C-001
SINGLE-PORT LAPAROSCOPIC CHOLECYSTECTOMY: COMPARATIVE STUDY IN THE CONSECUTIVE INITIAL 206 CASES

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Introduction: Laparoscopic cholecystectomy has been the standard of care for gallbladder diseases since the late 1980s. Many surgeons have rapidly adopted single-port laparoscopic cholecystectomy for gallbladder pathologies. The aim of present study was to analyze clinical outcome in initial single-port laparoscopic cholecystectomy.

Materials and Methods: Data from 206 consecutive single-port laparoscopic cholecystectomies between May 2008 and Jun 2012 were analyzed retrospectively. We divided the patient into four groups – group I (n = 56), II (n = 50), III (n = 50) and group IV (n = 50) consecutively. During each procedure only one longitudinal transumbilical incision, 1.5 to 2.0 cm in length, was made to access the abdominal cavity. One of the various single-port trocars was used for procedure. Standard laparoscopic instruments were used for the performance of cholecystectomy.

Results: Patient’s demographics did not differ among the groups. Of the fourteen cases that were converted to conventional laparoscopic surgery, seven were part of group I, one of II, five of III and one of group IV. Mean operation time for single-port laparoscopic cholecystectomy in each group was 71.6, 58.2, 69.1 and 53.3 minute in groups in order. There were two operative complications in the group I, five of III and one of group IV. During each procedure only one longitudinal transumbilical incision, 1.5 to 2.0 cm in length, was made to access the abdominal cavity. One of the various single-port trocars was used for procedure. Standard laparoscopic instruments were used for the performance of cholecystectomy.

Conclusion: Single-port laparoscopic cholecystectomy can be safely performed for various gallbladder lesions in selected cases, and the operation time improved with accumulation of cases.

C-002
NOTES AND GB SURGERY

G. V. Rao
Abstract not available at time of publication.

C-003
APPROACHES TO THE DIFFICULT GALL BLADDER (DIFFICULT LAPAROSCOPIC CHOLECYSTECTOMY)

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Laparoscopic cholecystectomy is now being performed for wider indications such as acute cholecystitis and other difficult situations. Factors that predict overall operative difficulty are – Clinical factors – Acute cholecystitis, Previous abdominal surgery, Cirrhosis, Age >65, Male and patients with BMI >27.2 kg/m² and Sonographic factors – GB wall >4 mm, Contracted GB, Pericholecystic collection, and Stone impaction in Hartman’s pouch. Using these risk factors, it was possible to divide patients into high-risk (Conversion Rate 15.3%) and low-risk groups (Conversion Rate 1.3%). Laparoscopic Cholecystectomy comprises four clear steps
1. Creation of pneumoperitoneum and insertion of all trocars: this may be difficult in patients with obesity, previous abdominal surgery.
2. Separation of all adhesions to the GB – A) Difficulty in retraction of GB. B) Difficult dissection around GB. Bleeding from dissected area can be troublesome especially in inflamed GB.
3. Dissection and skeletonization of the cystic duct and cystic artery. The cystic duct may be either short & wide, or adherent due to inflammation.
4. Excision and extraction of the GB is difficult if GB is friable, inflamed or has impacted large calculus.

Prediction of difficulty should not be considered to be contra-indication but surgeon must be better prepared. Improved optics, better instrumentations, special maneuvers & techniques and ‘tips and tricks’ learned from experience has allowed us to improve safety and reduce conversion rates even in these “difficult” cases. The presentation will cover techniques found useful in managing these cases at each step.

C-004
STRATEGY AND SKILLS ON PREVENTION OF BILE DUCT INJURY DURING LAPAROSCOPIC CHOLECYSTECTOMY

Q. Wang
Abstract not available at time of publication.

C-005
MANAGING GALLSTONE DURING PREGNANCY

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Introduction: Surgery during pregnancy entails the obvious added risk of morbidity for two – mother and fetus. Delay in definitive treatment of biliary disease during pregnancy increases acute biliary pancreatitis which impact on preterm delivery until fetus lost. Premature contractions became frequent and necessitating tocolytic and corticoid therapy used. Transient changes in the biliary system during pregnancy, including gallbladder stasis and the secretion of bile with increased amount of cholesterol and decreased amounts of chenodeoxycholic acid, increased the risk of gallbladder disease. Nonoperative management of symptomatic cholelithiasis increases the risk of complications of biliary lithiasis,
such as cholecystitis and empyema, while obstructing common bile duct stones with or without cholangitis and biliary pancreatitis raise maternal mortality.

**Methods:** Retrograde case report.

**Result:** One case of gallbladder stone during second trimester pregnancy was successfully treated with laparoscopic cholecystectomy in our institution.

**Conclusion:** Laparoscopic cholecystectomy during pregnancy has advantages for the mother in that it speeds up her recovery, giving her less pain and facilitated natural birth without a cesarean section. On the fetus side is always save, not induced preterm delivery or abortion.

Identification of gallbladder stone during pregnancy warrant a preventive laparoscopic cholecystectomy or endoscopic CBD exploration which promising a good outcome.

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**C-008**

**CHOLECYSTOSTOMY IN ACUTE CHOLECYSTITIS**

**P. Evans**

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Percutaneous Cholecystostomy (PC) tube placement is an established treatment option for acute cholecystitis. Procedure-related morbidity and mortality are low, but mean mortality from all causes is about 16% (range 0–48%) across most published series. Technical success rates for PC are high and in most cases there is resolution of acute cholecystitis within 1–3 days. Whilst transhepatic PC tube placement is preferred to direct puncture of the gallbladder, there is demonstrable difference in outcomes. PC tube blockage or dislodgement occurs in about 20% of cases, and recurrent cholecystitis occurs in approximately 10% of cases. In most series, half of all patients treated by PC eventually proceed to cholecystectomy. In the majority of cases this can be performed laparoscopically.

There are no universally-accepted indications for PC and multiple criteria have been suggested. It is generally reserved for those patients with high-risk for cholecystectomy (ASA >3, age >80 years, severe sepsis or ICU admission) or for patients with potentially reversible comorbidities. PC tube placement has been advocated for critically ill ICU patients with sepsis of unknown origin. There are no randomized controlled trials comparing PC to emergent cholecystectomy, and there is a need for such a trial. Any attempts to compare the two procedures based on published series is inappropriate due to selection bias.

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**C-009**

**ADVANCES IN DIAGNOSIS AND STAGING FOR HEPATOCELLULAR CARCINOMA**

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**Diagnosis:** Probably the best non-invasive approach to diagnosis of HCC was outlined by the AASLD. Because of the limitations of serum AFP measurements, other serum markers of HCC used alone or in combination with AFP have been evaluated for diagnosis or prognosis in patients with HCC. Although these other markers are not used in routine clinical practice, they continue to be a topic of investigation. When the studies are inconclusive, follow-up imaging may clarify the diagnosis. Molecular genetic studies have shown promise in identifying a molecular signature that can differentiate dysplastic nodules from HCC, but more studies are needed. Percutaneous biopsy should only be performed when imaging results are uncertain, and when the result would...
directly impact on management. Unfortunately, remains a challenge to properly differentiate a tumor-related from a cirrhosis-related benign portal vein thrombosis in a patient with HCC occurring in a cirrhotic liver.

**Staging Systems:** Many systems have been proposed to predict the prognosis for HCC, none of which has been universally adopted. These schemas variably incorporate: the severity of underlying liver disease, the size of the tumor, local tumor extension and the presence of metastases. A 2010 consensus conference from the AHPA proposed that the staging of the AJCC/IUCC should be used to predict outcome following resection or liver transplantation. The BCLC scheme is appropriate in patients with advanced HCC not candidate for surgery. However, there is no universal agreement as to which staging system is best in predicting the survival of patients with HCC.

C-010  
**MOLECULAR MARKERS OF HCC – A GUIDE TO TREATMENT OPTIONS AND PROGNOSIS**  
R. T-P. Poon  
Abstract not available at time of publication.

C-011  
**BIOPSY SHOULD BE PERFORMED BEFORE RESECTION OR TRANSPLANT FOR HCC**  
(for the ‘No’ side of the debate)  
K. Madhavan  
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In this debate regarding the biopsy of suspected HCC before liver resection or transplantation, I will be first laying out the reasons for even considering a biopsy prior to what is considered and hoped to be curative treatment of HCC.

Evidence will be looked at on which are based the advice to biopsy suspected lesions in the liver prior to surgical treatment. Most of these perceived benefits are based on not sound data and are far out weighted by the risks from a biopsy – both as regards complications and long term oncological disadvantages. Also, available evidence does not allow us to deny any patient transplantation or resection based on biopsy findings. The various techniques of biopsy employed now a days will be analyzed and their success rate and failure rate will be compared including the consequences of each. Finally a critical look at the benefits of a pre op biopsy and its “value” in the current surgical treatment of chronic liver disease will be undertaken.

C-012  
**DEBATE: BIOPSY SHOULD BE PERFORMED BEFORE RESECTION OR TRANSPLANT FOR HCC (FOR THE ‘YES’ SIDE)**  
M. C. Wu  
Abstract not available at time of publication.

C-013  
**RESECTION STRATEGIES IN HEPATOCELLULAR CARCINOMA (HCC)**  
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According to Japanese guidelines for HCC, liver resection is recommended for HCC patients with 3 or less tumors regardless of tumor size, provided liver damage (Child – Pugh classification) is A or B. For more appropriate patient selection, precise evaluation of hepatic functional reserve and extent of liver resection is essential. Liver surgeons in Japan routinely measure the indocyanine green (ICG) 15-minute retention rate for more precise evaluation. An ICG integrated algorithm to decide which extent of liver resection tolerable for each patient is widely used in Japan [Makuuchi M 1993 Semin Surg Oncol 9: 298].

HCCs often invade portal venous system or Glisssonian sheath, and therefore, surgery for these tumors should involve the resection of tumor-bearing portal venous branches or Glissonian pedicles. Anatomic resection, ultrasonically guided segmentectomy, is a method developed to overcome the dilemma between the benefits and risks of surgical procedures. Oncological advantage of anatomic resection has been shown by a number of cohort studies. Recent advance in 3-D computer simulation has enabled liver surgeons more precise and safe operative planning.

C-014  
**TECHNIQUES OF VASOCONTROL DURING LIVER RESECTION**  
W. Zhou  
Abstract not available at time of publication.

C-015  
**SALVAGE SURGERY AFTER DOWNSTAGING FOR HCC**  
H.-J. Kim  
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Surgical resection remains the best treatment for HCC, and small HCC resection has markedly improved the outcome after resection. Resection of large HCC may still provide an opportunity of long-term survival, but the outcome of patients with unresectable HCC is extremely poor. In clinical practice, large unresectable HCC still dominates in patients, for whom downstaging-resection is a new approach to surgery. Downstaging followed by resection (downstaging-resection, cytoreduction and sequential resection) plays a role in improving prognosis of patients with unresectable HCC.

We have experienced 20 downstaging resection patients until 2010. Approaches for downstaging included transarterial chemoembolization (TACE), hepatic intra-arterial infusion chemotherapy, portal vein embolization and radiotherapy with mono- or combined therapy. Our regimen for hepatic arterial infusion chemotherapy (HAIC) is low dose 5 FU plus cisplatin. Overall and recurrence-free survival rates at 1, 3 years were 81%, 61%, and 64%, 53%, respectively.
SURGERY FOR RECURRENT HEPATOCELLULAR CARCINOMA
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Hepatic resection is a major effective treatment for patients with HCC, however, 75%–85% of patients develop tumor intrahepatic recurrence within 5 years after resection. The treatment for intrahepatic recurrence after hepatic resection is of vital importance for prolonging overall survival of the patients. The treatment for recurrent HCC includes surgical treatment (repeat hepatic resection and salvage liver transplantation) and nonsurgical treatment (ablation therapy, percutaneous ethanol injection, transcatheater arterial chem-oembolization and medical treatment). Nonsurgical treatment is usually applied to recurrent HCC unsuitable for second operation, either because of advanced nature of recurrent HCC or insufficient preserved liver function. Radiofrequency ablation is usually recommended for patients with a limited number of small recurrent tumors, only with 5-year overall survival of 18%–51.6%. Transcatheater arterial chemoembolization is another widely accepted nonsurgical treatment for multinodular recurrent HCC, the 5-year survival only ranges from 0 to 27%. Molecular targeted therapies (such as sorafenib) are recommended for patients with advanced recurrent HCC, with limited benefit. Surgical removal is still believed to be the most effective treatment for recurrent HCC. The 5-year survivals of 23%–69% after repeat resection were reported. Our cohort study showed the 1-, 3- and 5-year overall survivals after repeat hepatic resection in 81 patients with recurrent HCC were 70.9%, 40.8% and 22.4%, respectively. Salvage liver transplantation is another treatment choice for recurrent HCC fulfilling the Milan criteria. Studies have indicated that salvage liver transplantation for recurrent HCC fulfilling the Milan criteria could achieve similar long-term survival as primary liver transplantation. Our cohort study showed that the 1-, 3- and 5-year overall survivals of salvage liver transplantation in 11 patients with unresectable recurrent HCC (8 of 11 patients with recurrent HCC beyond the Milan criteria) were 90.9%, 46.8% and 46.8%, respectively. Collectively, surgical treatment, either salvage liver transplantation or repeat hepatic resection, provides the best survival benefit in selected patients with recurrent HCC.
C-019  
**PANCREATITIS AND PANCREAS DIVISUM**  
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Pancreas divisum (PD) is the most common congenital anomaly of the pancreas, which accounts for 8% of normal population. It is controversial whether the relatively obstructive outflow of Santorini duct in PD can lead to recurrent acute pancreatitis (RAP), chronic pancreatitis (CP), or just an innocent bystander of idiopathic CP.

Critical reviews showed that the prevalence of PD in patients with RAP or CP is probably similar to patients without pancreatitis. Isolated dorsal pancreatitis which is the hallmark and suggests that PD is a culprit of RAP or CP is not always present (30–88%). CFTR and SPINK1 mutations have been found commonly in patients with PD and RAP or CP (22% and 42%, respectively). There are many case series but there is only 1 small RCT on the efficacy of endoscopic therapy for PD in RAP and none exists for CP. The proper endoscopic technique is not yet established. Results of the treatment also varied but are better in RAP (81%) than CP (69%).

Eventually, careful patient selection for the treatment is essential. Suitable patients are likely patients who present with RAP (not CP or pancreatic pain only), have isolated dorsal pancreatitis (by pancreatogram or EUS), dilated Santorini duct, Santorinicele or in the presence of CFTR or SPINK1 mutations.

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C-020  
**TECHNIQUES AND TIMING OF SURGICAL INTERVENTION IN ACUTE PANCREATITIS**  
R. Carter  
Abstract not available at time of publication.

C-021  
**MANAGEMENT OF HEMORRHAGIC COMPLICATIONS IN SEVERE ACUTE PANCREATITIS**  
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Massive hemorrhagic complications may occur in the course of severe acute pancreatitis (SAP) either in early or late period. The incidence of hemorrhagic complication in acute pancreatitis is reported with a wide range (from 1% to 15%) in the literature. Once hemorrhagic complications happen in patients with SAP mortality is considerably high. Hemorrhagic complications in SAP may include various types of source such as gastrointestinal (e.g. peptic ulcers, gastrointestinal varix), intraabdominal, retroperitoneal, surgical site, or abscess cavity.

Among gastrointestinal bleeding, left-sided portal hypertension (cause for gastrointestinal varices) due to isolated obstruction of splenic vein is frequently seen in SAP. Much more attention should be paid for patients with necrosis and/or pseudocyst who have higher incidence of splenic vein obstruction. First management of choice for hemorrhage from gastrointestinal varices is endoscopic treatment, but in cases with refractory bleeding surgical management with splenectomy should be considered.

Bleeding from local major vessels (artery and vein) is major cause of death of SAP. Pathophysiology of disruption of major vessel is various as follows; 1) devastation due to severe inflammation and pancreatic necrosis which is usually seen in the early period. 2) pancreatic or peripancreatic abscess which is more often observed in weeks to months after the onset. 3) pseudocyst formation which makes erosion, persistent compression, ischemia combined with enzymatic action. Management of hemorrhage from major vessel should be selected according to the site of bleeding. In bleeding from arteries interventional radiology (angiographic embolization) should be attempted as early as possible, keeping in mind that if it is fails then only surgical treatment gives the patient a chance to survive. On the other hand, venous bleeding is more frequently required surgical management such as packing or emergency proximal or distal pancreatectomy.

Hemorrhagic complications is fatal event in the course of SAP, awareness is needed especially for patients at high-risk such necrotizing pancreatitis, abscess, pseudocyst or patients after necrosectomy. Management should be selected in each case according to the site of bleeding, while the entire management for SAP. Of note when hemorrhagic complication occurred surgical management is sometimes still only chance to survive for patients with SAP.

C-022  
**ENDOSCOPIC THERAPEUTIC TECHNIQUES IN ACUTE AND CHRONIC PANCREATITIS**  
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ERCP has continued to have a role in management of acute and chronic pancreatitis. Endoscopic treatments serve as an adjunct to surgical treatment in many cases. The endoscopic treatments may provide definitive care without surgery.

ERCP is used in gallstone pancreatitis for patients with associated cholangitis and rising bilirubin. In other cases of gallstone pancreatitis, laparoscopic cholecystectomy with cholangiogram is the mainstay of treatment with ERCP reserved for failed laparoscopic stone extraction. Endoscopic management of chronic pancreatitis with stenting of strictures and drainage of pseudocysts has become standard first line of treatment. Techniques for transgastric drainage and debridement of pancreatic abscess and necrosis are also increasingly successful.

Prospective trials demonstrate improved outcome with decreased morbidity, mortality and hospital stay for patients with gallstone pancreatitis and associated cholangitis, if ERCP is done within 72 hours. Endoscopic stenting for chronic pancreatitis is successful in the medium term for approximately two-thirds of patients. Surgery remains the definitive treatment for endoscopic stenting failure, but with higher morbidity. Pancreatic pseudocysts can be drained endoscopically with expected 90% long-term success rate. Pancreatic abscess and infected necrosis can be approached in selected cases via an endoscopic transgastric route with
excellent results. In early studies, approximately two-thirds of patients treated with this approach can be successfully managed entirely endoscopically. The endoscopic approach does not seem to complicate surgery when it is used in an adjunctive fashion.

In summary, advances in endoscopic management of pancreatic disease are notable in the treatment of pancreatic stricture and pseudocyst/abscess. Successful endoscopic treatment has reduced the necessity of complex surgical approaches for selected subset of patients.

C-023
NOVEL THERAPIES FOR ACUTE PANCREATITIS
S. Connor
Abstract not available at time of publication.

C-024
THE MIRRIZZI SYNDROME
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The Mirrizzi Syndrome (MS), was first described by Pablo Mirrizi in 1948 as “Hepatic duct Syndrome”. This syndrome is rare and occurs as a result of an impacted stone in the Hartmann pouch compressing the common bile duct (CBD) and develop of a cholecyscholedocal fistula, replacing the entire CBD in advanced cases.

The diagnosis is suspected by the presence of jaundice in an atrophic gallbladder with stones in the Hartmann pouch and dilation of proximal bile duct. The cholangioMRI is the best non-invasive diagnostic test. The endoscopic retrograde cholangiography may be useful in doubtful cases or associated cholangitis.

The treatment of the MS depends to the grade of replacement of hepatic duct wall and can range from CBS plasty to Roux en Y biliary reconstruction. The historic approach to the MS had been by open surgery, however, some authors have development a laparoscopic approach with a complete resolution for initial grade. The best evidence nowadays suggests that laparoscopic surgery is possible in selected cases, therefore a precise preoperative diagnosis is required for best results.

We will discuss someone aspect about the MS with a particular emphasis in the diagnosis by image tools and the alternatives of treatment by open and laparoscopic surgery.

C-025
CASE PRESENTATION: GALLBLADDER POLYP(S)
A. K. Agarwal
Abstract not available at time of publication.

C-026
BILE DUCT INJURY CASE DISCUSSION
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Three case scenarios are presented
1. On table recognized bile duct injury during laparoscopic cholecystectomy.
Questions to be answered:
• 1. In the absence of a specialist HPB surgeon what is to be recommended.
2. 8 days post cholecystectomy patient has bile leak with ERCP showing complete cut-off. No evidence of sepsis
Questions to be answered:
• On present evidence what is best approach Immediate repair or late repair (6–8 weeks)
3. Established bile duct stricture with evidence of portal hypertension (Varices)
Question: What approach to be adopted?
Question: Role of endoscopic stenting in this or other patients of BDI.

C-027
CASE PRESENTATION: COMPLEX CHOLEDOCHAL CYST
V. Sitaram
Abstract not available at time of publication.

C-028
LAPAROSCOPIC EXCISION OF CHOLEDOCHAL CYSTS
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Introduction: In spite of benign disease, choledochal cyst must be removed with the gallbladder (GB) due to the cancer risk in the biliary tract. The most of patients are young female or children, who have strong interest in cosmetic results in addition to complete resolution of medical problems. Here we introduce laparoscopic management of choledochal cyst.
Methods: Between 2003 and 2011, we performed laparoscopic choledochal cyst excision in 82 patients using 4 hole method. There were 3 open conversion cases. There was one case of robotic surgery and one case of combined laparoscopic liver resection due to liver involvement of cyst. Excision of cyst and anastomosis were performed laparoscopically. We will present our method showing video.
Results: The mean operation time was 230 minutes. The estimated blood loss was 197 ml. The average length of hospital stay was 8.6 days. The most common complication was minor bile leakage (7%) and fluid collection (2.5%), which was managed conservatively.
Conclusions: The laparoscopic management can be a treatment of choice for the most of choledochal cyst considering good cosmetic result as well as operative safety.
C-030
MASTER VIDEO SESSION: RESECTION OF HILAR CHOLANGIOCARCINOMA WITH VASCULAR RECONSTRUCTION
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Abstract not available at time of publication.

C-029
RESECTION FOR ADVANCED GALLBLADDER CANCER
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Introduction: Advanced gallbladder cancer has been revealed to result in an ominous prognosis despite of aggressive surgical resection, especially in cancer of stage III and IV.

Methods: Therefore, we changed the surgical strategy for advanced gallbladder cancer for obtaining a sufficient outcome after aggressive surgical resection. The newly developed strategies are the severe patients selection for surgical indication, and the utilization of pre-operative down-staging chemotherapy.

Results: Herein I like to show the typical two cases of advanced gallbladder cancers, one of which was treated following severe patient selection despite of bile duct involvement, and the other one was a patient following preoperative down-staging chemotherapy with video presentation of surgical resection.

The first case is of a gallbladder cancer who had undergone CABG using the right gastroepiploic artery before. Tumor of the gallbladder neck invaded the bile duct, and she presented with jaundice. After preoperative biliary drainage, she underwent preoperative portal vein embolization of the right portal branch. Extended right hepatectomy and bile duct resection was done. Pathological findings revealed pT4, pN1 stage IVa. She recovered well after surgery, and still alive over 3 years after surgery.

The second case of advanced gallbladder cancer was 57-year-old woman.

Gallbladder cancer invaded the bile duct and the hepatic artery. We applied right portal vein embolization, and neoadjuvant chemotherapy with Gemcitabine was given for the aim of neoadjuvant down-staging.

After neoadjuvant chemotherapy gallbladder cancer decreased in size and right hepatic artery invasion appeared to be remarkably improved.

She underwent extended right hepatectomy with bile duct resection. She recovered well, and still alive 3 year after surgery.

Conclusions: Aggressive surgical resection might improve the outcome by the introduction of the new strategies such as severe patients selection and preoperative down-staging chemotherapy in the patients with advanced gallbladder cancer.

C-031
COMPLEX LIVER RESECTION FOR HILAR CHOLANGIOCARCINOMA
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Bile duct resection and major hepatectomy is considered as standard treatment for hilar cholangiocarcinoma (HC). However, the extent of hepatic resection according to the Bismuth classification is still controversial. Among hepatic resection which can be performed for hilar cholangiocarcinoma, liver parenchyma preserving surgery including central bissectionectomy with caudate lobectomy or isolated caudate lobectomy for Bismuth type I or II is very complex procedure. I would like to present these 2 procedures for HC in the master video session.

After bilirubin level was below 3 mg/dl through bile duct drainage with PTBD, surgery was performed. I prefer bilateral subcostal incision with median extension for the surgery of hilar bile duct cancer. For the details of central bissectionectomy with caudate lobectomy, the hepatoduodenal ligament was dissected to clear lymph nodes and to ascertain vascular invasion, and then the CBD was divided near the pancreas. After division of hepatic artery and portal vein to the anterior section of the right hemiliver, several small portal vein branches to the caudate and the Spigelian’s lobe were also controlled. Next the right hemiliver and the caudate lobe were mobilized through division of small hepatic veins to the IVC and the Arantius duct. Liver parenchymal dissection was begun between left lateral and medial section with CUSA dividing vessels to the medial section and bile duct at the peripheral level of the confluence of B2 and B3, and the middle hepatic vein was divided at the level of vena cava using Endo-GIA. Finally, liver parenchyma between right anterior and posterior section was transected along with the right hepatic vein and bile duct was divided at the confluence level of B6 and B7. Hepaticojejunostomy was performed withinterrupt sutures using 5.0 Vicryl.

For the details of isolated caudate lobectomy for type II hilar cholangiocarcinoma, the hepatoduodenal ligament was dissected to clear lymph nodes and then distal bile duct was divided near the pancreas. Then small portal vein infl ow was controlled with very meticulous technique and the whole caudate lobe was mobilized after small hepatic vein was dissected from inferior vena cava. Liver parenchyma dissection was performed with CUSA and 3 hepaticojejunostomy was carried out.

These parenchyma preserving technique could offer safer and radical resection for type II hilar cholangiocarcinoma without substantial parenchymal volume loss.

C-032
KLATSKIN TUMOR BISMUTH IIIB WITH CONTRALATERAL VASCULAR INVASION
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Sección de Cirugía Hepatobiliopancreática, Hospital Italiano de Buenos Aires-Argentina

Introduction: Since the first resection of a Klastkin more than 50 years ago, a significant progress in the different
C-033

ROBOTIC-ASSISTED LAPAROSCOPIC RADICAL RESECTION WITH MAJOR HEPATECTOMY FOR HILAR CHOLANGIOCARCINOMA

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Background: Laparoscopic hepatectomy has been reported extensively in the literature. However, hilar cholangiocarcinoma still remains contraindication for laparoscopic technique due to difficult radical resection and hepaticojejunostomy. At present, the robotic technique made the difference, allowing the performance of procedure with complex manipulative maneuvers otherwise not feasible in minimally invasive surgery. This video demonstrates technical aspects of the first case of robotic-assisted laparoscopic anatomic left hepatectomy and caudate segmentectomy, Roux-en-Y hepaticojejunostomy for radical resection of hilar cholangiocarcinoma in China.

Methods: A 54-year-old man with hilar cholangiocarcinoma was referred for surgical treatment. The robotic-assisted laparoscopic anatomic left hepatectomy and caudate segmentectomy, Roux-en-Y hepaticojejunostomy for radical resection of hilar cholangiocarcinoma was performed. The operation followed several distinct phases: liver mobilization, skeletonized hepatoduodenal ligament, dissection and division of the left hepatic artery and left portal vein, parenchymal transection with harmonic shears and endoscopic stapling device for division of the left hepatic vein, plasty of the right bile ducts and Roux-en-Y hepaticoenterostomy. Two abdominal drainages were placed posterior to the anastomosis. No Pringle maneuver was used. The specimen was extracted through a suprapubic incision using an endobag.

Results: The operative time was 600 min, and the blood loss was 600 ml, with no blood transfusion. The surgical resection margins were free of tumor. The transient bile leakage was observed and cured with conservative treatment on postoperative third day. The postoperative stay was 12 days.

Conclusions: Robotic-assisted laparoscopic anatomic left hepatectomy and caudate segmentectomy, Roux-en-Y hepaticojejunostomy for radical resection of hilar cholangiocarcinoma is safe and feasible. For the patients with hilar cholangiocarcinoma, robotic surgery builds upon the advances to open surgery introduced by minimally invasive surgery.

C-034

MOLECULAR TARGETING OF PANCREATIC CANCER

A. Biankin

Abstract not available at time of publication.

C-035

THE APPLICATION OF STEM CELL TECHNOLOGY IN HPB DISORDERS

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Introduction: Hepatocellular carcinoma is the third leading cause of cancer related mortality worldwide. 75% of patients are not amenable to locally curative therapy and current chemotherapeutic treatments have limited efficacy. Liver transplantation remains the only effective treatment for end stage liver disease and acute hepatic failure. However the magnitude of this intervention and the limited supply of donor livers have spurred efforts to find alternative solutions.

Both of these areas are being addressed by advances in our understanding of stem cell biology and the use of cell based therapies.

Methods: A review was undertaken of recent developments in stem cell biology especially as it relates to the understanding and treatment of hepatobiliary and pancreatic disorders.

Results: Advances in our knowledge of liver and pancreatic stem cells combined with an appreciation of the importance of the cancer stem cell hypothesis has lead to greater understanding of hepatocellular carcinoma and offers great promise for better therapeutic strategies in the future. Recent advances in basic cell biology have also provided a variety potential useful source of cells for cell based therapies. This could successfully over come one of the major stumbling blocks in the field thus far.

Conclusions: Developments in cell biology and stem cell biology in particular are providing exciting new insights into hepatobiliary disorders. Although these advances have not led to tangible therapeutic interventions yet, this is likely to change in the coming years.
C-036
LAPAROSCOPIC APPROACH FOR CYSTIC DISEASE OF THE BILIARY TRACT
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With rapid development and wide application of laparoscopic procedure, advanced laparoscopic operation is being performed more frequently in complex biliary diseases including choledochal cyst. Laparoscopic excision of choledochal cyst and Roux-en-Y choledocho-jejunostomy is being gradually introduced to the treatment of choledochal cyst. Between August 2004 and September 2011, 42 patients underwent laparoscopic excision of choledochal cyst and Roux-en-Y choledocho-jejunostomy for choledochal cyst. We retrospectively analyzed the clinical outcomes of the 41 patients, excluding 1 patients requiring conversion to open surgery. There were 12 men and 29 women, with a mean age of 30.2 years. The operation was performed with total laparoscopic method using the four-port technique in 40 patients and with laparoscopic assisted method in 1 patient. The mean operation time was 278 minutes. Intraoperative transfusion was needed in three patients (7.3%). The postoperative complication occurred in 9 patients (21.9%), including bile leakage (n = 3), aspiration pneumonia (n = 1), bacteremia (n = 1), melena (n = 1), intraabominal fluid collection (n = 1) and intraabominal bleeding (n = 2); one patient with intraabominal bleeding was treated by re-operation and the others were improved by conservative management. The mean postoperative hospital stay was 9.6 days. After a mean follow-up of 30 months, 5 patients (12.1%) experienced the anastomotic stricture, which were managed by radiologic intervention in four patients and revision of anastomosis in two patients. This study shows that laparoscopic excision of choledochal cyst and Roux-en-Y choledocho-jejunostomy is a useful therapeutic option in the treatment for the patients with choledochal cyst. Laparoscopic approach for biliary disease is more and more used than before, including cystic disease as well.

C-037
PARASITIC DISEASES OF THE BILIARY TRACT (BILIARY ASCARIASIS)
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Parasitic Infestation of the biliary tract is mostly caused by Ascaris lumbricoides, Clonorchis sinensis, Fasciola species, Opisthorchis species, Matorchis conjunctus and Dicrocoelium dendriticum. Ascariasis, a helminthic infection of humans, is the most common parasitic infestation of the gastrointestinal tract. It infects about 25% of the world’s population; around 20 thousand deaths occur per year from an adverse clinical course of the disease. The adult parasite commonly infests the small intestine without producing any significant symptoms. However, it may migrate via the papilla into the biliary ductal system leading to a wide range of features. This presentation is focused on biliary ascariasis, examining in some detail the pathogenesis of the disease with special reference to post cholecystectomy biliary ascariasis, postoperative biliary ascariasis, biliary ascariasis in pregnancy and related issues. Ultrasonography is a highly sensitive and specific method of detection of worms in the biliary tree. ERCP is an excellent diagnostic tool playing a definite therapeutic role in worm extraction. Surgery is only indicated in complicated cases. Although an endemic disease of tropical and subtropical countries, increasing population migration facilitated by fast improving communication facilities demands that clinicians everywhere be familiar with the clinical profile and management of biliary ascariasis.

C-038
ASYMPTOMATIC COMMON DUCT STONES – EXPLORE OR LEAVE ALONE
R. Finch
Abstract not available at time of publication.

C-039
MANAGEMENT OF PERIAMPULLARY DIVERTICULUM
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Background: Periampullary diverticula (PAD) are outpouchings of the duodenum that occur within 2 to 3 cm from the ampulla of Vater. In the majority of cases they are acquired and are most commonly noted in the elderly. They have been associated with a number of pancreaticobiliary diseases.
Methods: Management of PAD and their association with pancreaticobiliary disorders are evaluated.
Results: The prevalence of PAD ranges from 12–27% based on endoscopic studies and is rare below the age of 40 years. There are anecdotal accounts implicating PAD with choledocholithiasis, and with acute and chronic pancreatitis. Increased bacterial colonization of the biliary tract has also been associated with PAD. Bacterial overgrowth symptoms more commonly complicate jejunal diverticula than purely PAD. Bleeding and perforation are also rare complications of PAD. There is no role for surgical or endoscopic treatment of asymptomatic PAD. When associated with recurrent choledocholithiasis, endoscopic sphincterotomy or surgical biliary drainage procedures have been advocated. Surgical diverticulectomy and repair is reported in cases of perforation. Bleeding complications can be managed by endoscopic techniques, angiographic embolization and rarely require surgical diverticulectomy and suturing.
Conclusions: PAD are common but rarely produce pancreaticobiliary disease. Endoscopic intervention or surgery is reserved for truly symptomatic cases and when complicated by perforation or bleeding.

C-040
MOTILITY DISORDERS OF THE GALL BLADDER AND SPHINCTER OFOddi
J. Toouli
Abstract not available at time of publication.
C-041
MANAGEMENT OF ENDOSCOPIC PERFORATION OF THE CBD AND/ OR DUODENUM
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Perforation of the duodenum or bile duct is an uncommon complication of ERCP. With the advances of non-invasive imaging of the biliary tree, rarely is an ERCP required for diagnosis. The vast majority of ERCP’s is now done with therapeutic intent, and with that comes an increased inherent risk of complications. However, in experienced hands, the risk of significant perforation of the duodenum or bile duct is less than 1%.

Management of such perforations requires a selective approach. The need for intervention depends on the type and mechanism of injury, and the findings on CT imaging. Most perforations will be able to be managed conservatively, but a minority require prompt and effective surgical intervention, to minimize the risk of morbidity and indeed mortality.

The indications for and types of intervention will be discussed.

C-042
TRANSPLANTATION FOR HCC-OVERVIEW
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Patients with unresectable hepatocellular carcinoma (HCC) were a part of the initial experiences with liver transplantation (LT). These experiences often led to poor outcome. With newer chemotherapy and multimodality approach in the 1980s, LT was relegated to second line treatment. The largely ineffective neoadjuvant studies which included large and multi-focal tumors, and the long waiting time made LT for HCC impractical. This prompted the development of loco-regional treatment modalities. Later experience showed that excellent results could be achieved in patients given proper selection. Renewed enthusiasm for LT resurfaced by the 1990s with rigid selection criteria, improved organ allocation, and shorter waiting time for donor livers.

LT now offers the best chance for cure for selected patients with unresectable HCC. But not all patients with unresectable HCC are suitable to be transplanted. Improved outcome of LT for HCC greatly depends on recipient selection and accurate tumor staging. Both rely heavily on diagnostic imaging. The role of adjuvant and neoadjuvant treatments needs further evaluation in the overall objective of disease removal and liver replacement.

Henceforth, early cancer detection and accurate pretransplant staging are the key factors to successful LT outcomes for HCC. Using Milan criteria, excellent recurrence-free survival of >92% at 3 years is now achievable.

Although living donor liver transplantation (LDLT) assumed a key role in the pre Model for End-stage Disease (MELD) era, the current MELD prioritization for HCC reduced the necessity for LDLT in countries like the U.S. and parts of Europe. Unfortunately, there is a prolonged waiting time for candidates to receive allocated deceased organs in some countries due to a very low deceased donation rate which contributes in patient drop-out due to tumor progression. Advances in adult LDLT demonstrate survival benefits over deceased donor liver transplantation (DDLT) as regards to decreasing waiting time and drop-out since it is not restricted by organ allocation system but other studies observe that although LDLT decreases waiting time, it may also be associated with higher rates of disease recurrence.

There are no consensus accepted criteria for the use of LDLT for HCC. Centers offering LDLT use currently accepted criteria in DDLT or adopted their own criteria. The Milan criteria have been expanded to UCSF, Pittsburgh, Tokyo, Kyoto, and Hangzhou criteria. Novel approaches to down-staging tumors initially beyond the Milan criteria were evaluated using loco-regional therapies or a combination of strategies. Currently, new paradigms that look into tumor biological behavior are being investigated to explain HCC recurrence.

C-043
RESECTION OR TRANSPLANTATION FOR HCC
S. Cleary
Abstract not available at time of publication.

C-044
TRANSPLANTATION VERSUS LOCO REGIONAL THERAPY FOR THE SMALL HCC
D. Mirza
Abstract not available at time of publication.

C-045
EXTENDED CRITERIA FOR LIVER TRANSPLANTATION IN HCC
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Hepatocellular carcinoma (HCC) is the most common primary form of malignant liver tumor. Relative to other tumors, it ranks fifth in overall frequency (fifth in men and eighth in women) and fourth in annual mortality rate. China is one of the highest prevalent areas of HCC, mainly because chronic hepatitis B carrier account for more than 10% of the population. Liver transplantation (LT) is the ideal treatment for patients with HCC in the setting of cirrhosis with liver dysfunction, since it treats both the tumor and the underlying liver disease, and the prognosis has also been greatly improved.

However, the shortage of donor resources is the negative factor that curtail the development of LT for HCC. Therefore, to choose the most suitable HCC patients and to explore the most scientific criteria are the present mainstream point of view. In recent years, several selection criteria for HCC patients have been established by some transplant centers. Such as Milan criteria, Pittsburgh modified TNM criteria, University of California San Francisco (UCSF) criteria, Turkey criteria, Kyoto criteria, Tokyo 5-5 rule, Asan
criteria and so on. A scientific and effective criteria is considered to meet the following condition. First, The criteria should be not too restrictive. There are many patients with HCC who also have a significant chance for cure. Second, the criteria should be able to select patients eliminating the risk of post transplant HCC recurrence. Macro morphological characteristics of HCC, in fact, give an imprecise estimate of the tumor’s aggressiveness since a significant number of small HCC already have aggressive features such as a poorly differentiated grade or microscopic vascular invasion. Moreover, in China, nearly 40% donor livers are offered to HCC patients, who have hepatitis B related backgrounds and more advanced or aggressive tumor characteristics. Based on more than 10 years’ work, Hangzhou criteria was established by our center from Zhejiang University, Hangzhou, China. Apart from the presence of macrovascular invasion, HCC patients meeting Hangzhou criteria must fulfill one of the two following items: (a) Total tumor diameter less than or equal to 8 cm; (b) total tumor diameter more than 8 cm, with histopathologic grade I or II and preoperative AFP level less than or equal to 400 ng/mL, simultaneously. The difference between survival curves of patients fulfilling Milan criteria and patients fulfilling Hangzhou criteria did not achieve statistical significance. There are two advantages of Hangzhou criteria. First, a new cut-off point of total tumor size at 8 cm was set. Second, the new criteria does not only rely on tumor size, but also increase reliance on the histopathologic grading and serum AFP level. Hangzhou criteria expands the Milan criteria without significantly increasing the probability of post transplant HCC recurrence, and have achieved the similar long-term survival of Milan criteria through several transplant centers’ practical proof, so that more patients with HCC can be candidates for LT. This result is widely recognized and highly evaluated by many international transplant experts. Hangzhou criteria can lay a good foundation for not only the establishment of China criteria, but also the long-term development of LT in China.

Liver transplantation (LT) offers a potential curative option for patients with HCC, but post-operative tumor recurrence remains one of the most prevalent causes of unsatisfactory long-term survival. Therefore, identification of reliable prognostic factors for tumor recurrence and death could have significant clinical importance. Detection of tumor-associated biomarkers, especially the serum ones have a more extensive clinical application. Over the past few years, many groups have focused on searching for reliable molecular biomarkers to better distinguish subtypes. Our group have indicated that the expression of CpG island methylator phenotype (CIMP), Multidrug resistance 1 (MDR1) gene, HOTAIR and the protein level of X-linked inhibitor of apoptosis protein-associated factor 1 (XAF1) could be candidate biomarkers for predicting tumor recurrence in HCC patients who have undergone liver transplant. With the development of Molecular Biology and Genetic Engineering, more and more doctors transfer their viewpoint onto the gene which can be predicted the risk of tumor recurrence in HCC after transplantation. Future studies will be focused on searching for molecular biomarkers to reflect the phenotype and Pathological features and to consummate the criteria of HCC for LT, and proposing a more reasonable and optimized model for patient selection and prognosis prediction, which will benefit more HCC patients for LT.

C-046

MANAGEMENT OF HCC ON THE LIVER TRANSPLANT WAITING LIST

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Liver transplantation is an effective therapy for patients suffering from hepatocellular carcinoma and represents 26% to 34% of the indications. The consequence of waiting for a cadaveric organ is that the tumor can progress with possible effects on outcome. Waiting list monitoring should be performed every three months by contrast enhanced CT or contrast enhance MRI. The primary goal of bridging therapy will be to prevent waiting list drop-off by reducing tumor progression and secondary prevent HCC recurrence and improve survival after liver transplantation. Transarterial chemoembolization (TACE), radiofrequency ablation (RFA) and resection (Rx) are the most common locoregional treatments reported for HCC Radioembolization and other ablative therapies are still under evaluation. Most evidence indicates that bridging strategies seems to be indicated for T2 patients likely to wait longer than 6 months, in particular for larger tumors high AFP, more likely to develop contraindications while waiting. Waiting time will depend on the national or regional organ distribution and the prioritization of an HCC patient in each country. Evidence suggests that there may be a marginal advantage for RFA in terms of local ablation. Although Rx has the advantage of a selection tool according to tumor characteristics, the procedure is rarely used as a bridging therapy at the moment. In some countries, like Argentina, patient will not receive HCC MELD-exception points after Rx because the tumor has been removed. Newer bridging strategies combining TACE and RFA or using new methods (Y-90, targeted therapies) are needed to be investigated.

C-047

DCD AND MARGINAL DONORS

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Liver transplantation is a highly successful treatment option for selected patients with end-stage liver disease or hepatocellular carcinoma (HCC). However, the relative lack of suitable donors in the face of a large potential recipient population has lead to innovative approaches to increasing donor organ supply, including the use of extended criteria donors (ECD) and donation after cardiac death (DCD) organs.

A number of different definitions of ECD have been proposed. One of the most widely accepted is the donor risk index (DRI) developed by Feng et al.1 This identified donor age, race, height, cause of death, DCD and partial or split graft type as being independently significant factors in predicting graft loss. One limitation of the DRI is the fact that donor hepatic steatosis, a factor shown to be important in other ECD models2, is not included.

It has been demonstrated that recipient selection for ECD organs is important. In a study comparing outcomes of patients with differing model for end-stage liver disease

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(MELD) scores receiving livers from donors with differing DRI, the death censored graft survival of patients with a MELD score less than 15 was similar for those receiving grafts from donors with a DRI <1.8 and for those receiving grafts from donors with a DRI ≥1.8, whilst the outcome was worse for patients with MELD scores of 15 to 30 or >30 if they received a graft from a donor with a DRI ≥1.8. Another analysis of outcomes comparing patients of differing risk receiving organs from donors of differing risk revealed a much poorer outcome of high risk recipients receiving high risk grafts, whilst a low risk recipient receiving a high risk graft with a cold ischemia time (CIT) less than 6.4 hours had a similar outcome to a low risk recipient receiving a low risk graft. On the other hand, it has been shown that the relative survival benefit of transplantation over continued waiting is greatest for patients with the highest MELD score, even for high DRI grafts. However, the allocation of high risk grafts into high risk recipients results in a higher rate of primary non-function.

The outcome of liver transplantation using DCD grafts is inferior to donation after brain death transplants, with a HR of 1.87 (95% CI 1.60–2.17) for graft loss. In addition, there is a higher rate of ischemic cholangiopathy following DCD liver transplantation and this confers an increased risk of graft failure. The risk of a composite endpoint comprising death, primary non-function, graft loss within 1 year and diffuse biliary ischemia is greater with increasing donor age and duration of postextubation hypotension (systolic blood pressure <50 mmHg).

Although it has been shown that there is an increased risk of graft loss associated with ECD, including DCD, with careful donor and recipient selection and transplantation with short CIT, satisfactory outcomes can be achieved. Patients with HCC are particularly suitable as recipients of ECD grafts, because the majority do not have liver failure.

References:

C-048
LIVING DONORS FOR LIVER TRANSPLANTATION FOR HCC
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Introduction: Living donor liver graft was considered a more readily available graft for patients with hepatocellular carcinoma (HCC). However, early experience indicated that the recurrence-free survival rate was inferior compared with that of deceased donor liver transplantation (DDLT).
Methods: A retrospective study was made on the outcome of living donor liver transplantation (LDLT) for HCC at Queen Mary Hospital, Hong Kong.
Results: The 5-year survival rates of 104 HCC patients undergoing LDLT and 36 patients undergoing DDLT were 73% and 87%, respectively (p = 0.055). On multivariable analysis, salvage transplant (HR 3.84, 95% C.I. 1.9–7.7) and patient age (HR 0.945, 95% C.I. 0.9–0.99) are significant risk factors affecting survival. Excluding patients with salvage transplants, the 5-year survival rate of HCC patients undergoing LDLT as the primary treatment was similar to that of DDLT patients (79% vs. 89%, p = 0.144).
Conclusions: LDLT as a primary treatment for HCC carries a favorable prognosis as that of DDLT.

C-049
CHRONIC PANCREATITIS – THE ROLE OF SURGICAL INTERVENTIONS
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Surgery has an important role to play in the management of chronic pain and complications associated with chronic pancreatitis. There is however lack of consensus as to the best treatment. The recent progress made in the development of minimally invasive approaches has further blurred the role of surgery in this disease. Surgery should be undertaken in a multidisciplinary environment when other options are not indicated. Proper training and expertise in pancreatic surgery is required. Surgery should aim to resolve the problem with minimal morbidity and mortality and with preservation of as much pancreatic function as possible. The goals of therapy in CP includes; pain relief, improved quality of life, management of local complications, social and occupational rehabilitation and to exclude malignancy. There is a growing body of good evidence to support and guide surgical decision making. Surgical options include resection procedure, drainage procedures and a combination of the two with the recent development of organ preserving resections of the pancreas head. The duct drainage procedures result in recurrence of pain in about 30% of patients. The results from proximal distal resections are well reported and suggest that the pancreaticoduodenectomy (PD) has excellent long term results with acceptable morbidity and mortality outcomes. Distal resections should be avoided in CP. The combined procedures including the Frey, Beger and Izbicki procedures combine resection of the abnormal head of the pancreas with preservation of the duodenum. The presentation includes the authors experience with the Frey procedure for pain and in particular the management of obstructive jaundice in CP.
C-050
AUTOIMMUNE PANCREATITIS
P. Wagle
Abstract not available at time of publication.

C-051
TROPICAL PANCREATITIS
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Tropical Pancreatitis is a form of chronic pancreatitis affecting young non alcoholic individuals in the tropics and subtropics. The highest prevalence of this disease is in the South Western Indian state of Kerala, although it has been reported from other parts of the subcontinent, and from Africa, South America and other parts of Asia such as Indonesia, and Malaysia. The disease bears considerable similarity to chronic pancreatitis due to alcohol abuse in that abdominal pain, local complications, and functional deficiency occur. Patients require surgical management either for intractable pain, or for complications such as pseudocysts, inflammatory masses, biliary obstruction, or cancer. Pancreatic adenocarcinoma is frequently found and there is evidence that chronic pancreatitis may be premalignant. In selected patients with solitary head strictures, or a single stone, or dilated duct without stones, endotherapy may suffice, but most patients require surgery. The Frey procedure (head coring with lateral drainage) is the most suitable procedure as it allows a) conservation of pancreatic parenchyma and avoidance of a major head resection, b) wide drainage of the entire ductal system of the pancreas and relief of strictures, and c) tissue for biopsy to rule out cancer when there is a mass lesion (frozen section). In a series of 1000 patients with tropical pancreatitis, 94% of benign patients had good or excellent outcomes over a 10 year follow up. Major areas of failure included biliary obstruction, head masses (due to incomplete clearance of the head ducts) and cancer.

C-052
HOW I DO IT – TECHNICAL TIPS IN SURGERY FOR CHRONIC PANCREATITIS
R. Carter
Abstract not available at time of publication.

C-053
HEAD CORING FOR CHRONIC PANCREATITIS: PROBLEMS AND PROMISES
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Persistent abdominal pain remains the leading indication for surgery in patients with chronic pancreatitis. In a subgroup of these patients, the pancreatic head is enlarged and the usual procedure of lateral pancreaticojejunostomy fails to relieve the pain in this situation. Head coring or Frey’s procedure involves coring out of this enlarged and inflamed pancreatic head along with drainage of the pancreatic duct into the jejunum. Pain relief with this procedure is better than lateral pancreaticojejunostomy and the morbidity and mortality lesser than pancreaticoduodenectomy – which may be another operative option in such patients. We followed 60 patients who underwent head coring procedure using the Izbicki pain score. In our experience pre operative opioid use and persistent pattern of pain were associated with comparably poorer pain relief. Apart from being technically demanding, there are two main problems with this procedure, first its difficult to rule out presence of malignancy and the optimum management of patients who continue to have pain despite a technically well performed procedure.

C-054
DUODENUM PRESERVING TOTAL PANCREATIC HEAD RESECTION FOR CHRONIC PANCREATITIS
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Introduction: The Beger procedure is a limited surgical procedure with the impact of replacing the Whipple procedure for chronic pancreatitis, and it has been performed extensively in recent years. The purpose of this study was to describe a modified Beger procedure for the treatment of chronic pancreatitis with an enlarged pancreatic head, in which total pancreatic head was resected without segment resection of the duodenum.
Methods: Between January 1999 and December 2010, 65 patients were operated on by the modified procedure. In the modified procedure, the Anastomosis of the residual pancreatic head and the jejunum in Beger procedure was avoided, and the posterior pancreaticoduodenal arcade was preserved for the blood supply of the duodenum. To preserve the common bile duct and its blood supply, a thin sheet of pancreatic tissue is preserved behind the intrapancreatic common bile duct and between the common bile duct and the duodenum.
Results: The mortality of the modified procedure was 0. The overall morbidity was 17%. 1 patient developed duodenal fistula caused by ischemia. No patient underwent re operation for severe complications. 40 patients who suffered abdominal pain in preoperative stage obtained complete pain relief, the mean EORTC QLQ-C30 pain scale decreased from 57 ± 28 to 11 ± 23. In the postoperative stage, the endocrine function of the patients compared equally to the preoperative stage.
Conclusions: Compared with Beger procedure in which the pancreatic head was subtotally resected, the modified procedure obtains acceptable postoperative outcomes, and benefits on extirpation of more inflammatory lesions.
C-055
RECURRENT PAIN FOLLOWING PRIMARY OPERATIONS FOR CHRONIC PANCREATITIS: MANAGEMENT OPTIONS
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Chronic unremitting pain remains a major challenge in patients with chronic pancreatitis. These patients benefit from multidisciplinary assessment by gastroenterologists, pancreatic surgeons and pain management teams. Endoscopic and surgical techniques to treat these symptoms have been well described and outcomes are discussed. An even greater therapeutic challenge is presented by those patients who do not respond after these procedures. The role, indications and outcomes associated with salvage procedures is discussed. Other modalities including immunotherapy, pancreatic suppression, radiotherapy, nerve block, pain modifying agents and nutritional strategies are discussed.

C-056
MASTER VIDEO SESSION & DISCUSSION: NOTES CHOLECYSTECTOMY
G. V. Rao
Abstract not available at time of publication.

C-057
SILS CHOLECYSTECTOMY
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Since laparoscopic cholecystectomy became the gold standard for the treatment of symptomatic cholelithiasis in the last three decades, surgeons have tried to minimize the scars and reduce the port sites and achieve the elusive goal of scarless surgery. Mini laparoscopy caught everyone’s fancy for a while and there was much ado about NOTES. This led to the search for better avenues to render the procedure scarless. The authors have pioneered the technique of Single Incision Cholecystectomy since May 2007, using the R Port as an access device and trying to mimic a standard laparoscopic cholecystectomy. Improvements in the techniques, the access device and various curved and articulating instruments, have led to the usage of a telescope and three instruments via the umbilicus, thus mimicking a standard four-port cholecystectomy. The video shows how the critical view can be maintained and the procedure rendered almost scarless, using purely the umbilicus for access and organ retrieval.

C-058
MASTER VIDEO SESSION & DISCUSSION: A CASE OF SEVERE BILE DUCT INJURY IN LAPAROSCOPIC CHOLECYSTOMY
Q. Wang
Abstract not available at time of publication.

C-059
MANAGEMENT OF COMPLEX BILE DUCT INJURY
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Introduction: Common bile duct injuries represent a serious and challenging surgical complication. These complex injuries are most often a consequence of laparoscopic cholecystectomy (LC). Proper management requires a skilled and experienced hepatobiliary surgical team and interventional radiological team.
Method: Data reviewed from the review of published medical literature related to mechanism of bile duct injury, complications of bile duct injury as well radiological & surgical treatment of bile duct injury.
Results: Commonest cause of bile duct injury is laparoscopic cholecystectomy. Contributing factors to bile duct injury include inflammation of Calot’s triangle, a short cystic duct, excessive cephalad retraction on the gallbladder fundus, and insufficient or excessive lateral retraction of the gallbladder infundibulum. Complete transection of the common bile duct is the most frequent biliary injury, and the most challenging to manage. Intraoperative recognition of bile duct injury and accordingly management can prevent complications during postoperative period. Delayed presentation like bile leak and biliary obstruction needs to be classified and accordingly management should be performed.
Conclusion: Bile duct injury is a serious surgical complication and needs skilled & experienced surgical team. Intraoperative recognition of injury can prevent postoperative complications. For patients who present with bile leak, the biliary anatomy should be defined using percutaneous cholangiography, and leak should be controlled. For patients who present with complete biliary obstruction, cholangiography and biliary drainage are indicated to control sepsis before planning elective repair.

C-060
RIGHT HEPATECTOMY USING THE LIVER DOUBLE-HANGING MANEUVER THROUGH THE RETROHEPATIC AVASCULAR TUNNEL ON THE RIGHT OF THE INFERIOR VENA CAVA
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The key to Belghiti’s liver-hanging maneuver is to develop a retrohepatic tunnel. This procedure requires a blind dissec-
tion of the plane anterior to the inferior vena cava (IVC), with the inherent risks of damaging the short hepatic veins and consequential bleeding. Here we describe a liver double-hanging maneuver with the advantage of being technically simple and safe. The operator uses his or her right index finger to dissect the space from below upward between the hepatic parenchyma and the anterior and superior edge of the right adrenal gland, which is situated just on the right side of the IVC. The operator then uses his left index finger to dissect the retrohepatic space from above downward on the right side of suprahepatic IVC, which is lateral to where the right hepatic vein joins the IVC. The retrohepatic tunnel is built when the 2 fingers touch each other. A kidney pedicle forceps is used to place 2 tapes around the liver for suspension. 65 patients underwent right hepectomy using this maneuver. The study included 62 patients with hepatocellular carcinoma (tumor size: mean ± SD, 10 ± 3.7 cm), and 3 patients had hepatic cavernous hemangioma, with a maximum diameter of 12.6 cm, 14.4 cm, and 22.6 cm, respectively. No major bleeding was encountered during the creation of the retrohepatic tunnel, with a success rate of 100%.

Conclusion: To develop the retrohepatic tunnel in the space on the right of the IVC is absolutely bloodless, and it is technically easy and safe.

C-061
LIVER RESECTION COMBINED WITH INFERIOR VENA CAVA GRAFT REPLACEMENT

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The presented case was a 49-year-old woman with intrahepatic cholangiocarcinoma (ICC). The tumor was located at the hepatic vein confluence. The tumor did not invade the right hepatic vein; therefore, the IVC just below the right hepatic vein and the IVC just below the tumor were cut over a length of 5 cm under active bypass using a bio-pump. An expanded polytetrafluoroethylene graft (GORE-TEX FEP ringed vascular graft), with an internal diameter of 20 mm, was used and the IVC and the graft were sutured with 4-0 prolene. After suturing the superior part, the clamp at the superior part of the IVC was released. After suturing the inferior part of the IVC, the clamp at the hepatoduodenal ligament was released. The operation time was 375 minutes and the blood loss was 3500 ml. The time of total vascular exclusion was 45 minutes. The patient’s postoperative course was uneventful, and she was discharged 14 days after surgery.

Eleven patients have undergone hepectomy combined with graft replacement in our hospital. Liver resection combined with IVC graft replacement is a complicated surgical procedure. However, this procedure is indicated in some selected patients because the procedure was safely performed without severe complication and offers hope for patients with liver cancer invading the IVC which cannot be cured with chemotherapy.

C-062
MASTER VIDEO SESSION & DISCUSSION: LAPAROSCOPIC LIVER RESECTION FOR ADENOMA

P. Herman
Abstract not available at time of publication.

C-063
SINGLE-PORT LAPAROSCOPIC LIVER SURGERIES: THE INITIAL EXPERIENCES IN 89 CASES

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Introduction: Surgeons have rapidly adopted single-port laparoscopic surgery for many abdominal operations. The aim of the present study was to assess our initial experiences with single-port laparoscopic liver surgery.

Methods: Between December 2008 and June 2011, 89 patients underwent various single-port laparoscopic liver surgeries such as laparoscopy-assisted donor right hepatectomy in living-donor liver transplantation (43 patients), hepatocellular carcinoma (21 patients), hepatic metastatic lesion from malignant neoplasm (9 patients), cholangitis associated with an intrahepatic duct stone (5 patients), cholangiocarcinoma, focal nodular hyperplasia (2 patients), hepatocellular adenoma (2 patients) and so on. Besides 43 donor operation, 24 were right partial resections, 11 were left hepectomies, 5 were left lateral sectionectomies, 3 were right hepectomies and 3 were left partial resections etc.

Results: Median operating time and blood loss of single-port laparoscopic liver resection patients were 201 minutes (range, 39–546 minutes) and 526 mL (range, 50–1000 mL), respectively. Four procedures were converted to multi-port laparoscopic hepectomy due to instrument length limitations. Conversion to laparoscopy-assisted hepatic resection took place in six because of technical failure (n = 2), stapling failure, old, bleeding, advanced tumor status. There was no serious intraoperative or postoperative complication in this series. Median postoperative stay was 8.3 days (range, 3–21 days).

Conclusions: Our selected series has demonstrated the feasibility and safety of single-port laparoscopic liver resection in a variety of hepatocellular carcinoma lesions, secondary liver tumors and benign hepatic lesions. However we need more cases and randomized studies for evaluation of role of this challenging technique whether it is applicable or not in the liver resection.

C-064
THE ASSESSMENT OF BIOLOGY OF HPB MALIGNANCY USING PET

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Positron Emission Tomography (PET) has been used to diagnose and stage various malignancies, most commonly...
using a radiolabelled glucose analogue known as 18F-fluorodeoxyglucose (18F-FDG). The utility of this radiotracer and other non-FDG radiotracers will be described in a range of hepatobiliary malignancies, including hepatocellular carcinoma, cholangiocarcinoma and pancreatic carcinoma.

C-065
FUTURE DEVELOPMENTS IN CHEMOTHERAPY FOR COLORECTAL LIVER METASTASES
A. Haydon
Alfred Hospital, Melbourne

Early in the last decade a number of new chemotherapeutic agents for the treatment of metastatic CRC made their way into clinical practice. As a result, outcomes improved and median survivals approaching 2 years were commonly achieved in clinical trials. However, since the introduction of the monoclonal antibodies targeting VEGF and EGFR over 5 years ago, there have been no new chemotherapeutic agents reach the clinic.

Currently most of our efforts are focused on individualizing treatments based on patient factors, tumor factors and treatment intent. My talk will cover these issues as well as looking at biomarkers that may predict therapeutic benefit, optimum treatment duration and also touch on some of the new agents showing promise.

C-066
STAGING FOR GB CANCER – THE ROLE OF EUS AND PET SCANNING
D. S. Yoon
Department of Surgery, Gangnam Severance Hospital, Yonsei University Health System, Seoul, Korea

Introduction: The accurate preoperative staging is mandatory for appropriate planning of surgery in gallbladder cancer. The purpose of this study is to evaluate the role of endoscopic ultrasound and fl udeoxy glucose-positron emission tomography (FDG-PET) in establishing the benign and malignant of gallbladder lesions.

Methods: A total of 133 patients, with polypoid GB lesion or suspicious GB cancer, are enrolled in this retrospective study; 118 patients are evaluated with preoperative EUS and 25 patients with PET. All patients are pathologically diagnosed by surgical resection or biopsy after preoperative EUS or PET scan. EUS or PET findings are compared with histopathologic reports.

Results: Of the 118 patients evaluated with EUS, there were 105 (89%) cases of benign GB lesions and 13 (11%) cases of GB cancer. Diagnostic sensitivity of malignancy was 69.2% and specificity was 95.2%. EUS failed to show accuracy of diagnosis of lymph node metastasis. Of the 25 patients evaluated with PET scan, there were 9 (36%) cases of benign GB lesions and 16 (64%) cases of GB cancer. Diagnostic sensitivity of malignancy was 100% and specificity was 88.9%.

Conclusions: EUS is useful to diagnose GB cancer and predict the depth of invasion but not for evaluating the lymph node status. PET scan is useful to diagnose GB cancer and evaluate the lymph node status and distant metastasis.

C-067
INCIDENTAL CARCINOMA FOLLOWING CHOLECYSTECTOMY. WHAT DO I DO?
A. Richardson
Westmead Hospital, Westmead, Australia

The frequency of incidental gallbladder cancer detected in cholecystectomy specimens for presumed benign disease ranges from 0.2–2.1%. Prognosis for gallbladder cancer has improved over the last 20 years and five year survival rates may approach 50% in some studies.

The treatment is dictated by the stage of disease, as is the prognosis. Lymph node involvement has an adverse prognostic effect. The stage of disease will generally be treated as follows:

T1A – Probably cured with cholecystectomy alone
T1B – Controversial
T2–T3 – Definitive resection improves survival

There is probably no adverse effect on survival of a previous laparoscopic cholecystectomy. Port-site resection is not associated with increased survival. Incidental gallbladder cancer should be managed in specialist hepatobiliary centers to achieve the best results.

C-068
THE SIGNIFICANCE AND MANAGEMENT OF LYMPH NODE INVOLVEMENT IN CARCINOMA OF THE GALLBLADDER
A. L. Montagnini

Abstract not available at time of publication.

C-069
EXTENT OF LIVER RESECTION IN GALLBLADDER CANCER (GBC)
P. Jagannath
Department of Surgical Oncology, Lilavati Hospital & Research Centre, Mumbai, India

The extent of liver resection depends on 1) Location of timor in gallbladder 2) triplanar (transverse, coronal and sagittal) extent of liver involvement.

Location of GBC – Fundic type GBC involves segment 4B–5 in accordance with venous drainage and a radical cholecystectomy with Seg 4B–5 excision is necessary for T1–T3.

The ‘neck type’ GBC mimics a mid ductal cholangiocarcinoma with extension into porta hepatitis. Surgical approach is similar to hilar cholangiocarcinoma and the resection is influenced by the vascular involvement at the porta.

Extent of liver involvement in GBC – A Triphasic Triplanar CT scan allows a simultaneous assessment of the extent of liver involvement in the axial, sagittal and coronal planes.

Tumors involving Seg 5 duct without involvement of seg 8 duct: Seg. 4B–5 excision is necessary in such tumors. Resection starts from the round ligament preserving the portal pedicle to Seg 4A. Transection runs horizontally to connect to Seg 5/Seg 6 plane avoiding the posterior sector pedicle.
Plantation (DDLT) currently used was established largely by S. T. Fan

Introduction: Department of Surgery, The University of Hong Kong, S. T. Fan

IN LIVER TRANSPLANTATION
TECHNICAL INNOVATIONS

Patients with far advanced GBC. Therefore HPD should be carefully indicated for selected cases. Advances and high morbidity and mortality of this surgery were reported. Advanced GBC with varying degree of success and high morbidity, mortality and no significant survival advantage. Surgery is not recommended in presence of para aortic nodal metastasis. Neoadjuvant Chemotherapy can downsize locally advanced GBC and a parenchyma preserving resection can be offered.

C-070 SURGICAL OPTIONS FOR ADVANCED GALLBLADDER CANCER – AN OVERVIEW
T. Sano and Y. Nimura
Aichi Cancer Center Hospital, Nagoya, Japan

Although aggressive surgical strategy for advanced gallbladder cancer (GBC) had been adopted, the long-term outcome after potentially curative surgery still remains dismal. To establish the radical surgery, type of liver resection, extent of lymph node dissection and necessity of extrhepatic bile duct resection and/or pancreateoduodenectomy have been discussed, and many retrospective studies revealed beneficial effects on lymph node dissection in radical surgery for GBC. However any randomized controlled trial (RCT) has not been performed to clarify the value of paraaortic node dissection. Several types of hepatectomy have been applied to achieve negative resection margins for locally advanced GBC. Wedge resection of the gallbladder bed is popular for a small cancer with subserosal invasion or minimal liver involvement. Segmental liver resection such as S4a + 5 resection is indicated for tumors with limited gallbladder bed invasion. Right hepatectomy + S4a + S1 resection plus extrhepatic bile duct resection is widely applied for advanced GBC involving the right portal pedicle or the hepatic hilum. The clinical impact of extensive hepatobiliary resection has been published mainly from Japan. However any RCT has not been done to clarify which type of hepatectomy is recommended for locally advanced GBC. The value of combined portal vein and liver resection for locally advanced GBC has not been clarified. Hepatopancreatoduodenectomy (HPD) has been carried out as an ultimate radical surgery for more advanced GBC with varying degree of success and high morbidity and mortality of this surgery were reported. Therefore HPD should be carefully indicated for selected patients with far advanced GBC.

C-071 TECHNICAL INNOVATIONS IN LIVER TRANSPLANTATION
S. T. Fan
Department of Surgery, The University of Hong Kong, Queen Mary Hospital, Hong Kong, China

Introduction: The technique of deceased donor liver transplantation (DDLT) currently used was established largely by Starzl and Calne. Recent innovation of the technique of transplantation focuses on living donor operations.

Methods: Review of recent literatures.

Results: Liver transplantation is performed mostly without veno-venous bypass nowadays. Side-to-side inferior vena cava anastomosis results in proficient drainage of graft and a better outcome. In living donor liver transplantation, right liver donation is the main stream whereas dual graft operation can overcome graft size discrepancy. Small-for-size graft syndrome is largely overcome by attention to portal flow and modulation by splenic artery ligation or splenectomy. Biliary drainage is mainly established by duct-to-duct anastomosis. Caudal shifting of living donor graft and utilization of hilar plate in 2 or 3 duct-to-common hepatic ducts may improve results further.

Conclusions: Continuous modification of techniques of liver transplantation and improvement of results have been observed in recent years.

C-072 LIVE DONOR LIVER TRANSPLANTATION; AN OVERVIEW
K. H. Kim
Division of Hepatobiliary Surgery and Liver Transplantation, Department of Surgery, University of Ulsan College of Medicine and Asan Medical Center, Seoul, Korea

Owing to the shortage of deceased donor organs, live donor liver transplantation (LDLT) has become an established treatment for patients with acute and chronic disease. The first successful pediatric LDLT, of a left lateral section graft from a mother to her son, was performed in Brisbane, Australia in 1989. Since then, this life saving procedure has been applied to adult patients. The greatest impact of LDLT has been in Asian countries, where cadaveric organ donation has been uncommon or non-existent. LDLT using left-lobe was introduced for adult recipients in 1993, but this procedure did not become wide-spread owing to the inability of these relatively small-sized grafts to meet the metabolic demands of the intended recipients. To overcome the inadequate graft volume encountered with left-lobe grafts, transplantation with right-lobe liver grafts was introduced for adult recipients in 1996. Although this method rapidly led to the worldwide use of adult LDLT, right-lobe hepatectomies are associated with a greater surgical risk for live donors than left-lobe hepatectomies, and are associated with increased morbidity and mortality rates, owing to the reduced volume of remnant liver in the donor. In LDLT, donor safety is of paramount importance and cannot be compromised regardless of the implication for the intended recipient. Moreover, the absence of hepatic venous drainage to the right anterior sector has led to the right-lobe graft congestion and failure. Although graft size is critical for successful outcomes, the importance of uniformly good venous drainage of the anterior sector of the right-lobe liver graft has been regarded as crucial for maximizing graft function. The reconstruction of the middle hepatic venous tributaries of a right-lobe graft was introduced in 1998. Not all potential donors can donate their right-lobes because safe donation is possible only when the estimated remnant liver volume is more than 30%. If the volume of the right-lobe in potential donors is more than 70%, relative to the volume of the whole liver, one alterna-
tive may be dual left-lobe graft LDLT, in which smaller left-lobe grafts from two donors are transplanted into one recipient. This technique was first introduced in 2000 to minimize donor risk and alleviate the small-size graft problem. Until more cadaveric grafts become available, adult LDLT will continue to be a relevant therapy for patients with irreversible end-stage liver disease.

References

C-073
SPECIAL ISSUES IN PAEDIATRIC LIVER TRANSPLANTATION
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Several topics had changed to improve the outcome in pediatric liver transplantation, these issues include: the appropriate timing for referral, the optimal timing for surgery, the specific indications in children's like biliary atresia or Hepatoblastoma. All of these issues were very important steps to increase the survival in this population.

The lack of suitable organs for children led to several innovations to improve donor availability, first with reduced size liver, split livers and living related donors, these innovations allowed pediatric waiting list mortality to fall.

The survival and outcome in terms of quality of life; current strategies for monitoring infectious complications and steroid withdrawal are very important issue in the pediatric population.

We start our pediatric program in 1992 and we performed 545 Pediatric liver transplant. 396 Cadaveric organs and 149 living donors. We implant 196 whole liver and 346 reduce size including 55 splits. Median weight: 13.75 kg (R: 2.5–80 kg), median age: 3 years(R: 40 d – 18 y.)

A special problem in Argentina was FHF due to Hepatitis A virus; since we start with the vaccination to this group we eradicate the transplant to this pathology.

Previously age less than 1 year and weight less than 10 kg were significant risk factors for infant survival after LTx. Currently; there are no limits on age or weight for referral for a patient for consideration of LTx.

Pediatric LTx continues to evolve and offer hope to children with acute or chronic liver disease without limitations in age, weight or associate diseases.

C-074
TRANSPLANTATION FOR METASTATIC DISEASE OF THE LIVER
J. Belghiti

Abstract not available at time of publication.

C-075
TRANSPLANTATION FOR HILAR CHOLANGIOCARCINOMA
J. McCall
Abstract not available at time of publication.

C-076
QUALITY OF LIFE AFTER LIVER TRANSPLANTATION
C. W. Pinson
Abstract not available at time of publication.

C-077
MANAGEMENT OF ADVANCED PANCREATIC CANCER
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The resectability rate and postoperative survival rate for pancreatic carcinoma are poor. Aggressive resection including vascular resection and extended lymphadenectomy represent one strategy for improving survival. This study was carried out to clarify the indications for extended resection, especially vascular resection for pancreatic carcinoma.

From July 1981 to March 2011, we performed curative resection in 507 of 220 patients with pancreatic carcinoma in our department (70.0%). Vascular resection in 314 (62.3%) and portal vein resection without arterial resection was performed in 297 patients. Combined portal and arterial resection was performed in 15 patients and arterial resection without portal vein resection in two. Extended lymphadenectomy including para aortic lymph node was done. Postoperative survival rate was stratified according to operative and pathologic findings.

Operative mortality (any death within 30 days after surgery) occurred in 11 of 507 curative resection patients (2.2%), including one of 193 patients without vascular resection (0.5%), 5 of 297 portal vein resection patients without arterial resection (1.7%), and 5 of 15 arterial resection patients undergoing portal vein plus (3.3%). Most patients who survived for 2 or 3 years had carcinoma–free surgical margins. The most important indication for vascular resection in pancreatic cancer is the ability to obtain cancer–free surgical margins. Recent postoperative adjuvant chemotherapy has been contributing to the survival.

C-078
THE EARLY DETECTION OF PANCREATIC CANCER – SURVEILLANCE OF HIGH RISK PATIENTS
A. Biankin
Abstract not available at time of publication.
C-079
OBESITY AND PANCREATIC CANCER
H. A. Pitt
Indiana University, Indianapolis, USA

Obesity is a global epidemic which is fueled by dietary indiscretions related to both fatty acids and carbohydrates. Central obesity results in an altered adipokine milieu which is associated with diabetes, hyperlipidemia, cardiovascular disease (the metabolic syndrome) as well as with cancer. Patients with common malignancies have been found to have high circulating leptin and low adiponectin. Leptin has been shown to enhance cell growth and angiogenesis and to inhibit immune function whereas adiponectin has the opposite effects.

Human epidemiologic data suggest that obesity is associated with an increased incidence of pancreatic cancer as well as decreased survival after resection. Murine studies in our laboratory have confirmed these observations and have demonstrated more fat in the pancreas as well as more adipocytes in the tumor microenvironment of obese animals.

Therefore, we designed a human study to test the hypothesis that pancreatic steatosis as well as adipocytes in the tumor microenvironment would be associated with increased dissemination and reduced survival in patients with resected pancreatic cancer. Twenty lymph node negative patients were matched with 20 node positive patients with adenocarcinoma of the pancreas undergoing pancreatoduodenectomy. The node positive patients had significantly (p < 0.02) less fibrosis and more adipocytes in the pancreatic neck as well as significantly (p < 0.05) more adipocytes in the tumor microenvironment. As expected, the node positive patients had a significantly (p < 0.04) shorter survival.

These data suggest that pancreatic steatosis and adipocytes within the tumor microenvironment promote the dissemination and lethality of human pancreatic cancer.

C-080
THE ROLE OF PET IMAGING AND EUS IN PANCREATIC CANCER
B. N. J. Thomson
Peter MacCallum Cancer Centre, Melbourne; Royal Melbourne Hospital, Melbourne, Australia

The treatment of pancreatic adenocarcinoma remains problematic particularly due to the presence of metastatic disease even in small tumors. Approximately 95% of patients have lymph node metastases, local vascular involvement or distant metastatic disease at the time of diagnosis.

Computed tomography (CT) in combination with positron emission tomography with 18-fluorodeoxyglucose (FDG CT-PET) is not currently medicare approved for staging or diagnosis of pancreatic cancer in Australia. The sensitivity of CT-PET is similar to CT in the detection of the pancreatic primary as well as metastatic disease. Detection of involved lymph nodes is higher, however the clinical significance of such of finding remains unclear. The evidence for CT-PET to differentiate adenocarcinoma from chronic pancreatitis is also weak.

In comparison endoscopic ultrasound (EUS) has emerged as an important investigation for pancreatic cancer. Fine-needle aspiration cytology allows definitive diagnosis prior to consideration of surgery, pre-operative chemoradiotherapy or palliative treatment. It has excellent utility in the detection and diagnosis of small pancreatic tumors as well as the assessment of local vascular invasion in locally advanced pancreatic cancer.

C-081
PANCREATEODUODENECTOMY SHOULD BE PERFORMED AS A PALLIATIVE PROCEDURE FOR PANCREATIC CANCER
(for the ‘Yes’ side of the debate)
D. G. Chhabra
Department of Surgical Oncology. Dr. L.H. Hiranandani Hospital (Powai), Mumbai, India

Earlier, many considered pancreateoduodenectomy (PD) to be ‘palliative’ as survival was dismal despite resection. This nihilistic attitude has turned to cautious optimism. Recently more aggressive surgical approach has emerged in managing pancreatic cancers due to declining morbidity, mortality and improved survival with PD. PD as a palliative treatment can be considered in carefully selected patients in high-volume centers. Currently, most palliative resections take place in operations with curative intention when irreplaceability is established after a ‘point of no return’ or, in R1-situation when the histopathology shows microscopically-involved resection margins. Implementation of Leeds protocol has resulted in increased recognition of R1 status in most high volume centers where resections have long been categorized R0. Thus in the oncological view, R1 resections are considered ‘palliative’. Despite this fact, studies have reported significantly prolonged overall survival after PD in patients with positive surgical margins compared to unresectable patients palliated with biliary and/or gastric bypass. There is no evidence based data comparing palliative resections with bypass procedures. A palliative PD can be considered in patients with a solitary liver deposit (limited liver metastases) as long as R0 resection is warranted. Limited data is available on Quality of Life (QoL) after palliative pancreatic surgery; however it is clear that surgical techniques of resection and reconstruction do not affect QoL. A palliative PD may improve the effects of additional palliative chemo/radio-therapy. It is emphasized that successful palliative surgery depends on the ability of the institution to provide a safe operation with minimal perioperative morbidity and mortality.

C-082
PANCREATEODUODENECTOMY SHOULD BE PERFORMED AS A PALLIATIVE PROCEDURE FOR PANCREATIC CANCER
(for the ‘No’ side of the debate)
S. V. Shrikhande
Tata Memorial Centre, Mumbai, India

Pancreatic cancer (PC) remains a dismal disease and the principal reason for its aggressive behavior is the number of growth promoting pathways that are active in this disease. The characteristic feature of PC is early involvement of retroperitoneal nerves and lymph nodes with development of early metastases.
Pancreatoduodenectomy (PD) is the only curative option for PC. This is a demanding procedure with a steep learning curve where the morbidity is 20–30% and mortality is 3–5% even in centers of excellence. Superior survival after PD is reported in node negative compared to node positive PC. The Leeds protocol for standardized reporting of PD specimens has regenerated interest amongst surgeons with regard to completeness of resections. Some series, reevaluating their R0 resections with the new Leeds protocol, observed that a number of them were in fact R1 resections. Such observations have pushed pancreatic specialists towards improving R0 resection rates. Neoadjuvant chemoradiotherapy, the uncinate first technique and SMA first approach have been important advances in that direction.

Thus, a major resection like PD should be offered only after a careful evaluation of the benefit ratio in the individual patient. R0 resections (and occasionally the inevitable R1 resection) should be the standard of care in high volume centers. On the background that curative R0 resections have superior survival rates compared to R1/R2 resections, palliative PD as a procedure is difficult to justify in an era that has witnessed impressive strides in chemoradiotherapy, targeted therapy, therapeutic endoscopy and interventional radiology.

C-083

PURE LAPAROSCOPIC MEDIAL AND VENTRO-ANTERIOR SECTIONECTOMY FOR HEPATOCELLULAR CARCINOMA

G. Wakabayashi
Department of Surgery, Iwate Medical University School of Medicine, Japan

Anatomical liver resection appears to be superior to non-anatomical liver resection both in operative and oncological results. We present a case to describe pure laparoscopic anatomical liver resection for HCC with poor hepatic reserve.

Case presentation: A 68 y/o male patient with HCV negative and HBV negative was referred to our institute for resection of a relatively large HCC (6.5 cm in diameter) located in S4 and S5/8. Central bisectioectomy was initially planned, but the hepatic reserve was estimated moderately poor. Child-Pugh score was grade A but indocyanine green (ICG) clearance was 20% at 15 min. The HCC was located mainly in S4 and ventro-anterior sector leaving caudal S5 intact. The tumor seems to be compressing the middle hepatic vein (MHV) from ventral to dorsal side but not adjacent to the MHV.

Operative procedure: Anatomical liver resection was performed by Glisssonian approach at the hilar plate. Several Glissons into S4 were clipped and divided at the right side of the ligamentum teres hepatitis. Parenchymal transection first started from the left margin of S4, then along the falci-form ligament, and finished at the root of MHV. At this stage, the Cantlie line was visualized because the left medial sector was devascularized. Parenchymal transection continued to prepare the anterior trunk. Several Glissons coming ventrally from the anterior trunk into the ventro-anterior sector were clipped and divided leaving caudal S5 vascularized. The demarcation line moved from the Cantlie line to the border of the ventral and the dorsal part of anterior sector. Parenchymal transection along the right margin of the ventro-anterior sector finished at the root of MHV. The root of MHV was stapled and divided.

Results: Operative time was 424 min and blood loss was 76 ml. The resected liver was 256 g. The patient was discharged on the 7th post-operative day without having any complications.

C-084

MASTER VIDEO SESSION:
LIVER TRANSPLANTATION FOR HYDATID DISEASE

H. Wen

Abstract not available at time of publication.

C-085

RADICAL R HEPATECTOMY EXTENDED TO IVC FOR E ALVEOLARIS

G. A. Mantion and M. Ayav
University Hospital Besançon, France

This movie concerns the case of a 46 years old man with a right liver EA lesion treated with albendazole since 5 years. Due to radiological progression of the lesion and inferior vena cava (IVC) a radical resection was attempted including “en bloc” right hepatectomy, retrohepatic IVC and diaphragm. IVC reconstruction used a charrière 16 ringed PTFE prosthetic graft with an omental wrap. The patient was discharged at day 10 and a treatment with albendazole was given for two years with long term anticoagulation. The discussion will concern the benefit of radical Ro resection in locally advanced AE and the interest of IVC reconstruction.

C-086

FREY’S OPERATION FOR CHRONIC PANCREATITIS

A. Chaudhary
Medanta Medicit Hospital, Delhi, India

This video demonstrates the technique of performing head coring and pancreaticojejunostomy for chronic pancreatitis. The procedure was performed in a young male with persistent abdominal pain.

C-087

ROBOTIC-ASSISTED LAPAROSCOPIC ANATOMIC RIGHT HEPATECTOMY

J. H. Dong
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Background: The surgical robotic system is superior to traditional laparoscopy in regards to 3-dimensional images and better instrumentations. Robotic surgery for hepatic resection has not yet been extensively reported. The first case of robotic-assisted laparoscopic anatomic right hepatectomy in China was performed at our institution in July 2009. This video will show the pertinent steps to perform a robotic-assisted laparoscopic anatomic right hepatectomy.

Methods: A 53-year-old man with right-sided intrahepatic cholangiocarcinoma was referred for surgical treatment. The robotic-assisted laparoscopic anatomic right hepatectomy
was performed. Liver mobilization and cholecystectomy were performed in the usual fashion. After dissection and division of the right hepatic artery, right portal vein and right hepatic duct, parenchymal transection was performed with harmonic curved shears and bipolar electrocautery. The branches of the middle hepatic vein to segments V and VIII were either ligated intraparenchymally with Hem-o-lock clips or controlled by suture ligation with monofilament suture. Right hepatic vein and connective liver tissue were transected with an endoscopic stapling device. The specimen was extracted through a suprapubic incision using an endobag. A single abdominal drainage was placed in the subphrenic space. No Pringles’ maneuver was used.

Results: The operative time was 520 min, and the blood loss was 500 ml, with no blood transfusion. The surgical resection margins were free of tumor. The postoperative recovery was uneventful, with discharge on days 6. Until now, no intrahepatic recurrences or port-site metastases have been observed in this patient.

Conclusions: Robotic-assisted laparoscopic anatomic right hepatectomy is safe and feasible. It should be performed only by surgeons with expertise in laparoscopy and hepatobiliary surgery.

C-088
SINGLE-PORT LAPAROSCOPIC SPLENECTOMY: 13 INITIAL CASES
Department of Surgery, Division of HBP Liver Transplantation, Seoul St. Mary's Hospital, The Catholic University of Korea, Seoul, Korea

Introduction: Today, laparoscopic surgery has replaced open surgery in most abdominal surgeries because there were clear benefits of laparoscopy over open surgery. Laparoscopic splenectomy has been the standard of care for splenic diseases. The pursuit of minimal invasive surgery such as laparoscopic surgery makes a trend toward less invasion and less scarring. So, single port laparoscopic surgery is rapidly gaining attention worldwide since Navarra published a transumbilical cholecystectomy technique in 1997. Therefore we have attempted the single port laparoscopic splenectomy from October, 2008.

Materials and Methods: From October 2008 to July 2011, we retrospectively reviewed 13 patients who had undergone single-port laparoscopic splenectomy. Preoperative and postoperative management, including vaccination, was performed in a routine manner. During operation, the patients were given a right lateral position as conventional laparoscopic splenectomy. A 3 to 5 cm transverse incision at the anterior axillary line on umbilicus level or transumbilical incision was used as a single-port entry point. We evaluated demographics of patients, operative and postoperative outcomes.

Results: Among 13 patients, 6 patients were men and 7 patients were women. The median age was 36 years old (13–61) and median operative time was 125 minutes (75–245). We experienced no cases that converted to open procedure. There was one case that we added one port to reinforce GIA suture line. All patients recovered well and were discharged without any complications.

Conclusion: We propose that single-port laparoscopic splenectomy is a feasible alternative to multiport conventional laparoscopic technique.

C-089
LAPAROSCOPIC CAUDATE LIVER RESECTION
X. J. Cai, H. Yu, X. Liang and Y. F. Wang
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Introduction: The complicated and highly difficult laparoscopic hepatectomy has been administrated due to surgical instrument improvement and experience accumulation. We presented here a successful case of laparoscopic resection of Spiegel lobe by curettage and aspiration.

Methods: Firstly, we bluntly dissected hepatoduodenal ligament to expose the hepatic artery and identified the extrahepatic portion of left hepatic artery branches to Spiegel lobe which were clipped and divided.

Then the left inferior border of the first porta hepatis transversal furrow was well exposed by assistant. In there the liver capsule and parenchyma was opened and blunt dissected with LPMOD and all of the left intrahepatic Glisson branches to Spiegel lobe were gradually exposed. The small vessels from left hepatic artery and portal vein to Spiegel lobe as well as small biliary ducts were identified, isolated, clipped and divided.

Third step was disconnecting the Spiegel lobe bridge. The Spiegel lobe was gently pushed to the left and the bridge parenchymal was dissected along the border of tumor. Finally, the Spiegel lobe had completed dissociated from liver. Subsequently the Spiegel lobe was lift upward to expose the retrocaudate short hepatic veins which were clipped in sequence of from lower one to upper, from right one to left with titanium clips.

Results: The operation was completed laparoscopically. Blood loss was 900 ml without transfusion. There were no major complications intro and postoperatively.

Conclusions: Laparoscopic resection of Spiegel lobe is a feasible and difficult laparoscopic surgery.

C-090
HEPATIC RESECTION FOR LARGE LIVER TUMORS
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A brief summary of our results for resection of large liver tumors will be presented. This includes resection of tumors more than 10 cm in size. A short video presentation of the techniques of liver resection using the liver hanging maneuver will be demonstrated. Morbidity and mortality, long term outcome and histopathological characteristics will also be presented.
C-091
LAPAROSCOPIC LIVER SURGERY: CURRENT STATUS

H.-S. Han
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Recently the indications and application of LLR have been changed a lot since its introduction. In early stage, only tumorectomy was possible, and major liver resection, such as right and left hepatectomy, has been challenging procedures. With encouraging postoperative outcomes after LLR, there have been pioneering attempts to apply this procedure to more difficult cases. Therefore, LLR including major resection is more frequently performed recently. Previous limitation of laparoscopic approach to posterior and superior parts of the liver has been overcome with recent accumulation of experiences as well. Liver resection in the vicinity of major vascular structures, such as the hilum, major hepatic veins and IVC, is still not indicated in laparoscopic procedure. However, with the accumulation of the experiences, a dozen of cases, which are close to major vessels, have been performed with laparoscopic liver resection. When we perform liver parenchymal resection close to major vascular structures, there is high risk of injury to these vessels, which may cause massive bleeding, even in open surgery. Laparoscopic surgery has similar risks of unwanted mishaps as in open surgery, and furthermore, control of bleeding is more difficult due to limitation of freedom which is inherent in laparoscopic procedure.

To minimize unwanted bleeding is performing anatomical liver resection as possible. In anatomical liver resection, the liver parenchyma is straightly transected under the guidance of the ischemia line after selective ligation of a portal pedicle supplying the section or segment where the tumor is located. In several series, anatomical liver resection has been shown to be more advantageous in performing parenchymal transection and reducing bleeding. In addition, it has theoretical advantages of high survival outcomes after resection of HCC by eradicating all portion of liver supplied by portal pedicles. However, anatomical liver resection except left lateral sectionectomy still remains difficult to perform with laparoscopic procedure. Laparoscopic CUSA is useful in detecting important anatomical structures and decreasing the risk of injury to these structures that is more likely to occur after blind application of ultrasonic shears. In conclusion, the limitation of LLR for HCC will be overcome if advanced techniques of LLR will be more widely applicable and more experiences will accumulate.

C-092
SINGLE INCISION LAPAROSCOPIC SURGERY FOR LIVER RESECTION

H. Kaneko
Toho University, Tokyo, Japan

The continuing evolution of laparoscopic surgery, which has been rapidly adopted as minimally invasive surgery, has been applied to the laparoscopic liver resection. Laparoscopic liver resection is a highly specialized field, however, important technological developments and improved endoscopic procedures are being established. Thus, laparoscopic hepatectomy has been more actively performed recently. We have pursued laparoscopic hepatectomy as a means of surgical therapy.

Recently, we have successfully performed laparoscopic extended liver resection such as laparoscopic pure-hemihepatectomy, hepatectomy of giant HCC and tumor located upper segment, recurrence tumor.

Meanwhile, laparoscopic surgical procedure have begun to advance to scar-less technique of single incision laparoscopic surgery. It has been applied for liver resection.

In the congress, the technique of the single incision laparoscopic hepatectomy will be shown to the patient with hepato-cellular carcinoma. Tumor size was 30 mm, located in Seb 3. Blood loss was less than 20 ml, operative time 125 min with quick recovery.

Single incision laparoscopic hepatectomy appears to be a viable surgical alternative in selected cases. This procedure is expected to develop further in the future as a new surgical method for liver surgery as less invasive surgery although the indication is limited to feasible tumor location.

C-093
LAPAROSCOPIC ANATOMICAL LIVER RESECTION FOR HEPATOCELLULAR CARCINOMA

G. Wakabayashi
Department of Surgery, Iwate Medical University School of Medicine, Japan

Background: The introduction of laparoscopic liver resection has a great impact on liver surgery especially in the treatment of hepatocellular carcinoma (HCC). Anatomical liver resection appears to be superior to non-anatomical liver resection in operative and oncological results. The aim of the present study was to describe the procedure of laparoscopic anatomical liver resection and to review a single institution’s experience of laparoscopic liver resection (LLR) including totally laparoscopic liver resection (TLLR) and laparoscopy-assisted liver resection (LALR) as a minimally invasive surgery for HCC.

Methods: Anatomical liver resection was performed by Glissonian approach either with TLLR or LALR. Between May 1997 and December 2010, 212 patients underwent LLR for hepatocellular carcinoma (HCC) (75 patients), liver metastases (92), cholangiocellular carcinoma (CCC) (3), carcinoid (1), benign liver lesions (16), and living donor (25). Operations included 119 TLLR (96 wedge resection, 17 lateral sectionectomies, 4 major anatomical hepatectomy, two S5 subsegmentectomy), 93 LALR (2 right trisectectomy, 16 right hepatectomy, 17 left hepatectomy, 3 central bisectectomy, 5 right anterior sectionectomy, 8 extended right posterior sectionectomy, 25 donor hepatectomy, and others). Nineteen percent of TLLR, 100% of LALR, and 67% (141/212) in total, were anatomical liver resection.

Results: Median operating time was 161, 324 min, and blood loss, 57, 546 ml for TLLR, LALR, respectively. One TLLR was converted to a LALR. Only ten patients (4.7%) experienced postoperative complications, 4 patients (1.9%) showed bile leakage, and 6 patients (2.8%) developed wound infections. Overall 5-year survival for HCC was 65%.

Conclusions: Laparoscopic anatomical liver resection can be performed safely for a variety of primary, secondary liver tumors, and even for live donors. Procedures vary from...
hybrid to pure technique and seem to offer at least short-term benefits in selected patients. The number of anatomical resections has increased as our experience increases.

C-094
SYMPOSIUM: LAPAROSCOPIC LIVER SURGERY: COMPLICATIONS OF LAPAROSCOPIC LIVER SURGERY
N. O’Rourke
Abstract not available at time of publication.

C-095
NEW INTERNATIONAL REGISTRY ON PERIHILAR CHOLANGIOCARCINOMA
P-A. Clavien
Abstract not available at time of publication.

C-096
STAGING AND PATIENT SELECTION FOR HILAR CHOLANGIOCARCINOMA
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Goal of accurate preoperative staging in Hilar cholangiocarcinoma is to identify patients who demonstrate clinical or radiological conditions that would offer curable resection. Staging essentially involves assessment of ductal extent, periductal extension into soft tissue including Hepatic artery, Portal Vein and it’s branches, distant metastasis and function of future remnant Liver.

For ductal extent invasive methods include ERCP and PTC. ERCP underestimates the extent of tumor into primary and secondary biliary radicals. PTC has the utility in both, to define the biliary anatomy and to decompress the obstructed Liver with it’s risk of cholangitis. Non invasive imaging of MRI/MRC has an accuracy of 90% and it has become primary imaging modality. Triphasic MDCT has sensitivity of 92% and specificity of 100% in assessment of vascular involvement. CT and MRI are useful with 85% of sensitivity it should be done before stenting.

Evaluation of nodal status has been difficult. EUS with FNA has accuracy of 90%, CT accuracy is up to 50% and MRI up to 60%. PET-CT results are discordant from 15–86%. PET-CT has reliability up to 70 to 80% for distant metastasis.

Preoperative workup fails to ascertain the presence of peritoneal and hepatic metastasis which can only be seen on laparoscopy in 15 to 25%.

In jaundice without signs of infection or lobar atrophy, one can proceed to surgery after staging. In presence of cholangitis, preoperative biliary drainage is mandatory, preferably unilateral on the future remnant liver. If the future remnant liver is less than 30–40% portal vein embolization with preventive biliary drainage is preferred.

C-097
SURGICAL STRATEGIES IN HILAR CHOLANGIOCARCINOMA
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Hilar cholangiocarcinoma was firstly described by Klatskin in 1965. He suggested that palliative surgery aimed at relieving biliary obstruction may restore the patient to a good state of health for a remarkably long period of time.

In 1980’s, efforts to resect this tumor were made, especially from UCLA, but combined liver resection was not accepted due to high postoperative mortality and low radicality. They insisted that curative resection was recommended when it was can be done without a concomitant hepatic resection.

In 1990’s, several excellent surgeon, including professor Nimura from Nagoya University, reported improved postoperative survival rates with combined hepatic resection. Professor Nimura suggested that curative resection should be designed according to the preoperative finding of the extent of cancer in each segmental duct, and caudate lobe resection should be performed together with hepatic segmentectomy.

On the other hand, Neuhaus from Berlin, Germany reported that combined hepatic resection should be regarded as the surgical procedure of choice. In addition, right trisectionectomy with portal vein resection can offer best long-term survival in terms of tumor biology and anatomical considerations in 1999. According to the large scaled report from MSKCC, they suggested that margin status is one of the important prognostic factors, and combined hepatectomy for hilar cholangiocarcinoma can offer best chance of radical R0 resection resulting in better survival. When D’Angellica from MSKCC analyzed several papers on the treatment for hilar cholangiocarcinoma, he elucidated that increased resectability and R0 resection rates can be obtained following hepatic resection.

There are still controversies on the extent of hepatic resection, because extensive hepatic resection which may bring the best chance of R0 resection, is not always safe. Therefore, parenchymal preserving hepatic resection will be required to avoid the risk of postoperative liver failure. But, extensive liver resection including right trisectionectomy with caudate lobectomy can be required to achieve R0 resection for advanced hilar cholangiocarcinoma. Because the extensive liver resection for cholestatic liver is likely to bring about liver failure, preoperative management such as preoperative biliary drainage or preoperative portal vein embolization should be necessary. However, a consensus on the safe level of preoperative bilirubin level or safe future remnant liver volume to avoid the liver failure is lacking, now.

Anyway, we need to carry out liver resection including vascular resection with/without preoperative biliary drainage and portal vein embolization for hilar cholangiocarcinoma according to precise preoperative evaluation of this tumor.
C-098
PREOPERATIVE PORTAL VEIN EMBOLIZATION IN HILAR CHOLANGIOCARCINOMA
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Introduction: Portal vein embolization (PVE) increases the volume of future liver remnant (FLR) and thereby decreases the risk of postoperative liver failure. However, a few have reported PVE before major hepatectomy for hilar cholangiocarcinoma due to the small number of surgery cases.

Methods: Between Jan 2007 and Jan 2010, 71 consecutive patients with hilar cholangiocarcinoma who were scheduled to receive major hepatectomy were involved in this study. All PVEs were performed in patients with an estimated FLR of <50%. Hepatic volume and function changes after PVE were analyzed, and operative outcomes were compared between patients with or without PVE.

Results: PVE procedures were performed in 27 patients. PVE-related complications occurred in 6 patients (22.2%) and did not preclude hepatectomy, which included bile leakage (n = 1) and coil displacement (n = 5). Two weeks after PVE, the FLR to total liver volume ratio increased statistically (40.7 ± 7.2% vs. 44.8 ± 6.9%; p < 0.001), and the mean increase in FLR was 4.9 ± 3.4 cm³/day. In the PVE group, 21 patients (77.7%) underwent radical surgery, and the rest were precluded because of insufficient hypertrophy of FLR and tumor dissemination. The PVE group had similar operative mortality and morbidity compared to the non-PVE group. The 1- and 2-year survivals for PVE group (radical surgery only) and non-PVE group were 72.5% and 54.2%; 70.7% and 53.7%, respectively. There was no significant difference of survival.

Conclusions: PVE is a safe and efficacious procedure, and offers potential benefit for patients in hilar cholangiocarcinoma with small FLR.

C-099
SURGICAL TECHNIQUES FOR HILAR CHOLANGIOCARCINOMA: RIGHT OR LEFT HEPATECTOMY
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Introduction: When you consider the appropriate surgical procedure for the patient with hilar cholangiocarcinoma, you should evaluate from the three points of views. Hepatectomy, Combined vascular resection, and combined pancreateicoduodenectomy.

Methods & Results: In hepatectomy, there are several procedures of hepatectomy for the surgical treatment of hilar cholangiocarcinoma. Right sided hepatectomy, left sided hepatectomy, central hepatectomy such as parenchyma-preserving hepatectomy, extended hilar bile duct resection using transhepatic anterior approach.

The second issue for appropriate surgical resection is combined vascular resection. Portal vein, hepatic artery, and hepatic vein are usually involved by hilar cholangiocarcinomas. Surgical margin-free, curative resection has brought about 37% of 5-year survival. On the contrary, non-curative resection has resulted in 5.6% of 5-year survival, which was significantly worse than that of the curative resection group, but significantly better than the survival of the irresectable patients.

In the curative resection, the non-vascular resection group had significantly better survival than the vascular resection group, 42% of 5-year survival rate. However, the portal vein resection alone seems to be more beneficial than the hepatic artery resection group, which brought about 21% of 5-year survival rate. Morbidity rate for left-sided hepatectomy was almost the same as for right-sided hepatectomy. However biliaryenteric anastomotic leakage occurred in 18% in left-sided hepatectomy. Surgical mortality rate was relatively high in right-sided hepatectomy, but was not statistically significant. In the cases of left-sided hepatectomy, only 2 independent factors influencing survival were revealed by multivariate analysis, curability and hepatic artery resection. In contrast in the cases of right-sided hepatectomy, multivariate analysis demonstrated curability, lymph node metastases, and hepatic artery resection as independent prognostic factors. The survival after resection was not significantly different between two groups of right-sided and left-sided hepatectomies. In the cases of combined portal vein resection, survival of left-sided hepatectomy was comparable to that of right-sided hepatectomy. Since left-sided hepatectomy is a safe procedure and represents the only curative resectional option for type IIb tumor, aggressive surgical resection should be performed even in cases with portal vein involvement.

Conclusions: Appropriate surgical procedures should be selected on the basis of preoperative imaging findings of cancer extension and surgical fitness of the patients among variable operative procedures.

Both of right- and left-sided hepatectomies could be applicable to the patients with hilar cholangiocarcinoma as a suitable surgical procedure for obtaining a curative resection.

C-100
ANATOMICAL VARIATIONS IN THE SURGICAL TREATMENT OF HILAR CHOLANGIOCELLULAR CARCINOMA
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Introduction: Surgical resection in Hilar cholangiocellular carcinoma is based on the Bichthmus classification Normal variations in bile duct, hepatic artery and portal vein are very common and these anatomic variation should be considered in the surgical resection. Based on our experience, new guidelines have been used in the surgical decision making.

Methods: A total of 101 patients underwent surgery for hilar cholangiocarcinoma by a single surgeon at the Asan Medical Center. Clinical, radiological, and pathological data were analyzed retrospectively. Concomitant hepatic resection was performed in 64 patients, of whom 39 underwent conventional resection (period I; 2004–2006), and 25 underwent surgery using the new guidelines (period II; 2007–2008).

The new guidelines were: a left hepatectomy for right-sided HA variations such as a replaced RHA from the supe-
C-101
A NEW APPROACH FOR THE TREATMENT OF HILAR CC WITH INVASION OF THE CONTRALATERAL SIDE
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Introduction: Recent advances in liver surgery have led to a more efficient approach of hilar cholangiocarcinoma (CCH). En-block resection of liver parenchyma with the extrahepatic bile duct is mandatory to obtain tumor-free surgical margins and better long-term outcomes. One of the most important criteria for irresectability is the local extensive invasion to major vessels. Since the CCH Bismuth IIIB often requires a left hemihepatectomy extended to the right anterior segments, the invasion of the right hepatic artery (RHA) usually contraindicates performing these procedures.

Methods: We describe a novel technique that allowed us to carry out an oncological resection in two patients with CCH Bismuth IIIB and contralateral arterial invasion. By means of microsurgery an arterial reconstruction is made as the first step between the posterior branch of the RHA and the common hepatic artery. Once arterial vascular flow is restored, left trisectionectomy with caudate lobe resection is done with or without portal vein reconstruction if needed.

Results: Neither patient developed postoperative complications. 18 months after surgery both are free of disease.

Conclusions: In patients with CCH, HA resection is associated with a higher operative mortality rate than PV resection due to the fact that most times the HA resection needs the combination of PV resection with longer periods of liver ischemia. This new surgical technique allows achieving a complete resection (R0) with less severe ischemic damage to the remnant liver and might improve the outcome in the selected patients with locally advanced CCH.

C-102
LONG OUTCOMES FOLLOWING VASCULAR RECONSTRUCTION FOR HILAR CHOLANGIOCARCINOMA
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Radical surgical resection has been revealed to be the only hope of cure for the patient with hilar cholangiocarcinoma. Therefore, major efforts have been made to increase the resection rate by surgeons employing combined hepatic resection and vascular resection of the portal vein and the hepatic artery.

The technical feasibility and surgical safety of hepatic resection with combined portal vein resection have recently been reported by several authors and they found no significant difference between patients with and without portal vein resection in the occurrence of complications and mortality rates.

The impact of portal vein resection on long-term survival is less clear. Multiple other studies have shown equivalent or worse survival in patients undergoing en bloc resection of the portal vein. In Ebata’s group, the 5-year survival rates were 9.9% and 36.8%, respectively, being significantly lower in patients with portal vein resection. According to the authors, portal vein resection contributed to long-term survival in a small number of patients with advanced cancer. In Miyazaki’s group, the 5-year survival rates in patients with curative resection were 25% and 41% for those receiving combined portal vein resection and those receiving nonvascular resection, respectively. Although the prognosis was significantly poorer in patients with combined vascular resection, it was better compared with that in unresectable patients. Considering the difference of disease stage, more sufficient scientific evidence are needed to clarify the significance of combined portal vein resection.

On the other hand, there have been few reports of combined hepatic artery resection in hilar cholangiocarcinoma. Most of the previous studies involved less than or about 10 patients, showed negative results, and did not recommend combined resection of the hepatic artery for biliary cancer. Miyazaki et al reported that mortality was 33.3% (3/9) in patients who underwent hepatectomy plus hepatic artery resection. Furthermore, none of the patients survived for more than 3 years. However, Nagino et al reported 50 cases of hepatectomy with simultaneous resection of the portal vein and hepatic artery for advanced perihilar cholangiocarcinoma, the mortality was 2.0% and the 1-, 3-, and 5-year survival rates were 78.9%, 36.3%, and 30.3%, respectively, suggesting that this surgery can be performed with acceptable morbidity and mortality by an experienced surgeon and offer a better chance of long-term survival in selected patients.
C-103
TREATMENT OF CHOLANGIOCARCINOMA ARISING IN PSC
C. W. Pinson
Abstract not available at time of publication.

C-104
NON ALCOHOLIC FATTY LIVER DISEASE (NAFLD) – IMPLICATIONS FOR LIVER RESECTION AND TRANSPLANTATION
M. Rela
Abstract not available at time of publication.

C-105
MINIMIZING ISCHEMIA REPERFUSION INJURY IN LIVER SURGERY
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Ischemia/reperfusion injury (IRI) is an inevitable pathophysiological process still relevant due to its strong association with increased morbidity and mortality after liver resection. It includes a direct cellular injury as the result of ischemic insult and a delayed dysfunction and damage due to activation of inflammatory pathways. Various methods have been attempted to limit the adverse consequences of IRI and improve function and regeneration of the remnant liver. Protective strategies proposed can be divided in the following categories: surgical interventions, pharmacological interventions and gene therapy. Most relevant surgical strategies described are: intermittent clamping and ischemic preconditioning (IPC). Among the different methods of vascular occlusion, intermittent portal triad clamping has most evidence to support the clinical application. IPC demonstrated beneficial effects in human liver surgery, principally in specific groups such as young patients and patients with liver steatosis or cirrhosis. In a systematic review of randomized controlled trials, IPC showed that reduces blood transfusion requirements and decreases the enzymes markers of liver parenchymal injury after liver resections performed under vascular control but without clinical benefit. New trials are necessary to assess the role of IPC according to type of resections, parenchymal characteristics and surgical approach. In reference to pharmacologic interventions several agents may have protective roles against IRI like methylprednisolone, trimetazidine, dextrose and ulinastatin. Based on current evidence they cannot be recommended for routine use in liver resection. Further research investigating how the immune system is activated after IRI may lead to develop novel protective strategies.

C-106
ENHANCING LIVER REGENERATION IN LIVER SURGERY
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The ability of the liver to regenerate is one of the most intriguing phenomena in liver physiology. In the regenerating liver, parenchymal cells divide at increased rate leading to an increase in volume of the regenerating (part of the) liver.

One of the most effective methods to enhance liver regeneration is to occlude one of the main branches of the portal vein, either by ligation or (percutaneous) embolization. This will lead a compensatory hypertrophy of the liver segments with still complete portal venous perfusion, at the expense of atrophy of the liver segments in which portal venous flow is arrested. As a preoperative procedure or in two-stage liver resection, this allows for a larger volume of future remnant liver. Interestingly, selective hepatic arterial occlusion alone, will usually not result in ipsilateral atrophy and contralateral hypertrophy of the liver lobes. Sequential arterial and portal venous embolization however, is effective in boosting regeneration in the contralateral liver, while suppressing tumor growth during regeneration. There is little evidence that the combination of portal venous and hepatic venous occlusion increases the efficacy of liver regeneration as compared to portal venous occlusion alone.

The factors mediating liver regeneration are poorly defined. Parenchymal perfusion, regeneration-specific cytokines, growth factors and metabolic factors probably play a synergistic role. There are no confirmed, clinically effective pharmacological interventions to enhance liver regeneration. Several experimental studies have shown that local tissue damage and selective administration of hormones such as erythropoietin potentially enhance liver regeneration.

C-107
STRATEGIES TO PRESERVE THE FUTURE LIVER REMNANT
G. Starkey
Abstract not available at time of publication.

C-108
MINIMIZING BLEEDING IN LIVER SURGERY: OPTIMUM ANAESTHESIA
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Major blood loss and the transfusion of allogeneic red cells is associated with adverse outcome in surgery. Historically, controlling blood loss and minimising transfusion requirement has fallen solely in the surgical domain. Increasingly, particularly in liver surgery, the importance of anaesthesia management is being recognised. During this session I will touch on general measures including temperature and guided coagulation management and discuss special techniques, some controversial, including low CVP anaesthesia, acute normovolemic hemodilution, epidural analgesia and intraoperative blood salvage.
Concurrent Sessions: Invited Speakers

C-109
LOCAL HAEMOSTATIC AGENTS IN LIVER SURGERY
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Surgeons in the past have been reluctant to operate on the liver partly because it has a propensity to bleed. Liver dysfunction can also be associated with a coagulopathy which worsens this tendency. With understanding of the anatomical arrangement of the liver vasculature, understanding of parenchymal dissection techniques and improved anaesthetic management, more aggressive liver surgery is undertaken. Many technologies have been tried to locally enhance haemostasis, ranging from coagulation devices to topical haemostatic agents. The use of and the evidence of their effectiveness of these products will be discussed.

C-110
SYMPOSIUM: MINIMIZING BLEEDING IN LIVER SURGERY: SURGICAL TECHNIQUES AND TIPS IN MINIMIZING OPERATIVE BLOOD LOSS
T. C. Gamblin
Abstract not available at time of publication.

C-111
THE ROLE OF PANCREATIC ENucleATION IN PANCREATIC SURGERY
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At high-volume centers the mortality of pancreatic surgery has improved over the past four decades. As a result, the most common procedures performed for small neuroendocrine and cystic tumors of the pancreas are pancreatectoduodenectomy and distal pancreatectomy. However, the short- and long-term morbidity of a major pancreatic resection remains high. Thus, debate continues as to whether small benign and premalignant lesions of the pancreas should be observed or resected. In comparison, enucleation is a low-risk procedure which preserves pancreatic parenchyma and function. Thus, pancreatic enucleation may be an underutilized procedure that should be considered for small, frequently asymptomatic, pancreatic lesions that, if observed, have the potential to grow and metastasize.

Three recent studies have demonstrated that enucleation has advantages over resection. Analysis of the American College of Surgeons—National Surgical Quality Improvement Program database has shown that the relative mortality of enucleation is dramatically lower than for both distal pancreatectomy and pancreatectoduodenectomy. Another comparative study of patients with small neuroendocrine tumors from four Midwestern university hospitals also demonstrated that short-term outcomes were better for patients with lesions in the pancreatic head and uncinate. Another case-control study from Indiana University has shown that enucleation is associated with significantly (p < 0.05) shorter operative time, blood loss, need for an ICU stay and serious postoperative complications as well as less subsequent endocrine and exocrine insufficiency.

Thus, for small benign and premalignant pancreatic lesions, enucleation should be considered the procedure of choice when technically appropriate.

C-112
LOCO-REGIONAL THERAPIES FOR PANCREATIC MALIGNANCY
I. Frigerio

Introduction: Radical resection, in combination with adjuvant therapy, is reportedly the only strategy able to affect the prognosis of patients affected by pancreatic cancer. Unfortunately, the biggest majority of patients presents a locally advanced stage of disease at presentation (LAPC) being, as a consequence, no longer candidate for radical resection. At these stages, standard treatments are considered the combination of chemotherapy and radiotherapy for locally advanced disease, and chemotherapy alone for the metastatic setting. Encouraging results seems to come from locally ablative methods, such as radiofrequency, brachytherapy and cryosurgery techniques.

Aim: We briefly analyze the different ablative techniques and report our experience in RFA ablation of LAPC with particular interest in feasibility, safety and efficacy.

Patients and Methods: All patients with LAPC (diagnosis based on citology) were treated with RFA during laparotomy as first step treatment or after different association of chemoradiotherapy, and received palliative surgery associated when needed. Pancreatic fistula, acute pancreatitis, duodenal injuries and portal thrombosis were considered RFA related complications. After surgery patients were sent to the oncologist to begin or complete the adjuvant treatment and were reevaluated every three months. For efficacy evaluation only patients with a minimum of 12 months follow up were considered.

Results: One hundred and forty-eight patients underwent RFA between February 2007 and March 2011; of those, 82 had a minimum follow-up of 12 months, and were considered eligible for the current analysis. When RFA was not performed as up-front treatment (n = 35; 42.7%), it followed different associations of chemoradiotherapy, with a median interval between diagnosis and RFA of 6 months. In 46 cases (56.1%) RFA was performed together with palliative surgery. In particular, biliary by-pass was carried out in 8 (9.8%) patients, digestive by-pass in 10 (12.2%), double by-pass in 27 (32.9%), and a pancreatico-jejunosotomy in one patient. Forty out of 46 (87%) surgical palliations were performed for tumors located in the pancreatic head. RFA related complications occurred in 9.4% of cases but none required re-operation. Mortality due to the procedure was 3.7%. The Ca 19.9 serum levels decreased from a median preoperative value of 109.50 U/mL (range: 4–2558) to 52.5 U/mL (range: 9–880) one week after RFA (P = 0.237).

Median length of follow-up was 13 months (Range: 1–35). During follow-up, 40 (48.8%) patients died of their disease and 5 (6.1%) for causes non-related to primary tumor. Median disease-specific survival (DSS) was 20 months (95% CI: 13.1–26.3), and 2-year DSS rate was 46%. The progression-free survival (PFS) rate at 1 year was 33% with a median of (95% CI: 6.3–11.7). The 2-year disease-specific survival was 50% and 38% in both groups, respectively (P
C-113 MANAGEMENT OF THE ISOLATED METASTASES TO THE PANCREAS
P. Evans
Abstract not available at time of publication.

C-114 R1 RESECTION FOLLOWING PD FOR CARCINOMA PANCREAS – PREVENTION AND MANAGEMENT
M. D. Smith
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Surgery may have reached its maximum benefit in the management of carcinoma pancreas. R1 resections have poorer survival but with the current reduction in morbidity and mortality may still have a role to play in the management of these patients. Preventing R1 resections begins with case selection and the accuracy of imaging. Surgical technique may offer some benefit and dissection of the SMA may reduce positive margins. Vascular resections have been shown to benefit survival. Better histo-pathological reporting has identified a greater number of R1 resections. Understanding the pathology identifies areas where this procedure fails most often. R1 resection may offer better palliation and quality of life outcomes. The role of adjuvant therapy has improved survival in R0 resections but the evidence for a benefit in R1 resections is less clear. This paper focuses on preoperative strategies, intra-operative approaches including vascular resections and dissection of the superior mesenteric artery. The role of adjuvant therapy will be dealt with briefly.

C-115 MANAGEMENT OF PREOPERATIVE JAUNDICE IN PATIENTS WITH PANCREATOBIARY MALIGNANCY
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Introduction: The relative merits of preoperative intervention to establish biliary drainage in patients undergoing surgery for peripancreatic malignancy has been debated extensively over the past two decades.

Methods: Studies debating the potential advantages and disadvantages of routinely draining jaundice before major pancreatic surgery have been reviewed, and the results to be presented will focus on distal obstruction of the common bile duct.

Results: Early studies favoured routine drainage of jaundice before major surgery as it allowed reversal of many of the pathophysiological disturbances seen in jaundiced patients. However, recent evidence has contradicted this theory and it has been shown that preoperative routine biliary drainage cannot be justified before major surgery for peripancreatobiliary malignancy as it is associated with an increased rate of infective complications. This approach is not always feasible however, due to the constraints of different healthcare systems, and when necessary drainage may be undertaken via the percutaneous transhepatic route, or preferably endoscopically in cases of distal bile duct obstruction.

Conclusions: Surgery for pancreatobiliary malignancy is safe in the presence of undrained jaundice and results in fewer postoperative complications. It should be the management of choice in situations where it is feasible.

C-116 PROGNOSTIC INDICES OF PANCREATIC ADENOCARCINOMA – BEYOND CLINICAL AND RADIOLOGICAL CRITERIA
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Establishing prognosis in pancreatic cancer has value in selection of patients for various treatment options. Historically, histologic assessment of cellular characteristics such as ductal differentiation, mucin production, nuclear arrangement and pleomorphism, and mitotic activity has been a mainstay of establishing tumor prognosis. A major advance has been the development of the UICC/AJCC TNM staging system which, for most cancers, more powerfully stratifies patients by outcome and has proven usefulness in identifying patients who may benefit from certain interventions. In pancreatic cancer, tumor size, invasion of retroperitoneal structures or major arteries, nodal involvement and resection margin status all are statistically significant factors predicting outcome. However, our current staging systems have limited usefulness because of overlap of survival curves for patients of various stages, their lack of predictability in terms of response to therapy, and the reliance on examination of resected specimens to establish stage. A strong trend in all cancer therapy has been towards multimodal therapies, including neoadjuvant treatment. To optimally select patients for these treatment pathways, it is becoming increasingly important to establish prognosis before the primary tumor is resected. Three general strategies are being employed, including advances in imaging, particularly functional imaging, determination of molecular characteristics from small volume tumor biopsies such as fine needle aspirations or circulating tumor cells, and identification of biomarkers in plasma or serum that have either prognostic significance, predict response to therapy, or identify novel treatment targets.
**Imaging advances:** Accurate staging of pancreatic cancer includes both an understanding of the extent of the primary tumor, especially in terms of vascular and nodal involvement, as well as identifying distant metastases. Empiric evidence from survival curves of early stage, “resectable” pancreatic cancer patients shows that we dramatically underestimate the presence of distant metastases at the time of initial staging. Wider use of functional imaging, including FDG-PET, offers the potential for increased sensitivity in identification of metastases, but current technology does not identify small deposits effectively and has a disadvantage of unacceptable specificity.

**Molecular characteristics:** An improved understanding of the molecular characteristics of pancreatic cancer has occurred through study of biopsies and resected specimens. Activating point mutations in the K-ras oncogene, overexpression of Her-2/neu gene product, and inactivation of the p16, p53, SMAD4, and BRCA2 tumor suppression genes are hallmarks of this disease. The prognostic significance of these genetic alterations is not clear, but may help guide approaches to therapy. BRCA2 mutations, for example, inhibit DNA repair mechanisms, making these patients more responsive to DNA cross-linking agents such as mitomycin-C. Loss of p53 function is predictive of lack of response to drugs that induce apoptosis through p53, such as 5-fluorouracil. The loss of SMAD4 signal transduction protein function is highly correlated with the presence of metastatic disease and poorer prognosis. P21 (CIP1), a cyclin-dependent kinase inhibitor, regulates cell cycle progression through inhibition of cyclin D1 and retinoblastoma. Loss of p21(CIP1) is associated with poor prognosis in patients undergoing adjuvant chemoradiation following pancreatic cancer resection. Angiogenesis is a hallmark of cancer development, and expression of vascular endothelial growth factors (VEGF) in pancreatic cancer has been shown to be correlated with poorer prognosis. The epithelial adhesion molecule, EpCAM, is frequently overexpressed in epithelial cancers and in pancreatic cancer its expression has been linked to good prognosis. Conversely, high S100A2 expression has been linked to poor prognosis and a metastatic phenotype in resected pancreatic cancer. Intensive effort is underway to assess the possible value of determination of these and other genetic alterations in circulating tumor cells prior to resection.

**Biomarkers:** Historically, CEA and CA 19-9 were the first serum tumor markers examined in pancreatic cancer, and both have limited clinical utility. Generally, higher levels of these markers and lack of decrease during therapy are adverse prognostic factors. Easily measurable markers from blood that have high sensitivity and specificity in pancreatic cancer would have value in early diagnosis screening programs – currently no markers with sufficient accuracy are clinically useful. Small series suggest that certain markers may have prognostic significance. For example, high serum MMP-7 levels are associated with poor prognosis in resectable patients and high serum platelet factor-4 levels are predictive of poor prognosis and death related to venous thromboembolism. A compendium of potential biomarkers in pancreatic cancer has been published based on upregulation of mRNA in tumor tissue, evidence of overexpression at the protein level, discrimination or expression in stromal or epithelial tumor elements, and presence on cell surface or secretion in body fluids. With these criteria, over 200 molecules have been identified as potentially important biomarkers in pancreatic cancer. Additionally, identification of circulating microRNA may have potential in establishing diagnosis or prognosis. For example, miR-21 appears to differentiate patients with pancreatic adenocarcinoma from those with chronic pancreatitis and miR-196a is associated with poor prognosis in adenocarcinoma. Current efforts are underway to assess these molecules value as diagnostic, prognostic and predictive markers and as potential targets for chemoprevention in high risk patients or therapy in affected patients.

**C-117 OPTIMIZING POST OPERATIVE MANAGEMENT FOLLOWING PANCREATIC SURGERY**

O. J. Garden

Abstract not available at time of publication.

**C-118 INCIDENTAL CYSTIC LESION OF HOP**

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**Introduction:** Incidentally detected cystic lesions of the pancreas presents numerous challenges in terms of diagnosis and management

**Methods:** We present a case of an elderly lady, detected to have a cystic lesion in the head of the pancreas on a routine ultrasonography of the abdomen for vague abdominal symptoms. An evaluation with a contrast enhanced computerized tomography, endoscopic ultrasound evaluation and aspiration of fluid for analysis was performed. The diagnostic approach and decision making algorithm is discussed and its application and outcome in this particular case is discussed.

**Conclusions:** Evaluation and management of incidental cystic lesions in the head of pancreas is best done through a well defined algorithm.

**C-119 CASE PRESENTATION: IPMN**

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A 39 year old woman developed abdominal pain and a mass, with some deterioration of general health. She sought medical attention, and was diagnosed as having chronic pancreatitis with a head mass. Surgery was advised, but at operation, the lesion was declared as unresectable owing to “portal vein infiltration”. However biopsy from the mass suggested the possibility of intraductal papillary mucinous tumor. She lost considerable weight, and despite re-evaluation (CA 19-9 was 152), was not operated, as the resectability was not guaranteed. Eventually, she developed obstructive jaundice, and was referred to this center. Side viewing endoscopy revealed a fish mouth appearance and mucin draining out of the papilla. She was operated, and two masses (in the head and the distal body) were encountered with a dilated pancreatic
duct containing mucinous material. She underwent total pancreaticoduodenectomy and has remained well and disease free over the last 4 years.

C-120
CASE PRESENTATION: CHRONIC PANCREATITIS WITH BILIARY OBSTRUCTION
A. K. Agarwal
Abstract not available at time of publication.

C-121
PANCREATITIS AND PANCREAS DIVISUM
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Pancreas divisum (PD) is the most common congenital anomaly of the pancreas, which accounts for 8% of normal population. It is controversial whether the relatively obstructive outflow of Santorini duct in PD can lead to recurrent acute pancreatitis (RAP), chronic pancreatitis (CP), or just an innocent bystander of idiopathic CP.

Critical reviews showed that the prevalence of PD in patients with RAP or CP is probably similar to patients without pancreatitis. Isolated dorsal pancreatitis which is the hallmark and suggests that PD is a culprit of RAP or CP is not always present (30–88%). CFTR and SPINK1 mutations have been found commonly in patients with PD and RAP or CP (22% and 42%, respectively). There are many case series but there is only 1 small RCT on the efficacy of endoscopic therapy for PD in RAP and none exists for CP. The proper endoscopic technique is not yet established. Results of the treatment also varied but are better in RAP (81%) than CP (69%).

Eventually, careful patient selection for the treatment is essential. Suitable patients are likely similar to patients without pancreatitis. Isolated dorsal pancreatitis which is the hallmark and suggests that PD is a culprit of RAP or CP is not always present (30–88%). CFTR and SPINK1 mutations have been found commonly in patients with PD and RAP or CP (22% and 42%, respectively). There are many case series but there is only 1 small RCT on the efficacy of endoscopic therapy for PD in RAP and none exists for CP. The proper endoscopic technique is not yet established. Results of the treatment also varied but are better in RAP (81%) than CP (69%).

C-122
LAPAROSCOPIC SPLEEN PRESERVING DISTAL PANCREATECTOMY
C-K. Ho
Nexus Surgical Associates, Mount Elizabeth Hospital, Singapore
Laparoscopic distal pancreatectomy with preservation of the spleen is a feasible surgical technique with acceptable outcome. The primary intent of spleen preservation is to reduce post-operative infectious morbidity. This video will briefly go through the selection of cases, the advantages of spleen-preservation, the optimal method to preserve the spleen and our technique.

C-123
TECHNICAL TIPS FREY PROCEDURE
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The strategy for surgical treatment of chronic pancreatitis is as follows: a) clearance of stones and strictures, b) biopsy of suspicious areas, c) wide drainage of the pancreatic ductal system, d) preservation of the duodenum, and e) conservation of pancreatic parenchyma as far as possible. All these can eminently be achieved by the Frey procedure. The critical steps of the operation are: a) wide and thorough mobilization of the pancreas from head to tail including release of the gland from the retroperitoneum by dividing the peritoneal attachments at the superior and inferior borders; b) division of the right gastro-epiploic artery to expose the neck adequately, c) ligation of the gastroduodenal/superior pancreaticoduodenal artery at the upper and lower border of the head/neck junction; d) thorough Kocherization to allow control of the head to minimize bleeding, and also guide the coring process, e) use of intra operative C Arm fluoroscopy to identify retained stones and assist clearance of strictured pockets of duct which are otherwise inaccessible; f) two layered anastomosis to a Roux loop of jejunum. The strategy for head coring depends on whether there is an inflammatory mass in the head or if the head is mainly containing calculi. In the former, a serial coring out of the duct permits access to side branches and the process is continued till only a small rind of pancreas remains. In the latter, the approach is by filleting out the duct in the head, clearing the stones, and then excising the intervening tissue to complete the coring. Complications include anastomotic leak, secondary bleed, intestinal obstruction and wound infection. In a series of 400 cases, 7 patients died (all within the first 150 cases). Over a follow up of 10 years, 355 out of 400 patients had excellent or good result, with 92% having good quality-of-life scores. 43 patients required re-intervention (all in the first 4 years after the initial operation). In the author’s experience, a carefully performed Frey procedure relieves pain and preserves pancreatic function in the majority of patients with chronic pancreatitis.

C-124
LAPAROSCOPIC PSEUDOCYST ENTEROSTOMY
R. Ardhanari
Meenakashi Mission Hospital & Research Centre, Tamil Nadu, India
Laparoscopic pseudocyst enterostomy is performed for symptomatic pseudocyst which either has a lot of necrotic debris or as an alternative to endoscopic drainage. It is performed under GA. The patient is in legs apart supine position. The surgeon stands between legs; the cameraman to the right of the patient and monitor is towards head end. After establishing access the best route is selected. Here a laparoscopic pseudocyst gastostomy is shown. After anterior gastostomy the cyst is entered and disc of gastric and pseudocyst wall removed. All debris is removed and cavity irrigated.
Pseudocyst gastric anastomosis done with 2/0 'VICRYL'.
Anterior gastostomy is closed with single layer 2/0 'VICRYL'.

C-125

PANCREATIC HEAD RESECTION WITH SEGMENTAL DUODENECTOMY (PHRSD)

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We proposed pancreatic head resection with segmental duodenectomy (PHRSD) for benign or low grade malignancy tumor of the pancreatic head region as a function-preserving operation instead of pylorus preserving pancreaticoduodenectomy (Hepatogastroenterol, 1998). This operation is simple, easy and safe procedure compared with duodenum preserving pancreatic head resection (DpPHR).

Laparotomy is done by upper midline skins incision. The gastrocolic and duodenocolic ligament is divided. Intraoperative US study is done. By conserving the right gastric artery and gastroduodenal artery, 5 to 7 cm of the first portion of the duodenum is preserved with good arterial circulation. The anterior superior pancreaticoduodenal artery and posterior superior pancreaticoduodenal artery are ligated and divided. In addition, by conserving the anterior inferior pancreaticoduodenal artery, the third portion and anal side of the second portion of the duodenum are preserved with good arterial circulation. Resection of the pancreatic head with 3 to 4 cm of segmental duodenectomy including minor and major papilla completes PHRSD. The distal pancreas is examined by ultrathin pancreatoscope. Reconstruction of the alimentary tract is then performed with pancreatogastrostomy, end to end duodenoduodenostomy and end to side choledochooduodenostomy.

PHRSD is simple, easy, safe and function-preserving operations for benign or low grade malignancy tumor of the pancreas (Ann Surg, 2007; Pancreas, 2011). In this video, PHRSD for the branch duct type of IPMN of the pancreatic head is presented.

C-126

LAPAROSCOPIC APPROACH TO MIRIZZI SYNDROME

C-N. Tang

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Mirizzi syndrome is a spectrum of disease process evolving from gallstone impaction with biliary obstruction to cholecystocholedochal fistula to complete erosion of common hepatic duct. Surgery is the mainstay of therapy for Mirizzi syndrome and has long been known to present a great technical challenge to surgeons. The distortion of anatomy and the presence of cholecystocholedochal fistula increase the risk of bile duct injury during cholecystectomy. In the era of minimally invasive surgery, the role of laparoscopic surgery in the management of Mirizzi syndrome is still not well defined and remains controversial.

Between 2004 and 2010, five cases of Mirizzi syndrome were diagnosed in our institution. Three cases were performed with total laparoscopic approach and two with robotic assistance. The mean operation time was 148.4 ± 18 minutes. Median hospital stay was 5 days (range 3–11). No conversion, readmission and major complication including bile duct injury or residual stones were encountered.

The operative management of Mirizzi syndrome depends on the type of the lesion encountered. For McSherry type 1, the majority of patients can be successfully treated with laparoscopic cholecystectomy, but with special caution during dissection around the area of inflammation adjacent to common bile duct to avoid possible injury. While the surgical management for McSherry type 2 is largely dependent on size of cholecystocholedochal fistula, which includes partial cholecystectomy with primary closure, Roux-en-Y hepaticojejunostomy, cholecysto-duodenostomy or choledochoplasty with gallbladder flap.

We concluded that with a correct pre-operative diagnosis, careful operative strategy, increasing expertise with laparoscopic technique and introduction of robotic surgical system, laparoscopic management of Mirizzi syndrome is safe and feasible.

C-127

ROBOT ASSISTED LAPAROSCOPIC WHIPPLE’S OPERATION FOR PERIAMPULLARY TUMOR

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Traditionally, pancreatic surgery is considered as one of the most complex surgeries among the abdominal procedures. Minimally access surgery (MAS) development in pancreatic surgery is also lag behind that in other gastrointestinal organs. Recently, there has been growing interest in the ability to perform complex pancreatectomy using the laparoscopic approach. These advanced MAS require surgeons to have highly experienced laparoscopic skills. The recently developed surgical robotic systems can overcome many of the limitations and drawbacks of conventional laparoscopic approach. This may fasten the MAS development of pancreatectomy. The advantages of robotic systems are many because they overcome many of the obstacles of conventional laparoscopic surgery. They increase dexterity, restore proper hand-eye coordination and an ergonomic position, and improve visualization. Several steps of complex pancreatectomy may be improved with robotic surgery, including dissection of the pancreatic gland from major vasculatures, lymph node dissection, dissection and resection of the uncinate process, and reconstruction of anastomoses. There are also several disadvantages to these systems. First of all, robotic surgery is a new technology and its uses and efficacy have not yet been well established. Another disadvantage of these systems is their cost. Clinical trials comparing the robot-assisted technique with the conventional laparoscopic technique for different pancreatectomy are not available. Based on the current evidence, despite technical feasibility of conventional laparoscopic or robot-assisted laparoscopic pancreateoduodenectomy, in the absence of definitive advantages over the open approach, and in light of remaining
uncertainties regarding long-term oncologic outcome, caution should be exercised in the assessment of the appropriateness of this operation for individual patients.

C-128
MECHANISMS OF MALNUTRITION AND CACHEXIA IN PANCREATIC CANCER
T. Gilliver
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Cachexia is a multifactorial syndrome causing marked malnutrition, poor quality of life and reduced survival time. There are multiple mechanisms involved in this wasting process and the effects on body composition differ from that seen in starvation. Anorexia, caused by the tumour or the treatment is an important co-existing issue but is not directly related to the loss in body mass. Many patients with pancreatic cancer have a higher resting energy expenditure and this is often associated with the acute phase response. Futility metabolic cycles, including the Cori cycle can account for energy wastage of up to 300 kcal per day. Weight loss in patients with cachexia ranges between 15–30% in pancreatic cancer, and translates to an 85% loss of fat and 75% loss of skeletal muscle mass. Loss of skeletal muscle directly correlates with respiratory muscle function deterioration and is an important prognostic factor.

Cachexia affects both the fat and skeletal muscle mass. It appears that lipid mobilising products produced by either the host or the tumour cause increased lipolysis in cancer. These products include Lipid Mobilising Factor/Zinc α2-Glycoprotein, Tumour Necrosis Factor-α (TNF-α), Interleukins 1&6 and Interferon-γ. Studies results vary as to whether muscle mass is affected by increased protein degradation, reduced protein synthesis or both. Tumour and host factors also affect muscle mass and include proteolysis-inducing factor, glucocorticoids, TNF-α, Interleukin-6, and angiotensin II. Treatments include agents to stimulate appetite, omega-3 to attenuate the loss of muscle mass, thalidomide to reduce the production of TNF-α, and nonsteroidal anti-inflammatory agents.

C-129
NUTRITION IN PANCREATIC DISORDERS: NUTRITIONAL PREDICTORS OF POSTOPERATIVE OUTCOMES IN CARCINOMA OF THE Pancreas
M. Brooke-Smith
Flinders Medical Centre, Bedford Park, Australia

Carcinoma of the pancreas is uncommonly managed operatively, as it often presents late. The metabolic demands of cancer in addition to loss of function of the pancreatic gland mean that this group of patients is often malnourished. Surgery in the nutritionally impaired is associated with an increased risk of complications. The focus of this paper will be identifying nutritional issues in patients with pancreatic cancer, with particular reference to those undergoing major pancreatic surgery and potential strategies to improve outcomes.

C-130
EVALUATION OF NUTRITIONAL STATUS IN PATIENTS WITH PANCREATIC DISORDERS
J. Bailey
Austin Health, Melbourne, Australia

Patients with pancreatic disorders have many risk factors for malnutrition. Malnutrition is a common but unrecognized problem for hospitalized patients, and is associated with poor clinical outcomes including increased length of stay, increased infective complications, poor wound healing, functional decline, and surgical wound dehiscence.

Malnutrition is treatable, but assessment of nutritional status is often overlooked in the busy healthcare environment. Early detection of nutritional risk or depletion can enable timely nutrition interventions. The pre-operative period provides a window of opportunity to optimize the nutritional status of surgical patients and thereby improve postoperative recovery and healing.

This presentation provides an overview of the anthropometric, biochemical, clinical, and dietary components of assessing nutritional status in patients with pancreatic disorders.

C-131
OPTIMUM NUTRITIONAL SUPPORT IN PATIENTS UNDERGOING PANCREATIC SURGERY
B. N. J. Thomson
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Pancreatic cancer is frequently associated with significant weight loss predominantly due to the inflammatory response and production of cancer cachexins. Furthermore jaundice can also accelerate weight loss due to malnutrition and loss of appetite. Peri-neural invasion occurs frequently and leads to gastroparesis in as many as 40% of patients with further exacerbation of weight loss. For patients presenting for pancreatic surgery 70% are already suffering from weight loss with 40% having lost >10% of their stable weight. Post pancreaticoduodenectomy delayed gastric emptying remains the commonest post-operative complication.

There is little evidence in the literature specifically for nutritional support in pancreatic surgery patients however stronger evidence does exist for patients having major abdominal surgery (including pancreatic surgery). Total Parenteral Nutrition (TPN) only has a proven role for malnourished patients in the pre-operative period. Enteral nutrition remains the preferred route for feeding with good evidence for improved outcomes when administered pre-operatively for malnourished patients. Further evidence also exists for the use of immuno-nutrition in all patients pre-operatively. Recent prospective randomized trials of early enteral nutrition in pancreatic surgical patients have shown improvements in surgical outcomes as well as a decrease in the length of stay. For post-operative complications such as pancreatic fistula and delayed gastric emptying enteral feeding remains a safe and effective route for the administration of nutrition.
C-132
HEPATICOLITHIASIS – MANAGEMENT OPTIONS
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Hepatolithiasis, which is defined as the occurrence of stones in any intrahepatic bile duct proximal to the confluence of the right and left hepatic ducts, is a prevalent disease in China.

An optimal classification of hepatolithiasis can be helpful in determining treatment strategies. We have established a novel classification based on the pathological characteristics of biliary tree and hepatic parenchyma. In the novel classification, hepatolithiasis was divided into two types: Type I and Type II. Type I is a localized stone disease with stones locating in unilateral or bilateral lobe; Type II is a diffuse stone disease, which is divided into three subtypes: Type Ila (without any atrophy of hepatic parenchyma or stricture of intrahepatic bile ducts); Type I Ib (with segmental atrophy and/or stricture of intrahepatic bile ducts) and Type I Ic (with biliary cirrhosis and portal hypertension). The letter “E” represents additional type for extrahepatic stone, which is divided into three subtypes- “Ea”, “Eb” and “Ec” according to normal, relaxation and stricture of Sphincter of Oddi respectively.

Hepatectomy for hepatolithiasis can simultaneously remove the stones, the biliary stricture, and the atrophic part of the liver, thus reducing the risk of recurrent intrahepatic stones and of cholangiocarcinoma, thus, it would appear to be the most robust approach for the treatment of hepatolithiasis. The classifications of Type I and Type II b are the best indications for hepatectomy; Type II is a high risk of stone recurrence type, so all of patients with Type II should be performed with stone removal combining with Roux-en-Y hepaticojejunostomy or hepaticojejunostomy, furthermore, for Type II b patients accompanied hepatic lesions (e.g. segmental atrophy hepatic abscess, cholangiocarcinoma, etc.), hepatectomy is also the best choice to resect the lesions. Type IIc patients with biliary cirrhosis, portal hypertention and liver failure should be a indication to liver transplantation. Moreover, for hepatolithiasis with “Eb” (relaxation of Sphincter of Oddi) and “Ec” (stricture of Sphincter of Oddi), a hepaticojejunostomy should be performed too.

C-133
INTRA HEPATIC STONES: REMOVE THE STONES OR RESECT THE LIVER?
M. T. Cheung
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Introduction: The long-term outcome for patients with hepatolithiasis treated with liver resection was good for a selected group of patients. Liver resection should also be offered to those patients with complex hepatolithiasis such as bilateral stones or those with strictures.

Methods: All patients suffering from hepatolithiasis who were treated with liver resection (LR group) or removal of stones primarily by percutaneous cholecodochoscopy (SR group) were studied. The patients’ characteristics, the results of each procedure and the long-term outcomes of both groups of patients were carefully compared and contrasted.

Results: Fifty-two patients underwent liver resection for hepatolithiasis. The majority of the group was patients with stones localized to the left side. The overall success rate of stone removal was 98%. Occurrence of biliary sepsis at 5 years after resection was 13.3%. The overall success rate of stone removal primarily by percutaneous choledochoscopy was 70.5%. The bilaterality of stones, the presence of stricture and the presence of atrophy were found to be significant risk factors for a poor long-term outcome after just stone removal alone. The occurrence of biliary sepsis at 5 years was 26.4% and 43.2% for those without stricture and those with stricture, respectively.

Conclusions: The long-term outcome after liver resection for hepatolithiasis was excellent for a selected group of patients. Poor outcomes were recorded those patients whose intrahepatic stones were removed primarily by percutaneous choledochoscopy – especially those with strictures. Indication of liver resection for hepatolithiasis should be extended to those patients with strictures or those with bilateral stones. A combination of different treatment modalities is necessary to improve the outcome of these patients.

C-134
THE MANAGEMENT OF DIFFICULT INTRAHEPATIC BILIARY STRICTURES WITH COMPLEX HEPATOLITHIASIS
K.-S. Jeng
Department of Surgery, Far Eastern Memorial Hospital, Taipei, Taiwan

Introduction: Recurrent or residual (the so-called complex) hepatolithiasis is usually difficult to treat especially when it is associated with intrahepatic biliary strictures. After the improvement of diagnostic tools and technical skills with instruments, whether the treatment outcome of the recent 10 years is significantly better than that of the past 10 years remains to be elucidated. We compare the treatment modalities and the outcome between the past decades (1990–2000) and the recent decade (2001–2010).

Methods: All the interventions of medicine, surgery and radiology had been reviewed. The resection policy, the cholangioscopic use, the radiological interventions, the procedural complications, the rates of retained stones, recurrent cholangitis, and recurrent stones, the need of rehospitalization and retreatment are compared between the two decades.

Results: The duct oriented resection, the modified nonsurgical radiological interventions, the days of hospitalization and the procedural complications improved significantly in recent decade. The imaging studies, the improved skills and adequate cholangioscopic procedures and modified nonsurgical radiological intervention significantly decreased the treatment sessions, shortened the days of treatment, and decreased the retained stone rate. However, recurrent cholangitis or and hepatolithiasis may occur. The associated cholangiocarcinoma still exists.

Conclusion: Resection for regional hepatolithiasis and biliary stricture is the golden treatment. However, the nonsurgical interventions may be an alternative or adjunctive treatment to avoid reoperation and decrease the residual stones. How to eliminate biliary strictures to minimize recurrent hepatolithiasis need continuing investigations.
C-135
MANAGEMENT OF MIRIZZIS SYNDROME
A. L. Montagnini
Abstract not available at time of publication.

C-136
ADVANCES IN DIAGNOSTIC AND THERAPEUTIC ENDOSCOPIC TECHNIQUES OF THE BILIARY TRACT
G. C. Vitale
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Role of endoscopy in managing benign and malignant disease of the biliary tract has continued to increase in the era of minimally invasive surgery and laparoscopy. Endoscopy is useful in the treatment of choledocholithiasis, strictures of the bile duct secondary to iatrogenic injury, trauma and malignancy.

There is no consensus on the optimal management of patients with choledocholithiasis particularly in patients who undergo cholecystectomy. Local expertise in a given institution is critical to decision making for treatment of CBD stones. For suspected CBD stones if cholecystectomy is required, laparoscopic CBD exploration at cholecystectomy followed by ERCP for failure is probably the optimal approach. ERCP with stenting is now a valuable tool in the diagnosis and treatment of bile duct injuries. It is also the mainstay in the palliative treatment of malignant bile duct strictures.

ERCP for gallstone pancreatitis should be limited to patients with associated cholangitis and rising bilirubin. In all other cases, the patient should undergo cholecystectomy with intraoperative cholangiogram when pancreatic inflammation subsides. Benign postoperative bile duct strictures can be managed primarily with ERCP with excellent results in 85–90% of selected cases with surgery being reserved for failures. Plastic and metallic stent placement for effective palliation of malignant bile duct and pancreatic tumors can be achieved in 80% of proximal tumors (Klatskin) and over 90% of distal tumors (pancreatic) with minimal morbidity and mortality for long term palliation.

Advances in endoscopic therapy for benign and malignant biliary tract disease have yielded safe and effective treatments which are increasingly being incorporated into surgical training and decision making.

C-137
HEPATIC INCIDENTALOMA
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The problem of hepatic incidentaloma has increased progressively with the number of imaging techniques and the volume of imaging performed in the patient population. When a hepatic incidentaloma is discovered it should be possible in the majority of circumstances to make a diagnosis without the need for diagnostic biopsy or resection for diagnostic as well as therapeutic reasons. The sophistication of currently available imaging techniques has significantly increased the preoperative diagnostic accuracy. When confronted with a patient with hepatic incidentaloma the past history exposure to hormones evidence for compromised liver function is all important. With respect to the imaging of the liver the approach is to obtain information of the background liver parenchyma (normal v steatotic v fibrotic or cirrhotic) and the individual characteristics of the incidentaloma. An assessment of whether the incidentaloma is comprised of liver cells or non liver cells and if non liver cells, whether primary or secondary.

Different information can be obtained from ultrasound, CT and MRI scanning. Appropriately selected combinations of these modalities and the use of different contrast agents will allow identification through utilization of excretion into different cellular or extra cellular elements. The usual IV contrast agents distribute in the extra cellular space and will allow identification of the presence of lesions but not necessarily the content. With MRI and CT it is important to do both arterial and portal phases and often a delayed phase will give further information. With MRI scanning some contrast agents will collect in Kupfer cells (iron oxide) and others into bile ducts (eg. GD-EOP-DTPA) which helps with discriminating between focal nodular hyperplasia and hepatic adenoma.

Examples of the use of all the imaging modalities to establish a diagnosis will be given.

C-138
THE PATHOLOGICAL APPROACH TO HEPATOCELLULAR ADENOMA (HCA)
A. Clouston1,2
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Although the diagnosis for many benign hepatocellular lesions is straightforward, there are some that remain challenging. Questions commonly asked include “Why are some tumours difficult to diagnose radiologically?”, “Why is the pathologist sometimes unable to classify a benign lesion as either focal nodular hyperplasia or HCA?” and “Is there really a malignant risk for HCA, since transformation seems vanishingly rare?” The answers to these questions lies in the recent recognition that HCA is a heterogeneous group of neoplasms with at least 3 different groups based on mutational analysis, each with distinctive radiological, pathological and clinical features.

Recent work has identified three (3) major mutational groups: HNF1a-inactivated HCA, inflammatory HCA with gp130 mutation (previously called “telangiectatic FNH”) and b-catenin-activated HCA.1 A fourth group remains unclassified. HNF1a-inactivated HCA (35–40%) has typical radiology, is usually steatotic, and is the most common type found in adenomatosis. Immunoperoxidase staining shows a loss of normal staining for LFABP.

Inflammatory adenoma (45–60%) has atypical but often distinctive radiology (marked high intensity signal on T2-weighted sequences associated with delayed persistent enhancement)2, and unusual histological features including focal bile ductular reaction, variable steatosis, telangiectatic vessels and a morphological overlap with FNH. This explains our previous difficulty in categorising these lesions as HCA or FNH in the past. The atypical radiology also explains why
many are biopsied. These lesions show positive immunostaining for amyloid A protein.

The third group of b-catenin-activated HCA (10–15%) is the most common type found in males and those with glycogenoses. These lesions frequently have cytological atypia, and this is the type with an increased risk of malignant transformation. Immunostaining with b-catenin may show aberrant cytoplasmic or nuclear (rather than normal membrane) staining, but the downstream protein glutamine synthetase is a more reliable marker and shows diffuse positive staining in this form of HCA. Importantly, about 10% of inflammatory HCA also have activating b-catenin mutations in addition to mutation in gp130.

References:

C-139
MANAGEMENT OF HEPATIC ADENOMA
K. H. Liau
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Hepatic adenomas are benign tumors which carry rare potential complications of an unpredictable hemorrhage and malignant transformation. Studies have revealed that the risks of hemorrhage, spontaneous rupture and malignant change depend on the size of the adenoma. Clinical differentiation of hepatic adenoma from focal nodular hyperplasia and hepatocellular carcinoma, especially the well-differentiated subtype of hepatoma, can be challenging for physicians. Currently, dynamic multi-slice and multi-phasic computed tomography and magnetic resonance imaging are the main diagnostic imaging techniques to identify and characterize these tumors. With these modern imaging technologies, the accuracy of diagnosis has improved, albeit imperfect. The options of treatment range from conservative management to interventional ablation, enucleation, surgical resection and orthotopic liver transplantation. The indications for each option depend on the symptoms, diagnostic certainty and the growth of the tumor. This lecture reviews the current update on the recent improvement in imaging techniques and their significant implications on surveillance and the choice of therapeutic management of hepatic adenoma.

C-140
LAPAROSCOPIC LIVER RESECTION FOR BENIGN LIVER TUMORS
N. Jarufe
Digestive Surgery Department, Pontificia Universidad Católica de Chile

Surgical treatment of benign liver tumors remains a controversial topic. Candidates are patients with symptomatic tumors or high risk of rupture, bleeding or malignancy.

When feasible, minimally invasive hepatic surgery is associated with less blood loss, less pain medication requirement, better cosmetic results and shorter length of hospital stay. All this benefits make the costs of the laparoscopic approach at least comparable with the traditional open surgery. Because wide margins and anatomical resections are usually unnecessary in surgical procedures for benign liver tumor, more conservative resections are possible, making the laparoscopic approach a good strategy to reduce the morbidity.

In this conference we will discuss indications, benefits and contraindications of laparoscopic resection for benign tumor disease as well as provide selected videos from laparoscopic benign liver tumors resection.

C-141
THE SURGICAL MANAGEMENT OF POLYCYSTIC LIVER DISEASE
C. W. Pinson

Abstract not available at time of publication.

C-142
DIAGNOSIS AND MANAGEMENT OF FOCAL NODULAR HYPERPLASIA
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Focal nodular hyperplasia (FNH) is a common benign hepatic neoplasm. These lesions are often detected on incidental imaging but can be symptomatic. Current imaging techniques, particularly contrast-enhanced MRI scanning is highly sensitive in characterizing these liver tumors. Differentiation of FNH from other liver lesions enables appropriate management decisions. Unlike premalignant and malignant neoplasms, the indication for hepatic resection is poorly defined and is determined by the stability of the lesion, patient symptoms and clarity of diagnosis.

C-143
HEPATIC Cavernous HEMANGIOMA: AN ANALYSIS OF 172 CASES
X.-H. Fu, X.-P. Yao, F. Shen and M.-C. Wu
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Objective: Hepatic hemangiomas are congenital vascular malformations and are the most common benign hepatic tumors. Surgery of hemangioma involving porta hepatis is technically more challenging than that for peripheral lesions. The indications for surgical resection of liver hemangiomas remain controversial. This study aimed to explore the feasibility of operation on hepatic cavernous hemangioma.

Methods: The clinical data of 172 patients with hepatic cavernous hemangioma performed from 2004 to 2006 at Eastern Hepatobiliary Surgery Hospital of Second Military Medical University were analyzed retrospectively. The tumors were removed by dissecting the plane between the capsule of the hemangioma and normal liver tissue. The diameters of the tumors ranged from 4 to 32 cm. Among them, 128 patients with hemangioma involved porta hepati
Surgery of hemangioma involving porta hepatis had more intraoperative bleeding (P < 0.001), longer time of inflow exclusion (P < 0.001), and higher incidence of postoperative pleural fluid (P = 0.005), while no significant difference exists in the complication of operation and postoperative recovery. There was no hospital mortality.

**Conclusions:** Surgery of hemangioma involving porta hepatis is safe and effective. For patients with symptoms or young patients with rapidly enlarging mass, the enucleation of the tumor is needed and feasible. Especially for the young patients with rapidly enlarging mass, delayed surgery may increase the risk of intraoperative bleeding and postoperative complications. It should be carried out strictly in accordance with the rules of the liver surgery and the characteristics of the hemangioma so as to ensure the safety of the operation.

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**C-144**

**STAGING FOR AMPULLARY CARCINOMA: THE ROLE OF EUS**

S. Panpimanmas

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**Introduction:** Endoscopic ultrasonography (EUS) is highly accurate for the staging of tumors of the biliary and pancreatic systems. Ampullary carcinoma is relatively rare cancer but it has better prognosis as it’s early symptoms and more chance for curative surgical treatment Preoperative staging is important in planning the most appropriate treatment.

**Methods:** Retrospective review of ampullary carcinoma patients from January 2009 to December 2010, there were 85 patients admitted and treated in hospital. Every patients had preoperative CT scan, only twelve patients had EUS assessment before surgery. Accuracy and staging comparison of CT scan and EUS were evaluated.

**Results:** Twelve ampullary carcinoma patients (7 women and 5 men), only 50% could be detected by CT scan especially in early stage that difficult to be found by this imaging. Overall accuracy of EUS in detecting of ampullary tumors was 91.7% which was significantly superior than CT scan. Tumor size, tumor invasion and regional lymph nodes detection were also superior by EUS, as accuracy of T stage by EUS was 83.3% and regional metastatic lymph nodes was 75% compared with CT scan was only 25% but EUS had limitation in detecting far area lymph nodes and liver metastasis, that CT scan had more benefit.

**Conclusion:** EUS is more accurate in detecting and staging ampullary tumor and locally lymph nodes (T, N) and better for evaluating prognosis and resectability of ampullary tumor. EUS staging improve the treatment and prevent some unnecessary operations.

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**C-145**

**LOCAL EXCISION IS THE PREFERRED OPTION TO RADICAL RESECTION FOR EARLY TUMORS OF THE AMPULLA**

(for the ‘Yes’ side of the debate)

C.-K. Ho

Nexus Surgical Associates, Mount Elizabeth Hospital, Singapore

All ampullary tumors should be resected. While there is general agreement that pancreatico-duodenectomy is the operation of choice for ampullary adenocarcinoma, the ideal treatment for benign neoplasms, with or without dysplasia, and lesions with micro-invasion remains controversial. As it is, ampullary cancers have the best survival amongst the various types of periampullary malignancy. For early tumors, local excision, whether by an endoscopic technique or a transduodenal approach, is an attractive alternative. As opposed to radical resection, local resection has a significantly shorter operation time, a significantly lower incidence of surgery-related morbidity, and hence consequently, a significantly shorter postoperative hospital stay. The Proposition will present the care on why local excision is the preferred option for early tumors of the ampulla.

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**C-146**

**DEBATE: LOCAL EXCISION IS THE PREFERRED OPTION TO RADICAL RESECTION FOR EARLY TUMORS OF THE AMPULLA**

(for the ‘No’ side)

S. Connor

Abstract not available at time of publication.

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**C-147**

**THE MANAGEMENT OF MULTIPLE DUODENAL – AMPULLARY ADENOMAS IN FAP**

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Up to 90% of patients with Familial Adenomatous Polyposis (FAP) develop duodenal adenomas. The cumulative risk of development of duodenal or peri-ampullary carcinoma by 60 years of age is between 5–10%. Duodenal adenomas may present at a young age in this group of patients. The incidence and severity of duodenal adenomatosis increase with age and close endoscopic surveillance is indicated. There is some evidence that chemoprevention by the use of celecoxib may slow the progression of the adenomatosis in FAP. Local endoscopic techniques are not effective in controlling adenoma progression.

Spigelman devised a classification stratifying the risk of malignant change according to the number, size, histological type and presence of dysplasia. The risk of malignant change in Spigelman Stage IV disease is such that prophylactic duodenal resection, typically by pancreaticoduodenectomy, is indicated.
Reference


C-148

PANCREATIC-SPARING DUODENECTOMY: INDICATIONS AND TECHNIQUE

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Introduction: In pancreatic surgery, as in other organs there is a tendency towards organ-preserving techniques. Pancreas-sparing duodenectomy (PSD) was introduced as an alternative to pancreateoduodenectomy (PD) in a variety of conditions

Methods: From 1989 to 2010, 19 patients with nine different kinds of disease underwent PSD at our institutions.

Methods: 1) Dissection: Duodenum is dissected from the pancreas. Owing to dense adhesion, the proximal part of the duodenum is separated from the pancreas leaving the outer muscular layer of the duodenum on the pancreas. The proximal part of the duodenum is then separated from the pancreas. 2) Resection: Duodenum is transected at both ends. Whether the major papilla is preserved or not depends on the pathology. 3) Reconstruction: Reconstruction of the alimentary tract is performed after either the Billroth I or Billroth II method. Papillojejunostomy is the most important anastomosis. Generally the cut edge of the major papilla is anastomosed to a small opening on the jejunum with about ten 5–0 interrupted absorbable sutures. In the case where the major papilla is preserved, we would suggest to use binding duct to mucosa anastomosis (Peng et al. CJS 2011, in print), which is very easy and safe to perform.

Results: Total morbidity was 30%, including anastomotic leak in two cases. One patient died of underline disease of heart attack on the 5th post-op day.

Conclusions: PSD is a safe surgical procedure for a variety of conditions involving the duodenum. As a new procedure binding duct to mucosa anastomosis is recommended.

C-149

IPMN – CLASSIFICATION, INVESTIGATION, AND MANAGEMENT GUIDELINES

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IPMN of the pancreas is a fascinating entity that is drawing more and more attention. The international consensus guidelines were published by the working group in the International Association of Pancreatology (IAP) in 2006 (Tanaka, et al. Pancreatology 2006;6:17), based on the yield of a symposium in the IAP congress in Sendai, Japan, in 2004. Although these guidelines greatly contributed to our improved understanding, some issues still remain to be solved especially on IPMN of the pancreas.

#1. Uncertainty exists regarding classification of IPMNs. Necessity of mixed-type category of IPMN and whether classification should be defined radiographically or histologically needs to be defined.

#2. Preoperative distinction of branch duct (BD-) IPMNs from non-mucinous cysts should be further investigated so that potentially malignant lesions can be identified and management strategies guided effectively. The role and safety of cystic fluid analysis remains to be clarified.

#3. With regard to diagnosis of malignancy in BD-IPMNs, criteria for identifying malignancy need to be re-evaluated. Presence of mural nodules is a reliable predictor; however, controversy exists over the value of size of BD-IPMN (Tanaka M. Nature Rev Gastroenterol Hepatol 2011;8:56).

Criteria with increased specificity are needed, perhaps including histological subtype, to reduce the false-positive rate of present Sendai criteria.

#4. Finally, the best modality and interval for surveillance of BD-IPMNs requires determination because of its significance in terms of malignant transformation, development of distinct pancreatic ductal adenocarcinoma during surveillance, and the same phenomenon and IPMN recurrence after resection.

C-150

LAPAROSCOPIC PANCREATICODUODENECTOMY

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Since the introduction of laparoscopic pancreatic surgery for staging of advanced pancreatic cancer in the early 1980s, its use has been widened to include palliation of unresectable pancreatic cancers, drainage of pancreatic pseudocyst, and pancreatic resection including distal pancreatic resection or pancreaticoduodenectomy. In contrary to laparoscopic distal pancreatic resection widening its application, laparoscopic pancreaticoduodenectomy (LPD) remains as complicated operation to perform safely until now because of its complicated procedures and possibility of high mortality and morbidity. Since LPD was introduced to reduce the postoperative morbidity firstly by Gagner et al in 1994 as a most advanced laparoscopic surgical trial, limited reports only have been described by some experienced centers with unsatisfied clinical outcomes. Some barriers are present for the LPD to be a widespread clinical application for the resection of pancreatic head lesions; long operation time, technical difficulties from proximity to large vessels to dissect and reconstruction procedures. Therefore LPD was not accepted as a generalized surgical modality for the resection of pancreatic head lesions. Most surgeons are reluctant against LPD for malignant lesion of pancreas head because of oncologic point of view yet. However, as for the benign or low grade malignant lesions, if technical feasibility and safety are, LPD can be accepted as an alternative option for open pancreaticoduodenectomy. Technical progress for LPD has been made since Gagner’s first trial by some pioneer laparoscopic surgeons, such as hand assisted LPD, laparoscopic assisted pancreaticoduodenectomy, robotic assisted pancreaticoduodenectomy.
We performed 75 cases of LPD in mainly in benign or low grade malignant disease of pancreas head. Male was 36, and female was 39. Mean age was 50.5 years. The number of operation was increased year by year from 10 cases in 2007 to 20 cases in 2011. July Mean operation time was 8.5 hr, which is markedly decreased in 2011, 6.5 hr. Mean hospital stay was 15 days, which also decreased in 2011, 11.6 days. Complication rate was also decreased year by year.

In conclusion, technically, LPD is feasible with acceptable mortality and morbidity in benign or low grade malignant disease in pancreas head. Clinical outcomes have improved by accumulation of experiences. When it comes to advanced malignant disease, more experience and research would be required.

C-151
TECHNIQUES IN LIVER TRANSPLANTATION
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The past 20 years have seen the development of liver transplantation in China. One-year patient survival of liver transplant patients approaches 90% in many leading medical centers. The number of liver transplantation increases dramatically. Techniques in liver transplantation developed very quickly as well.

In early stage of in China, classic orthotopic liver transplantation with venous-venous bypass was adopted in almost all centers in china. In 2003, we abandoned venous-venous bypass, and adopted modified piggy-back orthotopic liver transplantation. We totally blocked IVC blood flow and sutured the suprahepatic IVC of graft to the anterior wall of IVC in recipients. Totally blocking IVC and abandoning bypass had no effect on renal function and bowel function.

As to biliary reconstruction, we experienced for stages. In the first stage, we placed a T-tube in the CBD after duct-to-duct anastomosis. In the second stage, we abandoned T-tube. In the third stage, we performed biliary anastomosis with continuous suture in posterior wall and interrupted suture in anterior wall. In the fourth stage, we reperfused the graft after both portal vein and hepatic artery reconstruction. After 4-stage technique innovation, biliary complication in liver transplant recipients was as low as 5.8%.

The donor shortage was the most important problem in organ transplantation all over the world. Therefore, Living donor liver transplantation (LDLT) has become an established treatment for patients with acute and chronic disease. The first successful pediatric LDLT, of a left lateral section graft from a mother to her son, was performed in Brisbane, Australia in 1989. Since then, this life saving procedure has been applied to adult patients. The greatest impact of LDLT has been in Asian countries, where cadaveric organ donation has been uncommon or non-existent. LDLT using left-lobe was introduced for adult recipients in 1993, but this procedure did not become widespread owing to the inability of these relatively small-sized grafts to meet the metabolic demands of all adult recipients. To overcome the inadequate graft volume encountered with left-lobe grafts, transplantation with right-lobe liver grafts was introduced for adult recipients in 1996. Although this method rapidly led to the worldwide use of adult LDLT, right-lobe hepatectomies are associated with a greater surgical risk for live donors than left-lobe hepatectomies, and are associated with increased morbidity and mortality rates, owing to the reduced volume of remnant liver in the donor. In LDLT, donor safety is of paramount importance and cannot be compromised regardless of the implication for the intended recipient. Moreover, the absence of hepatic venous drainage to the right anterior sector has led to the right-lobe graft congestion and failure. Although graft size is critical for successful outcomes, the importance of uniformly good venous drainage of the anterior sector of the right-lobe liver graft has been regarded as crucial for maximizing graft function. The reconstruction of the middle hepatic venous tributaries of a right-lobe graft was introduced in 1998. Not all potential donors can donate their right-lobes because safe donation is possible only when the estimated remnant liver volume is more than 30%. If the volume of the right-lobe in potential donors is more than 70%, relative to the volume of the whole liver, one alternative may be dual left-lobe graft LDLT, in which smaller left-lobe grafts from two donors are transplanted into one recipient. This technique was first introduced in 2000 to minimize donor risk and alleviate the small-size graft problem. Until more cadaveric grafts become available, adult LDLT will continue to be a relevant therapy for patients with irreversible end-stage liver disease.

References

C-155
MASTER VIDEO SESSION: LIVER RESECTION FOR COLORECTAL METASTASES
T. C. Gamblin
Abstract not available at time of publication.

C-156
IN VIVO-EX SITU TREATMENT OF INTRAHEPATIC CHOLANGIOCARCINOMA
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Introduction: Intrahepatic cholangiocarcinoma (ICC) is the second most common primary liver tumor. Vascular invasion is a negative prognostic factor. Since complete resection offers the only chance for cure, an aggressive surgical approach with extended liver resection in combination with complex vascular or biliary reconstructions is justified.

Methods: We present a 54-year-old male patient with an abdominal mass found during a routine examination. Tumor markers were within normal limits. A CT-scan revealed a liver tumor in the right lobe with compromise of the right portal vein, the right and middle hepatic veins and the inferior vena cava (ICV). Preoperative right portal embolization was performed. Under venous extracorporeal circulation by cannulation of the left femoral vein, the inferior mesenteric vein and the left axillary vein, total vascular exclusion was achieved and a right trisectionectomy with en-block resection of the retrohepatic IVC was performed. Caval reconstruction was accomplished using a Gore-tex graft with reimplantation of the left hepatic vein. Biliary reconstruction was performed in an end-to-side fashion hepaticoeyunostomy.

Results: The patient developed a hemoperitoneum that required relaparotomy and bilateral pleural effusion that was treated by chest tubes placement. The histo-pathological report informed ICC with negative lymph nodes and tumor free margins. Twenty eight months later the patient is free of disease and in good condition.

Conclusions: In vivo-ex situ major hepatectomy performed with techniques of vascular exclusion and caval resection was feasible with satisfactory results. In patients with tumoral involvement of the IVC this surgical alternative offers the possibility to achieve complete tumor removal.

C-157
SURGICAL TREATMENT OF GIANT HEPATIC HEMANGIOMAS: TECHNICAL POINT OF VIEW
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Introduction: Hepatic hemangiomas are the most common benign tumors of the liver. Surgical treatment can be difficult as a result of the high risk of intraoperative hemorrhage. The present study reviewed the clinical features of patients with hepatic hemangioma and surgical techniques used in their treatment.

Methods: Eight patients with giant hepatic hemangiomas underwent hepatectomies at the Asan Medical Center between January 2006 and March 2009. Patient demographic, clinical, and surgical characteristics and outcomes were reviewed retrospectively.

Results: There were 7 females and 1 male with a mean age of 48.5 years (range, 33 to 58 years). Indications for surgical interventions were abdominal pain (62.5%), an abdominal mass (37.5%), Kasabach-Merritt syndrome (25%), and increased size (25%). The hemangiomas were usually multiple (87.5%) and bilobar (75%) and had a median size of 14.5 cm (range, 7 to 29 cm). All patients underwent major hepatic resection with early vascular control using the Glissonean pedicle transection method (GPTM), the liver hanging maneuver (LHM), and preparation for total vascular exclusion (TVE). There was no major morbidity or mortality. The minor morbidity rate was 25% with transfusion rate of 37.5%.

Conclusions: Early vascular control using the GPTM, the LHM, and preparation for TVE is essential for safe resection of large hepatic hemangiomas.

C-158
CHRONIC PANCREATITIS: MANAGEMENT OF BILIARY OBSTRUCTION
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Bile duct obstruction (BDO) is common during the advanced stages and may be caused by edema, pancreatic pseudocyst fibrosis or a combination thereof. The clinical presentation varies from an incidental discovery to overt jaundice with or without associated cholangitis. Jaundice which occurs during acute exacerbations is often transient and may resolve completely without requiring intervention. The risk of developing secondary biliary cirrhosis is low particularly in non-jaundiced patients.

Management is largely dictated by the clinical presentation and morphological changes of the pancreas. Clinical factors to consider include the presence and severity of associated pain, the occurrence of jaundice and duration thereof, concern about malignancy and co-morbid diseases. Surgical strategy will depend on the presence of an inflammatory mass in the head of the pancreas and the degree of bile duct and pancreatic duct dilatation.
Patient with asymptomatic BDO should be treated conservatively with regular follow-up. Endoscopic interventions and stenting should be discouraged in these patients as this may cause secondary infection. Patients who present with jaundice should initially be treated conservatively unless associated with cholangitis when a temporary stent should be placed.

A hepatico-jejunostomy is preferred for persistent jaundice and, when associated with pain, a pancreatic drainage operation (e.g. Frey procedure) should be added. A pylorus preserving pancreatico-duodenectomy is indicated when a malignancy is suspected.

Stenting should be preserved for cholangitis and those unfit for surgery. The role of covered and biodegradable expandable stents requires further evaluation.

C-159
SYMPOSIUM: CHRONIC PANCREATITIS: RESECTION VS BYPASS FOR CHRONIC PANCREATITIS
D. Martin
Abstract not available at time of publication.

C-161
KEYNOTE LECTURE: SURGICAL MANAGEMENT OF PORTAL HYPERTENSION: WHICH SHUNT AND WHEN?
J. Y. Zhu
Abstract not available at time of publication.

C-162
MANAGEMENT OF PORTAL HYPERTENSION AS A BRIDGE TO LIVER TRANSPLANTATION
L. A. Carneiro D’Albuquerque
Abstract not available at time of publication.

C-163
NON SHUNT SURGERY FOR PORTAL HYPERTENSION
S. K. Mathur
Abstract not available at time of publication.

C-164
PORTAL BILIOPATHY
A. Chaudhary
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The term portal biliopathy is used to describe biliary ductal and gall bladder wall abnormalities in patients with portal hypertension. These changes are predominantly seen in patients with extra hepatic portal vein obstruction and present as strictures and dilatation of both the intrahepatic and extrahepatic bile ducts and are believed to be caused by the pressure of the varices in and around the bile duct wall. Majority of these patients are asymptomatic and these changes are seen on endoscopic retrograde cholangiography or magnetic resonance cholangiography. Occasionally these patients are symptomatic due to presence of either bile duct calculi, a stricture in the bile duct and rarely due to the varices themselves causing the obstruction. Only symptomatic patients need intervention. Bile duct calculi can be managed endoscopically. Patients who have bile duct strictures may need endoscopic stenting. Surgery when needed, is always in the form of a porto systemic shunt which decompresses the bile duct varices and can relieve the obstruction if the varices were responsible for biliary obstruction. In patients with a dominant stricture in the bile duct, the portosystemic shunt allows access to the bile duct to permit performance of a biloenteric drainage. Direct approach to the bile duct in these patients can cause significant bleeding.

C-165
RADIOLOGICAL AND ENDOSCOPIC TECHNIQUES IN THE MANAGEMENT OF PORTAL HYPERTENSIVE BLEEDING: RADIOLOGICAL
M. Brooks
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A range of effective image guided interventions exist for the management of bleeding variceal. The development of TIPS in the 1990s overshadowed alternatives such as transhepatic embolisation. Retrograde transrenal balloon occlusion for the obliteration of gastric varicose has developed over a number of years but has only recently been adopted outside of Japan and Korea.

With a wide range of treatments now available the challenge is to develop a rational approach to selection of appropriate treatment modality.

When in the course of an acute presentation should we switch from endoscopic to an image guided approach. Which patients should be treated primarily with TIPS or other image guided techniques?

C-166
ENDOSCOPIC TECHNIQUES IN THE MANAGEMENT OF PORTAL HYPERTENSIVE BLEEDING
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Introduction: Endoscopic techniques play a central role in the management of patients with portal hypertensive bleeding. Therapy is guided by careful diagnostic upper endoscopy to identify patients with gastro-oesophageal varices and to stratify risk of bleeding. Therapeutic techniques such as endoscopic variceal ligation (EVL), sclerotherapy, glue injection and other novel approaches such as insertion of fully covered self-expanding metal stents (SEMS) will be discussed.

Diagnostic endoscopy: All patients should be screened for the presence of gastro-oesophageal varices by diagnostic upper endoscopy at the time the diagnosis of cirrhosis is made. Oesophageal varices should be characterized according to size as small (<5 mm) or medium/large (>5 mm) and the presence of red signs (red wale marks or red spots) noted.
Gastric varices are best characterized as gastro-oesophageal (GOV) or isolated gastric varices (IGV).

**Therapeutic endoscopy:** Endoscopic varical ligation is a proven technique for primary prophylaxis of large oesophageal varices and lacks much of the local morbidity associated with sclerotherapy. In acute bleeding, EVL is preferred although sclerotherapy may be performed in patients in whom EVL is not feasible. EVL should be continued every 1–2 weeks until variceal obliteration. Use of glue has a role in therapy of bleeding gastric fundal varices, although can be associated with rare embolic complications. Fully covered SEMS have been described as a rescue therapy in patients failing conventional endoscopic therapy and in whom alternative rescue therapies (eg surgery, TIPS) is not indicated.

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**C-167**

**GENERAL SURGICAL PROCEDURES IN THE PATIENT WITH PORTAL HYPERTENSION**

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Patients with portal hypertension (most commonly due to cirrhosis of the liver), who require surgery, are subject to greater risk for surgical and anesthesia related complications compared to normal patients. The magnitude of complications depends upon the type of anesthesia used, the specific surgical procedures, and the severity of liver disease. Emergency surgery and surgery in patients with previously undiagnosed portal hypertension prove especially hazardous as there is no time for optimization of these patients. In addition, perioperative events, such as hypotension, sepsis, or the administration of hepatotoxic drugs, can compound injury to the liver occurring during the procedure.

In an attempt to predict outcomes in this group of patients, researchers have adopted various methods of assessment. The most reproducible of these have been with the Child-Pugh classification where mortality rates of 2, 12, and 20 percent for patients undergoing abdominal surgery with Child-Pugh class A, B, and C cirrhosis, respectively, are now being reported.

The MELD score, a statistical model predicting survival in cirrhotic patients being evaluated for liver transplantation, is now being used increasingly in predicting surgical risk in the nontransplant setting. Results have been promising and this may ultimately supplant the Child’s classification as the principal method for determining surgical risk in all patients with liver disease undergoing any form of surgery.

The Mayo group has proposed a post operative mortality risk prediction model that uses the Child’s or MELD score together with the ASA physical class and patient age. This model has recently been validated in Korean cirrhotic patients. More studies however, are needed to determine the best method of risk assessment for this group of patients.

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**C-168**

**KEYNOTE LECTURE: RESECTION FOR CRC LIVER METASTASES – OVERVIEW**

J. Belghiti

Abstract not available at time of publication.

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**C-169**

**THE ROLE OF PET IN THE DIAGNOSIS AND TREATMENT OF CRLM**

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Positron Emission Tomography (PET) is a non-invasive imaging investigation to diagnose and stage colorectal carcinoma, with a significant impact on management. The role of PET in colorectal cancer and in particular those with liver metastases will be discussed, including the use of novel tracers and parameters to assess the prognostic implications of PET.

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**C-170**

**THE INFLUENCE OF CHEMOTHERAPY ON SURGICAL STRATEGIES FOR COLORECTAL LIVER METASTASES**

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Surgical decision-making in the management of colorectal liver metastases (CRLM) used to be straightforward. Can I remove it – yes or no? The downside to this simplistic surgical decision was that less than one in ten patients with CRLMs confined to the liver were deemed ‘operative’.

The introduction of more effective chemotherapy drugs, biological agents and differing regimes of administration over the past two decades has revolutionized how we manage patients with CRLMs. Whilst up to 50% of such patients may now come to surgery, the planning and the timing of all interventions has become increasingly complex and spawned the development of specialist multi-disciplinary teams. Options must now include all permutations of the order of play for colorectal surgery, chemotherapy and liver surgery. The tumor load of either the primary or liver metastases is now the driving force behind decision-making. Inoperable but potentially operable CRLMs now dictate that chemotherapy is our first therapeutic endeavor. With those CRLMs that are at the limit of resectability, we would adopt the ‘liver-first’ approach to surgery, with the colorectal surgeons unusually last in the queue. Bilateral distribution of CRLMs may require the first intervention to include colorectal resection and clearance of the left liver lobe (left portal vein ligation) as the first move. This presentation will include examples of novel approaches in what is becoming an increasingly complex treatment algorithm.

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**C-171**

**SURVIVAL BENEFITS OF COMBINED RESECTION OF LIVER AND EXTRAHEPATIC DISEASE FOR COLORECTAL METASTASES**

I. C. Cameron

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**Introduction:** The survival benefits of the resection of colorectal liver metastases are well documented, with extensive publication on this subject over the last 15 years.
Improvements in systemic therapy have allowed the indications for liver resection to continually expand, and combined or staged resection of liver metastases together with extrahepatic disease has become established practice in many HPB centres.

**Methods:** A literature search was performed to enable a detailed review of the potential indications for combined resection of colorectal liver metastases and extrahepatic disease. Evidence for the combined or staged resection of lung, adrenal, splenic, brain, peritoneal and lymph node metastases will be presented, with emphasis on case selection for this type of surgery and the potential survival benefits of this strategy.

**Results:** There are now clear indications for an aggressive surgical approach with combined resection of liver and extrahepatic disease in patients with advanced colorectal cancer, although this surgical approach has never been subjected to a randomised controlled trial.

**Conclusions:** Patient selection is crucial for this aggressive surgical approach, combined with systemic chemotherapy, to be helpful in terms of survival benefit in patients with advanced colorectal cancer.

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**C-172**

**PARENCHYMAL PERFUSION AND RECONSTRUCTION TECHNIQUES IN RESECTION FOR CRC LIVER METASTASES**

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Outcomes following liver resection for colorectal metastases have improved to the point that it is reasonable to consider major vascular reconstruction in conjunction with liver resection for this diagnosis. There are a number of techniques that allow vascular reconstruction in the context of liver resection. These generally involve total vascular exclusion of the liver, and more recently have included cold perfusion of the liver to optimize parenchymal preservation over the time of vascular exclusion. The ultimate example of this approach is ex vivo liver transplantation; however, due to its high morbidity and mortality this approach cannot be recommended for metastatic CRC. On the other hand, in situ cold perfusion of the liver accomplishes much the same and allows a great deal of flexibility in dealing with vascular problems. In situ cold perfusion is tolerated remarkably well by the liver and the patient, with an overall mortality of roughly 10% in published series (all diagnoses; likely less for patients with metastatic CRC). In this talk technical issues and patient cases are discussed, as are critical selection criteria (Patient – what constitutes a reasonable patient for the approach; Tumor – selecting reasonable tumor biology; Liver – what constitutes a reasonable liver remnant and liver function). As with metastatic CRC in general, decisions regarding the application of in situ perfusion are best dealt with in a multidisciplinary forum.

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**C-173**

**LAPAROSCOPIC PANCREATIC SURGERY – AN OVERVIEW**

*C. Palanivelu*

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In the fast growing era of laparoscopic surgery, the feasibility of wide variety of pancreatic procedures by the laparoscopic approach is well established. The list of procedures being performed by laparoscopy is growing daily with innovations in techniques and technology. The indications for laparoscopic intervention may be elective or emergent and both benign and malignant diseases can be tackled by this approach.

In the emergent setting of infected pancreatic necrosis, laparoscopic pancreatic necrosectomy reduces the stress response and wound healing complications associated with the more morbid open surgery and helps in faster recovery and better outcome. Various approaches have been described including transperitoneal and retroperitoneal routes for debridement of the necrosed pancreas. Among the most common elective indications is pseudocyst of the pancreas which is mainly done by laparoscopy though the endoscopic approach is fast catching up. The main drainage procedure is cystogastrostomy which can be performed transgastrically or intragastrically. Laparoscopic cystojejunostomy using Roux en Y limb of jejunum is the next most commonly performed procedure for pseudocyst. Chronic calcific pancreatitis is endemic in many tropical countries including India and is associated with dilated pancreatic duct with multiple intraductal calculi. Laparoscopic lateral pancreateojejunostomy (modified Puestow’s procedure) for chronic calcific pancreatitis is being commonly done in our center and has yielded good long term results comparable to open surgery with advantages of laparoscopy. Tumors of pancreas can be tackled with laparoscopic approach. Tumors in the body and tail of pancreas which are less than 5 cms are amenable to lap resections. In cases of benign tumors, spleen can be preserved as far as possible. Cases of laparoscopic distal pancreatectomy have been done with a minimal leak rate. Besides this, small tumors of the central body are amenable to median pancreatectomy which is also possible by laparoscopy and preserves maximum pancreatic mass and function. Laparoscopy for management for carcinoma of pancreas is a formidable procedure due to the unique anatomy of the organ surrounded by major vascular structures and difficult exposure. Though not initially accepted widely, in centers of laparoscopic excellence with a high volume of cases like ours, we have established a safe and feasible technique of pancreatoduodenectomy and have one of the largest case series in the world. The results of our series show the oncological radicality of resection and long term results similar to that of open surgery with the potential advantage of less immunosuppression. Of course, extensive laparoscopic and open experience with careful patient selection is necessary before such advanced procedures can be routinely attempted.

The entire laparoscopic community is moving towards the single incision revolution and laparoscopic pancreatic surgery is no exception. Recently, cystogastrostomy, cystojejunostomy, lateral pancreateojejunostomy and distal pancreatectomy have all been performed through a single incision at the umbilicus by use of special access or routine ports and instrumentation. Our centre has been a pioneer in this revolution and has good short term results but need further studies to establish them as standard procedures.
C-174

IS DRAINAGE NECESSARY AFTER PANCREATIC SURGERY?

A. Chaudhary
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Pancreatic resections have traditionally been associated with a high morbidity and higher mortality than most other abdominal procedures. The leading cause of death and complications is the development of a pancreatic fistula. Pancreatic fistulae are responsible for intra abdominal sepsis, bleeding and even gastroparesis. With improvements in operative technique and a greater familiarity with the procedure, the incidence of pancreatic fistulae has decreased. In addition, with advances in interventional radiology, the management of these fistulae and their complications has also become better. Therefore the mortality associated with pancreatic leaks has reduced. In view of these improvements, there has been a trend to avoid routine drainage in pancreaticoduodenectomy. We are sharing our experience with selective drainage in patients undergoing pancreaticoduodenectomy at our center. Drains were not placed in patients in whom the operating surgeon felt that the chances of development of a pancreatic fistula are unlikely. Our results showed that avoidance of drainage in these patients did not adversely affect their outcome.

C-175

BINDING PANCREATOGASTROSTOMY: A RELIABLE TECHNIQUE TO PREVENT ANASTOMOTIC LEAKAGE

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Introduction: Binding pancreaticojejunostomy (BPJ) can be safely used in most circumstances when pancreaticoduodenectomy is indicated. However, when the pancreas stump is too large it might be difficult to be inserted into the jejunal lumen. To solve these problems, Binding Pancreatogastrostomy (BPG) is developed

Methods: The stump of pancreas is inserted into stomach and held in place with only two purse-string sutures which do not penetrate the pancreas. Four steps are included: 1) Isolation of pancreatic stump for 2 cm. 2) A piece of seromuscular layer at the posterior gastric wall is excised, the size being equivalent and the location being opposite to the pancreas stump. Around the sero-muscular defect a purse-string suture is pre-placed A small incision is made later at the mucosa layer to accommodate pancreas stump; 3) An incision is made at the anterior gastric wall. In the gastric cavity, the edge of the mucosal opening at the posterior gastric wall is held up by forceps forming a mucosal tube, around which the second purse-string suture is pre-placed. 4) Binding anastomosis: After the pancreas remnant is pulled into the gastric lumen. The first purse-string suture is tied (outer binding) and then the second one is also tied (inner binding). Pancreatogastrostomy is thus easily and reliably established.

Results: The overall postoperative complications developed in 25 patients (24.9%), while there is no anastomotic leak.

Conclusions: Clinical use has proved BPG to be very effective, safe and better than BPJ in terms of manipulation and accommodating a large pancreas stump.

C-176

MEASURES TO PREVENT PANCREATIC FISTULA FOLLOWING PANCREATICODUODENECTOMY

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Improvements in anesthesia, and perioperative management decreased the surgical mortality rate of pancreaticoduodenectomy to less than 5%. Unfortunately, the postoperative morbidity rate remains high and approaches 50% even in large series. The key determinant of outcome after pancreaticoduodenectomy remains the pancreaticoenteric anastomosis. Sepsis and hemorrhage, caused by pancreatic fistula, are associated with a mortality rate of 20–40% and result in prolonged hospitalization and increased hospital expenses. The terminology in the medical literature to describe pancreatic fistula, pancreatic leakage or anastomotic insufficiency is confusing and the terms have been interchangeably used. The reported pancreatic fistula rate ranged from 2% to 22%,...
depending on the definition used. However, there is no universally accepted definition of pancreatic fistula. A number of pharmacologic measure, such as the use of somatostatin, and different techniques of pancreaticoenteric anastomosis, such as pancreaticojejunostomy, pancreaticogastrostomy, different positions of the jejunal loop (antecolic, retrocolic, or retromesenteric), isolated Roux loop pancreaticojejunos-
tomy, ducting technique, duct-to-mucosal anastomosis, the use of internal or external pancreatic duct stent, have been suggested to decrease the pancreatic fistula rate, but the results have been controversial. The only consistently reproducible factor for preventing pancreatic fistula is the establishment of specialist centers performing pancreatic surgery in a high volume. More large scale comparative studies and randomized controlled trials are required to determine the optimum pharmacological interventions and technique of pancreaticoenteric anastomosis.

C-177
DRAINAGE OF Pancreatic PSEUDOCysts – OPTIONS?
K. Raman
Selayang Hospital, Kuala Lumpur, Malaysia

A pancreatic pseudocyst is the most common cystic lesion of the pancreas and is defined as a localized collection of fluid rich in amylase within or adjacent to the pancreas, enclosed by a nonepithelialized wall. It occurs as a result of acute or chronic pancreatitis, pancreatic trauma, or pancreatic duct obstruction. Treatment may be broadly divided into i) percutaneous drainage ii) surgical intervention and iii) endoscopic drainage.

Percutaneous drainage is simple, diagnostic, requires minimal sedation and multiple drains can be placed. However, complications and a high failure rate limit its use to the most ill patients.

Surgical intervention may be in the form of external drainage, cystogastrostomy, cystoduodenostomy, cystojejunostomy, resection, and laparoscopic drainage. Internal drainage is dictated by the anatomic location of the pseudocyst – in general, the pseudocyst should be drained into the closest segment of bowel be it stomach, duodenum or jejunum.

Endoscopic drainage can be performed through the major papilla (transpapillary) or through the gastric (endoscopic cystogastrostomy) and duodenal (endoscopic cystoduodenostomy) walls. Endoscopic drainage can be performed with or without EUS guidance. EUS should be the initial procedure because its findings can change/influence management in up to 20% of cases. Based on EUS findings, either transenteric drainage or ERCP followed by a transpapillary approach should be considered. The endoscopic experience, with the aid of EUS, has the lowest complication rate of all drainage procedures. Among endoscopic procedures, EUS-guided drainage is associated with the lowest recurrence rates, with comparable success and mortality rates relative to other drainage procedures.

C-178
MANAGEMENTS OF GROOVE PANCREATITIS
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Groove pancreatitis is an uncommon manifestation of chronic pancreatitis occurring in the pancreatoduodenal groove formed by the pancreas, duodenum and the common bile duct. Patients with groove pancreatitis present with weight loss, pain in the upper abdomen, nausea and occasionally vomiting after meals possibly due to an element of duodenal stenosis secondary to the ‘pseudotumour’ formation. Groove pancreatitis has been regarded as a rare clinical entity resulting in it often being misdiagnosed as other clinical lesions including pancreatic cancer and autoimmune pancreatitis. An increased awareness of the disease has resulted in a steady increase in the number of cases reported in literature in recent years. This has enabled a better delineation of the radiological features of this disease. Radiology, coupled with the use of duodenal biopsies, whenever feasible, has been found to be useful in diagnosing these lesions. While pain control, lifestyle modifications and endoscopic stenting of the minor papilla have been shown to afford relief in the short term, surgery (pancreatoduodenectomy) remains the final frontier in patients with uncontrolled pain, worsening duodenal obstructive symptoms, and more importantly in those patients in whom the diagnosis of a cancer cannot be completely excluded. The current presentation aims to provide an overview of the current understanding of the pathology of this disease and the outcomes of its management based since its first description, 40 years ago!
C-183

LAPAROSCOPIC LIVER RESECTION FOR HCC

H.-J. Kim
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With accumulation of experience, laparoscopic liver resection is increasing recently. Laparoscopic liver resections are associated with less intraoperative bleeding, fewer postoperative complications, less postoperative analgesic consumption, and a shorter hospital stay. Laparoscopic liver resections are expanding to operation for malignancy, major hepatic resection, and difficult locations. Advantages of laparoscopic liver resection (LLR) for HCC are avoidance of collateral vessel ligature, decreased postoperative ascites, decreased postoperative hepatic insufficiency, fewer postoperative adhesions, and wound complications. One of the major advantages of laparoscopy in liver resection is that it decreases operative bleeding. Recent report indicates that prior LLR for HCC compared OLR facilitated subsequent salvage liver transplantation with decreased morbidity. Laparoscopic HCC resection is safe and leads to good postoperative and oncologic outcomes.

We have experienced 61 LLR for malignant liver tumors. Among 61 patients, 33 were HCC patients. Patients with wedge resection, Lt. lat. sectionectomy, segmentectomy, post. sectionectomy and left hepatectomy were 10, 8, 9, 4, and 2, respectively.

I will introduce our technique with a representative case who received left lateral sectionectomy and segment 8 wedge resection for bilateral HCCs.

In conclusion laparoscopic resection for HCC is feasible in a large number of patients, with good operative and oncologic results. Laparoscopic liver resection for HCC should be considered in selected patients in centers experienced in open liver surgery and in advanced laparoscopic surgery.

C-184

CENTRAL HEPATECTOMY USING THE GLISSONEAN TRANSECTION METHODS

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Central hepatectomy is a complicated operation in liver surgery. A J-shape or a reversed T laparotomy is performed in the right subcostal area. The tertiary branches to S4 from the umbilical portion are ligated and divided. The liver parenchyma is dissected along the falciforme ligament and then the middle hepatic vein is ligated and divided. The anterior surface of the inferior vena cava and the trunk of the right hepatic vein are confirmed. The right anterior Glissonean pedicle is encircled and clamped. The tumor location should be checked by ultrasonography. After confirming the tumor location, the liver parenchyma is dissected on the borderline between the right anterior and the posterior section. The small branches from the right hepatic vein are divided and liver dissection is performed along the main right hepatic vein. We performed central hepatectomy for 57 HCC patients from 1990 to 2010. The morbidity and mortality are the same as those in other type of sectionectomy or himihepatectomy. Central hepatectomy is a feasible and safe operation for tumors located in the central area of the liver.

C-185

LAPAROSCOPY-ASSISTED RESECTION FOR HILAR CHOLANGIOCARCINOMA

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Precise skeletonization of the hepatoduodenal ligament and a safe and reliable hepaticojejunostomy are essential for resection of hilar cholangiocarcinoma. We present a case to describe laparoscopic-assisted left trisectionectomy for hilar cholangiocarcinoma of Bismuth–Corlette classification type IV with both portal vein and hepatic artery reconstructions. Case presentation: A 68 y/o female patient was diagnosed with hilar cholangiocarcinoma located at the bifurcation and invaded to both the portal vein and the hepatic artery. Laparoscopic-assisted left trisectionectomy with S1 resection was planned with both portal vein and hepatic artery reconstructions. Operative procedure: After a full mobilization of the left lateral sector, the Spiegel lobe was carefully detached from the inferior vena cava under pneumoperitoneum. A 10 cm upper midline incision was made and a Penrose drain was placed between the middle hepatic vein (MHV) and the right hepatic vein (RHV) for hanging the transection line. The hepatoduodenal ligament was precisely skeletonized with lymph node dissection through the mini-laparotomy. Parenchymal transection started from the root of RHV and finished around the right posterior portal pedicle at the hilum. The posterior branch of the right portal vein and the right hepatic artery were taped and the posterior bile ducts were divided. The duct margin was cancer free. The portal vein was resected and the posterior branch was anastomosed with the main portal branch. The left trisectionectomy with S1 resection was completed after the hepatic artery resection. The posterior branch of the right hepatic artery was anastomosed with the main right hepatic artery using a magnifier loupe. Hepaticojejunostomy was performed through mini-laparotomy. Results: Operative time was 682 min and blood loss was 640 ml. The patient was discharged on the 42nd postoperative day after having a minor leakage of the hepaticojejunostomy.

C-186

LAPAROSCOPIC EXTENDED LIVER RESECTION

H. Kaneko
Toho University, Tokyo, Japan

The continuing evolution of laparoscopic surgery, which has been rapidly adopted as minimally invasive surgery, has been applied to the laparoscopic liver resection. Laparoscopic liver resection is a highly specialized field, however, important technologic developments and improved endoscopic procedures are being established. Thus, laparoscopic hepatectomy has been more actively performed recently. We have pursued laparoscopic hepatectomy as a means of surgical therapy.

We have accumulated laparoscopic hepatectomy cases, and the operative time has been shortened with less bleeding in recent cases. Laparoscopic hepatectomy was found to be less invasive than conventional hepatectomy. The patients
were given more rapid recoveries consequently allowed shorter hospitalizations.

The five-year survival rate and the survival rate without recurrences for HCCs are almost same as that by open conventional heptectomy although further analysis would certainly be necessary to reach definitive conclusions.

Recently, we have successfully performed laparoscopic extended liver resection such as laparoscopic pure-hemihepatectomy, heptectomy of giant HCC and tumor located upper segment, recurrence tumor.

Laparoscopic extended liver resection appears to be a viable surgical alternative in selected cases. This procedure is expected to develop further in the future as a new surgical method for liver surgery as less invasive surgery.

The technique of the laparoscopic extend liver resection of laparoscopic hemihepatectomy, heptectomy of giant HCC and tumor located upper segment, recurrence tumor will be shown in the congress.

C-187
SYMPOSIUM: ACUTE LIVER FAILURE: MEDICAL MANAGEMENT OF ACUTE LIVER FAILURE
P. Angus
Abstract not available at time of publication.

C-188
ORTHOTOPIC LIVER TRANSPLANTATION FOR ACUTE LIVER FAILURE
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New Zealand
Acute liver failure (ALF) is an uncommon condition in which the rapid deterioration of hepatic synthetic function leads to jaundice, coagulopathy and encephalopathy in a previously healthy individual. Common causes include paracetamol, idiosyncratic drug reactions, viral hepatitis, metabolic derangements or idiopathic in approximately 25%. Treatment is primarily focused on the optimization of fluid balance to maintain end organ perfusion, prevention of cerebral edema, cardio-respiratory support, monitoring of metabolic parameters, surveillance for infection and providing adequate nutritional support. While the majority of patients with ALF recover with supportive measures, orthotopic liver transplantation (OLT) is the only potential curative treatment for those who continue to deteriorate or have adverse prognostic factors. The use of hepatic assist devices remains experimental as they have not been shown to improve survival. Several prognostic scoring systems have been devised to select patients who require OLT, including the Kings College, Clichy and APACHE II criteria. As a result of improved patient selection, peri-operative care and surgical techniques many centers are now achieving >80% one year survival in patients undergoing OLT for ALF.

C-189
SYMPOSIUM: ACUTE LIVER FAILURE: AUXILLARY LIVER TRANSPLANTATION FOR ACUTE LIVER FAILURE
M. Rela
Abstract not available at time of publication.

C-190
SYMPOSIUM: ACUTE LIVER FAILURE: ARTIFICIAL LIVER SUPPORT SYSTEMS
G. Starkey
Abstract not available at time of publication.

C-191
IATROGENIC BILE DUCT STRICTURES – AN OVERVIEW
M. Joshi Rajeev
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Iatrogenic bile duct strictures are often seen in young patients and injuries during surgery account for more than 90% of cases. Strictures may occur in the extrahepatic and/or intrahepatic bile ducts and may be solitary or multiple. Bismuth classification is useful for localization but does not encompass the entire spectrum. Strasberg et al have proposed a comprehensive classification system that incorporates Bismuth’s scheme but is much broader in scope. These pose a difficult management proposition. Unlike in malignant biliary obstruction, where short term palliation is often the goal of therapy, benign strictures require durable repair since most patients are in otherwise good health and are expected to survive longer. Improper or inadequate management may lead to biliary fistula, biliary cirrhosis, PHT or recurrent cholangitis. It is therefore imperative that any attempt at repair be carried out in a precise and expert manner.

Surgical reconstruction remains the “Gold Standard”. It is well recognized that strictures involving the distal duct are easier to repair than proximal strictures. Factors associated with stricture recurrence are proximal strictures, multiple prior attempts at repair, PHT, hepatic parenchymal disease, end-to-end biliary anastomosis, surgeon inexperience, concurrent cholangitis and hepatic abscess, intrahepatic stones, external or internal biliary fistula and hepatic lobar atrophy. In recent years, endoscopic stenting has been successful in a selected subgroup of patients. However, long term results of endotheraphy as definitive treatment are debatable. Surgery is a reliable and results of numerous studies show its long-term success with minimal morbidity. To push or sidestep? The debate continues!

C-192
ASSESSMENT OF INJURY AND TIMING OF SURGERY
V. Muralidharan
Abstract not available at time of publication.
C-193
SURGICAL TECHNIQUES OF REPAIR OF BILE DUCT STRICTURES
S. Harjit
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Several different surgical techniques have been used to repair benign bile duct strictures. The choice of technique is determined by the anatomical location, extent and nature of the stricture and the presence or absence of any biliary obstruction associated complications. Preoperative imaging and delineation of the biliary anatomy is crucial for the planning of surgery.

Repair of strictures involving the extrahepatic portion of the bile duct is relatively straightforward while that involving the confluence and intrahepatic bile ducts is complex and technically demanding. The key-factors for a successful repair include complete excision of the strictured segment and reconstruction of a tension-free, meticulous, anastomosis between the bile duct stump and the bowel using fine, single layer, interrupted, monofilament absorbable sutures.

Although various surgical operations have been described, the best long-term outcomes are obtained with the Roux-en-Y hepaticojunostomy or choledochojunostomy. Various modifications of the bilio-enteroanastomosis have been utilized for the repair of the different types of bile duct strictures. The presence of intrahepatic strictures with atrophy of the corresponding segments of the liver is best managed by resection of the affected segments while the presence of secondary biliary cirrhosis and its associated complications is best remedied by liver transplantation.

The results of surgical repair of bile duct strictures in specialized units are excellent with successful long-term outcomes being in excess of 90% in most series. Proper and prompt management of bile duct strictures by skilled & experienced hepatobiliary surgeons is mandatory to avoid long term morbidity and mortality.

C-194
DIAGNOSIS AND MANAGEMENT OF VASCULAR INJURIES ASSOCIATED WITH BILE DUCT STRICTURES
K. Madhavan
National University Health System, Singapore
Bile duct injury during cholecystectomy is an uncommon complication (3/10000) but with serious consequences to the patient and often to the surgeon. Bile duct injury at cholecystectomy may present soon after the operation or indeed at a late stage with bile duct strictures. Vascular injuries sustained at the time of bile duct injuries are of little consequence in late stricture presentations except influencing the nature of a planned operation specially if the ipsilateral liver is atrophic and there are intrahepatic strictures in the bile duct on that side. The surgeon may in these circumstances, elect to offer the patient a hemihepatectomy rather than biliary reconstruction. However, the implication of a vascular injury at the time of bile duct injury presenting acutely is very different. So is the case if the vascular injury in arterial, portal venous or both.

For medicolegal reasons, it is very important that a surgeon called upon to repair a bile duct injury document or establish by appropriate investigations, whether a concomitant vascular injury existed. Controversy still exists as to whether at the time of a definitive repair of the bile duct, any evident arterial injury should be also repaired. Technical difficulties under such condition as well as results of such “double repairs” will be discussed.

Portal vein injuries are rarely associated with bile duct injuries and much literature does not exist about how this should be managed. A review of the published literature on this rare condition will be undertaken and some personal tips will be provided as to their management.

C-195
LIVER RESECTION AND TRANSPLANTATION FOR BILE DUCT INJURY
O. J. Garden
Abstract not available at time of publication.

C-196
DEBATE: PERCUTANEOUS AND/OR ENDOSCOPIC APPROACHES VS SURGERY FOR CHRONIC BILE DUCT STRICTURES (SURGERY)
V. Sitaram
Abstract not available at time of publication.

C-197
PERCUTANEOUS AND ENDOSCOPIC APPROACHES TO CHRONIC BILE DUCT (CBD) STRICTURES
M. Cox
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CBD strictures include:
1. Post operative strictures due to some form of operative injury following cholecystectomy, gastric surgery or hepatic resections. These may present early (<2 years) or late.
2. Anastomotic strictures following biliary-enteric anastomosis.
3. Strictures associated with complications of pancreatitis, including chronic pancreatitis.

For many cases of biliary stricture the debate is not should they have an endoscopic or surgical approach, but rather it is part of a management algorithm.

Post operative strictures below the biliary confluence should be managed initially with a trial of endoscopic dilation and serial stenting (multiple plastic or removable metal stents) and surgery performed for cases that are not successfully managed endoscopically. Most (90%) of post operative strictures distal to the confluence are successfully managed long term with an endoscopic approach.

The management of post operative strictures at or above the biliary confluence is more controversial. Endoscopic management has a much lower success rate with a higher incidence of cholangitis and other complications. Percutaneous management may be trialled initially but has a
moderately high failure rate. Therefore, strictures at or above the confluence are probably better managed with surgical intervention from the outset.

Anastomotic strictures following a biliary-enteric anastomosis are best managed with percutaneous dilatation techniques rather than revision surgery. This is the case whether the biliary anastomosis was performed as part of a planned resection or for the management of a post-operative stricture.

Distal biliary strictures due to complicated acute or chronic pancreatitis are best initially managed with a trail of endoscopic dilatation and stenting and treatment of any causative factors of pancreatitis. If there is a significant component of acute inflammation in the causation of the stricture there is a chance of resolution without requiring surgery. If the endoscopic therapy fails then surgical intervention is required.

Therefore, with the exception of high biliary strictures endoscopic therapy is preferred as the initially treatment modality and surgery for the failures. Biliary enteric anastomotic strictures are best managed with PTC techniques.

C-198
CARCINOMA OF THE SIGMOID WITH SYNCHRONOUS METASTASIS RIGHT LOBE LIVER
P. Herman
Abstract not available at time of publication.

C-199
HEMIHEPATECTOMY WITH LIMITED RESECTION FOR MULTIPLE LIVER METASTASES FROM CRC
Hepato-Biliary-Pancreatic Surgery Division, Department of Surgery Graduate School of Medicine, University of Tokyo, Tokyo, Japan

Introduction: Hepatic resection has been the only treatment for cure against liver metastasis from colorectal carcinoma (CRC), however, the significance of major hepatectomy for multiple tumors, which can be regarded as potentially R1 resection, remains unclear.

Methods: From 1994 to 2010, total 402 patients with CRC liver metastasis underwent hepatic resection in Tokyo University Hospital, among which 37 underwent left or right hemihepatectomy with limited resection in the contra-lateral hemiliver. Portal vein embolization was performed in 13 patients before hepatectomy, because future liver remnant was estimated to be less than 40% of total liver volume. The median size of the largest tumor and number were 5 cm and 5, respectively.

Results: No mortality occurred in the 37 cases of hemihepatectomy with limited resection. The 3-year survival rate was 49%, although the recurrence rate at 2 years was high up to 92%.

Conclusions: Hemihepatectomy with limited resection can be safely performed for multiple liver metastases from CRC, although it may be invasive. Portal vein embolization is useful to increase the safety of major hepatectomy. The long-term outcomes after the aggressive therapy were acceptable, even though the tumor status was advanced.

C-200
COMPLETE RESOLUTION OF CRC RESECTABLE LIVER LESIONS AFTER NEOADJUVANT CHEMOTHERAPY
M. (M.) Rees
Basingstoke, UK

The improved effectiveness of chemotherapy for colorectal liver metastases (CRLM) has enabled a stepwise increase in the percentage of patients suitable for surgery. Some centers are now operating on approximately half of the patients presenting with metastatic spread confined to the liver. A major drawback of this chemotherapeutic success story is what to do with lesions that “disappear” on sequential imaging. Our first rude awakening more than a decade ago was to realize that such “total” eradication is short-lived. We and others have shown that more than 90% of these “eradicated” lesions become apparent either at the time of surgery or within the post-operative period, sometimes up to two years later. If possible, the latter group will be subjected to further therapeutic intervention of the liver by ablation or surgery. Avoidance of this can only be achieved by careful pre-treatment planning and liaison between oncologists, radiologists and surgeons. Examples of novel treatment strategies will be highlighted during the presentation. The key take-home message is, get your best and most thorough imaging prior to starting any chemotherapy. Using this baseline “roadmap” in any subsequent surgery will minimize the risk of further intervention.

C-201
RESECTABLE LIVER METASTASES WITH AN UNKNOWN PRIMARY CANCER (UPC)
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Approximately 5% of cancer patients are diagnosed with UPC. Of these, 10–30% have liver metastases. In different series the liver was the only metastatic site in 32–38% of patients, while it was accompanied with other metastatic sites in 62–68% (the commonest: lung, bone and lymph nodes).

Hepatic metastases in UPC patients are associated generally to a poor prognosis and encompass a variety of different pathologic entities. However, subsets of patients with more favorable outcomes can be identified by available clinical and pathologic data and as example neuroendocrine CUP are associated with a significantly better prognosis than the other malignancies (adenocarcinomas).

Before patients are considered for surgery, a multidisciplinary team assessment and evaluation consisting of computed tomography, PET, tumor markers, somatostatin receptor scintigraphy, and upper and lower endoscopy should be done.

The pathologic approach is stepwise and uses the clinical context, morphology, and immunohistochemistry. The most frequent histological types observed were adenocarcinoma, undifferentiated, neuroendocrine and squamous-cell carcinomas. Liver biopsy could be essential for histological diagnosis and important to identify the tumors who may benefit from specific and effective therapy (breast cancer, prostate cancer, ovarian cancer and small-cell carcinoma of the lung). Systemic chemotherapy represents the most frequently treatment.
For patients with liver metastases and neuroendocrine UPC, there is a consensus that surgical exploration is indicated and effectively identifies and resects occult primary tumors in the majority of the cases. The tumors are often located in the small intestine, and are usually small and multifocal, so careful palpation of the small intestine is essential.

Adenocarcinoma metastases carry a dismal prognosis; however in selected cases the surgical exploration is indicated and could identify the original digestive tumor and also resects it. Prognosis is poor mainly by the biology of the tumor and the synchronous appearance.

Few series of liver resections for UPC metastases are described. In the Adam’s series of no colorectal non neuroendocrine metastases resections, twenty-nine patients with UPC origin were included in the study. This indication was associated with a 5-year survival of 38% with low morbidity. Liver resections were safe and effective, with outcomes mainly dependent on primary tumor site and histology.

Improved patient selection, new and of more effective systemic treatments, and the low morbidity and mortality rates of liver resections in centers of excellence are likely to provide continued improvements in outcomes. The understanding of the underlying tumor biology for each cancer type and application of individualized care to each patient may also improve the results.

In summary liver resectables metastases of UPC should be resected in selected patients with good status performance, due to low mortality of liver surgery in reference centers and the potential benefit to improve the survival according to the histology of the tumor. Also by abdominal exploration is possible to identify and resect the original tumor. When applied in these situations, surgery may be able to offer a benefit in long-term survival.

C-202
THE APPROACH TO SYNCHRONOUS RESECTABLE LUNG AND LIVER CRC METASTASES
T. C. Gamblin
Abstract not available at time of publication.

C-203
NON RESECTABLE LIVER ONLY CRC METASTASES: WHAT SHOULD I DO AND WHY?
R. S. Stubbs
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Years ago, the knowledge that individuals dying from CRC frequently had liver-only disease encouraged surgeons to take what often appeared to non-surgeons, to be a fool-hardy local approach to what was widely believed to be a systemic problem. However, time and experience has vindicated this seemingly aggressive attitude to the problem of liver-only CRC metastases. Despite this, there commonly remains something of a dichotomy of opinion between surgeons and non-surgeons, with respect to the management of non-resectable liver-only CRC metastases.

The fall back position was once masterful inactivity and palliative care. Time has shown we can do better than this. Not so long ago, when systemic chemotherapy options revolved only around single agent chemotherapy with 5-fluorouracil, surgical enquiry and endeavor ruled. A variety of what might be termed ablative or regional approaches were explored and variably employed. These included such modalities as devascularization procedures, regional chemotherapy, cryoablation, microwave ablation, radiofrequency ablation and selective internal radiation therapy. Each have had their proponents, and each have had demonstrable success. However, the advent of more effective systemic chemotherapy options, coupled with the increasing reliance on the randomized trial as the only method of validation of efficacy, has seen these regional approaches lose out to the widespread adoption of first-line chemotherapy, followed by successive lines of usually increasingly expensive, toxic, and inevitably less effective chemotherapy regimens. The knowledge that at times such chemotherapy can downstage non-resectable disease to resectable disease has become a real drawcard. In the process, it is possible that a variety of effective, but less well studied physical and regional approaches are being ignored. These approaches should not necessarily be seen as being in competition with systemic chemotherapy, but might rather be used in a complementary fashion, for the ultimate benefit of the patient. This possibility will be explored in the course of the presentation.

C-204
IS THERE A ROLE FOR TOTAL PANCREATECTOMY IN CARCINOMA OF THE PANCREAS?
J. Samra
Abstract not available at time of publication.

C-205
SIGNIFICANCE AND MANAGEMENT OF MAJOR VESSEL INVOLVEMENT IN CARCINOMA OF THE PANCREAS
W. S. Helton
Abstract not available at time of publication.

C-206
MANAGEMENT OF RESECTABLE LIVER METASTASES FROM PERIAMPULLARY CARCINOMA
K. H. Liu
Nexus Surgical Associates, Mount Elizabeth Medical Centre, Singapore
With better understanding of tumor biology and improvement in liver surgery, hepatic metastasectomy is an accepted treatment for colorectal, ovarian and neuroendocrine tumour. However, the role of hepatic metastasectomy for periampullary carcinoma is controversial. Even though attempts have been made to resect a minority of patients with solitary hepatic metastatic periampullary carcinoma, the result on survival improvement has yet to be demonstrated. It is not surprising to witness the continuing evolution of this approach as better outcome from liver resection and better...
systemic and targeted therapies become available in the recent years. Although pancreaticoduodenectomy and liver resection can be performed safely in experienced centers, the benefits and long-term outcome of surgery for liver metastases from periampullary carcinoma, even in a highly selected group of patients, have yet to be proven. While surgeons are pushing the forefront of surgery in metastatic diseases, the concepts of “what can be done does not mean it ought to be done” and “short-term and long-term outcomes must outweigh the risk of intervention” remains the key factors for a universal acceptance as a standard recommendation. The perspective of this approach will be discussed in this symposium lecture.

C-207
DOES THE EXTENT OF LYMPH NODE CLEARANCE MATTER IN CARCINOMA OF PANCREAS?
K. Wada
Teikyo University School of Medicine, Tokyo, Japan
Pancreatic ductal adenocarcinoma (PDAC) still have dismal prognosis. The only potential “curative” treatment for PDAC is surgical resection, but majority of cases have advanced, metastatic disease at diagnosis. Even in patients with “resectable” PDAC surgery alone is no longer standard treatment according to recent clinical trials, thus R0 resection combined with adjuvant therapy is current standard treatment.

The extent of lymph node clearance has been subject of hot discussion in the 1990’s to 2000’s as more than 70% of patients with resected PDAC have nodal metastasis. Because the presence of nodal metastasis showed poorer prognosis achieving a greater lymph node clearance should hypothetically influence survival. Several randomized controlled trials and meta-analysis comparing extended versus standard lymphadenectomy for PDAC have been conducted to date, but none of them showed the advantage for extended lymphadenectomy in terms of survival. And increasing morbidity and impaired QOL were also noted when performing extended lymphadenectomy which may cause intolerability and impaired QOL were also noted when performing extended lymphadenectomy which may cause intolerability and impaired QOL were also noted when performing extended lymphadenectomy which may cause intolerability and impaired QOL were also noted when performing extended lymphadenectomy which may cause intolerability and impaired QOL were also noted when performing extended lymphadenectomy which may cause intolerability and impaired QOL were also noted when performing extended lymphadenectomy which may cause intolerability and impaired QOL were also noted when performing extended lymphadenectomy which may cause intolerability and impaired QOL were also noted when performing extended lymphadenectomy which may cause intolerability and impaired QOL were also noted when performing extended lymphadenectomy which may cause intolerability and impaired QOL were also noted when performing extended lymphadenectomy which may cause intolerability.

As of 2010’s more effective systemic agents are available, and also quality of imaging is dramatically improved, surgical planning can be more individualized in clinical practice including the extent of lymph node clearing. Prophylactic extended lymphadenectomy should be performed only in the setting of clinical research. Based on the fine imaging, usually thin-sliced, multi-phase contrast enhanced MDCT, “R0-directed operation” should be performed for patients with PDAC, while minimizing severe postoperative morbidity and keeping QOL for fast delivery of adjuvant treatment.

C-208
RADICAL ANTEGRADE MODULAR PANCREATEOSPLENECTOMY: RATIONALE AND RESULTS
P. C. Bornman
Department of Surgery University of Cape Town and Groote Schuur Hospital Cape Town RSA
Compared to pancreaticoduodenectomy (PD), relatively few distal pancreatectomies (DP) are performed for pancreatic cancers mainly due to more advanced disease at time of diagnosis. As a consequence DP has not gone through the same technical refinements of PD to achieve R0 resections. To this end, Strasburg et al. (1) have devised a modified distal pancreatectomy, termed radical antegrade modular pancreateosplenectomy (RAMPS) to achieve more R0 resections. The operation starts with transaction of the neck followed by an ante-grade mobilization of the body and tail of the pancreas with en-bloc removal of the lymph nodes draining the pancreas body and tail. An important step of the operation is to establish the correct posterior dissection plain which should be either anterior or behind the adrenal gland depending on whether the latter is involved by tumor or not. The purported advantages of this operation are: i) better identification of the dissection plain and in particular the anterior surface of the renal vein and adrenal gland ii) better identification of the large vessels which allows early control and safer dissection iii) providing the option of early planned posterior resection behind the adrenal gland onto the posterior abdominal wall when this is involved iv) improve the chances of a complete resection margin and N1 lymph nodes.

Although the results achieved by the Washington group(1) in terms of complete resection rate and survival are encouraging, there is a paucity of data to allow for a meaningful comparison with conventional distal pancreatic operations. The potential advantage of RAMPS and the performance of this laparoscopically, require further evaluation to determine its role in the management of body and tail pancreatic cancers.

Reference

C-209
STRATEGIES TO DOWNSTAGE PANCREATIC CANCER
V. Usatoff
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Long-term survival after the diagnosis of pancreatic cancer is only possible in patients who are able to undergo resection with clear (R0) margins prior to the development of metastatic disease. Only 20% of patients with pancreatic cancer fit into this category and this group can expect a median survival of 12–24 months. This poor prognosis, despite “curative” surgery, even with extended radical procedures, supports the premise that pancreatic cancer is a systemic disease at diagnosis and consequently systemic treatment with chemotherapy is likely to be an important part of the management. The survival advantage with chemotherapy is
well demonstrated in the adjuvant, post resection setting. In patients where resection is not likely without negative margins, a neoadjuvant approach to downstage the tumor prior to resection has a basis in logic. With only small, single centre studies published, there continues to be little convincing evidence to support this approach. This lack of conclusive evidence is partly due to a lack of agreed upon definition of resectability and “borderline” resectability. Furthermore, CT scanning offers an inadequate assessment of response to neoadjuvant treatment with CA19.9 and PET scanning possibly offering some benefit in assessing metabolic response. Another difficulty in assessing the evidence, is the large number of different chemotherapy regimens (with and without radiotherapy) that are utilized. This paper explores the potential advantages and disadvantages of a neoadjuvant approach, particularly in the borderline resectable cases, with an attempt to bring together the available evidence to make some workable recommendations.

C-210

PALLIATIVE OPTIONS – STENTING OR BYPASS PROCEDURES FOR NON-RESECTABLE LOCALIZED PANCREATIC TUMOR

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Introduction: Almost 85 to 90% of pancreatic cancers require palliative procedures for relief of three symptoms Obstructive Jaundice, Duodenal Obstruction and Pain.

Methods: Palliative options are Surgical or Endoscopic procedures. Surgical options are choledocho/cholecysto-enterostomy with palliative or elective gastro-jejunostomy. Endoscopic options are biliary stent with or without duodenal stenting.

Results: Outcome of the patients was better in patients in whom decision of palliative bypass was done intraoperatively due to nonresectability, than those who were electively posted for palliative bypass procedures. Readmissions for reasons like cholangitis were significantly low in surgical group. Overall survival rate was superior in surgical group as compared to stented group.

Conclusions: Combined surgical biliary and gastric bypass achieves effective palliation until death in almost 95% of the patients. This remains first line therapy in patients identified as having unresectable disease at laparotomy. Cholecysto-jejunostomy is technically simple to perform as compared to choledocho/hepatico-jejunostomy. Intraoperatively patency and adequate dilatation of cystic duct must be ensured. Results of cholecysto jejunostomy are comparable to choledocho jejunostomy. Gastric bypass procedures should be electively performed in order to avoid future need for treatment of gastric outlet obstruction. Endoscopic biliary stenting procedures are technically demanding and need high end equipments. Though initial hospital stay is short, these patients need frequent readmissions for treatment of cholangitis. Patient might need simultaneous duodenal stenting which is technically more demanding. Surgical options are better and should be performed for patients with longer life expectancy verses endoscopic options should be reserved for patients with shorter life expectancy.

C-211

PAIN RELIEF FOR ADVANCED CARCINOMA OF THE PANCREAS

D. Martin

Abstract not available at time of publication.

C-212

EHPBA CONSSENSUS CONFERENCE ON HCC: RESULTS

P-A. Clavien

Abstract not available at time of publication.

C-213

RISK FACTORS IN RESECTION FOR HCC

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90% of HCC occur in cirrhosis and chronic liver disease. Hepatectomy in cirrhosis is associated with elevated morbidity and mortality, primarily due to postoperative hepatic insufficiency. This risk is associated with the degree of preoperative hepatic dysfunction, the volume of liver resected, the presence of portal hypertension and the level of hepatitis activity. Hepatic function can be estimated with the Child-Pugh score or indocyanine green retention, with major resections limited to Child’s A cirrhosis. Estimation of functional residual liver volume by liver volumetry is important, with the aim to preserve 50% of functional liver volume. Anatomic resections are recommended for HCC to reduce recurrence, and parenchymal-preserving anatomic techniques can be employed to improve the residual volume. Residual volume can also be increased by preoperative portal vein embolization, and a documented increase in volume post embolization demonstrates the regenerative capacity of the liver. Portal hypertension contraindicates a major hepatectomy, but a minor resection can be considered with grade II varices. Specific surgical techniques such as the type of vascular control employed, low central venous pressure, use of the anterior approach and hanging maneuver, and utilization of the laparoscopic approach are important considerations. 10% of HCC occur in normal livers, and the normal regenerative capacity of these livers means that extended hepatectomies are usually tolerated.

C-214

THE ROLE OF ANTIVIRAL THERAPY IN THE MANAGEMENT OF HEPATOCELLULAR CARCINOMA (HCC)

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Chronic viral hepatitis, predominantly chronic hepatitis B (HBV) infection, is the leading cause of HCC worldwide. In regions where HBV is endemic, such as the Asia-Pacific region, chronic HBV infection is present in 80–90% of patients with HCC. It is known that ongoing hepatic
inflammation produces an environment that favors development of HCC, and as such it is no surprise that long-term suppression of viral replication with nucleos(t)ide analogues such as lamivudine and entecavir is associated with a reduced risk of HCC, as well as a reduction in fibrosis progression and other cirrhosis-related complications. Likewise, treatment of chronic hepatitis C (HCV) infection with the combination of pegylated-interferon and ribavirin, also results in a significantly decreased risk of HCC, particularly in those patients who achieve a sustained virological response.

Until recently there was a scarcity of data on the role of antiviral therapy post curative treatment of HCC, such as those patients who have undergone hepatectomy, where cumulative recurrence rates at 5-years of 50–70% have been reported. Further surgical management of recurrent disease in this population is often limited by impaired liver function in the remnant liver. The use of antiviral therapy post hepatectomy is now recommended. This presentation will focus on the latest evidence supporting the use of antiviral therapy (both for HBV and HCV) as an adjunct for the curative treatment of HCC, in particular the effects of antiviral treatment on long-term survival, HCC recurrence, and suitability for further attempts at curative therapy.

C-215
ADJUVANT THERAPY FOLLOWING RESECTION FOR HCC

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Hepatocellular carcinoma (HCC) is common worldwide and its incidence is increasing. Even after curative liver resection, recurrence is common and is the main cause of death. In this meta-analysis, the role of adjuvant therapy after resection of HCC was reviewed.

C-216
COMBINATION THERAPY WITH SELECTIVE INTERNAL RADIATION AND SORAFENIB FOR ADVANCED HEPATOCELLULAR CARCINOMA – THE AHCC05 TRIAL

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The Asia-Pacific bears the largest portion (70%) of the global burden of HCC mainly because of the high incidence of chronic viral hepatitis in this part of the world. While surgical resection and transplantation are potentially curative in HCC less than 20% of patients are amendable to these treatments at diagnosis. Survival in inoperable patients with poor liver function remains grave. Novel therapeutics are thus directed at advanced HCC with preserved liver function and this is the group where the biggest impact on survival may be achieved.

The Asia-Pacific Hepatocellular Carcinoma Trials Group protocol 05 (AHCC05) (NCT00712790) phase I/II trial combines an efficacious loco-regional therapy (selective internal radiation therapy (SIRT) with yttrium-90) with a proven systemic agent (sorafenib) in patients with both locally advanced and metastatic HCC. The trial closed in June 2009 and overall survival in patients compared well with treatment by either SIRT or sorafenib alone. Median survival were 20.6 months in BCLC B and 8.2 months in BCLC C and the positive results demonstrate proof of principle of this combination therapy.

The success of the AHCC06 trial has lead to the launch of the phase III AHCC06 trial “Randomized Controlled Trial of SIR-sphere vs Sorafenib in locally advanced inoperable HCC” (NCT01135056).

C-217
NOVEL THERAPIES FOR HCC

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The systemic management of advanced or metastatic hepatocellular carcinoma has been problematic because of HCC is relative insensitivity to commonly used cytotoxic chemotherapeutics and because of the constraints resulting from co-morbidities, especially impaired liver function and portal hypertension. The availability of Sorafenib following the successful randomized SHARP trial opened new possibilities for treatment by targeting activated tyrosine kinases. Median overall survival and time to progression were both increased by about three months, and 44% (compared to 33% of placebo patients) remained alive at one year. Other TKIs such as Sunitinib have not been shown to be as effective and over the past Phase III trial in this response, other angiogenesis inhibitors such as Bevacizumab and Lenalindomide have only shown only modest clinical impact. Sorafenib has greater activity against RAF than sunitinib, so differential effects on MAPK pathway inhibition are worth evaluating. Other agents currently under evaluation include additional inhibitors of angiogenesis, mTOR, the EGF receptor, HGF receptor (c-met), and fibroblast growth factor (FGF) receptor. Cancer Testis antigens including MAGEA3 are frequently expressed in HCC and an Asia/Pacific trial is currently being planned to assess immune targeting of HCC. As these agents are systematically evaluated it is anticipated that more effective agents and combinations can be identified to further prolong survival or palliate symptoms in patients with HCC.

C-218
HPB FELLOWSHIP: OPTIMUM REQUIREMENTS FOR A SUCCESSFUL TRAINING PROGRAM IN HPB SURGERY

S. Orloff  
Abstract not available at time of publication.
C-219
SIMULATION TRAINING IN HPB SURGERY
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Simulation offers the opportunity for the rehearsal of a wide range of skills in a controlled, risk-free environment, allowing for the development of mastery at a pace appropriate to the learner and offers a means for objective verification of skills (1). The case for using simulation in surgical training is compelling and in some jurisdictions required even though the evidence for skills transfer after simulation training is limited (2). Offsetting the benefits are a number of limitations in relation to virtual reality simulation where functionality is often sub-optimal, educational benefits not well established, objective measures difficult to interpret, being confined to technical competencies, proficiency criteria usually not defined, intensity and duration of training unknown, the relatively high cost and that the simulation training is not embedded in curriculum (3). And there is a resolute tension where the advantages are greatest for the simulation of complex procedures that are only rarely encountered and the difficulty and cost associated with producing simulation training for them. It is therefore no surprise that simulation training in HPB surgery remains in its infancy. Current models for VR simulation training are not sustainable. A new conceptual framework is required if there is going to be the cost-effective development of VR simulation in HPB surgery, for both technical and non-technical skills acquisition. Approaches of promise will be discussed.

References

C-220
FUTURE PLANNING OF HPB TRAINING IN INDIA
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An acute shortfall of formally trained HPB surgeons is felt in India with increasing recognition of surgically correctible HPB diseases by the newer diagnostic modalities and increasing awareness. Capacity needs are particularly felt not only because of the great health disparities, weak infrastructures and deficient resources but lack of adequate training environments too. Most of the HPB training has been by way of clinical and surgical exposures that are not structured and by short CMEs and live operative workshops. Formal training is limited to only about 40 students in the country in a year through courses that cover not just the sub-speciality but the entire gamut of gastrointestinal surgery in university-affiliated post doctoral programs.

HPB-India’s initiative to conduct certificate courses of one week duration to supplement the practical knowledge to pre-selected batches of 25 general surgeons with HPB interest, periodically at various recognized high-volume centers has yielded interesting results. The programs are residential, non formal and the trainees have ample opportunity to interact with the experts throughout the week. The course curriculum is common and the sessions are replete with case snippets and video clips to illustrate problems and variations in diagnosis, surgical techniques and the follow-up problems. The course is flanked by pre- and post tests. The feedback has been excellent.

This initiative provides a practical example of supplementing the capacity building framework by a professional organization by integrating with the more formal academic centers. The evolving public-private partnership seems to be the way to go in planning the future HPB training models in India.

C-221
HPB TRAINING IN MAINLAND CHINA
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Surgery has not been well-developed in traditional Chinese Medicine. At the end of the 19th century, western medicine was introduced into China. Soon hospitals and medical schools with general surgical units were established in the big cities along the coastal region, the Yangtze River, the Yellow River and the Pearl River. HPB surgery soon flourished because of the high prevalence of HPB diseases.

There are many HPB centers in China. However, like other specialties/subspecialities, China still uses an apprenticeship system in training. The accreditation of HPB surgeons is usually single-hospital based and there is no unified training/examination system for the whole of China. Recognizing the problem, the Chinese Medical Doctors Association was founded on 9/11/2002. It was organized under the Medical Practitioners’ Act 1999 and registered with Ministry of Civil Affairs. One of its main duties is to supervise and organize postgraduate medical education/assessment of 2.1 million medical practitioners in China. This organization is helped by the Chinese Medical Association founded in 1915 to do this job. The Chinese College of Surgeons was inaugurated on 22/9/2007.

Surgical training in China is now going internationally. There are 9 training centers in China which have been accredited by the College of Surgeons of Hong Kong and the Royal College of Surgeons of Edinburgh for training in basic surgery, higher training in general surgery/orthopedics/urology. There has not yet been any discussion on accreditation of training in HPB surgery, which is a subspecialty after general surgery training.

C-222
TRAINING IN HEPATO-BILIARY-PANCREATIC SURGERY IN JAPAN
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Japanese Society of Hepato-Biliary-Pancreatic Surgery, Tokyo, Japan

All new doctors after graduation from medical school in Japan are required to undergo two years of obligatory initial
postgraduate clinical training in internal medicine, emergency medicine, pediatrics and surgery. After this initial training, trainees advance to specialty training in a specialty of their choice. Those who wish to become a board-certified hepato-biliary-pancreatic (HPB) surgeon must undergo 4 or 5 years of specialty training in HPB surgery, while at the same time undergoing training for 5 years towards board certification in gastroenterological surgery. To be a board-certified surgeon in gastroenterology one must demonstrate competence in procedures such as routine gastrectomy and colec-tomy. During training in gastroenterological surgery, HPB surgical fellows must perform 50 high-level difficulty operations in the field of HBP and submit a video recording of the procedures to the board. The video recording is evaluated by 3 board-certified instructors at other institutes. There currently are 400 board-certified instructors at 180 board-certified training institutes in Japan. The first 12 board certifica-tions in HBP surgery were awarded in 2011. These 12 new HBP specialists will go on to train the next generation of young HBP surgical fellows.

C-223
HPB TRAINING IN KOREA
S. W. Kim
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Since the HPB surgery is very complicated and rapidly pro-gressed, it requires CME system as well as a strict and efficient training system. In Korea, to be a hepato-biliary surgeon, he or she has to take subspecialty fellowship training courses after 4 year resident training in the hospitals where the HPB training system is available. Korean Surgical Society has planned the subspecialty board system for the last few years and submitted it to Korean Academy of Medical Science this year. The aim/objectives of training and the standard and curriculum for the training are documented. In Korea, some hospitals have good conditions for HPB training in terms of the hospital volume and number of trainer. Most of the big hospitals have 2 separate units: Hepatic surgery including transplantation unit and pancreato-biliary surgery unit. Rotation system let trainee to complete the course where available. Survey study for current status of HPB training system in each hospital has been carried out and will be reported and HPB training systems in a few big hospitals will be introduced during my talk.

C-224
THE ANZHPBA TRAINING PROGRAM – TWO YEARS ON
C. Christophi
Abstract not available at time of publication.

C-225
NEUROENDOCRINE TUMORS (NET) OF PANCREAS
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Neuroendocrine tumors are now called neuroendocrine neo-plasias (NEN) and WHO classification 2010 of gastroentero-pancreatic NET includes histopathological grading (G1, G2, G3), location of tumors, functional status, nodal involvement and metastasis. Tumors are classified from T1–T4 on basis of size, confinement to pancreas and adjacent organ or large vessel invasion.

Insulinoma and Glucogonoma are the most common func-tional pancreatic NENs that are usually small and tumor localization if often a challenge. In contrast non-functioning pancreatic NENs present as mass lesions diagnosed incidentally or with pressure symptoms.

Treatment depends mainly on localization and functional status. Contrast enhanced MRI and endoscopic ultrasound are useful for localizing small functional tumors. DOTATOC PET scan has emerged as a useful imaging modality for NENs.

Histopathological grade is an important determinant in planning management. Well differentiated G1 and G2 NENs are classically treated by surgery. Small and localized functioning NENs can be treated with enucleation and pancreas preserving resections while the usually large non functioning tumors need radical resections such as pancreatoduodenectomy or a spleen preserving distal pancreatectomy depending on tumor location. NENs with liver metastasis need a tailored approach. A resection of the primary and debulking of metastasis should be strongly considered. RFA or trans arterial chemo embolization (TACE) are options to treat residual liver metastasis.

G1 and G2 tumors can also treated by peptide receptor tagged radiotherapy (PRRT) using lutetium 177 if they have positive receptors on Somatostatin Scintigraphy. Sandostatin LAR is used for non resectable G2 tumors while poorly differentiated G3 tumors are treated with Cytoxic chemotherapy.

C-226
LOCALIZATION OF NET OF THE PANCREAS
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Localization of neuroendocrine tumors of the pancreas can be difficult, particularly for functioning symptomatic tumors which cannot be localized using conventional techniques. Ultrasound examination of the pancreas is frequently limited by overlying bowel gas and body habitus. Computed tomography (CT) scanning may show a hypervascular lesions but only if an adequate arterial pancreatic phase is performed and in tumors larger than 8 mm in diameter. Magnetic resonance imaging of the pancreas has similar sensitivity to CT scanning. Venous sampling has been used for isolating the position of pancreatic insulinoma however the precise localization remains difficult. There are a number of surgical techniques that can be utilized such as trans-illumination of the duode-
num for gastrinoma and intra-operative ultrasound for detection of intra-pancreatic tumors.

The majority of NETs have somatostatin receptors on the cell surface of which there are 5 subclasses. These can be targeted for imaging with somatostatin receptor scintigraphy using various somatostatin analogues (i.e. 111Indium octreotide). Such imaging can be combined with CT scanning to provide anatomical. Recent advances in Positron Emission Tomography tracers have allowed excellent imaging for gastro-intestinal and pancreatic NETs. CT PET using gallium-68-DOTA allows the best detection of both small pancreatic NETs as well as nodal and distant metastatic disease.

C-227
SURGICAL TREATMENT FOR PANCREATIC NEUROENDOCRINE TUMORS
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Pancreatic neuroendocrine tumors (PNETs) are no longer a rare entity. Their complex biological behavior, indolent nature, and small numbers have precluded optimal therapeutic options. These neoplasms can present either as non-functional tumors or as functional entities related to clinical syndromes of hormonal excess. Functional tumors are often small and difficult to localize. Endoscopic ultrasound and specialized nuclear scans aid identification of these tumors. Tumor size, location, and malignant potential determine the type of resection varying from a simple enucleation to a formal pancreatectomy. Non functional tumors present as large lesions with mass effect and radical pancreatic resections (pancreatoduodenectomy, central/distal pancreatectomy, with or without vascular reconstruction) and/or en bloc removal of adjacent organs is necessary. Surgical excision is the only curative treatment esp. for well-differentiated PNETs. The surgical goals are to: 1. prolong survival by resecting the primary and any nodal or hepatic metastases, 2. control symptoms related to hormonal secretion, 3. prevent or treat local complications. Patients with resectable, early-stage tumors are usually managed surgically. In addition, cytoreductive surgery may be appropriate even in metastatic disease, particularly if the metastases are confined to the liver. Patients with limited liver metastases who undergo complete or near-complete resection of metastases have demonstrated prolonged survival. Major liver resections, radiofrequency ablation and liver transplantation are options for treating neuroendocrine liver metastases. The prognosis of patients with unresected PNET is poor.

C-228
THE MEDICAL THERAPY OF GASTROINTESTINAL NEUROENDOCRINE TUMORS
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Gastrointestinal Neuroendocrine tumors (GNETs) are rare malignancies but whose incidence is increasing, possibly reflecting aggressive diagnostic procedures, greater awareness and ?environmental factors. Their prognosis is based upon disease extent, primary site and histological grade (differentiation and proliferative index as measured by Ki67). GNET histological grading based on biopsy can be associated with sampling error from tumoral heterogeneity. To better characterize disease biology and individualize therapy imaging based on somatostatin-receptor expression (Octreotide-SPECT/CT or Gallium-DOTA-PET/CT) and tumoral glucose metabolism (FDG-PET/CT), are now routine in our centre as part of the workup. Patients are hence characterized into 3 distinct biological groups:

(1) Those with advanced well-differentiated Somatostatin receptor-expressing (Octreotide avid) tumors. Offered therapy somatostatin analogue, regardless of symptoms. The supporting results of the randomized Phase III PROMID and RADIANT-II trials will be presented. Patients with progressive disease can be offered radioactive peptide receptor therapy often with radiosensitizing chemotherapy. Other treatment options include chemotherapy, generally Streptozotocin-or Temozolamide-based regimens. Phase III trials have also demonstrated the utility of the m-TOR inhibitor Everolimus and the multitargeted tyrosine kinase inhibitor Sunitinib in this setting.

(2) Patients with advanced poorly differentiated disease (FDG-avid, non-Octreotide avid) are treated with chemotherapy similar to small cell lung cancer.

(3) Patients with mixed disease biology, are considered for sequential chemotherapy followed by radioactive peptide receptor therapy.

Management is multidisciplinary involving several subspecialties.

Conclusions: The medical management of GNETs is complex but evolving with the ability now to individualize therapy and the introduction of novel biological agents. Multidisciplinary consultation is optimal.

C-229
PANCREAS TRANSPLANTATION – AN OVERVIEW
H. Pleass
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Type 1 diabetes mellitus is a chronic condition often leading to disabling complications including retinopathy, neuropathy and cardiovascular disease which can be modified by intensive treatment with insulin. Such treatment, however, is associated with a restrictive lifestyle and risk of hypoglycemic morbidity and mortality.

Pancreas transplantation is a highly specialized procedure which has evolved both in terms of the surgical technique, patient selection and assessment and is currently the only proven option to achieve long-term insulin independence, resulting in an improvement or stabilization of those diabetic related complications. The hazards of pancreas transplantation as a major operation are well known. Balancing the risks of a surgical procedure, with the benefits of restoring normoglycemia remains an important task for the pancreas transplant surgeon.
C-230
REVERSAL OF TYPE 1 DIABETES BY ISLET TRANSPLANTATION
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Introduction: Type 1 diabetes, an autoimmune disease in which the pancreatic beta cells are destroyed places an enormous burden on individuals and their families, as well as on the healthcare system. Diabetes is currently treated with multiple daily insulin injections but this is imperfect. Our eventual aim is to treat the underlying mechanisms that lead to the disease in at risk and affected individuals. Treatment without insulin injections will require restoration of insulin production as well as correction of autoimmunity. Both are being trialled at present. Islet transplantation is being carried out in patients in whom insulin therapy has failed especially those with severe hypoglycemia not corrected by conventional means such as insulin infusion pumps or long-acting insulin.

Methods: Islets are isolated from the pancreas of organ donors and transplanted into the liver via portal cannulation.

Results: We have carried out over 30 islet transplants in the last 3 years into people with severe hypoglycemia. In virtually all cases hypoglycemia is corrected even when insulin is still required. Approx half the patients no longer require insulin, one has been insulin independent for over 3 years. Side-effects have been infusion and anti-coagulation related and immunosuppression has been well-tolerated. Weight loss has been observed in virtually all recipients and the mechanisms of this studied.

Conclusion: Islet transplantation effectively restores insulin production but has the major problems of insufficient donors and the need for immunosuppression to prevent rejection.

C-231
XENOTRANSPLANTATION OF PANCREATIC ISLET CELLS – DREAM OR REALITY?
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Xenotransplantation is now a possibility in Australia after the recent lifting of the five-year moratorium. Of all the animal species, the pig is the most suitable donor for a variety of reasons. In particular, pigs can be modified by genetic engineering to be less immunogenic and more resistant to immune destruction.

Xenotransplantation of pig islets to humans offers a solution to the chronic shortage of human islets from deceased donors. Clinical pig-to-human transplantation is limited by the complexity of the xenograft response however this is progressively being resolved. Collectively, data from our laboratory and others demonstrate that xenograft protection by local secretion of immunomodulatory molecules is feasible and effective. However, the strategy requires refinement and improvement since in most instances graft modification results in prolongation but not indefinite survival.

These refinements as well as the current state of genetic modifications and preclinical pig-to-primate and clinical pig-to-human trials will be reviewed.

C-232
CRITICAL SUCCESS FACTORS FOR SURGEONS LEADING TRANSPLANT OR OTHER PROGRAMS
C. W. Pinson
Abstract not available at time of publication.

C-233
SMALL FOR SIZE SYNDROME IN LT
C. M. Lo
Abstract not available at time of publication.

C-234
MANAGING THE VASCULAR COMPLICATIONS OF LT
A. S. Soin
Abstract not available at time of publication.

C-235
BILIARY STRICTURES AFTER LIVER TRANSPLANTATION – ANASTOMOTIC AND NON ANASTOMOTIC
S. Orloff
Abstract not available at time of publication.

C-236
BILIARY COMPLICATIONS IN LIVER TRANSPLANTATION: HOW I DEAL WITH THEM
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Introduction: Biliary complications after liver transplantation include biliary stones, bile leaks and biliary strictures. With an incidence of approximately 30%, biliary complications are the greatest cause of morbidity after adult living-donor liver transplantation (LDLT). Although data about the incidence and management of biliary complications after deceased-donor liver transplantation (DDLT) are well defined, those pertaining LDLT are conflicting.

Description of Contents: Duct-to-duo biliary reconstruction is favored over hepatico-jejunostomy for LDLT in many centers to prevent ascending cholangitis and to facilitate endoscopic access to the bile ducts. Although endoscopic treatment is accepted as a first-line therapy to treat biliary complications after liver transplantation, endoscopic treatment of anastomotic biliary strictures is less successful in patients after LDLT. This is likely attributable to biliary anatomy that is challenging to the endoscopists. In contrast most biliary leaks are usually treated with success at endoscopy after LDLT or DDLT. Complications after liver trans-
plantation mainly consist of anastomotic biliary strictures and/or biliary leaks, with significant more incidences of both complications in LDLT recipients. Partial graft, a pediatric recipient and a Roux-en-Y biliary anastomosis are independent predictors of biliary strictures. When conservative management with endoscopy or percutaneous treatment has failed surgery is indicated, and biliary reconstructions, segmental resections or even re-transplantation may be required.

**Conclusions:** Biliary complications are significantly more frequent after LDLT compared with DDLT, and they are less amenable to endoscopic treatment. Although most biliary complications after LDLT can be successfully treated by non-surgical approaches, management of multiple biliary anastomoses and non-anastomotic strictures continues to be a challenge. Surgery should be reserved for patients who have failed conservative treatment.

C-237

**DIFFERENTIAL DIAGNOSIS AND PREOPERATIVE EVALUATION**

J. W. Chen

Abstract not available at time of publication.

C-238

**ASSESSING THE RISK OF MALIGNANCY: OBSERVATION OR SURGICAL INTERVENTION**

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Intraductal Papillary Mucinous Neoplasms (IPMNs) are nowadays the most frequent cystic neoplasm of the pancreas, even in asymptomatic patients, in which they represent an incidental finding. In our experience, IPMNs are one of the most common indication for pancreatic resection. During the consensus held in Sendai in 2005, a group of surgeons, gastroenterologists and pathologists edited the first guidelines in the management of IPMNs. Before 2005 all patients with a diagnosis of IPMN were considered potentially at risk for develop a malignancy and therefore surgery was always proposed. After the Sendai meeting two different approaches have been defined when considering MD-IPMN (together with the mixed form) or BD-IPMN. By considering epidemiology, pathological finding, improvements in radiology and new genetical aspects of IPMNs we try to define how to manage these patients.

**Main Duct-IPMN:** Patients affected by IPMN involving the main duct or the mixed form should always be candidate to resection because of the high prevalence of in situ and invasive carcinoma found in the resected specimens (70%). Noteworthy is that in MD-IPMNs malignancy can be present regardless the presence or absence of symptoms and so the radiological aspect of these lesions gives the indication for surgery. The surgical management of main duct IPMNs represents a challenge for the surgeon. The segmental dilatation of the main duct showed in the preoperative studies may occur both proximally and distally to the tumor, because of mucus overproduction, making more difficult the localization of the neoplasia. A typical resection (pancreaticoduodenectomy, left pancreatectomy, total pancreatectomy, according to the site and extension of the disease) with lymph node dissection must be performed. Because IPMN extends along the pancreatic duct and it can do so without macroscopic tumor, it is important to exclude residual tumor with frozen section. In case of de-epithelialization, adenoma or borderline tumor at surgical margin the optimal surgical strategy remains controversial: we usually extend the resection a few centimeters to obtain a new margin, trying to obtain a negative resection margin. In our experience with 140 patients affected by main duct IPMN who underwent surgical resection, the rate of negative margins in the surgical specimen was 58.5%, and the results of the intraoperative frozen section analysis modified the surgical plan, leading to an extension of the resection or to total pancreatectomy in 29 patients (20.7%). Recurrence in the pancreatic remnant may develop even if the transection margin is negative and even in patients with noninvasive disease. Some authors have reported that for malignant IPMNs the frequency of recurrence (local recurrence or distant metastases) is similar whether or not total pancreatectomy was performed. Finally, in patients with MD-IPMN undergoing pylorus-preserving pancreaticoduodenectomy, pancreaticogastrostomy can be preferred instead of pancreaticojejunostomy because it allows direct access to the pancreatic stump by endoscopy during follow-up, giving the possibility to sample of pancreatic juice for cyto logical examination.

**Branch-Duct IPMN:** Behavior of BD-IPMNs is different because the prevalence of malignancy is quite lower (25%) than MD-IPMN and it is predictable on the basis of symptoms, size and morphological criteria. For this reasons a strict follow up is suggested for patients with BD-IPMN smaller than 3 cm, with no nodules nor duct dilatation (which would imply a combined IPMN). Follow up consists in MRCP repeated 6 months after the first diagnosis and then yearly together with Ca19.9 dosage, unless there is an increase in size, the development of nodules or the onset of symptoms. We like to stress the fact that this non-operative approach should be carried out in experienced centers and data from large series is needed to validate this approach. When surgery is indicated a typical resection should be performed for branch duct IPMNs. For asymptomatic patients with small single lesion (<3 cm) of the neck of the pancreas, without any suspicion for malignancy, a middle pancreatectomy can be considered. In the case of multifocal disease, a total pancreatectomy or an extended standard resection would ensure a radical treatment; however, a more selective approach can be considered with segmental resection of the biggest lesion (or of the lesion “suspected” for malignancy) and non-operatively management with strict follow-up of the remnant BD-IPMN. Indications for surgery in multifocal BD-IPMN follow the same rule as uni-focal BD-IPMN: symptomatic patients and suspicion of malignancy.

**Combined IPMNs:** In which category the mixed form of IPMNs harbor is still to be defined: whether they originate from MD-IPMN or arise as a combined form itself. It does not change the fact that their biological behavior is similar to that of MD-IPMN and therefore their treatment follows the same rules as the MD-IPMN do: high risk of malignant degeneration and, for all surgically fit patients, indication for surgery. After resection, strict follow-up should be done. Patients affected by malignant IPMN present an obvious higher risk of recurrence, but neoplastic recurrence can arise even in the presence of a benign tumor with negative resection margins, particularly for main duct IPMN. It is important to detect a
“recurrence” or the development of a new disease in the remnant since another resection shall be considered. We identify in a recent study based on a multivariate analysis, three independent factors associated with poor prognosis in invasive IPMN carcinoma: Ca19.9 value higher than 37 U/mL (adjusted for jaundice), familiar history of pancreatic cancer and a lymph node ratio (LNR) >0.2. These three factors are associated with a 5-years survival of 44.2%, 16.7% and 11% respectively. In conclusion, it is still difficult to define the impact on the clinical practice of these prognostic factors. Only familial history and Ca19.9 can be known preoperatively and therefore have a role in the decision making for example in those patients, like BD-IPMN, where surgery may not be the first option.

At this time the strategy we follow is that early surgery of high risk lesions and early detection of signs of malignancy or recurrence may be beneficial for prognosis in these patients.

C-239
EUS-GUIDED THERAPY FOR CYSTIC TUMORS OF THE PANCREAS

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EUS-guided intervention has been recently used for the treatment of pancreatic cystic tumors (PCT). Preliminary reports showed the safety and feasibility of EUS-guided PCT treatment. Treatment responses varied among studies as previous studies involved small number of patients and short-term follow-up.

Our group conducted a series of studies to evaluate the technical feasibility, safety and therapeutic efficacy of EUS-guided PCT ablation. At first, we conducted a pilot study and selected 14 patients with PCT received EUS-guided ethanol lavage and paclitaxel injection (EUS-EP) and observed for 6 months. Complete resolution (CR) of PCT was observed in 11 patients and partial resolution (PR) in 2 patients. Next step study was focused on septated PCT and we observed 60% of CR and 20% of PR. Encouraged by above results, we conducted a long-term follow-up study after EUS-EP of PCT. Fifty-one patients were enrolled for EUS-EP by the following inclusion criteria; 1) uni- or oligolocular cyst, 2) indeterminate tumors for which EUS-FNA was required, and 3) PCTs showing size growth during the observation period. Under EUS-guidance, cyst fluid aspiration, ethanol lavage and injection of paclitaxel were performed. Twenty PCT were oligolocular. Mean CEA level was 463 ng/mL (1–8190). The median follow-up was 20.6 months. Mean volume of PCT decreased from 14.09 mL to 3.31 mL. CR was observed in 28 patients, PR in 6 patients, and a cyst persisted in 12 patients. Splenic vein thrombosis as procedure-related complication occurred in 1 patient. EUS-EP appears to be a safe and effective method for treating PCT.

C-240
OPERATIVE TECHNIQUES FOR CYSTIC TUMORS OF THE PANCREAS

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Introduction and Background: The benefit of maintaining exocrine function of the pancreas is the reason why less radical resections of the pancreas have come into vogue, especially when the chance of malignancy is low. Enucleation maybe attempted when CT scan, EUS or IOUS show a high probability of the lesion being benign and there is no involvement of the main pancreatic duct or adjacent organs. Remaining outside the pseudocapsule is mandatory. Harmonic scalpel, tissue coagulation devices, hemoclips etcetera ensures a successful enucleation rate of 90%, but upto 50% of patients may develop self limiting leaks. For cystic tumors in the neck or body, with duct involvement, central pancreatectomy can be done. The duct is suture ligated in the stapled head and a duct to mucosa anastomosis is done in the tail. Distal spleen preserving pancreatectomies by techniques like Warshaw have shown no difference in complication rates as compared to spleen sacrificing techniques. Laparoscopic distal pancreatectomy is performed in the right lateral decubitus position as there is natural gravity retraction of viscera.

Methods: Electronic data was reviewed using PubMed as the search engine using the meta-tags, “cystic tumors”, “pancreas” and “operative techniques”. Conclusions were also drawn from printed literature, case reports, patient series and institutional published data.

Conclusions: Non standardized resections for cystic lesions of the pancreas should be considered provided there is no oncological compromise.

C-241
FOLLOW UP AND MANAGEMENT OF RECURRENT DISEASE

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Pancreatic cystic tumors are detected due to greater awareness and superior imaging. Their spectrum is vast but common tumors are serous cystadenomas, mucinous cystadenomas (MCN) and cystadenocarcinomas, IPMN’s and solid papillary epithelial neoplasms of the pancreas (SPEN). While serous cystadenomas can be observed without offering definitive surgery, the others are best treated by complete surgical resection. Margin negative resections are crucial for long term disease free survival. Equally important is the degree of invasiveness. When MCN is completely resected followed by adequate histopathologic examination, absence of invasion predicts a curative operation and detailed follow up is unnecessary. Invasive cystadenocarcinoma often behaves like pancreatic ductal adenocarcinoma and recurrences are known and detailed follow up every 4–6 months is necessary. However, some reports suggest that all MCN’s should be considered as mucinous cystadenocarcinomas of low grade malignant potential since assessment of benign, borderline, or malignant categories is often impossible. In IPMN’s, disease extent is carefully assessed and pancreatic resections performed accordingly. It is important to differen-
tiate tumor free margins from de-epithelialized margins on frozen section during surgery. Recurrences are known with de-epithelialized margins. Also, it is important to differentiate invasive IPMN from non-invasive IPMN. Invasive IPMN’s can recur and large SPEN’s are likely to be malignant and in both follow up is essential. Triphasic CECT examination is the preferred follow up investigation. Locally recurrent disease is best treated by re-resection. In metastatic disease, approach is unclear. Chemotherapy might be beneficial but high level evidence supporting its use is still lacking.

C-242
ECHINOCOCCUS ALVEOLARIS – CHANGING EPIDEMIOLOGICAL PATTERNS AND MANAGEMENT STRATEGIES (I)
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Alveolar echinococcosis, due to the development of larval stage of the cestode Echinococcus multilocularis, is located in the liver in 97% of the cases. The progression is very slow and the course of the disease is silent for many years. Larval development behaves like a slow growing liver cancer with progressive invasion of the liver parenchyma, vessels and biliary ducts. In addition, the marked granulomatosis surrounding the larva followed by a very strong reactive fibrosis, also contribute to the severity of the disease. Progressive extension to adjacent organs and distant metastases by hematogenous spreading can also be observed. Purely extra hepatic alveolar echinococcosis is exceptional, but physicians in endemic area should be warned of these particular forms of disease. This may avoid delay to diagnosis. Important changes in diagnosis circumstances have occurred during the past twenty years. By the past, clinical presentation was similar to a liver cancer: progressively getting worse jaundice due to involvement of the hilum, huge, hard and irregular hepatomegaly resembling to a liver cancer, chronic Budd Chiari syndrome due to hepatic veins involvement. Currently, due to the extensive use of abdominal ultrasonography, earlier diagnosis of alveolar echinococcosis at an asymptomatic stage is common. Alveolar echinococcosis may also be revealed by a complication: cholangitis episodes due to communication between the parasitic mass and the lumen of a biliary duct, or to pigmental stones accumulating above a parasitic biliary stenosis, liver abscesses related to centro-parasitic necrosis, hemaetemesis due to oesophageal varices in case of portal vein involvement. Metastatic localization, mainly in the lungs, may also be the revealing manifestation in 5 % of the cases.

Alveolar echinococcosis is characterized by a long asymptomatic period, but without any treatment, mortality reaches 80% within 10 years of diagnosis. Due to the lack of fast-acting and totally efficicent chemotherapy, partial radical hepatic resection is the only chance of cure for patients. These resections concern now 30%—40% of the patients and may include complex vascular and biliary reconstruction procedures. Liver transplantation may also be indicated in very selected patients (about 5%) with life-threatening complications after failure of the other treatments. More recently innovative surgical techniques were applied for end stage AE patients such as living donor liver transplantation (2) and ex vivo liver resection and liver auto transplantation (3) that widen the potential of radical cure by surgical approach in very selected patients. Interventional radiology or endoscopy are efficient to drain liver abscesses and or infected and obstructed bile ducts, as palliative procedures or as a bridge to radical resection. In all cases, parasitostatic benzimidazole therapy, using especially albendazole continuously, is mandatory for at least two years after radical resection and for life in inoperable patients. This new and aggressive approach will improve life expectancy of AE patients at nearly the same level as general population (4).

References:

C-243
CHEMOTHERAPY ALONE AS DEFINITIVE TREATMENT OF HYDATID DISEASE:
H. Wen
Abstract not available at time of publication.

C-244
PERCUTANEOUS MANAGEMENT (PAIR) VERSUS SURGERY FOR HYDATID DISEASE
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Hydatid disease of the liver is a common benign infestation of the liver that affects the global population in a heterogeneous distribution.

Optimal care of hepatic hydatidosis usually requires a considered combination of medical and interventional techniques. This combination will frequently involves either surgical drainage or resection; or a Percutaneous Aspiration, Injection and Re-aspiration (PAIR) procedure.

Despite these approaches having been developed over a number of years little comparative data exists perhaps reflecting the differences in expertise and incidental distribution of hydatidosis. Each approach has its own set of indications and contraindications which render the clinical decision-making somewhat complex.

In this discussion I will cover the fundamental technical details of these approaches and current evidence will be examined to try and elucidate some clinical guidance with reference to appropriate therapy in a given clinical setting.
C-245
SURGICAL APPROACHES TO COMPLEX HYDATID DISEASE OF THE LIVER
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Hydatid disease is a parasitic disease of worldwide distribution. Seventy five percent of hydatid cysts are found in liver. It can involve adjacent structures or organs by developing fistulous tracts and dissemination of daughter cysts into the biliary tree, pleura, bronchi, or peritoneum. The incidence of complicated hydatid cysts is reported to be as high as 60% among patients diagnosed and treated for liver hydatid disease. Treatment of liver hydatid disease continues to be a matter of debate, and till date no clear guidelines are available. That, medical therapy alone is ineffective and unreliable is the common belief. Operative therapies vary from complete resection (e.g., total pericystectomy or heptectomy) to minimal invasive procedures (e.g., percutaneous aspiration of cysts). Lately, reports have been published on laparoscopic approaches to the treatment of hepatic hydatid cysts. The choice of therapy is dictated by factors like, the general condition of the patient, number and localization of the cysts, surgeon’s expertise, and quality of hospital at which the surgery is performed including the possibility of intensive postoperative care. The current presentation is aimed at analyzing the clinical presentation, operative strategy and long-term outcome of patients treated for complicated liver hydatid cysts at our center.

C-246
LAPAROSCOPIC TECHNIQUES FOR HYDATID DISEASE OF THE LIVER
J.-H. Zhang
Abstract not available at time of publication.

C-247
DEVELOPMENTS IN IMMUNOSUPPRESSION FOR LIVER TRANSPLANTATION
D. Bowen
Abstract not available at time of publication.