-CI:0.58-0.98; p=0.03). Changes in skeletal muscle mass were not associated with survival.

Conclusion: Ectopic fat in muscle and liver may be an important marker of tumour progression since it was associated with shorter disease-free survival and overall survival.

EP01E-073
INDOCYANINE GREEN FLUORESCENCE GUIDED SURGERY IN PRIMARY AND METASTATIC LIVER TUMORS: PRELIMINARY RESULTS FROM A SINGLE-CENTER EXPERIENCE
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Introduction: Indocyanine green fluorescence-guided surgery (ICG-FGS) has emerged as a potential new imaging modality for improving the detection of hepatic focal lesions in both, primary and metastatic liver tumors. We want demonstrate the technique and details for a complete and safe liver resection through using ICG-FGS surgery and to assess its potential applications.

Methods: From December 2017 to 15 January 2018, 5 patients (1 primary, 4 metastatic tumors) underwent surgery with ICG-FGS. ICG (0.4 mg/kg) was injected intravenously 24 h before surgery. We perform hepatic IOUS, as indocyanine green fluorescence-guided surgery (ICG-FGS) detected all already known lesions (n=7) and identified 1 additional small tumor (1 metastasis, diagnostic improvement 12.5%). All metastatic nodules
were hypofluorescent with a hyperfluorescent rim, whereas hepatocellular carcinoma was hyperfluorescent. In all cases, in vivo and ex vivo fluorescence revealed cleared liver margins, and postoperative pathological examination greatly benefited of liver fluorescence to assess radicality. **Conclusions:** ICG-FGS was shown to be an effective and safe instrument to help intraoperative staging and to assess radicality in the surgical treatment of primary and metastatic liver tumors.

**EP01E-074**  
**COMPARISON OF CT AND HEPATOBILIARY SCINTIGRAPHY IN VOLUMETRY OF FUTURE LIVER REMNANT AFTER PORTAL VEIN EMBOLIZATION AND RALPSS**  
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**Background:** The study was aimed to compare accuracy of CT and hepatobiliary scintigraphy (HBS) in volumetric estimation of future liver remnant (FLR) before and after portal vein embolization (PVE) and Radiofrequency Assisted Liver Partition with Portal vein embolization in Staged liver resection (RALPSS).  
**Methods:** During three years (January, 2015-December, 2017) 46 patients with different malignancies of liver and bile ducts included in the study: PVE (29) and RALLPS (17) were performed when major liver resection was indicated in patients with small FLR.  
**Results:** After PVE alone the mean rate of FLR hypertrophy estimated by HBS was significantly larger than the mean rate estimated by CT-volumetry: 71(20-171)% and 31(10-97)%, respectively (p=0,001). After RALPSS the mean rate of FLR hypertrophy estimated by HBS was also significantly larger than the mean rate estimated by CT-volumetry: 86(25-264)% and 45 (0-113)%, respectively (p=0,027). There was no significant differences in the rate of FLR hypertrophy between PVE and RALPSS, estimated by CT (p=0,099) and HBS (p=0,471).  
**Conclusion:** HBS is more effective and more precise method of FLR volumetry in comparison with CT-volumetry as HBS considers volumetry of functioning liver parenchyma. In terms of FLR hypertrophy RALPSS did not show evident advantage over PVE, nevertheless, there was a tendency to more effectiveness of RALPSS.

**EP01E-075**  
**APPLICABILITY OF 3D PRINTING IN THE PLANNING OF COMPLEX LIVER SURGERY (LIV3DPRINT)**  
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**Introduction:** Three-dimensional (3D) printing has gained popularity in medicine in the last decade. Hepatic resections are challenging operations due to the complex nature of the liver anatomy, so 3D printing is a promising new tool for surgical planning.  
**Methods:** Complex hepatic tumors (bilarbular disease, infiltration of suprahepatic veins or two-stage resection or intrahepatic vascular reconstruction). A CT and / or MRI was performed preoperatively to document the tumor distribution, estimate the remaining volume of the future liver and identify tumor-vessel relationships. In all patients, a 3D digital image reconstruction and a 3D printing model were performed.  
**Results:** A 3D digital image reconstruction and a 3D printing model were performed in a total of 10 patients. In 6 of them an ALPPS was performed (3 due to hepatic metastasis of colorectal ca, 1 hepatocellular carcinoma, 1 intrahepatic cholangiocarcinoma and 1 Klastkin tumor), in 1 patient an extended right hepatectomy with Roux-en-Y hepaticojejunostomy for Klatskin tumor, in 1 patient a right hepatectomy for intrahepatic cholangiocarcinoma, in 1 patient an exploratory laparotomy for assessment of response to neoadjuvant treatment of colorectal cancer metastasis, and in 1 patient a renal venal graft in right suprahepatic metastasis of colorectal cancer.  
**Conclusions:** Surgeons reported greater confidence with the use of the 3D model for the identification of the intrahepatic and extrahepatic structure, segmentation and specific tumor extension. At the same time, they highlighted its applicability in the teaching of students and residents as well as its usefulness in the information of the patient.