

ORIGINAL ARTICLE

OUTCOME OF EARLY LAPAROSCOPIC CHOLECYSTECTOMY IN ACUTE CALCULOUS CHOLECYSTITIS

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Background: Laparoscopic cholecystectomy was introduced in mid 1980s as treatment of symptomatic gallstone disease. This study was conducted to compare the outcome of early vs interval laparoscopic cholecystectomy in acute cholecystitis. **Methods:** It was a randomized controlled study conducted at Department of Surgery, DHQ Teaching Hospital, DI Khan from Jan 2018 to Jan 2019. Eighty patients with diagnosis of acute calculous cholecystitis were included in the study and were divided into 2 groups of 40 each. Group-A underwent early laparoscopic cholecystectomy within 72 hours of presentation. Group-B were kept on conservative treatment, discharged after improvement, and readmitted at 6 weeks interval for laparoscopic cholecystectomy. Patients who failed to respond to conservative treatment after 48 hours were operated in the same admission but were kept in group B. Length of stay, intra-operative blood loss, complications, mean operative time, and conversion rate were documented. **Results:** There were 6 (15%) males and 34 (85%) females in group A, and 5 (12.5%) male and 35 (87.5%) female patients in group B. Mean operating time (79.65±8.33 vs 99.5±10.78 min, $p=0.002$), mean operative blood loss (52.12±9.99 vs 81.22±8.63 ml, $p=0.000$), and mean duration of hospital stay (3.1±0.3 vs 8.1±.8 days, $p=0.000$) were observed in group A and B respectively. Frequency of bile duct injury was higher in group B (0% vs 0.025%), but the difference was not significant ($p=0.500$). **Conclusion:** Early laparoscopic cholecystectomy is better regarding hospital stay, early recovery, complications, and conversion rate compared to delayed laparoscopic cholecystectomy with acute cholecystitis.

Keywords: Acute calculous cholecystitis, Laparoscopic cholecystectomy, Biliary calculi, Cholecystitis

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INTRODUCTION

Gallstone disease is one of the common upper gastrointestinal diseases with worldwide prevalence of about 2–15%.¹ However, it is symptomatic only in 20–30% of the patients with colicky pain being the most common presenting symptom.² Symptomatic gallstone disease has both infective and non-infective presentations.² The common complications of symptomatic gallstone disease are acute calculous cholecystitis (ACC) leading to chronic cholecystitis, acute pancreatitis, mucocele gallbladder, empyema gallbladder, gangrenous gallbladder and gallbladder perforation which can lead to life threatening peritonitis.³

The common opinion about treatment of acute cholecystitis is initially conservative treatment followed by interval cholecystectomy.⁴ Cholecystectomy can be done either open or laparoscopically.⁵ However, with the increase of advancements, laparoscopic cholecystectomy has become a popular alternative to open cholecystectomy (OC).^{6,7} It was first introduced in the mid of 1980s⁸ and with the passage of time and advancement it is becoming the gold standard in the treatment of ACC.⁹

There is a continuous debate regarding different time intervals of the procedure that is 'early' or 'interval' in case of ACC till date.¹⁰ Early laparoscopic

cholecystectomy (LC) is usually performed within 72 hours of admission, while interval LC after 6–8 weeks of conservative treatment.¹¹ Earlier studies have shown that early LC has higher complication rate, a prolonged operation time, and a higher rate of conversion to open surgery because of perceived difficulties in dissection. Conservative treatment of acute cholecystitis followed by delayed-interval LC became a commonly accepted practice in the nuance of laparoscopy.¹² With the growing experience and improvement in laparoscopic skills, many recent studies have demonstrated that early LC is safe for ACC.¹³ Randomized trials have also shown that early LC for the treatment of ACC is safe, feasible, and associated with a shorter hospital stay.¹⁴

A controversy still exists locally that which is preferable, early versus interval laparoscopic cholecystectomy. Hence, in USA, the standard is early LC within 48–72 hours, whereas in UK, according to the National Institute for Health and Care Excellence guidelines, implemented in 2011 and updated in 2017, LC should be performed within 1 week of presentation, but despite a drive toward providing early surgery, many patients in the UK are still initially managed conservatively with planned interval laparoscopic cholecystectomy 6–8 weeks following discharge.¹⁵

The aim of this study was to compare the outcome of early vs interval laparoscopic

cholecystectomy in cases of acute cholecystitis. In this study, we implement our experience in a trial to have guidelines toward early cholecystectomy compared with delayed cholecystectomy in patients with acute calculous cholecystitis.

PATIENTS AND METHODS

This was a randomized control trial conducted at the Department of Surgery DHQ Teaching Hospital, Dera Ismail Khan. All patients were admitted through emergency or outdoor patient department. Patients were randomly allocated in two groups, i.e., group A and group B by lottery method after taking history. All patients were properly investigated including blood complete picture, LFTs, serum Amylase, random blood sugar and ultrasound abdomen. Patients having obstructive jaundice or acute pancreatitis were excluded from the study. All patients were kept nil by mouth and conservative treatment including intravenous antibiotics, IV fluids, analgesics and proton pump inhibitor.

Group A patients were planned and counselled for early cholecystectomy on the upcoming OT list within two days. Informed written consent was taken including conversion to open surgery. In group B patients were kept for conservative treatment initially, and interval cholecystectomy was planned at 6 weeks.

Group B patients were kept on conservative treatment initially for 48–72 hours and were closely observed for deterioration. If the patient improved with conservative treatment, he/she was discharged and counselled and readmitted for interval cholecystectomy after 6 weeks. And if the patient deteriorated within 24–48 hours or developed complication like mucocele, empyema or suspected perforated gall bladder, the patient was operated immediately but was kept in group B as per already allocated group. All patients were operated by the same surgeon.

Parameters assessed for both groups were demographic data like age, gender etc. and length of hospital stay, operation time, conversion rate and complications like biliary injury or conversion to open surgery. Data was collected on predesigned proforma. Results were analysed using SPSS-22, and $p \leq 0.05$ was considered significant.

RESULTS

A total of 80 patients were included in the study, which were divided into group A and B with 40 patients in each group. Demographic data was recorded on a pre-designed proforma while taking history. Other aspects including operating time, length of stay, conversion rate, complication like biliary injury, amount of blood loss during surgery and operating time were assessed and compared in both groups including the outcome.

Groups A included 34 (85%) females and 6 (15%) males and group B had 35 (87.5%) female and 5 (12.5%) male patients ($p=0.623$). Mean age of both the groups A and B was 45.3 ± 4.5 years and 47.8 ± 6.12 years respectively ($p=0.265$). Length of hospital stay for group A was 3.1 ± 0.3 days and that for group B was 8.1 ± 0.8 days including both initial admission for conservative treatment and later post interval laparoscopic cholecystectomy. None of the group A patient was converted to open cholecystectomy, neither any major complication like biliary injury was observed.

Mean operative blood loss for group A was 52.12 ± 9.99 ml and that for group B was 81.22 ± 8.63 ml with a $p=0.000$ which is statistically significant. Thus, blood loss was less in group A patients as compared to group B. Mean operating time for group A and B was 79.65 ± 8.33 minutes and 99.5 ± 10.78 minutes respectively ($p=0.002$). Early LC took less time than interval LC.

In group B, all patients were admitted for conservative treatment initially and were reassessed after 72 hours for deterioration. Thirty-three (82.5%) patients improved, discharged and readmitted for interval cholecystectomy after 6 weeks. Among the rest seven patients, 3 patients developed mucocele gall bladder, 3 patients developed empyema gall bladder and one patient developed gangrenous gall bladder. All these 7 patients were operated initially laparoscopically but among them 3 patient’s needed conversion to open surgery because of complication or difficult dissection and remaining four went successfully. Among those three patients who had been converted to open surgery, one patient had undergone biliary injury for which T-tube was placed and removed 10th day postoperatively. Other 2 patients had dense dissection and increased bleeding.

Seven patients who were operated due to development of complication were included in group B as the groups were allocated in the beginning of surgery and were not excluded from the study (Table-1, 2).

Table-1: Demographic characteristics of the patients

Demographic Characteristics	Group A (n=40)	Group B (n=40)
Age (years)	45.3±4.5	47.8±6.12
Male	6	5
Female	34	35

Table-2: Comparison of variables between groups

Variables	Group A (n=40)	Group B (n=40)	p
Length of stay (days)	3.1±0.3	8.1±0.8	0.000*
Blood loss (ml)	52.12±9.99	81.22±8.63	0.000*
Mean operative time (minutes)	79.65±8.33	99.5±10.78	0.002*
Complications (Biliary injury)	0 (0.0%)	1 (0.025%)	0.500
Conversion to open cholecystectomy	0 (0.0%)	4 (0.1%)	0.058

Independent sample t-test, *Significant

DISCUSSION

The feasibility of the early laparoscopic technique in the condition of ACC has been assessed and reported in several publications.^{1,6,22}

In this study the age of the patient ranges from 26–61 years with a mean age of 45.3±4.5 vs 47.8±6.12 years, which shows that middle age group population is the most affected group of this disease. Similar age pattern was observed in a study conducted by Mustafa *et al.*¹⁶ In our study 85% patients were female and 15% were male in group A with a female to male ratio of 5.6:1 which is consistent with another study conducted at Khyber Teaching Hospital Peshawar by Naeem *et al.*¹⁷ and reported 82% female patients. This shows that acute calculous cholecystitis is more common among females than males. Initially laparoscopic cholecystectomy was considered as relative contraindication in acute cholecystitis but with the more experience and expertise in laparoscopy, it has been adapted in acute cases as well because results are comparable as in few national and international studies.^{10,18}

Mean length of stay, mean operating time and mean peroperative blood loss were significantly lower in group A patients with early laparoscopic cholecystectomy as compared to interval cholecystectomy. Earlier studies have reported less hospital stay for early laparoscopic cholecystectomy. A study conducted by Riquelme *et al.*¹⁹ observed mean length of stay was 2.5 vs 7 days which is consistent with our study. Mean operative time shown in this study was 72 vs 77 min which is also similar to our study. Another study²⁰ had shown shorter length of stay in early laparoscopic cholecystectomy and low blood loss which is in agreement with our study.

In our study there was no conversion in group A cases and no complications like biliary injury was seen as compared to interval cholecystectomy in which there was about 0.025% of biliary injury. Altieri *et al.*²¹ showed low complication rate in early cholecystectomy as in our study, though not statistically significant.

Early LC is a better option than interval LC. The advantage of early laparoscopic cholecystectomy over the interval cholecystectomy is that it decreases the hospital stay which in turn decreases burden on patient as well as the hospital. Morbidity of patient in terms of early recovery from disease because conservative trial period is omitted and direct intervention reduces the antibiotic and analgesic needs. In Group A, when laparoscopic cholecystectomy was performed within 72 hours, all cases were done successfully without complications. As adhesions are early so dissection in plane does not need much operating time, comparable to interval cholecystectomy.²² It has been observed that due to

increasing antibiotic resistance and some patients failed conservative treatment and need urgent surgery. In these case when complications develop, conversion rate is 80%, chances of injury is more. Operating time in interval laparoscopic cholecystectomy is also more because recurrent attack can lead to dense adhesion formation which needs more time for dissection and more chances of complications. Hence, early laparoscopic cholecystectomy has better results in term of hospital stay, decreased blood loss and intraoperative time.

CONCLUSION

Early laparoscopic cholecystectomy was found to be associated with excellent outcome in terms of shorter hospital stay, less blood loss, early recovery with minimum chances of complications and low conversion rate compared to delayed laparoscopic cholecystectomy with acute calculous cholecystitis.

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