

# Early postoperative endoscopic sphincterotomy for retained common duct stones

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## Summary

*The results of endoscopic sphincterotomy in 30 patients with retained common bile duct stones and a T-tube in situ following surgical exploration of the common bile duct are presented. Successful stone extraction was achieved in 27 cases (90%). There was one death, which was not procedure related. Early postoperative T-tube cholangiography is advocated and if necessary sphincterotomy can be safely performed 1 week following surgery. This approach has advantages in shortening hospital stay and minimising patient discomfort.*

## Introduction

The problem of retained common bile duct (CBD) calculi after bile duct exploration is, unfortunately, relatively common. When a T-tube is in position, early T-tube cholangiography will determine the presence of retained CBD calculi. If the stone lies in the lower duct then flushing through the T-tube can be attempted (1,2), but the reported success rate is very variable and it is less effective with large stones (3). Percutaneous extraction via the T-tube tract, popularised by Burhenne (4) has the disadvantage that extraction attempts cannot be made for at least 4 weeks following surgery.

Endoscopic sphincterotomy has found increasing favour as the procedure of choice for the removal of CBD calculi (5,6). We have previously published data on our initial experience with endoscopic sphincterotomy in patients with CBD calculi (7) and this paper records our more recent experience with 30 patients who had retained calculi demonstrated on T-tube cholangiography following CBD exploration.

## Patients and methods

Over a 4-year period ending December 1988, 30 patients

with retained CBD calculi and a T-tube *in situ* following recent cholecystectomy and common bile duct exploration were referred for endoscopic sphincterotomy. There were ten males aged 35–87 years (mean 58.8 years), and 20 females aged 20–80 years (mean 55.4 years). Endoscopic sphincterotomy was performed using a side viewing endoscope and a balloon catheter was used to remove calculi. Antibiotics were not used routinely but were given to those patients in whom stone extraction was unsuccessful.

Success was established by radiological demonstration of duct clearance on subsequent T-tube cholangiography. The time from initial surgery to successful calculus extraction ranged from 7 to 28 days (mean 16 days). Eighteen patients had successful sphincterotomies performed within 14 days of surgery, and the majority of patients endoscoped after this time were referred from other institutions.

## Results

The procedure was successful in 27 cases (90%), although one patient required two attempts, and in one case stone removal was combined with a saline flush through the T-tube. Of the three failures, two patients had large stones situated above the upper limb of the T-tube and were subsequently removed at surgical exploration of the common duct, and one patient, a male in multiple organ failure before emergency surgery for obstructive jaundice, died 4 days after a failed endoscopic sphincterotomy. This death was not directly related to the endoscopic procedure, and there was no significant procedure-related morbidity in the other cases.

## Discussion

Despite the common use of operative cholangiography and operative choledochoscopy after common duct exploration, the retained common duct calculus remains a

worrying problem. It is acknowledged that complete clearance of duct calculi can be extremely difficult if not impossible in some cases, and choledochoduodenostomy remains a time-honoured and effective way of treating elderly patients in whom the surgeon suspects retained common duct stones at the time of surgery.

When the postoperative T-tube cholangiogram reveals a retained calculus, there are basically four treatment options: flushing through the T-tube, percutaneous extraction, endoscopic extraction and further surgery. In most centres surgical extraction is now reserved for cases where the other options have failed or are not available, as it is accepted that second or third operations on the biliary tree have a higher morbidity and mortality than the original operation, and may be technically very difficult.

An attempt may be made to flush out the stone and this is more likely to be successful if the stone is situated in the distal duct. The passage of proximally sited stones is likely to be prevented by the T-tube, except in very large ducts. Saline flushing may be used in combination with a sphincter of Oddi relaxant (3), but the technique is generally only successful if the stones are small. Stone dissolution may be tried with a stone solvent infused down the T-tube. Mono-octanoin is probably the agent of choice, but it can have troublesome gastrointestinal side-effects.

Percutaneous extraction via the T-tube tract is an accepted technique (4). It is associated with minimal morbidity and mortality and has a high success rate in experienced hands (8,9). There is, however, a significant disadvantage. The T-tube must be left *in situ* for 6 weeks to allow the tract to mature, and this may prove to be a major inconvenience to the patient. In addition, even after a period of 6 weeks the T-tube tract may fail to develop (10).

Endoscopic sphincterotomy is probably the most widely used technique for stone extraction. The success rate is comparable to that of percutaneous extraction, but it has a slightly higher morbidity from cholangitis, pancreatitis or bleeding. It has a definite advantage in that it can be performed soon after surgery, and we now advocate that the postoperative T-tube cholangiogram is arranged for the 4th or 5th postoperative day. By this time the patient is usually well recovered from surgery, and this allows endoscopic sphincterotomy to be performed on the 7th or 8th day should it be necessary. Following successful extraction, the T-tube can be removed on the 10th day, by which time the chances of problems following removal are greatly diminished.

O'Doherty *et al.* (6) reported a 95% success rate for endoscopic sphincterotomy in a series of 34 patients with retained stones, 27 sphincterotomies being performed within 4 weeks of surgery. Lambert *et al.* (11) report an 86% success rate of endoscopic extraction after sphincterotomy in a series of 73 patients, but the procedure was not performed within 2 weeks of surgery and the mean interval was 39 days. Their complication rate was also high at 19%, haemorrhage being the most frequent problem. Bickerstaff *et al.* (12) in a smaller but similar series to our own, achieved complete duct clearance in 94% of cases. In the present series the average time

between surgery and sphincterotomy was 16 days (range 7–28 days), the longer delays being in patients referred from other institutions. We found no advantage in prolonging the procedure beyond 1 week after surgery.

Our earlier experience with endoscopic sphincterotomy had a success rate of 80% in the group with retained stones. The present series shows a modest improvement (90%), and there were no significant complications of the procedure. The three failures were with large stones and the single death was in a malnourished male with Crohn's disease and was not procedure related. Stones situated above the T-tube can be particularly difficult to remove and we failed with two patients who had large stones in this position. Smaller stones, however, have been removed successfully.

Ultimately, the method used to remove retained common bile duct calculi will depend upon the expertise available locally. The results of extraction by endoscopic or percutaneous techniques are broadly comparable in experienced hands, but we believe that endoscopic extraction is a safe, successful method, which has the distinct advantage that it can be performed early in the postoperative period during the same hospital admission.

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