

## Complications of Laparoscopic Cholecystectomy: A study of 1100 cases at Sukkur, Pakistan

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### Objective

To determine the incidence of various complications of laparoscopic cholecystectomy (LC).

### Patients and Methods

This observational case series study was conducted at Sukkur Blood Bank Hospital Sukkur, GMC Teaching Hospital Sukkur and Red Crescent Hospital Sukkur from January 2004 to December 2010. It comprised of 1100 cases. All had routine investigations, Liver function tests and ultrasound abdomen. The patients who underwent LC, whether successful or converted, were included in this study. The procedure was carried out by standard four port technique. Clinical examination, investigations, operative time, postoperative complications, reasons for conversion and hospital stay were recorded on proforma.

### Results

The average age was 47.63 years while male to

female ratio 1:4.6. The weight ranged from 41 to 127 kg (mean 64 kg). Main complications observed were hemorrhage (3.18%), bile duct injury (0.27%), retained CBD stones (0.18%), bile leakage (1.19%) and gut injury (0.09%). Minor complications included gallbladder perforation (9.82%), spilled stones (3.9%), sub umbilical wound infection (1.6%) and ileus (1.3%). Overall conversion rate was 2.9%.

### Conclusion

The morbidity and mortality of LC are remarkably low. Incidence of complication is very low and less than open cholecystectomy, which makes this procedure safe, effective and procedure of choice for gallbladder disease. (Rawal Med J 2012;37:399-402).

### Key words

Laparoscopic cholecystectomy, cholecystectomy, cholelithiasis.

## INTRODUCTION

Gall stone disease can be either asymptomatic or symptomatic.<sup>1,2</sup> Laparoscopic cholecystectomy (LC) is an important milestone in surgical practice and heralds the development of further minimally invasive techniques. The advantages of LC are the reduction of trauma of access without compromise to exposure of operative fields, accelerated patient recovery and reduction of wound related complications. In Pakistan, LC is most common elective abdominal operation with over 5000 operations performed annually.<sup>3,4</sup> It was only after the advent of LC by Mouret et al 1987 in France, that general surgeons suddenly became interested in application of laparoscopy.<sup>5</sup>

Recently, some refined studies have shown that the metabolic response to operative trauma and immunosuppression is much less in LC with advantage for both patient and surgeons.<sup>6,7</sup> Though initially, there were some absolute and some relative

contraindications, but with experience and improvement of equipment, there is no contraindication. However in obese, obscure anatomy, adhesions, hemorrhage, damage to common bile duct and in acute cases, surgeons should be careful and willing to convert if necessary.<sup>8,9</sup> The aim of this study was to focus on complications of LC and its comparison with literature and thus highlight safety and effectiveness of this procedure.

## PATIENTS AND METHODS

This study included 1100 non selective cases that underwent LC from January 2004 to December 2010. The investigations carried out were CBC, ESR, blood urea, LFT, X-ray chest, ECG, and ultrasound of abdomen. Any further investigation was done if required for fitness of patient for procedure.

All patients were admitted on the day of surgery.

Nature of procedure was explained and permission for conversion was also taken. All were given three injections of ceftriaxone 1gm one on induction and then BD. Then ciproxin 500 mg oral was continued BD for five days. Nasogastric tube was kept for twelve hours in some patients. LC was done by the four port technique. Gall bladder was taken out through epigastric port. All the ports were closed with vicryl 0 (zero) and skin with vicryl rapid 3/0. All clinical data, investigations, operative findings, operative and post operative complications were recorded.

## RESULTS

The mean age in 1100 patient was 47.63% while male to female ratio was 1:4.6. Mean weight was 64 kg (rang 41- 127 kg). The commonest presenting symptom was biliary colic in 83% of the cases. Dyspepsia 60% and flatulence 52% was next common. Associated disease included diabetes in 13% cases.

Hyper tension 11%, and peptic disease 9.2% cases. Eighty three patients were more than 110 kg and all of them were females. 7% patients had previous history of abdominal surgery; however laparoscopy was safely performed in them. Omentum was adherent to gall bladder in 583 (53%), the colon and duodenum were firmly stuck to anterior and inferior surface of gall bladder in 89 (8.1%) patients and intraperitoneal adhesions in 80 patients (Table 1). Adhesiolysis was performed in these cases using electrocautry.

**Table 1. Preoperative findings.**

Findings	Number	Percentage
Peritoneal adhesions	80	7.23%
Adherent duodenum & colon	89	8.1%
Omental adhesion of gallbladder	583	53%
Fibrosis around the portal triad	69	6.23%
Edematous thickened Gall bladder	115	10.45%
Intrahepatic gall bladder	48	4.34%
Phrygian cap Deformity	31	2.82%
Hartmann's pouch	820	74.55%
<b>Anatomical variation of cystic duct</b>		
-angular	682	62%
-parallel	220	20%
-Spiral	55	5%
- Wide	68	6.2%
- Short	75	6.8%

Anatomical variations of cystic duct included angular union of cystic duct with common bile duct and parallel and spiral union (Table 1). The major complications included hemorrhage, retained common bile duct stones and bile leakage (Table 2). Bile duct injury occurred in 0.27% cases and all were converted with CBD repair and T tube. Two patients with retained stones were successfully treated with ERCP and papillotomy.

**Table 2. Major complications.**

Complication	Number	Percentage
Gall bladder perforation and bile leakage	108	9.82%
Spilled stones	43	3.9%
Shoulder tip pain	29	2.64%
Epigastric wound infection	18	1.63%
Chest infection	21	1.91%
Urinary tract infection	12	1.1%
Bleeding from port site	10	0.91%
Ileus	15	1.37%
Port hernia	0	0%

Eighty three percent i.e. 913 patients were pain free in 24 hours postoperatively, further 10 % patients became pain free in 48 hours.

## DISCUSSION

Vascular injury are the most lethal technical injuries of LC with incidence ranging from 0.25% - 8%.<sup>3</sup> These may be due to trocar, operative dissection or poor retraction. The most common vessel to be damage is epigastric and cystic artery due to trocar insertion.<sup>5</sup> Bleeding from other intra abdominal sites including mesenteric, omental, falciform ligament, gastroepiploic and splenic vessels result from puncture injury with verres needle or adhenolysis. Liver bed may bleed due to traction.<sup>3,10</sup> In our study, hemorrhage occurred in 35 (3.18%) patients. Source was cystic artery in 13, falciform ligament in 8 and misc 6, while it is repoted upto 10% by Kaushik R in his study.<sup>11</sup>

Bile duct injury is one of the serious complications. Potential of such injury is great with laparoscopic approach as less dissection of CBD is done. Therefore, CBD may be clipped and divided in mistake of cystic duct. Accessory duct may

encounter and be divided. In our study, there were three injuries of CBD (0.27%). All were converted to open for repair. In literature, CBD damage ranges from 0-2%<sup>7,9,12</sup> for laparoscopic surgery and 0-0.4% for open cholecystectomy.<sup>12</sup>

It has been noted that injury to CBD is related to experience of surgeon. This complication is more during learning curve i.e. initial 100 LC. All CBD injuries were identified per operatively in our study. However, It has been shown that 48.8% of CBD injuries are identified per operatively and 51.2% post operatively.<sup>3,13</sup> To minimize the CBD injuries, three rules were observed throughout our study; Full dissection of Calot's triangle before clipping or cutting, Dissection of cystic duct to display T junction with CBD and If anatomy unclear, conversion to open cholecystectomy.

In our study, 2 patients (0.18%) had retained CBD stones. These were treated successfully by ERCP and papillotomy. In literature, incidence of retained CBD stones after LC is 0.3-0.4%.<sup>9,13</sup> Even with policy of selective cholangiography, incidence of retained stones may not be reduced further. Now laparoscopic choledochotomy and choledocholithotomy are being practiced and reports from various centres are encouraging.

Bile leak is one of the most frequent postoperative technical complication of LC. In our study, 12 patients (1.9%) developed this. Literature shows 0.2-2% rate in different series.<sup>3,14,15</sup> Common cause of leakage is cystic duct due to improper clip placement or thermal injury. Other cause is gall bladder bed and CBD injuries. Bowel injuries are inflicted by verres needle, trocar or adhenolysis. These are either recognized per operatively or post operatively. Incidence of bowl injury is 0-5% in various series,<sup>14,16,17</sup> however, in our study it is 0.9%. Our low rate may be due to that all accessory trocar and cannulae were inserted under direct vision and in difficult cases or previous surgery, with Hasson's technique instead of verres needle.

Gall bladder perforation during procedure occurred in 9.82% cases in our series, while gall bladder stones spilled in peritoneal cavity in 3.9% cases. Most of these were retrieved but few lost. Fitzgibbons in series of 450 LC reported 30% perforation<sup>18</sup> and 20% escape of gall stone in

abdomen has been documented.<sup>19</sup> Feng et al reported 7.25% incidence of spilled gall stones.<sup>20</sup> Perforation of gall bladder doesn't appear to influence the outcome of procedure, provided the right sub phrenic and sub hepatic spaces are irrigated and aspirated thoroughly at the end of the procedure.<sup>21,22</sup>

Incidence of epigastric wound infection in our study was 1.63%. In different series it varied from 0.5% to 1%.<sup>14,21,23</sup> Chest infection occurred in 1.91% cases. Obesity and smoking are usually contributory causes. 83% patients in our series became pain free in 24 hours and up to 93% in 48 hours. 2.64% of complained shoulder tip pain and rest complained discomfort up to a week. All these settled on analgesics. Overall conversion rate in our study was 2.9% which is lower than the study of Malla BR where it was 3.92%<sup>24</sup> and 6.4% in a study from Peshawar.<sup>25</sup>

## CONCLUSION

Laparoscopic cholecystectomy was safe and effective and complications were very low and lesser than open cholecystectomy. Morbidity and mortality are low. The pain free post operative period and early ambulation lead to saving of valuable working hours.

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