

**Original article:**

## **Complications of laparoscopic cholecystectomy- a retrospective study at a tertiary care centre**

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### **ABSTRACT**

Background: Laparoscopic cholecystectomy (LC) is the gold standard for treating gall stones, although some incidents and complications appear rather more frequently than open technique. Several aspects of these complications and their treatment options are analysed.

Materials and methods: In this two years retrospective cross sectional study, 1040 cholelithiasis patients who were admitted in ASCOMS and Hospital, Jammu and were subjected to laparoscopic cholecystectomy from July 2015 to June 2017 were evaluated and considered for the study.

Results: The main operative incidents encountered were haemorrhage (26 cases, 2.5%), iatrogenic perforation of gall bladder (180 cases, 17.3%) and common bile duct injuries (2 cases, 0.19%). Conversion to open operation was done in 17 cases (1.63%) because of obscured anatomy due to presence of inflammation. The main post operative complication was bile leakage (6 cases, 0.57%), haemorrhage (2 cases, 0.19%), subhepatic abscess (1 case, 0.09%) and retained bile stones (3 cases, 0.28%).

Conclusion: Although LC is considered the gold standard technique for gall stone disease, however it's high rate of bile duct injuries should be given special attention.

Keywords: Cholelithiasis, Laparoscopic cholecystectomy (LC), Bile duct injury.

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### **INTRODUCTION**

Gall stone disease (cholelithiasis) is one of the commonly encountered diseases among the general population and its prevalence is variable in different countries from 10-15%.<sup>26</sup> This disease can be either asymptomatic or symptomatic. Gallbladder disease is a term for several types of conditions that can affect gallbladder, majority being caused by inflammation. A gall bladder with stone frequently leads to cholecystitis. A gallstone is a calculus or stone formed within the gallbladder as a concretion of bile components.<sup>1</sup> Risk factors include female sex,

increasing age, pregnancy, oral contraceptives, obesity, diabetes mellitus, ethnicity, rapid weight loss.<sup>2</sup> Symptoms can be specific including intermittent pains in the right upper quadrant of abdomen or can be nonspecific as nausea and vomiting.<sup>27</sup> Surgery for gall bladder removal is the only treatment for gall bladder stones and till 1985, this surgery was carried out only through open abdominal surgery<sup>3</sup> when Dr Med Erich Muhe performed the first Laparoscopic Cholecystectomy (LC), which is now prevalent. This method is applicable for the surgery of acute cholecystitis even

for patients with hernia, abdominal ascites and pregnancy.<sup>4,5</sup> It also decreases the duration of hospital stay, treatment costs and period of rest before return to work.<sup>6</sup> However, anaesthesia related complications in these patients are similar to the patients who undergo open surgery.<sup>7</sup> Also bile duct injury and stenosis rates are higher in LC compared to open cholecystectomy.<sup>8</sup>

**MATERIAL and METHODS**

This is a two years retrospective cross sectional study conducted on 1040 laparoscopic cholecystectomies done in the Department of surgery, at ASCOMS and Hospital, Jammu from July 2015 to June 2017. The data were acquired reviewing the patients' hospital files and surgery reports. The operative data and demographic characteristics were registered and analyzed. The results were discussed employing descriptive statistical methods.

**RESULTS**

Of the 1040 patients studied, 360 (34.61%) were male and 680 (65.38%) were female. Age ranges were between 15 years and 85 years. Overall, both intra operative and post operative complications were seen in 239 cases (22.9%), 225 being intra operative and 14 being post operative. The intra operative complications in order of frequency were iatrogenic perforation of gall bladder (180 cases) followed by haemorrhage (26 cases) and CBD injury (2 cases). Conversion to open procedure was performed in 17 cases. The most frequent post operative complication was bile leak (6 cases) followed by retained stone (3 cases), haemorrhage (2 cases) and subhepatic abscess (1 case).

The operative diagnosis are given in Table 1.

TABLE 1 : Operative diagnosis

Diagnosis	No. of cases (%)
Chronic calculous cholecystitis	815 (78.36%)
Acute cholecystitis	112 (10.76%)
Acalculous cholecystitis	75 (7.21%)
Gall bladder mucocele	30 (2.88%)
GB + CBD stone	8 (0.76%)

*Technical difficulty*

Acute cholecystitis, a shrunken fibrotic gall bladder and the presence of cirrhosis were associated with difficult procedure, sometimes requiring conversion to open technique. Difficulty was also associated with male sex, elderly patients and in the presence of inflammation. Inflammation was associated with adhesions, obscured anatomy, thickened GB wall,

omental adherence and friable tissue, thus leading to complications.

*Intra operative complications*

Perforation of the gall bladder was the most frequently recorded complication in as many as 180 cases. It causes more trouble by spillage of bile and stones, thus prolonging the procedure.

Haemorrhage was recorded in 26(2.5%) cases as depicted below:

Source	Number of cases
1. Cystic artery	8
2. Gall bladder bed	12
3. Hepatic artery	2
4. Greater omentum	4

Bleeding from cystic artery was controlled by clipping. Bleeding from gall bladder bed was seen in cases with acute inflammation and cirrhosis and hemostasis was achieved by using oxidized cellulose. Bleeding from hepatic artery needed conversion to

open. Omental bleeding was controlled laparoscopically.

Common bile duct injury was seen in 2 cases and both were managed by placing a T tube. Complete transection of CBD was not seen in any case.

Conversion to open procedure was required in 17 cases with acute cholecystitis due to obscured anatomy because of inflammation.

*Post operative complications*

As depicted in the table below:

Complication	Number of cases (%)
1. Bile leakage	6 (0.57%)
2. Post op haemorrhage	2 (0.19%)
3. Sub hepatic abscess	1 (0.09%)
4. Retained bile duct stone	3 (0.28%)

4 out of 6 cases with bile leakage had an output of 200 to 250 ml/day which stopped gradually over a period of 2 to 10 days and other 2 cases required ERCP stenting.

Prolonged bleeding from the sub hepatic drain seen in 2 cases necessitated relook laparoscopic intervention and placement of Surgicel patch on the gall bladder bed to stop the bleeding.

Sub hepatic abscess was seen in 1 case which was drained percutaneously under USG guidance.

Retained stones in the biliary tract were found in 3 cases on follow up and were removed by ERCP.

**DISCUSSION**

Cholecystectomy is one of most commonly performed procedure in general elective surgeries.<sup>9</sup> Laparoscopic cholecystectomy was introduced as the first surgical treatment for symptomatic diseases of gall bladder and its advantages against open cholecystectomy are well described.<sup>10</sup>

Contrary to primary reports that indicated an increase in the complications rate of LC in comparison to open surgery, recent data shows that LC accounts for less morbidity and mortality compared to open surgery.<sup>11-14</sup> In our study, a mortality of 0 % was observed whereas in a similar study 0.04% mortality

rate was reported.<sup>8</sup> In the comparative study by Jatzko *et al.*<sup>14</sup>, open operation was associated with 7.7% morbidity rate compared with 1.9% with LC and 5% mortality rate vs 1% for LC.

Bile duct injuries are the most serious complication of LC.<sup>18</sup> Although no significant difference has been reported in the rate of bile duct injury between open and laparoscopic cholecystectomy, injuries are more frequent in LC than open surgery and this rate is variable from almost 1% in LC<sup>19-23</sup> to 0.5% in open cholecystectomy. Bile duct injury rate in our study is 0.19% which according to other studies was found between 0.25% to 1.7%.<sup>20-23,28</sup>. This low incidence of bile duct injury in our study is attributed to the expertise of the operating surgeons in this field. Bile leakage and choleperitonitis after open cholecystectomy is rare but its rate increases in LC. Wood *et al.* reported that 17 of 34 cases with complications had bile leakage.<sup>24</sup> In this study, bile leak was reported in 6 patients.

Bleeding from cystic artery was seen in 8 cases, complicating 0.76% of our patients. All of the cases

had been diagnosed during the operation and repair had been performed during the surgery. All such patients were discharged in good general condition. Although bleeding from hepatic artery in our study was found in 2 cases which were converted to open. However, Hamazaki *et al* reported 14% bleeding rate and 0.2% bile duct injury rate which was higher than our results.<sup>25</sup>

Small bowel injury in our study was 0.09% while Deziel *et al.* reported 0.14%<sup>8</sup> and Amir D *et al.* reported 0.23%<sup>28</sup>.

### CONCLUSION

The results of our study and the studies done by others in the same field have found that LC is a safe and suitable procedure for the management of cholelithiasis. LC is a procedure with low mortality rate but bile duct injuries are still a major problem. For preventing these injuries, the surgeon must have thorough knowledge of the anatomy of biliary tract and its variations.

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