Editorial Article

Therapeutic Hepato-Biliary Endoscopy : Future Trends

Therapeutic endoscopy of the biliary tract has come a long way since its early application by McCune in 1966 when endoscopic retrograde cholangio-pancreatography (ERCP) was first introduced. A diagnostic procedure at its onset, ERCP has expanded to include a vast number of therapeutic procedures ranging from nasobiliary drainage, sphincterotomy, stenting, stone extraction and ballon dilatation of strictures as well as in the management of post liver transplant bile duct complication (Gholson 1995).

Endoscopic sphincterotomy is commonly performed in patients with common bile duct stones following cholecystectomy, or patients at high risk with the gallbladder in situ. Additional indications include sphincter of Oddi dysfunction, Sump syndrome and prior to balloon dilatation, stent placement or nasobiliary drainage. Balloon dilatation via the ERCP is an adaptation of the Gruntzig technique of endovascular balloon dilation and has added to the options available in therapeutic hepatobiliary endoscopy. Balloon dilation of the biliary tract is usually performed for strictures of inflammatory, neoplastic or postoperative origin and prior to insertion of stents. Biliary stents are useful for benign and malignant strictures as well as controlling leaks or fistulas. With laparoscopic cholecystectomy now the procedure of choice in the management of symptomatic gallstone disease, there has been an increase in the number of bile duct injuries and leaks (Mirza 1997). In minor bile duct leaks, endoscopic diversion by sphincterotomy or stenting provides a rapid solution, while more significant injuries where ductal integrity is intact, endoscopic dilatation and stenting may play a role in closing leaks and resolving strictures while averting surgery (Ponsky 1996).

The Rendezvous technique is a useful adjunct in the palliation of the difficult ERCP cannulation. This technique employs the placement of a guidewire via a percutaneous transhepatic route into the duodenum through an internal external percutaneous transhepatic biliary drainage tube. The guidewire is passed across the liver into the common bile duct and to the duodenum where the endoscopist grasps it and delivers the guidewire through the oral cavity. With the guidewire in place, the scene is set to pass a stent across the guidewire endoscopically under fluoroscopy guidance. Improved fibreoptic technology has seen the development of smaller diameter endoscopes that can be passed through small channels of an ordinary fibreoptic endoscope. The use of these "baby" fibreoptic endoscopes through a side viewing ERCP (mother) scope enables the operator to directly visualize the lumen of the biliary tree and sometimes the gallbladder. Through this "baby" fibreoptic endoscope, various diagnostic and therapeutic procedures such as biopsy, removal of polyps and hydrolithotripsy both laser and contact electrohydrolithotripsy, can be performed for calculi.

Current use of therapeutic endoscopy of the biliary tract also includes the use of the choledochoscope. The choledochoscope is used intraoperatively (both open and laparoscopically) to identify and extract calculi with the use of balloon catheters or a Dormia stone basket. Retained common bile duct stones can be managed via a T-tube tract using a steerable Burhene or Dormia stone basket or contact fragmentation under direct visualization with the choledochoscope.

The use of laparoscopy in hepatobiliary disease has expanded to laparoscopic bile duct exploration (Petelin 1993) and laparoscopic cholecystojejunostomy (Tarnasky 1995). These procedures are at present limited to a few centres however with increasing expertise will become a part of the general surgeons' armamentarium. In palliating malignant lesions, prior to fashioning a laparoscopic cholecystojejunostomy, it is useful to confirm a patent cystic duct with the aid of an ERCP (Tarnasky 1995).

Recent advances in the surgical management of choledochal cysts as well as intrahepatic calculi have led to a number of procedures that include a hepaticojejunostomy with either a subcutaneous access loop or an access stoma. In 1973, Chen of China, described a Roux-en-Y hepaticojejunostomy with subcutaneous jejunal access. Huston of USA described a Roux-en-Y hepaticojejunostomy with cutaneous access stoma for direct access to the bilioenteric anastomosis. Barker and Winkler of South Africa with the addition of an antireflux valve have used a similar method. Through these access stomas and subcutaneous loops, the biliary tracts can be viewed by the use of endoscopes such as the choledochoscope and calculi extracted or stenoses dilated or stented.

A further development in the access to the hepaticojejunostomy is the internal access loop as described by Steigman et al who described a Roux-en-Y hepaticojejunostomy with jejunoduodenostomy as internal biliary access loop in three patients. This technique allows endoscopic access for direct visualisation of the bilioenteric anastomosis for any intervention such as balloon dilatation and stent placement in the case of biliary stricture (Haron). Endoscopic balloon catheter or Domia Basket can extract biliary calculi. The incidence of bile reflux gastritis as seen in jejunal loop interposition or duodenal ulcer of Roux-en-Y hepaticojejunostomy has yet to be seen in this internal biliary access loop study as assessed by barium studies, HIDA scan and endoscopy.

Percutaneous transhepatic cholecystoscopy (PTCC) is a more recent development for the management of gallbladder polypoid lesions (Nakazawa). This technique employs the creation of a PTCC fistula through which a flexible fibreoptic endoscope is inserted into the gallbladder. This technique enables the operator to perform a polypectomy with a basket catheter or a snare. Initial results are promising however the indications appear to be limited.

In the past decade the introduction of the laparoscope has revolutionized the management of gallstone disease and hepatobiliary disease. The next millenium will see an expansion in the therapeutic options available in biliary tract endoscopy. There will be further refinements of current available technology and newer and less invasive methods will be developed to manage hepatobiliary disease.

Haron Ahmad, MS (UKM),
Akhtar Qureshi, FRCSEng (Gen)
Department of Surgery,
Hospital UKM,
Bandar Tun Razak,
56000 Kuala Lumpur.

REFERENCES

1. Barker EM, Winkler M. Permanent access hepatico jejunostomy. Br J Surg 1984; **71:** 188-191.
2. Chen HH, Zhang WH, Wang SS, Caruana JA. Twenty two year experience with the diagnosis and treatment of intrahepatic calculi. Surg Gynaecol Obstet 1984; **159:** 519-24.
3. Gholson CF, Zibari G, McDonald JC. Endoscopic diagnosis and management of biliary complications following orthotopic liver transplantation. Digestive Diseases & Sciences 1996; **41:** 1045-53.
4. Haron A, Jivan P, Qureshi A. Endoscopic access to hepaticojejunostomy via Roux-en-Y jejunoduodenostomy. (Submitted to Brunei J Med).
5. Huston DG, Russell E, Schiff E, Levi JJ, Jeffers L, Zeppa R. Balloon dilatation of biliary stricture through a choledochojejuno cutaneous fistula. Ann Surg 1984; **199:** 637-47.
6. Mirza DF, Narsimham KL, Ferraz Neto BH, Mayer AD, Macmaster P, Buckels JAC. Bile duct injury following laparoscopic cholecystectomy : Referral pattern and management. Br J Surg 1997; **84:** 786-790.
7. Nakazawa S, Inui K, et al. The detailed examination for early diagnosis of gallbladder cancer with percutaneous transhepatic cholecystoscopy PTCCS. Stomach and Intestine 1986; **21:** 515-20.
8. Petelin JB. Laparoscopic approach to common duct pathology. Am J Surg 1993; **165:** 487-91.
9. Ponsky JL. Endoscopic approaches to common bile duct injuries. Surgical Clinics of North America 1996; **76:** 505-13.
10. Steigmann GV, Mansour MA, Goff JS, Pearlman NW. Roux-en-Y jejunoduodenostomy for endoscopic access to hepati cojejunostomy. Surg Gynecol Obstet 1991; **173:** 153-54.
11. Tarnasky PR, England RE, Lail LM, Pappas TN, Cotton PB. Cystic duct patency in malignant obstructive jaundice. An ERCP-based study relevant to the role of laparoscopic cholecystojejunostomy. Ann Surg 1995; **221:** 265-71.