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SAGES Abstracts

NON-CIRRHOTIC HEPATOCELLULAR CARCINOMA IN SOUTH AFRICAN PATIENTS: CLINICOPATHOLOGICAL FEATURES AND PROGNOSIS

Bhaijee F, Krige J E J, Lockett M

Background: We describe the clinicopathological features and outcome of patients after hepatic resection for hepatocellular carcinoma (HCC) arising in normal liver ('non-cirrhotic HCC').

Methods: We utilised the Surgical Gastroenterology prospective liver resection database to identify all patients who underwent surgery for non-cirrhotic HCC between 1990 and 2008.

Results: Twenty-two patients (median age 47 years, range 21 - 79, 10 men, 12 women) underwent liver resection for non-cirrhotic HCC. Sixteen patients had non-fibrolamellar HCC (Group 1); 6 patients had fibrolamellar hepatocellular carcinoma (FLC) (Group 2). Group 1 had a median age of 55 years, and 6 were men (38%); group 2 had a median age of 21 years, and 4 were men (67%). Overall, we performed 4 extended right hepatectomies, 4 right hepatectomies, 5 left hepatectomies and 9 partial hepatectomies. Four patients in Group 2 also underwent porta hepatis lymphadenectomies. There were no perioperative deaths. Recurrence rates in Groups 1 and 2 were 81% and 100%, respectively. In Group 1, median survival was 39 months, with 1-, 3-, and 5- year survival rates of 100%, 56% and 38%, respectively. In Group 2, median survival was 61 months, with 1-, 3-, and 5- year survival rates of 83%, 67% and 67%, respectively.

Conclusion: Our series suggests that despite a high resection rate in non-cirrhotic HCC, both FLC and non-fibrolamellar HCC have a high recurrence rate with an ultimately poor clinical outcome. These findings resonate with recent international experience of non-cirrhotic HCC.

ANTIBIOTIC PROPHYLAXIS FOR PATIENTS UNDERGOING ELECTIVE ENDOSCOPIC RETROGRADE CHOLANGIOPANCREATOGRAPHY: A META-ANALYSIS

Brand M, Bizos D, O'Farrell P

Background: The use of prophylactic antibiotics before endoscopic retrograde cholangiopancreatography (ERCP) is recommended by all major international gastro-enterological societies, in an attempt to decrease or eliminate the incidence of septic complications following the procedure.

Objectives: To determine whether or not prophylactic antibiotics before ERCP decrease the incidence of cholangitis, septicaemia and mortality by way of a meta-analysis.

Method: Only randomised clinical trials were included, irrespective of blinding, language, or publication status. Participants were patients who underwent elective ERCP and were not on antibiotics, without evidence of acute or chronic cholecystitis, cholangitis,

or severe acute pancreatitis before the procedure. We compared patients given prophylactic antibiotics before the procedure to patients given a placebo or no intervention before the procedure. Trials were included regardless of the type, dose or route of administration of the antibiotic.

Results: Nine randomised control trials (1 356 patients) were identified. When all patients were included the meta-analysis favoured the use of prophylactic antibiotics in preventing cholangitis (relative risk [RR] 0.54 CI 0.33 to 0.91) and septicaemia (RR 0.35 CI 0.11 to 1.11) but not overall mortality (RR 1.33 CI 0.32 to 5.44). Sub-group analysis of patients in whom ERCP resolves biliary obstruction at the first procedure showed no benefit in using prophylactic antibiotics to prevent cholangitis (RR 0.98 CI 0.35 to 2.69).

Conclusion: It appears that prophylactic antibiotics are not necessary if the first ERCP procedure is successful in resolving the biliary obstruction. However if this is not the case, antibiotics should be given.

LAPAROSCOPIC GASTRIC BANDING – MANAGEMENT OF BAND EROSION

Brombacher G D

This paper will review the literature as well as the author's own experience with band erosion. In international series this complication remains one of the least reported of all the possible complications associated with laparoscopic banding for the management of morbid obesity.

The clinical signs as well as the diagnosis will be discussed.

Management of this complication will deal with both the acute phase when the initial diagnosis is made, often by a gastro-enterologist or surgeon not regularly doing band surgery – as well as the post-acute phase management of these patients.

Ultimately these bands need removal – in the non-acute phase of management. This has previously meant the end of the road for these patients re their obesity programme. However the author will discuss the role of band replacement or band removal and intra-gastric balloons for a holding period or ultimate conversion to another bariatric procedure.

EVOLUTION OF GASTRO-ENTEROLOGY TRAINING

Burger T, Mulder C J J, Telleman H

There have been rapid developments in gastro-enterology (GE) over the last decade. Up until the late 1980s GE training was incorporated into Internal Medicine training. The introduction of endoscopy has necessitated the need for additional training. Around the world different national boards have developed their own curricula which will be discussed in this paper.

Emphasis is placed on the curriculum recently introduced in The Netherlands. The Internal Medicine component has become a 2-

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year requirement (Common Trunk) and the duration of training in GE has been extended to 4 years. Because of the growing complexity of GE, there are now four subspecialties: Interventional Endoscopy, Neuromotility, Oncology and Hepatology that trainees should choose from. These subspecialties each have predefined specific requirements.

The World Gastroenterology Organization (WGO) has drawn up a standard curriculum which can be of help to the boards in different countries. The curriculum emphasises the knowledge and skill components. The curriculum also defines the training recommendations, the requirements of training facilities and competence evaluation of fellows and facilities, while less is said about research, finance and the number of gastro-enterologists required. In the coming decades the curriculum will need to be revised continuously. Personalisation of the curriculum will be the next challenge for the years to come.

A DESCRIPTIVE STUDY OF TUBERCULOSIS IN AN INFLAMMATORY BOWEL DISEASE COHORT FROM CAPE TOWN, SOUTH AFRICA

Deetlefs E, Epstein D, Seggie R, Watermeyer G

Introduction: Treatment of inflammatory bowel disease (IBD) with potent immunosuppressive therapy and biologicals is the standard of care but carries a risk of reactivation of tuberculosis (TB). In the Western Cape the latest data indicate a TB incidence of over 1 000/100 000/year. Data on TB in South African patients with IBD would be valuable in the development of locally appropriate guidelines.

Aim: To evaluate the occurrence of active TB in a cohort of IBD patients from the Groote Schuur Hospital IBD clinic in Cape Town.

Method: A retrospective analysis of all patients attending the Groote Schuur Hospital IBD clinic. Data were extracted from the existing IBD database, and patient notes and chest X-rays were evaluated according to CDC guidelines.

Results: Of the 1 388 patients on the IBD database, adequate TB data were available for 615 (44%). 72 patients (11.7%) were diagnosed with TB according to the following criteria: Microbiology = 17 (10 positive *Mycobacterium* TB culture, 7 direct smear positive), histology = 2, history of treatment for TB and chest X-ray changes compatible with previous pulmonary TB = 11, compatible chest X-ray changes only = 16, history of treatment for TB only = 26. 30 (53%) developed TB after the diagnosis of IBD, 27 (47%) prior to IBD diagnosis and 2 (4%) both prior to and after diagnosis of IBD.

Conclusion: 11.7% of over 600 patients had a diagnosis of TB either before or after the diagnosis of IBD. This is disturbing given the expanding use of biological therapy in IBD. We recommend that IBD patients be actively screened for TB at diagnosis.

region is one explanation for this occurrence. The terminal ileum also has the lowest concentration of bile acids in the intestine. This could be another mechanism.

Aim: To determine the effect of physiological concentrations of bile acids on *in vitro* growth of *Mycobacterium tuberculosis* (MTB).

Method: Individual concentrated solutions of cholic acid, deoxycholic acid, lithocholic acid, chenodeoxycholic acid and a combined solution of all four acids (Sigma Aldrich, SA) were prepared. These were added to Lowenstein-Jensen (LJ) media, to achieve human physiological concentrations. Each bile acid-LJ preparation was further diluted 4 times. Five control LJ media were prepared without any bile acids. All LJ-bile salt media and controls were inoculated with a suspension of MTB H37Rv. The media were incubated at 37°C for 8 weeks. MTB growth was assessed at 2 and 8 weeks according to the number of colony-forming units.

Results: Control media showed uninhibited growth of MTB. Chenodeoxycholic acid, deoxycholic acid and cholic acid alone and in combination showed concentration-dependant inhibition of MTB growth. Lithocholic acid alone had no effect on MTB growth.

Conclusion: Certain bile acids, alone or in combination, inhibit the growth of *Mycobacterium tuberculosis in vitro*. This could be explained by the effect of bile acids on the lipid-containing cell wall of MTB. Reduced bile acid concentrations in the terminal ileum may explain why 80% of intestinal TB lesions occur in this region.

CARDIAC TRAUMA AT SEBOKENG HOSPITAL: A 9-YEAR REVIEW

Harran N

Objective: To report on a 9-year experience with cardiac injuries at a single level 2 hospital.

Results: A total of 55 patients were reviewed. The majority of the patients (93%) had penetrating chest trauma – 47 stab wounds and 7 gunshot wounds. In 6 patients the injury was self-inflicted. 54% presented to casualty within an hour of the injury and 65% were in theatre within 45 minutes of arrival in hospital. Patients presented in casualty with shock and external bleeding (49%), shock with pericardial tamponade (41%) and in a stable condition (9%). One patient presented with a pericardial effusion 2 weeks after the injury. The surgical approaches were left anterolateral thoracotomy (49%), median sternotomy (38%) and bilateral thoracotomy (4%). Two patients had thoracoabdominal incision for associated intra-abdominal injuries.

Overall survival was 74% with 45 patients discharged from hospital within 10 days. 8 patients developed postoperative complications requiring prolonged ICU stay. The mortality rate was 5.5%. Only 12 patients were followed up at 6 months; 8 of these patients had a normal ECG, 2 showed signs of an old infarct and 2 had evidence of acute ischaemia.

Conclusion: The low mortality in this series is probably a reflection of fewer patients reaching hospital alive. Patients who arrive in hospital with detectable signs of life should be aggressively resuscitated, and early surgical involvement is vital.

THE EFFECT OF PHYSIOLOGICAL CONCENTRATIONS OF BILE ACIDS ON IN VITRO GROWTH OF MYCOBACTERIUM TUBERCULOSIS

Epstein D, Mistry K, Pettengell K, Watermeyer, Whitelaw A

Introduction: Intestinal tuberculosis (TB) occurs in the ileocaecal region in 80% of cases. The density of lymphoid tissue in this



ERCP IN HIV-POSITIVE PATIENTS AT CHRIS HANI BARAGWANATH HOSPITAL: THE SPECTRUM OF DISEASE

Klipin M, O'Jones O, Smith M, Sparaco A

Aim: To describe the spectrum of disease in HIV-positive patients in whom an ERCP was performed.

Methods: Retrospective study of prospectively collected data and review of ERCP radiological films. All patients with diagnosed HIV who had an ERCP from December 2007 to March 2009 were included. The radiological films were then shown to a panel of experienced physicians (2 surgeons, 1 gastro-enterologist and 1 radiologist), and a consensus diagnosis was reached for each patient.

Results: Twenty-seven patients were identified, 16 female and 11 male. Ages ranged from 23 to 54 years, average 36 years. The cholangiographic diagnoses were as follows:

Diagnosis	No.
Extrinsic hilar compression	1
Distal bile duct stricture	5
Bile duct stones	4
Normal	4
Retroviral associated cholangiopathy	10
Common hepatic stricture	1
Unkown	2
Total	27

The spectrum of disease is a combination of well-described diseases in which an ERCP may be indicated and retroviral-specific disease.

Conclusion: HIV-positive patients undergoing ERCP at Chris Hani Baragwanath have the usual spectrum of stone and malignant disease as well as retroviral-associated cholangiopathy.

ELECTROGASTROGRAM INDICATES ILEUS MAY BE DUE TO ELECTRICAL CHANGES

Lahr C, Montague G

Purpose: We recorded EGG signals in response to distending in patients with drug-refractory gastroparesis (GP) to evaluate temporary and short-term effects of gastric distension on gastric electrical activity.

Methods: 16 female and 3 male GP patients with a mean age of 45 years old underwent permanent gastric electrical stimulation (GES) system implantation. Intra-operatively, after seromuscular electrode placement but prior to abdominal closure, EGG recordings were performed sequentially for at least 5 minutes during the following periods: stomach partial inflation during endoscopy (baseline = Base), endoscopic maximal insufflations (I1), desufflation (D1), re-insufflation (I2), and repeat desufflation (D2). EGG recordings were analysed quantitatively for mean frequency (Freq, in CPM) and amplitude (Amp, in mV) as well as the Freq/Amp ratio (FAR). Results were compared for differences by paired t-tests.

Results: During the insufflation and deflation periods, a progressive decrease in amplitude from 0.72 to 0.40 was noted ($p < 0.01$ for I1 and I2 from baseline) and a gradual increase in the FAR was noted ($p > 0.05$). There was an initial decrease then stabilisation in frequency ($p < 0.001$ for I1 from baseline and $p = 0.04$ between I1 and I2).

Conclusion: Distending the stomach by endoscopic insufflation causes an immediate lasting decrease in the amplitude of serosal EGG. The serosal EGG amplitude does not rise back to its baseline when the stomach is deflated. This persistent fall in EGG amplitude may play a part in the cause of postoperative ileus.

HEPATIC DUCTAL ANATOMY: A CADAVERIC X-RAY STUDY IN YOUNG ADULT AFRICAN MALES

Loots E, Anderson F A, Naidoo S R, Thomson S R

Aim: Hepatic ductal anatomy demonstrates great variation and is relevant to the safe performance of liver surgery. These variations are well described in the classic literature. This prospective descriptive cohort study aims to describe for the first time the variations in hepatic anatomy in African males.

Methodology: 100 fresh cadaveric specimens of the second pathological dissection block were removed from the bodies of trauma victims undergoing medico-legal postmortem. Cholangiography was performed via the major papilla. A transfixion suture prevented spillage of contrast material with the needle serving as a marker for the major papilla. Stapling clips were used as markers at key anatomical intervals. Two to four radiographs were taken.

Results: 109 specimens were obtained between August 2008 and January 2009. Cholangiography was successfully performed in 104 cases. Both the left and right systems were observed in 88 cases and in 5 cases only the left system was imaged. Tables will describe the confluence variations and hepatic segmental variations according to Healy and Schroy (1953).

Discussion: Ductal anatomy of the confluence corresponds with described literature. Marked variation was noted in segment 8 and subsets (a) and (d) of segment 4. Newly described variations were noted in segments 5, 6 and 8.

PANCREATIC DUCTAL ANATOMY: A CADAVERIC X-RAY STUDY IN YOUNG ADULT AFRICAN MALES

Loots E, Anderson F A, Naidoo S R, Thomson S R

Objective: Congenital anomalies are rare and may be pathological. Some of these anomalies produce clinical syndromes while others are of no clinical relevance. The study describes for the first time ductal anatomy in young African males.

Methods: 100 fresh cadaveric specimens of the second pathological block of dissection were removed *en bloc* from the bodies of trauma victims undergoing medico-legal postmortem. The tail of the pancreas was transected 2 cm from its termination, cannulated and flushed with water. Ejection of fluid at the major papillae was noted. An absence of fluid ejecting from the minor papilla diagnosed a pancreas divisum. Stapling clips were used as markers at key anatomical intervals. The common bile duct was cannulated via the major papilla. Contrast material was separately injected into the pancreatic duct and the biliary system. Spillage was prevented. Two to four radiographs were taken.

Results: 110 cases were recruited from August 2008 until January 2009. The pancreas was cannulated in 105 cases with 93 cases of good quality. Secondary ducts were noted in 23 patients. Pancreas divisum was observed in 4 patients. In 20 patients the pancreatic ductal junction (PDJ) was not adequately observed.



A short common junction was noted in 50 patients and an ultra-short system in 27. None fulfilled the criteria for a long system. The longest length was 12 mm. There were no cases of annular pancreas or radiographic evidence of chronic pancreatitis.

Discussion: The prevalence of pancreas divisum in our cohort was 3.6% which was at the lower end of the reported incidence quoted in the literature (2 - 12%). The prevalence of a patent accessory pancreatic duct was 23% as opposed to 26 - 41% as described in the literature. The PBJ was well visualised in the majority of cases. The incidence of annular pancreas is too low to have expected any cases. This study outlines the fairly low prevalence of common pancreatic anomalies.

THE CHRYSALIS CLINIC: A REVIEW OF LAPAROSCOPIC BARIATRIC SURGERY AT LIFE KINGSBURY HOSPITAL, CAPE TOWN

Marr J

Objective: Morbid obesity is a growing problem and carries serious long-term health risks. We started the Chrysalis Clinic, a multi-disciplinary centre of excellence in laparoscopic bariatric surgery, at Kingsbury Hospital in Cape Town in 2005. This is a review of our setting-up process including accreditation of the team and hospital, method of operation, and results to date.

Results: We have performed 85 procedures including Roux-en-Y gastric bypass (LRYGB, 77), adjustable gastric band (5) and sleeve gastrectomy (3). Average age was 42.7 years (range 24 - 64) and average body mass index was 47.4 (36.2 - 65). Fifty-five patients (47%) had co-morbidities. Average theatre time was 5.7 hours for the first 10 LRYGB and 2.5 hours for the last 20 cases. Three patients (all in the first 11 cases) developed peri-operative and 7 late complications including 1 death. Average hospital stay was 3 days. Follow-up continues on all patients and has been up to 47 months. Weight loss has averaged 41 kg and is a factor of time after surgery, excess body weight, and BMI.

Conclusion: Laparoscopic bariatric surgery is an increasingly important part of the weight loss programme in some very obese patients. Although it is high-risk surgery with a steep learning curve, if performed in a specialised centre using a multidisciplinary team approach, it is relatively safe and effective for weight loss.

ENDOSCOPIC AND HISTOPATHOLOGICAL PATTERNS IN DYSPEPTIC PATIENTS AT MAPUTO CENTRAL HOSPITAL, MOZAMBIQUE

Modcoicar P, Arteaga J, Carrilho C, Cunha L, Lorenzoni C

Objectives: To relate the endoscopic pattern and histopathological reports to infection by *Helicobacter pylori* in patients afflicted by dyspeptic syndrome at the Digestive Endoscopy Unit at Maputo Central Hospital (HCM).

Method: A prospective study, from August 2005 to April 2008, targeting 310 patients who had been subject to higher digestive endoscopy for complaining of dyspepsia. Samples were collected from the antrum, incisura angularis and body of the stomach. The histopathological classification was based on the Sydney modified procedure.

Results: 193 (62.3%) of the 310 patients were females. The mean age was 34 years (median: 34 years; SD: 10 years). 215 patients

(69.4%) lived in the suburban area, while 28.7% (or 89 out of 310) resided in the urban area. Erythematous antrum gastropathy was the most common endoscopic diagnosis, with 159 patients (or 51.3%) out of 310. Normal endoscopy was reported in 16.8% (52/310), and *H. pylori* was present in 51.2% (107/209) and 17.7% (37/209) of the patients with the aforementioned conditions, respectively. 78.7% (244/310) had a histopathological diagnosis of chronic pan-gastritis and predominantly antrum chronic gastritis. Of all these, 92% (197/214) had detected *H. pylori*. 88 patients (28%) had undergone eradication therapy before the endoscopy, of which 72 (or 82%) had in addition received H2 receptor antagonists and/or proton pump inhibitors.

Conclusions: This study has shown that there is no correlation between the endoscopic findings and *H. pylori* infection.

CHRONIC MESENTERIC ANGINA IN A YOUNG ADULT

Naidoo V, Saeed S, Newton K A

Introduction: Mesenteric angina as a cause of chronic abdominal pain in a young patient is very rare and often overlooked.

Case presentation/Investigations: A 36-year-old white woman was referred for evaluation of chronic debilitating epigastric pain. She had associated sitophobia and significant weight loss over a 5-year period. She had no other gastrointestinal symptoms. Apart from smoking she had no other risk factors for atherosclerosis. Extensive initial investigations including laboratory tests, abdominal ultrasound, oesophogogastroduodenoscopy and barium meal with follow-through were normal. A CT angiogram of her mesenteric vessels with 3D reconstruction demonstrated marked narrowing of the coeliac trunk and the proximal superior mesenteric artery. No other abnormalities were seen.

Management: Intervention angiography confirmed the CT findings and stents were successfully deployed across the coeliac and superior mesenteric stenoses. Her symptoms promptly resolved and she was discharged on clopidogrel, aspirin and simvastatin.

Discussion: The exact cause of the isolated mesenteric stenoses remains elusive. There were no clinical nor laboratory evidence of a vasculitis and no history of cocaine abuse. Fibromuscular dysplasia was considered the most likely cause.

Conclusion: Classic symptoms of chronic mesenteric angina should prompt further investigation even in a young patient.

EFFICACY OF SALVAGE TIPS IN PATIENTS WITH UNCONTROLLED VARICEAL BLEEDING AFTER FAILED ENDOSCOPIC HAEMOSTASIS

Nel M, Beningfield S J, Bornman P C, Krige J E J, Shaw J M

Background: Endoscopic therapy is the treatment of choice to control acute bleeding from oesophageal varices. Transjugular portosystemic stenting (TIPS) provides minimal access shunting in high-risk patients who continue to bleed despite endoscopic intervention.

Aim: This study tested the validity of the hypothesis that emergency TIPS would reduce portal pressure sufficiently to stop recurrent variceal bleeding and death from oesophageal varices.

Methods: Prospective data collection was performed on all patients treated with TIPS following failed endoscopic therapy for bleeding



oesophageal varices between July 1991 and May 2009. Median survival and cause of death were analysed.

Results: Twenty-three patients (18 men, 5 women), mean age 52 years (range 32 - 68 years) were treated. Aetiology of portal hypertension was alcoholic cirrhosis (19), haemochromatosis (1), hepatitis C cirrhosis (1), sarcoidosis (1) and idiopathic cirrhosis (1). Thirteen patients died, 6 due to recurrent variceal haemorrhage (1 died during TIPS), 6 from liver failure and 1 from myocardial infarction. Ten patients left hospital alive. One survivor developed transient encephalopathy.

Conclusion: Recurrent variceal bleeding is associated with high mortality. TIPS provided control of bleeding in 78% and survival in 44% of patients in whom endoscopic therapy failed to control bleeding.

EARLY REBLEEDING AND DEATH IN ALCOHOLIC CIRRHOTIC PATIENTS WITH ACUTE VARICEAL BLEEDING TREATED WITH INJECTION SCLEROTHERAPY

Price C, Bornman P, Burmeister S, Kotze U, Krige J, Nel M, Shaw J

Background: This study evaluated rebleeding and death after a first episode of acute variceal haemorrhage (AVH) treated by emergency endoscopic sclerotherapy in a large cohort of alcoholic cirrhotic patients.

Methods: From January 1984 to December 2006, 310 alcoholic cirrhotic patients (242 men, 68 women; mean age 51.7) with AVH underwent 786 endoscopic variceal injection treatments (342 emergency, 444 elective) during 919 endoscopy sessions in the first 6 weeks after the first variceal bleed. Endoscopic control of initial bleeding, variceal rebleeding, and survival at 6 weeks were recorded.

Results: Endoscopic intervention controlled AVH in 304 of 310 (98%) patients. Seventy five (24.2%) patients rebled, 38 (12.3%) within 5 days and 37 (11.9%) within 6 weeks. No Child-Pugh A patients died. Seventy seven (24.8%) Child-Pugh B and C patients died, 29 (9.3%) within 5 days and 48 (15.4%) between 6 and 42 days. Mortality increased exponentially as the Child-Pugh score increased, reaching 80% when the Child-Pugh score exceeded 13.

Conclusion: Despite initial control of variceal haemorrhage, 1 in 4 patients (24.2%) rebled within 6 weeks. Survival at 6 weeks was 75.2% and was influenced by the severity of liver failure with most deaths occurring in Child-Pugh grade C patients.

INTRAHEPATIC PARAGANGLIOMA: CASE REPORT AND REVIEW OF THE LITERATURE

Panieri E, Bornman P C, Burmeister S, Davies J Q, James M R, Krige J E J, Ross I L, Wearne N

We report the case of a 31-year-old HIV-positive woman with an intrahepatic paraganglioma. She presented as a hypertensive emergency in cardiac failure following 3 months of worsening paroxysms of headaches, palpitations, sweating and weight loss. Of note was that the patient's father had died of hypertensive complications together with a history of paroxysmal sweating. Examination suggested fullness within the right flank. Biochemical evaluation demonstrated impaired renal function with hypokalaemia and raised serum aldosterone and urinary

normetanephrine values. Imaging by means of ultrasound, CT scan, MRI and MIBG localised a 5x8 cm mass closely related to the right adrenal gland and right lobe of the liver. There was no evidence of local invasion or metastatic disease. An MIBG scan showed increased uptake within the lesion. Pre-operative alpha-blockade was instituted and the patient planned for resection. At surgery the lesion was found to be within the liver and separate from a normal right adrenal gland. She underwent an uneventful right hemi-hepatectomy. At 4-month follow-up the patient remains well and a repeat MIBG scan has not demonstrated any residual lesion.

This is the 10th reported case of a paraganglioma strictly confined to the liver. We describe the clinical, biochemical, radiological and pathological features of this case and review the literature with respect to this rare problem.

A CASE OF HAEMOSUCCUS PANCREATICUS

Rangaka T

Objective: Upper gastro-intestinal bleeding caused by haemosuccus pancreaticus is uncommon. This is often seen in some patients with chronic pancreatitis. We report a case of haemosuccus pancreaticus successfully treated with arterial embolisation.

Case history: A 61-year-old woman with recurrent upper gastro-intestinal bleeding was referred to our institution. She had a long history of alcoholic chronic pancreatitis. She presented with haematemesis and melaena. Upper endoscopy showed blood in the stomach but no obvious source was found.

CT scan showed a pancreatic pseudocyst. Angiography showed a pseudo-aneurysm of the gastroduodenal artery and active bleeding from pancreaticoduodenal branches.

Conclusion: Superselection of gastroduodenal artery with embolisation was done. Haemostasis was achieved. We concluded that haemosuccus pancreaticus can be treated successfully with arterial embolisation in selected patients.

SELF-EXPANDING METAL STENTS AS AN ALTERNATIVE TO SURGICAL BYPASS FOR MALIGNANT GASTRIC OUTLET OBSTRUCTION

Shaw J M, Bornman P C, Krige J E J, Panieri E, Stupart D, Van Wyk M

Background: Gastro-duodenal obstruction due to malignancy can be difficult to palliate. Self-expanding metal stents (SEMS) are gaining acceptance as an effective alternative to surgical bypass, which has significant morbidity and mortality in patients with advanced disease.

Method: Patients with complete gastric outlet obstruction due to malignancy who were not suitable for surgical bypass were offered palliation with a SEMS from November 2004 to December 2008. The procedure was performed under fluoroscopic guidance and with conscious sedation. Data were collected prospectively on a database.

Results: 70 patients had attempted SEMS placement (hepatobiliary and pancreatic malignancy $N=44$, antral gastric carcinoma $N=19$, other $N=7$). Follow-up was complete in 69/70 (98.6%) patients. Technical and clinical success rates were 92.8% and 95.4%



respectively. Median hospital stay was 2 days (1 - 18), median survival was 1.8 months (0.1 - 19) and 88.6% ($p < 0.001$) had improved intake after SEMs placement. The only complications were two episodes of minor bleeding due to tumour ulceration from the SEMs.

Conclusion: The use of SEMs to alleviate complete malignant gastric outlet obstruction in patients with limited life expectancy is successful in re-establishing enteral intake in most patients with minimal morbidity, no mortality and a short hospital stay in this study.

THE ROLE OF ERCP AND PTC IN THE MANAGEMENT OF BILE LEAKS AFTER PENETRATING LIVER TRAUMA

Shaw J M, Benington S J, Bornman P C, Burmeister S, Krige J E J, Nicol A J, Navsaria P

Objective: This study evaluated optimal management and outcome of persistent biliary fistulas and strictures following penetrating liver trauma in a tertiary referral trauma centre.

Method: The study included all patients admitted to Groote Schuur Hospital with penetrating liver trauma who had a persistent bile leak or biliary stricture. Patient data were reviewed retrospectively using the liver trauma data base and endoscopy records. Imaging of the biliary system was by ERCP ($N=61$) or PTC ($N=9$). Lesions were classified according to their anatomical location on cholangiography as either extra-hepatic (common bile duct, common hepatic duct or left and right hepatic ducts) or intra-hepatic (central or peripheral segmental ducts). Bile leaks or strictures that did not resolve after endoscopic stenting underwent surgical repair.

Results: Between 1985 and 2009, 66 patients presented with either a persistent bile leak ($N=56$), a biliary stricture ($N=3$) or a combination ($N=7$). 21 patients had postoperative bile drainage while 31 patients had percutaneous radiological and 9 subsequent surgical drainage. 23 patients had biliary pleural effusions drained either via an intercostal chest drain ($N=21$) or a percutaneous catheter ($N=2$). The site of the biliary lesion was identified by ERCP in 48 patients. Of the 42 intra-hepatic injuries, 38 resolved with endoscopic therapy. Of the 17 extra-hepatic injuries 11 required surgical intervention.

Conclusion: Central and peripheral intra-hepatic bile leaks are likely to resolve with endoscopic stenting. While endoscopic therapy should be considered, extra-hepatic injuries invariably require surgical intervention.

INTRAVENOUS IRON THERAPY IN TWO PATIENTS WITH X-LINKED DOMINANT PROTOPORPHYRIA

Sonderup M, Corrigall A, Davidson B, Haumann C, Meissner P

Background: Recently described X-linked dominant protoporphyria (XLDPP) is due to unique gain-of-function deletions in delta-aminolaevulinic acid synthase. Patients manifest with photosensitivity and liver disease, mimicking erythropoietic protoporphyria (EPP); however liver disease incidence was 17%. This is higher than the <5% incidence observed with EPP. In XLDPP mitochondrial iron delivery rate limits ferrochelatase activity thus elevating protoporphyrins, hence depleting iron stores may reduce protoporphyrin levels. The question remains whether this response influences liver disease.

Aim: To determine the clinical response (protoporphyrin concentration, liver function tests and photosensitivity) in 2 patients with XLDPP-associated liver disease, in response to iron.

Methods: Two patients, a father and daughter, age 63 and 24 respectively, with XLDPP and evidence of protoporphyrin-associated liver disease received 3 divided doses of IV Venofer over a 5-day period. Protoporphyrin levels, liver function tests and iron studies were performed before, during and following therapy and repeated at 1, 2 and 3 months.

Results: Protoporphyrin levels initially increased and within 15 days decreased to below pretreatment levels. Liver function tests began to normalise within 7 days of therapy. Both effects were maintained beyond 30 days post therapy. Iron studies normalised after treatment. A marked reduction in photosensitivity symptoms was observed.

Conclusion: In 2 patients with XLDPP and liver disease, IV iron produced a sustained improvement in liver function tests that mirrored a reduction in protoporphyrin levels. This study suggests that a sustained reduction in protoporphyrin levels, even if relatively minor, should decrease hepatic toxicity and may be a promising treatment strategy.

ADVANCED NEOPLASIA OF THE LEFT HEMICOLON ARE BETTER DETECTED BY FAECAL IMMUNOCHEMICAL TESTS THAN RIGHT-SIDED LESIONS

Terhaar sive Droste J, Coupe V, Loffeld R, Meijer G, Mulder C, Oort F, Van der Hulst R, Van Heukelem H, Westorp E

Introduction: Faecal immunochemical tests (FITs) detect the globin part of human haemoglobin using specific antibodies and is degraded in the intestinal lumen. Theoretically, this makes FIT selective for colonic blood loss since globin from blood lost proximal to the colon will be degraded. However, this could have a negative effect on the detection rate of right-sided neoplasia as well.

Aim: To assess whether there is a difference in sensitivity of FIT for right- and left-sided advanced neoplasia.

Methods: All patients scheduled for a colonoscopy in 5 participating hospitals were asked to perform a FIT (OC sensor®, Eiken Chemical Co, Japan) prior to colonoscopy. The cut-off value was set at 100 ng/ml. Test results were compared with colonoscopy findings. Advanced neoplasia was defined as adenomas >1 cm, with villous architecture and/or high-grade dysplasia or cancer.

Results: In 1 808 individuals who underwent total colonoscopy, 193 advanced adenomas and 62 cancers were found. Individuals with synchronous left- and right-sided lesions were excluded ($N=48$). In the right colon, 41 advanced adenomas were found as well as 23 cancers. In the left hemicolon, 104 advanced adenomas and 23 cancers were found. The FIT was positive in 11.7% of individuals. Detection rate for right-sided advanced neoplasia was 39.1% versus 56.6% for left-sided advanced neoplasia ($p=0.01$).

Conclusions: Left-sided colonic advanced neoplasia are better detected by FIT than right-sided lesions. With a rising incidence of right-sided lesions, this is an important limitation of FIT when applied in CRC screening.



FLAT ADENOMAS ARE LEFT UNDETECTED BY FAECAL IMMUNOCHEMICAL TESTS

Terhaar sive Droste J, Loffeld R, Meijer G, Mulder C, Oort F, Van der Hulst R, Van Heukelem H, Voorham R, Wesdorp E

Introduction: In Japan, flat colorectal adenomas and carcinomas (flat lesions) represent 10 - 40% of all colorectal neoplasia. The occurrence of flat lesions was considered to be rare in Western countries; however, recent studies have reported the opposite.

Faecal occult blood testing (FOBT) is implemented in several countries for colorectal cancer screening. However, FOBT accuracy may be limited in case of flat lesions, owing to a smaller surface area and the fact that they are less protruding than polypoid adenomas.

Aim: We discuss whether flat lesions are detected by a quantitative immunochemical FOBT (FIT) using colonoscopy as gold standard.

Methods: Patients scheduled for a colonoscopy in 5 participating hospitals were asked to sample a FIT (OC sensor®, Eiken Chemical Co, Japan) prior to colonoscopy. Test results were compared with colonoscopy findings. A haemoglobin concentration >50 ng/ml in the test sample was considered a positive test result.

Results: In 78 out of 1 897 individuals a flat lesion was the exclusive finding at colonoscopy. Histology of 45/78 flat lesions was classified as adenomatous. Of the remaining 33 lesions histology revealed hyperplastic or normal colon mucosa. One of the 45 flat adenomas appeared to be an adenocarcinoma and 11 were advanced adenomas. The FIT was negative in 38/45 flat adenomas. Nine out of 11 flat advanced adenomas were not detected, nor was the carcinoma.

Conclusions: The FIT tested negative in most patients with flat adenomas even at a low cut-off. Consequently, these flat (pre-cancerous) lesions will remain undetected in screening programmes using FIT.

HIGHER CUT-OFF VALUES FOR FIT IN CRC-SCREENING: LESS COLONOSCOPIES, SAME DETECTION RATES FOR CURABLE CANCERS

Terhaar sive Droste J, Coupe V, Loffeld R, Meijer G, Mulder C, Neerincx M, Oort F, Rakers M, Van der Hulst R, Van Heukelem H, Wesdorp E

Introduction: The goal of screening is to detect colorectal cancer (CRC) at an early, curable stage. Faecal immunochemical tests (FITs) produce a quantitative outcome which allows adjustment of the threshold for calling a test positive. A higher cut-off value will result in fewer positive tests, fewer screenees referred for colonoscopy and thus less strain on capacity. However, whether this will influence the detection rate of (curable) CRCs is unknown.

Aim: To assess the effects of higher cut-off values of a quantitative FIT on the positivity rate and on the detection rate of early-stage CRCs.

Methods: All patients scheduled for a colonoscopy in 5 participating hospitals were asked to perform a FIT (OC sensor, Eiken Chemical Co, Japan) prior to colonoscopy. Tests of all patients were assessed using cut-off values of 50, 100, 150 and 200 ng haemoglobin per ml. Test results were compared with the gold standard colonoscopy.

Results: In 1 897 individuals who underwent colonoscopy, 62 cases of CRC (3.3%) were identified. 28/62 patients were diagnosed with early-stage (Dukes A+B) and 31 patients with late-stage (Dukes C+D) CRC. Three rectal cancers could not be staged adequately. The FIT was positive in 8.8%, 9.8%, 11.4% and 14.0% at cut-offs of 200, 150, 100 and 50 ng/ml, respectively. The detection rates for early-stage CRCs ranged from 75.0% to 78.5% depending on the threshold of FIT.

Conclusions: A higher cut-off value for FIT can reduce strain on colonoscopic capacity with only a slight decrease in detection rates of curable CRCs.

INCOMPLETE COLONOSCOPY: SIGNIFICANT FINDINGS IN A MIXED REFERRAL POPULATION DURING FOLLOW-UP

Terhaar sive Droste J, Bartelsman J, Loffeld R, Mulder C, Neerincx M, Rakers M, Tuynman H, Van der Hulst R

Background: Caecal intubation is inadequate in 87 - 98% of colonoscopies. However, the magnitude of missed lesions in the unobserved part of the colon remains unknown and the efforts made to visualise the remaining part of the colon are elusive.

Aim: We evaluated 1) the reasons for failure, 2) the diagnostic yield after a second investigation of the colon, and 3) the highest diagnostic accuracy adjusted for the various procedures.

Methods: Incomplete colonoscopies were identified from a population-based cohort study. Incompleteness was defined as inability to intubate the caecum. Secondary examinations to visualise the unobserved part of the colon were assessed until 18 months after the index colonoscopy. Follow-up examinations included repeated colonoscopy, CT colonography, barium enema, CT abdomen and surgical interventions.

Results: Of 3 149 procedures, 289 were incomplete (9.2%). Incomplete colonoscopy was predominant in females (OR 1.39) and in procedures without conscious sedation (OR 2.65). Reasons for failure included dolichocolon (19%), discomfort (13%), obstructing tumour (13%), suspected adhesions (13%), stenosis/diverticulosis (13%), insufficient preparation (12%) and severe inflammation (2%). Follow-up was performed in 55% of the patients. With follow-up examination, CRC was diagnosed in 16 patients (6%), advanced adenoma in 3 patients (1%) and other polyps in 6 patients (2%). In 17% of repeat colonoscopies, advanced neoplasia was found.

Discussion: In 22/289 patients, neoplasia was found that was missed by incomplete colonoscopy. Surgical intervention and repeated colonoscopy resulted in the highest secondary diagnostic yield. Incomplete colonoscopy should therefore be followed by a repeated colonoscopy or additional imaging and if necessary surgical intervention.

THE ROLE OF ENDOSCOPIC RETROGRADE PANCREATOGRAPHY IN THE TREATMENT OF LOCAL COMPLICATIONS OF PANCREATIC TRAUMA

Thomson D, Bornman P, Hameed F, Krige J, Kotze U, Shaw J

Aim: This study reviewed the role of endoscopic retrograde pancreatography (ERP) and endoscopic intervention in the treatment of patients with complicated pancreatic trauma.



Methods: 310 patients who had pancreatic injuries between April 1983 and March 2009 were reviewed. Patients who had an ERP either pre- or postoperatively for complications of pancreatic trauma were included in the study. The indication for ERP, its timing in relation to the injury, findings at ERP, therapeutic intervention performed and the need for further surgery were analysed.

Results: 43 patients (38 men, 5 women, mean age 29.6, range 15 - 68 years) were referred for ERP after blunt trauma ($N=23$), gunshot ($N=13$) or stab wounds ($N=7$) to the pancreas. 27 patients had a pre-operative ERP. The pancreatic injury involved the head of the pancreas ($N=12$), neck ($N=4$), body ($N=18$) and tail ($N=8$); 1 site was unknown. ERP was successful in 42 patients. In 1 patient no pancreatic leak was demonstrated on ERP. Twenty patients had a pancreatic fistula, 12 patients had a main pancreatic duct stricture and 9 patients had a pseudocyst. Endoscopic intervention was successful in 25 patients (pancreatic duct sphincterotomy $N=12$, pancreatic duct stent $N=5$, pseudocyst drainage $N=8$). Ten patients required pancreatic surgery (distal resection $N=6$, pancreaticojejunostomy $N=3$, cystjejunostomy $N=1$). Six patients with distal pancreatic fistulas resolved on conservative treatment.

Conclusion: Pancreatic duct injury is a major determinant of outcome after pancreatic trauma. ERP is an effective endoscopic option in the diagnosis and treatment of local complications of pancreatic trauma.

THE EARLY MANAGEMENT OF HYPERTRIGLYCERIDAEMIA IN ACUTE PANCREATITIS

Thomson S, Anderson F, Mbatha S Z

Introduction: The management of acute pancreatitis associated with elevated triglyceride (TG) levels poses unique problems. Insulin dextrose therapy, Plasma exchange, and plasmapheresis are the clinical methods of lowering TG levels. Decreasing the TG levels to below 5.65 mmol/l alleviates the abdominal pain and is purported to improve outcome. We analyse our experience with insulin dextrose therapy in this setting.

Patients and methods: Patients presenting with pancreatitis and hypertriglyceridaemia were assessed. All patients with presenting TGs >10 mmol/l were monitored for resolution to a level below 5.65 mmol/l at days 3 and 5. Patients with TG levels in excess of 50 mmol/l were treated with standard therapy (npm and intravenous fluid) or 5% dextrose and 10 units of insulin infusion.

Results: In the period June 2001 to April 2008, there were 434 admissions of 381 patients with a diagnosis of acute pancreatitis and 24 (6%) had hypertriglyceridaemia in excess of 10 mmol/l at admission. Standard therapy was used in all patients and in 5 patients it was the sole therapy. Dextrose and insulin infusion was used in 19 cases. Two patients died prior to repeat estimation. On day 3, 7(32%) of the measured TG levels had fallen below 5.65 mmol/l and on day 5 all had decreased dramatically though 4 (17%) remained above 5.65 mmol/l, 1 of whom died.

Conclusion: Standard therapy was equivalent to the use of dextrose and insulin in the resolution of hypertriglyceridaemia. Our morbidity and mortality is similar to the levels quoted when plasmapheresis was used in other centres.

THE SPECTRE OF AIR AND THE BILIARY TRACT

Thomson S, Anderson F, Reddy P

Introduction: Air in (pneumobilia) and around the biliary tract has several different causes. We describe our experience with the aetiologies with the view to developing rational investigative and management algorithms.

Methods: These cases of air in and around the biliary tree were encountered over a 3-year period in the Durban metropolitan area. A descriptive categorisation of these cases follows.

Conclusion: Air in and around the biliary tract has incidental and lethal causes. A high index of suspicion is required to make the correct diagnosis as plain radiology signs may be subtle. Interventions depend on the diagnosis and range from nil, to aggressive resuscitation with interventional endoscopy or surgery.

Results: See table below.

Pathology, sex and age	Presentation	Imaging	Intervention	Result
Hepatico-duodenal fistula Female, 17	RUQ pain Mild cholangitis	AXR, US, CT ERCP, MRCP	Hepatico- jejunostomy	A&W
Choledocho-duodenal fistula Male, 66	RUQ pain Mild cholangitis	AXR, US, ERCP, MRCP, Barium	Medical management	A&W
Small-bowel obstruction Female, 77	Cholangitis	AXR, US	Medical	A&W
Cholangitis, liver abscesses Female, 50	Reynold's pentad.	AXR, US, CT	Supportive	Died
Sump syndrome Female, 50	Recurrent cholangitis	AXR, US, ERCP, MRCP	ERCP extraction	A&W
Gallstone ileus Females, 76 & 68	Bilious vomiting & obstruction	AXR, US	Ileotomy extraction	A&W Died
Choledocholithiasis ERCP perf Females, 73 & 58	Peritonitis	AXR	Surgical repair	Died A&W
Choledocholithiasis Pre-ERCP Female, 44	Intermittent jaundice	AXR	ERCP extraction	A&W
Emphysematous cholecystitis Female, 55	RUQ pain	AXR	Cholecystectomy	A&W