SOMATOSTATIN INFUSION INHIBITS STELLATE CELL ACTIVATION AND COLLAGEN DEPOSITION IN THE ACUTE PHASE OF “SMALL-FOR-SIZE” LIVER REGENERATION

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Purpose: The development of “small-for-size” syndrome (SFSS) after extended hepatectomies is associated with dreadful consequences for the patient. Excessive portal pressure and flow in the remnant liver may cause severe endothelial injury and impairs the normal process of liver regeneration leading to postoperative liver insufficiency. Somatostatin has been described as a protective pharmacological agent to prevent this syndrome when a partial graft is transplanted for its hemodynamic effects in the splanchnic area. In the present study, we investigated if somatostatin (SST) could promote a better regeneration and prevent the development of the SFSS after extended hepatectomies.

Methods: A porcine model of 75% hepatectomy, 90% hepatectomy and 90% hepatectomy treated with somatostatin were performed. Animals were maintained 5 po days and euthanasia was also planned at 1 po day to evaluate the liver weight and immediate tissue changes after resection. Tissue samples were taken before resection and before euthanasia to perform analysis of proliferation (immunohistochemistry of Ki-67), stellate cells activation (PCR, Western Blot and immunohistochemistry of α-SMA), collagen production (PCR and PicroSirius Red staining) sinusoidal endothelial cells injury (immunochemistry of CD-31) and apoptosis (Western Blot of Bax and Bcl-2 and TUNEL).

Results: Changes in liver mass caused changes in the proliferation rate of remnant hepatocytes. Although both 90% and 90%-SST group had the same proliferation rate, and higher compared with the 75% group (2±2 vs. 1±1 p<0.001) 1 day after the resection, on the 5th day of follow-up, the proliferation was statistically higher in the 90%-SST, 10±7, versus 2±2 nuclei from the 75%, (p<0.001) and versus 5±6 from 90% (p<0.001). These differences between 90% and 90%-SST on the 5th day could be related to the higher apoptosis on the 90% group (p<0.001). Stellate cell activation was higher in the 90% group 1 day after surgery (p<0.001), which led to higher production and deposition of collagen around the sinusoids (p<0.001), and so, induced a higher contraction during all the follow-up (p<0.001).

Conclusion: Somatostatin protects the remnant liver after extensive hepatectomy by reducing the activation of stellate cells, preserving both contractibility and the stability of the sinusoidal endothelial cells and inhibiting apoptosis.

SCORING SYSTEMS IN LAPAROSCOPIC LIVER SURGERY: COMPARISON OF TWO DIFFICULTY SCORES ON THE BASIS OF 100 CONSECUTIVE LAPAROSCOPIC LIVER RESECTIONS

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Purpose: In recent years two scoring systems have been proposed to estimate difficulty of laparoscopic liver resections (LLR) preoperatively. The aim of this analysis was to compare them in an independent patient cohort regarding the predictability of morbidity.

Method: All LLRs performed between 01/2011 until 01/2019 were identified from our prospective institutional database. We analyzed patient characteristics, intra- and postoperative data. Complications occurring postoperatively were graded according to Dindo-Clavien classification. Difficulty of LLRs was classified using IWATE- and Halls-score, P-values <0.05 were considered significant.

Results: We identified 100 LLRs. Liver cirrhosis was present in 13 patients. Conversion rate was 4% (due to bleeding of the left liver vein in two cases, tumor rupture in one case and infiltration of the bile duct in one case). The most frequent indication for LLR were colorectal liver metastases (34%) and hepatocellular carcinoma (23%). Postoperative complications graded IIIa and higher occurred in 10% of the patients. Two of these patients died within 90 days. Higher levels of difficulty were associated with higher intraoperative blood loss (p<0.001 and p=0.002), longer duration of surgery (both p<0.001) and hospital stay (p=0.012 and p=0.033) for the Halls- and IWATE-scores, respectively. ROC curve analysis revealed better performance for the Halls- than for the IWATE-score regarding morbidity as well as for mortality.

Conclusion: Both the IWATE- and the Halls-score correlate well with postoperative morbidity, whereas the Halls-score predicted postoperative morbidity and mortality slightly better than the IWATE-score.

MOLECULAR BIOMARKER KRAS AS SUPERIOR PREDICTOR OF OVERALL SURVIVAL IN PATIENT WITH RESECTABLE COLORECTAL LIVER METASTASES

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Introduction: This study pursues to investigate the prognostic value of different risk factors associated with the
primary colorectal tumor in patients with resected colorectal liver metastases (CRLM).

**Methods:** All patients who underwent resection of CRLM with curative intent from January 2010 to August 2018 were included. The relationship between overall survival (OS) and six clinicopathologic variables related to the primary colorectal tumor, such as tumor location, T4 status, lymph node positiveness, lymphovascular invasion (LVI), perineural invasion (PNI), extrhepatic disease, and KRAS status (mutated vs wild type) were analyzed. Univariate analysis was performed with Kaplan-Meier and the log-rank test. For multivariate analysis, Cox proportional hazard regression model was used.

**Results:** Data were available for 129 patients. Univariate analysis identified extrahepatic disease, *mt-Kras*, and lymph node positiveness of the primary colorectal tumor as adverse prognostic factors for OS after hepatic resection.

In multivariate analysis, extrhepatic disease [HR of 3.89 (95% CI: 1.33-11.37) (p=0.013)] and *mt-Kras* [HR of 2.59 (95%CI: 1.46-4.58) (p=0.001)] were independently associated with significantly shorter OS.

**Conclusions:** In the last years, a bunch of risk scores with different clinicopathologic characteristics have been evaluated as survival prognostic factors, but their feasibility is not totally widespread. Our study shows how a molecular biomarker as *mt-Kras*, is an indicator of a worse outcome for patients with resectable colorectal liver metastases.

**EP006**

**PRONOSTIC FACTORS AFTER BREAST CANCER LIVER METASTASES SURGERY**

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**Hospital Universitario de Badajoz, Cirugía Hepatobilio-pancrátiaca y Trasplante Hepático, Spain**

**Introduction:** Approximately, half of women with metastatic breast cancer will develop liver metastases (LM), however, the role of hepatic resection in these patients remains unclear.

**Method:** Retrospective analysis of patients with LM from breast cancer who underwent liver surgery in our center between 2008-2020.

**Results:** A total of 17 women were involved with an average age of 54.13 years (SD11.67).

Breast tumor histology were: intraductal carcinoma (82.4%), adenocarcinoma (11.8%) and papillary carcinoma (5.9%). 64.7% of patients were estrogen-receptor-positive, 58.8% progesterone-receptor-positive and 11.8% Her2+.

The median time from breast surgery to LM diagnosis was 31.52 months (IQR 88.52-13.88).

Neoadjuvant therapy (NT) prior to liver resection was administered to 8 patients (47.1%), 75% of whom were responsive.

Minor-hepatectomy was the most frequent resection performed, 14 patients (82.4%). The median DFS after liver surgery was 14.75 months (IQR 64.52-4), recurrence was identified in 9 patients (52.9%), (22.2% extrahepatic, 44.4% hepatic, 33.3% both).

The prognostic factors which might have a negative influence on overall survival (OS) were T3 tumor (p=0.038), Her2+ (p=0.002), poorly differentiated tumors (p=0.057), synchronous LM (p=0.079), no response to NT before liver surgery (p=0.008) and an interval until LM appearance <72 months (p=0.048).

Moreover, patients without neoadjuvant response (p=0.057) and an interval until LM appearance <72 months (p=0.049) showed a worse DFS after liver surgery.

**Conclusion:** Breast cancer LM surgery is a valid procedure in selected cases. Response to NT, the interval until LM appearance, T3 tumors, Her2+, poorly differentiated breast cancer and synchronous LM are prognostic factors that we should take into account to select those women who may benefit from liver surgery.

**EP007**

**PREDICTIVE SIGNIFICANCE OF PREOPERATIVE FIBRINOGEN-TO-ALBUMIN RATIO IN MICROVASCULAR INVASION OF HEPATOCELLULAR CARCINOMA**

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**Beijing Hospital, National Center of Gerontology, Institute of Geriatric Medicine, Chinese Academy of Medical Sciences, Department of General Surgery, China**

**Purpose:** Hepatocellular carcinoma (HCC) is a deadly disease with high postoperative recurrence and microvascular invasion (MVI) is a significant prognostic factor affecting overall survival in HCC patients after surgical resection. However, the diagnosis of MVI can only be determined by pathological examination of specimens. There is a lack of criterion in preoperative diagnosis of MVI. Accurate preoperative prediction of MVI is conducive to clinical decisions. In this study, we will develop a preoperative diagnostic model for MVI based on fibrinogen-to-albumin ratio (FAR).

**Methods:** Data from 193 patients with HCC who underwent surgery at Beijing Hospital between January 2013 and October 2020 were retrospectively collected. Patients were grouped according to an optimal value of FAR. Logistic regression analysis was used to identify variables significantly associated with MVI that were then included in the nomogram. And the discrimination and calibration ability of the nomogram were evaluated by using R software.

**Results:** MVI was confirmed in 88 (45.6%) patients by a pathological examination. Multivariate logistic regression analysis identified four risk factors independently associated with MVI: Tumor size [odds ratio (OR) = 3.263; 95% confidence interval (CI): 1.300-8.261; P = 0.012], serum α-fetoprotein (20–400 ng/mL, OR = 2.326; 95%CI: 1.026–5.721; P = 0.043; ≥400 ng/mL, OR = 2.818; 95% CI: 1.214–6.542; P = 0.016), total protein (OR = 1.107; 95%CI: 1.038–1.181; P = 0.002), and FAR (OR = 2.600; 95%CI: 1.079–6.261; P = 0.033). A nomogram incorporating statistically significant factors was developed and the AUROC was 0.755. Calibration curve with Unreliability rating statistically significantly associated with MVI were then included in the nomogram. And the discrimination and calibration ability of the nomogram were evaluated by using R software.

**Conclusions:** breast cancer LM surgery is a valid procedure in selected cases. Response to NT, the interval until LM appearance, T3 tumors, Her2+, poorly differentiated breast cancer and synchronous LM are prognostic factors that we should take into account to select those women who may benefit from liver surgery.
Conclusion: We have developed a preoperative prediction model for MVI in HCC patients based on FAR. The model could aid physicians in clinical treatment decision making.

EP008
THE IMPACT OF THE COVID-19 PANDEMIC ON LIVER SURGERY IN SOUTH WALES
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Cardiff Liver Unit, University Hospital of Wales, United Kingdom

Introduction: As the COVID-19 pandemic continues, it is increasingly apparent that the victims of the pandemic are not just those who contract the virus, but also the innumerable patients with other life limiting conditions who have had access to potentially life-saving surgery delayed due to lack of inpatient beds. Like many, our hospital initially cancelled all elective surgery but was able to re-instate it relatively quickly owing to the development of a “green pathway.” We sought to review how the pandemic has impacted hepatobiliary surgery at our unit.

Methods: Our prospectively maintained database was interrogated to identify all surgical activity in our unit during 2019 (pre-COVID) and 2020 (COVID).

Results: Our green pathway involves patients isolating for 14 days prior to admission to a separate ward with dedicated junior doctors who do not see non-green patients.

Our green pathway involves patients isolating for 14 days prior to admission to a separate ward with dedicated junior doctors who do not see non-green patients.

Between January 1st and December 31st 2020, 129 patients underwent exploration with a view to liver resection. 106 resections were undertaken. This compares to 152 explorations with 123 resections in 2019.

In 2020, our median length of stay was 6 days (1-41). Twelve patients (9%) developed a significant (CD 3 or 4) complication. There was no inpatient mortality. Median length of stay in 2019 was also 6 days (1-69). Twelve patients (8%) had significant morbidity. A single patient died (0.7%).

Conclusion: In spite of the COVID pandemic, our unit has managed to continue to offer a high volume tertiary hepatobiliary surgical service without an increase in length of stay, morbidity or mortality.

EP010
HCC SURVEILLANCE AT A TERTIARY/QUATERNARY CENTRE: DEVIATION FROM EASL GUIDANCE AND ITS CONSEQUENCES
T. Gill and S. Wadhwani
Queen Elizabeth Hospital, Radiology, United Kingdom

Purpose: This study evaluates a Tertiary/Quaternary Centre, measuring adherence and identifying key deviations to EASL guidelines for the surveillance/diagnosis of at-risk patients for Hepatocellular Carcinoma.

Method: The authors present a retrospective cohort study. At risk adults commencing ultrasound surveillance for HCC at a specialist Tertiary/Quaternary Unit in the United Kingdom, between 01 Jan 2015 to 30 June 2015 were identified. The data underwent inclusion/exclusion criteria to identify a cohort of 140 individuals with 1010 scans over a 5-year period (2015-2020). Sequence and time intervals between initial surveillance imaging and further imaging/biopsy were assessed, with attention to their impact and consequences in clinical outcome.

Results: USS detected nodules <1cm were appropriately followed-up in 74.3% of cases, (mean 133.0 days, median 108.5 days). Nodules >1cm were appropriately followed-up in 93.7% of cases, with CT and MRI used as 1st modality 28.6% and 71.4% respectively. CT (mean 28.4 days, median 23.0 days); MRI (mean 56.7 days, median 41.0 days). Indeterminate nodules at first modality imaging were appropriately followed-up for second modality in only 26% of cases (mean 48.8 days, median 46.0 days). Total nine biopsies were undertaken (mean 80.7 days, median 66.0 days). Three malignant diagnoses (33%), six benign pathology (67%).

Conclusion: Our Unit demonstrates high adherence to baseline USS surveillance and performs interval USS appropriately for positive and negative cases. First modality follow-up is efficient, with Imaging led perceptual choice of CT vs. MRI. Second modality follow-up deviates from guidance to a higher degree, with high straight-to-biopsy rate as is optional for Specialist Unit based programmes. Earlier reversion to routine/expedited USS deviates from established EASL guidance; however, this does not appear to affect outcomes detrimentally. In addition, extending further surveillance intervals to six months does not cause adverse outcomes.

EP011
SPANISH SURVEY ON LIVER SURGERY UNITS
J. M. Ramia1, G. Blanco2, R. de la Plaza3, M. A. Gomez Bravo1, G. Rodriguez-Laiz1, L. Sabater4, M. Serradilla-Martin1 and Spanish Liver Units Survey
1Hospital General Universitario de Alicante ISABIAL, Surgery and Liver Transplantation, 2Complejo Universitario de Badajoz, 3Hospital Universitario de Guadalajara, 4Virgen del Rocio, 5Hospital Clínico, University of Valencia. Biomedical Research Institute, and 6Hospital Universitario Miguel Servet, Surgery, Spain

Purpose: The technical, human, scientific and medical assistance characteristics of the Units that attend a complex pathology are little studied and known.

Material and Methods: Multi-institutional descriptive study (survey) on the characteristics of the Units where liver surgery (LS) is performed in Spain.

Results: 88 surveys were sent. 60 centres answered (68.2%) belonging to all spanish autonomous communities (17). The sum of inhabitants attended was near 35 millions inhabitants (75% of spanish population). Mean number of beds per hospital was 740. 21 Units (35%) also perform liver transplantation. The mean number of surgeons per Unit is 5. Only 3 Units had a HPB fellowship program. 100% of the Units have intraoperative ultrasound for open approach and 50 (83.3%) have intraoperative ultrasound for laparoscopic approach. In 61.7% of the Units (37/60) the
ultrasound was performed by the surgeon, radiologist 15% (9/60) and both 23.3% (14/60). 65% (39/60) of the Units have a 3D laparoscopic tower. 65% (39/60) have an ICG module. 95% (57/60) have the equipment to perform radiofrequency ablation of lesions. 40% has Portal flow measurement device (24/60). 100% can perform intraoperative cholangiography.

The mean of liver resections per Unit during 2019 was: 20 major hepatectomies, 29 minor hepatectomies and 3 liver hydatidosis cases. Mean percentage of laparoscopic liver surgery was 20%. Preoperative nutritional assessment is carried out systematically by 43.3% Units (26/60), selectively 50% (30/60) and never 6.7% (4/60). Operative fragility is assessed in 45% of the Units (27/60), selectively in 50% and never in 6.7% (4/60). 86.7% Units (52/60) have a preoperative rehabilitation program, and it is systematically applied by 42.3% (22/52) and selectively by 57.7% (30/52). Answers about real-life practice in liver resections are in Table 1. Laparoscopic approach is more frequent in minor hepatectomies. Abdominal drain and hemostatics are more employed in major resections. In 2015-2018, 39 Units published 226 manuscripts. Mean impact factor/paper was 1.3.

**Conclusions:** This survey provides updated information about the majority of the Units where liver surgery is performed in Spain, and could also serve as a starting point for prospective multicenter studies.

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**EP012**

**FIRST CASE OF SURGICAL EXTENDED LIVER VENOUS DEPRIVATION (ELVD) ASSOCIATED TO PARTIAL-ALPPS IN A PATIENT WITH CENTRAL HCC**

L. Capobianco¹, M. Bongers², M. Mehrlander³, A. Della Penna¹, M. Peters¹, M. Quante¹, A. Königsrainer¹ and S. Nadalin¹

¹University Hospital Tübingen, General, Visceral and Transplant Surgery, ²University Hospital Tübingen, Department for Diagnostic and Interventional Radiology, and ³University Hospital Tübingen, Department of Anesthesiology and Intensive Care Medicine, Germany

**Purpose:** Radiological extended liver venous deprivation (eLVD) is a promising augmentation technique with similar hyperthropy potential but lower morbidity than ALPPS.

Herein we present the first case of surgical eLVP associated to partial-ALPPS (p-ALPPS) in a 65 year old male patient with central HCC in liver fibrosis.

**Method:** Preoperatively, volumetry and elastography were performed to assess the Future Liver Remnant (FLR). The surgical eLVD consisted of ligature of right portal vein (RPV) and hepatic vein (RHV) and partial transection of the liver parenchyma (p-ALPPS) along the umbilical fissure. Middle hepatic vein (MHV) remained untouched.

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**EP011 Table I**

<table>
<thead>
<tr>
<th></th>
<th>MINOR</th>
<th>MAJOR</th>
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<tr>
<td><strong>Approach</strong></td>
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<tr>
<td>Laparoscopic</td>
<td>50 (83.3%)</td>
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<tr>
<td>Open</td>
<td>10 (16.7%)</td>
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<tr>
<td><strong>Pringle Manouver</strong></td>
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<td>2 (3.33%)</td>
<td>1 (1.67%)</td>
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<tr>
<td>Selective</td>
<td>41 (68.3%)</td>
<td>30 (50.0%)</td>
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<tr>
<td>Systematic</td>
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<td>29 (48.3%)</td>
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<td><strong>Parenchyma Dissection</strong></td>
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<td>55 (91.7%)</td>
<td>54 (90.0%)</td>
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<tr>
<td>Others</td>
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<td>6 (10.0%)</td>
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<td><strong>Haemostasia</strong></td>
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<tr>
<td>Aquamantis ®</td>
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<td></td>
</tr>
<tr>
<td>Energy (Caiman ®, Ligasure ®, etc...)</td>
<td>4 (6.67%)</td>
<td>2 (3.33%)</td>
<td></td>
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<tr>
<td>Clips/sutures</td>
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<td>3 (5.00%)</td>
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<tr>
<td>Mix of previous methods</td>
<td>46 (76.7%)</td>
<td>50 (83.3%)</td>
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<tr>
<td><strong>Abdominal Drain</strong></td>
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<td>31 (51.7%)</td>
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<tr>
<td>1</td>
<td>29 (48.3%)</td>
<td>48 (80.0%)</td>
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<tr>
<td>2</td>
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<tr>
<td>Always</td>
<td>15 (25.0%)</td>
<td>35 (58.3%)</td>
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<td>Never</td>
<td>3 (5.00%)</td>
<td>2 (3.33%)</td>
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<tr>
<td>Selective</td>
<td>42 (70.0%)</td>
<td>23 (38.3%)</td>
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<tr>
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<td>28 (46.7%)</td>
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<tr>
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<td>35 (58.3%)</td>
<td>32 (53.3%)</td>
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</table>
After Stage 1, the clinical and laboratory course was monitored, and weekly volumetry was performed until sufficient volume was achieved. A HIDA-functional scintigraphy was performed before Stage 2.

At Stage 2, parenchyma transection was completed and a right trisectionectomy was performed. Complications were recorded according Dindo-Clavien (DC) classification.

**Results:** Preoperative FLR-Volume was 280 ml (FLR/Body Weight-Ratio: 0.37).

No intraoperative complication was recorded. The Interstage was uneventful.

Laboratory tests showed a postoperative elevation of transaminases (both ALT and AST) up to 5100 U/L at POD 2, which rapidly normalized within 1 week.

The hypertrophy of the FLR was 78.6% on POD 7 (Kinetic Growth Ratio: 11%/d), but remained unchanged at POD 14.

A HIDA scintigraphy at POD 14 showed a liver clearance normalized to body surface area (BSA) of FLR of 4.1% per min/m².

The Stage 2 was performed on POD 18.

The definitive histology confirmed a Fibrosis Ishak grade 5/6 and 10% Steatosis (Dixon Scale 2). The tumor stadium was T3, NX, L0, V0, Ph0, R0. The tumor size was 6.6 cm.

Postoperatively the patient developed a PHLF Grade B, which rapidly normalized within 1 week.

Preoperative FLR-Volume was 280 ml (FLR/Body Weight-Ratio: 0.37).

**Conclusion:** We reported the first case of surgical eLVD. This approach is a feasible alternative augmentation technique, also associated with partial-ALPPS.

However, after right vein ligation, volumetric growth appears to be limited to the first week, therefore, in the event of insufficient growth, an exit strategy must be considered preoperatively.

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**EP013**

INTRAOPERATIVE ULTRASOUND AND LIVER METASTASIS: DIAGNOSTIC VALUE

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**Introduction:** The preoperative diagnosis of liver metastases has improved in recent years with CT and MRI. Intraoperative ultrasound can identify metastases that had gone unnoticed.

**Objective:** Compare the number of metastases identified in preoperative radiological tests, intraoperative ultrasound findings and their histological correlation.

**Material and Methods:** From May 2009 to September 2020, 145 cases previously evaluated in the Digestive Tumors Committee were operated.

The diagnostic study was based on abdominal CT and +/-resonance.

The preoperative radiological diagnosis was complemented in the surgical intervention with manual palpation and systematic intraoperative ultrasound performed in our unit by the liver surgeon.

**Results:** During the study period, 145 cases were operated on, and 133 resections were performed in 111 patients. Eight cases with portal embolization were excluded from the study due to the difficulty of evaluating them correctly.

After performing an exploration of the abdominal cavity and intraoperative ultrasound detailing the number of lesions and their location, 12 patients (8%) were not resectable.

The comparative results between radiological tests, intraoperative ultrasound, and histological analysis (Table 1) found that in 14 cases (11%) the ultrasound identified more metastases than the tests performed in the preoperative study.

**Conclusions:** Intraoperative ultrasound in MH metastasis surgery must be performed thoroughly and systematically.

In our experience, intraoperative ultrasound identifies 11% of liver metastases not described in preoperative imaging tests, all of them with subsequent histological confirmation.

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**EP015**

CASE REPORT OF Tourniquet ALPPS AND SIMULTANEOUS SLEEVE GASTRECTOMY: A VALUABLE ASSOCIATION TO ACHIEVE AN ADEQUATE FUTURE LIVER REMNANT IN OBESE PATIENTS

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**Hospital Virgen de la Arrixaca, Spain**

**Purpose:** Obesity represents a risk factor in case of major hepatectomy, because the future liver remnant (FLR) must be proportional with body weight (BW). To avoid post-hepatectomy liver failure, and further increase the ratio between FLR and body weight, we performed a bariatric procedure in the first stage of the ALPPS technique.

**Methods:** We present a descriptive study based on a novel case of tourniquet ALPPS (T-ALPPS: Tourniquet-Associated Liver Partition and Portal vein ligation for Staged hepatectomy) and simultaneous sleeve gastrectomy.

**Results:** A fifty-four-year-old woman, with morbid obesity (BMI 58.5) and type II diabetes mellitus, was scheduled for a major hepatectomy due to multiple colorectal liver metastases.
EP016
ALBUMIN/NLR SCORE AS PREDICTOR OF COMPLICATIONS IN COLORECTAL CANCER LIVER METASTASIS SURGERY

Introduction: Nutritional status markers (albumin, prealbumin) and inflammatory scores, such as the neutrophil lymphocyte ratio (NLR), are used as predictors of survival in patients undergoing digestive cancer surgery. However, few studies analyze its association with postoperative complications, so we propose a new score, relationship between albumin and NLR (ANLR), as a predictor of complications in colorectal cancer liver metastases (CRCLM) surgery.

Methods: Retrospective study, analyzing our database of patients undergoing liver surgery for CRCLM, January-2014 to June-2020. Variables: morbidity according to the Clavien-Dindo (CD) classification, infectious complications, transfusion, LOS, blood test and inflammatory scores.

Results: 81 patients were analyzed (men: 61.7%, age: 65.6 ± 11.8 years). Postoperative complications: global (50.6%), infectious (22.2%), Clavien-Dindo ≥ II (17.3%), transfusion (9.9%), 6.2% of the patients required reoperation. Hospital stay: 7 (IQR: 6-10 days).

ROC curves were performed to determine the best cutoff point for the variables preoperative albumin and preoperative-NLR in relation to complications, resulting in 4 g/dL and 2, respectively. We used these cut-off points to distribute the variables albumin and NLR into 2 groups, we assigned 0 points to patients with albumin > 4 g/dL or NLR ≤ 2 and assigned 1 point to albumin ≤ 4 or NLR > 2, accordingly. We grouped the patients into 2 groups: low risk (0-1 point) and high risk (2 points).

When analyzing both groups (low risk vs. high risk), patients with high risk had higher incidence of global complications, CD ≥ II and infectious (60% vs. 35.5% p = 0.03, OR: 2.73; 28% vs. 0%, p = 0.001 OR: 1.39 and 32% vs. 6.5%, p = 0.007 OR: 6.82 respectively) and similar incidences of reintervention and transfusion (p > 0.05).

Conclusion: Albumin and NLR using this new score (ANLR) could be a good predictor of patients more susceptible to postoperative complications in patients undergoing CRCLM surgery.

EP017
7 AND 8 LIVER SEGMENTS LAPAROSCOPIC RESECTION: FROM THE INITIAL RESTRICTIONS TO THE CURRENT INDICATIONS
1Hospital Virgen de la Arrixaca, Spain, 2New Tokyo Hospital, Japan, and 3Hospital Los Arcos del Mar Menor, Spain

Purpose: Resection of the posterior superior segments has been considered one of the most difficult procedures due to difficult access. Our aim is to prove that, in spite of all the disadvantages, such as poor visualization, difficult instrumentation, and greater complexity in bleeding control, the laparoscopic approach is a feasible way to resect these liver segments.

Methods: A systematic search strategy was performed using a combination of terms and standardized index numbers: (laparoscopic liver surgery) AND (posterior superior segments) AND (segment 7) AND (segment 8).

Results: A total of 13 hospital series and 6 clinical cases that exclusively analyzed the segments 7 and/or 8 were included in this review. The most frequent indication was metastasis (55.4%), followed by hepatocellular carcinoma (28.7%). The average size of the lesions ranged from 13 to 39 mm. The mean surgical times were between 105 and 420
minutes. Six groups conducted the pringle maneuver in 8-84% of patients. Blood losses ranged from 50-550 ml with a conversion rate between 0-42%. Major complications ranged from 0-10.86% with average stays between 2 and 12 days. The resection margin was negative in 90-100% of the resections.

The intrahepatic glisssonian approach to segment 7 consists on locating G7 by ultrasound and identification of the right hepatic vein. Once G7 is ligated, resection begins from the demarcation that occurs between S6 and S7 to expose the full length of the right hepatic vein. In case of the intrahepatic glisssonian approach to segment 8, the approach begins taking as reference the middle hepatic vein. The dissection should continue in this direction more deeply until reaching the root of the G8. Glisssonian branches from segment 7 or 8 can be isolated extrahepatically from the hilum of the liver. It is possible through an avascular plane to dissect the right anterior and posterior pedicles in the hepatic hilum until the corresponding G7 and G8 branches are isolated near their origins. Segmental pedicles to segment 7 can be approached after dissecting the liver in the Rouviere groove, while segments 8 first need to locate the G5 and G8 branches that branch from the right anterior pedicle to later isolate G8 exclusively.

**Conclusions:** The accumulated experience of the different groups in minimally liver surgery invasive treatment have facilitated resection of tumors in segments 7 and 8 with similar and even better results than open surgery.

**EP018**

**A NEW SURGICAL TECHNIQUE VARIANT OF PARTIAL ALPPS (TOURNIQUET PARTIAL - ALPPS)**

V. López-López, R. Brusadín, A. López-Conesa, Á. Navarro-Barrios, P. Gómez-Valles, V. Cayuela, A. Caballero-Illanes, B. Gómez-Pérez and R. Robles-Campos

**Hospital Virgen de la Arrixaca, Spain**

**Purpose:** Associating liver partition and portal vein ligation for staged hepatectomy (ALPPS) results in liver regeneration in only 9 days. We present a new variant of partial-alpps modified, based on a tourniquete “partial-Tourniquete ALPPS (pT-ALPPS)”, with the aim of reducing the first-time surgery aggressiveness.

**Methods:** Twelve patients were included in this prospective study comparing T-ALPPS (n = 6) and Tp-ALPPS (n = 6). The increase in volume of the FLR after the first time was the primary endpoint. We also analyzed morbidity (overall and ≥ IIIB), mortality at 90 days, and overall survival (OS) at 1 year, and disease-free survival (DFS). Our study was reviewed by an ethics committee.

Description of Tp-ALPPS: after sanitizing the left lobe, the right portal vein is ligated. Under ultrasound control, a Kelly forceps is introduced from the base of the liver to pass across the liver parenchyma through an avascular area. When a right hepatectomy is planned, the forceps is inserted from the right side of the base of segment 4b across segment 8, between the right and middle hepatic veins. A 3mm tape was passed and the tourniquet was tied. In the case of the right trisectionectomy, the forceps is introduced from the left side of the base of segment 4b crossing to segment 4a, between the middle and left hepatic veins. In the second stage, a right trisectionectomy or a right hepatectomy is performed.

**Results:** There were no statistically significant differences (DES) in demographic data between the two groups. There were no differences in volume increase at 10 days. In the first stage, blood losses and transfusion tended to be lower in the Tp-ALPPS group, without statistical differences. Surgical time was shorter in the Tp-ALPPS group (90 min versus 135 min) (p < 0.023). In the second stage, blood loss and transfusion were similar in both groups, but the surgical time tended to be longer in the T-ALPPS group, which could be related to the surgical technique performed. Overall morbidity was similar in both groups. There was no postoperative death. Hospital stay tended to be shorter, only after the first time, in the Tp-ALPPS group. The DFS at one year (67% in both groups) (p = 0.424) and the OS at 1 year (83% for T-ALPPS versus 100% for Tp-ALPPS) (p = 0.439), were similar.

**Conclusions:** Tp-ALPPS achieved a similar increase in volume to T-ALPPS though with a shorter surgical stage 1 and similar morbidity and mortality.

**EP020**

**SURGICAL TREATMENT OF LIVER METASTASES FROM GASTROINTESTINAL STROMAL TUMOR**

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1Military University Hospital Prague, and 2Motol University Hospital, Czech Republic

**Introduction:** Gastrointestinal stromal tumors (GISTs) are rare tumors which can arise within in most parts of gastrointestinal tract. Most common sites of metastatic spread are liver and the peritoneum. Thyrosinkinase inhibitors greatly improved prognosis of the locally advanced and metastatic disease allowing patients to gain several years of overall survival, yet majority of them will eventually develop progression and succumb to disease. The role of surgical therapy in metastatic setting still remains unclear.

**Methods:** Within the years 2011 - 2020, we performed 29 surgical procedures on 24 patients with liver metastasis from GISTs. We monitored postoperative morbidity, DFI and overall survival in all patients.

**Results:** We identified 24 patients (range 32-80 years), 17 men and 7 women. In 15 patients a metachronous occurrence of metastases was found, most often within the median 2 years after the primary resection (range 2 - 9 years). 9 patients had synchronous disease. 6 synchronous resections were performed (primary tumor and liver), 3 stage resection were performed. 6 large resections were performed, otherwise mainly extraanatomical resections, eventually combined with RFA (4x) were performed. Only RFA was performed 5 times. The morbidity according to Clavien – Dindo classification > 2 was 24 %. 20 patients (83%) received systemic treatment before the surgery, and 21 patients (88%) after the surgery. The 1-, 3- and 5-year survival rate was 91%, 86%, and 72%.

**Conclusion:** Surgical treatment of liver metastases from GIST is a safe method. RO resection and a good therapeutic response to systemic thyrosinkinase inhibitors therapy is
important predictive factor of recurrence. A multidisciplinary approach for treatment of liver metastases from GISTs is necessary. We need further studies to determine the benefits of surgical treatment.

EP021
RECURRENT OF LIVER HYDATID CYST AND PREDICTIVE FACTORS
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Objective: To determine the recurrence of liver hydatid cysts and the risk factors involved.

Methods: A retrospective study was conducted, reviewing all patients with liver hydatid cysts operated on between 2006 and 2020. The minimum follow-up time was 6 months. Regression models for multivariate analysis were used to investigate risk factors of recurrence.

Results: 279 patients were included in the study. Of the 149 patients who had a recurrence, 8 were re-operated. The median time to relapse was 44 months. Regression analysis showed that the most frequent type of recurrence is hepatic, 14 (82.4%). Among the patients who had a recurrence, 8 were re-operated. The median time to relapse was 44 months (IQR 20-79.25).

Risk factors related to recurrence included having more than two cysts (p=0.029), were related with a higher risk of recurrence.

Conclusion: Different risk factors of recurrence have been described in the literature. In our series, we observed that to have multiple cysts and the WHO classification CE3-5 are related to a higher risk of recurrence. We have not found a higher risk according to the type of surgery.

EP022
CLINICAL PROGNOSTIC FACTORS FOR SURVIVAL IN PATIENTS WITH RESECTABLE COLORECTAL LIVER DISEASE
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1Hospital Universitario Río Hortega, and 2Hospital Clínico Universitario, Surgery, Spain

Introduction: The study aims to investigate the characteristics of the liver metastasis and their association with the overall survival in patients with colorectal liver metastases (CRLM) undergoing curative resection.

Methods: All patients undergoing curative hepatectomy for CRLM from 2010 to August 2018 were collected, of 171 consecutive patients identified, 157 were deemed eligible for analysis.

Univariate analysis was performed with Kaplan-Meier method and the log-rank test, in order to determine the influence of variables on overall survival (OS). For multivariate analysis, Cox proportional hazard regression model was used to pinpoint the variables associated with OS.

Results: In univariate analysis, neoadjuvant chemotherapy (HR=2.46, p=0.021), bilobar disease (HR=0.014), larger metastasis than 4cm (HR=0.007), number of metastases >1cm (p=0.034), intraoperative blood transfusion (p=0.026), positive margin resection (p=0.010), and Clavien-Dindo grade >3 post-surgical complications (p=0.010) were associated with significantly shorter OS.

Conclusion: Prehepatectomy chemotherapy, positive margin and Clavien-Dindo grade >3 revealed to have a negative impact on overall survival for patients with resectable CRLM. These factors should be taken into consideration when selecting treatment strategies in CRLM.
was 1.36 (95% CI=1.13-1.62; p = 0.0009). The study of Yin et al. included patients with HCH in initial stage BCLC 0, a Hazar ratio (HR) for survival was 0.99 (95% CI=0.39-2.54; p = 0.99, I2 = 0%); at 3 years: HR 0.64 (95% CI=0.41-1.00; p = 0.05, I2 = 0%); at 5 years: HR 0.63 (95% CI=0.42-0.95; p = 0.03, I2 = 0%). On the other hand, Majumdar et al. demonstrated that mortality (> 1 year) was lower in the surgery group than in the radiofrequency ablation group with OR 0.39 (95% CI =0.22-0.68). The recurrence rate was lower in the surgery group with 41.2% compared to the radiofrequency ablation group (56.9%) (OR 0.53; 95% CI=0.35 -0.78). In the last study He et al included HCC patients with initial stages where relative risk (RR) of overall survival at 3 years was 0.90 (95% CI: 0, 83e0.98, p = 0.01, I2 54%) and 0.84 at 5 years (95% CI: 0.75e0.95, p = 0.004 I2 50%) in favor of HR. In addition, in early HCC stages, the overall survival rate at 3 years showed RR= 0.9 (95% CI -0.85-0.98; p = 0.003, I2 59%) and RR=0.84 at 5 years (95% CI:0.75-0.94) (p = 0.002, I2 76%).

Conclusion: The effectiveness of RFA is comparable to LR regarding short-term survival rates, however, a greater recurrence rate is observed in patients treated with RFA.

### EP024
**ASSESSMENT OF HEPATIC FUNCTION AND PARENCHYMA ATTENUATION WITH INDOCYANINE GREEN, ULTRASOUND AND CT IN A RAT MODEL: PRELIMINARY STANDARDIZATION OF BASELINE PARAMETERS**

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¹Clinical and University Virgen de la Arrixaca Hospital - Biomedical Research Institute of Murcia-Virgen de la Arrixaca (IMIB-Arrixaca), Department of Surgery, ²Core Facilities University of Murcia, Laboratory Animal Service, ³Faculty of Medicine, University of Murcia, ⁴Faculty of Medicine, University of Murcia (IMIB-Arrixaca), Department of Physiology, and ⁵Faculty of Medicine, University of Murcia (IMIB-Arrixaca), Spain

**Purpose:** Standardization in experimental animal models plays a crucial role in preclinical studies by providing useful information on the type and extent of liver disease. However, it is necessary to combine these determinations with functional dynamics imaging and testing techniques to implement a non-invasive protocol for liver evaluation.

**Method:** Six healthy SD rats were followed for 4 weeks. The aim was to determine hepatic function, perfusion and parenchyma attenuation with biochemical blood parameters, indocyanine green, ultrasound and computed tomography.

**Results:** Indocyanine green clearance 5 and 10 minutes after its injection was 80.12% and 96.59%, respectively. Hepatic perfusion evaluation with the high-frequency ultrasound was related to cardiovascular hemodynamic and renal perfusion. Portal area, hepatic artery resistance index and average between hepatic artery and porta was 3.41 ± 0.62 mm², 0.57 ± 0.04 mm ²/s and 4.82 ± 0.96 mm ²/s, respectively. Heart rate, cardiac output, left renal artery diammetre and renal blood flow were 331.01 ± 22.22 bpm, 75.58 ± 8.72 mL/min, 0.88 ± 0.04 mm 2 and 13.65 ± 1.95 mm 2 /s. CT-scan hepatic average volume for each rat were 21.08±3.32, 17.57±2.76, 14.87±2.83 and 13.67±2.45 cm 3 with an average attenuation coefficient of 113.51±18.08, 129.19±7.18, 141.47±1.95 y 151.67±1.2 HU.

**Conclusion:** Indocyanine green and high-frequency ultrasound could be used in rats as a suitable marker of liver function. Computed tomography help to characterize liver parenchyma, and could be a potential tool for early detection and linear follow-up of patients. Further studies in rats with liver disease are necessary to verify the usefulness of these parameters.

### Table 1
**Indocyanine Green plasma clearance (ICG) rate**

<table>
<thead>
<tr>
<th>Rat</th>
<th>ICG plasma concentration (µg/mL)</th>
<th>Min 1</th>
<th>Min 5</th>
<th>Min 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>128.1±65.18</td>
<td>19.45±2.28</td>
<td>5.41±3.32</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>161.47±65.82</td>
<td>28.58±9.23</td>
<td>5.75±3.60</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>160.63±27.68</td>
<td>33.14±6.95</td>
<td>7.44±0.52</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>189.16±51.05</td>
<td>38.13±6.95</td>
<td>3.47±0.05</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>165.91±23.91</td>
<td>47.51±8.82</td>
<td>2.90±0.76</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>130.65±10.21</td>
<td>19.24±3.54</td>
<td>6.91±0.99</td>
<td></td>
</tr>
<tr>
<td>Average ICG Concentration (µg/mL)</td>
<td>155.99±23.11</td>
<td>31.01±11.01</td>
<td>5.31±1.82</td>
<td></td>
</tr>
</tbody>
</table>

**Average Clearance %**

<table>
<thead>
<tr>
<th></th>
<th>0.00</th>
<th>80.12</th>
<th>96.59</th>
</tr>
</thead>
</table>

µg/mL: microgram/mililitre
EP025
RESULTS OF MINIMALLY INVASIVE LIVER RESECTION FOR BENIGN TUMORS
The Loginov Moscow Clinical Scientific Center, Department of HPB Surgery, Russian Federation

Purpose: The aim of the study was to evaluate the results of minimally invasive liver resections for benign tumors.

Methods: Data were accumulated since 2014. Benign liver tumors were the indication for liver resection in 116 patients: in 99 (83%) women and 17 (17%) men, aged from 23 to 76 years. Minimally invasive procedures were performed in 107 (92%), including 13 robotic resections. Nine patients underwent operation through open approach. The benign lesions were presented by hemangioma (63), adenoma (20), FNH (17) and cystadenoma (16). Indications for liver resection were giant (>10 cm) growing lesions with clinical signs and suspicion for malignancy.

Results: Major hepatectomy was performed in 14 (12%) patients. Partial resection of postero-superior segments and caudate lobe was performed in 42 (36%) patients. Robotic system was used in 8 of them.

Major morbidity after minimally invasive liver resection was observed in 3 (2.8%) — bile leakage. After 9 open liver resections bile leakage took place in 3 (33%) patients and required additional drainage. Mean operation time of minimally invasive and open liver resection was comparable: 280 min and 320 min, respectively. The mean blood loss for minimally invasive and open procedures was 348 ml and 1433 ml, respectively. The mean postoperative hospital stay after minimally invasive and open resection was 6.7±2.4 and 13.1±8.3 days, respectively.

Conclusion: Minimally invasive liver resection is the safe option for treatment of giant symptomatic benign tumors, including difficult-to-reach liver segments lesions and may be considered as the first choice approach if surgery is indicated.

EP026
INITIAL EXPERIENCE WITH MAJOR LIVER RESECTION IN A NIGERIAN TERTIARY HEALTH FACILITY
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Purpose: Liver resection remain the primary treatment of choice for most liver primary neoplasms and selected cases of metastatic tumors. However, this procedure is rarely performed in Nigeria because of the associated with significant morbidity and mortality rates and. The study was aimed at analysing our initial experience with liver resections over a period of 5 years.

Methods: Consecutive patients who underwent liver resection from January 2015 to December 2020. Major liver resection was defined as removal of 2 or more liver segment.

Results: Eighteen (15 females and 3 males) patients underwent major liver resection during the study period, with a mean age of 53.5 years (range 7-80 years). The indication for liver resection includes hepatocellular carcinoma in 6 patients, gallbladder cancer in 8 patients, metastatic colorectal carcinoma in 2 and, neuroendocrine tumor in 1 and complex biliary injury in 1. All the patients that had HCC had the tumor on the right lobe of the liver and they had right hepatectomy. Blood transfusion was needed in 3 patients — one patient with rupture hepatocellular carcinoma, a child with hepatoblastoma and a patient with gallbladder cancer. The patient with rupture hepatocellular carcinoma had acute renal insufficiency perioperatively. We recorded 2 (11.1%) operative mortalities. Size of the tumor removed ranged from 4cm to 15cm. Low central venous pressure was achieved in 10 patients and was associated with significantly less blood loss. Vascular exclusion was utilized in 6 cases. Median hospital stay was 7.5 days (range 3-24 days).

Conclusion: Liver resections can be performed with low mortality and acceptable morbidity rates in a low resource setting like ours in well selected cases. Blood transfusion may be reduced by employing meticulous technique and, whenever indicated, vascular exclusion.

EP028
IS THERE SOMETHING NEW IN 2021 IN THE RESECTION OF LIVER METASTASES FROM COLORECTAL CANCER INVOLVING THE INFERIOR VENA CAVA?
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1Hospital Universitario Miguel Servet, 2Hospital Universitario de Guadalajara, and 3Hospital General Universitario, Spain

Purpose: Liver resection remains the only potentially curative treatment for metastatic tumours of the liver. In the past, suspected involvement of inferior vena cava (IVC) was considered a contraindication for liver resection. The development of technical innovations have made it possible to perform combined liver and IVC resections and favourable clinical outcomes have been reported. We conducted a systematic review of the literature on this topic.

Method: A systematic review of the English literature was performed in PubMed and Cochrane Library to evaluate the safety and efficacy of combined liver and IVC resection in patients with colorectal liver metastases involving IVC from any time to January 2021.

Results: A total of 163 patients were described in 23 papers. All the studies were observational. Mean age was 57.9 years (range 35-84). We included 68 men and 57 women (3 studies did not include the sex). The mean number of resected metastases was 2.7 (range 1-27). The most frequent hepatic resections were: 39 right hepatectomies, 23 right trisectionectomies, 14 segmentectomies, 10 left hepatectomies, 9 extended right hepatectomies, 8 extended left hepatectomies, and 7 left trisectionectomies.
In 4 cases the right adrenal gland was resected, in 3 cases the diaphragm was resected, and in 1 the right kidney. The most performed types of vascular control were: total vascular exclusion in 57 cases, lateral clamping in 40 cases, and total vascular exclusion with hepatic hypothermic perfusion in 14 cases. Postoperative morbidity was 42.2%, mortality was 2.7%. Survival at 3 and 5 years was 64.1% and 29.6%. The mean follow-up was 24.0 months, and the median disease-free time was 12.0 months.

Conclusion: Technical surgical advances allow the increasing resection of patients with liver metastases of colorectal cancer involving IVC. Published perioperative morbidity and mortality are comparable to the data published for this type of tumors without involvement of IVC. In the absence of prospective randomized studies, the IVC resection is safe and feasible in high-volume centers.
reoperation. Hospital stay: 7(IQR:6-10days). The optimal cut-off value to detect global complications was CLR=2.3 [AUC:0.63 (95%CI:0.51-0.75), p=0.004].

Patients with global complications and those who needed transfusion had higher CLR values with statistically significant differences (5.02±7.57 vs. 1.94±1.91 p=0.015 and 10.82±14.3 vs. 2.69±3.16 p=0.1 respectively). Patients with Clavien-Dindo ≥III, infectious and reoperation also had higher CLR values but without statistically significant differences (5.51±710.65 vs. 3.08±4.05 p=0.4; 4.79±9.48 vs. 3.12±4.14 p=0.2 and 4.1±3.76 vs. 3.46±5.85 p=0.8 respectively).

Patients with CLR value ≥2.3 had higher rate of global complications, CD≥III, infectious, reoperations and transfusion (65.5% vs. 42.3% p=0.04; 24.1% vs. 13.5% p=0.2; 27.6% vs. 19.2% p=0.3; 10.3% vs. 3.8% p=0.2; 17.2% vs. 5.8% p=0.09 respectively).

**Conclusion:** C-reactive protein (CRP) to lymphocyte ratio (CLR) could be a good predictor of postoperative complications.

**EP031**

LEFT RENAL VEIN GRAFT AND IN SITU LIVER PERFUSION FOR COMPLETE TUMOR INVASION OF THE HEPATIC VEINS: HEMODYNAMIC OPTIMIZATION AND SURGICAL TECHNIQUE

V. López-López1, J.-A. García-López1, P.-V. Fernández2, L.-A. Martínez-Insfranç3, R. Brusadin1, A. López-Conesa1, P. Gómez-Valles1, V. Cayuela1 and R. Robles-Campos1
1Hospital Virgen de la Arrixaca, and 2Hospital Reina Sofia, Spain

**EP031 Table 1**

<table>
<thead>
<tr>
<th>Nº</th>
<th>Diagnoses</th>
<th>Gender</th>
<th>Age</th>
<th>Previous Chemo</th>
<th>Nº of lesions</th>
<th>Size (cm)</th>
<th>Blood losses (ml)</th>
<th>Surgical time (min)</th>
<th>Complications (Clavien)</th>
<th>Warm ischemia (min)</th>
<th>ICU length of stay (days)</th>
<th>Hospital stay (days)</th>
<th>Tumor recurrence</th>
<th>Survival time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CRLM</td>
<td>M</td>
<td>53</td>
<td>Xelox</td>
<td>1</td>
<td>40</td>
<td>1500</td>
<td>240</td>
<td>No</td>
<td>77</td>
<td>4</td>
<td>15</td>
<td>No</td>
<td>Alive (118)</td>
</tr>
<tr>
<td>2</td>
<td>CRLM</td>
<td>F</td>
<td>60</td>
<td>Folfox + Cetuximab</td>
<td>2</td>
<td>40; 20</td>
<td>300</td>
<td>420</td>
<td>No</td>
<td>60</td>
<td>5</td>
<td>11</td>
<td>No</td>
<td>Death (90)</td>
</tr>
<tr>
<td>3</td>
<td>BCLM</td>
<td>F</td>
<td>53</td>
<td>Anthracycline</td>
<td>1</td>
<td>70</td>
<td>500</td>
<td>300</td>
<td>Pleural effusion (IIIa)</td>
<td>62</td>
<td>7</td>
<td>15</td>
<td>Yes</td>
<td>Alive (98)</td>
</tr>
<tr>
<td>4</td>
<td>CRLM</td>
<td>M</td>
<td>40</td>
<td>Folfini + Cetuximab</td>
<td>1</td>
<td>34</td>
<td>500</td>
<td>480</td>
<td>Intraabdominal collection (IIIA)</td>
<td>72</td>
<td>5</td>
<td>24</td>
<td>No</td>
<td>Alive (6)</td>
</tr>
</tbody>
</table>

**Purpose:** Tumoral affection of the hepatic veins represents a surgical challenge due to the technical difficulty and the hemodynamic disorders that occur during the surgery. Despite left renal vein (LVR) graft is not a widely used option, we want to show that hepatic veins resection and autologins LVR for hepatic vein reconstruction is possible without increased morbidity and impairment of renal function.

**Methods:** This is a retrospective study on a prospective database of 1750 liver resections performed from July 1985 to March 2020 at Virgen de la Arrixaca University Hospital, Murcia. Patients undergoing a resection of hepatic vein(s) with hepatic vascular exclusion and LRV placement were selected. Our study was reviewed by an ethics committee.

We also describe the hemodynamic management and surgical technique, from the initial staging and hepatic transection, to the LRV graft preparation (Figure 1d-e), the total hepatic vascular occlusion (clamping right portal vein and cannulaling left porta: Figure 1f), the tumor resection and graft placement (Figure 1g), and in the end, the hepatic reperfusion.

**Results:** Four patients underwent left hepatectomy with vascular reconstruction using LVR for tumor invasion of the confluence of hepatic veins (Table 1). Median lesion size was 40 mm (interquartile range (IQR), 35-62). Liver lesions involved right hepatic veins and the origin of middle and left hepatic veins in all cases. The median blood loss was 500 ml (IQR, 300-1500), median surgical time was 360 min (IQR, 255-465), perfusion time with cold ischemia was 67 min (IQR, 60.5-77.5) and warm ischemia time was 63.5 min (59-77). The median length of the graft was 4.5 cm (IQR, 3.1-5.2) and the grafts remained patent during the follow-up with no signs of thrombosis. Three of the 6 patients presented a complication and none of them exceeded a Dindo-Clavien grade IIIb, with a median hospital stay of 15 days (IQR, 12-21). Median follow-up was 97 months (IQR, 27-113). One of the three patients currently alive had a lung recurrence (case 3) and the patient who died, did it disease-free due to a cerebral hemorrhage (case 2).

**Conclusions:** VRI grafts for the reconstruction of a hepatic vein are a safe alternative when hepatic resection is the only curative alternative. In addition, the use of in situ liver perfusion reduces ischemic damage to the liver without the need for a veno-venous bypass with adequate hemodynamic control.

**EP032**

RISK FACTORS OF CYSTOBILARY COMMUNICATION IN LIVER HYDATID CYSTS

Hospital Universitario de Badajoz, Department of HPB Surgery and Liver Transplantation, Spain

**Purpose:** The cystobiliary communication (CBC) is the most frequent complication of liver hydatidosis (2-42%).
The aim of our study was to analyze the predictors of the presence of CBC in patients with liver hydatidosis, as well as risk factor of postoperative biliary leak.

**Method:** A retrospective observational study of the operated patients of liver hydatidosis in our service between 2006-2019 was carried out. A subanalysis was performed in patients with CBC diagnosed preoperative test or intraoperative surgery. The study was approved by the ethics committee.

**Results:** 278 patients were included, 149 (53.6%) were male. The mean age of 51.76 years (IQR 14.87-89.80), 72 (25.9%) patients had a CBC. 8 (11.1%) had a history of previous hydatidosis.

Dates of the group with CBC were collected in table 1. The postoperative biliary leak treatment was conservative in 14 cases (58.3%), ERCP was performed in 5 (20.8%), percutaneous drainage of biloma in 3 (12.5%) and rein intervention was required in 2 (8.3%).

The presence of CBC was related to higher postoperative morbidity (p=0.000239), and postoperative biliary leak (p=0.001). In the univariate analysis, a relation was observed with patients ≥ 70 years, jaundice at diagnosis, previous hydatidosis history, size ≥ 10 cm or BT ≥ 5. In the multivariate analysis, the preoperative bilirubin value (p=0.086) and jaundice at diagnosis (p< 0.001) were significantly related to the CBC.

**Conclusion:** CBC is the most frequent complication in liver hydatidosis. In our study, the preoperative BT ≥ 5 and obstructive jaundice at diagnosis have been related to CBC.

### Table 1

<table>
<thead>
<tr>
<th>CBC</th>
<th>72 patients (25.9%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcified cyst</td>
<td>17 (23.6%)</td>
</tr>
<tr>
<td>Single cyst</td>
<td>52 (72.2%)</td>
</tr>
<tr>
<td>Jaundice</td>
<td>25 (34.7%)</td>
</tr>
<tr>
<td>Preoperative diagnosis (MRCP)</td>
<td>29 (40.3%)</td>
</tr>
<tr>
<td>Location</td>
<td>Right hepatic lobe 41 (56.9%)</td>
</tr>
<tr>
<td>Maximum diameter</td>
<td>8 (IQR 5.15-13)</td>
</tr>
<tr>
<td>Median of preoperative bilirubin</td>
<td>4.1 (IQR 1.9-5.5)</td>
</tr>
<tr>
<td>Morbidity postoperative</td>
<td>43 (59.7%)</td>
</tr>
<tr>
<td>Clavien-Dindo ≥ 3a</td>
<td>14 (19.5%)</td>
</tr>
<tr>
<td>Postoperative biliary leak</td>
<td>24 (33.3%)</td>
</tr>
</tbody>
</table>

**EP033**

**SURGICAL TREATMENT OF LIVER HYDATID CYSTS IN ELDERLY PATIENTS**

I. Jaén Torrejimeno¹, B. García Gómez¹, C. López Fernández¹, A. Rojas Holguín¹, D. López Guerra¹, N. De Armas Conde¹ and G. Blanco Fernández¹

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**Purpose:** Liver hydatid disease is an endemic zoonosis in the Mediterranean area. Life expectancy worldwide has increased greatly in recent decades, resulting in an aging population. The influence of age on the outcome of surgery has already been extensively analyzed in some fields, and liver surgery of colorectal metastatic cancer or hepatocellular carcinoma, but not in benign disease.

The aim of this work is to analyze the incidence of postoperative complications after surgical treatment of hydatid cysts in elderly patients.

**Methods:** A retrospective observational study of liver surgery of hydatidosis was carried out in elderly patients (age > 70 years) operated between 2006-2020 in our unit. The American Society of Anesthesiologists (ASA) score, was used as an indicator of morbidity after abdominal surgery in these patients. Comorbidities were tabulated into the Charlson Comorbidity Index (CCI) for each patient. The study was approved by the ethics committee.

**Results:** Out of 280 patients, 35 have more than 70 years old. In general group, the median age is 75 years (IQR 70-89). The ASA score and Charlson Index were higher in elderly group [1 (IQR 0-2) vs 4 (IQR 3-5), p < 0.0001]. Body mass index (BMI) > 30 is more frequent in the elderly group (39.9% vs 68.8%, p=0.010). The patients with symptomatic at diagnosis are more frequent in elderly group (41.2% vs 60%, p=0.036). A complicated cyst was described in 34.3% of patients in the group under 70 years old and 57.1% in the elderly group (p=0.009): cystobiliary communication 24.1% vs 37.1% (p=0.006): infected cysts 5.7% vs 17.1% (p=0.014) and rupture cysts 2.4% vs 14.3% (p=0.001). There was no difference in the type of surgery performed (partial cystectomy 39.6% vs 51.4%, p=0.183; liver resection 8.6% vs 5.7% p=0.750). We observed a higher postoperative morbidity, with more rate of severe complications (Clavien-Dindo ≥ IIIa), especially respiratory (7.8% vs 22.9%, p=0.010). No differences with respect to infectious complications.

**Conclusion:** It is important to select these patients properly taking into account their physiological characteristics. Liver surgery in elderly patients is safe with acceptable rates of postoperative morbidity and mortality.

**EP034**

**OUR INITIAL EXPERIENCE IN ROBOTIC HEPATECTOMY**


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**Introduction:** The robotic surgery allows the surgeon to perform liver surgery procedures with the potential to improve precision and ergonomics, as well as a three-dimensional view of the surgical site.

**Methods:** We present our initial experience of robotic hepatectomy performed in the period October 2019 - December 2020. Fifteen patients undergoing robotic hepatectomy (da Vinci Xi).

**Results:** The mean age was 69 years (±10.7), 66.7% were men and the mean BMI was 29.6 kg/m². 93.3% of the hepatectomies were performed due to malignancy. 46.7% colorectal metastasis, 20% hepatocarcinoma, 13.3% cholangiocarcinoma. In 80% of the cases, liver segmentectomies were performed and 20% tumorectomy.
Considering the Iwate Complexity Score, 5 were categorized as Low (33.3%), 5 Intermediate (33.3%), 4 Advanced (26.6) and 1 Expert (6.6%). 40% of the patients had chronic liver disease. The mean operative time was 220 minutes, and the estimated blood loss was 300 mL. There was conversion to open surgery in two cases. Intermittent total clamping was performed in 73.3%. The mean number of clamps was 3 with a total mean time of 26 min. There was 1 case of postoperative abscess (6.7%) that required drainage by interventional radiology (Dindo-Clavien: IIIa). The postoperative stay of 1 day in the ICU was 86.7%. The mean hospital stay was 5.8 days. No patient required readmission to hospital.

**Conclusions:** Robotic hepatectomy is safe and effective, however, it involves a demanding learning curve that requires a high level of training, skill, and dexterity.

**EP037**

**THREE-DIMENSIONAL (3D) MODELS BASED ON PRE-OPERATIVE COMPUTED TOMOGRAPHY SCANS TO PERSONALIZE THE PLANNED LIVER SURGERY IN COMPLEX CASES**

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**Purpose:** In the last two decades, an increased number of patients has been submitted to liver resection for malignancy. That was possible thanks to a better knowledge of tumor biology, perioperative management as well as improvement of surgical technique. Recently, three-dimensional (3D) models visualization systems based on pre-operative imaging has been proposed to plan liver surgery in complex cases. The aim of this study was to assess the feasibility and accuracy of a 3D models for patients undergoing major/extended liver resection for malignancies.

**Method:** The Medical Device Custom Made with Hyper Accuracy 3D™ reconstruction method was applied to preoperative computed tomography (CT) scans of patients undergoing major/extended liver resections for malignancies at our institution since February 2020. The 3D models were used to guide the liver resections, including details regarding anatomical variations of the main vessels (hepatic artery, hepatic veins and portal vein) and the bile ducts as well as their relationship with the tumor and an accurate estimation of the future remnant liver volume (FRLV).

**Results:** A total of 17 patients were included in this preliminary study. The most frequent diagnoses were hilar cholangiocarcinoma (PH-CCA, 52.9%) and intrahepatic cholangiocarcinoma (I-CCA, 23.5%). The 3D reconstruction showed anatomical vessels’ variations in 12 (70.6%) patients that were confirmed intraoperatively. A total of 5 (29.4%) patients underwent portal resection for tumor invasion. A good to optimal correspondence between the hepatectomy planned using the 3D models and the intraoperative data was found in terms of bile duct and vessels resected. With a median FRLV at the 3D reconstruction of 31%, 4 (23.5%) patients had transient post hepatectomy liver failure (PHLF) of grade A/B. The median estimated blood loss was 750 mL and the median operative time was 332 minutes while the median length of stay was 12 days.

**Figure 1:** A schematic representation of hepatocellular carcinoma recurrence following hepatocellular differentiation by the clonal origin of the tumor.
2 (11.7%) patients the resection planned on the basis of the CT imaging was changed after the pre-operative analysis of 3D reconstructions.

**Conclusion:** These preliminary data regarding the use of 3D models in the accurate and personalize planning of complex liver resections showed that the 3D liver reconstruction might provide useful and additional information about anatomical vessels’ variations and tumor extension. The analysis of 3D reconstructions might lead the surgeon to change the planned resection.

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**EP038**

**COMBINED MINI-INVASIVE SURGICAL CORRECTION OF REFRACTORY ASCITES IN PATIENTS WITH DECOMPENSATED LIVER CIRRHOSIS**

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**Introduction:** Occurrence of refractory ascites in liver cirrhosis considerably complicates treatment. Evolution of cirrhotic ascites is strongly related with severe lymph circulation disturbance and violations of peritoneal absorption.

**Objective:** To determine methods of surgical correction of refractory ascites in patients with decompensated liver cirrhosis through cervical thoracic lymphatic duct decompression and simultaneous laparoscopic sanitation with post-surgery fractional rinsing of abdominal cavity.

**Materials & methods:** From 2014 to 2020, 118 patients (65 men (55.1%) and 53 women (44.9%)), aged 28 to 73 underwent surgery for cirrhosis with massive refractory ascites Child C (9-10), without obvious signs of hepatic encephalopathy. Major etiological factors were: viral hepatitis C (51 patients (43.2%)), B (34 pts (28.8%)), B+D (23 pts (19.5%)), toxicity (10 patients (8.5%)). To prevent possible bleeding at the first stage, endoscopic filling of esophageal varices with fibrin glue was performed in 103 patients (87.3%). After testing the effectiveness of varices filling, in the following 5-7 days decompression surgery of thoracic lymphatic duct was performed under local anesthesia to improve lymphatic drainage from liver and abdominal organs. Simultaneously, laparoscopic sanitation of abdominal cavity was performed, with complete evacuation of ascites fluid, rinsing and drainage. Fractional post-surgery rinsing was repeated daily for 3-5 days towards removing peritoneum edema and improving its absorptive properties. Results evaluation was performed 3, 6 and 12 months after surgery, based on criteria of liver reserves and ascites volume.

**Results:** Post-surgery mortality from liver failure was 5.1% (6 pts), 7 other patients (5.9%) died of the same cause the following 3-6 months. Annual survival rate was 93.2%. Complete ascites regression over 3-12 months after surgery was noted in 58 patients (49.2%), significant regression and stabilization in 35 (29.7%), moderate regression with need for periodic decompressive laparocentesis in 12 (10.2%) cases. In all patients, functional liver reserves and life quality significantly improved.

**Conclusion:** Using this technique for refractory ascites correction in patients with liver cirrhosis — through laparoscopic sanitation and post-surgery fractional rinsing of abdominal cavity, with simultaneous decompression of thoracic lymphatic duct — has proved its efficacy and is worth being established as clinical practice.

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**EP039**

**BUDD-CHIARI SYNDROME BY AN ELEVATED DIAPHRAGM**

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I. Aloa Hermoso de Mendoza2,

M. Gómez López de Munain1 and V. Etxenagusia Serrats3

1Araba University Hospital, Surgery, and 2Araba University Hospital, Radiology, Spain

**Purpose:** We describe a case of Budd-Chiari Syndrome resulted from compression of the suprahepatic veins by an elevated right hemidiaphragm.

**Method:** We did a review about Budd-Chiari syndrome’s etiology and employed the medical history and iconography from the case that we describe.

**Case report:** A 79 year-old woman diagnosed with Lateral Amyotrophic Sclerosis, was admitted to our hospital due to presenting a cholecystitis-pancreatitis. She was studied by computed Tomography (TC) and hepatic doppler-ultrasound (ECO) discovering, accidentally, the right hemidiaphragm was markedly elevated, probably by a right phrenic’s paralysis, which caused an abrupt narrowing of the right and middle suprahepatic veins at the level of their union with the inferior cava vein (picture 1). In addition, there were several venous shunts between suprahæpatic veins, veins drain’s changed and collateral vessels developed around left suprahæpatic vein. Moreover, we could see hypertrophy of caudado and left hepatic lobes. FInds agreeing to raddicular Budd-Chiari Syndrome diagnosis. Previously, only have been found two cases like this described in medical literature. The patient had not symptoms yet about this new diagnosis.

**Results:** In most cases the Budd-Chiari syndorme’s etiology is trombotic and it is located in the suprahæpatic veins. Other described causes are extrinsic compression or vein invasion. And less than 10% are idiopathic. There are not described patognomotic laboratory values but, in cronic cases, frequently they develop a cirhotic profile because of the portal hipertension progress with hepatic necrosis and cirrhosis. Doppler-ultrasound is the best tool diagnostic due to see and describe the hepatic venous dreins variations and their evolution with colateral vessels, hipertrophic caudado and left lobes, venous shunts.

**Conclusion:** Budd-Chiari syndrome is defined as hepatic venous outflow obstruction at any level from the small hepatic veins to the junction of the inferior vaca vein, regardless of the cause of obstruction. In most cases the etiology is trombotic. Previously, only have been found...
two cases described which are caused by right hemidiaphragm elevated. We contribute with one more case. Ultrasound-doppler must be the first line for diagnosing.

EP040
SHORT-TERM RESULTS OF MINIMALLY INVASIVE LIVER RESECTION FOR CYSTADENOMAS
The Loginov Moscow Clinical Scientific Center, Department of HPB Surgery, Russian Federation

Purpose: The aim of the study was to evaluate the results of minimally invasive liver resections for cystadenomas.

Methods: Data were accumulated since 2014. Cystadenomas were the indication for liver resection in 12 patients: only women, aged from 23 to 66 years. Minimally invasive procedures were performed in 10 (83%), including 1 robotic resection. Two patients underwent operation through open approach. The mean difficulty index was intermediate according to IWATE criteria, which was associated with a high rate of resections of the posterior-superior segments. Indications for liver resection for cystadenomas, first of all was suspicion for malignancy.

Results: Major hepatectomy was performed in 2 patients (left hemipatectomy). Partial resection of postero-superior segments and caudate lobe was performed in 8 (67%) patients. There is no major morbidity after minimally invasive liver resection. After 2 open liver resections bile leakage took place in 1 (50%) patient and required additional drainage. Mean operation time of minimally invasive and open liver resection was comparable: 315 min and 293 min, respectively. The mean blood loss for minimally invasive and open liver resection was comparable: 315 ml and 300 ml, respectively. The mean postoperative hospital stay after minimally invasive and open resection was 7 and 19 days, respectively.

Conclusion: Minimally invasive liver resection is the safe option for treatment of cystadenomas, including difficult-to-reach liver segments lesions and may be considered as the first choice approach if surgery is indicated.

EP041
BUDD-CHIARI SYNDROME — THE FORGOTTEN DANGER OF REPEAT LIVER SURGERY
D. Koh, A. Gray and D. Crough
Monash Medical Centre / Monash Health, Department of HPB and UGI Surgery, Australia

Introduction: Budd-Chiari syndrome (BCS) is defined as obstruction of the hepatic outflow anywhere along the hepatic venous course. With certain liver resections, a risk exists for inadvertent disruption to the main venous outflow tracts predisposing to iatrogenic BCS in return resections. Specified pre-operative imaging of the hepatic outflow is generally not undertaken prior to repeat hepatic resections, meaning the hepatic venous outflow can remain unclassified in operative planning. We present the death of a man whose main venous outflow was inadvertently divided during a right hepatectomy following a previous segment 4 metastectomy.

Discussion: Our case report describes an iatrogenic cause of BCS after routine stapling of the right hepatic vein eliminated all hepatic outflow due to the patient’s abnormal venous vasculature following previous resection. The patient’s previous hepatic surgery had inadvertently disrupted the hepatic outflow at the confluence of the left and middle hepatic veins, making the right hepatic vein the main outflow route. This was not identified pre-operatively despite the patient undergoing innumerable imaging procedures including portal vein embolization. He subsequently died immediately following surgery from a combination of blood loss and acute liver failure.

Conclusion: In the setting of previous hepatic surgery, it is imperative to assess in detail the pre-operative hepatic venous vasculature. Furthermore, when unusual intra-operative hepatic congestion and bleeding occurs, operators need to strongly consider the possibility of obstruction to the venous outflow tracts and thus make every effort to return venous outflow to the remnant liver.

EP042
HEPATIC PSEUDOLYMPHOMA: CASE REPORT AND REVIEW
Hospital General Universitario de Alicante, Servicio de Cirugía General y del Aparato Digestivo, Sección de Cirugía Hepatobiliopancreática, Spain

Purpose: Hepatic Pseudolymphoma or Reactive Lymphoid Hyperplasia is a rare benign neoplasm characterized by a polyclonal lymphocytes proliferation gathered in nodes with an active germinal center. Its pathophysiology is uncertain though it is clearly related to inflammatory or infectious diseases, collagen disorders and malignancy. Diagnosis is often difficult due to its similarities to malignant tumors. If diagnostic is confirmed, a conservative approach may be applied.

Method: A 57 years old woman with a history of lung adenocarcinoma T1a surgically managed by a left inferior lobectomy in 2015. That same year the patient develops an idiopathic autoimmune hemolytic anemia treated with steroids. During follow-up dissociated cholestasis is detected with elevation of hepatic enzymes. Primary Biliary Cholangitis was suspected. Imaging studies (RMI, US) show an 18mm hypervascular nodule between liver segments II and III. Core Needle Biopsy is performed showing polymorphic lymphoid infiltrations, polyclonal lymphocytes B and T, and germinal center cells, findings compatible with hepatic pseudolymphoma or low grade lymphoma.

Results: Segment III hepatectomy was performed, without postoperative complications. Patient was discharged 2 days after surgery. Studies confirm hepatic pseudolymphoma. After 54 months follow up no recurrence has been detected.
Conclusion: Hepatic Pseudolymphoma is a rare (less than 70 published cases) benign disease, often associated to autoimmune disorders, malignancy or collagen disorders. Treatment of this pathology could be conservative, but the difficulties regarding differential diagnosis (malignancy) makes surgical approach often required. If diagnosis is confirmed, a conservative approach may be applied.

EP043
RADICAL SURGERY IN LIVER HYDATID CYST WITH TRANSDIAPHRAGMATIC RUPTURE AND LUNG HYDATID CYST
J. J. Rubio García¹,2, G. P. Rodríguez Laiz²,3, C. F. Alcázar López²,1, P. Melgar Requena¹,2,3, C. Villodre Tudela¹,2, O. Coronado de Frias¹,1,2, J. Ruiz López¹,2, S. Bolufer¹,2, J. Navarro Martínez³,2 and J. M. Ramia Angel¹,2
¹Hospital General Universitario Alicante, Cirugía General y del Aparato Digestivo, 2ISABIAL Instituto de Investigación Sanitaria y Biomédica de Alicante, Hospital General Universitario de Alicante, 3Hospital General Universitario Alicante, Unidad de Cirugía Biliopancreática y Trasplante Hepático, Cirugía General y del Aparato Digestivo, 4Hospital General Universitario Alicante, Cirugía Torácica, and 5Hospital General Universitario Alicante, Anestesiología y Reanimación, Spain

Introduction: Hydatidosis is a parasitic disease caused by E. Granulosus. This zoonosis may behave aggressively, invading vital structures and causing serious complications. Synchronous involvement of the diaphragm, chest and liver is a rare but serious complication.

Methods: We present a case of hepatopulmonary hydatidosis with diaphragm involvement and close contact with heart and suprahepatic inferior vena cava (SIVC) treated with radical surgery (RS).

Results: Female, 38 year-old, presented at our Department for cough, whitish expectoration, episode of hemoptysis, low-grade fever, weight loss and chest pain. Positive serology for hydatidosis. CT/MRI showed: Multiple septated cysts in the right liver, anterior displacement of the inferior vena cava (IVC) and other lesions in the left liver (Fig. 1A), above all a large suprahepatic cyst (12cm) with extension paracardiac and transdiaphragmatic, involving right lung, in contact with SIVC and right atrium (Fig. 1AB).

Surgical procedure: thoracotomy: right lower lobectomy; laparotomy: right hepatectomy and pars flaccida resection of the destroyed diaphragm; after opening the pericardium, separation of the cyst from the IVC and atrium, and total cystectomy of left liver cyst (Fig. 2). The diaphragm was closed without the need for prosthesis. Hospital stay: 7 days. CCI: 0 in return resections. Specified pre-operative imaging RS in these rare cases is feasible but technically demanding. RS is associated with less morbidity and recurrence than conservative surgery. Proper planning with a multidisciplinary team comprising hepatobiliopancreatic surgeons, thoracic surgeons and anesthetists and the use of a combined approach (laparotomy + thoracotomy) allow excellent exposure of the surgical field.

EP044
SYSTEMIC IMMUNE-INFLAMMATION INDEX PREDICTS MAJOR AND INFECTIOUS COMPLICATIONS AFTER COLORECTAL LIVER METASTASIS SURGERY

Introduction: Colorectal cancer (CRC) is a leading cause of morbidity and mortality worldwide, and approximately 25-40% of patients with CRC have distant metastasis at the initial diagnosis. Liver resection remains the gold standard of care and the only potential cure; however, it is associated with significant morbidity. The purpose of this study was to evaluate whether the systemic immune-inflammation index (SII) could help predicting postoperative complications in patients with CRC liver metastasis (CRCLM).

Methods: Retrospective study, analyzing our database of patients undergoing liver surgery for CRCLM, between 2014-2020. Variables: morbidity according to the Clavien-Dindo(CD) classification, infectious complications, transfusion, LOS and blood test. SII was calculated as [(platelet count)/C2/(the neutrophil-to-lymphocyte ratio)]. Univariate and multivariate analyses were performed to identify factors predicting postoperative complications. Receiver operating characteristic (ROC) analysis was used in order to choose the optimal cut-off value.

Results: 81 patients were analyzed (men:61.7%, age:65.6±11.8years). Postoperative complications: global(50.6%), infectious(22.2%), Clavien-Dindo≥III (17.3%), transfusion(9.9%). 6.2% of the patients required
reoperation. Hospital stay: 7(IQR:6-10) days. The optimal cut-off value to detect major (CD ≥II) complications was SII=386 [AUC:0.75 (95%CI:0.62-0.87), p=0.004; S:78.6%, E:72.8%]. Patients with major and infectious complications had higher SII values (855.7±512.7 vs. 508.8±460.1 p=0.014 and 832.8±650.6 vs. 495.9±403.3 p=0.01 respectively).

Patients with SII value ≥386 had higher rate of global complications, CD ≥III, infectious, reoperations and transfusion (59.5% vs. 4.5% p=0.1; 29.7% vs. 6.8% p=0.007; 37.8% vs. 9.1% p=0.002; 13.5% vs. 0% p=0.012; 16.2% vs. 4.5% p=0.07 respectively).

Conclusion: Systemic immune-inflammation index (SII) could be a useful tool to predict postoperative complications, especially for major and infectious complications, in patients with CRCLM following hepatic resection.
replacement on chronic oral anticoagulation treatment (acenocumarol). An abdominal ultrasound showed a central hepatic lesion (57mm). CT showed a 30-mm increase in size, characterized as malignant, and located between the portal bifurcation and the hepatic veins confluence. Tumor markers (CEA/AFP/CA19.9/CA-125) were all normal. Biopsy diagnosis was cholangiocarcinoma. Due to its size and location, we planned for ex-situ/ante-situ surgery.

**Results:** We found a large, central, firmly encapsulated tumor with no apparent infiltration of the surrounding structures, lacking the appearance of cholangiocarcinoma. It was in intimate contact with the hepatic hilum, the suprahepatic veins and the Inferior Vena Cava. No other abdominal lesions were found. The tumor could be excised with meticulous dissection, and we had to reconstruct the right hepatic bile duct with primary reanastomosis. Her postoperative recovery was excellent, being discharged on POD 4. The pathology exam showed a G1 NET, Ki67 1%, synaptophysin(+), chromogranin-A(-), and no lymph node involvement. Whole-body extension survey failed to reveal an extrhepatic origin.

**Conclusions:** Hepatic involvement of NET is often secondary to a systemic disease, PHNET being extremely rare. They are more likely to appear in females over 50, with no symptoms, and they are usually incidental discoveries. An increase in chromogranin-A is generally used to monitor their response to treatment and for follow-up. The hepatic resection is mandatory, with a five-year survival rate of 74-78%.

**EP049**

**PURE LAPAROSCOPIC VS HAND-ASSISTED MINIMAL-INVASIVE LIVER SURGERY FOR POSTEROSUPERIOR SEGMENTS: PROPENSITY SCORE MATCHING ANALYSIS**


**Virgen de la Arrixaca University Hospital-IMIB, Department of Surgery, HBP Unit, Spain**

**Purpose:** To compare the intraoperative and postoperative outcomes of patients operated on for lesions located in segments 7 and 8 using Hand assisted laparoscopy surgery (HALS) and pure laparoscopic surgery (PLS).

**Method:** From December 2004 to January 2021 we have included patients with lesions located in segments 7 and 8 who underwent minimally invasive surgery in our unit. Laparoscopic cyst fenestration, hepatotomies, radiofrequency and microwave ablation were not included. To overcome selection bias, we performed 1:1 propensity score matching (PSM) between HALS and PLS cohorts.

**Results:** A total of 79 minimally-invasive liver resections, 46 by HALS and 33 by PLS have been included in this study. In overall series, the mean age of the patients was 61.33 ± 12.82 years, with 50 men (%) and 29 women (%). BMI was 27.17 ± 3.53 m / kg with a median Charlson index of 6.29 ± 3.35. The most frequent indication for surgery was colorectal cancer liver metastases (58.22%), followed by hepatocarcinoma (20.25%), benign lesions (12.65%) and non-colorectal metastases (8.86%). The median size of the lesions was 25 mm (IQR, 17-42) and the number of lesions was 1 (IQR, 1-2). The median operative time was 150 min (IQR, 120-180). There was no intraoperative mortality and according to the Dindo-Clavien classification, global complications were 8.86% with 6.32% grade IIIa complications. The median hospital stay was 4 days (IQR, 3-4). After PSM operative time, blood losses, pringle maneuver, clamping time and morbidity was similar between both groups with no statistically significant differences. The hospital stay was lower in PLS group (3 vs 4 days, p <0.01).

**Conclusion:** PLS presents similar intraoperative and postoperative results as HALS to lesions located in segments 7 and 8. Therefore, in those centers with experience...
in laparoscopic liver surgery, PLS can be performed safely in these segments. Even so, HALS at present, according to our experience, can still be useful in isolated cases as a previous step to converting to open surgery in case of bleeding that cannot be controlled or large tumors, and especially for groups with less experience in PLS.

**EP050**

**QUANTITATIVE STUDY OF THE EFFECTS OF EARLY STANDARDIZED AMBULATION ON SLEEP QUALITY IN PATIENTS AFTER HEPATECTOMY**

Y. Yang, Y. Tang, Z. Wang and W. Zhou

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**Purpose:** To investigate the effects of early ambulation on sleep quality in patients after liver resection via a quantitative study.

**Methods:** A total of 120 patients with hepatic tumors who underwent liver resection were randomly divided into two groups. The Pittsburgh Sleep Quality Index (PSQI) was used to score and compare the physical activities and sleep quality between the two groups.

**Results:** Compared to patients in the control group, patients who started early ambulation after liver resection had significantly better sleep quality, faster recovery of gastrointestinal function and shorter lengths of post-operative hospital stay. No statistically significant difference was observed in the incidence of postoperative complications between the groups.

**Conclusion:** Early standardized physical activities are safe and feasible for patients after liver resection. They can significantly increase the patient’s sleep duration and improve the sleep quality to reduce the patient’s pain and the nursing workload and achieve rapid recovery.

**EP051**

**NON-INFECTIONOUS HEPATIC CYST DISEASE: STUDY OF 28 CASES**

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*Hospital General Universitario de Elda, Department of Surgery, Hospital General Universitario de Elda, Department of Radiology, and Hospital General Universitario de Elda, Department of Pathology, Spain*

**Introduction:** Non-infectious hepatic cysts have an incidence of 5-10%.

**Material and Methods:** We present the patients evaluated by our unit referred from medical specialties or diagnosed in the emergency department after presenting symptoms. Cases were entered into a prospective database.

**Results:** From August 2009 to October 2020, 28 patients diagnosed with simple liver cysts or polycystic liver disease were evaluated in our unit, of which 8 (29%) were men and 20 (71%) were women. The diagnostic study was based on radiological tests, with abdominal ultrasound being the first and the one that provided the definitive diagnosis in 15 cases (54%). In the remaining 13, CT or resonance was necessary. After performing a detailed evaluation of the symptoms, in 20 (71%) it was considered related to cystic disease, but only 10 were subject to surgery. The most frequent symptoms were secondary to intracystic hemorrhage. The mean size of the cysts of the operated patients was 15±6 cm (range 8-28). In all patients, the surgical technique was fenestration, associated with cholecystectomy in 5. The initial approach was 80% laparoscopic. Mortality was 10% (1 patient) Clavien-Dindo grade I. Postoperative mortality was nil. The mean follow-up was 70±37 months (range 4-138). Only 1 case (10%) recurred 12 months after surgery and was treated with percutaneous sclerosis with good evolution.

**Conclusions:** Symptoms should be carefully evaluated so as not to indicate surgery in patients who would not benefit from it. Surgical treatment of symptomatic cysts has good results in both the short and long term.

**EP052**

**WHAT IS THE ROLE OF SURGERY IN THE MANAGEMENT OF NEUROENDOCRINE LIVER METASTASES (NETLM)?**


*Hospital Universitario Ramón y Cajal, General Surgery, and Hospital Universitario Ramón y Cajal, Pathology, Spain*

**Purpose:** The management of NETLM is a source of great controversy amongst experts. In recent years, it’s becoming more obvious that surgical resection is associated with better long-term results. The purpose of this study is to review our experience in the surgical treatment of NETLM.

**Methods:** We conducted a retrospective study based on pathology records, including all liver biopsies with a histopathological diagnosis of neuroendocrine tumor (NET), in the period between January 2001 and January 2021. Clinical and histopathological parameters, surgical approaches and clinical outcomes, were analyzed using STATA software.

**Results:** All liver biopsies with the diagnosis of NET metastasis were collected (N=131). 67 cases were excluded base on the exclusion criteria: Extra-gastrointestinal location (55%), unknown origin (21%) lack of follow-up (12%), and mixed NET. Of the remaining 64 cases, 52 were described as NETLM not amenable for resection. Those patients who underwent surgical treatment of NETLM (N=12) had metastasis at the time of initial diagnosis in 90% of cases. Primary tumor location: pancreas (3), small intestine (3), colon (2) and rectum (2). Average age at diagnosis of 66 years. All patients underwent multiple metastasectomies and 2 had hepatectomies. There was a statistically significant difference between the number of lesions diagnosed with preoperative imaging and those diagnosed intraoperatively (2.5 Vs 3.25). All patients had a favorable histology. Disease- free survival at 5 year was 23%. Overall disease survival at 10 years was 63%.

**Conclusions:** Surgical resection of NETLM is associated with a long-term survival and disease control advantage. Recognizing the prognostic factors is useful in patients selection. Therapeutic decisions must be made in multidisciplinary committees.
**EP053**

**PREOPERATIVE MUSCLE MASS MEASUREMENT AND IMMUNE-INFLAMMATORY MARKERS AS PREDICTORS OF POST-OPERATIVE SHORT-TERM OUTCOMES IN PATIENTS WITH COLORECTAL LIVER METASTASES**


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**Background:** We studied the short-term prognostic impact of preoperative muscle mass and its association between immuno-inflammatory scores (prognostic nutritional index-PNI, Glasgow prognostic score-GPS, neutrophil/lymphocyte ratio-NLR, platelet/lymphocyte ratio-PLR and lymphocyte/monocyte ratio-LMR) and postoperative morbidity after hepatic resection for colorectal liver metastasis (CRLM).

**Methods:** 81 patients who underwent surgery for CRLM between 2015-2019 were analyzed retrospectively. Clinicopathological factors and 30-days postoperative complications were recorded. Psoas muscle areas were measured on CT scans at the third lumbar vertebra and immuno-nutritional scores were calculated from standard preoperative blood test.

**Results:** 41 patients (50.6%) developed complications, 14 (17.28%) major (Clavien-Dindo III), 18 infectious (22.2%) and 5 (6.1%) reoperations. Two patients died (2.5%). 40 patients (49.4%) had LMM defined as below than sex-specific median size. Low Muscle Mass (LMM) cohort had more rectal tumors (p=0.005), higher NLR values (p=0.017), and more subjects in the high-risk group (NLR>2: p=0.003), lower values of LMR (p=0.001) and more subjects in the high-risk value (LMR <3.5: p=0.005). Differences between LMM and no-LMM were observed in major complications (p<0.001), infectious complications (p=0.002) and reoperations (p=0.023). In multivariate analysis LMM remained independently associated with CD ≥III complications (OR 7.28, 95% CI 1.22–43.48; p=0.02) and infectious complications (OR 4.99, 95% CI 1.25-19.98; p=0.02).

**Conclusions:** Psoas muscle index is an useful tool, by itself or in conjunction with immuno-nutritional scores, identifying patients with higher risk of postoperative complications after CRLM resection.

**EP054**

**PROGNOSTIC NUTRITIONAL INDEX PREDICTS MORBIDITY AFTER COLORECTAL LIVER METASTASIS SURGERY**


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**Introduction:** Colorectal cancer (CRC) is the third most common type of cancer in men, and the most common malignancy tumor in Spain. Roughly 25-40% of patients with CRC have distant metastasis at the initial diagnosis. Despite immense efforts in developing advanced treatments for CRC, its overall survival remains poor. Colorectal cancer liver metastasis (CRCLM) is currently the leading cause of cancer-related morbidity and mortality. Hepatic resection remains the gold standard of care and the only potential cure; however, it is associated with significant morbidity. The purpose of this study was to evaluate whether the prognostic nutritional index-PNI could help predicting postoperative complications in patients with CRCML, thus improving patient outcomes.

**Methods:** Retrospective study, analyzing our database of patients undergoing liver surgery for CRCLM, between 2014-2020. Variables: morbidity according to the Clavien-Dindo (CD) classification, infectious complications, transfusion, LOS and blood test. Univariate and multivariate analyses were performed to identify factors predicting postoperative complications. Receiver operating characteristic (ROC) analysis was used in order to choose the optimal cut-off value.

**Results:** 81 patients were analyzed (men:61.7%, age:65.6±11.8years). Postoperative complications: global (50.6%), infectious (22.2%), Clavien-Dindo ≥III (17.3%), transfusion (9.9%). 6.2% of the patients required reoperation. Hospital stay: 7(IQR:6-10days). The optimal cut-off value to detect CD ≥III complications was PNI=42.

Multivariate analysis identified: PNI value as independent predictive and protective factor for global complications and reoperations (OR 0.89, 95% CI 0.81-0.99, p=0.04; OR 0.73, 95% CI 0.57-0.95, p=0.02). PNI <42 as independent predictive and risk factor for global, major and infectious complications (p=0.04; OR 3.94, 95% CI 1.33-11.69, p=0.014; OR 3.61, 95% CI 1.02-12.82, p=0.047; OR 2.56, 95% CI 0.81-8.13, p=0.1).

**Conclusion:** PNI is an independent predictive and protective factor for the development of postoperative complications following hepatic resection for CRCLM, especially for global and major complications.

**EP055**

**COMMON HEPATIC ARTERY ARISING FROM THE HEPATOMESENTERIC TRUNK: THE CHALLENGE OF PANCREATODUODENECTOMY**


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**Introduction:** Pancreatoduodenectomy (PD) is the surgical procedure for tumours located in the head of the pancreas. Arterial anomalies of the hepatic arteries are common, these anomalies are potnetially at risk of being damaged during surgery. Therefore, preoperative imaging of the hepatic arterial anatomy must be evaluated and classified according to Michel’s or Hyatt’s classifications.
Methods: We report two patients that underwent PD with hepatomesenteric trunk (HMT).

Results: The first case, a 75-years-old male consulted the Emergency Department for abdominal pain. The second case, a 65-years-old male consulted the Emergency Department for jaundice, light-colored stools and dark-colored urine. An abdominal-pelvic CT identified a 2.7cm and a 5cm tumour in the head of the pancreas without vascular involvement, respectively. The CT detected an HMT without tumour invasion in both cases (Fig. 1). Biopsy confirmed the presence of an adenocarcinoma. During PD, the HMT was detected ascending behind the head of pancreas and crossing behind the common bile duct to the usual location of gastroduodenal artery (Fig.2AB). The correct identification avoided any morbidity related to this arterial anomaly.

Conclusion: Anomalous common hepatic artery arising from the superior mesenteric artery, known as HMT, is classified as Michaels type IX or Hyatt type V. HMT may be accidentally damaged during PD procedure due to misinterpretation, causing severe intra-operative or post-operative bleeding and/or can be involved by tumour requiring resection and arterial reconstruction or even making tumour unresectable. Awareness of the presence of HMT is essential during performing pancreatic head resection and help to achieve a safer pancreatic head dissection.

EP056
RADIOEMBOLIZATION WITH YTRIUM-90 AS A NEOADJUVANT THERAPY IN AN INITIALLY UNRESECTABLE INTRAHEPATIC CHOLANGIOCARCINOMA

Hospital Universitario Cruces, Spain

Introduction: Only 30-40% of intrahepatic cholangiocarcinoma (ICC) can initially benefit from surgery. When ICC remains located in the liver and is not initially resectable, different therapeutical approaches could be used. In these setting, selective internal radiation therapy (SIRT), also known as Yttrium-90 microsphere radioembolization, has given promising results.

Case report: We present the case of a 55-year-old woman with ICC affecting segments 4, 5 and 8. Extended right hepatectomy was needed to achieve R0 resection, but remaining liver volume was insufficient. Therefore, she was offered primary local and systemic treatment with 12 cycles of chemotherapy with Gemcitabine and Oxalaplatin and posterior SIRT. 7 months later, the tumor remained stable, however, a 40% hypertrophy of the left lateral segments were observed. The patient was operated and a right trisectionectomy plus caudectomy and extrahepatic bile duct resection with locoregional lymphadenectomy and reconstruction with double hepatic-jejunosotmy-Roux-en-Y were performed. The patient presented favorable postoperative evolution, being discharged on the 15th day.

Discussion: On the one hand, SIRT may achieve local tumor control in up to 34.4% of cases. On the other hand, it may generate atrophy of the affected segments and, what it is more interesting, a growth of the contralateral liver. In this way, initially unresectable tumors due to insufficient remaining liver volume may end up being surgically resectable.

Conclusion: Despite the limited published evidence and the need for more studies, SIRT should be taken into account in cases of ICC initially not amenable to surgical treatment.

EP057
ANALYSIS OF MORBI-MORTALITY RELATED RISK FACTORS AFTER LIVER RESECTION FOR COLORECTAL LIVER METASTASIS

Hospital Universitario San Juan de Alicante, Spain

Purpose: Patients with colorectal cancer develop liver metastasis in 50-70% of the cases. Liver resection offers the best survival benefit, but is related with postoperative complications. The aim of this study is to identify and analyse factors associated with morbi-mortality.

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Purpose: Patients with colorectal cancer develop liver metastasis in 50-70% of the cases. Liver resection offers the best survival benefit, but is related with postoperative complications. The aim of this study is to identify and analyse factors associated with morbi-mortality.
Methods: A retrospective study of the cohort of patients that underwent liver resection for colorectal metastas during the period 2016 to 2020 was analysed. All primary liver tumours and metastasis from other cancers were excluded. The two groups were compared depending on the presence of postoperative complications. The statistical analysis of the quantitative variables was measured in means and standard deviation when they followed the normal distribution and in medians and percentiles 25 and 75 when they did not. The categorical variables were measured in frequencies and percentages. The continuous variables were evaluated using the Student’s t test for the parametric variables and the Mann-Whitney U test for the nonparametric ones. The categorical variables were evaluated using the Chi-square test and odds ratio (OR).

Results: In the study period 28 liver resections for colorectal liver metastases were performed. The mean age was 64±8 years and 82% were male. There were no significant differences in terms of demographic, clinical, and perioperative variables between the groups. The tumour size was significantly higher in the postoperative morbidity group (21 vs 35 mm, p=0.025). The hospital stay was longer in the group with complications (4 vs 12 days, p=0.033). Although no significant statistical difference was reached, 60% of the patients that presented postoperative complications had a previous liver resection (p=0.082). Factors that were related with higher risk were male gender (OR=3.07, p=0.207), sarcopenia (OR=2.083, p=0.459) and the ASA (OR=1.68, p=0.528), however none of them was significant. There was no 90-days mortality.

Conclusion: A zero postoperative mortality rate should be a benchmark. Tumour size was significantly related to postoperative morbidity, concordant with previous studies in the literature and multiple predictive scores. Out of the factors with higher odds ratio the sarcopenia is the unique modifiable factor on which a nutrition intervention could be taken preoperatively.

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**EP058**

**METRONOMIC CHEMOTHERAPY WITH CYCLOPHOSPHAMIDE AS A SECOND LINE TREATMENT IN ADVANCED HEPATOCELULAR CANCER: A CASE REPORT**

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**Purpose:** Metronomic chemotherapy is a new modality of drug administration in cancer management. Metronomic chemotherapy entails chronic, equally spaced administration of low doses of various chemotherapeutic drugs without extended rest periods. The use of metronomic therapy as a second-line treatment in advanced hepatocellular cancer (HCC) or metastatic HCC still remains under investigation. We report an unusual case with advanced metastatic HCC, who had an impressive response to metronomic therapy with Cyclophosphamide.

**Method:** A 49-year-old Caucasian female patient diagnosed with a very large (~14cm) right liver lobe HCC on a background of non-alcoholic fatty liver disease. In July 2016 she underwent initially right hepatic artery transarterial chemoembolization (TACE) and right hepatectomy ten days after TACE. During the follow-up period, she presented early disease recurrence (in 8 months post-liver resection) with lung and peritoneal metastases. A protein kinase inhibitor (Sorafenib) was administered for six months, without response. Afterwards, Cyclophosphamide administration at low doses, as metronomic chemotherapy, provided complete regression of the metastatic lesions.

**Results:** The patient remains in good performance status 4.5 years after the initial diagnosis, without signs of recurrence in her recent follow-up.

**Conclusion:** Using Cyclophosphamide as metronomic chemotherapy in advanced HCC may have an anti-angiogenic antitumor effect. Future clinical trials need to demonstrate this effect in terms of tumor suppression and increased disease-free survival.

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**EP059**

**LIVER HYDATID CYST WITH CHOLANGITIS SECONDARY TO RIGHT BILE DUCT COMMUNICATION**


Hospital Universitari de Tarragona Joan XXIII, General and Digestive Surgery, Spain

**Introduction:** Communication of a liver hydatid cyst (LHC) with the bile duct is a life-threatening complication that requires rapid diagnosis and treatment. We present the case of a 36-year-old woman diagnosed of a giant LHC occupying the whole right lobe and partially the IVA segment. The patient developed an acute cholangitis secondary to a communication of the cyst with the right bile duct. Preoperatively an ERCP allowed the drainage of purulent material and several vesicles from the bile duct and the placement of a prosthesis.

**Methods:** During the surgery, an abscessed LHC, fused with the diaphragm and the inferior vena cava was found. Dissection was done preserving the abdominal and thoracic cavities from cyst spillage, protecting the field with hypertonic solution soaked gauze. In order to avoid further bile duct contamination, a right hepatectomy with extra-glissonian approach was performed. A T-tube was placed in the bile duct.

**Results:** Postoperative recovery was uneventful. Control cholangiography at the 9th postoperative day showed a correct permeability of the biliary duct, without bile leak. The T-tube was closed afterwards, and the patient was discharged two weeks after the surgery. After two months, the T-tube was removed without complications in the outpatient clinic.

**Conclusion:** The cases of complex LHC, such as the ones with bile duct communication, must have a surgical approach to provide the best possible treatment. In those cases, it is important to assure bile duct permeability in order to avoid postoperative complications.
HEPATIC BRUCELLOMA: AN UNUSUAL CONDITION

M. Jiménez Fuertes, M. P. Orihuela Arroyo, C. Meliga, M. Escanciano Escanciano, V. Domínguez Prieto, S. Gonzalez Soares, S. Qian Zhang, F. Vélez Pinto, P. Villarejo Campos, H. Guadalajara Labajo and D. García Olmo

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Introduction: The most common zoonosis in the world is brucellosis, which is caused by microorganisms of the genus Brucella, a gram-negative aerobic bacteria with the in vivo capability to behave like facultative intracellular parasites.

Case: We present a 49-year-old man complained of abdominal pain in the right hypochondrium associated with fever. Ultrasound, CT, and abdominal MRI scans were performed, which showed a 7-cm hypodense liver lesion in segment VII, with a 2-cm calcification (Image 1).

A blood test revealed only elevated CRP levels, without leukocytosis or neutrophilia, and serology of echinococcus granules was negative. Blood cultures were also negative. The affected segment was resected. The postoperative period was satisfactory.

Results: Histopathologic analysis determined the presence of a hepatic necrotizing granuloma with internal calcification. The lesion was negative for Zhiel_Neelsen, Grocott, and PAS, but compatible with bruceloma of the liver. Serological diagnosis was subsequently confirmed by means of the Bengal rose test. The patient was then treated with doxycycline with rifampicin for 6 weeks.

Hepatic brucelomas appear as single lesions with a pseudotumoral appearance and typically exhibit central calcification. Serological studies are based on the detection of antibodies and are performed with Bengal rose staining. Use of the PCR technique is advisable, both in blood and in the tissue sample.

Conclusion: The combination of liver surgery and antibiotic treatment for 6 to 8 weeks is ideal to guarantee complete eradication of this zoonosis, but approximately 5% to 15% of patients relapse.

RECURRENT CYSTIC LIVER INJURY. BENIGN OR MALIGNANT?

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Purpose: Liver cysts are common, occurring in up to 5% of the population. For many types of cysts, a variety of different treatment options exist and the preferred management is unclear.

Method: We present the case of a 75-year-old woman with arterial hypertension presented to the emergency department in August 2017 with severe acute abdominal pain. A Computed tomography (CT) scan showed a septate cystic injury in the right liver with a current diameter of 23x18x16 cm. Appearance of free subhepatic and periportal fluid. The patient underwent emergency surgery performing laparoscopic cystectomy and cholecystectomy.

Six months after the first surgery, she presented a new recurrence in the control CT scan, which showed a significant increase in the size of the cystic lesion (diameter 19x15x23 cm). This lesion conditioned right hemi-diaphragmatic elevation with compression on the inferior vena cava and the right heart chambers. The patient underwent surgery again, we performed a right hepatectomy. The pathological result showed a cystic lesion of undetermined origin and behavior.

After 28 months of the last surgery, she returned to the emergency department for general abdominal pain. A CT scan showed right hemidiaphragm elevation and post-operative changes of right hepatectomy with the presence of a large focal lesion, suggestive of a recurrence. We performed a new resection of the lesion plus the central tendinous portion of the diaphragm. The pathological result showed angiosarcoma grade 2 FNCLCC.

Results: Congenital simple cysts are most common and account for most cystic lesions in the liver; these simple cysts usually do not give rise to symptoms or complications.
Angiosarcoma liver is an extremely rare disease entity that accounts for approximately 0.1%-2% of primary liver malignancy. It is three times more common in men than women and usually affects the former in their sixth or seventh decade of life.

This case highlighted the hepatic angiosarcoma diagnosis is difficult, especially if the patient does not have history of exposure to carcinogens.

The prognosis of hepatic angiosarcoma is extremely poor which is attributable to early metastases to other organs, resistance to traditional chemotherapy and radiotherapy regimens and rapid progression of the tumour.

**Conclusion:** All patients with cystic lesions in the liver require discussion at multidisciplinary meetings to confirm the diagnosis and determine the most appropriate method of treatment.

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**EP063**

**PREDICTIVE FACTORS OF MORBIDITY AND MORTALITY FOLLOWING MAJOR HEPATECTOMY ON NON-CIRRHOTIC LIVER**

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**Purpose:** During the past decades, the indications for major hepatectomy have evolved. Most of these indications concern primitive and secondary malignant tumours. This study aims to analyse the immediate results of major liver resections and to identify the predictive factors of morbidity, mortality and hepatocellular insufficiency.

**Methods:** A retrospective study that included 60 patients that have had a major hepatectomy between 2010 and 2017. The main judgment factors were mortality, global morbidity and hepatocellular insufficiency.

**Results:** Median age was 57 years. Sex-ratio M/F was 0.94. Most resections were indicated for malignant tumours. Hepatic metastasises of colorectal cancer were in the first place with 45% of the major liver resections followed by hepatocellular carcinomas (20%). The most frequent interventions are right hepatectomy (30%), left hepatectomy (23%) followed by right trisectionectomy (22%) and right lobectomy (13%). Mortality rate was 10%. Mortality predictive factors were blood transfusion (p=0.001) and portal fibrosis in the non-tumoral liver (p=0.007). The morbidity rate was 48%. The identified risk factors were portal fibrosis (p=0.039) and blood transfusion (p=0.012). The most severe complication was hepatocellular insufficiency with a 12% rate. The main factors associated with this complication were right lobectomy (p=0.017), blood transfusion (p=0.005) and the existence of fibrosis (p=0.001) or steatosis (p=0.002) on the non-tumoral liver.

**Conclusion:** Morbidity and mortality and postoperative hepatocellular insufficiency rates are comparable to the literature. The pathological non tumoral liver, blood transfusion and extended resections are the identified independent factors of liver failure. Prevention and early diagnosis and management of hepatocellular insufficiency seem to be the main conditions to reduce morbidity and mortality after major hepatectomy.

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**EP064**

**MORBI-MORTALITY PREDICTIVE POWER OF SCORING SYSTEMS USED IN PATIENTS WITH LIVER RESECTION FOR COLORECTAL LIVER METASTASIS**


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**Purpose:** Scores commonly used to stratify risk in patients undergoing liver resection for colorectal liver metastasis (CRLM) include classical scoring systems like the American Society of Anesthesiologists (ASA), Age Adjusted or not Charlson Comorbidity Index (CCI), and others, that are being validated in CRLM patients like Sarcopenia, Lymphocytes-Monocytes Ratio and MELD.

The aim of the study was to review the scoring systems to predict morbi-mortality and evaluate their predictive power.

**Method:** A retrospective study of patients who underwent liver resection for colorectal liver metastasis in the period 2016 to 2019 was performed. Demographics, comorbidities, clinical, laboratory and radiological findings, perioperative data, length of hospital stay, postoperative morbidity and mortality, and survivor data were collected. Receiver Operating Characteristics (ROC) curve was used to estimate the predictive ability of the scoring systems. The Area Under the Receiver Operating Characteristics (AUROC) for all the scoring systems were compared with SPSS v24.

**Results:** The study included 28 patients that underwent a liver resection for colorectal liver metastasis. There were 17.9% (5 patients) with postoperative complications, of which half were medical complications and the surgical complications were minor (Clavien-Dindo grade I-II: wound infection and bile leak) and only one complication grade IIIA required a pig-tail insertion. There was no 30-day postoperative mortality.

AUROC curve for the different scoring systems used for mortality was very good for the Charlson comorbidity index - 0.864, Age adjusted CCI – 0.790, MELD - 0.784, ASA - 0.761, Sarcopenia 0.568 and LMR - 0.284 (Figure 1). Postoperative morbidity AUROC resulted in LMR of 0.590, Age adjusted CCI of 0.529, CCI 0.467, Sarcopenia 0.448, ASA 0.443, MELD 0.390.

![ROC Curve](image)

**Figure 1 ROC curves for predictive power of risk scores for postoperative mortality for CRLM.**
Conclusion: The Charlson comorbidity index score presented the highest predictive power within the six scoring systems analyzed. MELD score also resulted better in predicting mortality compared to the ASA score, which is more frequently used. However, the power in predicting postoperative complications is low for all the stratification systems used, highlighting that the LMR obtained the highest AUROC. New scoring systems centered in the morbidity need to be developed to stratify the patients, including a determination for the cut-off of the LMR.

EP065

LAPAROSCOPIC APPROACH IN A RARE SYMPTOMATIC SIMPLE HEPATIC CYST: A CASE REPORT

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Purpose: Hepatic cysts are formations of liquid content with multiple histological types that differ from each other due to their etiology, symptoms, and clinical management. Specifically, simple cysts are commonly asymptomatic and only require clinical observation. In particular, jaundice is a very rare clinic in these patients.

Our goal is to show a case of a simple hepatic cyst that caused jaundice and needed surgery in order to emphasize how infrequent the case is.

Methods: We present a descriptive study based on a case of a simple liver cyst that required surgery through a laparoscopic approach.

Results: A 79-year-old woman had consulted to the Emergency room due to jaundice for 15 days. The blood test that was carried out showed elevated total bilirubin (12mg/dL) and transaminases levels with a cholestatic pattern, without alterations in the hemogram or elevation of acute phase reactants. An abdominal computerized tomography (CT) and a cholangioresonance revealed dilation of the intrahepatic bile duct secondary to a large cystic lesion in the right lobe of the liver, which measured approximately 10 centimetres. She underwent laparoscopic surgery, unroofing the cyst and the following day the patient was discharged from hospital without jaundice or any surgery complication. Finally, the anatomopathological study demonstrated a simple hepatic cyst, so the woman did not require more periodic controls.

Conclusion: Simple liver cysts rarely cause symptoms and only require clinical observation. However, it is very important to perform an adequate anamnesis and carry out the necessary complementary tests to confirm such a diagnosis, since they can be confused with other liver cysts. Some examples might be a hydatid cyst or even a cystadenoma, which has the capacity to become malignant and require more aggressive management. In these patients, if surgery is needed, laparoscopy is a suitable approach, as allows the total resection of the lesion and provides an early postoperative recovery.

EP066

RESULTS OF TRANSARTERIAL CHEMOEMBOLIZATION FOR NON-RESECTABLE HEPATOCELLULAR CARCINOMA IN A MID-VOLUME HPB UNIT

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Hepatocellular carcinoma (HCC) is the most frequent primary liver tumor. Usually occurs in cirrhotic liver which limit therapeutic options. In non resectable tumors, there are several new strategies, but Transarterial chemoembolization (TACE) is still first choice in many centers.

TACE feasibility and safety is high, global complication rate is around 30-40%, but serious complications less than 10% and mortality less than 4%. Our objective is evaluating the results of HCC patients undergoing TACE in our mid-volume HPB Unit.

Material and Methods: Descriptive retrospective study. Inclusion criteria: HCC patients BCLC stage B treated with TACE between 2009-2019. Exclusion criteria: any contraindication for TACE.

Results: 93 procedures were analyzed in 48 patients (13 women/35 men). The mean age was 70.6 ± 9.7 years. 56.2% of the patients were positive for HCV. Lesions were located most frequently in right lobe (66%). The median number of procedures per patient was 1.5 (range: 1-6), hospital stay per procedure was 2.4 days (range 1-15). The distribution of residual disease per month, recurrence and morbidity according to the number of procedures performed is shown in table I.
30-day mortality: 0%. Morbidity: 31.20% Post-embolization syndrome was the most frequent complication (62%). Hepatic artery dissection, one of the most serious adverse event occurred only in 2 procedures. Overall survival was 27 months with median follow-up of 17 months. Conclusion: TACE is still a useful, feasible and safe treatment in patients with unresectable HCC. In our mid volume Unit, we present a rate of major complications, mortality, and survival similar to published data. New ongoing techniques for this kind of patients should be compared with TACE results.

EP067
SOLITARY FIBROUS TUMOR OF THE LIVER: CASE REPORT
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Introduction: Solitary fibrous tumor (SFT) of the liver is a rare mesenchymal tumor. Most patients are asymptomatic. Clinic-radiological features are non-specific. Definitive diagnosis of SFT is usually made based on the histological features and immunohistochemistry data of the resected specimen. In this case report, we describe the case of an elderly female who presented with a large mass in the left lobe of the liver with normal level of tumor markers and atypical radiological findings. The patient successfully underwent resection of the tumor and the diagnosis was confirmed on histopathology.

Methods: A 81-year old woman with abdominal pain for the past 2 months. Examination revealed a large mass palpable in the epigastric region. CT and MRI showed a 25 × 16 cm-sized hypervascular mass arising from the left lobe of liver. The mass displace stomach, the transverse colon and cause a chronic obstructive pancreatitis due to the compression. The level of tumor markers was within the normal limits: AFP 3.3 ng/ml, CEA 2.3 ng/ml, and CA 19-9 27 U/ml. Liver functions were in the normal range. Based on the atypical imaging findings biopsy of the lesion was done. It was suggestive of solitary fibrous tumor. Since the lesion was resectable, surgery was planned. Transectionectomy before surgery was planned. Transarterial chemoembolization was done after the surgery without incidences. The patient underwent left lateral sectionectomy. Intraoperatively, a solitary large tumor arising from the segment II and III of the liver was identified and no evidence of distant metastasis. The postoperative course was uneventful.

The tumor measured 19 × 14 × 9.5 cm-sized, with an external well delimited surface. Microscopic examination showed atypia with spindle cells and collagen bundles between the tumor cells. On IHC, the tumor was positive for STAT6, CD34, Bcl2, and focal and patched positive for CD34 and CD99. There was no evidence of recurrence on follow-up for 7 months.

Conclusion: SFT of the liver is a rare entity. Most patients are asymptomatic, but in some cases, abdominal fullness and palpable masses are present. Definitive diagnosis is usually made based on the histological features and immunohistochemistry data of the resected specimen. IHC remains the most important tool for conclusive diagnosis of SFT. Complete surgical excision is the treatment for hepatic SFT. Follow up is advised as some of the patients with benign tumors on initial histological examination developed distant metastasis later.

EP068
LIVER RESECTION COMBINED WITH BACKFLOW TROMBECTOMY AND SDJUVANT TACE FOR HEPATOCELLULAR CARCINOMA INFILTRATING THE PORTAL VEIN AND ITS MAIN BRANCHES
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Introduction: Hepatocellular carcinoma (HCC) tends to invade the intrahepatic vasculature, especially the portal vein (PV). Portal vein tumor thrombosis (PVT) represents a strong negative prognostic factor, due to the increased risk of tumor spread into the bloodstream, with a median survival of 3 months without treatment. Sorafenib represents at the present time the recommended therapy in this
category of patients, giving a small prolongation of life expectancy. However, some surgical series reported better outcomes in patients with gross PVTT (PVTT in the portal trunk, its first-order branch, or its second-order branch), and preserved liver function, the 3-year and 5-year survival rates are 15% to 28% and 0% to 17%, respectively. Efficacy of adjuvant strategies is still under debate.

**Methods:** We observed a 74-year-old man with HBV-related chronic hepatitis and incidental diagnosis of a large liver mass at ultrasound examination. Triphasic spiral computed tomographic scan confirmed HCC 8 cm in diameter in the left lobe of the liver. In addition, PVTT of the main portal trunk and left branch that extended to the right PV was present (Vp4, Liver Cancer Study Group of Japan).

**Results:** The procedure included left hepatectomy and PV thrombectomy during clamping of the distal PV trunk. The PV was incised at the bifurcation, and the thrombus was extracted with the help of the backflow from the distal branches. PV clamping and length of operation were 8 and 220 minutes respectively. Intraoperative blood loss was 1200 mL. The patient was discharged on postoperative day 6th. An adjuvant Transarterial chemoembolization (TACE) was performed 20 days after surgery. The patient was disease-free in the liver at 60 days after surgery, but lung metastasis appeared thereafter. The patient is currently alive 6 months after surgery.

**Conclusions:** HCC with PVTT is a complex anatomical and clinical condition, including a wide range of patients with different prognosis and new treatment possibilities according to the degree of PV involvement, tumor biological aggressiveness, complications caused by portal hypertension, patient’s clinical features and tolerance to antineoplastic treatments. Patients with HCC and PVTT still remain a subgroup with poor survival, but they can benefit from an aggressive multimodal approach in selected cases. Liver resection associated with adjuvant TACE should be considered a possible therapeutic option to prolong survival of HCC patients with PVTT.

**EP069**

**HEPATIC MUCINOUS CYSTIC NEOPLASM DECEPTIVE AS HYDATID CYST: MESSAGE LEARNED**

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**Purpose:** Mucinous cystic neoplasms (MCN) are infrequent non-invasive lesion of the liver. The diagnosis of such lesions relies mainly on the histopathological findings. They are often misinterpreted as hydatid cysts clinically and on imaging leading to partial resection or de-roofing.

**Case presentation:**

Case 1: A 57-year-lady presented with complaint of fluid cystic fluid in the liver. She was contacted but lost to follow up. However, after 2 years she again reported with complaints of pain in upper abdomen. CECT abdomen revealed a recurrent multiloculated cystic lesion in the remaining segment IVb of the liver. She was counselled and re-resection of residual lesion with gall bladder was performed. Histopathology examination again confirmed MCN.

Now, both the patients are doing well after 1 year of re-do surgery and having no features of recurrence.

**Conclusion:** MCN-L are rare with a wide clinical with radiological presentation and may be misdiagnosed pre-operatively. Complete excision, even if re-do surgery has to be done as it prevents future recurrence and malignant conversion.

**EP070**

**DIFFERENTIAL DIAGNOSIS OF FOCAL LIVER LESION IN A HELATHY AND YOUNG WOMEN**


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**Purpose:** Present a unusual case of a intrahepatic cholangiocarcinoma in a helathy and young patient.

**Method:** Review the approachment of focal liver lesions (FLL) in young patients after attending a case of cholangiocarcinoma in a healthy 38-year-old woman.

**Results:** Focal liver lesions are defined as solid or liquid-containing masses foreign to the normal anatomy of the liver that may be told apart from the latter organ using imaging techniques. Their nature is widely varying, and may range from benign lesions with an indolent clinical course to aggressive malignant tumors. The critical components of evaluating an FLL are a detailed history, physical exam, radiological tests, and pathology. Decisions regarding specific imaging modalities for diagnoses, the use of liver biopsy, therapeutic options, and appropriate follow-up are all determined by the presentation of the lesion and associated patient characteristics. The presence of risk factor for liver malignancy, for hepatocellular carcinoma (eg, cirrhosis, chronic hepatitis B infection) or for liver metastases (eg, history of extrahepatic malignancy) and the radiologic lesion characteristics are going to guide our approach. In a healthy young patient benign lesions are the most prevalent lesions and the hemangioma is the commonest tumor in the liver. Pectoral Nodular Hyperplasia and adenoma should be ruled out in younger women or with a history of oral contraceptive use. But, more importantly, the evaluation of liver lesions has taken on greater importance because of the increasing incidence of primary hepatic malignancies, especially hepatocellular carcinoma.
and cholangiocarcinoma. That’s why, we present the case of a women 38 years old. She had no medical diseases previously. The patient presented abdominal pain in right upper quadrant and a computerized tomography was made. The CT showed a 8cm mass in segment IV of the liver that was diagnosed with focal nodular hyperplasia (FNH). To confirm the diagnosis a MRI was performed. The radiological image was not typical of FNH and biopsy was carried out. The histology shown an adenocarcinoma and a segmentectomty of segment IV and colecistectomy was performed with definitive histology of intrahepatic cholangiocarcinoma.

Conclusion: Benign tumor are the most important etiology of FLL but we can not forget the malignant etiologies because of the increasing incidence and it prognostic impact even in young patients.

EP071
SURGICAL TREATMENT OF HEPATOCARCINOMA: SHORT AND LONG TERM INITIAL RESULTS
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Introduction: Hepatocellular carcinoma (HCC) is the third death cause related to cancer in the world. The most effective treatments for HCC are hepatic resection and transplantation. The surgical mortality has been reduced to 1-3% in experienced centres due to the advances in the surgical technique, the patient selection and the perioperative following.

However, some complications have to be taken into consideration, some of them product of the surgery itself, such as intraabdominal collection, biliary fistula, hepatic insufficiency or postoperative hemorrhage.

Objectives: We propose a description of the results obtained in a consecutive sample of patients with HCC who go under hepatic resection or ablative therapies, in terms of tumoral recurrence, mortality and postoperative complications. Besides, the variables which are related to postoperative morbimortality in comparison to the literature available.

Material and Methods: A retrospective observational descriptive study has been designed over a prospective sample of 61 patients with HCC who went under hepatic resection or ablative treatment, analyzing which variables of the patients have an influence on short and long term postoperative morbimortality.

Results and Conclusion: 84% of the patients were male, with an average of 64 years old. 77% of them had cirrhosis at the time of diagnosis. A third of the patients had complications, most frequently medical issues (75%). The factors statistically significative related to mortality and postoperative complications were diabetes, EPOC, cirrhosis, Child, preoperative embolization, blood transfusion and serum albumin. The incidence of recurrence was 40% and the patient’s average survival was 69 months.

Therefore, medical and surgical factors are related to postoperative complications and long-term survival, similarly to the current literature.

EP072
MYCOTIC HEPATIC ARTERY ANEURYSM, A RARE COMPLICATION OF AORTIC VALVE ENDOCARDITIS
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Purpose: Mycotic hepatic artery aneurysms (MHAAs) are uncommon (less than 0.1%) and mainly affect the extrahepatic region. In most cases, MHAAs are asymptomatic and a high clinical suspicion is needed. Arteriography is the gold standard and it can be used as a diagnostic and therapeutic tool. MHAAs are associated with a high risk of rupture, even in patients without symptoms suggestive of MHA or previous endocarditis. Thus, an early diagnosis and treatment is necessary. Surgery or endovascular techniques may be performed. The endovascular approach is accepted in intrahepatic MHAAs or in high risk patients.

Methods: Below we present a case of MHAAs secondary to aortic valve endocarditis.

Results: A 58-year-old male underwent an aortic valve replacement due to an acute aortic regurgitation for aortic valve endocarditis. The patient maintained febrile syndrome during the postoperative period, in spite of broad-spectrum antibiotics. The CT scan showed an aneurysmal dilatation (45 mm in diameter) on the right hepatic artery. The appearance of a rapidly growing aneurysmal lesion, which was observed in previous radiologic examinations, suggested a diagnosis of a mycotic aneurysm secondary to infective endocarditis. A selected angiography of the celiac trunk was performed, which confirmed the diagnosis. An endovascular approach was applied and an aneurysm coil embolization was performed. Targeted antibiotic therapy was applied during 6 weeks and the patient showed an improvement and was discharged. He is currently asymptomatic.

Conclusion: High clinical suspicion and multidisciplinary early approach is necessary to achieve a satisfactory outcome in MHAAs.

EP075
A SINGLE CENTRE COMPARATIVE STUDY OF TOTAL LAPAROSCOPIC VERSUS OPEN LIVER RESECTION OF RIGHT POSTERIOR SEGMENTS
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Purpose: Patients with lesions in the right posterior segments of the liver have been considered technically challenging for laparoscopic liver resection (LLR). The aim of the current study is to compare short-term outcomes of LLR and open liver resections (OLR) of the right posterior segments.

Methods: Retrospective review of patients undergoing resection of the right posterior segments of the liver from June 2016 to January 2018 in our tertiary centre.

Results: Eighteen patients in each group (LLR and OLR) underwent resection of the right posterior segments. The mean age and gender distribution were comparable between both groups. In four patients (22.2%), conversion to open surgery was indicated. The maximum tumour diameter was
compared between the groups (4.04 ± 2.52cm in LLR versus 3.88± 2.26 in OLR, p=.876). Similar operating times were found in LLR and OLR (244.66 ± 79.42 and 220.75 ±102.35 minutes respectively) (p=0.187). There was no difference in intraoperative blood loss (p=0.539), duration of Pringle manoeuvre (p=0.157) and resection margins (p=0.114). Postoperative complications were comparable using Dindo-Clavien classification. Length of stay (LOS) was shorter following LLR (4.8 ± 1.72 versus 9.0 ± 3.9 days in the OLR, p<0.0005).

Conclusion: LLR for carefully selected patients with lesions in the right posterior segments is safe and feasible with similar short-term outcomes and shorter LOS compared to the OLR group.

EP077
DIFFERENCES IN CLINICOPATHOLOGICAL FACTORS AND OUTCOMES AFTER MAJOR LIVER RESECTION AND BILE DUCT RESECTION FOR BILIARY TRACT CANCERS
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Purpose: The surgical treatment of perihilar cholangiocarcinoma (PHC), intrahepatic cholangiocarcinoma (ICC) and gallbladder cancer (GBC) can be similar in case of hilar tumor infiltration. The aim of the present study was to investigate short- and long-term outcomes between these cancers operated with a major liver resection (>3 Couinaud’s segments) and extrahepatic bile duct resection.

Methods: All patients subjected to a major liver resection and bile duct excision for PHC, ICC and GBC at a single center between 2012-2019 were included. Clinicopathological factors and survival were compared between groups.

Results: In total, 81 patients were included (52 PHC, 9 ICC, 20 GBC). Tumor size was 30, 67 and 48 mm for PHC, ICC, and GBC (P<0.001). Percentage node positivity and peritoneal invasion were 52, 67 and 85% (P=0.033) and 31, 44 and 50% (P=0.046), for PHC, ICC, and GBC. Mortality within 90 days was 4, 0 and 35% for PHC, ICC, and GBC (P=0.002). Median survival and 5-year survival excluding perioperative mortality were 31, 21 and 18 months, and 42, 13 and 20% for PHC, ICC, and GBC, respectively (P=0.197).

Conclusion: PHC, ICC and GBC necessitating a major liver resection and bile duct resection for tumor clearance display differences in pathological features. Survival for GBC was low.

EP079
LAPAROSCOPIC MAJOR HEPATECTOMY FOR HEPATIC HYDATID CYST: CASE REPORT AND REVIEW OF LITERATURE
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Background: Despite the wide spread acceptance of the role of laparoscopy in the treatment of hepatic hydatid cyst, there is limited data on the role of laparoscopic major heptatectomies for the extirpation of the hydatid cyst.

Case presentation: We present a case of a laparoscopic major hemihepatectomy for the treatment of large CE2 hydatid cyst with a major cystobiliary fistula in a male patient 55 years old. The size of the hydatid cyst was 11cm (please give me he size the size of the cyst — the size of the cyst was 14cm). There was no intraoperative spillage and no need for blood transfusion. Estimated blood loss was 250ml. Length of stay was 3 days. Follow-up period was 14 months with no evidence of recurrence. Review of the literature revealed another 14 cases of major heptatectomy (12 left hemihepatectomies) for resection of hydatid cyst either as primary treatment either post failed percutaneous or laparoscopic procedures. The morbidity of those procedures and preoperative complications are comparable to those patients undergoing open pericystectomy or corticaisation procedures with similar perioperative morbidity and lower recurrence rate.

Conclusion: Laparoscopic major heptatectomy for radical resection of hydatid cyst is safe and effective when performed by experienced surgeons, with low morbidity rates and no recurrence and should be considered as a treatment option in highly selective cases.

EP080
LAPAROSCOPIC RADICAL AND CONSERVATIVE SURGERY OF HYDATID LIVER ECHINOCOCOSIS. PSM BASED COMPARATIVE ANALYSIS OF IMMEDIATE AND LONG-TERM OUTCOMES
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This study aimed to compare the immediate and long-term outcomes after laparoscopic radical and conservative cystectomies.

Methods: HPB center (center 1) and general surgery hospital in endemic area (center 2) participated in retrospective study. Radical surgery included total, subtotal pericystectomy and liver resection. Conservative surgery comprised cystectomy without/with partial pericystectomy.

Results: The total number of patients was 204. Laparoscopic cystectomy was performed in 97 (47%) patients. Radical (n-40) and conservative (n-61) laparoscopic procedures were performed in center 1 and center 2, respectively. Twenty-five pairs of patients were matched. The length of hospital stay and time of abdominal drainage were significantly shorter after radical surgery before and after PSM. The rate of severe morbidity did not differ. The mean follow-up length was 34 and 45 months in center 1 and center 2, respectively. No differences were found in the disease recurrence rate.

Conclusion: Laparoscopic radical surgery leads to a reduction in the treatment time and can be recommended as the preferred treatment option in a specialized HPB center.
LAPAROSCOPIC RESECTION FOR PRIMARY LIVER TUMOURS. OUTCOMES IN 72 CASES


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Purpose: The number and complexity of laparoscopic liver surgery is progressively increasing in HPB units. The purpose of the study is to analyse the outcomes of our experience in the laparoscopic treatment of primary liver tumours.

Method: Between January 2014 and December 2020, we have performed 125 laparoscopic liver resections. Of these, 72 correspond to patients with primary liver tumors. In 58% of the cases they were women, and 42% men, aged between 21 and 83 years. In all cases, a fast-track protocol was applied to the patients.

Results: Regarding the histological type, the most frequent of the benign tumors was the simple cyst / polycystic disease (39%) and the hepatocellular carcinoma the most frequent of the malignant neoplasms (24%). According ASA classification system, our patients were distributed as follows: 18% (1), 48% (2), 28% (3) and 6% (4). Regarding technical aspects, we performed 3 right hepatectomies and 1 left hepatectomy. Unroofing was the standard procedure in cases of liver cyst and different types of partial liver resection in the rest of the patients. The operative time ranged between 50' and 510', and 3 patients received intraoperative blood cell transfusion. Five patients (7%) were converted to open, due to technical difficulties. In 19% of cases (14 patients) a drain was left in place and in 24% (17 cases) hemostatic/sealant material was applied at the level of the surface of parenchymal transection. The mean postoperative stay was 2.3 days (1-23) for the global series. Excluding the 28 patients with cyst/polycystic disease whose postoperative stay was only 1 day, for the rest of the series the median/mean stay was 2/3.4 days respectively. Two patients presented a grade II and one grade III A complication of the Clavien classification. There were no mortality at 90 days.

Conclusion: Laparoscopic resection of primary liver tumours is a safe procedure, with a low rate of complications, allowing a rapid recovery of our patients.

LIMITED UPPER MIDLINE INCISION FOR MAJOR HEPATECTOMY IN ADULTS: SAFETY AND FEASIBILITY

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Purpose: The optimal incision for major hepatectomy remains controversial. In this study we describe our experience with a limited upper midline incision (UMI) for major hepatectomy.

Method: This is a retrospective study based on a prospectively collected database of consecutive major liver resections. The objective was to analyze the feasibility, and the safety of the UMI in major hepatectomy.

Results: A limited UMI was successfully utilized for 57 patients for major hepatectomy. In 85% of the patients the indication was malignancy, with a median tumor size of 6cm. Fifty three percent of the patients had underlying chronic liver disease and liver fibrosis was found in 61% of the patients; 19% of patients had previous upper abdominal surgery. Twenty-six patients underwent left hepatectomy, 20 patients had right hepatectomy and 11 patients trisegmentectomy. Additional combined surgical procedures were performed in 42% of the patients. The median operative time was 323 minutes, estimated blood loss was 500 ml, and median post-operative hospital stay was 7 days. Surgical complications occurred in 22 patients (39%). The 5-year overall survival was 67%. When compared with a separated control group of patients who underwent major hepatectomy with conventional incision (CI), patients with UMI had no statistical difference on operative time, estimated blood loss, length of hospital stay, complication rate, and overall survival.

Conclusion: Major hepatectomies can be safely performed through the UMI. This approach should be considered as a reasonable option in addition to the conventional and the laparoscopic approaches for major hepatectomies.

LONG-TERM RESULTS OF NON ANATOMIC LAPAROSCOPIC LIVER RESECTION FOR HEPATOMACARCINOMA. A SINGLE-CENTER EXPERIENCE

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Introduction: Laparoscopic resection is widely accepted for hepatocellular carcinoma (HCC); however, the best surgical approach either anatomical or non-anatomical is still under debate. Our aim was to analyze the long-term survival outcomes of non-anatomic laparoscopic liver resection (NALLR) in HCC.
Material and Methods: This is a single-center retrospective study of NALLR in hepatocarcinoma. Study period was January/2007 -December/2019. During this period, 226 laparoscopic liver resections were performed, 58 patients with HCC were included. Primary endpoint was disease-free survival (DFS). A multivariate analysis of risk factors for tumor recurrence was performed.

Results: HCC was single in 81% of the cases with a median size of 3 cm (IQR 2.2-3.9). Resection was considered low/intermediate according to the Iwate grading system in 86.2% of the cases. Median estimated blood loss was 225 mL (IQR 30-425). Median tumor margin was 4.5 mm (IQR 2.9-9.2). Satellitosis was observed in 17.2% of the cases. According to Clavien-Dindo classification, morbidity grade >2 occurred in 10.3% with no cases of 90-day mortality. Median follow-up was 38 months. 5-year recurrence rate was 37.8%. 3- and 5-year DFS was 59.5% and 34.8%, respectively. 3- and 5-year overall survival was 80.3% and 77.1%, respectively. In the multivariate analyses, satellitosis (OR 5.31 [1.18; 30.3]) and degree of differentiation (G2 vs G1: OR 0.18 [0.04; 0.65], G3 vs G1: OR 0.14 [0.02; 0.75]) were the only risk factors for tumor recurrence.

Conclusion: Non-anatomic laparoscopic liver resection is a valid option in the treatment of HCC, with low complication rate and acceptable oncological outcomes.

EP087
RISK FACTORS FOR OVERALL AND DISEASE FREE SURVIVAL IN THOSE PATIENTS WITH MULTIPLE COLORECTAL LIVER METASTASES IN THE ERA OF TARGET THERAPY

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Purpose: Although, the number of colorectal liver metastases (CRLM) is decreasingly considered as contraindication to surgery, most of the scores still include the number of lesions (GAME score, Tumor Burden Score) as one of main predictors of worst overall survival. This study aimed to evaluate the outcome after liver surgery of those patients with 5 or more lesions and to identify prognostic factors for survival in such group of patients.

Methods: The study population consisted of an European unicentre cohort of patients with CRLM operated from January 2010 to December 2019 and whose data were prospectively collected in the LivermetSurvey registry after Ethics Committee approval. An univariate and multivariate analyses was performed to identify the risk factors associated with overall and disease free survival in those patients with ≥5 lesions at diagnoses.

Results: We included 250 patients of whom 54 patients had ≥5 lesions. The main characteristics of this group: right side primary tumor in 22%, stage N positive of primary tumor in 65%, CEA level at diagnoses in 16.8ng/mL (0.5-2.933), synchronous disease in 78%, KRAS and BRAF mutation 43% and 4%, GAME Score ≥4 in 22% and preoperative chemotherapy 91% of whom targeted therapy was administered in 50% of the patients. The median overall survival (OS) and disease free survival (DFS) in this group was 25 months (4-108) and 10 months (0-103) respectively. Multivariate analyses showed that the primary tumor stage N positive (HR=3.41) and right side primary tumor (HR=1.93) emerged as the strongest risk factor for OS. Regarding DFS, R1 resection (HR=3.09), right side primary tumor (HR=1.88) and KRAS mutation (HR=1.56) were the main risk factors. The model demonstrated that a median of 30 months of OS could be achieved in selected cases and more than 16 months of DSF was possible providing R0 resection associated with at least an more additional favorable factor.

Conclusions: Multiple CRLM is an important factor with impact in long-term survival however longer OS and DFS could be achieved in selected cases.
EP088
SARCOPENIA, OBESITY, AND OUTCOMES FOLLOWING HEPATIC RESECTION FOR COLORECTAL LIVER METASTASES: A SYSTEMATIC REVIEW
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Purpose: Obesity is a well described risk factor for the development of colorectal cancer. Some data suggest that obese patients with advanced colorectal cancer may have improved outcomes. Limited evidence exists in the case of obese patients undergoing hepatic resection for colorectal liver metastases. Sarcopenia has been associated with poorer outcomes for patients treated with chemotherapy, but there are limited data examining outcomes for these patients undergoing hepatic resection.
Methods: A systematic review of the literature was performed. Pubmed, Embase, Cochrane Central, Web of Science, SCOPUS, and CINAHL databases were searched to identify articles examining outcomes for patients undergoing liver resection or metastatectomy for colorectal liver metastases, with subgroup evaluation of obese, sarcopenic, or sarcopenic obese patients. Relevant articles were selected in accordance with PRISMA guidelines. Primary outcomes were overall survival and disease-free survival.
Results: 11 studies met the inclusion criteria incorporating 2,609 patients. Two studies examined outcomes for obese patients alone, seven included sarcopenic patients alone, and two examined outcomes for both groups. One study also included a subgroup for sarcopenic obese patients (n=49). Significant methodological heterogeneity was noted between studies in the definition of both sarcopenia and obesity. 5-year overall survival was 49-60%, 10-59%, and 49-79% for obese patients, sarcopenic patients, and the control groups respectively. 5-year disease free survival was 20-25%, 15-38%, and 22-38% respectively.
Conclusion: Limited and heterogenous evidence exists describing the impact of obesity and sarcopenia on outcomes following hepatic resection for colorectal liver metastases. However, sarcopenia has a clear negative prognostic impact.

EP089
SECOND STAGE OPEN EXTENDED RIGHT HEMIHEPATECTOMY WITH VENORRHAPHY OF THE INFERIOR VENA CAVA FOR INTRAHEPATIC CHOLANGIOCARCINOMA AFTER ALPPS
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Purpose: Intrahepatic cholangiocarcinoma must be resected to offer a chance for cure. In a patient with a diminutive liver remnant, a two stage resection with Associating Liver Partition and Portal vein Ligation (ALPPS) with second stage resection following confirmation of adequate future remnant hypertrophy offers the best chance of attaining cure. In our 70 year old female patient, Robotic ALPPS was followed by an Open Resection with resection and repair of the Inferior Vena Cava at the notch between the right and middle hepatic veins, both of which were involved by the patient’s malignancy; our abstract describes the tactics and outcome following the second part of this patient’s curative intent procedure.
Method: The patient was taken to the operating room after confirmation of adequate future remnant hypertrophy by preoperative imaging. A midline and transverse incision was performed and exposure achieved with omniretractor. Full liver mobilization was followed by right hepatic artery ligation, completing right inflow occlusion allowing for demarcation. Parenchymal transection was performed by superficial cautery and bipolar device for deeper biliary vascular structures, the latter exposed carefully by ultrasonic aspiration and suction. The middle and right hepatic veins were involved and taken with a diving stapler device followed by venorrhaphy at their root at the inferior vena cava. The left hepatic vein was carefully preserved along with the left portal vein and left hepatic artery to preserve the remnant segment II and III.
Results: The patient recovered uneventfully, was discharged home on postoperative day 6. An 8.5cm poorly differentiated intrahepatic cholangiocarcinoma was resected to negative margins (R0). Adjuvant therapy was initiated in a timely fashion. Multiple postoperative clinic follow ups confirmed excellent tolerance of both the procedure and her chemotherapy regimen.
Conclusion: In a patient with a large Intrahepatic cholangiocarcinoma where curative resection is limited by diminutive future remnant, a two stage hepatectomy can prevent postoperative liver failure via future remnant hypertrophy after ALPPS. The oncologic challenges and aggression of neoplastic involvement at the inferior vena cava must be addressed by advanced hepatobiliary surgical techniques involving resection and repair to attain R0 resection and long term survival if not cure.
EP090
SHORT-TERM OUTCOMES OF ROBOTIC LIVER RESECTION IN A SINGLE INSTITUTION
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Purpose: Liver surgery has traditionally been characterized by the complexity of its procedures with potentially high rates of morbidity and mortality in inexperienced hands. During the last years, minimally invasive liver surgery has increased notably, however, the robotic approach still remains concentrated in some centers and the experience continues to be limited. The aim of this study was to analyze the outcomes and feasibility of a starting robotic liver resection program in an experienced laparoscopic hepatobiliary center.

Method: A total of 40 consecutive patients underwent robotic hepatectomies (da Vinci Xi, intuitive com., USA) in the period June 2019-January 2020. Patients were prospectively followed. Outcomes included operative time, morbidity, mortality, and hospital stay.

Results: The mean age was 59.6 years, 45% were female and the mean BMI was 29.41 kg/m² (±4.67). 22.5% of the patients were cirrhotic. Patients were divided by type of resection: 10 segmentectomies, 3 wedge resection, 10 Left Lateral Sectionectomies, 6 bisectionectomies (2 V-VI bisectionectomies, 4 Ivb-V bisectionectomies), 2 Right Posterior Sectionectomy, 2 Right Anterior Sectionectomy, 5 left hepatectomy and 2 right hepatectomy. Malignant lesions represented 72.5%.

Mean operative time was 247.63 minutes (±119.17) and two patients were trans fused intraoperatively (5%). There was a single conversion due to uncontrollable hemorrhage. Inflow occlusion was used in 30 cases (75%) and mean total clamping time was 32.62 min (ED ± 26.65). Major postoperative complications (Dindo-Clavien ≥ IIIb) occurred in 3 patients (7.5%) and mortality was 2.5%. Mean hospital stay was 5.6 ± 6.1 days. No patient required readmission to hospital.

Conclusion: Robotic hepatectomy is safe and feasible with favorable short-term outcomes, however, it involves a demanding learning curve that requires a high level of training, skill and dexterity.

EP091
STAGING LAPAROSCOPY IS UNNECESSARY IN THE PRE-SURGICAL WORK-UP OF PATIENTS WITH PERI-HILAR CHOLANGIOCARCINOMA (PH-CCA)
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Introduction: The majority of patients with peri-hilar cholangiocarcinoma (PH-CCA) are not candidates for surgery either because of co-morbidity or locally advanced/metastatic cancer. Staging laparoscopy is advocated to reduce non-therapeutic laparotomy. However, modern high-resolution cross-sectional imaging can effectively identify patients with metastatic disease or bi-lobar vascular involvement. This series reports outcome in patients evaluated for surgery without staging laparoscopy.

Method: During the 11 year period January 2009 to January 2020, 424 patients underwent hepatectomy by an individual HPB surgeon (AKS) in a regional liver surgery service. 22 underwent hepatectomy for type III or type IV PH-CCA and constitute the study population of this report. Patients undergoing surgery for intra-hepatic cholangiocarcinoma are excluded. Pre-operative preparation included percutaneous trans-hepatic drainage of the future liver remnant followed by cardiopulmonary exercise testing and CT of the abdomen and thorax. Vascular involvement was assessed by pre-operative contrast-enhanced magnetic resonance scan. No patients underwent staging laparoscopy.

Results: 8 (36%) were IIa, 7 (32%) were IIib and 7 were type IV. All underwent major hepatectomy with 4 (18%) requiring arterial reconstruction to the new remnant liver. During the study period 1 further patient (1 of 23) underwent non-therapeutic laparotomy (4%) because of nodal involvement in stations 8 and 9. Histology confirmed an R0 resection margin in 15 (68%).

Conclusion: As with other single centre reports this is a highly selected series and care must be exercised when extrapolating from these results. However, the data question the dogma of routine pre-operative staging laparoscopy prior to resection of PH-CCA.

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THE SAFETY AND LEARNING CURVE OF LAPAROSCOPIC-ASSISTED SURGERY FOR MAJOR HEPATECTOMY: A SINGLE-CENTER EXPERIENCE
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Purpose: Laparoscopic (major) hepectomy is evolving fast and possibly the new standard of care in liver surgery. However, the restrictions in instrument movements, fixed pivot point, and 2-dimensional view limit the learning curve, especially in laparoscopic major hepectomy (LMH).

Method: Data for all patients undergoing LMH (defined as resection ≥ 3 segments according to the Brisbane classification) between 2017 and 2020 were recorded in a prospective database. Among the 65 performed laparoscopic hepectomies, 24 (37%) were elective LMHs without conversion to laparotomy. To evaluate improvements in operation time with increasing experience, the operation times of LMHs were analysed, which were consecutively performed by only one surgeon with a personal experience of >500 open liver resections.
Results: Seven patients (29%) underwent multi-visceral resection, and the Pringle maneuver was performed in 79% of patients (n=19). The mean operation time decreased as the number of LMHs increased, and after the first 15 operations, the mean operation time was significantly decreased and reached a plateau (p=0.046). Also, the range of standard error of means decreased as the number of LMH increased, which indicates reduced fluctuation and increased stability as surgeon experience increases (Figure). None of the patients faced severe complications including bleeding, bile leakage, or liver failure after the operation and none of the patients died within 90 days after LMH.

Conclusion: LMH is a safe and feasible method with a relatively short learning curve for experienced liver surgeons. However, the results and cost-effectiveness of this method should be further evaluated, especially with other available minimally invasive methods.