ABSTRACT:

Background: Laparoscopic Cholecystectomy (LC) is hazardous in difficult cases due to distorted anatomy at callot’s triangle by acute or chronic cholecystitis. Laparoscopic subtotal cholecystectomy (LSC) is a feasible option in severe and complicated cholecystitis minimizing the rate of open conversion.

Objectives: To assess the feasibility of LSC without cystic duct clipping thus avoiding the potentially hazardous dissection at callot’s triangle in difficult cases.

Study design: Descriptive observational study.

Place and duration: Conducted at Ghulam Mohammad Mahar Medical College and Hira Medical center Sukkur during a period of last three years from Jan 2008 to Dec 2010.

Patients and methods: This is a prospective study included 33 patients with severe acute or chronic calculus cholecystitis and having dense adhesions at callot’s triangle. Laparoscopic subtotal cholecystectomy was done in all 33 patients without cystic duct dissection or ligation /clipping. When dissection at callot’s triangle was found difficult and hazardous and cystic duct could not be identified safely, the LSC was performed. The anterior wall of the gall bladder was incised removing all the stones and excision of the anterior wall was done leaving the posterior wall of the gall bladder. The remnant mucosa of the gall bladder was diathermized. Drain was placed in the Hartmann’s pouch and sub hepatic space. The results of all these patients and complications are analyzed.

Results: out of 33 patients, 21 patients were females and 12 were males, with male to female ratio 1:2. The median age of the patients was 48 years. The median operative time was 90 minutes and median duration of hospital stay was 03 days. The indications for LSC were severe fibrosis with difficult dissection at callot’s triangle in 19 patients, inflammatory mass with distorted anatomy at callot’s triangle in 12 patients and gangrenous gall bladder in 02 patients. Temporary postoperative bile leak was found in 04 (12.12%) patients which resolved spontaneously after 7-10 days. Three patients required endoscopic retrograde cholangiopancreatography (ERCP) post operatively with extraction of retained bile duct stones and stent insertion for persistent biliary leaks. One patient required laparotomy for biliary peritonitis and subphrenic collection. No mortality was seen in the study. No complications were associated with ablated gall bladder mucosa.

Conclusion: LSC without cystic duct clipping or ligation is an alternative to open conversion in difficult cases to avoid hazardous dissection at callot’s triangle. Bile leaks are predictable and readily managed.

Key words: Laparoscopic subtotal cholecystectomy, without cystic duct clipping, bile leakage.

INTRODUCTION:

Laparoscopic cholecystectomy (LC) is the ‘gold standard’ treatment for benign gall bladder diseases specially gall stones. In early 1990s, acute cholecystitis was considered...
as comparative contraindication for laparoscopic cholecystectomy. With growing experience and expertise in the field of laparoscopy, LC is now routinely performed in patients with acute cholecystitis. During standard cholecystectomy there is an increased risk of bleeding and bile duct injury by dissection at Callot’s triangle particularly in the presence of severe inflammation or fibrosis of the gall bladder . Whichever approach is used, standard cholecystectomy requires safe dissection at Callot’s triangle. This is rendered difficult in the presence of acute or chronic inflammation, dense omental adhesions or gangrenous gall bladder, with associated higher rates of bile duct injury and difficult LC may leads to open conversion . In addition, a dissection that is difficult laparoscopically is often equally difficult at open operation and open conversion does not guarantee the avoidance of inadvertent biliary or vascular injury. Laparoscopic subtotal cholecystectomy (LSC) has been reported as a safe and feasible alternative to open conversion in difficult cases . In recent years, few studies with few cases of LSC have reported good results in patients with dense inflammatory adhesions in callot’s triangle . However its feasibility, indications, benefits and technical characteristics are less well documented. This study was designed to describe our experience and to evaluate the results of LSC without cystic duct clipping or ligation in severe cholecystitis with difficult dissection at callot’s triangle . The safety of this approach was compared with that of standard practice and its impact on open conversion rates was assessed.

**PATIENTS AND METHODS:**

This prospective study was carried out in 33 selected patients as an alternative to open conversion in GMMC Sukkur and Hira Medical Center Sukkur during the period of last three years from Jan 2008 to Dec 2010. Pre-operative biliary investigations included liver function test, all routine investigations and ultrasound abdomen were done in all patients. The LSC was performed only in patients with severe inflammatory adhesions or fibrotic changes in callot’s triangle; or when the gall bladder was entered inadvertently or when excessive bleeding occurred because of difficulty in finding a plane of dissection between the gall bladder and liver bed. The technique of LSC involved a standard four port approach. An early assessment was made of the safety and feasibility of LC. If dissection of callot’s triangle was deemed unsafe, the LSC was performed. The anterior wall of the gallbladder was excised, leaving the posterior wall of the gallbladder in situ. All gallstones were retrieved and extracted in a bag along with the excised gallbladder wall. The irrigation and suction was done in gall-bladder fossa as well as in Morison’s pouch. No attempt was made to dissect out, divide or clip the cystic duct or artery. Drains were placed in the gallbladder fossa and subhepatic space for 48 hours, or until any postoperative bile leakage ceased. Two doses of cephalosporin antibiotics were given prophylactically. Postoperative endoscopic retrograde cholangiopancreatography (ERCP) was carried out selectively if there was prolonged biliary leakage, or when common bile duct stones were suspected.

### TABLE - I

**INDICATION FOR LSC IN THE STUDY.**

<table>
<thead>
<tr>
<th>Indications</th>
<th>No. of Patients n=33</th>
<th>%age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sever acute calculus cholecystitis (5 with Mirizzi type-I syndrome)</td>
<td>8</td>
<td>24.24%</td>
</tr>
<tr>
<td>Chronic Calculus cholecystitis with severe fibrosis</td>
<td>16</td>
<td>48.48%</td>
</tr>
<tr>
<td>Acute on chronic cholecystitis with inflammatory mass and distorted anatomy at callot’s triangle</td>
<td>07</td>
<td>21.21%</td>
</tr>
<tr>
<td>Gangrenous gall-bladder</td>
<td>02</td>
<td>6.06%</td>
</tr>
</tbody>
</table>

### TABLE - II

**Complications of LSC in the study**

<table>
<thead>
<tr>
<th>Complication</th>
<th>No. of patients n=33</th>
<th>%age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporary bile leakage</td>
<td>04</td>
<td>12.12%</td>
</tr>
<tr>
<td>Persistent bile leakage</td>
<td>03</td>
<td>9.09%</td>
</tr>
<tr>
<td>Biliary peritonitis</td>
<td>01</td>
<td>3.03%</td>
</tr>
<tr>
<td>CBD – injury</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>Bleeding</td>
<td>02</td>
<td>6.06%</td>
</tr>
<tr>
<td>Open conversion</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>Mortality</td>
<td>00</td>
<td>00</td>
</tr>
</tbody>
</table>
SPSS.

RESULTS:
LSC was performed in 33 patients; out of these, 21 were females & 12 males, with male to female ratio of 1:2. The median age of the patients was 48 years. The median operating time was 90 minutes and median duration of hospital stay was 03 days. The indications of LSC are shown in Table-I. Temporary post-operative bile leakage was found in 04(12.12%) patients, which was managed conservatively & resolved spontaneously after 7-10 days. In all these four patients, bile leakage was seen immediately on opening the gall-bladder at the time of the initial LC and continued into the postoperative period. One patient was readmitted after one week of surgery with biliary peritonitis and subphrenic collection. First drainage was done with ultrasound guidance; latter laparotomy was done due to repeated collection. Patient was settled after laparotomy and open drainage. Three patients with persistent bile leaks and jaundice with raised alkaline phosphatase postoperatively were referred for ERCP to other tertiary care hospital at Karachi. Stones were extracted from CBD by ERCP and stents placed in these patients. Of these 03 patients, two had previously unsuspected common bile duct stones extracted at ERCP. Stent placement led to complete resolution of bile leakage in all patients. No mortality and no bile duct injuries were found in the study.

DISCUSSION:
There is a considerable challenge for safe dissection of the structures in callot’s triangle during both open and laparoscopic cholecystectomy. Open partial cholecystectomy with drainage of the gallbladder stump is used occasionally when the tissues in the callot’s triangle are hostile. The indications for LC have gradually been expanded with the development of equipments, devices, and techniques of laparoscopy and especially the experience of the surgeons. Now LC is technically feasible in the majority of the patient with acute cholecystitis and other severe/complicated cholecystitis. But compared with elective LC, the open conversion rate is higher and the operative time is longer with an increased risk of bleeding and bile duct injury in these instances. The difficulties may be due to the severe adhesions of the gallbladder to the surrounding organs, fibrosis of the gallbladder bed and liver and difficulty in identifying and dissecting structures in callot's triangle. Open subtotal cholecystectomy is a safe, simple and definitive procedure in these conditions. Increasing laparoscopic experience and expertise have made LSC a feasible option. This study confirms the feasibility and safety of performing LSC thus avoiding open conversion in most patients. In some respects, the laparoscopic approach may have certain advantages over the open technique. The operative view, magnification and approach to callot’s triangle are superior laparoscopically as compared to open surgery. In certain cases with complicated cholecystitis, the structures in callot’s triangle are difficult to identify due to dense adhesions between the gallbladder and liver or adjacent organs. So it is difficult to complete LC in these situations. If we still want to dissect the cystic duct and artery as in routine LC and excise the gallbladder totally, the chances of bleeding and bile duct injury increase significantly. In these instances, LSC is a good option instead of conversion to open surgery. This study has shown that LSC without cystic duct ligation represents an alternative to open conversion when dissection of callot’s triangle is deemed unsafe.

In one study, before the introduction of LSC, the rates of open conversion and CBD injury were 5% and 0.2% respectively. But after the introduction of LSC, the open conversion rates progressively fell to 2% and CBD injury to 0.1%. In our institution since we started the LSC, the open conversion rate (0.65% out of 1224 patients) and CBD injury (0.08% out of 1224 patients) are also decreased as compared to national and international literature. In recent reports, the conversion rates during LC ranged from 0 to 9%. The overall rate of conversion in one study with LSC was 0.6%, which is lower than most published data. But we still think that a low threshold for conversion from LC to open surgery should be maintained. Conversion is not a complication, but a means of preventing more serious problems. The results of this series indicated that LSC for patients with severe acute cholecystitis or chronic cholecystitis with severe fibrosis and dense adhesions is feasible and relatively safe. Nevertheless, the procedure is still complicated and highly extremely difficult, and may be associated with significant morbidity compared with that of patients with routine cholecystectomy. In our study, temporary post operative bile leaks were found in 04 (12.12%) patients, and were managed conservatively and settled spontaneously after one week, while open drainage was done in one patient with biliary peritonitis. ERCP and stent insertion was done in 03 (9.09%) patients with persistent bile leaks and retained CBD stones. In these patients a policy of early post-operative ERCP was adopted with the aim of shortening the time to resolution of bile leakage and hastening discharge from hospital. So 08(24.24%) patients out of 33, showed complication of bile leakage in this series which is comparable to the literature. No deaths and CBD injury found in this study. Early diagnosis and treatment of bile leak is crucial in decreasing morbidity and mortality related to this complication. ERCP with stent placement and/or sphincterotomy is highly effective to treat this problem. Several studies have showed that “post-operative” cystic duct leak is a are complication of LC and associated with fairly low morbidity. LSC in patients with complicated cholecystitis should be performed by experienced laparoscopic surgeons. Bleeding and bile leakage complications are significantly more common in LSC. Extreme caution with constant control of haemostasis is the hallmark of the procedure. However, it is feasible, relatively safe and advantageous over open surgery, but it remains a non-routine choice.

CONCLUSION:
This study concluded that LSC is feasible in the majority of cases when total removal of the gall-bladder is not possible in complicated cholecystitis. It is relatively safe with an acceptably low morbidity. It also reduces the open conversion rate and bleeding as well as bile duct injury complications. However, it is not risk free and the surgeons should be aware of the risks and complications of the procedure. With the increasing experience and expertise of surgeons, the more and more patients with various complicated cholecystitis will get benefit from LSC in the future.

REFERENCES:
3. Cheney KE, Jourdain S, Mendes da Costa P. Laparoscopic cholecystectomy for acute cholecystitis in the elderly: a retrospective