

## Original Research

### Comparative analysis of Open Cholecystectomy and Laparoscopic Cholecystectomy

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#### ABSTRACT:

**Background:** Laparoscopic surgery has induced a tremendous revolution in the treatment of gallbladder disease. Surgery has been traditionally considered the last therapeutic resort for symptomatic cholelithiasis before the advent of laparoscopy, whereas lithotripsy and cholecystostomy have been commonly favored as less invasive alternatives. **Aim of the study:** To compare open cholecystectomy with laparoscopic cholecystectomy. **Materials and methods:** The present study was conducted in the Department of General Surgery of the medical institute. The study is a retrospective study, so past records of the Department were checked for patients who underwent cholecystectomy for acute cholecystitis at out department for the study period. It was made sure to include only those cases who had history of abdominal pain and tenderness at upper right quadrant showing clinical symptoms of acute cholecystitis. The diagnosis of acute cholecystitis was confirmed by reviewing the ultrasound in which signs of thickened gall bladder wall and pericholecystic fluid were evident. For the study, we randomly selected 30 cases each of laparoscopic cholecystectomy and open cholecystectomy and their records were compared on the basis of various post-operative parameters. **Results:** A total of 60 cases were included in the study. Out of 60 cases, 30 underwent Laparoscopic cholecystectomy and other 30 underwent open cholecystectomy. The surgical procedure for LC and OC were performed by experienced surgeons. The Male/Female ratio in Group 1 and 2 was 21/9 and 19/11 respectively. The mean age of patients in group 1 was 39.1±5.2 years and in group 2 was 41.2±5.1 years. The mean operative time period for group 1 was 60.12 minutes and for group 2 was 89.22 minutes. Blood loss more than 500 mL was seen in 3 patients for group 1 and 6 patients for group 2. The nasogastric tube was employed in 7 patients in group 1 and 11 patients in group 2. The mean postoperative stay after completion of procedure was 5.19 days for group 1 and 8.81 for group 2. **Conclusion:** From the results of the present study, this can be concluded that open cholecystectomy and laparoscopic cholecystectomy are both effective for acute cholecystitis; however laparoscopic has lesser operative time, fewer complications and less post-operative stay at hospital which makes it better in certain prospective.

**Key words:** Cholecystectomy, laparoscopic, gall bladder, cholecystitis.

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#### INTRODUCTION:

Laparoscopic surgery has induced a tremendous revolution in the treatment of gallbladder disease. Surgery has been traditionally considered the last therapeutic resort for symptomatic cholelithiasis before the advent of laparoscopy, whereas lithotripsy and cholecystostomy have been commonly favored as less invasive alternatives.<sup>1</sup> In the era of minimally invasive surgery, indications for surgery have become more liberal, resulting in an enormous rise in the number of laparoscopic

cholecystectomies performed annually.<sup>2</sup> The laparoscopic procedure has been shown to offer the advantages of decreased pain, shorter convalescence, reduced operative stress and limited inflammatory response.<sup>3</sup> LAPAROSCOPIC cholecystectomy (LC) has clearly displaced open cholecystectomy (OC) in the management of simple biliary lithiasis.<sup>4, 5</sup> However, the role of LC in the treatment of acute cholecystitis (AC) is somewhat controversial because some surgeons claim that the inflammation, edema, and necrosis experienced by patients

with AC make dissection more difficult, which can, therefore, increase the rate of complications. LAPAROSCOPIC cholecystectomy (LC) has clearly displaced open cholecystectomy (OC) in the management of simple biliary lithiasis.<sup>4,5</sup> However, the role of LC in the treatment of acute cholecystitis (AC) is somewhat controversial because some surgeons claim that the inflammation, edema, and necrosis experienced by patients with AC make dissection more difficult, which can, therefore, increase the rate of complications.<sup>6</sup> Hence, the present study was conducted to compare open cholecystectomy with laparoscopic cholecystectomy.

**MATERIALS AND METHODS:**

The present study was conducted in the Department of General Surgery of the medical institute. The ethical clearance for the protocol of study was obtained from the ethical committee of the institute before starting the study. The study is a retrospective study, so past records of the Department were checked for patients who underwent cholecystectomy for acute cholecystitis at our department for the study period. It was made sure to include only those cases who had history of abdominal pain and tenderness at upper right quadrant showing clinical symptoms of acute cholecystitis. The diagnosis of acute cholecystitis was confirmed by reviewing the ultrasound in which signs of thickened gall bladder wall and pericholecystic fluid were evident. A total of 128 patients in total underwent cholecystectomy, out of which 89 cases had laparoscopic cholecystectomy and 39 cases underwent open cholecystectomy. For the study, we randomly selected 30 cases each of laparoscopic cholecystectomy and open cholecystectomy and their records were compared on the basis of various post-operative parameters. The patients who had laparoscopic cholecystectomy were grouped under

group 1 and who had open cholecystectomy were grouped under group 2.

The statistical analysis of the data was done using SPSS version 11.0 for windows. Chi-square and Student’s t-test were used for checking the significance of the data. A p-value of 0.05 and lesser was defined to be statistical significant.

**RESULTS:**

A total of 60 cases were included in the study. Out of 60 cases, 30 underwent Laparoscopic cholecystectomy and other 30 underwent open cholecystectomy. The surgical procedure for LC and OC were performed by experienced surgeons. **Table 1** shows the comparison of demographic data between group 1 and group 2. The Male/Female ratio in Group 1 and 2 was 21/9 and 19/11 respectively. The mean age of patients in group 1 was 39.1±5.2 years and in group 2 was 41.2±5.1 years. The mean body weight of group 1 and group 2 was 70.2±8.1kg and 69.1±8.3 kg respectively. The history of previous surgery was present in 4 patients in group 1 and 3 patients in group 2. The comparison of data between both groups showed non-significant difference for all variables (p>0.05). **Table 2** shows the comparison of various parameters for both the groups. The mean operative time period for group 1 was 60.12 minutes and for group 2 was 89.22 minutes. Blood loss more than 500 mL was seen in 3 patients for group 1 and 6 patients for group 2. The nasogastric tube was employed in 7 patients in group 1 and 11 patients in group 2. The mean postoperative stay after completion of procedure was 5.19 days for group 1 and 8.81 for group 2. The difference for nasogastric tube and mean post-operative stay was statistically significant with p-value less than 0.05 [Fig 1].

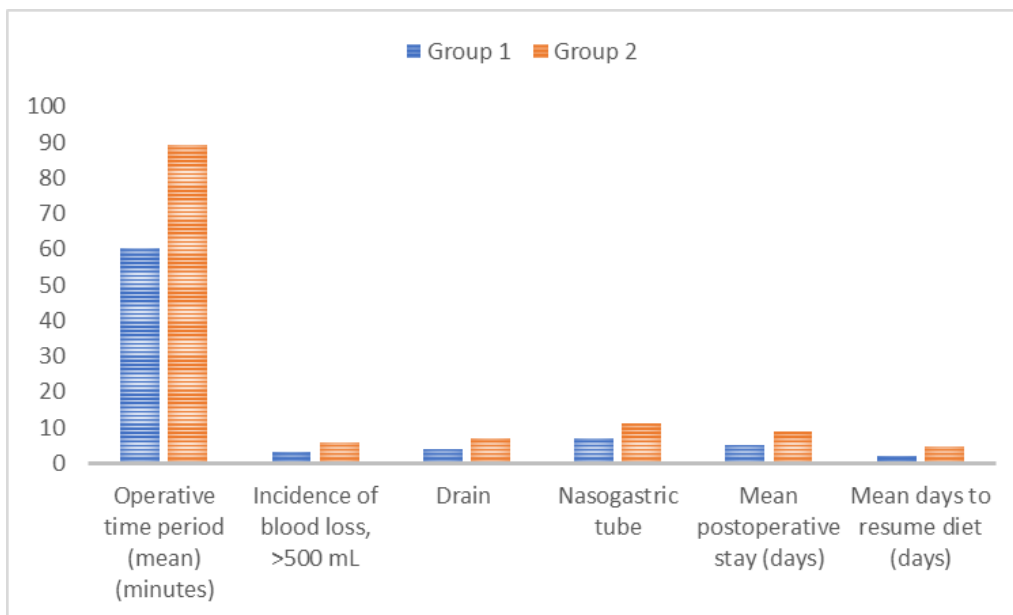
**Table 1: Comparison of demographic variables for both groups**

Variables	Group 1	Group 2	p-value
Sex (M/F)	21/9	19/11	0.21
Mean Age (years)	39.1±5.2	41.2±5.1	0.33
Mean Body weight (kg)	70.2±8.1	69.1±8.3	0.98
Previous surgery (n)	4	3	0.07

**Table 2: Comparison of post-operative parameters for both the groups**

Variables	Group 1	Group 2	p-value
Operative time period (mean) (minutes)	60.12	89.22	0.88
Incidence of blood loss, >500 mL	3	6	0.19
Drain	4	7	0.87
Nasogastric tube	7	11	0.005*
Mean postoperative stay (days)	5.19	8.81	0.002*
Mean days to resume diet (days)	2.12	4.65	0.78

**Figure 1: Comparative analysis of Group 1 and 2 on the basis of various parameters**



**DISCUSSION:**

In the present study, we compared laparoscopic cholecystectomy with open cholecystectomy in patients with acute cholecystitis. We observed that the mean operative time in open cholecystectomy is more as compared to laparoscopic cholecystectomy. Similarly, the complication of blood loss was seen more in open cholecystectomy as compared to laparoscopic cholecystectomy. The postoperative stay in hospital was more in open cholecystectomy as compared to laparoscopic cholecystectomy. Similar results were seen by other authors. Hardy KJ et al compared open cholecystectomy (OC) with laparoscopic cholecystectomy (LC) in terms of clinical aspects and a limited review of costs. The study was conducted at the Austin Hospital, Melbourne, a university teaching hospital. Prospective LC patients were compared with a retrospective group of OC patients whose surgery had been performed by the same surgeons. Consecutive patients undergoing LC were interviewed, their medical records were analysed and the cost of their hospitalisation was assessed. Similar data, collected previously from patients undergoing OC, were used for comparison. There were 108 patients in each group, 93.5% treated electively. All had gallstones. No deaths or common bile duct injury occurred. The mean operating room time was 131 +/- 3.7 minutes for OC and 164 +/- 4.7 minutes for LC. Operative cholangiography was attempted in 80% in each group, being successful when attempted in all OCs and in 95% of LCs. The conversion rate of LCs to OCs was 4.5%. Minor complications were more frequent with OCs. The mean duration of hospital stay was 6.5 +/- 0.3 days for OCs and 2.0 +/- 0.2 days for LCs. The amount and period of analgesia were significantly less in the LC group.

Patients recovered significantly faster after LC during the first eight weeks after surgery. There was no difference by 12 weeks. The overall cost for each LC was \$838 less than OC for the entire hospital stay. These results supported the view that LC is a safe and justified replacement for OC in the elective situation, with benefits to the patient, hospital and general community. The hospital cost for LC was less than for OC. Sanabria JR et al determined the efficacy of laparoscopic cholecystectomy (LC) in the treatment of gallstone disease, all patients who underwent elective surgery for cholelithiasis during three consecutive periods (1989, 1990 and 1991) were studied. There were 121 patients in each period. All patients in the first period underwent open cholecystectomy (OC), whereas 70 (58%) patients underwent laparoscopic procedures in the second period (OC-LC). LC was the treatment of choice in the third period. Multiple factors, including sex, age, clinical and biochemical presentation of the disease and modified Apache II score were comparable among the three groups. The authors found significant differences in length of hospitalization (6.4 +/- 4.2 days in the OC group, 3.6 +/- 2.4 days in the OC-LC group and 2.4 +/- 1.7 days in the LC group, p < 0.01 when compared with the OC group) and return to work after surgery (5.8 +/- 2.8 weeks, 2.8 +/- 1.2 weeks and 1.3 +/- 1.8 weeks respectively, when compared with the OC group). There was no significant difference in postoperative complications among the groups, but complications in the OC patients were more severe. Although operative time increased significantly after the introduction of LC, it returned to the range of OC after 36 procedures. Nine patients (5%) with LC required conversion to OC. Benefits of LC include a shorter hospital stay and a shorter recovery period. There were no deaths,

very low morbidity, a substantial decrease in overall cost and a high degree of patient satisfaction with LC.<sup>7, 8</sup>

Kelley JE et al compared open cholecystectomy with laparoscopic cholecystectomy. One hundred ninety-six laparoscopic cholecystectomies were performed from April 1990 through February 1991. Initial patient selection was restricted to elective procedures for chronic cholecystitis with expanded indications as experience was gained. Of the 196 cases, 11 required conversion to open cholecystectomy, leaving 185 laparoscopic cholecystectomies for comparison. During the same period, 82 open cholecystectomies were performed. Thirty-nine of these were complicated cases and would not have been considered for laparoscopic cholecystectomy early in the study, leaving 43 routine open cholecystectomies for comparative purposes. In the laparoscopic group, 1.1 per cent of the patients had major operative complications as opposed to the open group, which had none. There were no common bile duct injuries in either group. To provide a true cost-benefit analysis, a group of patients was identified that would qualify for elective, same-day admission for either an open or laparoscopic procedure. Laparoscopic cholecystectomy (LC) was performed on 70 patients, and open cholecystectomy (OC) was performed on 26 patients. A comparison of data from these groups showed no significant difference in age or sex. Hospitalization costs averaged \$5,390 for the LC group versus \$5,392 for the OC group. Postoperative hospital stay averaged 1.3 days for the LC group versus 3.7 days for the OC group. Lujan JA et al compared the results of laparoscopic cholecystectomy (LC) with those of open cholecystectomy (OC) in the treatment of acute cholecystitis. One hundred fourteen patients underwent LC, and 110 underwent OC. The patients underwent surgery within 72 hours of the onset of symptoms. The patients were selected for LC or OC depending on the surgeon's experience in laparoscopic surgery. Conversion from LC to OC was necessary in 15% of the patients. The mean operating time was 77 minutes for the OC group and 88 minutes for the LC group. Complications occurred in 14% of the patients in the LC group and in 23% of the patients in the OC group, with no significant differences between the 2 groups. The number of moderate or severe complications was similar in both groups, whereas mild complications were more common in

the OC group. The length of the hospital stay averaged 8.1 days for the OC group and 3.3 days for the LC group. They concluded that laparoscopic cholecystectomy is a safe, valid alternative to OC in patients with acute cholecystitis. The technique has a low rate of complications, implies a shorter hospital stay, and offers the patient a more comfortable postoperative period than OC.<sup>9, 10</sup>

#### CONCLUSION:

From the results of the present study, this can be concluded that open cholecystectomy and laparoscopic cholecystectomy are both effective for acute cholecystitis; however laparoscopic has lesser operative time and post-operative stay at hospital which makes it better in certain prospective.

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