RETAINED STONES IN THE COMMON BILE DUCT: RESULTS OF MANAGEMENT

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ABSTRACT
Seventeen patients underwent treatment for retained common bile duct stones. In 7 patients the stones were removed via 0 1-tube tract using steerable catheters while 5 patients underwent ERCP and sphincterotomy and 5 underwent surgical re-exploration. Considering morbidity, mortality, success rate and patients’ stay in the hospital, non-operative modalities should be the treatment of choice for retained common bile duct stones (JPMA 43:90, 1993).

INTRODUCTION
Despite routine per-operative cholangiography and choledoscopy during bile duct exploration, retained stones in the common bile duct following cholecystectomy continues to be a problem. The incidence of retained stones is not uncommon and occurs in 4-10% of patients. Retained stones are discovered on post-operative T-tube cholangiograms or the patient may present with cholangitis and obstructive jaundice later. Small stones may pass spontaneously but some need active intervention. Many options are available and include surgical re-exploration, ERCP and sphincterotomy, extraction through the T-tube tract using steerable catheters or flexible choledoscope/nephroscope, chemical dissolution and percutaneous or extracorporeal lithotripsy.

PATIENTS AND METHOD
At the Aga Khan University Hospital all patients undergoing cholecystectomy have operative cholangiograms, if abnormal, the common bile duct is explored through a supra-duodenal choledochotomy and choledoscopy is done using a rigid scope. Stones are removed by saline irrigation under pressure, Desjardins forceps, Fogarty biliary balloon catheters, Dormia baskets or by the stone grabbing forceps mounted on the rigid scope. The common bile duct is closed over a large size T-tube (14F or more). A postoperative T-tube cholangiogram is performed on the seventh to tenth day. Non-operative modalities available for removal of retained stones at our hospital include extraction via the T-tube tract using steerable catheters and ERCP/sphincterotomy.

RESULTS
In a retrospective study of 422 cholecystectomies, the common bile duct was explored in 66 patients (15%), there were 10 (2.3%) negative CBD explorations, retained stones on postoperative T-tube cholangiogram were detected in 4 patients and 2 patients presented with obstructive jaundice. In these 2 patients stones were missed on operative cholangiogram. The incidence of retained stones being 1.4% (6 patients). Overall 17 patients underwent treatment for retained stones (11 patients were outside referrals). Five patients were treated by surgical re-exploration, 7 patients had a T-tube in situ and these
were treated by extraction via T-tube tract and 5 were treated by ERCP/sphincterotomy. Various modalities of treatment have been compared with regard to cost, hospital stay, morbidity, mortality and success, as shown in the Table.

**TABLE. Various modalities of treatment.**

<table>
<thead>
<tr>
<th></th>
<th>T-tube ext.</th>
<th>ERCP/Sphinct.</th>
<th>Surgical expl.</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>7</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Success rate</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Morbidity</td>
<td>1 (fever)</td>
<td>1 (pancreatitis)</td>
<td>0</td>
</tr>
<tr>
<td>Patient stay</td>
<td>Day care</td>
<td>5 days</td>
<td>12 days</td>
</tr>
<tr>
<td>Cost*</td>
<td>Rs.2,500</td>
<td>Rs.14,000</td>
<td>Rs.18,000</td>
</tr>
</tbody>
</table>

*Figures in 1989.

**DISCUSSION**

Retained stones in the common bile duct can be removed if the T-tube is in situ, by saline or heparinized saline flushed down the T-tube. This method is indicated if the stones are small and distal to the T-tube and the sphincter of Oddi is relaxed with glycerol trinitrate or glucagon. The method may be effective in 50% of the selected patients. Stones can also be dissolved using agents such as mono-octanion or methyl tertiary butyl alcohol. This chemical dissolution therapy has given variable results. Extraction of stones via the T-tube tract using steerable catheters is claimed to be the procedure of choice in a selected group of patients who have a T-tube in place. This procedure is done as a day case in the radiology department after the T-tube has been in place for 4 weeks or more and the tract has matured. No fasting or premedication are necessary. It is recommended that a size of 14F or a larger T-tube be used at surgery, as it makes subsequent extraction easier due to the large diameter of the tract. The overall success rate of this procedure is reported to be 95%; no mortality was reported in a series of 661 patients, morbidity amounted to 5%. ERCP/sphincterotomy is the other modality which is becoming the treatment of choice for removing retained CBD stones. Safrany reported a morbidity of 6 to 8% and mortality of 1 to 2% in a large series. Surgical re-exploration has been reported to carry a mortality of about 2 to 3%. Mortality and morbidity increase with age and the poor general health of patients, mainly in the form of sepsis and retained stones. Various options are available to treat patients with retained common bile duct stones. Management of an individual patient depends upon the expertise and facilities available, the age and general health of the patient, size of retained stones and whether a T-tube is in place. In a selected group of patients, extraction via the T-tube tract is a safe and cost-effective method. ERCP/sphincterotomy is also a valuable method of treatment, however, it should be avoided in patients who have had recent surgery and a T-tube is in situ. Surgical re-exploration should be avoided if these non-operative modalities are available as it has a higher morbidity and mortality, however, if the stones are large or when complications arise as a result of ERCP/sphincterotomy, it may become necessary. At Aga Khan University Hospital patients with retained common bile duct stones have been managed mainly by ERCP/sphincterotomy and extraction via the T-tube tract, surgical re-exploration has been done in special circumstances only.
REFERENCES