

THERAPEUTIC BILIARY ENDOSCOPY – PRESENT STATUS

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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 endoprosthesis) 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 endoprosthesis by bacteria biofilm and sludge deposition remain a major unsolved problem that can lead to stent clogage, 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 strictures 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

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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.

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