Outcome of surgery for failed endoscopic extraction of common bile duct stones in elderly patients

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Endoscopic sphincterotomy (ES) is the treatment of choice for common bile duct stones in elderly patients. For those in whom endoscopic clearance of the common bile duct fails the treatment options include stenting, dissolution therapy and lithotripsy. Surgery is often avoided because of the reported high morbidity and mortality in elderly patients. We have reviewed the outcome of patients referred for surgery after failed endoscopic clearance of common bile duct stones.

Over a 3-year period, 100 patients with common bile duct stones were referred specifically for endoscopic clearance of the common bile duct (median age 69 years, range 19–97 years). In seven patients duct clearance was possible without ES and in five patients ES was considered inappropriate. ES was attempted in 88 patients and was successful in 75 (85%). Of the 13 patients failing ES or stone removal, surgery was performed in nine and four were stented. Of patients having successful ES (n=75), ten were referred for surgery because of incomplete duct clearance.

Surgery was performed to obtain duct clearance in 19 patients (eight male, 11 female, median age 77 years, range 47–90 years). Of the 19, eight had previously undergone a cholecystectomy (42%) and 17 of the 19 had biliary tract drainage preoperatively (90%). The procedures performed consisted of choledocholithotomy in all plus cholecystectomy (11), choledochoduodenostomy (7) and choledochojejunostomy (7). There were no deaths and only one major complication. The median total inpatient stay was 26 days (range 14–75 days) and the median postoperative stay was 12 days (range 7–50 days). We would conclude that open surgery can be performed safely and effectively in elderly patients with retained bile duct stones.

The advantage of endoscopic removal of common bile duct (CBD) stones over open surgery was initially realised in elderly patients presenting acutely with jaundice or cholangitis (1,2). Until recently, younger patients with residual gallbladder stones were often referred for open surgery because of possible long-term risks of endoscopic sphincterotomy (ES) (3,4) and the chance of developing symptomatic gallbladder stones (5). Since the widespread adoption of laparoscopic cholecystectomy, however, ES has become the standard treatment of ductal stones, thereby avoiding open surgery (6,7).

Endoscopic sphincterotomy is possible in over 90% of patients with ductal stones, although the success rate of duct clearance is considerably lower (8,9). Failed ES is usually due to anatomical reasons such as periampullary diverticulae, whereas duct clearance rates are directly correlated with the size of the CBD stones (10,11). The ideal management of patients with retained CBD stones has not been established. Options range from mechanical.
(12), laser (13) or ultrasonic lithotripsy (14) to nasobiliary dissolution therapy (15) or endoprosthesis insertion (16).

The role of surgery for retained common bile duct stones is controversial. Although a high mortality for bile duct exploration has been reported from some centres (17,18), others have reported results which are comparable to an endoscopic approach (19). The importance of medical risk factors to outcome have been demonstrated in retrospective studies (20).

We have analysed the outcome of patients referred for surgery because of a failed endoscopic clearance of CBD stones.

Patients

Over a 3-year period 100 patients were referred to the Hepatobiliary Unit for endoscopic removal of common bile duct stones (median age 69 years, range 19–97 years). In seven patients, duct clearance was possible without ES and in five patients ES was considered inappropriate (acute cholecystitis (2), stone > 30 mm (1), multiple packed stones (1), Mirizzi syndrome (1)). ES was attempted in 88 patients, and was successful in 75 (85%). Nineteen patients were referred for surgery after failed ES (n = 9) or failed duct clearance after a successful sphincterotomy (n = 10) (Fig. 1). Four patients had stents inserted after failure of ES; their ages ranged from 78 to 97 years and they were considered unfit for surgery.

Of the nine patients referred for surgery after failed ES, this had been attempted on one occasion in eight, only one patient having a second attempt. The reason for failure of ES was a duodenal diverticulum in two patients, previous partial gastrectomy in one and anatomical difficulties in six.

In those in whom ES was successful, four patients had two attempts at duct clearance, five had three attempts and one had five attempts. None of the patients in whom ES was successful but extraction failed had stones less than 10 mm in maximal transverse diameter and the majority had stones over 15 mm in diameter (Fig. 2).

Of the 19 patients referred for surgery there were 8 males and 11 females with a median age of 77 years (range 47–90 years). The presenting features of these patients was jaundice in 14 (74%), pain in 15 (79%) and acute cholangitis in 8 (42%). The majority of patients (63%) had significant associated medical problems which are listed in Table 1. Most patients underwent a period of preoperative biliary drainage (17/19, 90%) by either a nasobiliary (15) or percutaneous drain (2). Eight patients had previously undergone a cholecystectomy (42%).

Results

All 19 patients had exploration of the common bile duct with removal of the retained stones. The 11 patients with gallbladder in situ underwent a cholecystectomy. Three patients had insertion of a T-tube and two had a primary closure of the common bile duct. The majority of patients (14/19, 74%) had a biliary-enteric anastomosis (chole-

Table I. Major medical problems in patients with retained bile duct stones referred for surgery (n = 19)

<table>
<thead>
<tr>
<th>Medical problem</th>
<th>No.</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No major medical problems</td>
<td>7</td>
<td>(37%)</td>
</tr>
<tr>
<td>Septic shock, renal failure, DIC</td>
<td>2</td>
<td>(10%)</td>
</tr>
<tr>
<td>MI/IHD/BP/CCF</td>
<td>5</td>
<td>(26%)</td>
</tr>
<tr>
<td>COAD/DOE</td>
<td>3</td>
<td>(16%)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>1</td>
<td>(5%)</td>
</tr>
<tr>
<td>Severe OA</td>
<td>1</td>
<td>(5%)</td>
</tr>
</tbody>
</table>

Key

DIC Disseminated intravascular coagulopathy
MI Myocardial infarction
IHD Ischaemic heart disease
BP Hypertension
CCF Congestive cardiac failure
COAD Chronic obstructive airways disease
DOE Dyspnoea on exertion
OA Osteoarthritis
dochoduodenostomy in seven, choledochojejunostomy Roux-en-Y in seven). There were no significant intraoperative complications.

There were two postoperative complications. One patient was found to have a retained stone on postoperative T-tube cholangiogram which was removed successfully by a further ES. A second patient in whom a perforated gangrenous gallbladder was found in addition to choledocholithiasis at the time of surgery developed a subhepatic abscess which was drained surgically. This was the only patient considered to have a potentially life-threatening complication. There were no deaths.

The median inpatient stay was 26 days (range 14–75 days) and the median postoperative stay was 12 days (range 7–50 days). The longest inpatient stay was due to the social rehabilitation of a 90-year-old patient.

Of the four patients in whom a stent was inserted after failed ES, three had further biliary tract problems at 1, 11 and 29 months after insertion (acute cholangitis \(n = 1\), stent displacement \(n = 1\) and stent occlusion \(n = 1\)). All three were successfully managed endoscopically.

**Discussion**

This study would suggest that open surgery can be performed both safely and effectively in elderly patients in whom an endoscopic attempt has failed to remove bile duct stones. These results are similar but perhaps even more encouraging than those of Lavelle-Jones et al. (21), who reported on 65 patients undergoing surgery over a 12-year period after failed ES. There was a mortality of only 3% but a major complication rate of 13.5%.

Although the surgical experience reported in this series included only 19 patients, this represented all surgical referrals over a 3-year period in a regional referral centre for hepatobiliary problems and reflects the fact that the majority of CBD stones are removed endoscopically. The incidence of patients undergoing surgery for retained CBD stones in this series (19%) is higher than that reported from some other centres (Vaira et al., 3.5% (9), Neoptolomos et al., 10.5% (1)). This may reflect our policy over the study period of obtaining duct clearance at initial hospital admission in preference to insertion of a biliary stent with ERCP review after a period of biliary drainage (9).

Surgery resulted in duct clearance in 95% of patients, one patient having a residual CBD stone discovered on postoperative T-tube cholangiography. This complication may have been avoided by the routine use of choledochoscopy (22). The clearance rates are significantly better than those recently reported for extracorporeal or laser lithotripsy or with nasobiliary dissolution therapy (13–15).

A mechanical lithotriptor may have reduced the number of patients requiring surgery, but the reported clearance rates with mechanical lithotriptors vary widely from 25% to 100% (12,23,24), and a satisfactory instrument was not available during the period of this study.

The only other complication was one patient who developed a subhepatic abscess in the postoperative period which required open surgical drainage. This patient was found, unexpectedly, to have a perforated gangrenous gallbladder at the time of operation and would not, therefore, have been a candidate for alternative therapy.

Although surgery is clearly more effective in dealing with retained ductal stones than its alternatives, it is generally considered to be associated with a higher morbidity and mortality. Many of the published surgical series, however, were reported before endoscopic procedures were widely available (17,18). The majority of patients in this series had preoperative sphincterotomy drainage and this may be an important factor in reducing morbidity and mortality in seriously ill patients, particularly those with acute cholangitis (25–27). Two of the patients in this series, for example, presented in septicemic shock with acute renal failure and disseminated intravascular coagulopathy, and a high percentage had presented with acute cholangitis (42%). The mortality of biliary tract surgery for common bile duct stones has previously been shown to rise markedly in the presence of acute cholangitis, the operative mortality rate without cholangitis being 1.2% compared with 11.9% in patients with cholangitis (26). The absence of mortality in the present series may well be related to the successful treatment of preoperative sepsis by antibiotics plus nasobiliary or percutaneous drainage.

In addition to effectiveness of treatment and the associated morbidity and mortality, consideration must also be given to the cost of treatment. The major cost of treatment in the present series would be the inpatient stay, which was a median of 26 days. Half of the stay was preoperative, involving attempts at stone removal and optimising the condition of the patient. An improved ability to select patients whose stones are unlikely to be removed endoscopically would reduce this inpatient stay significantly. Stone size is well documented as an important factor (10,11) and others need to be established. The hospital stay must be compared with that required for dissolution therapy, which often takes 1–2 weeks and leaves many patients requiring additional treatment (28), or the capital costs involved in establishing extracorporeal or laser lithotripsy for a small number of patients. Endobiliary stenting is, perhaps, a more cost-effective method of managing patients with retained CBD stones with either a further admission for attempted endoscopic duct clearance or leaving the endoprosthesis in situ (9,16,29).

We would conclude from this study that open surgery can be carried out safely and effectively in elderly patients in whom endoscopic stone removal has failed. Alternative forms of endoscopic treatment are required for this patient group and the results and costs of these may be compared critically with those achieved in this surgical series.

**References**


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