

Early postoperative endoscopic sphincterotomy for retained biliary stones

KENNETH I BICKERSTAFF ChM FRCSEd

Senior Surgical Registrar

ALAN R BERRY ChM FRCS

Senior Surgical Registrar

John Radcliffe Hospital, Oxford

ROGER W CHAPMAN MD MRCP

Consultant Gastroenterologist

JULIAN BRITTON MS FRCS

Consultant Surgeon

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Summary

Endoscopic sphincterotomy was attempted on 18 patients with retained biliary stones. Endoscopy was performed within 2 weeks of the operation in 13 patients and within 3 weeks in 5 patients. A T-tube was present in 14 patients and 6 patients had multiple stones. Sphincterotomy and complete duct clearance was achieved in 17 patients (94%) and a complication (haemorrhage) occurred in one patient (6%).

Introduction

Despite the widespread use of peroperative cholangiography and the increasing use of choledochoscopy, retained stones occur in 4–9% (1,2) of patients who have undergone an exploration of the common bile duct. Retained stones frequently cause obstructive jaundice, cholangitis or pancreatitis and their early removal is usually recommended. Although endoscopic sphincterotomy is now well established in the management of common bile duct stones (3), there has been a reluctance to use the technique in the early postoperative period. Encouraging results have been reported from small series, but doubts remain about both the effectiveness and safety of the procedure.

We report our experience of early postoperative endoscopic sphincterotomy in 18 patients with retained biliary stones. Our results indicate that the procedure is highly effective and relatively safe, and allows stones to be removed during the same admission.

Patients and methods

From March 1983 to September 1987, endoscopic sphincterotomy was attempted during the early postoperative period in 18 patients with retained biliary stones. There were 11 females and 7 males with an age range of 22 to 84 years. All patients had undergone a cholecystectomy. In 14 patients a peroperative cholangiogram had revealed bile duct stones and a supraduodenal choledochotomy had been performed and a T-tube in-

serted. In one patient a common bile duct stone was detected by a peroperative cholangiogram but choledochotomy was not performed because of operative difficulties. Peroperative cholangiography or choledochotomy had not been performed in the remaining three patients; two of these patients developed biliary fistulae from the cystic duct stump, and the third experienced severe postoperative pain.

Endoscopic sphincterotomy was attempted within 2 weeks of operation in 13 patients, and within 3 weeks of operation in five patients. The shortest interval between surgery and sphincterotomy was 5 days. The size of the stones ranged from 2 to 12 mm in diameter (mean 6 mm), and six patients had more than one retained stone. In 14 patients at least one of the stones was situated above the entry point of the T-tube.

Endoscopic sphincterotomy was performed using an Olympus JF-1T® duodenoscope and Classen-Demling sphincterotome. A Dormia® basket or a balloon catheter was used to extract the stones. Removal of the stones was confirmed by T-tube cholangiography or, in the absence of a T-tube, by retrograde cholangiography.

Results

Endoscopic sphincterotomy and the removal of the retained stones was achieved in 17 of the 18 patients. All stones were extracted immediately after the sphincterotomy and T-tube irrigation was not required. The stones of 12 patients were extracted whilst the T-tube was in place. In one patient with a stone situated above the T-tube extraction was only possible after removal of the T-tube. The biliary fistulae resolved immediately after the removal of the stone.

Sphincterotomy could not be performed in one patient because of the impaction of the stone in the ampulla of Vater. The stone could not be removed but a later T-tube cholangiogram showed that it had passed spontaneously. Endoscopic sphincterotomy was performed without any mortality but was complicated by a haemorrhage in one patient. This patient was treated successfully by blood transfusion and a laparotomy

was not required. No delayed complication of the sphincterotomy has occurred.

Discussion

Although experience with early postoperative endoscopic sphincterotomy for retained biliary stones is limited, all published studies (4-7) have reported a high incidence of success (95-100%). We found endoscopic sphincterotomy in the early postoperative period to be no more difficult than at any other time and the complete removal of stones was achieved in 17 of the 18 patients (94%). The use of early postoperative endoscopic sphincterotomy has been reported in a total of 154 patients (including the present series), with complete duct clearance being achieved in 147 patients; a collective success rate of 95%. After sphincterotomy the stones can be flushed from the common bile duct by T-tube irrigation or extracted using a basket or balloon catheter. T-tube irrigation is successful in 50-100% of patients (4,6) but prolonged irrigation may be necessary and if unsuccessful an instrumental extraction will be required at a later date. These disadvantages can be avoided by the immediate extraction of stones. In the present study the immediate extraction of stones was achieved in all patients on whom a sphincterotomy had been performed, but in a previous study (7) immediate extraction was possible in only 50% of patients. In our experience the presence of the T-tube did make extraction of the stones more difficult than usual. Particular difficulty was experienced with stones lodged above the T-tube because the basket tended to pass along the T-tube tract rather than into the common hepatic duct. A potentially serious complication, haemorrhage, occurred in one of our patients but the collective experience of early postoperative endoscopic sphincterotomy indicates that the technique is relatively safe. A serious complication has arisen in only five of the 154 reported cases (3%) and no deaths have occurred (4-7).

The effectiveness and safety of early endoscopic sphincterotomy compare favourably with those of other non-operative methods of removing retained stones. T-tube irrigation with saline is a safe procedure but is only successful in approximately 50% of patients (8). Mono-octanoin is one of the most effective cholesterol solvents, but in the largest study of the agent complete duct clearance was achieved in only 34% of patients and the incidence of serious complications was 5% (9).

Percutaneous extraction of stones via the T-tube tract is a more efficient technique with reported success rates of 79-95% (10,11). Complications occur in 5% of patients (12) and a few deaths following the procedure have been reported (11,13). The procedure is only

applicable to patients with a suitably placed T-tube of adequate calibre, and requires a delay of 6 weeks for maturation of the T-tube tract.

The initial experience of early postoperative endoscopic sphincterotomy indicates that it is a highly effective technique with an acceptable incidence of morbidity. It is applicable to virtually all patients, and allows the stones to be removed during the same admission with little or no delay in discharge. Furthermore, endoscopic extraction is likely to be safer than persistent attempts at operative extraction when the anatomy is unclear or obscured by inflammation. As in one patient in our series it is probably safer to close the abdomen and later to remove the stones endoscopically.

References

- 1 Glen F. Retained calculi within the biliary ductal system. *Ann Surg* 1974;179:528-39.
- 2 Feliciano DV, Mattox KL, Jordan GL. The value of choledochoscopy in explorations of the common bile duct. *Ann Surg* 1980;191:649-53.
- 3 Cotton PB. Endoscopic management of bile duct stones (apples and oranges). *Gut* 1984;25:587-97.
- 4 Soehendra N, Kempeneers I, Erchfuss HP, Reynders-Frederix V. Early post-operative endoscopy after biliary surgery. *Endoscopy* 1981;13:113-17.
- 5 Ghazi A, Beaton HL. Early endoscopic sphincterotomy for extraction of residual stones of the common bile duct. *Surg Gynecol Obstet* 1984;159:45-6.
- 6 Simpson CJ, Gray GR, Gillespie G. Early endoscopic sphincterotomy for retained common bile duct stones. *J R Coll Surg Edinb* 1985;30:288-9.
- 7 O'Doherty DP, Neoptolemos JP, Carr-Lock DL. Endoscopic sphincterotomy for retained common bile duct stones in patients with T-tube *in situ* in the early post-operative period. *Br J Surg* 1986;73:454-6.
- 8 Motson RW. Dissolution of common bile duct stones. *Br J Surg* 1981;68:203-8.
- 9 Palmer KR, Hofman AF. Intraductal mono-octanoin for direct dissolution of bile duct stones: experience of 343 patients. *Gut* 1986;27:196-202.
- 10 Burhenne HJ. Percutaneous extraction of retained biliary tract stones: 661 patients. *Am J Radiol* 1980;134:888-98.
- 11 Irwin ST, McIlrath EM, Kennedy TL. Burhenne technique for extraction of retained biliary calculi. *J R Coll Surg Edinb* 1985;30:39-42.
- 12 Burhenne HJ. Complications of non-operative extraction of retained common duct stones. *Am J Surg* 1976;131:260-2.
- 13 Polack EP, Fainsinger MH, Bonnanon SV. A death following complication of roentgenological non-operative manipulation of common bile duct calculi. *Radiology* 1977;123:585-6.

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