Endoscopic management of post-cholecystectomy complications: Experience of Endoscopic Retrograde CholangiopancreaticoGRAPHY (ERCP) at a tertiary care referral center

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ABSTRACT

Objectives
To study the the short and long term role of ERCP in management of patients with post-cholecystectomy complications.

Patients and Methods
Patients with post-cholecystectomy complications including abdominal distension, fever, and jaundice were included. All underwent ERCP followed by therapeutic intervention, as was indicated. They were followed for up to six months to assess the effectiveness of intervention, any procedure related complication and morbidity/ mortality.

Results
Total of 59 patients with female to male ratio 3.92 (47/12) were included with majority in 20-60 years age group. Jaundice, abdominal pain and abdominal distension were major symptoms. Predominant post-cholecystectomy complications included were choloedocholithiasis in 16 (27%), Biliary leak in 16 (27%), biliary stricture in 11 (19%)
patients and CBD ligation in 9 (15%) patients. Endoscopic CBD stone extraction was possible in 14/16 patients (88%) of choledocholithiasis, while sphincterotomy with or without stenting was done in 13(81%) patients with biliary leak. Dilatation and stenting was possible in 6/11 (55%) patients with biliary channel stricture while none of the 9 patients with CBD ligation was amenable to endoscopic therapy. Long-term follow-up in 25 patients revealed highly successful outcome of endoscopic therapy.

Conclusion
Retained CBD stones, biliary leaks, biliary strictures and CBD ligation were predominant post-cholecystectomy complications and ERCP was an effective mode of treatment for them with good long term outcome except for complete CBD ligation and to some extent CBD strictures. (Rawal Med J 2011;36:79-82).

Key Words
Biliary fistula, biliary stricture, ERCP, post-cholecystectomy.

INTRODUCTION
The laparoscopy has become the modality of choice for cholecystectomy. Initially the complication rate of this procedure was about 2% that was higher than conventional cholecystectomy.\(^1\) With more experience and technological improvements, this rate has now come down to 0.6%,\(^2\) but still two fold higher than that of open cholecystectomy (0.6%).\(^3\) Post-cholecystectomy complications include retained CBD stones and CBD injury (fistula, stricture and complete ligation).\(^4,5\) Reconstructive surgery is usually undertaken for the treatment of postoperative biliary strictures, usually with a hepaticojejunostomy.\(^6\) Surgical management of biliary fistulae is associated with high morbidity and mortality.\(^7\) Fistula may recur in one-third of patients and strictures may
occur in 37% to 50% of patients after reoperation.\textsuperscript{8} Percutaneous therapy in the form of percutaneous transhepatic biliary drainage (PTBD) is not only difficult in cases with non-dilated biliary passages, but may also result in significant complications.\textsuperscript{9} Biliary endoscopic procedures have become the treatment of choice for the management of post operative complications and include balloon dilatation with or without insertion of one or more stents to calibrate the zone of stricture\textsuperscript{10} as well as sphincterotomy with or without biliary diversion (stent or nasobiliary drain). Our aim was to study the presentation of patients with post-cholecystectomy complications and assess the short and long-term efficacy of ERCP in their management.

**PATIENTS AND METHODS**

Patients with cholecystectomy in last 6 months and symptoms suggestive of surgery related complications were included in this study. These were jaundice, pain right hypochondrium with or without fever, abdominal distension, high bile output from intraabdominal drains or t-tubes or pruritis with clay colored stools. All patients were completely evaluated and only patients confirmed to have cholecystectomy related complications were included in the final analysis.

Endoscopic procedures were performed with a duodenoscope (TJF 20, Olympus Optical Co., Tokyo, Japan) and prophylactic antibiotics were given intravenously before the procedure and continued post-procedure for 24-48 hours. Conscious sedation was given and after cholangiography and localization of the abnormality, therapeutic procedures like sphincterotomy, biliary dilatation, biliary stenting and nasobiliary drainage (NBD) were performed. If residual stones were seen in the common bile duct, sphincterotomy
was followed by stone extraction using basket or balloon. Biliary strictures were dilated with 5F, 9F or 11F biliary dilators or by 6 mm or 8 mm pneumatic biliary dilatation balloons. After ERCP, patients were kept under observation in a high dependency unit for 4 hours. They were either discharged at this point or kept under observation with administration of antibiotics for another 24 hours in some cases. All patients were advised to follow up in outpatient after 2 weeks and then once a month for 6 months as outpatient or via phone. On each follow up patients were questioned for improvement of symptoms and any subjective complaint. Investigations like liver function tests, ultrasound abdomen or CT scan abdomen were carried out if needed.

Main outcome measures were need for surgery, relief of symptoms, improvement in liver function tests and absence of complications on abdominal ultrasonography. Statistical analysis was performed using SPSS 11.1. Numerical variables were described as mean ± standard deviation (SD) while categorical variables were described as percentage of total patients.

RESULTS
The study had 59 patients with a female to male ratio of 3.92 (47/12). Age ranged from 20 to over 60 years. Thirty (51%) patients were referred by operating surgeons, 10 (17%) by their respective hospitals, 8 (14%) by physicians other than the operating surgeon, while 11 (19%) presented in the outpatient department of our hospital. Twenty nine (50%) patients had open cholecystectomy, 25 (41.7%) had laproscopic cholecystectomy (LC) while the rest (5 (8%)) were LC converted to open surgery. Predominant indication for ERCP was jaundice after cholecystectomy, present in 31 (52.5%) patients, followed by abdominal distension in 10 (16.94%) patients, abdominal pain along with distension in
7 (11.86%) patients, jaundice with abdominal distention in 5 (8.4%) patients, abdominal pain alone in 4 (7%) and 1 (1.7%) patient had abdominal pain along with jaundice.

Table 1. Follow up data.

<table>
<thead>
<tr>
<th>ERCP Diagnosis</th>
<th>Symptoms status at follow up</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Settled</td>
<td>Improved</td>
</tr>
<tr>
<td>Bile leak at the site of cystic duct</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>CBD ligation</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>CBD stricture</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Retained CBD stone</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Normal ERCP</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Unsuccessful ERCP</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Bile leak above the area of cystic duct</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Dilated CBD with distal obstruction</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
<td>2</td>
</tr>
</tbody>
</table>

Major findings of ERCP were biliary leakage in peritoneal cavity in 16 (27.1%) patients, retained stone in CBD in 16 (27.1%), complete CBD ligation in 9 (15.25%) and stricture of biliary channels in 11 (18.64%) patients. One patient each had cholangiocarcinoma and a periampullary growth missed at the time of surgery. Apart from 3 unsuccessful ERCPs and 2 normal cholangiograms therapeutic intervention was attempted in all patients. Biliary stents were placed in 13 (81%) patients with biliary leakage while remaining 3(19%) had surgery due to failure to pass stent across disrupted area of CBD.
Extraction of CBD stone was possible in 14 (88%) patients while remaining 2 (12%) had stent placement. Biliary dilatation and stent placement was possible in 6 (55%) of the patients with biliary channel stricture while only sphincterotomy was done in 1 (9%) patient to relieve ampullary stricture. Therapy was not possible in 4 (36%) patients and surgery was needed in them. None of the 9 patients with ligation of common bile duct was amenable to therapy on ERCP. A 6 month follow up was possible in only 24 patients. Eighteen (75%) became asymptomatic without a need for further intervention (Table 1).

**DISCUSSION**

More than half of the patients presenting with post-cholecystectomy complications had undergone open cholecystectomy. This might be explained by the fact that majority of the open surgeries are done in smaller peripheral hospitals by inadequately trained surgeons and may result in a higher complication rate. Retained CBD stone, CBD stricture, bile leakage and accidental ligation of CBD were predominant post-operative complications in our study. In a series of 119 patients 48% had residual stone in CBD, bile leakage was seen in 25%, 17% revealed CBD stricture and CBD injury was identified in another 10%. In another study of 56 patients referred for ERCP after LC, retained stones were found in 41%, 25% had CBD injuries, 11% had complete ligation of the CBD, 2% had CBD strictures and 4% had unsuspected malignancies. Our study has shown similar findings except the incidence of CBD strictures is higher. This could also be related to a delay in referral for ERCP.

Endoscopic interventions with sphincterotomy, stent placement or nasobiliary drainage heal fistulas with almost 100% success. In a series of 24 patients with bile leak, endoscopic treatment was successful in all patients. In our study, all but one patients
were treated with sphincterotomy and stent placement. The placement of stents does not appear to be particularly effective in the first instance. However the limited number of patients who could be followed prevents us from making any definite conclusions.

There is no consensus on the best strategy for management of stricture (dilatation versus stenting), the number of stents to use, or the duration of stenting. Certain authors recommend stenting for three months, others for 12 to 24 months with variable number of stents (up to three or four).\textsuperscript{17-20} Long-term success rate was 80\% after endoscopic treatment and 77\% after surgical treatment\textsuperscript{21} and 83\% for both methods.\textsuperscript{22} Success rate of 70\%\textsuperscript{23} and 100\%\textsuperscript{24} was reported in recent studies several months after stenting for biliary stricture. We were able to retrieve stones in all but 2 patients. There are several limitations of our study which include high number of patients lost to follow-up, data on the timing of ERCP, details of the strictures and their likely etiology and data on bile leak were missing. It is likely that the pattern of post-cholecystectomy complications in our population is somewhat different due to late referral for ERCP.

**CONCLUSION**

Retained CBD stones, biliary fistulas, biliary strictures and CBD ligation were predominant post-cholecystectomy complications seen in our patient population. ERCP is an effective treatment with good long term outcome for all these patients with the exception of complete CBD ligation and to some extent CBD strictures.

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Received: November 1, 2010 Accepted: April 10, 2011
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