EXPERIENCE WITH ENDOSCOPIC BILIARY DRAINAGE IN SINGAPORE

R Guan, J Y Kang

ABSTRACT

In several overseas centres endoscopic biliary drainage is now a standard procedure in the initial or definitive management of biliary tract obstruction. We report the first nine patients in whom this procedure was carried out in our unit.

Four patients presented with acute cholangitis due to cholelithiasis. Urgent endoscopic biliary drainage improved the general condition in three patients prior to subsequent elective surgery. In one other patient with huge common bile duct calculi a biliary stent prevented recurrent episodes of cholangitis. Endoscopic endoprostheses were used in three patients with maglignant biliary tract obstruction. Two had terminal metastatic disease and endoscopic drainage provided adequate palliation of jaundice and pruritis in one. Endoprosthesis blockage necessitated percutaneous drainage in the other patient. The third patient with carcinoma of the head of the pancreas was improved by endoscopic drainage prior to an open surgical bypass procedure. Another patient with obstructive jaundice due to terminal gall bladder carcinoma experienced relief of jaundice and pruritis following endoscopic insertion of a nasobiliary drain.

We anticipate that endoscopic biliary drainage will become increasingly used in Singapore.

Keywords: Endoscopy, Biliary Drainage

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INTRODUCTION

Endoscopic retrograde cholangiopancreatography (ERCP) was first introduced in the early seventies as a diagnostic procedure. More recently its therapeutic capabilities have come into prominence. Therapeutic ERCP covers two broad areas : (1) sphincterotomy and extraction of common bile duct calculi and (2) establishment of biliary drainage, either through a nasobiliary catheter or using an internal stent.

Relief of biliary obstruction traditionally requires open surgery. Percutaneous transhepatic drainage was introduced in the seventies and more recently transhepatic insertion of an internal stent for biliary drainage has also been described. Manipulation via the transhepatic route is however associated with significant risks. Endoscopic drainage of biliary obstruction offers a safer alternative especially as a definitive procedure for patients with short life expectancy or those otherwise considered unfit for open surgery. It may also be used as a temporary drainage procedure prior to later surgery.

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

R Guan, MBBS, MRCP (UK), AM (S'pore)
Associate Professor and Consultant Physician

J Y Kang, MD, FRCP, FRCPEd,
Associate Professor and Consultant Physician

Correspondence to : Dr Guan

Diagnostic ERCP and endoscopic sphincterotomy with stone extraction are now standard procedures in several endoscopic units in Singapore. We report, however, the first series of patients to have undergone endoscopic biliary drainage in Singapore.

CASE REPORTS (Table I)

An 80 year old lady (LH) was admitted because of abdominal pain associated with fever and vomiting. She had a leucocytosis of 11.8 x 10^9/L and liver biochemistry confirmed biliary obstruction. The diagnosis of cholangitis was made. Emergency ultrasonography showed several gall-bladder stones and a probable calculus within a dilated common bile duct. She was started on gentamycin. The next day emergency ERCP was performed revealing a common bile duct stone which was too large to be extracted endoscopically. Endoscopic sphincterotomy was performed and a nasobiliary drain inserted to assist in drainage (Fig 1). Her temperature, leucocytosis and jaundice settled. She had a choledochoduodenostomy two days later and was discharged well 2 weeks after surgery.

Three other patients, YWL (female 80), LHS (male 60) and YAP (male 85) presented in a similar way. Urgent abdominal ultrasound examination in each patient showed dilatation of the intrahepatic and common bile ducts. Gall bladder calculi were also demonstrated in two. Urgent diagnostic ERCP within 2 days of admission confirmed choledocholithiasis in each case. Sphincterotomy was technically difficult in two patients (YWL, LHS) and one patient (YAP) was thought to be too ill for a definitive procedure. In each case a nasobiliary drain was inserted and biliary decompression achieved. With continued antibiotic administration all three patients improved and

Table I
Patient Details

Patient	Sex/ Age	Primary Disease	Drainage Procedure	Serum Bilirubin (umol/L)/ Serum Alkaine Phosphatase (IU/L)		Course
				Before	After	
LH	F/80	Cholelithiasis + Cholangitis	Sphincterotomy + Nasobiliary drain	74/415	30/205	Choledochoduodenostomy
YWL	F/80	Cholelithiasis + Cholangitis	Nasobiliary drain	58/162	Not done	Elective Choledochojejunostomy
LHS	M/60	Cholelithiasis + Cholangitis	Nasobiliary drain	85/565	19/330	Cholecystectomy + Exploration of common bile duct
YAP	M/85	Cholelithiasis + Cholangitis	Nasobiliary drain	122/80	81/76	Cholecystectomy + Exploration of common bile duct
MKH	F/67	Huge Cholelithiasis	Stent	240/391	50/84	Repeated stent change
CHK	M/61	Carcinoma of lung with metastases	Stent	484/900	31/124	Died
CPY	M/55	Carcinoma of lung with metastases	Stent	119/68	167/966	Blocked stent repeat attempt at re-insertion failed percutaneous drainage
GCK	M/84	Gall bladder + Cholangitis	Nasobiliary drain	543/789	189/332	Died of liver failure
QCK	M/42	Carcinoma pancreas	Stent	162/139	71/92	Cholecystojejunostomy

Fig 1
Nasobiliary drain in position. Note a stone (arrowed) in the common bile duct.

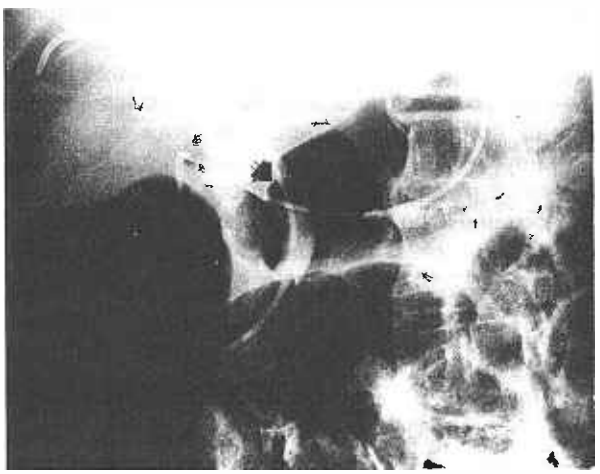


Fig 2
Biliary stent in position. Note multiple huge common bile duct stones. The stent acts as a splint allowing drainage of bile.

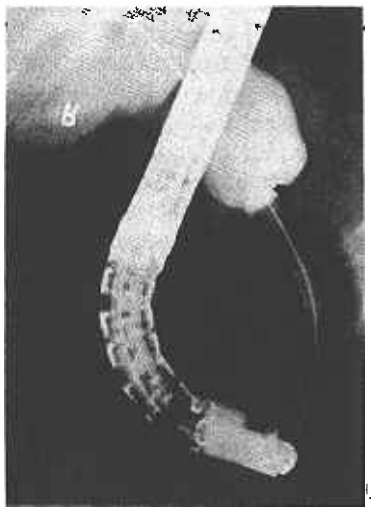
were able to undergo elective or semi-elective surgery. All three were discharged within two weeks of admission.

A 69 year old lady (MKH) first presented with empyema of the gall bladder and cholangitis secondary to calculi in both the gall bladder and the common bile duct. Following cholecystectomy and common bile duct exploration she developed a common bile duct stricture. A repeat laparotomy to repair this stricture was unsuccessful. Because of recurrent episodes of cholangitis over a three-year period due to multiple retained common bile duct stones, percutaneous transhepatic drainage was attempted but this did not

relieve her symptoms. Endoscopic stone extraction was felt to be inappropriate because of the size of her stones (> 15mm) (Fig 2). A biliary stent was inserted endoscopically. Her jaundice improved and no further episodes of cholangitis occurred over the subsequent 12 months. However, stent blockage manifested by rising bilirubin levels necessitated stent change on two occasions. We plan to treat her common bile duct stones with extracorporeal shock wave lithotripsy.

A 61 year old man (CHK), known to have bronchial carcinoma of the lung presented with a history of progressive painless jaundice, pruritis, loss of appetite and weight. Examination revealed a thin jaundiced gentleman with pallor and scratch marks. No abdominal masses were palpable. Liver biochemistry indicated an obstructive jaundice. Urgent abdominal ultrasound revealed dilated intrahepatic and extrahepatic ducts with a large gall bladder stone. A percutaneous cholangiogram revealed extrinsic compression at the lower end of the common bile duct probably due to enlarged lymph nodes. A biliary stent was inserted endoscopically with relief of jaundice (Fig 3), although we had to change it for a shorter stent one week later to improve drainage. He was discharged after another week and succumbed to his lung malignancy three months later.

Fig 3
ERCP showing malignant obstruction of the distal common bile duct. A biliary stent is being pushed into position over a guide wire. Note the dilated common bile duct above the obstruction (arrowed).



Two other male patients, CPY aged 55 and GCK aged 84, presented with jaundice due to malignant obstruction of the common bile duct. CPY had metastatic lymphadenopathy from bronchogenic carcinoma while GCK had carcinoma of the gall bladder. Definitive surgery was clearly inappropriate for CPY. GCK also had cholangitis and was considered too frail for laparotomy. A biliary drainage stent was successfully inserted for CPY but cholangitis due to stent blockage occurred after 10 days, necessitating percutaneous drainage. He later died from his bronchogenic carcinoma. Duodenal deformity due to the gall bladder tumour prevented the use of a large diameter duodenoscope necessary for stent insertion in GCK. We therefore inserted a nasobiliary drain which gave useful palliation of the jaundice and pruritis (Fig. 4). The patient subsequently died of liver failure.

Fig 4
Nasobiliary drain for malignant obstruction (arrowed) near the porta hepatitis.

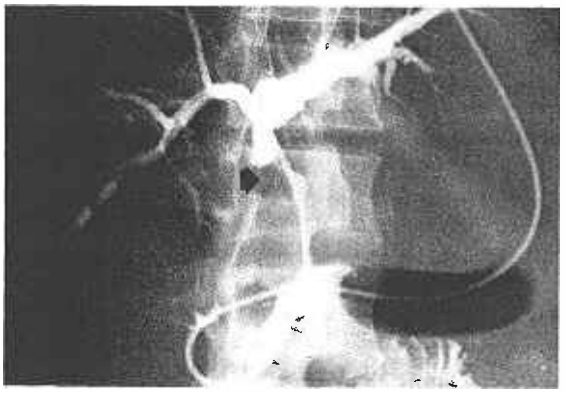


Fig 5a
Common bile duct obstruction by carcinoma of head of pancreas (arrowed).

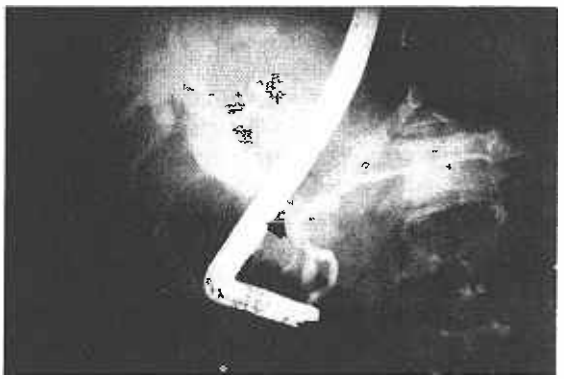
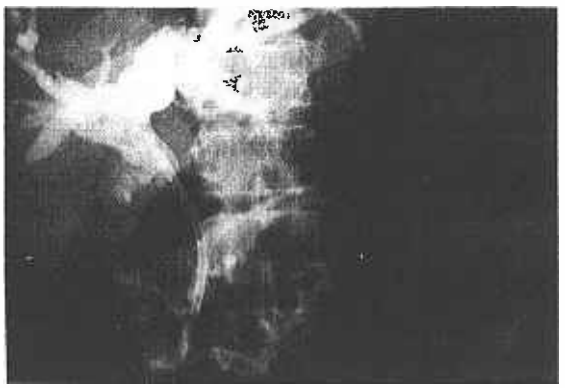


Fig 5b
Drainage in the same patient secured by a biliary stent.



A 42 year old man (QCK) was admitted because of progressive painless jaundice of five days duration. He had a palpable gall bladder with stigmata of liver insufficiency. Obstructive jaundice was revealed by liver biochemistry. An ultrasound examination as well as computed tomography demonstrated carcinoma of the head of the pancreas with dilatation of the gall bladder, intrahepatic and extrahepatic ducts. ERCP delineated the obstructed segment of the common bile duct (Fig 5), and a biliary stent was inserted for drainage with subsequent improvement of cholestasis. Laparatomy and cholecystojejunostomy was performed four weeks after initial presentation.

DISCUSSION

The above patients illustrate the value of endoscopic biliary drainage using nasobiliary drains or endoprostheses. These are relatively minor procedures performed under sedation with intravenous diazepam. Using a side-viewing duodenoscope, a teflon catheter with a guide wire is inserted into the common bile duct through the stricture under fluoroscopic guidance. A pusher tube is used to manoeuvre the stent over the catheter and into the bile duct until its proximal tip lies above the stricture (Fig. 3). The catheter, wire and pusher tube are then removed leaving the distal end of the stent free in the duodenum.

For insertion of a nasobiliary drain, the bile duct is cannulated with a catheter/guide wire assembly and this is manoeuvred through the stricture. The catheter is then removed and the nasobiliary drain passed over the guide wire. With the drain in position the guide wire is removed and the endoscope slowly withdrawn. One end of the drainage tube is preshaped into an alpha-loop to keep the drain in position (Fig. 1).

Endoscopic cholangiography has added a new dimension to the treatment of acute cholangitis. Traditionally this condition was treated by emergency surgery and incurred a significant mortality rate. ERCP in this setting can be diagnostic and therapeutic (1). In some patients with common bile duct stones immediate endoscopic sphincterotomy and stone removal may be appropriate and may indeed be the definitive treatment especially if cholecystectomy had previously been performed. Failure to clear the bile duct of stones renders a patient at risk from recurrent cholangitis and pancreatitis(2), but this can be overcome by the use of a nasobiliary drain. If the stones are too large to be extracted by the endoscopic route, insertion of a nasobiliary tube allows drainage of the bile. When the cholangitis settles, subsequent surgical therapy may then be performed in an elective setting.

A permanent indwelling stent was used in the 69 year old lady with huge common bile duct stones and bile duct stricture as she was considered unfit for surgery. In this situation, the stent splints the duct and allows bile to flow round the stones(3).

In the context of malignant biliary obstruction endoscopic drainage is useful in two situations : in patients who are poor surgical risks and in those with extensive malignancy where curative surgery is precluded. Endoscopic drainage allows palliation of distressing pruritis and improves the quality of remaining life. The alternative of surgical biliary-enteric bypass is a major procedure(4). Hospital stay following major surgery means that these patients have to spend a significant proportion of their remaining lives in hospital.

Two potential problems can occur with endoscopic drainage as the definitive treatment of malignant jaundice. The first is that of stent blockage which will result in recurrent jaundice and cholangitis. This complication is less common with the larger 10 French stents, now available, when compared to 7 French stents used when only small diameter duodenoscopes were in use. The second potential problem is that of intestinal obstruction by tumour, a problem which would be preventable at open surgery by a gastroenterostomy. Prospective studies, however, indicate that this complication is uncommon when duodenal obstruction was not already present at the time of stent insertion(5).

Compared to an endoprosthesis the nasobiliary drain has two disadvantages. The tube gives pharyngeal discomfort and the patient has to have a bag attached permanently. Also the patients' bile is unavailable for digestive and other functions. The nasobiliary drain however allows for easy accessibility to the biliary system for repeat cholangiographic studies should extracorporeal shock wave lithotripsy be considered. In some centres solvents are infused for stone dissolution through these drains(6).

Percutaneous transhepatic biliary drainage was popular in the sixties. Unlike the endoscopic approach, however, there is the risk of haemorrhage and leakage of bile. A percutaneous drain is also more likely to be dislodged than a nasobiliary drain or an endoprosthesis.

Percutaneous transhepatic insertion of an endoprosthesis for biliary drainage has been described recently but the risk of haemorrhage is real and may be severe enough to require intervention by radiological embolisation or by surgery. Bile leakage is another potential complication. Further, a blocked stent cannot be readily changed via this route in contrast to a blocked endoscopic endoprosthesis.

In some patients endoscopic drainage may be difficult or impossible for technical reasons, e.g. after biliary diversion surgery or when there is total malignant obstruction of the biliary tree. A combined transhepatic - endoscopic approach has been described in which a guide wire is inserted by the percutaneous transhepatic route to emerge through the papilla. The endoscopist can then rail-road his drainage tube in a retrograde fashion up this guide wire (7).

Endoscopic biliary drainage is a useful adjunct in the management of obstructive jaundice and we anticipate that it will become increasingly used in Singapore over the next few years.

REFERENCES

1. Sommerville JA. Biliary obstruction is best managed by endoscopists. Gut 1988; 29: 741-5.
2. Neoptolemos JP, Davidson BR, Shaw DE, Lloyd D, Carr Locke DL, Fossard DP. Study of common bile duct exploration and endoscopic sphincterotomy in a consecutive series of 438 patients. Br J Surg 1987; 74: 916-21.
3. Cairns SR, Dias L, Cotton PB, Salmon PR, Russell RCG. Additional Endoscopic procedures instead of urgent surgery for retained common bile duct stones. Gut 1980; 30: 535-40.
4. Bornman PC, Harries-Jones EP, Tobias, R, Van Steigmann G, Terblanche J. Prospective controlled trial of transhepatic biliary endoprosthesis versus bypass surgery for incurable carcinoma of head of pancreas. Lancet 1986; i: 69-71.
5. Speer AG, Cotton PB, Russell RCG et al. Randomised trial of endoscopic versus percutaneous stent insertion in malignant obstructive jaundice. Lancet 1987; ii: 57-62.
6. Murray WR, Laferla G, Fullarton GM. Choledocholithiasis - in viro stone dissolution using methyl tertiary butyl ether (MTBE). Gut 1988; 29: 143-5.
7. Passi RB, Rankin RN. The transhepatic approach to a failed endoscopic sphincterotomy. Gastrointest Endosc 1986; 32: 221-5.