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Original Research

Comparison of Laparoscopic cholecystectomy and Open cholecystectomy in acute cholecystitis patients

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***ABSTRACT*:**

Background: The incidence of gallstones is 10-15% and the lifetime recurrence rate of symptoms or complications in such patients is about 35%.In situations when LC is unsafe the surgeon might have to convert to an open procedure. The risk of conversion is higher in LC for acute cholecystitis than it is in an elective procedure.**Aim of the study:** To compare Laparoscopic cholecystectomy and Open cholecystectomy in acute cholecystitis.**Materials and methods:** The present study was conducted in the Department of General Surgery of the medical institute. For the study, we retrospectively viewed the medical records of patients aged 30-65 years with acute cholecystitis who underwent Laparoscopic cholecystectomy (LC) and were compared patients who underwent open cholecystectomy (OC). A total of 100patients (50 each for LC and OC) were selected for the study. The analysis of preoperative, intra-operative, and postoperative parameters was done and was compared. **Results:** A total of 100 patients were included in the study. Out of 100 patients, 50 patients underwent Laparascopic cholecystectomy and 50 underwent open cholecystectomy. The mean operative time period for LC was 70.9 minutes and for OC was 93.6 minutes. Blood loss more than 500 mL was seen in 5 patients for LC and 8 patients for OC. The nasogastric tube was employed in 9 patients in LC and 16 patients in OC. The mean postoperative stay after completion of procedure was 7.13 days for LC and 10.32 for OC. **Conclusion**: In conclusion, Laparoscopic cholecystectomy is safer procedure as compared to open cholecystectomy in patients with acute cholecystitis.

Key words: Acute cholecystitis, Chronic cholecystitis, laparoscopic cholecystectomy, open cholecystectomy.

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INTRODUCTION:

The incidence of gallstones is 10-15% and the lifetime recurrence rate of symptoms or complications in such patients is about 35%.[1] Laparoscopic cholecystectomy has become the gold standard in the treatment of symptomatic gallstones. The major advantages of laparoscopic cholecystectomy (LC) include less postoperative pain, less time required for hospitalization and recovery, and better cosmetic results.[2]The golden standard in the treatment of cholelithiasis is laparoscopic cholecystectomy (LC). LC is more advantageous since it offers less pain, earlier discharge, early recovery, better cosmetic outcomes, and low cost.[3] Due to an increase in the quality of life, the elderly population gradually increases and hence, the prevalence of cholecystitis in the population also increases.Gallbladder disease is among the leading causes for hospital admission for acute abdomen among adults and the most common indication for abdominal surgery in the elderly.[4] In situations when LC is unsafe the surgeon might have to convert to an open procedure. The risk of conversion is higher in LC for acute cholecystitis than it is in an elective procedure.[5] The risk of conversion for patients undergoing LC for acute cholecystitis has been linked to male gender, age, previous endoscopic retrograde cholangiopancreatography (ERCP), a non-palpable gallbladder, elevated C-reactive protein (CRP) and white

blood cell count (WBCC), gangrenous inflammation and the experience of the operating surgeon.[6] Hence, the present study was conductedto compare Laparoscopic cholecystectomy and Open cholecystectomy in acute cholecystitis.

MATERIALS AND METHODS:

The present study was conducted in the Department of General Surgery of Hind Institute of Medical Sciences, Ataria , Sitapur, U.P., India. The ethical clearance for the protocol of study was obtained from the ethical committee of the institute. For the study, we retrospectively viewed the medical records of patients aged 30-65 years with acute cholecystitis who underwent Laparoscopic cholecystectomy (LC) and were compared patients who underwent open cholecystectomy (OC). A total of 100patients (50 each for LC and OC) were selected for the study. The analysis of preoperative, intra-operative, and postoperative parameters was done and was compared. The selected patients had history of abdominal pain and tenderness at right upper quadrant showing clinical picture of acute cholecystitis and were admitted in emergency. The confirmation of the diagnosis of acute cholecystitis was done by ultrasound in which signs of thickened gall bladder wall and pericholecystic fluid were seen. Standard four-port technique was used to perform laparoscopic cholecystectomy.

The statistical analysis of the data was done using SPSS software for windows. The significance of the data was checked using Chi-square test and Student's t-test. A p-value<0.05 was predetermined to be statistical significant.

RESULTS:

A total of 100 patients were included in the study. Out of 100 patients, 50 patients underwent Laparascopic cholecystectomy and 50 underwent open cholecystectomy. The surgical procedure for laparoscopic cholecystectomy and open cholecystectomy were performed by experienced surgeons. **Table 1** shows the comparison of demographic data between LC group and OC group. The Male/Female ratio in LC and OC group was 30/20 and 28/22 respectively. The mean age of patients in LC group was 45.23 years and in OC group was 47.21 years. **Table 2** shows the comparison of postoperative parameters for both the groups. The mean operative time period for LC was 70.9 minutes and for OC was 93.6 minutes. Blood loss more than 500 mL was seen in 5 patients for LC and 8 patients for OC. The nasogastric tube was employed in 9 patients in LC and 16 patients in OC. The mean postoperative stay after completion of procedure was 7.13 days for LC and 10.32 for OC. 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

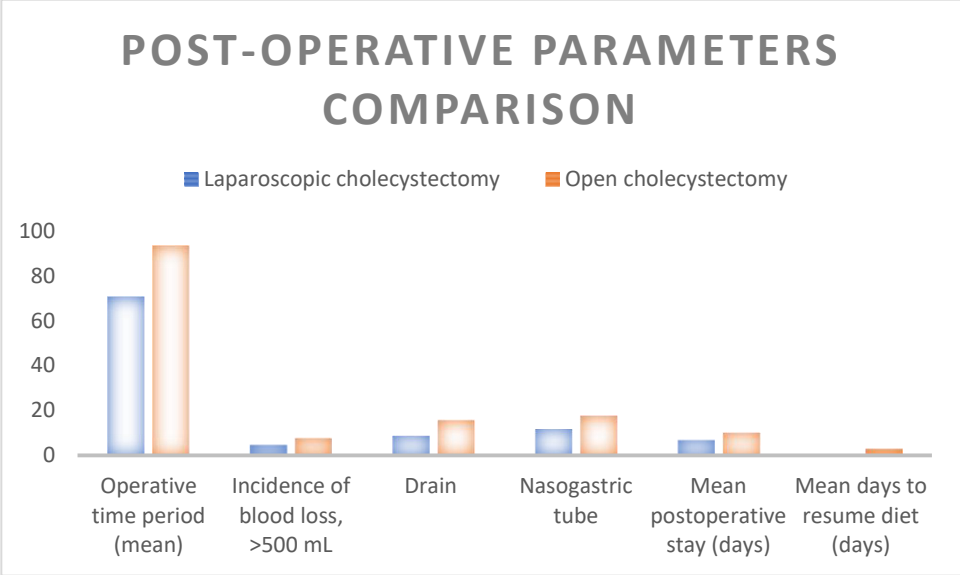
Variables	Laparoscopic cholecystectomy	Open cholecystectomy
Sex (M/F)	30/20	28/22
Mean Age (years)	45.23	47.21
Mean Body weight (kg)	68.32	70.2
ASA physical status score		
1	13	3
2	25	28
3	7	9
4	5	10

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

Variables	Laparoscopic cholecystectomy	Open cholecystectomy	p-value
Operative time period (mean)	70.9	93.6	0.88
Incidence of blood loss, >500 mL	5	8	0.98
Drain	9	16	0.25
Nasogastric tube	12	18	0.01*
Mean postoperative stay (days)	7.13	10.32	0.02*
Mean days to resume diet (days)	2..14	3.22	0.51

*Significant

Figure 1:



DISCUSSION:

In the current study, we compared laparoscopic cholecystectomy with open cholecystectomy in patients with acute cholecystitis. We observed that the mean operative time in OC is more as compared to LC. Similarly, the complication of blood loss was seen more in OC as compared to LC. The postoperative stay in hospital was more in OC as compared to LC. Acar T et al compared the outcomes of the patients to whom we applied early or late cholecystectomy after hospitalization from the emergency department with the diagnosis of AC between March 2012-2015. They retrospectively reviewed the files of totally 66 patients in whom we performed early cholecystectomy (within the first 24 hours) (n: 33) and to whom we firstly administered conservative therapy and performed late cholecystectomy (after 6 to 8 weeks) (n: 33) after hospitalization from the emergency department with the diagnosis of acute cholecystitis. The groups were made up of patients who had similar clinical and demographic characteristics. While there were no statistically significant differences between the durations of operation, the durations of hospitalization were longer in those who underwent early cholecystectomy. Moreover, more complications were seen in the patients who underwent early cholecystectomy although the difference was not statistically significant. They concluded that rarly cholecystectomy is known to significantly reduce the costs in patients with acute cholecystitis. However, switching to open surgery as well as increase of complications in patients who admitted with severe inflammation attack and who have high comorbidity, caution should be exercised when selecting patients for early operation. Ekici U et al compared the outcomes of laparoscopic cholecystectomy (LC) in the elderly and younger patients. The medical records of 665 patients undergoing LC were evaluated retrospectively. The patients were divided into two groups: ≥60 years of age and <60 years of age. Ages, genders, comorbid diseases, indications of surgery, American Society of Anesthesiologists scores, whether it is converted to an open cholecystectomy or not, reasons for conversion if it is converted, total duration of surgery, initiation of oral nutrition, duration of discharge, and postoperative complications of the patients in both groups were recorded. The American Society of Anesthesiologists scores were statistically significantly higher in ≥60 years age group. The rate of experiencing acute cholecystitis with a stone in the gallbladder was significantly higher in the 60 years group. Comorbidity was statistically significantly higher in the ≥60 years age group. Hospitalization period, the mean hour of initiation of oral nutrition were statistically significantly higher in the ≥60 years age group. Conversion to an open cholecystectomy and postoperative complication rates of the ≥60 years age group were statistically significantly higher. They concluded that LC can be safely performed in the elderly people as well. However, it should be kept in mind that comorbidity may make the surgery and postoperative follow-up period complicated.[7, 8]

Song GM et al assessed discordant meta-analyses and generate conclusive findings to facilitate informed decision-making in clinical context eventually. They electronically searched the PubMed, Cochrane Library, and EMBASE to include meta-analysis comparing early with delayed LC for acute cholecystitis through August 2015. Two independent investigators completed all tasks including scanning and appraising eligibility, abstracting essential information using prespecified extraction form, assessing methodological quality using Oxford Levels of Evidence and Assessment of Multiple Systematic Reviews (AMSTAR) tool, and assessing the reporting quality using Preferred Reporting Items for Systematic Reviews and

Meta-Analyses (PRISMA), as well as implementing Jadad algorithm in each step for the whole process. A heterogeneity degree of ≤50% is accepted. Seven eligible meta-analyses were included eventually. Only one was Level I of evidence and remaining studies were Level II of evidence. The AMSTAR scores varied from 8 to 11 with a median of 9. The PRISMA scores varied from 19 to 26. The most heterogeneity level fell into the desired criteria. After implementing Jadad algorithm, 2 meta-analyses with more eligible RCTs were selected based on search strategies and implication of selection. The best available evidence indicated a nonsignificant difference in mortality, bile duct injury, bile leakage, overall complications, and conversion to open surgery, but a significant reduction in wound infection, hospitalization, and operation duration and improvement of the quality of life when compared early LC with delayed LC. However, number of work days lost, hospital costs, and patient satisfaction are warranted to be assessed further. With the best available evidence, we recommend early LC to be as the standard treatment option in treating acute cholecystitis. Teixeira J et al evaluated the results in comparison with classic cholecystectomy, since the latter is still used by some surgeons in certain situations. Their research corresponds to the analysis of 520 patients operated on for acute cholecystitis performed in the department of surgery at the SÉoJoÉo Hospital in Oporto - 412 (79.2%) laparoscopic cholecystectomies and 108 (20.8%) open cholecystectomies - from 2007 to 2013. We evaluated comorbidities, leukocytosis, time between diagnosis and surgery, ASA, per and postoperative complications, mortality, reoperations, lesion of main bile duct, conversion rate and hospital stay, in order to compare these two techniques. The conversion group was included in laparoscopic cholecystectomy. Statistical analysis was based on descriptive statistic procedures and the evaluation of contrast between groups was based on Fishers' exact test. Significant values were considered for p < 0.05. Laparoscopic Cholecystectomy versus Open Cholecystectomy: Mortality: 0.7% vs 3,7%; Peroperative complications: 3.6% vs 12.9%; Surgical postoperative complications: 7.7% vs 17.5%; Medical postoperative complications: 4.3% vs 5.5%; Lesion of the main bile duct: 0.9% vs 1.8%; Reoperation: 2.9% vs 5.5%; Hospital stay up to 4 days after surgery: 64.8% vs 18.5%. The convertion rate was of 10.7%: 8.8% in early surgery (before 4 days after de diagnosis) and 13.7% in the late surgery (after this time but in the same stay). Multiple causes led to convertion: surgical complications; complications during the pneumoperitoneum, unclear anatomy and scoliosis. Postoperative complications in laparoscopic cholecystectomies converted group vs non-converted: surgical 20.4% vs 6.2% and medical 6.8% vs 4.1%. The results justify the frequency with which laparoscopic cholecystectomy is performed in acute cholecystitis, in comparison to open surgery, thus taking an increasingly prominent place in the treatment of this disease.[9,10]

CONCLUSION:

In conclusion, Laparoscopic cholecystectomy is safer procedure as compared to open cholecystectomy in patients with acute cholecystitis.

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