

Evaluation of Efficacy of Various Techniques of Cholecystectomy: A Comparative Study

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Original

Article

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ABSTRACT

Background: Open cholecystectomy has been the treatment of choice for more than a century since its introduction and the procedure is standardized among surgeons. Encouraged by the success of laparoscopic cholecystectomy, which has become the gold-standard treatment for gallstone disease in a short span of time, laparoscopic surgery has gained in popularity and found application in almost every surgical specialty. **Aim of the study:** To compare laparoscopic cholecystectomy and open cholecystectomy with acute cholecystitis. **Materials & Methods:** The present study was conducted in the Department of General Surgery of Mahatma Gandhi Hospital, Bhilwara, Rajasthan, India. 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 44 (22 each for LC and OC) were selected. The analysis of preoperative, intra-operative, and postoperative parameters was done and was compared. **Results:** A total of 44 patients were included in the study. The surgical procedure for LC and OC were performed by experienced surgeons. The Male/Female ratio in LC and OC group was 14/8 and 12/10 respectively. The mean age of patients in LC group was 42.1±4.8 years and in OC group was 44.5±4.2 years. The mean body weight of LC and OC group was 60.2±9.3 kg and 58.6±8.3 kg respectively. The mean operative time period for LC was 66.8 minutes and for OC was 91.2 minutes. Blood loss more than 500 mL was seen in 2 patients for LC and 4 patients for OC. The nasogastric tube was employed in 8 patients in LC and 12 patients in OC. **Conclusion:** Laparoscopic cholecystectomy is safer procedure in comparison to open cholecystectomy. The postoperative stay at hospital was shorter with laparoscopic cholecystectomy.

Key words: Open cholecystectomy, laparoscopic cholecystectomy, acute cholecystitis

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INTRODUCTION

Acute cholecystitis is one of the most common surgical emergencies requiring appendectomy, with a life-time risk of 6%. The overall mortality rate for open cholecystectomy (OC) is around 0.3% and morbidity about 11%.^[1,2] Open cholecystectomy has been the treatment of choice for more than a century since its introduction and the procedure is standardized among surgeons. Encouraged by the success of laparoscopic cholecystectomy, which has become the gold-standard treatment for gallstone disease in a short span of time, laparoscopic surgery has gained in popularity and found application in almost every surgical speciality.^[3] In the early years of minimally invasive surgery, acute cholecystitis

was considered to be a relative contraindication to laparoscopic cholecystectomy because of inflammatory changes making dissection difficult and because of friability of tissues and ill-defined surgical planes.^[4] As laparoscopy became the gold standard treatment for chronic cholecystitis with cholelithiasis, and the surgeons excelled in performing the surgery, even acute cases were considered for laparoscopy.^[5] The acute inflammation associated with acute cholecystitis creates an edematous plane on liver bed.^[6] Hence, the present study was planned to compare laparoscopic cholecystectomy and open cholecystectomy with acute cholecystitis.

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METHODS

The present study was conducted in the Department of General Surgery of Mahatma Gandhi Hospital, Bhilwara, Rajasthan, 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 44 (22 each for LC and OC) were selected. 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 44 patients were included in the study. Out of 44 patients, 22 patients underwent Laparoscopic cholecystectomy and 22 underwent open cholecystectomy. The surgical procedure for LC and OC 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 14/8 and 12/10 respectively. The mean age of patients in LC group was 42.1±4.8 years and in OC group was 44.5±4.2 years. The mean body weight of LC and OC group was 60.2±9.3 kg and 58.6±8.3 kg respectively. The history of previous surgery was present in 2 patients in LC group and 3 patients in OC group. The ASA physical status score 2 was seen in majority of patients in both the groups. The comparison of data between both groups showed non-significant difference for all variables (p>0.05). Table 2 shows the comparison of postoperative parameters for both the groups. The mean operative time period for LC was 66.8 minutes and for OC was 91.2 minutes. Blood loss more than 500 mL was seen in 2 patients for LC and 4 patients for OC. The nasogastric tube was employed in 8 patients in LC and 12 patients in OC. The mean postoperative stay after completion of procedure was 6.21 days for LC and 9.21 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	LC	OC	p-value
Sex (M/F)	14/8	12/10	0.31
Mean Age (years)	42.1±4.8	44.5±4.2	0.41
Mean Body weight (kg)	60.2±9.3	58.6±8.3	0.46
Previous surgery (n)	2	3	0.09
ASA physical status score			
1	6	1	0.06
2	11	13	0.72
3	3	6	0.23
4	2	2	0.33

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

Variables	LC	OC	p-value
Operative time period (mean)	66.8	91.2	0.71
Incidence of blood loss, >500 mL	2	4	0.12
Drain	6	9	0.52
Nasogastric tube	8	12	0.02*
Mean postoperative stay (days)	6.21	9.21	0.03*
Mean days to resume diet (days)	3.21	3.91	0.16

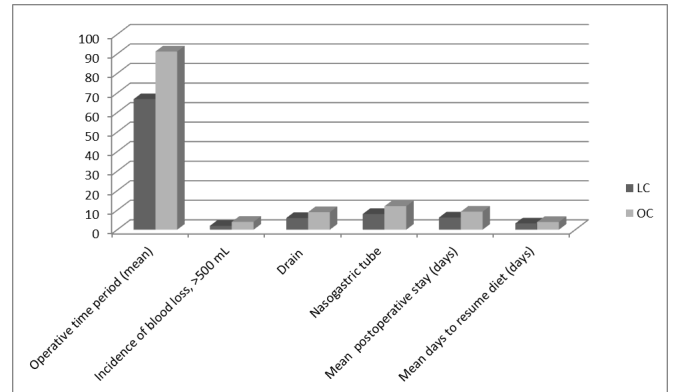


Fig 1: Comparison of post-operative parameters for both the groups

DISCUSSION

The prevalence of cholelithiasis and the incidence of complications would be expected to increase with age, therefore biliary surgery is performed more frequently for elderly patients. There is no doubt that LC is the treatment of choice for elderly patients with symptomatic cholelithiasis since the outcomes are better than those of OC in terms of lower morbidity rate and shorter hospital stay.^[7,8] In the current study, we compared laparoscopic cholecystectomy with open cholecystectomy in patient 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. Similar results were seen by other authors. Karim T et al studied safety and efficacy of laparoscopic cholecystectomy in patients of cholelithiasis by comparing with results of open cholecystectomy by comparing use of Post-operative analgesia, Operative Time, Post-operative hospital stay, morbidity and mortality. It is a prospective randomized study of 100 Patients of cholelithiasis aged between 25 years to 65 years operated during 2011-2012 at a suburban teaching hospital. They were divided into open and laparoscopic cholecystectomy group by draw a lot method. Patient's written valid informed consent for the particular procedure was taken and the pros and cons of both the procedure were explained in detail to the patient. This study was done after due clearance of Ethical committee. The median (range) operation time for laparoscopic cholecystectomy was 50-175 min (mean=103.98 min) and 35-95 min (mean=70 min) for open cholecystectomy. During the study period operation time for laparoscopic cholecystectomy showed a tendency to become shorter. The use of Injectable analgesics in case of laparoscopic cholecystectomy (Mean no. of days=1.5) is considerably less than open cholecystectomy (Mean no. of days=3.36). Conversion rate in literature in laparoscopic cholecystectomy ranges from 3% to 15% in well trained

hands. In our series it is 6% in spite of being a teaching and training institution. The authors concluded that minimally invasive surgery is better than open cholecystectomy in terms of post-operative pain, analgesic requirement and early return to work. However, open cholecystectomy is preferred method for Surgeons in the beginning of their career and in case of difficult cholecystectomy.^[9]

Antoniou SA et al investigated the comparative effect of laparoscopic and open cholecystectomy in elderly patients. Laparoscopic cholecystectomy has induced a revolution in the treatment of gallbladder disease. Nevertheless, surgeons have been reluctant to implement the concepts of minimally invasive surgery in older patients. A systematic review of Medline was embarked on, up to June 2013. Studies which provided outcome data on patients aged 65 years or older, subjected to laparoscopic or open cholecystectomy were considered. Mortality, morbidity, cardiac and pulmonary complications were the outcome measures of treatment effect. The methodological quality of selected studies was appraised using valid assessment tools. The random-effects model was applied to synthesize outcome data. Out of a total of 337 records, thirteen articles (2 randomized and 11 observational studies) reporting on the outcome of 101559 patients (48195 in the laparoscopic and 53364 in the open treatment group, respectively) were identified. Odds ratios (OR) were constantly in favor of laparoscopic surgery, in terms of mortality, morbidity, cardiac and respiratory complications. Critical analysis of solid study data, demonstrated a trend towards improved outcomes for the laparoscopic concept, when adjusted for age and co-morbid diseases. They concluded that further high-quality evidence is necessary to draw definite conclusions, although best-available evidence supports the selective use of laparoscopy in this patient population. Yang TF et al evaluated preoperative risk factors for converting laparoscopic to open cholecystectomy (LOC). Evaluated risk factors of all clinical studies published from 1990 to 2012. All kinds of converting laparoscopic to open cholecystectomies were searched in the the Med-line, Embase, Science Citation Index, and PubMed databases. Random and fixed-effect models were used to aggregate the study endpoints and assess heterogeneity. The RevMan 5.2 was used for pooled estimates. Eleven NRCTs containing 14645 patients (940 in the LOC group and 13705 in the LC group) were included in the present meta-analysis. From the pooled analyses, age > 65 years, male gender, Diabetes Mellitus, acute cholecystitis, thickened gallbladder wall and previous upper abdominal surgery were independent predictive risk factors for conversion. Previous lower abdominal surgery, preoperative endoscopic retrograde cholangiopancreatography (ERCP) and the gallstone pancreatitis were not significantly associated with conversion.

Their study indicates that age > 65 years, male gender, acute cholecystitis, thickened gallbladder wall, Diabetes Mellitus and previous upper abdominal surgery were significantly associated with increased risk of conversion. Evaluating these factors was useful for the doctors to make suitable operation scheme.^[10,11]

Lujan JA et al performed a prospective study in 264 patients aged >65 years undergoing surgery for symptomatic cholelithiasis. They were divided into two groups according to the surgical technique performed: OC (131 patients) and LC (133 patients). Conversion from LC to OC was necessary in 11 patients (8.3%). Mean surgery time was 70.9 min for the OC group and 75 min for the LC group. The LC group had a lower rate of postoperative complications (13.53%) than the OC group (23.6%). The incidence of mild complications was similar in both groups; however, the rate of moderate complications was significantly higher in the OC group. Hospital stay was significantly longer in the OC group (9.9 days) than in the LC group (3.71 days). These results suggest that LC should be indicated in elderly patients, as they are better than those obtained with OC and involve a lower morbidity rate and shorter hospital stay.^[12]

CONCLUSION

From the results of present study, we conclude that Laparoscopic cholecystectomy is safer procedure in comparison to open cholecystectomy. The postoperative stay at hospital was shorter with laparoscopic cholecystectomy.

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