# BOOK of ABSTRACTS *BILIARY*

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A rare complication following laparoscopic cholecystectomy; a case series

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Background
Foreign bodies such as coils and clips in the abdomen are known to migrate internally or externally. Pathophysiology is unknown but thought to be related to (sterile) inflammation. We present a case series of 4 patients who presented with CBD stones, years after cholecystectomy.

Methods
Varying from 5 to 17 years after cholecystectomy, 4 patients presented themselves with symptomatic choledocholithiasis with biochemical and radiological signs of biliary obstruction. 2 patients also had fever and infectious parameters, indicating concurrent cholangitis.

Results
Patients with cholangitis were treated with antibiotics. All patients successfully underwent ERCP with papillotomy and stone extraction. In 3 patients, obstruction of CBD was caused by a single, relatively large stone that had formed around a clip (supposedly the cystic duct clip). In one patient, multiple stones had formed around a cluster of coils that had been used for arterial embolization and that had migrated into the bile duct.

Conclusion
Foreign bodies can migrate into the biliary tract and function as a nidus for the formation of gallstones. Extraction of clips and stones by ERCP is treatment of choice as proved successful in all of our 4 patients.
A risk score model to predict incidental gallbladder cancer in patients scheduled for cholecystectomy

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Background
The aim was to construct a risk score model to predict IGBC, developed through statistical modelling, based on our groups previous findings.

Methods
Data from cholecystectomies registered in the Nationwide Swedish Register for Gallstone Surgery were analysed. The derivation cohort underwent surgery 2007-2014 and the validation cohort 2015-2016. From the multivariable logistic regression in the derivation cohort, an additive risk model, based on the odds ratio, was constructed and validated. The scoring model’s ability to predict IGBC was estimated by AUROC and Hosmer-Lemeshow (HL) test.

Results
The derivation cohort consisted of in total 36,355 patients, including 215 with IGBC, who underwent cholecystectomy. Age (≤41 years 0 points, 42-66 years 10p, ≥67 years 50p), female gender (3.5p), previous cholecystitis (1.5p) and the combination jaundice without acute cholecystitis (2.5) and acute cholecystitis without jaundice (1.5p) were significantly associated with IGBC. The accuracy of the model was assessed both on the derivation cohort, and in the validation set of 9,948 patients, including 42 with IGBC. The AUROC scores for predicting IGBC were 0.80 (CI:0.77-0.83) in the derivation cohort and 0.78 (CI:0.72-0.84) in the validation cohort, with a good calibration (HL test, p=0.19).

Conclusion
We present the first risk score model to predict IGBC. The model is based on five easily registered clinically relevant variables. This validated model may help to optimize treatment strategies in high risk patients.
A unique choledochal cyst

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Background
Herein we present a unique case of choledochal cyst (CC) which cannot be directly classified as any of the known types.

Methods
Case presentation: A 57-year-old female presented with ongoing right upper quadrant pain. Her history included a laparoscopic cholecystectomy after repeated episodes of gallstone pancreatitis. CT and MRI scans depicted a saccular dilatation in the middle of the extrahepatic ducts involving the cystic duct stump, consistent with a CC. An abnormal pancreaticobiliary ductal junction (APBDJ) was also noted.

Results
She underwent a laparoscopic converted to open procedure due to bleeding from a pseudoaneurysm, where the extrahepatic biliary tree was excised radically, and reconstruction was performed with a Roux-en-Y hepaticojejunostomy. She was discharged 50 days later after recovering from a complicated anastomotic leak. Histological examination confirmed the presence of a CC of the cystic duct stump involving the main bile duct trunk.

Conclusion
APBDJ is linked with a higher incidence of development of CCs and cholangiocarcinoma even years after excision of the extrahepatic biliary tree. So far, 40 cases of CC involving the cystic duct have been described; however, this is the first case of a CC arising from the cystic duct stump after cholecystectomy on ground of APBDJ. This unique association confirms the concept of an additional non-congenital pattern of development of CCs and highlights a new indication for long-term follow-up in patients with APBDJ.
Adjuvant chemotherapy did not improve gallbladder cancer prognosis.

Background
Surgery is standard of gallbladder cancer (GBC) care. Chemotherapy (chemo) is indicated only in locally advanced and metastatic disease.

Aim: Ameliorate 03 years disease free survival (DFS) of GBC after R0 surgery and adjuvant chemo.

Methods
It's a prospective randomised study. From January 2010 to March 2013, 83 patients were curatively resected for GBC. 80 patients were included, 41 patients in surgery group and 39 patients surgery and adjuvant chemo. Surgical resection was cholecystectomy bisegmentectomy IVb-V and lymphadenectomy. Chemo regimen consisted in gemcitabin (1250 mg/m2 d1/d8) and cisplatin (70 mg/m2 d1) all 21 d (06 cycles).

Results
There were 64 women and 16 males (sex ratio: 0,25), median age was 57, median follow up is 53 months (m). median recurrence delay is 25,8 m. Surgery was R0 in all patients, median lymph nodes number is 12.5. Post operative mortality is 3.61% (03 patients), the morbidity is 40% (32 patients); 10.2% major complications (Clavien III-IV). Chemo toxicity concerned 57% in adjuvant chemo group (39 patients). DFS at 3 and 5 y is 67,7% et 63,8 % respectively. DFS at 03 and 05 y in chemo is 58,6% and 52,9% versus 73,2% and 67,5% in surgery alone group respectively (p=0,125). Multivariate analysis: age up to 65y, BMI up to 25, number of positive lymph nodes and main bile duct infiltration were recurrence predictive factors.

Conclusion
Adjuvant chemo did not improve GBC prognosis. R0 resection is the standard of care and should be reserved for experienced teams.
An unusual cause of liver abscess in western countries.

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Background

Liver abscess for Ascaris lumbricoides is rare, accounting for 1% of all cases. It usually has a good response to conservative treatment with oral antihelmintics; however, the diagnosis in non-endemic areas can be very difficult. We present a case diagnosed following percutaneous drainage.

Methods

A 60 year old male patient was admitted to our hospital with abdominal pain and high temperature. He previously underwent an endoscopic sphinterotomy for acute biliary pancreatitis. Liver ultrasound showed a 18 cm liver abscess.

Results

The patient was submitted to percutaneous drainage, obtaining biliary content mixed with fragments dead ascarides. Diagnosis of Ascariasis was made and treatment with Albendazole was started with good outcome.

Conclusion

Ascaris lumbricoides migrates through the biliary tree and it can occasionally be responsible for liver abscess even in non-endemic areas. This might have been facilitated by the previous endoscopic sphincterotomy.
Biliary surgery: Clinical
FP12.04

Bile duct injuries after minimal invasive and open cholecystectomy. Management, treatment and results in a hepato-biliary center.

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Background
Despite ongoing evolution of the surgical techniques regarding minimal invasive cholecystectomy, bile duct injuries still occur. Scope of this study was to elucidate the management and outcome of this cases

Methods
Between March 2005 and November 2015 n=51 patients were treated in our center due to bile duct injuries during open (n=4; 7,8%) or laparoscopic (n=47; 92,2%) cholecystectomy. Retrospective statistical analysis of patient data and perioperative parameters was performed.

Results
In 18 of 47 laparoscopic cholecystectomies an immediate conversion laparotomy was performed after bile duct injury. A direct reconstruction of the bile tract or a hepaticojejunostomy procedure followed in n=5 (9,8%) cases in the external hospital, respectively. After transfer in our center, in n=5 (9,8%) cases surgical reconstruction of bile tract was performed. N=46 (90,2%) patients received a hepaticojejunostomy. In n=3 (5,9%) cases the right hepatic artery was reconstructed. Second look laparotomy was necessary in n=12 (23,5%) cases. Anastomotic leakage of the hepaticojejunostomy was observed in n=7 (13,7%) cases. Right liver lobe resection was necessary in n=5 (9,8%) patients. N=4 (7,8%) patients died during follow up. Mean hospital stay was 30,6±33,2 days. Adipositas, diabetes mellitus and cardiovascular disease had no impact on outcome (p=NS).

Conclusion
Bile duct complications after cholecystectomy remain challenging with high morbidity rates. Immediate treatment in specialized centers is strongly advocated.
Biliary surgery: Clinical
P4.03

Bile duct injury repair after laparoscopic cholecystectomy: A call for standardized reporting

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Background
Bile duct injuries (BDI) represent a severe complication after laparoscopic cholecystectomy (LC). The surgical management of BDI is challenging and current recommendations on optimal timing of repair are not consistent. The aim of this study was to analyze the quality of reporting of timing in BDI repair.

Methods
The MEDLINE, EMBASE and The Cochrane databases were systematically screened up to December 2016. All studies reporting timing of BDI repair after LC were assessed for eligibility.

Results
A total of 371 abstracts were screened and 15 studies were analysed, including 12,032 patients. Overall 2,327 BDI were reported and 61% (n=1422) were classified as major. Three different classification systems were used to describe major BDI: Strassberg in 24% (n=348), Bismuth in 11% (n=163), Stewart Way in 21% (n=307). A classification was lacking completely in 4 studies including 43% (n=624) of patients. Timing of BDI repair was described as immediate (36%, n=499), early (27%, n=376), delayed (26%, n=369) or late (10%, n=143). Standardization of definition for timing of repair was remarkably poor. Definitions for immediate repair ranged from <24h- 6weeks after LC, while early repair ranged from < 24h- 12 weeks. Likewise, delayed ( > 24h- > 12weeks) and late repair (>6 weeks) showed a broad overlap.

Conclusion
Lack of standardization among studies does not allow a conclusive recommendation on optimal timing of BDI repair after LC. This finding suggests a need for a standardized reporting system of BDI repair.
Biliary surgery: Clinical
P2.05

Bile duct necrosis at hepatic hilum: description of two cases and role of transhepatic drainage

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Background
We describe the management of two patients with hilar bile duct necrosis treated with portoenterostomy tutorized by percutaneous transhepatic biliary drainage (PTBD).

Methods
CASE 1
A 77 year-old male patient presented with high volume bile leak after severe necrotizing pancreatitis following a hepaticojejunalostomy. An attempt to tutorize it by PTBD was failed. At laparotomy the hepaticojejunalostomy was found necrotized at the hilum and completely disconnected from the bowel loop therefore a portoenterostomy was planned. Under ultrasound guidance in theatre, a right PTBD was placed through the anastomosis looping into the bowel from the right to the left biliary tree.

CASE 2
A 79 year-old male patient was diagnosed with bile leak after hilar biliary injury following cholecystectomy. A right hepatic artery (RHA) injury was also detected. Bilateral PTBD were placed. No viable extrahepatic biliary tree could be identified at laparotomy. Both PTBDs were pushed into the jejunal loop to tutorize the portoenterostomy.

Results
In both cases an intraoperative cholangiography was performed and confirmed good biliary drainage and absence of leak. The catheters were removed at 8 and 6 weeks, respectively and no biliary strictures were identified at 24 and 18 months follow-up, respectively.

Conclusion
Use of PTBDs can be very helpful in patients with hilar bile duct necrosis. In case of portoenterostomy, they seem to be effective in preventing postoperative bile leak and long term complications such as biliary strictures.
Bouvery syndrome and high jejunal obstruction. A case report.

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Background
Bouveret syndrome, is a rare form of gallstone ileus resulting in gastric outlet obstruction. It accounts only for 1–3% of the cases of gallstone ileus.

Because of the rarity of this condition specific therapeutic guidelines do not exist but the majority of cases will require surgical intervention.

Methods
A 68 year old male was referred to our hospital due to hematemesis. He had a history of acute myocardial infraction, mild heart failure and hypertension. He had no significant findings in clinical examination and laboratory tests apart from anemia. The GI endoscopy revealed a bleeding erosion in the pyloric bolbus and a gallstone impacted in the first portion of the duodenum. CT revealed signs of cholecystitis, multiple gallstones of 1,5 cm in the duodenum and gallstones in the proximal jejunum causing obstruction.

Results
The patient underwent exploratory laparotomy in which enterectomy and gallstone removal was performed in the jejunum as well as gastrotomy and gastrenteroanastomosis to remove the stones from the first portion of the duodenum. The patient had an uneventful postoperative course and was discharged on the 7th postoperative day.

Conclusion
Due to its rarity, Bouveret syndrome requires a high index of clinical suspicion, especially in older patients with a history of cholelithiasis. X-ray, US, CT and endoscopy can assist diagnosis. Existing evidence supports a surgical intervention to remove the obstruction without intervention to the biliary tree.
Cholecystectomy In The Laparoscopic Era; More Than 200 Consecutive Cholecystectomies With Zero Conversion Rate; Is There A Necessity For Conversion?

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Background
Laparoscopic Cholecystectomy (LC) is the gold standard surgical procedure for removal of gall bladder. However in difficult situations, it is customary to convert it to an open procedure.

Methods
A prospective data analysis was done for 208 consecutive cases of LC performed in a surgical unit at National Hospital of Sri Lanka from September 2012 to January 2017.

Results
Out of 208 patients, 152 were women (73.1%) with a mean age of 47.6 years (range 21-79). Biliary colic (37.5%), chronic cholecystitis (31.6%) and acute cholecystitis (10.1%) were the commonest indications for LC. Eighteen patients who had CBD stones underwent CBD exploration simultaneously. Among 208 cases 19 had empyema, 8 had mucocoele and 1 had choledochoduodenal fistula. In 31 difficult cases retrograde cholecystectomy was performed and out of them 9 patients underwent subtotal cholecystectomy. All cases were successfully managed laparoscopically with zero conversion rate. Bile spillage was the commonest complication (21.4%) and average postoperative hospital stay was 2.9 days.

Conclusion
With safe dissection and timely resorting to retrograde cholecystectomy in experienced hands, there seems to be no reason for conversion to open cholecystectomy. Most of the complicated cases can be successfully managed laparoscopically without conversion to open procedure.
Cholecystocutaneous fistula occurring through the chest wall

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Background
Spontaneous cholecystocutaneous fistula (SCCF) is nowadays a very rare entity. The treatment consists in broad-spectrum antibiotics, drainage of subcutaneous abscess if present, and cholecystectomy in fit patients. It usually occurs through the abdominal wall. We describe a rare case of cholecystocutaneous fistula occurring through the chest wall.

Methods
A 68 year-old female patient was referred with a right anterior chest wall abscess. The patient had a history of obesity and schizophrenia. Following skin incision, a large amount of yellowish and purulent discharge was obtained from the abscess. CT-scan showed a communication between the gallbladder and a subcutaneous collection of the right anterior chest wall containing a 5 x 2 cm gallstone. The large stone was retrieved from the chest wall and the fistulous tract was tutorized with a Foley catheter ending into the gallbladder as confirmed by intraoperative fistulogram. An obstructive CBD stone was also visualized and therefore the patient underwent an ERCP and the foley catheter was removed posteriorly.

Results
The patient was discharged and 6 weeks later received a laparoscopic cholecystectomy. The postoperative course was uneventful. Histology of the gallbladder did not show malignancy.

Conclusion
SCCF is a rare entity and extrabdominal cutaneous tract is even rarer. If a good drainage can be achieved, delayed laparoscopic cholecystectomy can be safely performed. Presence of gallstones along the tract should always be ruled out.
Critical view of safety (cvs) in laparoscopic cholecystectomy; what if you fail to establish?

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Background
Concept of establishing Critical View of Safety is currently recommended in Laparoscopic Cholecystectomy (LC) to minimize iatrogenic bile duct injuries.

Methods
A prospective analysis was done on 72 consecutive LCs from April 2016 to January 2017 in a surgical unit at National Hospital of Sri Lanka. The hepatocystic triangle was dissected to establish CVS. Photo documentation of CVS was done prior to division of cystic duct and artery in each case. Retrograde dissection was performed when establishing CVS was difficult.

Results
Out of 72 cases 53(73.6%) were females. Mean age was 48 (range: 21-79) years. CVS was established in 55(76.3%) cases which included 3 empyemas, 5 mucocoeles, 3 acute cholecystitis and 14 chronic cholecystitis. Mean time for establishing CVS was 35.9(±16.2) minutes. Fibrosis and adhesions in hepatocystic triangle (64.7%) and doubtful anatomy (17.6%) were the commonest reasons for not establishing CVS. Three underwent subtotal cholecystectomy including one case of Mirizzi syndrome. Bile spillage (19.4%) & gallstone spillage (9.7%) were the commonest complications. Majority (92.1%) were discharged within 48 hours. None had bile duct injuries. Conversion and Mortality rates were zero.

Conclusion
Establishing CVS is recommended as the starting point of dissection in LC. However if CVS is not established timely decision on retrograde dissection with appreciation of variable biliary anatomy will minimize the risk of iatrogenic bile duct injuries as well as conversion to open procedure.
Diagnostic features and surgical outcomes in patients with Mirizzi syndrome

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Background
Mirizzi syndrome is a rare complication of longgoing cholelithiasis, commonly accompanied by variety of structural changes in hepatopancreatoduodenal region.

Methods
34 patients underwent surgical treatment. There were 9 (26,4%) male patients and 25 (73,6%) female patients. Median age of 67.3 ± 1.8, ranging from 40 to 83. All patients classified according Beltran and Csendes 2008.

Results
Dominant symptom: in 14 cases majority of symptoms indicates on acute cholecystitis, in 18 cases – obstructive jaundice and cholecystitis, in 2 cases – acute small bowel obstruction. Pathological process in patients with initial stages of Mirizzi syndrome (I-II) corrected by cholecystectomy with external drainage of common bile duct, in one case with choledohoduodenanoanastomosis. Roux-en-Y hepaticojejunostomy performed in two patients with Mirizzi syndrome III and one - type IV. Optimal treatment for patients with Mirizzi syndrome IV-Va was cholecystectomy with common bile duct repair using gallbladder tissue. Only symptomatic surgery for bowel obstruction performed for patient with Mirizzi syndrome Vb due the severity of patients condition in both cases.

Conclusion
With prolongation of disease severity of anatomical changes increases. Surgical treatment of patients with Mirizzi syndrome that requires precise surgical technique and individualized tactics.
Does Endoscopic Retrograde Cholangiopancreatography influence the effectiveness of Percutaneous Transhepatic Biliary Drainage?

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Background
Endoscopic retrograde cholangiopancreatography (ERCP) is a first-choice diagnostic and treatment procedure for patients with malignant obstructive jaundice. If ERCP is impossible to perform percutaneous transhepatic biliary drainage (PTBD) acts as an alternative method. The aim was to evaluate the effectiveness and the influence of ERCP prior PTBD in the treatment of patients with malignant obstructive jaundice.

Methods
Retrospective review of patients undergoing PTBD from 2014 to 2015 at the Department of Surgery, Hospital of the Lithuanian University of Health Sciences was performed. Group I - ERCP prior PTBD, Group II - no ERCP prior PTBD. Length of hospital stay, total serum bilirubin values, additional interval procedures, complication and mortality rates were compared.

Results
Group I consisted of 66 patients and Group II of 48 patients. PTBD significantly reduced total serum bilirubin values in both groups: from $287.87\pm118.99\mu mol$ to $178.35\pm102.61\mu mol$ in Group I (p<0.001) and from $306.83\pm142.83\mu mol$ to $215.97\pm127.19\mu mol$ in Group II (p<0.001). However there was no statistically significant difference between total serum bilirubin values, drainage related complication and mortality rates, additional interval procedures.

Conclusion
ERCP attempt prior PTBD was not associated with serum bilirubin reduction, higher drainage related complication or mortality rates. On the other hand, patients after ERCP, tend to stay longer in hospital, what is associated with higher treatment cost.
Extended Left hepatectomy and Hepatic Vein Reconstruction with Insitu Hypothermic Perfusion and Veno-Venous Bypass for Intrahepatic Cholangiocarcinoma

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Background
We herein describe a case of 67 year old woman (BMI 36) with an 8 cm, centrally located intrahepatic Cholangiocarcinoma (ICC) that underwent extended left hepatectomy, hepatic vein reconstruction under hypothermic perfusion with Veno-venous bypass (VVB).

Methods
Abdominal CT scans revealed a large central mass invading left, middle and right hepatic veins encroaching on their junction with vena cava. Biopsy confirmed ICC and 60% liver steatosis. Right lobe (61% of total liver volume) was chosen as FLR. Operation was planned using a dedicated software for 3D modelling of future liver remnant (FLR), requiring 3 separate right hepatic veins to be reconstructed to vena cava.

Results
We present a video of preoperative planning as well as the operation in detail.
Total vascular isolation of the liver was performed and parenchymal transection proceeded after selective control and cannulation for in-situ perfusion and VVB. After hepatectomy, interposition cadaveric vena cava graft was used for reconstruction of the 3 hepatic vein orifices joining the preserved vena cava using 3 liters of HTK solution for in-situ hypothermic perfusion. The duration of the operation was 12 hours, requiring 6 units of erythrocyte transfusion.
Postoperatively, patient experienced pulmonary embolism requiring respirator y support.

Conclusion
She was discharged after 32 days of hospitalization. In postoperative 10 months follow up, there were no mass in the remnant liver, the tumor markers were normal with normal liver function tests.
Extended resection for xanthogranulomatous choleystitis mimicking gallbladder carcinoma: review of cases and diagnostic approach.

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Background
Xanthogranulomatous cholecystitis is a rare variant of chronic cholecystitis which may involve adjacent organs including liver, colon and duodenum mimicking gallbladder cancer. Preoperative differentiation of xanthogranulomatous cholecystitis from gallbladder cancer is often difficult and the final diagnosis is usually made on histopathology of the resected specimen.

Methods
We report four cases of xanthogranulomatous cholecystitis which were misdiagnosed as cases of advanced gallbladder cancer based on presentation and radiological findings.

Results
All the four patients presented with history of upper abdominal pain while two patients had history of associated weight loss. Radiological features were strongly suggestive of gallbladder cancer with involvement of adjacent organs in all cases. Based on the imaging findings, these patients underwent radical resections but the final histopathology was a diagnostic surprise.

Conclusion
Xanthogranulomatous cholecystitis is still a diagnostic challenge as no clinical and imaging modality has been helpful to make a definitive diagnose of this entity. We review the role of available diagnostic modalities in this challenging area of uncertainty. Radical resection may be justified in patients who present with the features mimicking gallbladder cancer.
Feasibility of delayed vascular repair after surgical combined injury to the bile duct and hepatic artery: case series and systematic review

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Background
Concomitant vascular injury to the hepatic artery (HA) can adversely impact outcomes after iatrogenic bile duct injury (IBDI) during cholecystectomy. An emergency attempt to reconstruct the artery is usually recommended as it is thought to avoid serious biliary and hepatic complications. However, the feasibility of delayed reconstruction of the HA is uncertain to date.

Methods
First, we present a retrospective case series comprising of 6 consecutive patients who underwent delayed surgical repair of the HA after IBDI in addition to bile duct reconstruction. The patency of the HA and clinical outcomes were assessed postoperatively. Second, we provide a systematic review (SR) on this topic utilizing EMBASE, Medline/PubMed, Cochrane und Scopus databases.

Results
The arteries of all 6 patients were successfully reconstructed on average 5 days after injury (range 1-10). The types of injuries included in all cases the right HA and in one case an additional injury to the proper HA. All arteries were patent at the last follow-up (mean 27 months, range 3-72). After reconstruction, one patient suffered from a stricture of the hepatico-jejunostomy. In the SR, we identify case series that report the success rates of late vascular repair and support our clinical findings.

Conclusion
Delayed vascular repair of concomitant injury to the HA after IBDI appears feasible, results in long-term vessel patency and provides a viable alternative to early vascular reconstruction.
Gallbladder Polyps versus Cancer: Is there a role for prevention? Single Centre six-year experience in management of Gallbladder polyps

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Background
Gallbladder polyps (GBPs) are common, while GB cancer is rare & often presents at late stages (5-year survival 3%). GBPs 1-2cm are associated with 43-77% cancer incidence, while polyps >2cm are almost always 100% malignant. Our aim is to assess management of GBPs in the absence of UK guidelines.

Methods
1743 ultrasound scans (USS) & clinic letters reviewed from Hospital database.

Results
115 patients were diagnosed with GBPs over 6-year period, Jan 2011 - Dec 2016. Male to Female ratio was 48:67 with median age of 55 (24-83).
18 patients had other imaging to confirm diagnosis, where 15 patients had MRI & three had CT.
USS showed increased size of GBPs in 52 patients over median period of 12 months (8-60).
7 patients had laparoscopic cholecystectomy and all had evidence of chronic cholecystitis with Rokitansky Aschoff sinuses.
35 patients were discharged from clinic back to their general practitioner(GP).
30 patients are followed up in the Upper GI clinic, 29 with Gastroenterology & 17 had unclear follow-up.

Conclusion
USS is the imaging of choice for follow-up. GBPs increasing in size or in cases with discrepancies, we advise follow-up USS to be done by the same sonographer or consultant Radiologist. Annual follow-up USS is advised as no remarkable increase in size occurred in less than 1 year.
Patients with GBPs≥8mm should be offered laparoscopic cholecystectomy in the surgical clinic.
Elective surgery for GBPs is safe as all patients only had chronic cholecystitis with Rokitansky Aschoff sinuses & no cancer.
Grade II acute cholecystitis: laparoscopy or laparotomy? A retrospective cohort study using Propensity score adjustment analysis

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Background
According to the Tokyo Guidelines 2013 (TG13), the management of Grade II acute cholecystitis (AC) is not consensual. Our aim was to compare laparotomy to laparoscopy for grade II AC using Propensity score adjustment analysis.

Methods
Our study is retrospective, including 448 patients operated for grade II AC according to TG13. Patients were divided into two groups: 231 patients operated by laparoscopy (group A) and 217 patients operated by laparotomy (group B). Both of these groups were comparated before and after adjustment using the Propensity score.

Results
Before adjustment patients in group B were older than patients in group A, with a higher rate of patients suffering from heart disease; white blood cell count and total bilirubin were higher in group B; there were more thickening of the gallbladder wall at ultrasonography in group B and the rate of gangrenous cholecystitis was higher in group B. These factors were considered as confusing. After computation of this PS, area under the ROC curve of the model was 80.9% ±0.033, suggesting its good performance. After the adjustment, there were no significant differences between the two groups for the confusing factors. The morbidity, the mortality and the reoperation rate were similar in the two groups. The duration of hospital stay and the direct medical costs were significantly higher in group B.

Conclusion
Patients with grade II AC should be operated using laparoscopic approach since their hospitalisation is shorter and without significant complications.
Biliary surgery: Clinical
P42.07

Iatrogenic bile duct injury delayed repair and treatment of complications - case report.

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Background
With the increase of laparoscopic cholecystectomies performed in Poland, the occurrence of complications also rises. Many surgery departments still do not refer patients with bile duct injuries to hepatobiliary centers or do so with delay.

Methods
A 72 yr. female H. M. with jaundice, fever, pain in the upper abdomen, after 5 laparotomies and 1 ERCP, with a biliary fistula and extrahepatic drainage was admitted to the Center after 12 months of hospitalization at another facility in Poland. In May 2011 an open cholecystectomy was performed after a laparoscopic conversion due to cholecystitis. The patient was transferred with a persistent duodenal fistula secreting about 400ml content daily and bilirubin concentration = 6.45 mg. During the next 5 weeks the patient was treated pharmacologically and rehabilitated prior to surgery. After the improvement of nutritional status and body weight increase, the patient underwent surgery.

Results
Early post-surgery complications were limited to a duodenal fistula treated successfully during 6 consecutive weeks. Control cholangiography gave no evidence of anastomosis leakage and abdominal ultrasound showed no abnormal fluid collections. The patient was nourished orally and discharged from hospital in good general condition after 118 days.

Conclusion
Complications that occur must be attended to with adequate resources in the appropriate time and optimal conditions according to HPB consensus guidelines. Any other conduct may be harmful for patients and cost-ineffective.
IgG4-associated cholangitis mimicking perihilar cholangiocarcinoma; a persistent dilemma

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Background
Immunoglobulin G4-associated cholangitis (IAC) is a major manifestation of IgG4-related disease (IgG4-RD), a multi-organ inflammatory disorder. Since the disease mimics malignancies of the pancreatobiliary tract, misdiagnosis and unnecessary surgery are common.

Methods
All patients resected for presumed PHC at our institution between 1984 and 2015 were included. Benign histological specimens were re-evaluated by a pathologist and scored according to the international pathological consensus criteria for IgG4-RD. Patients with benign disease postoperative who were still alive, were re-evaluated to assess IgG4 serum levels and IgG4/IgG RNA ratio in order to detect persistent activity of IgG4-RD.

Results
321 patients underwent liver and bile duct resection for presumed PHC. Of all patients 15% (47/321) were found to have benign disease on histological examination. 45% (21/47) of patients with benign disease had evidence of IAC based on histological criteria (n=17) or laboratory parameters (n=4). The remaining specimens showed unclassified sclerosing inflammation. Out of 15 patients with IAC who were still alive and were re-evaluated postoperatively, 8 had ongoing active disease.

Conclusion
Benign biliary disorders mimicking PHC have led to a considerable number of liver and bile duct resections. There was evidence of IAC in 45% of the patients. When left untreated, IgG4-RD can remain active for years. More awareness and novel diagnostic tests might reduce misdiagnosis and unnecessary surgery.
Immediate surgical repair of post-laparoscopic cholecystectomy bile duct injuries: The earlier the better

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Background
Most of bile duct injuries (BDI) diagnosed during laparoscopic cholecystectomy requires surgical reconstruction, and this repair is preferably performed in the late period. We aimed to assess long-term outcomes after repair, focusing on immediate surgical treatment.

Methods
Between January 2012-October 2015, patients who underwent immediate surgical repair (within 72 hours) for post-cholecystectomy BDI by the same surgical team expert in hepatobiliary surgery. Demographics, type of BDI, time to diagnosis, surgical procedures and outcome were recorded.

Results
There were 11 patients with a median age of 46(24-65). Classification of BDIs were as follows: Type E in five patients (45%), Type D in three patients (27%), Type C1, Type B and Type A in one patient each (9%). Median time to diagnosis was 12(5-48) hrs. Surgical procedures included Roux-Y hepaticojejunostomy for 5 patients with type E injury, primary repair of common bile duct for 3 patients with Type D injury and primary suturing of the gallbladder bed was performed in one case with type C injury. Other two patients with type B and A injury underwent removal of clips that placed on common bile duct during index operation and re-placing of clips on cystic duct where stump bile leakage was observed. Median length of hospital stay was 5 days (3-12). Morbidity rate 27%(n=3) was observed during a median follow-up period of 25 months (6-40).

Conclusion
Immediate surgical repair of post-cholecystectomy BDIs by an experienced surgical team results in promising outcome.
Impact of antiplatelet therapy on increased blood loss and bleeding complication in patients undergoing urgent cholecystectomy for acute cholecystitis

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Background
The impact of antiplatelet therapy (APT) on surgical blood loss (SBL) and postoperative bleeding complications (PBCs) in patients receiving emergency cholecystectomy for acute cholecystitis (AC) still remains unknown.

Methods
A total of 243 consecutive AC patients undergoing emergency cholecystectomy were reviewed. In patients receiving APT (APT group, n=89), surgery was performed without preoperative reversal of the APT effect. Perioperative and outcome variables of the APT group were compared with those of patients without APT (non-APT group, n=154).

Results
In this cohort, 106 laparoscopic and 137 open operations were included. There were 18 patients with increased SBL (>=500mL, 7.4%) and 7 PBCs (2.9%). Patients with APT showed higher occurrence of Grade 3 acute cholecystitis (46% vs 28%, p=0.005) and less frequently received laparoscopic surgery (34% vs 49%, p=0.022) compared to those in the non-APT group. Multivariate analyses showed that Grade 3 acute cholecystitis (HR=2.76, p=0.046) and male gender (HR=12.99, p=0.017), but not APT use or laparoscopic surgery, were independent prognostic factors for increased SBL. However, increased PBCs were significantly associated with use of multiple APT (HR=14.85, p=0.044) and anticoagulation (HR=47.18, p=0.002).

Conclusion
Single APT does not pose a risk for either SBL or PBCs after emergency cholecystectomy for acute cholecystitis, whereas patients with multiple APT or anticoagulation still represent a challenging group and need to be rigorously managed.
Incidental gallbladder cancer - The first report from Africa

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Background
Incidental gallbladder cancer (iGBC) is found in 0.3-1.5% of cholecystectomy specimens. GBC is uncommon with significant variation amongst geographical regions and ethnic groups. Less than 100 GBC’s have been reported in sub Saharan Africa, hence the need for this national audit in South Africa.

Methods
National data was obtained from the South African NHLS for 2003-2015. 34 294 cholecystectomy specimens were included of which 239 were GBC’s; 135 were iGBC.

Results
iGBC incidence was 0.42% with a male:female ratio of 1:4.6. Mean age was 62.2 (range 20-88; male 64.83 and female 61.67). Indications for surgery were acute cholecystitis in 49% & biliary colic in 44%. GBC T stages were Tis 12.6%, T1a 4.4%, T1b 8.8%, T2 37.8%, T3 13.3% and Tx 22%. Lymph nodes were found in 10 patients, of which 5 were N1. R1 resection occurred in 32.6% of the cohort. Univariate analysis found female sex, chronic inflammation and the presence of dysplasia to be associated with iGBC. No association was found with surgical indication, presence of gallstones or other histological findings (polyps, xanthogranulomatous inflammation, calcification & RAS). Only female gender was associated with iGBCa after multivariate analysis.

Conclusion
This large series demonstrates a similar incidence of iGBC in an African cohort to those reported from more developed nations, with female gender being the most significant risk factor. Delay in presentation may explain the more advanced stage (T2 and T3) and a resultant high rate of R1 resection.
Intra and extraglissonian approach with partial resection of IV-V segments for intrahepatic bile duct injuries

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Background
Laparoscopic bile duct injuries (LBDI) are more often intrahepatic, with associated vascular injury and disappearance of the bile duct segments than in open surgery. Their repair is a difficult challenge for the surgeon.

Methods
Between January 1991 and March 2016, 11 patients with LBDI (E4) were satisfactorily resolved by an extra and intraglissonian approach developed by our unit. We performed a combined intraglissonian and extraglissonian approach resecting the base of the IVb and V segment, in search of the intrahepatic bile radicals to the uninjured zone. We performed and intrahepatic HY-Roux in all cases and due to the low caliber of intrahepatic bile radicals we left transanastomotic tutors (between 2 and 5), which were maintained between 3 and 6 months after surgery. In 4 cases they had RHA injury. Nine patients were treated at their hospital with HY-Roux. Four patients were diagnosed of secondary biliary cirrhosis candidate to liver transplant. Three patients had acute diffuse peritonitis requiring urgent surgery.

Results
There was no mortality. One patient had a biliary leakage treated with percutaneous radiological drainage. Surgical time was 270 min (range 200-480 min). Patients are asymptomatic with a median follow up of 6 years (range: 10 months-19 years).

Conclusion
Our technique in severe intrahepatic lesions associated with vascular lesions obtained satisfactory results.
Intrahepatic cholangiocarcinoma – 102 resections from a single center

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Background
Unicentric studies on intrahepatic cholangiocarcinoma (ICC) and surgical outcome are rare. Multicentric studies, however, are biased by various surgical approaches and unevenly distributed patients. Therefore, predictors for survival vary widely in the literature.

Methods
Between 2008 and 2015, patients with ICC who underwent exploration were prospectively recorded. Data was analysed with the Kaplan Meier and Cox regression model regarding overall and recurrence-free survival.

Results
Out of 137 patients, resection was performed in 102 patients (74.5%), and R0 resection was achieved in 87 patients (85.3%). A vascular or visceral extension was required due to suspected tumor infiltration in 28 and 35 patients, respectively. Tumor infiltration of the additionally resected specimen was histologically proven in more than 40% of these cases.

In univariate survival analysis, the R0 resections resulted in better survival than R1 resections and were superior to exploration only (p<0.001). While in univariate analysis N-stage, R-stage, tumor size and UICC stage were significant factors for overall survival, multivariate analysis showed only tumor size (p=0.001) and UICC stage (p = 0.001) as independent predictors for overall survival. Both factors were also predictive for recurrence-free survival in the multivariate analysis (tumor size: p=0.023, UICC-stage: p=0.026).

Conclusion
Tumor size and UICC-stage are independent predictors for overall and recurrence-free survivals in our unicentric series for ICC.
Is percutaneous cholecystostomy reasonable alternative for the treatment of acute cholecystitis in high risk patients?

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Background
Laparoscopic cholecystectomy is a treatment of choice for acute cholecystitis. As an alternative treatment option in critically ill patients percutaneous cholecystostomy (PC) is performed. The aim of this study was to evaluate the clinical outcomes and possible benefit of a ultrasound guided PC in high risk patients.

Methods
Retrospective review of patients undergoing PC from 2008 to 2016 in Hospital of Lithuanian University of Health Sciences. Patients were reviewed for demographic features, laboratory tests, complications, hospital stay, American Society of Anaesthesiologists (ASA) physical status class and mortality rate.

Results
Thirty-eight patients (65.8% males) were included in the study with a median age of 77.1±9.4. Twenty-one patient (71.1%) were ASA III and 8 patients (21.8%) – ASA IV. Statistically significant decrease in WBC count (from 13.9±5.25 to 8.35±5.18) and C-reactive protein level (from 212.34±120.87 to 50.96±50.45) after PC was observed. Four patients (10.5%) developed post-procedure complications including obstructive jaundice (n = 2), septic shock (n = 1) and a gallbladder empyema with liver abscess (n = 1). The mean hospital stay was 12.78 ± 9.47 days and 30-day mortality - 10.5%. Eight patients (21.1%) underwent interval surgery.

Conclusion
PC is a reasonable low risk management option for high-risk patients with acute cholecystitis. It can be used as a temporizing measure or as a definitive treatment option with a low number of interval cholecystectomies.
Laparoscopic Cholecystectomy for Retained Gallbladder Remnant

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Background
Calculi formation after incomplete removal of gallbladder can cause post cholecystectomy syndromes. Diagnosis and management of the remnant gallbladder can be problematic. Once diagnosed, completion of cholecystectomy indicated. Despite of technical difficulties, laparoscopic approach for removal of the remnant gallbladder is possible.

Methods
Here, we present a laparoscopic completion of cholecystectomy for gallbladder remnant in a 34 years old female patient who was operated on for symptomatic cholelithiasis six years ago. The patient admitted for severe right upper quadrant pain. Sonography and magnetic resonance colangiopancreatography revealed gallbladder with multiple stones.

Results
Laparoscopic cholecystectomy for remnant gallbladder was performed. Post-operative course was uneventful and patient was discharged the day after surgery. Pathology report revealed chronic inflammation of the gallbladder remnant which was measuring 45 mm in length.

Conclusion
Although technically demanding, laparoscopic removal of the remnant gallbladder can be safely performed.
Laparoscopic common bile duct exploration (lcbde); a choice over ercp for managing cbd stones, first sri lankan experience

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Background
LCBDE is a single stage minimally invasive procedure with low morbidity and mortality. The use of ERCP is challenged because of its higher rate of complications, comparatively low clearance rate and failure of ERCP invariably ending up in surgical exploration.

Methods
LCBDEs have been performed in our unit since January 2013. Trans-ductal approach was used and stone extraction was done with the guidance of choledochoscope. T-tube was routinely inserted and cholangiogram was performed on 10th postoperative day.

Results
Out of 18 cases 13 were females (72.2%). Mean age was 57.7 years (range: 21-84 years). Nine of them had previous ERCP and stenting (two had ERCP 3 times). Four patients had cholangitis preoperatively. Four out of 18 had biliary sludge. Ten had multiple stones and 8 had single stone in the duct system. One patient had stones in CHD & CBD (Caroli disease), 1 had stone in CHD while other 16 had stone/s in the CBD. A hilar cholangiocarcinoma was detected intraoperatively in one case. Mean surgical time was 4 hours and 22mins (range: 105 to 360mins). Stone clearance rate was 100% and conversion rate was zero. None of the cases experienced major morbidity or mortality. Average hospital stay was 6.3 days (range: 4 to 25 days). Short term follow up revealed no recurrent CBD stones.

Conclusion
Compared to ERCP, LCBDE is a safe effective procedure with low morbidity and mortality in hands of experienced laparoscopic surgeon.
Laparoscopic repair of post-cholecystectomy bile duct injury

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Background
Despite widespread advances in laparoscopic surgery, laparoscopic repair of post-cholecystectomy bile duct injury (BDI) has rarely been reported related mainly to technical difficulties. We illustrate our experience by a video.

Methods
With our gained experience in hepatic pedicle dissection during laparoscopic pancreaticoduodenectomy, we decided to perform laparoscopic repair of BDI in patients with an intact biliary confluence without vascular injury. Three patients were operated including two women; one was re-operated by subcostal incision for peritonitis and 2 had undergone cholecystectomy without conversion. Surgical technique is detailed in the video.

Results
Three patients were operated and laparoscopic repair was performed between 45 and 300 days after cholecystectomy. Surgery lasted between 250 and 270 minutes with no conversion and no transfusion. The postoperative course was uneventful with a hospital stay ranging from 7 to 9 days. After a mean follow up of 9-33 months patients were symptom free with normal liver function tests.

Conclusion
The laparoscopic approach can be safely and effectively proposed to a subgroup of patients with BDI. This approach has the advantages of the laparoscopic approach and represents the main new surgical advancement in the management of BDI.
Liver resection for hilar Cholangiocarcinoma in patients over 70 years: does preoperative cholangitis exclude older patients from surgery?

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Background
Major surgery in elderly is little studied but in western countries average age is increasing. Hilar cholangiocarcinoma (HC) often affects people over 60 years and surgery is the only curative treatment. Herein we aim to study, through the review of a prospectively maintained database, age influence on treatment of patients undergoing surgery for HC.

Methods
All patients who underwent surgery for HC between 2006 and 2014 were reviewed and divided in two groups: G1 ≤70 years; G2 >70. Patient and tumor variables were reviewed to identify factors associated with age. Treatment variables, complication rates and long-term survival were compared.

Results
63 patients were treated: G1 included 42 patients, G2 21. 56 patients required major hepatectomy, 7 common bile duct resection. At univariate analysis G1 had more preoperative septic complications (P=0.067) and worst postoperative outcome with significantly higher rate of: complications (P=0.04); postoperative collections (P=0.02), biliary fistulas (P=0.047) and longer hospital stay (P=0.06). G1 had also a trend toward a more extensive nodal involvement (P=0.07) at pathology. Median survival was 38.9 (G1) and 25 months (G2), with no significant difference. Median follow-up was respectively 14 and 9.26 months.

Conclusion
Major surgery for patients older than 70 years is feasible and safe in selected patients. However herein we found that preoperative septic complications could exclude older patients from surgery. Preoperative care should be thus enhanced in this group.
Major hepatectomy with concomitant vascular resection (portal vein and/or hepatic artery) for perihilar cholangiocarcinoma

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Background

Background: Concomitant major vascular resection was required to achieve curative (R0) resection in perihilar cholangiocarcinoma, however, it is also difficult to go together R0 resection and surgical safety.

Purpose: To evaluate short and long term surgical results for perihilar cholangiocarcinoma who performed concomitant vascular resection.

Methods

Patients: From January 2000 to December 2015, we performed 200 major hepatectomy for perihilar cholangiocarcinoma patients. Among these patients 104 patients were performed concomitant vascular resection. These 104 patients were evaluated.

Results

Results: There were 76 of men. Median age was 68 year (46-80). There were 58 of right hepatectomy, 33 of left hepatectomy, 3 of right trisectionectomy, and 6 of left trisectionectomy. There were 78 of portal vein resection, 4 of hepatic artery resection, and 22 of both portal vein and hepatic artery. Operation time was 686min (325-1250). Operative bleeding was 1845ml (510-27860). Morbidity (Clavien Dindo IIIA≧) was 51% (3.8% patients had vascular related complications), and mortality (in hospital death) was 7.7%. We achieved 79% R0 resection, and 5-year survival rate was 40%.

Conclusion

Conclusion: Our surgical results of concomitant vascular resection for perihilar cholangiocarcinoma were thought to be acceptable, however, new strategy for decreasing morbidity and mortality is required.

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Background
Aim of the study is to choose rational method of biliary decompression in patients with malignant obstruction. 260 patients had biliary decompression for the 6 year period

Methods
We focused on the anatomical level of biliary tract occlusion. Obstruction at the level of the common bile duct (CBD) was detected in 78.8\% cases, common hepatic duct (CHD) with untouched confluence in 8.3\%, confluence and above on lobal and segmental level of occlusion in 12.9\%

Results
Cholecystostomy (CS) was performed in 24.2\% cases, Percutaneous biliary drainage (PBD) in - 13.2\%, Endoscopic stenting (ES) in - 47.6\%. In 14\% of cases we had to combine the two different methods of draining jaundice because of the inefficiency one of them. ES was successful in 91.3\% cases with an occlusion at the level of CBD, in 72.0\% at the level of the CHD In cases with occlusion above confluence ES was not applied. PBD was successfully in 87.5\% cases with obstruction at the level of the CBD, at the level of CHD - 90\%, at the level of lobal and segmental hepatic ducts - 88.2\%. CS was effective in 77.9\%, in cases with obstruction below the mouth of the cystic duct. Complications occurred in 13\% of cases. After ES leading complication was cholangitis. The main complications after PBD and CS was bile leakage into the peritoneal or pleural cavity.

Conclusion
ES has priority in cases with an occlusion level of the CBD and CHD with untouched confluence, PHD in cases with occlusion level of lobal and segmental ducts.
Management laparo endoscopic perforation post ERCP

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Background
Presentation as a case report of a post-ERCP perforation and its conservative surgical management by laparoendoscopic "Rendez Vous" technique (RVLE) in a patient with a history of cholecystectomy.

Methods
Post-ERCP perforation is a rare complication but with high morbidity and mortality in cases with late diagnosis. This is why some authors suggest an urgent surgical procedure due to the deterioration of the patient's clinical status, since its natural course is towards septic shock.

Results
Therapeutic behavior, whether conservative or surgical, depends, in addition to the clinical status of the patient, the site of perforation and the diagnostic moment (intra or postoperative). RVLE is a tool used to access the main biliary tract in cases of cholecystocytocholithiasis, which consists of cannulation of the biliary tract or endoscopic sphincterotomy through a transcystic-transpapillary guide, thus avoiding the need for instrumentation of the Bile duct decreasing the likelihood of adverse effects.

Conclusion
In our case, the re-dissection of the cystic duct with the subsequent RVLE technique allowed the successful cannulation of the biliary tract with the consequent removal of the colejicilar lithiasis and subsequent placement of biliary stents.
Miniinvasive interventions at malignant diseases of the hepatopancreatoduodenal zone, complicated with an obstructive jaundice

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Background
225 patients with malignant diseases of the hepatopancreatoduodenal zone organs, complicated with an obstructive jaundice were cured in 2010-2015 in Orel regional clinical Hospital.

Methods
The reasons of obstructive jaundice were: pancreatic head cancer - 60.9\%, cholangiocarcinoma of common bile duct - 14.7\%, cholangiocarcinoma of proximal bile ducts - 6.2\%, gallbladder cancer - 5.8\%, cancer of the major duodenal papilla - 2.6\%, regional metastases - 9.8\%.

Results
305 miniinvasive interventions were conducted: external cholangiostomy - 63\%; antegrade endobiliary stenting - 22.3\%; external-internal drainage of ducts - 11.8\%; antegrade balloon plastic -0.6\%; transcutaneous-transheaptic micro holetsistostomiya - 2.3\%. Complication were in 50 cases, and were mediated by dislocation of holangiostomic drainage in 24 patients (10.7\%); by acute cholecystitis in 9 cases (4\%); by acute pancreatitis in 5 cases (2.2\%); by hydrothorax in 8 patients (3.6\%). Lethal outcome appeared in 14 patients, and was due to the progression of the main disease.

Conclusion
Thus, miniinvasive intervention at malignant diseases of the hepatopancreatoduodenal zone organs, complicated with obstructive jaundice, allow timely and effectively to determine the level of the biliary tract obstruction, to stop biliary hypertension, to improve the general condition of the patients and to determine further treatment strategy.
New definition of post-hepatectomy liver failure after major hepatectomy for perihilar cholangiocarcinoma

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Background
Purpose: To assess proper criteria for post-hepatectomy liver failure (PHLF) in surgery for perihilar cholangiocarcinoma (PHCC) as early predictors of PHLF-related mortality.

Methods
Methods: Participants comprised 183 PHCC patients who had undergone major hepatectomy. Clinical values obtained until post-operative day (POD) 7 and newly established PHLF definitions were evaluated.

Results
Results: Seven patients (3.8%) died of PHLF-related causes. We compared several definitions of PHLF: 1) 3-3-50 criteria (T-Bil >3 mg/dl and PT% < 50% on POD 3); 2) modified 50-50 criteria (T-Bil >3.5 mg/dl and PT% < 65% on POD 5); 3) Max T-Bil criteria (T-Bil >7.3 mg/dl within POD 7); 4) ISGLS criteria; and 5) original 50-50 criteria. The 3-3-50 and Max T-Bil criteria showed higher positive predictive values (25.0% and 23.1%) and accuracies (88.5% and 90.7%, respectively) than the other criteria.

Conclusion
Conclusions: The 3-3-50 and Max T-Bil criteria could prove useful for defining PHLF-related mortality after hepatectomy for PHCC.
New surgical procedure for perihilar cholangiocarcinoma: transhepatic hilar approach to confirm a negative margin of proximal bile duct first

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Background
The most important factor for R0 resection for perihilar cholangiocarcinoma (PHC) is negative margin (NM) of the remnant liver, although surgical procedures can be performed in several ways. Our procedure, transhepatic hilar approach (THA), confirms a NM of proximal bile duct (BD) first (J Gastrointest Surg. 2016). This study aims to present THA procedure for PHC and outcomes.

Methods
First of all, partial hepatic parenchymal transection to expose hilar plate is performed, followed by skeletonization of HA, PV, and BD in the remnant liver. Then, the proximal BD resection is performed to confirm a NM, followed by the distal BD resection and skeletonization of the hepatoduodenal ligament. Thereafter, the heptectomy (Hx) with caudate lobe is completed. THA provides us with a clear surgical view to perform reconstruction of PV in the middle of Hx.
We performed THA for 27 patients between 2011.1 and 2017.1, of whom 17 (63%) received preoperative chemotherapy.

Results
There were left Hx in 13, trisectionectomy (TSN) in 2, right Hx in 9, TSN in 1, and others in 2. Vascular resection (PV in 12, HA in 1, PV and HA in 3) was performed in 16 (59%). R0 resection was achieved in 20 (74%). Clavien III or higher complications occurred in 13 (48%) without mortality. Five-year survival rate was 34% (MST:53M).

Conclusion
THA can provide us with an opportunity to confirm a NM of proximal BD first and with a clear surgical view to easily perform reconstruction of PV in the middle of Hx, resulting in satisfactory outcomes.
Background
The study of readmissions may help to characterize the postoperative morbidity associated with cholecystectomy. The use of a 30 day cutoff point may have led to an underestimation of the incidence of morbidity of the procedure. Our objective is to determine the incidence of readmission after cholecystectomy at our department using 90 days as a limit.

Methods
We retrospectively reviewed all patients undergoing cholecystectomy at the University Hospital of Guadalajara, Spain, for biliary pathology, from 2011 to 2015. All of those patients who were readmitted within 90 days to any hospital service were included.

Results
We analyzed 1,423 patients. There were 71 readmissions in the 90 days after discharge (rate 4.99%). Almost 50% were readmitted in the first week and most second readmissions occurred during the second month. Seven out of 10 readmissions occurred in the first month after discharge, and the other three between 30 and 90 days. Redefining the readmission rate to 90 days resulted in an increase, from 3.51% at 30 days to 4.99% at 90 days.

Conclusion
Hospital readmissions represent an important component of the associated costs of a disease and are an indicator of the quality of care. It is essential to standardize criteria regarding the reasons for readmission to be able to compare results. The use of a 30 day cutoff point may underestimate the true incidence of complications. The tendency is to use 90 days as a limit to measure complications associated with any procedure.
Outcomes of liver resection for hilar cholangiocarcinoma of Bismuth type III and IV: a minor versus major approach

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Background
Combined liver resection for hilar cholangiocarcinoma (HCCA) of Bismuth type III and IV is now adopted by most surgeons. However, the optimal extent of hepatic resection to achieve negative margin still remains controversial.

Methods
Between March 2006 and March 2016, 78 consecutive patients with Bismuth type III and IV HCCA underwent surgical resection with curative intent. Patients were classified into two groups: minor liver resection group (n = 46) and major liver resection group B (n = 32). The preoperative outcomes and long-term outcomes including overall or disease-free survival rate were compared.

Results
The major liver resection group had significantly higher R0 resection rates compared with the minor liver resection group (84.4% versus 60.1%, P = 0.025), albeit with higher blood transfusion requirements (62.5% versus 23.9%, P < 0.001) and longer length hospital stay (26.75±10.29 versus 20.48±6.90, P = 0.002).
Comparing with minor liver resection, major liver resection resulted in significantly higher general complications (34% versus 13%, P = 0.025), but it showed better overall survival (OS) (P = 0.006) and disease-free survival (P = 0.041).

Conclusion
Major liver resection, after biliary drainage and preoperative portal vein embolization, when necessary, should be considered in patients with Bismuth type III and IV HCCA.
Patterns of distribution of hepatic nodules (single, satellites or multifocal) in intrahepatic cholangiocarcinoma: prognostic impact after surgery

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Background
The aims of the study were to compare the clinicopathological features and survival after surgery of patients with intrahepatic cholangiocarcinoma (ICC) according with the patterns of distribution

Methods
A retrospective analysis of a multi-institutional series of 282 patients with ICC was carried out. Patients were further classified according to the pattern: single tumor (type I), single tumor with satellites in the same liver segment (type II) or multifocal scattered tumors (type III)

Results
173 (61.3%) patients were type I, 61 (21.6%) type II and 48 (17%) type III. Curative liver surgery was performed in 259 (91.8%) patients, with a significant difference according to the pattern: 94.8%, 96.7% and 75% in type I, II and III, respectively (p<0.001). The 5-years overall survival for the entire cohort was 38.2% and 48.9%, 26.4% and 7.3%, in type I, II and III, respectively (p<0.001). On multivariate analysis factors related with survival were pattern type II and type III (OR 3.499, p<0.001, and OR 4.394, p<0.001, respectively), Ca 19-9 >55 U/mL (OR 2.105, p=0.021), LN metastases (OR 2.254, p=0.007), R1 resection (OR 1.929, p=0.023) and size >5cm (OR 1.900, p=0.046), respectively

Conclusion
ICC could have three distinct patterns of distribution with different prognosis that should be considered in the therapeutic decision. Prognosis of type III patients is significantly worse but long-term survivors exist: efforts should be done for profiling in this subgroup of patients the long-term survivors
Percutaneous Cholecystostomy for severe Acute Cholecystitis: A life saving procedure

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Background
The gold standard treatment of AC is early laparoscopic cholecystectomy, however surgery can result in high morbidity and mortality in patients with severe co-morbidities, elderly, and in patients with poor physiological reserve. In such patients percutaneous cholecystostomy (PC) can be life saving. Aim: The aim of this study is to evaluate early and late outcomes following PC

Methods
This is a retrospective study of all patients who underwent PC for AC between January 2005 and September 2014.

Results
53 patients (22 female, median age 74 years) underwent PC during the study period. Twelve patients (22.6%) had acalculous cholecystitis (ACC). The main indications for PC were; significant co-morbidities (n=28, 52.8%) and too unwell for surgery (n=21, 39.6%). Median time from diagnosis of AC to PC was 3.6 (0-45 days). Median length of hospital stay was 27 (range: 4-87) days. 90-day mortality was 9.3%. The mortality was higher in patients with American Society of Anaesthesiology (ASA) 4-5 (17.8% vs. 0% in ASA 2-3, P= 0.025) and in patients with ACC (25 vs. 4.5%, P=0.032). Despite PC, ten patients (19%) had further admissions to hospital with AC. 45% of patients went on to have an elective cholecystectomy; laparoscopic =15, and open = 9. At one year follow up seven (13.2%) patients died.

Conclusion
PC can be a life-saving procedure in patients with acute cholecystitis who are not fit for surgery due to co-morbidities and severe sepsis.
Percutaneous transhepatic and endoscopic miniinvasive treatment of benign bilioenteric strictures and intrahepatic cholangiolithiasis

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Background
Benign strictures of hepaticojejunooanastomosis (HJA) with cholangiolithiasis occur in 10-30% of cases after reconstructive operations. Currently, the priority should be given to methods of minimally invasive treatment.

Methods
In our centre during the period from 2002 till 2016 were treated in 58 patients with HJA strictures. 13 patients from their was coexistant intrahepatic cholangiolithiasis. 46 (79.3%) patients was performed rehepaticojejunostomy. 12 patients was performed a minimally invasive intervention such as laser recanalisation using double balloon enteroscopy (DBE) (7 patients) and lithoextraction with DBE (1), transhepatic cholangioscopy (2 patients) with laser lithotripsy (1), balloon dilatation of the stricture HJA (4), lithoextraction (4), including with DBE ("randevoux" procedure) (1), stenting (2).

Results
We observed several complication such as cholangitis (5); recurrent cholangiolithiasis (1); restricture of HJA (2).

Conclusion
Miniinvasive endoscopic techniques treatment and endobilary correction of HJA strictures and cholangiolithiasis have shown good results.
Rationale surgical tactics at iatrogenic bile duct injury

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Background
The results of examination and treatment of 62 patients iatrogenic injury of the bile ducts (IBDI).

Methods
According to the international classification «ATOM» (EAES, 2013) injuries the main biliary duct (MBD) identified intraoperatively (n=16), one complete division in 10 patients and partial interruption - 6. In the postoperative period IBDI found in 46 patients, one complete division in 32 patients and partial interruption - 9. Injuries non-main biliary ducts (NMBD) are installed in 5 patients.

Results
Analysis of the main characteristics of classification IBDI possible to determine the indications for reconstructive in 27 of patients, recovery operations at 22, external drainage at 8 and reclipping non-main biliary ducts during relaparoscopic at 5.

The rational surgical tactics has achieved in 43 of patients with excellent, good and satisfactory early and late results of treatment with low postoperative mortality over this period (n=1).

Conclusion
The study results of the diagnosis and treatment of patients IBDI shows the usefulness of evaluating the main factors that characterize the iatrogenic damage, according to the classification «ATOM», which allows to personalize the program survey, and a rational option to choose surgery, minimizes the unsatisfactory results and a good quality of life.
Recurrence of intrahepatic cholangiocarcinoma – Patterns and therapy

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Background
After resection of intrahepatic cholangiocarcinoma (ICC) recurrence is common, but data regarding therapy and prognosis of tumor recurrence are lacking.

Methods
Patients with ICC (n=153) were recorded prospectively (2008 – 2015). Site of recurrence, disease-free interval as well as treatment were further analysed using Kaplan Meier model for overall and recurrence free survival.

Results
Out of 115 resections recurrence occurred in 70 cases (60.9 %). Location was intrahepatic (n=30 patients; 42.9%), intra- and extrahepatic (n=21; 30%) and extrahepatic (n=19; 27.1%). The median recurrence free survival (RFS) was 9.2 months (range 0.4 – 68.3) with a 1-, 3- and 5-year RFS of 35%, 16% and 16%, respectively. In total, 16 re-explorations with 13 resections (81.25%) were performed (8 external primary resections) and 10 R0 resections achieved. Patients not considered for surgical therapy underwent chemotherapy (n=40), TACE (n=2), RFA (n=3), SIRT (n=1) or best supportive care (n=16). Survival of repeated resection was significantly superior to alternative therapies (p=0.017). The repeated resection group had a median overall survival (OS) of 61.6 months (range 11.7 – 183.8, data starting with first liver resection) with a 1-, 3- and 5-year OS rate of 90%, 68% and 54%, respectively.

Conclusion
In solely intrahepatic recurrence repeated resection should be attempted to offer a chance for cure. Recurrent ICC amenable to repeated resection seem to be a positive selection associated with better survival.
**Repair of Major Bile Duct Injuries by Specialist Hepatobiliary Surgeons Results in Fewer Long-Term Biliary Complications and Invasive Procedures**

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**Background**
Strasberg type E injuries are the most severe type of bile duct injury. In the years after repair there is a significant risk of biliary complications such as stricture formation and recurrent cholangitis. This study aims to identify risk factors for long-term biliary complications and their clinical consequences.

**Methods**
The relationship between the type of surgeon and timing of repair with post-repair outcomes following Strasberg type E injuries between January 1990 and June 2015 were explored.

**Results**
Injuries of type E1-2 were observed in 82 of 139 patients (59%), with the remaining 57 having type E3-5 injuries (41%). Repairs were performed immediately on table in 37% of cases, early (< 21 days) in 53%, and late ( >21 days) in 10%, with 74% of repairs performed by specialist HPB surgeons. Long-term biliary complication rates were found to be significantly higher after repairs by non-specialist surgeons (p<0.001) and in patients with vascular injury (p=0.013). There was no significant difference in complication rates by the timing of the repair (p=0.339). Patients with a repair performed by a non-specialist also required significantly more invasive procedures (ERCP and PTC) following repair (p=0.008). Neither the type of surgeon (p=0.784) nor timing of repair (p=0.101) were significant predictors of patient survival.

**Conclusion**
Specialist hepatobiliary surgeons should repair Strasberg type E injuries in order to reduce long-term biliary complications and invasive procedures in the years after repair.

**References:**
Results of the treatment of the patients which underwent surgery concerning cystic transformation of biliary ducts

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Background

to analyse the results of surgery of the patients which underwent surgery concerning cystic transformation of biliary ducts (CTBD).

Methods

21 patients which have earlier underwent various interventions concerning CTBD addressed to A.V. Vishnevsky Institute of Surgery with complaints (middle age 41.1±13.5 years, 1(5.0%) man, 20 (95.0%) women. Earlier surgeries: internal drainage of cysts biliary ducts (CBD); intraoperative external drainage of CBD; transhepatic drainage of CBD; cholecystectomy. Presurgical inspection: US, CT, MRI, ERCP. All patients have been operated on.

Results

CTBD hasn't been liquidated in all cases. As a result of inadequately restored of bile outflow, has led to development of complaints in patients again.

Terms of observation: 5 months–38 years. The leading symptoms: recurrent cholangitis, mechanical jaundice. Earlier imposed anastomotic stricture, cholangiolithiasis and malignancy of cysts (at 4 patients) have revealed further. Malignant cysts were only in group of the patients who have earlier transferred the internal draining interventions.

Conclusion

Considering rather high probability of malignant growth in CTBD and the frequency of recurrence of clinical manifestations owing to inadequate restoration of bile outflow, it is expedient to seek for radical intervention, that is the fullest removal of pathologically changed biliary ducts.
Retrograde and percutaneous transhepatic interventions in benign mechanical jaundice

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Background
Diagnosing and treatment of mechanical jaundice is still actual

Methods
We analyzed 2438 patients with mechanical jaundice. To 2422 (99.3%) patients with benign mechanical jaundice ERPCH with different surgical manipulations were done.

Results
The causes were in 1380 cases - cholelithiasis with choledocholithiasis, in 344 - postcholecystectomy syndrome with choledocholithiasis, in 500 papillary stenosis, in 84 Mirizzi's syndrome, in 30 parafateral diverticulum, in 5 - choledocheal cysts, in 4 - parasitic invasion, in 75 bile duct strictures. Antegrade cholangiography were done to 16 (0.7%) patients. Among them in 2 patients were found iatrogenic bile duct injury, in 6 patients bile duct strictures, anomaly cystic duct inflow in 1 patient, 4 patients were with choledocholithiasis and in 3 patients were found Mirizzi’s syndrome.

Conclusion
Therefore in diagnosing of mechanical jaundice of different origin the ERPCH is predominates because of it is less invasive and allows to eliminate jaundice by endoscopic way.
Risk factors increasing post-ERCP complications: a referral center experience

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Background
Endoscopic retrograde cholangiopancreatography (ERCP) is an important therapeutic tool in patients with hepatopancreatobiliary diseases. In the present study, we sought to determine predictors of post-ERCP complications.

Methods
A retrospective analysis of patients who underwent ERCP in between January 2010- November 2011 was done. Demographics, ERCP findings, success rate and complications were evaluated with special emphasis on the difficulty in cannulation procedure, the primary etiology of the disease (benign/malign) and age. Chi-square analysis was applied for statistical analysis. The differences were considered statistically significant, if the p value was less than 0.05.

Results
A total of 112 ERCP was performed in 81 patients. Thirty-eight were male (46.9 %) and 43 were female (53.1%). Mean age was 61.3 (range 17-88), and 31 patients was seventy years and older (38.3 %). Complications were detected in 28 patients (34.6 %). Nine cases with difficult or unsuccessful cannulation (69.2 %) had complications (p=0.001). Patients with benign diseases showed less complications (21/70), in comparison with those with malignancies (7/11) (30 % vs. 63.6 %, respectively; p< 0.05). Complication rate in patients 70 years and older was 32.2 % (n=10) compared to 35.3 % in patients younger than 70 (n= 18) (p >0.05).

Conclusion
Risk factors such as difficult or incomplete cannulation and malignancy are considered as possible predisposing factors for complications. Age is an independent factor.
Robot-assisted resection of a Type I choledochal cyst and Roux-en-Y hepaticojejunostomy

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Background
There is an established association between choledochal cysts and cholangiocarcinoma. Consequently resection of choledochal cysts is advocated coupled with reconstruction of the biliary tree. This video demonstrates use of the da Vinci® robotic Surgical System to perform resection of a Type I choledochal cyst and formation of a Roux-en-Y hepaticojejunostomy.

Methods
The patient was a 39 year-old female diagnosed with a Type I choledochal cyst. The video includes the MRI appearances of the cyst. The video further demonstrates the Operating Room set-up.

Results
The operative technique is as demonstrated in the video with the resected specimen pictured at the end.

Conclusion
Robot-assisted surgery is a safe and feasible method for performing resection of Type I choledochal cysts and reconstructing the biliary tree.
Role of A.L.P.P.S. in treatment of perihilar cholangiocarcinoma: experience of single centre

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Background
We reported results of a mono-centric experience in the treatment of perihilar cholangiocarcinoma (PHCC) by Associated liver partition and portal vein ligation for staged hepatectomy (ALPPS).

Methods
Since January 2013, 16 patients with primary or secondary tumors of the liver and biliary tract, whose future liver remnant (FLR) was considered too small to allow for a liver resection, were evaluated prospectively for ALPPS procedure. Procedure was completed in 13 patients. The indication for surgical resection was PHCC in 4 cases (30.8%).

Results
The increase of the FLR between the two procedures was 80 ± 31% (p <0.001). By comparing the results of 4 patients underwent ALPPS for PHCC than the other 9 (No PHCC) emerge the following data: the average time between the first and second phase of the procedure was 8 ± 2 (PHCC) vs 11.7 ± 2 days (No PHCC); The overall postoperative mortality was 7.69% with only 1 death from liver failure in a patient with PHCC and concomitant liver fibrosis, 25% (PHCC) vs 0% (No PHCC); The overall postoperative morbidity rate was 75% in PHCC patients vs 77.7% (No PHCC). Overall survival was 75% at 6, 12, 24, 30 months (PHCC) vs 100% in 6-12 months, 85% at 12, 24, 30 months (No PHCC). The recurrence-free survival was 100% in 6-12, 24, 30 months (PHCC) vs 100% at 6 months, 87.5% at 12 months, 75% at 24, 30 months (No PHCC).

Conclusion
The ALPPS technique has effectively increased the resection of liver tumors otherwise inoperable as PHCC.
Role of lymph-node dissection in small (≤ 3cm) Intrahepatic Cholangiocarcinoma

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Background
The role of lymph-node dissection (LD) in patients with small intrahepatic cholangiocarcinoma (ICC) is still under debate.
The aims of the study were to compare the lymph-node (LN) status and its correlation with survival in patients with ICC after surgery according with the tumor size.

Methods
A retrospective analysis of a multi-institutional series of 259 patients submitted to curative surgery was carried out. Patients were further classified according to the tumor size in small-ICC (≤ 3cm) and large-ICC (> 3cm).

Results
Fifty-three patients had small-ICC and 206 had large-ICC. LD was performed in 194 (74.9%) patients, with a significant difference between small-ICC and large-ICC, 62% and 78%, respectively (p=0.016). LN metastases were identified in 38% of the entire cohort, in 30% and 39% of small-ICC and large-ICC, respectively (p=0.216). No differences in the number of LN retrieved, number of LN metastases and LN ratio were identified between small and large-ICC who underwent LD. The 5-years overall survival (OS) was 52% for small-ICC and 34% for large-ICC (p=0.019). The 5-years OS according with the LN status (N0 vs N+) was 85% and 36% (p=0.035) in small-ICC, and 44% and 15% in large-ICC (p<0.001), respectively.

Conclusion
Despite the lower rate of LD in small-ICC group, one third of the patients had LN metastases with important prognostic implications. LD should be performed, also in small-ICC, for a correct staging and for the allocation to adjuvant therapy.
Background
Biliary reconstruction is a common procedure for both benign disease (e.g. choledocholithiasis, choledochal cyst) as well as malignant biliary obstruction. However, it remains a challenging procedure when performed with laparoscopic approach.

Methods
We performed laparoscopic hepaticojejunostomy using 3D laparoscope for a 59-year old man who suffered from recurrent choledocholithiasis. This patient has history of laparoscopic cholecystectomy 2 years ago. Patient was placed in the supine position with legs apart and a 15° head up tilt. Five trocars of 5-12mm were used. Roux-en-Y hepaticojejunostomy was fashioned in a end-to-side manner with continuous suture.

Results
The operative time was 240 minutes and blood loss was 50ml. Patient was able to resume diet on post-operative day 2. Tubal drain was removed on day 3 and he was subsequently discharged on day 4.

Conclusion
Laparoscopic biliary reconstruction is technically demanding and the use of the 3D laparoscope could help to overcome some of the difficulties associated with the procedure.
Ruralization is protective from gallbladder disease

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Background
Epidemiological studies suggest that gallstone disease is rare in African populations. We hypothesize urbanization has led to an increase in cholecystectomy (CC) rates for gallstone disease in South Africa (SA).

Methods
Data from 34294 CC specimens were obtained from the SA NHLS (2003-2015). Population statistics, average real annual economic growth rate and urbanization ratios were obtained from Statistics SA for all 9 provinces. Two periods were analyzed, period 1 (2003-2009) and period 2 (2009-2015).

Results
The average real annual economic growth rate in SA increased year on year by 3.7% during the study period suggesting increased economic prosperity for the overall population. Urbanization ratios also increased in SA from 56% in 2001 to 63% in 2011, except in the Northern Cape which was the only province to show a decline in urbanization (81% to 76%). The overall SA CC rate increased by 37.63% (range per province: 1.85% to 61.63%) in period 2. The Northern Cape however showed a decline in CC’s by 28.3%. There was an overall 20.3% increase of incidental gallbladder cancer (iGBC) in period 2 (59 to 74 cases) in SA. The Northern Cape had a 900% decrease in incidental gallbladder cancer in period 2 (10 cases to 1 case). Three other provinces also showed smaller decreases in iGBC (Gauteng 24 to 20 cases; Mpumalanga 4 to 2 cases; Limpopo 1 to 0 cases).

Conclusion
This study suggests that living in a rural area is protective from symptomatic gallbladder disease and possibly from gallbladder cancer.
Biliary surgery: Clinical
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Short and long term outcomes of a Rendezvous procedure for bile duct injury after laparoscopic cholecystectomy

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Background
Bile Duct Injury (BDI) following laparoscopic cholecystectomy is a persisting problem. In recent years, the rendezvous procedure (RV) has been introduced in the management of BDI. Aim of this study is to assess outcomes of the RV

Methods
All consecutive patients with BDI referred to our tertiary center between 2001 and 2016 were analyzed. RV procedure was performed when endoscopic stenting or PTC failed, when deemed feasible by a dedicated MDT including hepato-biliary surgeon, endoscopist and interventional radiologist. Classification of BDI, technical success, procedure-related complications and outcomes were assessed

Results
Among a total of 502 patients, RV was performed in 38(7.6%). Of these 38 patients, 19(50%) were diagnosed with a type D/Strasberg E injury. RV was successful in 35 patients (92%). Reasons for failure (n=3) were inability to overcome the defect; these patients subsequently underwent a hepaticojejunostomy (HJ). In 24/38 patients (63%) RV was the final successful treatment. In 14/38 patients (34%) RV acted as a bridge to surgery; although the RV was initially successful, late complications (stenosis, stent dysfunction) required a more elective HJ. Cholangitis developed in 4 patients (10%) after RV; 1 patient(2.6%) developed a liver abscess. No major complications and no 30-day mortality occurred

Conclusion
In experienced hands, RV is safe with final nonsurgical success rate of 63%. When endoscopic stenting fails in complex BDI, RV can be considered as solution before surgical treatment
Single Incision Laparoscopic Cholecystectomy at UKM Medical Centre: An Early Experience

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Background
Laparoscopic cholecystectomy is the gold standard treatment for gallbladder disease. We have embarked on single incision laparoscopic cholecystectomy (SILC) at our institution. The aim of our study is to prove its safety, feasibility as well as patient’s satisfaction.

Methods
48 patients were recruited and underwent SILC at UKMMC between September 2014 to December 2016. All procedures were performed by a single experienced surgeon, under general anaesthesia.

Results
37 patients (77%) were female. The mean age was 50.2 years (range: 18 - 80). The mean BMI was 22.9 (range: 19.0 - 28.1). 7 patients need additional ports (1 port added in 3 patients, 2 ports added in 4 patients). This correlate with higher Cusheiri scale for difficulty. The conversion rates is 14.6%. The mean operating time was 82.3 minutes (range: 40 - 170). The operating time varies widely partly due to technical difficulty and patient’s factor. This is also reflected by the long learning curve. The mean score for post operative pain was 3.3 (range: 0 - 7) and none reported pain that interrupted daily activities. At 2 weeks follow-up, patients were highly satisfied with resultant scar. The mean satisfaction score was 8.9 (range 7 - 10). 4 patients (8.3%) developed grade 1 SSI at the umbilicus, which resolved with frequent dressing.

Conclusion
SILC is technically challenging compared to conventional laparoscopic cholecystectomy. We conclude this technique is safe and feasible with high patients’ satisfaction for cosmetics and less post-operative pain.
Surgical Management of Locally Invasive Gall Bladder Cancer: A Single Center Experience

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Background
Gallbladder cancer can present either as an incidental finding, or symptomatical with abdominal pain or jaundice. An aggressive surgical approach to gallbladder cancer has been suggested to decrease morbidity and improve prognosis. The aim of this study is to present all gallbladder cancer cases that presented to AUBMC with their management.

Methods
Data regarding the study was extracted from the medical records after approval from IRB committee. All patients with gallbladder cancer encountered at AUBMC were gathered using an approved worksheet designed for this study.

Results
58 cases of gallbladder cancer were diagnosed at our institution between 2000 - 2014. The most common presenting symptom was abdominal pain (59%). Patients were classified in 2 groups: the first group were diagnosed preoperatively with gallbladder cancer (89%). These patients either had a locally invasive or a metastatic disease upon presentation. The second group of patients were diagnosed incidentally upon tissue examination after cholecystectomy for choliolithiasis (11%). 65% of all patients received a cholecystectomy. Out of these, 36% had also partial hepatectomy due to local invasion. The remaining patients were not amenable to surgery.

Conclusion
R0 resection is the standard of care in patients with GBC and the only potentially curative therapy. In patients with locally advanced gallbladder cancer, major hepatectomy with extrahepatic bile duct resection can be considered, however mortality rate is still high.
Surgical repair for bile duct injuries after cholecystectomy in a tertiary referral center: long term results

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Background
Bile duct injuries (BDI) after laparoscopic cholecystectomy commonly occur close to the hilar plate. Hepatico-jejunostomy (HJ) according to Hepp-Couinaud (HC) technique in referral centers remains the best surgical treatment.

Methods
186 patients (pts) referred for BDI between 1994 and 2014, 163 pts (87.6%) for major BDI. Eighty-nine (47.8%) underwent surgical repair: 82 HJHC and 7 multiple-HJ. Aims of this study were: evaluate predictive factors of failure of biliary reconstruction, long term results after surgery and after percutaneous stenting (PTC) in postoperative strictures. Repair was defined successful when no further treatment was required. Symptom-free Survival (SFS) after surgery and Progression Symptom-free Survival (PSFS) after PTC of stricture were evaluated.

Results
Postoperative morbidity was 34.8% with no mortality. After a mean follow-up of 96 months, 76 pts (85.4%) had excellent/good outcome. Thirteen pts (14.6%) developed anastomotic stricture treated with PTC. Postoperative bile leakage was the only factor significantly related to a failure of biliary reconstruction (p=0.03; HR:4.963). Ten-years SFS was 82%. At the end of PTC treatment 8 pts (61%) reached excellent/good results with 10-years PSFS of 92.4% (p=0.049%).

Conclusion
Success of biliary reconstruction after BDI is related to development of postoperative bile leakage. Ten-year survival without symptoms was 82% after surgery and it was significantly increased to more than 92% after PTC management of failed repairs.
Surgical therapy of segmental Caroli’s Syndrom - A case of un-usual clinical and radiological results

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Background
Caroli’s disease is a rare entity of congenital bile duct disease with cystic or fusiform dilated intrahepatic bile ducts with consecutive cholestasis and recurrent episodes of bacterial induced cholangitis finally leading to liver cirrhosis and potentially CCC. Therapeutic options are based on the treatment of cholestasis finally leading to liver resection or transplantation.

Methods
A female pat. was referred to our department with recurrent abdominal pain with cramp-like character. Family history showed frequent occurrence of PSC. Ultrasound and MRI screening showed inhomogeneous structures in the central bile ducts of S II and III with additional choledocholithiasis. Slight elevation of the lab parameters was observed. Additional SpyGlas ERCP revealed a diffuse choledocholithiasis of the subsegmental bile duct S II and III as well with completely inconspicuous right-sided bile duct system.

Results
We performed a left hemihepatectomy, as PSC was evident within the family. The histological examination revealed an incidental Caroli’s syndrom in the left lateral liver segments with absence of recurrent cholangitis, history of chronic inflammatory bowel disease and intra hepatic bile duct dilation.

Conclusion
In conclusion we present an unusual case of left lateral Caroli’s syndrom. Nevertheless recurrence of cholangitis and intrahepatic choledocholithiasis as well as the significant elevated risk for a CCC contribute to the curative decision of left sided hemihepatectomy.
Surgical Treatment of Bile Duct Injuries Associated with Cholecystectomy

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Background
Bile duct injuries can be treated with percutaneous, endoscopic or surgical interventions. The aim of this study was to analyze demographic data, clinical presentation, and early and late results of surgical treatment.

Methods
A retrospective analysis of 57 bile duct injuries managed between 2005-2016 in three university hospitals was performed. Of these 51 (89%) injuries were seen during laparoscopic and 6 were seen during open cholecystectomy. There were 40 (70%) female and 17 male patients with a median age of 48 (range 18-82) years. Only 16 (28%) of these injuries could be diagnosed during cholecystectomy. Strasberg classification of biliary injuries was 23 type E2, 11 type E4, 9 type E1, 7 type E3 and 7 either type B, C or D.

Results
Median time of surgical repair after biliary injury was 51 days (range 0-5200). Four patients had also right hepatic artery injury. Majority of patients (n:47) had undergone Roux-Y hepaticojejunostomy. The most common early complications were wound infection and bile leaks which were manifest in 16 (28%) and 8 (14%) patients respectively. In hospital mortality was seen in 2 elderly patients. With a mean follow-up of 32 months (range 1-120) excellent or good results were achieved in 45 patients (79%) (Terblanche grading 1 and 2 are 30 and 15 respectively).

Conclusion
Although excellent or good long-term outcomes can be achieved with biliary reconstructive surgery in many patients, the morbidity and mortality of surgical interventions should be taken into consideration.
Surgical treatment of stage IV gallbladder cancer after complete radiological, metabolic and biochemical response with chemotherapy and Trastuzumab

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Background
Surgery is the only curative treatment for biliary cancer. Unfortunately most patients are diagnosed at an advanced stage. Current treatments for distant disease include radiation and chemotherapy with exceptional complete response and long-term survival. Trastuzumab is a monoclonal antibody that targets HER-2. Overexpression of HER-2 has been described in gallbladder cancer and cholangiocarcinoma.

Methods
We present the first case described of surgical treatment in stage IV gallbladder adenocarcinoma after complete radiological, metabolic and biochemical response.

Results
We present a 44-year-old male diagnosed of gallbladder cancer with liver and distant lymph nodes metastases. Ca19.9 22,000 U/ml. Metastases biopsy showed adenocarcinoma with bile duct origin. Cisplatin and Gemcitabine were started with disease progression. Immunohistochemistry showed intense positivity for HER-2. Chemotherapy was switched to Oxaliplatin and Capecitabine associated to Trastuzumab. Progressively a complete radiological, metabolic and biochemical response was seen. A mesohepatectomy associated with hilar and interaortocava lymphadenectomy was performed (pT2N0M0). After 3 years no recurrence has been observed.

Conclusion
Although, no conclusions can be drawn from a single case, Trastuzumab should be considered in patients with gallbladder adenocarcinoma at advance stage overexpressing HER-2.
The effectiveness of miniinvasive technologies in patients with tumor lesion of proximal bile ducts

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Background
Objective: To analyze the results of miniinvasive techniques use in tumor lesions of proximal bile ducts.

Methods
14 patients with cholangiocarcinoma of proximal bile duct (Klatskin tumor), complicated by obstructive jaundice were supervised in Orel regional clinical hospital in 2010-2015.

Results
All patients in the first stage were performed antegrade external drainage of biliary tracts with X-rays of the biliary tracts, and specifying the level and extent of the block.
Total 28 miniinvasive interventions were hold. Two patients in connection with the uncoupling of equity ducts were performed antegrade bilobar stenting with preliminary split external bile release.
There were complications after carried out interventions in 10 cases, which were associated with dislocation of holangiostomomic drainage in 5 patients (35.7%); with acute cholecystitis in 1 patient (7.1%); with hydrothorax in 2 patients (14.2%); near hepatic biloma in 1 case (7.1%).
1 patient (7.1%) had a recurrence of obstructive jaundice due to germination of endobiliary stent in late period after stenting. Lethal outcome appeared in 1 patient.

Conclusion
Conclusion: antegrade miniinvasive technologies in tumor lesions of the proximal bile ducts allow timely and effectively stop biliary hypertension and to determine further treatment strategy.
The efficacy of late cholecystectomy for acute cholecystitis using propensity score matching analysis - Validation of Tokyo guideline 13 –

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Background
Since the Tokyo guideline 2013 (TG13) establishment, urgent cholecystectomy within 72hrs was recommended. However, the late phase cholecystectomy (4-7days) was compelled to perform for G1 and G2 cholecystitis due to several reasons. The aim of this study was to assess the feasibility of late phase cholecystectomy.

Methods
One hundred sixty four patients with G1 and G2 cholecystitis according to TG 13 underwent urgent cholecystectomy within 72 hours from symptom onset between 2011 and 2015 were enrolled. 113 patients underwent operation within 72 hours from symptom onset (early phase operation group; EO group) and 51 patients underwent operation between 4 and 7 days from symptom onset (late phase operation group; LO group). Surgical outcomes, postoperative complications were analyzed for these two groups with propensity score analysis.

Results
A total of 164 patients with G1 and 2 cholecystitis were underwent emergency cholecystectomy. Postoperative complications were detected 8 patients in EO group, 5 patients in LO group, respectively. The rate of conversion to open procedure, operation time, intraoperative bleeding, and complications were equivalent in these two groups. After one to two propensity score matched analysis, 66 patients were enrolled into EO group, 39 patients were into LO group. Outcomes of LO group were not inferior to those of EO group even after propensity matching.

Conclusion
The late phase cholecystectomy was acceptable for the treatment of G1, 2 acute cholecystitis.
The evaluation of tumor markers and their impact on prognosis in gallbladder, bile duct, and cholangiocellular carcinomas – a pilot study

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Background
The behavior of tumor markers in biliary tract malignancies is not well-known and studied enough. This study analyzed the preoperative serum levels of AFP, CEA, CA 19-9, CA 72-4, TPA, TPS, CYFRA 21.1 in patients with gallbladder carcinoma, bile duct carcinoma (Klatskin) and cholangiocellular carcinoma in relation to the patient prognosis.

Methods
The study included 43 patients, who underwent either radical surgical procedure (n=21) or explorative laparotomy (n=22) for gallbladder carcinoma, bile duct carcinoma and cholangiocellular carcinoma (24, 8 and 11 patients) between 2003 and 2010 at the Department of Surgery, University Hospital and Faculty of Medicine in Pilsen, Charles University. Overall survival (OS) and disease-free interval (DFI) were computed by Kaplan-Meier method and statistically evaluated using LogRank test.

Results
The statistical analysis proved TK as a poor prognostic factor for shorter DFI (P<0.05) and also OS (P<0.05) in patients with gallbladder carcinoma treated with radical surgery. TPS was demonstrated as a poor prognostic factor for OS in patients with gallbladder carcinoma (P<0.05). CEA was proved as a factor of poor OS in patients after explorative laparotomy for all cumulated studied diagnoses (P<0.05).

Conclusion
The results of this study suggested the importance of tumor markers for assessment of prognosis. This work was supported by the National Sustainability Program I (NPU I) Nr.LO1503 provided by the Ministry of Education Youth and Sports of the Czech Republic.
The impact of service reconfiguration on the provision of laparoscopic cholecystectomy for patients admitted with acute gallstone related disorders.

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Background
IAP/APA guidelines recommend cholecystectomy during index admission for mild biliary pancreatitis while NICE guidelines recommend cholecystectomy within one week of diagnosis of acute cholecystitis. The present study evaluates the impact of a 7-day HPB emergency service on compliance with these guidelines.

Methods
Patients admitted acutely with gallstone disease in two 12-month periods (2013, 2015) were included. A 7-day HPB emergency service with 3 theatre sessions per week dedicated for urgent cholecystectomies was introduced in 2014. Primary endpoint was compliance with NICE and IAP/APA guidelines. Secondary endpoints included time to cholecystectomy, readmission rate and conversion rate.

Results
742 patients (n=305 in 2013) were included. Compliance with NICE guidelines improved from 44% in 2013 to 73% in 2015 (p<0.001). Compliance with IAP/APA guidelines improved from 28% to 73% (p=0.002). Time to surgery was reduced (28 vs 5 days, p<0.001). Proportion of index admission cholecystectomies was increased (37% vs 71%, p<0.005). Improvements were noted in operative time (135 vs 106 minutes, p=0.002), readmission rates (39% vs 20%, p<0.001) and length of stay (8 vs 6 days, p<0.001). There was no difference in conversion rates (5.5% vs 2.8%, p=0.411).

Conclusion
A dedicated seven-day emergency HPB service can significantly improve compliance with the NICE and IAP/APA guidelines. Early surgery and reduction in readmission rates and hospital stay have significant patient and health economic benefits.
The Role of Intraoperative Ultrasonography in the Verification of Choledocholithiasis

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Background
Preoperative magnetic resonance imaging (MRI) vastly improves the results of surgical treatment in patients with suspected choledocholithiasis. The aim of the study was to compare the value of preoperative MRI and intraoperative ultrasound (IOUS) in the verification of choledocholithiasis.

Methods
The diagnostic precision of preoperative MRI was compared to that of IOUS in a cohort of patients with suspected choledocholithiasis based on the Tokyo Guidelines.

Results
During the period from 2012 to 2016 a total of 381 patients underwent laparoscopic IOUS. 111 patients, mostly with cholangitis, hyperbilirubinemia, acute cholecystitis and acute pancreatitis (most frequently, p=0.022) were evaluated by preoperative MRI. In 70% of this group choledocholithiasis was proved by IOUS vs. 57% without MRI, p=0.019. MRI was performed in patients with a higher total bilirubin, p<0.001, and a lower CRP, p=0.001. IOUS was positive in 59% and 60% of all patients with cholangitis and jaundice, p<0.001, p=0.018. The incidence of choledocholithiasis was lower in patients with acute pancreatitis, p=0.002. No difference was found in the preoperative procalcitonin level and the need for postoperative ERCP.

Conclusion
Preoperative MRI is an important radiologic investigation in patients with jaundice and cholangitis when available shortly after admission. IOUS is equally informative and could be the preferable choice in patients who suffer from biliary pancreatitis.
The surgical treatment and adjuvant chemoradiotherapy for hilar cholangiocarcinoma

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Background
The multidisciplinary approach to surgical treatment of patients with hilar cholangiocarcinoma has improved long-term results

Methods
108 patients underwent liver resection between 2004 and 2016. Of these 85 patients were estimated. Bismuth-type IV tumor was 35, IIIa – 5, IIIb – 7, II – 3. The distribution of TNM staging were: I stage – 2 patients, II – 12, IIIa – 11, IIIb – 11, IV A -7, IV B – 7. Patients with grade (histology) 1 – 10, 2 – 23, 3 – 11. The clinicopathologic predictors for recurrence were tested. For patients with R1/R2 resection was performed adjuvant intraductal radiation(n=6)and chemotherapy(n=10).

Results
Curative surgical resection was achieved in 26 (35.6%). 5 (5.9%) patients underwent bile duct resection without hepatectomy. 80 (94,1%) patients underwent various types of hepatectomy with combined en bloc resection of the extrahepatic bile duct. 39 (45,9%) patients - hepatectomy with caudate lobe. The histological differentiation and surgical margin were independent factors. The 5-year survival rate was 21,1%, survival for R0 resection was 34,6%. The 3- and 5-years survival rates were 18.8% and 0% for R1/R2 resection without intraductal radiotherapy, while the 3- and 5-years survival rates for combined R1/R2 resection and radiochemotherapy were 18.8% and 5.5%.

Conclusion
Surgical treatment represents the potentially curative therapeutic option for hilar cholangiocarcinoma. The patients with R1/R2 resection are candidates for intraductal radiotherapy, however further studies are needed.
Biliary surgery: Clinical
P4.02

Total replacement of the extrahepatic bile duct using a jejunal conduit interposition of variable diameter in case of high stricture

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Background
The standard operation for major bile duct injury and biliary stricture is Roux-en-Y hepaticojejunostomy. But this method is not anatomical and physiological. The ideal interposition for restoring the continuity between the biliary tract and duodenum is a pedicle graft of jejunum reduced in caliber to approximately that of the ductal system. But in case of high stricture it might be difficult.

Methods
We present new method of reconstruction extrahepatic bile duct using an isolated intestinal segment of a variable diameter: the proximal part remains of original intestine segment during 3-5 cm (to create hepaticojejunal anastomosis in the hepatic hilum or with separate anastomoses for isolated ducts) and then the diameter is reduced to 1 cm, proportional to the biliary tract. For this the antimesenteric part of the intestinal wall of the distal part of intestinal segment was resected, and the free edges of the intestinal wall were sewn together. The distal anastomosis was formed with the end of the common bile duct or with duodenum.

Results
This method was applied in 10 patients with benign biliary strictures. 4 patients were Bismuth III and 6 - Bismuth IV. long-term results were obtained in all patients up to 10 years. There were no recurrence of stricture, cholangitis and normal biochemical parameters were observed.

Conclusion
This new technique is reliable and might be recommended as an alternative method for reconstruction extrahepatic bile duct in cause of major bile duct injury and biliary stricture.
Totally laparoscopic radical resection for incidental gallbladder cancer

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Background
Incidental gallbladder cancer is a common condition in high risk countries with an 3% incidence of all laparoscopic cholecystectomies. We present our approach for radical cholecystectomy in incidental gallbladder cancer.

Methods
A 53 year-old female with no comorbidities underwent a laparoscopic cholecystectomy for symptomatic gallstone disease. Postoperative histopathology study showed infiltrative adenocarcinoma to subserosal layer (pT2). A staging CT scan and CA19-9 were normal. We offered to her a totally laparoscopic radical resection (lymphadenectomy plus liver resection). the video shows a Kocher maneuver and an intercavo-aortic lymphadenectomy for contemporary frozen histopathology study. Five intercavo-aortic lymphatic nodes was negative. The hepatic pedicle lymphadenectomy was performed retrieving all tissue around the main bile duct, portal vein, celiac trunk, common hepatic artery and right and left hepatic arteries. A IVB-V liver resection using bipolar and ultrasonic scalpel to complete the radical resection was done. A Jackson Pratts drain was left at the surgical site. Blood loss was 50ml and Pringle maneuver lasted 20 minutes.

Results
She had an uneventful postoperative evolution and was discharged home on postoperative day 2. The histopathology study showed a 140g liver piece and 18 lymph node without evidence of residual disease.

Conclusion
Totally laparoscopic radical resection for incidental gallbladder cancer is feasible with oncological principles.
Type IV Cholangiocellular Carcinoma in a Patient With Neurofibromatosis Type 1

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Background
Neurofibromatosis type 1 is an inherited disease of autosomal dominant type. Although risk of malignancy is much more than normal population, cholangiocellular carcinoma is not a common type of malignancy in these patients.

Methods
We report a patient with NF type 1 and cholangiocellular carcinoma.

Results
Thirty one years old male patient admitted to clinic with the complaint of back pain, jaundice and pruritis. On physical examination there was icterus and too many neurofibromas and cafe au lait spots. In laboratory evaluation, liver enzymes and cholestatic markers were elevated and total and conjugated bilirubin levels were 16 and 14 mg/dl respectively. Magnetic resonance imaging revealed us dilated intrahepatic biliary ducts and a mass located in klatskin point. The tumor was extending to both left and right common hepatic ducts (type IV Klatskin tumor). Right anterior duct was totally invaded by tumor and right posterior duct was intact just at the confluence of right posterior and right anterior duct. With these findings we planned percutaneous transhepatic biliary drainage. After bilirubin levels achieved below 3mg/dL value, we performed extended left hepatic lobectomy and quadrate lobectomy.

Conclusion
We conclude that cholangiocellular carcinoma must be kept in mind as an entity in patients with neurofibromatosis type 1. According to our knowledge, this is the second case of co-occurrence of neurofibromatosis type 1 and cholangiocellular carcinoma reported in english literature.
Undiscribed Intra and Extrahepatic Congenital Choledochal Cysts

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Background
Choledochal cysts are congenital anomalies involving cystic dilatation of bile ducts. They usually lead to obstruction of the bile ducts and retention of bile. If the obstruction is not relieved, permanent damage may occur to the liver.

We report an undiscribed case of an intra and extrahepatic choledochal cystic dilatation.

Methods
A 5 years old female girl was referred to our center from Syria with C/C of abdominal pain and jaundice of few months duration. She was left untreated for few months because she couldnt seek medical attention because she was living in a war zone area.

Results
She was investigated and her blood tests revealed: serum bilirubin (total) 589 µmol/L, serum aspartate aminotransferase (AST) median 191.5 IU/L, gamma-glutamyl transferase 627.25 IU/L, alkaline phosphatase median 537 IU/L.

MRCP revealed dilatation of the right, left, common hepatic, common bile duct and cystic duct

Conclusion
Choledochal cysts are rare entities. The imaging modality of choice for diagnosing and characterizing choledochal cysts is MRCP. Our case has not been described before as it involves the intra and extra biliary system.
Validation study of the post-operative mortality risk score after liver resection for perihilar cholangiocarcinoma

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Background
A post-operative mortality risk score (POMRS) for perihilar cholangiocarcinoma (PHCC) has recently been published (Wiggers et al., J Am Coll Surg, 2016). In this report, the predicted mortality was 2% in the low-risk, 11% in the intermediate-risk, and 37% in the high-risk groups. The purpose of our study was to validate the previous study results in our department.

Methods
POMRS was calculated for 203 PHCC patients who had undergone major hepatectomy in our department using the five clinical characteristics from the previous study, which included 287 patients.

Results
The median age of the patients was 68 (41–86) years. Patients with preoperative cholangitis, future liver remnant (FLR) <30%, incomplete biliary drainage + FLR <50%, and portal vein resection were 37.4%, 1.4%, 0%, and 52.7%, respectively. The overall post-operative mortality rate was 6.4%. The mortalities in low-risk (n=47), intermediate-risk (n=99), and high-risk (n=57) patients were 2.1%, 7.1%, and 8.8%, respectively. There were no significant differences in mortality among these three groups (p=0.224).

Conclusion
There were no significant differences in the POMRS among low-risk, intermediate-risk, and high-risk patients in our department.
Video Choledochoscopy: A renaissance of an old technique?

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Background
Choledochoscopy has been proven to be helpful in various situations such as biliary obstruction and lesion identifications during liver surgery. The technique has not been used widely anymore due to modern radiological and gastroenterological imaging techniques. On the other hand video choledochoscopy can be set up as easily as a regular laparoscope helping the operating surgeon with ad hoc diagnosis and therapy in the OR.

Methods
This video shows the surgical treatment of a massive choledocho- and hepatolithiasis with help of a video choledochoscope.

Results
HD video choledochoscopy can be of value to the surgeon even in emergency situations with an easy setup using regular laparoscopic monitors in the OR in conjunction with a flexible, digital choledochoscope.

Conclusion
Direct HD visualisation of extra and intrahepatic bile ducts during surgery can be helpful in select patients.
Distal malignant biliary obstruction: A prospective randomised trial comparing plastic and uncovered self-expanding metal stents

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Background
The aim of this study was to determine the safety and clinical effectiveness of 10F plastic biliary stents compared to uncovered self expanding metal stents (SEMS) for palliative treatment of patients with inoperable extra-hepatic malignant biliary obstruction in a public hospital in South Africa.

Methods
From January 2009 to December 2013, 40 patients who were admitted to a tertiary academic centre because of distal malignant biliary obstruction were enrolled in a prospective randomized study. Patients were randomly assigned to receive an uncovered SEMS or a plastic stent deployed through the biliary stricture during endoscopic retrograde cholangiopancreatography.

Results
Median patient survival time in the two groups did not differ significantly (SEMS - 114 days; plastic - 107 days). Stent failure was more common in the plastic stent group (7/19 vs. 1/20). The results became significant after 6 months of follow-up. There was no significant difference between the two groups in the incidence of serious adverse events.

Conclusion
SEMSs had a longer duration of patency than plastic stents, which recommends their use in the palliative treatment of patients with biliary obstruction due to distal malignant biliary obstruction.
**Immunohistochemical and functional analysis of the new cholangiocellular carcinoma cell line CCC-5**

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**Background**

Cholangiocellular carcinoma (CCC) is a very rare tumor entity that evolves from small bile ducts. Because treatment options are limited better knowledge of the tumor physiology is needed. For this purpose, basic research is dependent on cell lines. As there are only few CCC cell lines disposable, we aimed to isolate new CCC cell lines from surgical samples.

**Methods**

The cell line was established from a 59-year-old Caucasian male patient who suffered from malignant pleural effusion of a distal cholangiocellular carcinoma (CCC). The cell line was established by explant culture and further characterized with immunohistochemistry and Western blotting. Mutational analysis was performed by means of AmpliSeq Cancer Panel v2. Additionally, we tested sensitivity towards commonly used chemotherapeutics by means of MTT assay.

**Results**

Immunohistochemistry and Western blotting showed expression of tumor markers typical for CCC cell lines such as CK7, CK18-8, Sox9, STAT3 and ERK. Analysis of sensitivity towards chemotherapeutics revealed that Irinotecan was the only agent with significant effect on cell proliferation. Mutational analysis identified different mutations in important oncogenes and tumor suppressor genes such as EGFR, p53 and NOTCH1.

**Conclusion**

The new cell line displays the typical characteristics of a CCC cell line. This new cell line might help to add new insights into this tumor entity and thereby help to find better treatment options for patients with CCC.
SHOX2 and SEPT9 Methylation is a potential biomarker for the diagnosis of biliary tract cancer

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Background
Biliary tract carcinoma (BTC) is a fatal malignancy with a late clinical presentation. Novel molecular markers for early diagnosis are urgently needed. The purpose of this study was to evaluate the diagnostic and prognostic value of promoter hypermethylation of SHOX2 and SEPT9 in BTC.

Methods
Relative DNA methylation of SHOX2 and SEPT9 was quantified in tumor specimens and matched normal adjacent tissue (NAT) from 71 BTC patients, as well as in plasma samples from an independent prospective cohort of 20 cholangiocarcinoma patients and 100 control patients. Receiver operating characteristic (ROC) curve analyses were performed to probe the diagnostic ability of both methylation markers. DNA methylation was correlated to clinicopathological and survival data.

Results
SHOX2 methylation was significantly higher in tumor tissue than in NAT (p < 0.001) and correctly identified 71% of BTC specimens with 100% specificity (AUC = 0.918; 95% CI 0.865-0.971). Elevated DNA methylation levels were also found in plasma derived from cholangiocarcinoma patients. SHOX2 and SEPT9 methylation as a marker panel achieved a sensitivity of 45% and a specificity of 99% in differentiating between samples from patients with and without cholangiocarcinoma (AUC = 0.752; 95% CI 0.631-0.873).

Conclusion
SHOX2 and SEPT9 are frequently methylated in biliary tract cancers. Promoter hypermethylation of SHOX2 and SEPT9 may therefore serve as a biomarker supporting diagnosis finding and therapy monitoring in clinical specimens.
The study presents successful treatment of a benign biliary stricture with biodegradable metallic biliary stents. The case involves a 19-year-old boy who presented with painless jaundice and negative tumor markers, brush cytology, and infective parameters. Pre-procedural MRCP confirmed a benign stricture at the distal CBD with dilated biliary systems. Consent was obtained to deploy a biodegradable balloon expandable biliary stent system (QualiMed Innovative Medizinprodukte GmbH, Germany) across the stricture via ERCP. The stent, made of flexible and magnesium-based material, was pre-mounted on an over-the-wire (OTW) stent delivery system.

Results showed the patient's symptoms resolved after deploying the stent. Repeat MRCP and ERCP at 10 months confirmed full degradation of the stent with no residual stricture and no jaundice. The stent maintained radial strength and patency, providing controlled delayed degradation over time.

Conclusion highlights the usability and mechanical properties of biodegradable biliary stents as comparable to regular metallic stent systems, with the advantage of fully degrading and leaving nothing behind.
The injury model of bile ducts in experiment

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Background
The data for this research were provided by the study of 10 experimental animals (pigs) with injuries to the common bile duct made during laparoscopic surgery using endoscopic equipment.

Methods
The animals were divided into two groups. The common bile duct was preliminary clipped in both groups, and then it was completely mechanically transected in one group, and thermally damaged in the other group.

Results
It was found that in the group of animals with mechanical transection of the common bile duct, its wall was damaged through its full thickness by 2.5±0.6 mm in the proximal stump and by 2.4±0.6 mm in the distal stump. In the group of animals with thermal injury, it spread over 11.0±0.7 mm proximally and over 11.3±0.5 mm distally from the transection, accompanied by choledoch necrosis through its full thickness over 3.7±0.2 and 3.4±0.5 mm, respectively. It is proved that in animals with thermal damage to the common bile duct, injuries were spread over 2/3 of its thickness due to mucosa and submucosa necrosis, as well as part of muscular component found at 6.3±0.8 mm in the proximal stump and at 6.7±0.6 mm in the distal stump.

Conclusion
Extrapolation of the case to human patients leads to the conclusion that in reconstructive surgery the proximal and distal stump of the common bile duct are to be re-resected by 3 mm in case of mechanical transection and by 7 mm in case of thermal injury.