LEADING ARTICLE

THERAPEUTIC BILIARY ENDOSCOPY – PRESENT STATUS

I Yap

SINGAPORE MED J 1994; Vol 35: 568-569

There has been rapid technical development in endoscopic management of biliary stones and strictures since the advent of endoscopic retrograde cholangiopancreatography (ERCP) in 1970[1]. However, endoscopic biliary stone extraction and bile duct stenting are the two commonest methods employed. All other procedures are either infrequent or still in the experimental stage.

Endoscopic sphincterotomy (ES), first reported in 1974[2,3], is now the method of choice for removing retained or recurrent common bile duct (CBD) stones after cholecystectomy. The place of ES in frail, elderly and high risk patients, patients with cholangitis and patients with acute gallstone pancreatitis is also well established [4-6]. Whether the procedure should be performed in young, fit patients with gall bladder-in-situ remains controversial[7]. Studies[8,9] have suggested pre-cholecystectomy ES with bile duct stones removal may reduce surgical morbidity and cost but the only prospective randomised trial[10] did not show any benefit in overall morbidity and mortality. However, the increased use of laparoscopic cholecystectomy in recent years changes the situation as common duct stones are more difficult to deal with laparoscopically. About 10-15% of all patients undergoing cholecystectomy have duct stones and a history of jaundice or pre-operative elevation of both bilirubin and alkaline phosphatase is a reliable predictive factor[11]. Only patients with a strong suspicion of CBD stones require preoperative ES if expert ERCP service is available[11]. The success rate of endoscopic CBD stone clearance is 80 to 95% in expert hands. However, there is a limit to the size of the sphincterotomy that can be made safely. Stones less than 1.5 cm in diameter can be extracted using occlusion balloons and Dormia baskets. Larger stones must be fragmented before their removal endoscopically. Methods for fragmentation include mechanical lithotripsy, electrohydraulic lithotripsy, stone solvents, laser lithotripsy and extra corporeal shockwaves lithotripsy[12]. Endoprosthesis insertion to establish drainage is the alternative method when stone extraction is difficult or considered hazardous, especially in elderly or high risk patients[13-15]. Serious complications of ES including bleeding, pancreatitis, perforation and sepsis occur in about 10% of patients after ES. Most of the complications can be treated conservatively and less than 20% of them require surgery, and the overall mortality is about 1.5%[16]. Complications of sphincterotomy are more common in patients with Oddi's sphincter, nondilated and small-diameter CBD[17]. Needle knife papillotomy is also associated with high complication rate and should only be performed by experts and in patients who have a clear indication for biliary intervention[18].

Endoscopic decompression of the bile duct can be achieved with either external or internal drainage. For external drainage, a naso-biliary catheter is introduced, whereas for internal drainage, a stent (or endoprothesis) is inserted. Stent placement has become the standard technique. Naso-biliary catheter placement is used mainly for bile duct irrigation in the treatment of bacterial cholangitis or during lithotripsy (extracorporeal shock wave or electrohydraulic).

Endoscopic placement of transpapillary stents was first described by Soehendra and Reijnders-Frederix in 1980[19]. Stenting has become the main-stay of endoscopic palliation of malignant biliary strictures. The insertion of prostheses does not always require a sphincterotomy but it facilitates the initial insertion as well as later replacement, and may reduce the incidence of post-insertion pancreatitis. The ES performed usually is small and carries little risk of complication. Recent reviews have documented an overall 90% success rate of prosthesis insertion for malignant biliary obstruction, with a direct procedure-related mortality of 2%[4,18]. Results are better with lower complication rate in patients with distal CBD stricture than in those with proximal stricture. Proximal strictures pose more technical difficulties and combined percutaneous-endoscopic techniques ("rendez-vous" procedure) are required in some patients. Occlusions of endoprothesis by bacteria biofilm and sludge deposition remain a major unsolved problem that can lead to stent cloggage, recurrent jaundice and cholangitis. About 20-35% of stents placed for malignant disease need replacement[4]. Self-expanding large-bore metal stents are an exciting advance in the last few years as they remain patent for a longer period than conventional endoprotheses[20]. However, metal stents have the disadvantage of being inaccessible for future removal, expensive and the possibility of tumour ingrowth in between the mesh. New plastic stent designs are undergoing investigation.

Post-operative biliary strictures occur in 0.2 to 0.5% of patients following surgery on the biliary tract[21]. Endoscopic treatment for benign post-operative biliary stricture is controversial. Surgical reconstruction in expert hands provide good long-term results in 80 to 90% of patients. The Amsterdam group and our local study have shown favourable results with endoscopic stenting[21,22]. However, 17% of the Amsterdam group of patients developed restrictures during a mean follow-up of 42 months after stent removal, with patients having to undergo an average of five ERCPs for stent exchange[18,21]. At the moment, endoscopic stenting should be the treatment of choice for patients unfit for surgery or those who present with concomitant biliary fistula. To achieve more permanent dilatation, placement of a large bore or several prostheses for at least 3 months is recommended. Patients with total obstruction of biliary tree and failures of endoscopic treatment must be referred for surgery. Endoprosthesis placement in patients with benign bile duct stricture is often difficult, time consuming and requires much

Department of Medicine
National University Hospital
Lower Kent Ridge Road
Singapore 0511

I Yap, MBBS, M Med (Int Med), FAMS
Associate Professor

skill. The choice for operative or non-operative treatment will very much rely on local expertise.

Endoscopic dilatation of benign strictures can be performed using a balloon or dilating catheter. In a group of 35 patients with primary sclerosing cholangitis, treatment of major ductal strictures resulted in significant reductions in the cholangitis episodes. However, repeat dilatations at 6-12 monthly intervals thereafter were necessary to maintain improvement[23].

Post-operative biliary leaks usually originate from either delayed closure of the cystic stump or direct injury to the CBD. Bile leaks occur in about 2% of patients undergoing laparoscopic cholecystectomy[24]. The optimal management of post-operative bile leaks remains to be defined. The traditional therapeutic approach has been surgical, but in recent years endoscopic sphincterotomy, nasobiliary drainage and endoprosthesis placement have become the treatment of choice for the management of bile leaks[24,25]. The main advantages of endoscopic treatment are that it obviates general anaesthesia and reduces the need for postoperative hospitalisation.

References

1. Oi I. Fiberduodenoscopy and endoscopic pancreatocholangiography. Gastrointest Endosc 1970; 17:69-72.
2. Classen M, Demling L. Endoskopishe sphinkterotomia der papilla vateri und steinextraktion aus dem ductus choledochus. Dtsch Med Wochenschr 1974; 99:496 7.
3. Kawai K, Abasaka Y, Murakami K. Endoscopic sphincterotomy of the ampula of vater. Gastrointest Endosc 1974; 20:148-51.
4. Dowsett JF, Vaira D, Polydorou A, Russell RCG, Salmon PR. Interventional endoscopy in the pancreatobiliary tree. Am J Gastroenterol 1988; 83:1328-36.
5. Stain SC, Cohen H, Tsuishoysha M, Donovan AJ. Choledocholithiasis – Endoscopic sphincterotomy or common bile duct exploration. Ann Surg 1991; 213:627-33.
6. Fink AS. Current dilemmas in management of common duct stones. Surg Endosc 1993; 7:285-91
7. Horton RC, Larri A, Dooley JS. Endoscopic removal of common bile duct stones: current indications and controversies. Postgrad Med J 1991; 67:107-11.
8. Heinerman PM, Boeckl O, Pimpl W. Selective ERCP and preoperative stone removal in bile duct surgery. Ann Surg 1989; 209:267-72.
9. Van Stiegmann G, Pearlman NW, Goff JS, Norton LW Endoscopic cholangiography and stone removal prior to cholecystectomy. Arch Surg 1989; 124:787-9.
10. Neoptolemos JP, Carr-Locke DL, Fossard DP. Prospective, randomised study of preoperative endoscopic sphincterotomy versus surgery alone for common bile duct stones. Br J Surg 1987; 294.470-4.
11. Cotton PB, Baillie J, Pappas TN, Meyers WS. Laparoscopic cholecystectomy and the biliary endoscopist. Gastrointest Endosc 1991; 37.94-7.
12. Fouich PG. Endoscopic management of large common duct stones. Am J Gastroenterol 1991; 86:1561-5.
13. Cotton PB, Forbes A, Leung JWC, Dineen L. Endoscopic stenting for longterm treatment of large bile duct stones: 2 to 5 year follow-up. Gastrointest Endosc 1987; 33: 411-2.
14. Kill J, Kruse A, Rokkjaer M. Large bile duct stones treated by endoscopic biliary drainage. Surgery 1989; 105:51-6.
15. Peters P, Macmathuna P, Lombard M, Karari J, Westaby D. Management of CBD stones with a biliary endoprothesis. Report on 40 cases. Gut 1992; 33:1412-5.
16. Cotton PB, Lehman G, Vennes J, Greenen JE, Russell RCG, Meyers WC, et al. Endoscopic sphincterotomy complications and their management: an attempt at consensus. Gastrointest Endosc 1991; 383-93.
17. Sherman S, Ruffolo TA, Haves RH, Lehman G. Complications of endoscopic sphincterotomy: a prospective series with emphasis on the increased risk associated with sphincter of oddi dysfunction and non-dilated bile duct. Gastroenterology 1991; 101:1068-75.
18. Chung SSC. Biliary endoscopy. Curr Opin Gastroenterol 1992; 8:770-8.
19. Sochendra J, Reijnders – Frederix V. Palliative bile duct drainage. A new endoscopic method of introducing a transpapillary drain. Endoscopy 1980; 12:8-11.
20. Neuhaus N, Hagenmuller F, Griebel M, Classen M. Percutaneous cholangioscopic or transpapillary insertion of self expanding biliary metal stents. Gastrointest Endosc 1991; 37:31-7.
21. Davids PHP, Rauws EAJ, Coene PPLO, Tytgat GNJ, Huibregtse K. Endoscopic stenting for post-operative biliary strictures. Gastrointest Endosc 1992; 38:12-8.
22. Lim CC, Law NM, Cheng J, Ng HS. Role of ERCP in the management of bile duct lesion post bile duct surgery. Singapore Med J 1994; 35: 571-4.
23. Johnston GK, Geenen JE, Venu RP, Schmatz MJ, Hogan WJ. Endoscopic treatment of biliary tract strictures in sclerosing cholangitis: a large series and recommendation for treatment. Gastrointest Endosc 1991; 37:38-43.
24. Brooks DC, Becker JM, Connors PJ, Carr-Locke DL. Management of bile leaks following laparoscopic cholecystectomy. Surg Endoscopy 1993; 7:292-5.
25. Binmoeller KF, Katon RM, Shneidman R. Endoscopic management of postoperative biliary leaks: Review of 77 cases and report of two cases with biloma formation Am J Gastroenterol 1991; 86:227-31.