

Evaluation of Early Versus Late Laparoscopic Cholecystectomy in Calculus Acute Cholecystitis

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Abstract: The role of early laparoscopic cholecystectomy for acute cholecystitis with cholelithiasis is controversial. The aim of this prospective study was to evaluate the safety and feasibility of early LC for acute cholecystitis and to compare the results with delayed LC. Between August 2015 to August 2017, 60 patients with diagnosis of acute cholecystitis were assigned to early group, (LC within 72 hrs of admission), and delayed group, (initial conservative treatment followed by delayed LC, 6–8 weeks later). We found in our study that the conversion rate in early LC and delayed LC was 4.33% and 0%, respectively, Operation time for early LC was 69.4 min versus 66.4 min for delayed LC, post-operative complications for early LC and delayed LC were comparable, and blood loss was equivalent in both groups. However early LC had significantly shorter hospital stay (4.1 days versus 8.6 days). Early LC for acute cholecystitis with cholelithiasis is safe and feasible, offering the additional benefit of shorter hospital stay. It should be offered to the patients with acute cholecystitis, provided that the surgery is performed within 72 hrs of acute symptoms by an experienced surgeon.

Keywords: LC-Laparoscopic Cholecystectomy, AC-Acute Cholecystitis.

INTRODUCTION

Removal of the gallbladder (cholecystectomy) is currently considered the best treatment option for people with symptomatic gallstones [6]. This is generally performed by laparoscopic cholecystectomy.

Since 1990's Laparoscopic cholecystectomy made a dramatic entry in the field of general surgery. This is perhaps the only surgical procedure to be rapidly accepted throughout the globe even without customary randomised controlled trials. Not many randomised control trials were conducted worldwide to compare and evaluate laparoscopic cholecystectomy vis-à-vis open cholecystectomy. The benefits of laparoscopic cholecystectomy were too apparent and obvious to have them subjected to rigorous scientific scrutiny. Patient accepted this new modality due to advantage like smaller incision, less pain, early recovery and less hospitalisation.

For many years, surgeons have preferred to perform laparoscopic cholecystectomy once the inflammation settles down completely (which usually takes about six weeks) because of the fear of higher complication rates including injury to the bile duct[11,12].

Another reason for the surgeons' preference for delaying the operation is to avoid an open surgery, as there has been a perception that early surgery increases the risk of an open surgery[10,12]. However, delaying the surgery exposes the people to the risk of complications related to gallstones.

As acute cholecystitis forms the major bulk of cholecystectomies, its timing poses another challenge to the laparoscopic surgical scientists. In the pre laparoscopic era, prospective randomised studies demonstrated that early open cholecystectomy done within seven days of onset of symptoms was superior to delayed interval surgery because of shorter hospital stay of recuperation period.

In this prospective study of sixty patients we plan to compare early versus late laparoscopic cholecystectomy for acute calculus cholecystitis. We will judge efficacy of early cholecystectomy on the parameters of intraoperative morbidity, conversion rate,

post-operative morbidity, pain score and socio-economic benefits that include post-operative stay, total hospital stay, total recuperation period and duration of loss of working capacity between early and delayed surgery and see which should be the preferred approach.

AIMS AND OBJECTIVE

The role of early laparoscopic cholecystectomy for acute cholecystitis with cholelithiasis is not yet established. The aim of our prospective study was to evaluate the safety, feasibility and efficacy of early Laproscopic Cholecystectomy for acute cholecystitis and to compare the results with delayed Laproscopic Cholecystectomy.

MATERIALS AND METHODS

This prospective cohort study was conducted in MMIMSR from 2015 to 2017, over a period of 1.5 years. The study was comprised of 60 patients selected for laparoscopic cholecystectomy with the diagnosis of acute cholecystitis. These patients were divided into 2 equal groups (A&B).

Group A was studied as early group of 30 patients in whom laparoscopic cholecystectomy was done within 3-5 days of onset of symptoms and diagnosis of acute cholecystitis. Group B was studied as late group of 30 patients in whom delayed laparoscopic cholecystectomy was performed.

Inclusion criteria

- Patients with symptomatic gall bladder disease.
- Acute or chronic cholecystitis with cholelithiasis.

Exclusion criteria

The following patients were not considered in the study.

- Patients with spreading peritonitis.
- Patients with previous upper abdominal surgery.
- Any bleeding disorder.
- Patients those are unfit for surgery due to cardiac or renal compromise.
- Suspected malignant disease or pregnancy.

Conduct of operation

After randomisation and obtaining valid consent operation, early or late performed by consultant under general anaesthesia and endotracheal intubation in supine position with nasogastric tube in position. Pneumoperitoneum is created with veres needle through incision in supraumbilical region with pressure maximum of 14 mm of Hg. This site converted to camera port. Then epigastric port 10 mm put for dissection and suction. 5 mm port put on Right side in midclavicular region below costal margin and fourth port 5mm in right flank at the level of umbilicus. Then proper anatomy is defined in reference to Calots triangle and cystic duct and artery identified, dissected, clipped and cut. Gall bladder is dissected from liverbed with monopolar cautery. Complete haemostasis is

achieved and port sites closed with stapler without or with drain if required. If need to be converted to open then Subcostal incision is used.

Postoperative assessment

Postoperative patient allowed orally liquids after 6 hrs. Analgesic and anti-emetics given sos. Severity of pain noted on visual analog scale.

Study parameters

All data related entered in Performa.

Statistical Analysis

Data was statically analysed by using student t-test, Fisher's exact test, and Wilcoxon rank-sum test. A P value <0.05 was considered significant.

RESULTS

In the present study the mean age in group-A was 44.6±14.96yrs and in group-B was 46.37±9.23yrs. Maximum cases in group-A were present in age group of 38-47yrs while in group-B they were present in age group of 48-57yrs. The male to female ratio in early group is 4:11 and delayed group is 7:8.

Clinical findings

In the study 30(100%) patients in group-A present with Pain while in group-B also 30 (100%) patients presented with the chief complaint of Pain. 15 (50%) patients in group-A had dyspepsia while in group-B, 12(40%) patients had dyspepsia. 17 (56.67%) patients in group-A had nausea while 12(40%) patients in group-B had the same complaint. 15 (50%) patients in group-A had vomiting while in group-B only 2(6.67%) patients had the complaint. 5(16.67%) patients in group-A had fever while 2(6.67%) patients in group-B had fever. 2(6.67%) patients in group-A and 2(6.67%) patients in group-B had cough. 5(16.67%) patients in group-A and 2(6.67%) patients in group-B had past history of diabetes or hypertension. 13 patients in group-A had history of previous surgery while 4 patients in group-B had history of previous surgery.

6(20%) patients in group-A and 8(26.67%) patients in group-B had icterus. 26 (86.67%) patients in the early group had a positive Murphy's sign while only 6(20%) patients in group-B had a positive Murphy's sign.

Laboratory Investigation

5(16.67%) patients in group-A and 6(20%) patients in group-B had haemoglobin concentration less than 10 g/dl. 7(23.33%) patients in group-A had Raised TLC while in group-B 3(10%) patients had a raised TLC. 7(23.33%) patients in group-A and 2(6.67%) patients in group-B had a raised Total bilirubin. 6(20%) patients in group-A and 2(6.67%) patients in group-B had a raised Direct bilirubin.

Usg findings

9(30%) patients in group-A and 4(13.33%) patients in group-B had single calculus on USG. 13(43.33%) patients in group-A had adhesions while 8(26.67%) patients in group-B had adhesions. 10 (33.33%) patients in group-A and 2(6.67%) patients in group-B had increased wall thickness.

Operating time

7(23.33%) patients in group-A and 12(40%) patients in group-B were operated in under 1(3.33%) hour. 21 patients in group-A and 17(56.67%) patients in group-B were operated in 1-2 hours. 2(6.67%) patients in group-A and 1(3.33%) patient in group-B were operated in over 2 hours.

Adhesions and conversion

22(73.33%) patients in group-A and 13(43.33%) patients in group-B had adhesions. 2(6.67%) patients in group-A and no patient in group-B were converted from Laparoscopic Cholecystectomy to Open operation.

Drain requirement

23(76.67%) patients in group-A had a drain placed while in group-B only 7(23.33%) patients had a drain. No drain was placed in 6(20%) patients of group-A and 23(76.67%) patients of group-B. 13(43.33%) patients in group-A and 5(16.67%) patients in group-B had drain placed for 1-3 days. 11(46.67%) patients in group-A and 2(6.67%) patients in group-B had drain for more than 3 days.

Analgesic requirement

22(73.33%) patients in group-A had an analgesic requirement of more than 3 doses. While in group-B there were 12(40%) patients who required more than 3 doses of analgesics.

Hospital stay

one(3.33%) patient in group-A had a stay of less than 5 days while in group-B there were no patients with stay <5 days (Total hospital stay for two admissions, one for conservative management and second for operative part) . 22(73.33%) patients in group-A and 27(90%) patients in group-B had a total hospital stay between 5-10 days. 7(23.33%) patients in group-A and 3(10%) patients in group-B had a stay of more than 10 days.

Complications

There was no death in any of these two groups and there is no bile duct injury occurred in any patient. Morbidity rate was 24%(8/30) in group A and 18% (6/30) in late group.

DISCUSSION

It was proved earlier that early open cholecystectomy was safe in acute cholecystitis and

having medical and socio-economic advantages over delayed elective cholecystectomy before the pendulum swung towards laparoscopic cholecystectomy. Due to advent of LC in 1987, the application of LC in acute calculous cholecystitis remained controversial due to suspected higher rate of biliary injury and other complications. This study was done to evaluate safety and feasibility of LC in acute cholecystitis.

In our study total hospital stay in early group is less by 5 days from late group and the period of patient's incapacity for work by around two weeks. The data suggested that for acute cholecystitis early surgery is preferable when performed by experienced surgeons with adequate pre and post-operative aids. Besides lower cost it offers the advantage of avoiding recurrent attacks and emergency operations without increasing mortality and morbidity [1].

In our study complication rate in early group is 24% and in late group is 18% which is comparable. According to, there was no difference in frequency of intra-operative and post-operative complications between early group and delayed group [2]. According to [13] there was no significant difference in bile duct injuries and other complications between the two groups¹⁸ In our experience in acute setting there is more adhesions and edema and vascularity and usually GB is distended and in this setting experience of the surgeon is most important factor. Using harmonic scalpel and decompressing gall bladder is very helpful. Surgery was performed within 72 hours of admission in our study in the early group and in delayed group patients were put on conservative management and called after 6-8 weeks after acute attack for elective laparoscopic cholecystectomy.

In our study 3(10%) patients in early group and 4(13.3%) patients in delayed group had obstruction in the CBD, they were subjected to endoscopic retrograde cholangiopancreatography (ERCP) prior to surgery and CBD was cleared. Wilson *et al.* did ERCP in one patient of acute cholecystitis that developed jaundice in post-operative period. Chi-Leung *et al.* [8] did the ERCP in the postoperative period in early group in 1 patient and pre-operative ERCP in 11 patients.¹⁷ Chung *et al.* [9] in their patients did the ERCP prior to surgery in the patients with evidence of cholangitis or CBD obstruction as done in our study.

In our study all the patients in early group and 9(60%) patient in delayed group had distended gall bladder. 8(53.33%) patients in early group and 9(60%) patients in delayed group contained turbid bile, biliary sludge or pus in gall bladder.

Wilson *et al.* also found more dense adhesions to gall bladder including localized necrosis with delaying the surgery [3,4]. In study conducted by Chi-Leung *et al.* gall bladders were more distended in early

group as in our study than delayed group and turbid bile or pus was more in gall bladder in early group[8].

In selective patients, aspiration of gall bladder done in the present study, the same was also done in both the studies. However adhesions were more encountered in early group in our study, 14 patients (93.33%) as compared to 10(66.67%) patients in delayed group but they were denser in delayed group as compared to early group including fibrosed gall bladder in some patients. In study conducted by Chi-Leung *et al.* severe dense adhesions were more in delayed group as compared to in early group. In our study gall bladder perforation was encountered in 3(20%) patients in early group and 5(33.39%) patients in delayed group[8] Jarvinen *et al.* in their study had gall bladder perforation in total 5 patients, 2 patients in early group and 3 patients in delayed group[1]. Norrby *et al.* in their study 2 patients encountered gall bladder perforation in early group while none in delayed group[2].

Mean surgery time (after the patient being induced under general anaesthesia up to removal of gall bladder) was 56.67±11.70 (minutes) in early group and 75.67±20.52 (minutes) in delayed group. So more of operative time required in delayed group as the adhesions were denser including fibrosed, necrosed and contracted gall bladder in some patients. Norrby *et al.* took 110±55 minutes in early group while 100±40 minutes in delayed group [2]. Rattner *et al.* showed that lesser time is needed to do surgery early in acute phase.[5] In study conducted by Chi-Leung *et al.* the total operative time was more in early group than in delayed group (141.5±55.2 minutes) in early and 108.8±47.4 (minutes) in delayed group[8].

2(6.67%) patients in our study needed conversion to open surgery and none had bile duct injury. Chi-Leung *et al.* in their study had overall conversion rate of 13.5% in both the groups[2]. Guruswamy *et al.* reported a 19.7% in the early group while it was 22.1% in the late group[13]. Chung *et al.* in their study had 11% conversion rate in early group and 23% in delayed group[9]. One patient in delayed group had bile duct injury in their study. In our study 20% patients in early group and 26.67% patients in delayed group developed post-operative complications, including wound infection (1:1), chest infection (1:2) and urinary tract infection (1:1). In study- conducted by Jarvinen *et al.* no mortality was seen in early group while one patient died of post-operative thrombosis of superior mesenteric artery in delayed group[1]. The abdominal complications were more seen in the delayed group (11% in early group and 13% in delayed group) which is comparable to our study. In study conducted by Chi-Leung *et al.* 22% patients in early group and 20% patients in delayed group developed post-operative complications[8]. Reported no significant difference between early (6.5%) and late (5%) group in terms of Bile duct injuries. There was no significant difference

in terms of other serious complications[13]. Closed suction drainage was required in all the patients in early group.

The post-operative pain score was 2.27±0.59 in early group by 2.67±0.72 in delayed group. So, there was not much of difference seen in post-operative pain score in both the groups studied. In our study fewer doses of analgesics were required by patients in early group as compared to delayed group. In their study found no difference in dose of analgesics required by both the groups[8]. in their study found no characteristic difference in pain score in both the groups; however, fewer doses of analgesics were required in patients of early group as compared to delayed group as seen in our study[9].

Post-operative stay was 3.40± 1.99 days in early group as compared to 3.27±2.91days in patients of delayed group and total hospital stay was 5.07±2.19 days in patients of early group and 8.07±3.17 (which includes double hospitalisation)days in patients of delayed group. So, total hospital stay was significantly shorter in early group by around 3 days than in delayed group in our study. In study conducted by the post-operative stay was same in both the groups while total hospital stay was shorter by 6 days in early group than delayed group[1]. The results were similar as in our study. noted in their study that the total hospital stay in the early group was 4 days less than the delayed group[13].

In our study total recuperation period was a bit shorter in early group as compared to in delayed group (9.80±2.57 days in early group, 9.93±2.05 days in delayed group) but not showed much of difference. The duration of loss of working capacity was significantly shorter in early group than in delayed group (18.27±6.26 days in early group and 24.27±6.67 days in delayed group). observed shorter total recuperation period in early group than in delayed group. The duration of loss of working capacity was significantly shorter in patients of early group than in the delayed elective group by 11 days[9].¹⁷ The results are similar to our study.

Hence, at the end of the study, the observations reveal that in cases of acute cholecystitis early surgery (0-3 days) has many advantages over delayed surgery (4-6 weeks). Hospital stay, analgesic requirement, post-operative complications etc. were less in the early group (A). Loss of work and expenses were also less in group-A. However a larger number of patients and a longer duration of study would definitely yield confirmatory results. Moreover, early surgery would be beneficial when done by a surgeon with good experience in dealing with complicated Laparoscopic gall bladder surgery.

CONCLUSION

In conclusion, our data show that LC for AC during the index admission is safe and associated with a low morbidity and a low conversion rate. These findings refer not only to those patients who undergo surgical treatment very early, but also to those treated after the window of the first 3 or 7 d from the onset of symptoms. Further prospective randomized trials focusing on this particular question are required to validate these results. However, it appears reasonable to state that in units with expertise in laparoscopic surgery, every effort should be made to operate on all patients with AC during the index admission as soon as diagnosis is made and co-morbidities are dealt with, regardless of the time delay from the onset of symptoms. This policy is safe, not associated with a higher conversion rate or morbidity and results in an overall shorter hospitalization by avoiding re-admissions.

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