Evaluation of Early Urgent Versus Delayed Urgent Laparoscopic Cholecystectomy in the Treatment of Acute Cholecystitis

Imran Javed, Muhammad Fahim, Naveed Akhtar Malik, Muhammad Sohaib Khan, Iram Adalat, Jahangir Sarwar Khan, Muhammad Mussadiq Khan
Department of Surgery, Holy Family Hospital, Rawalpindi and Rawalpindi Medical College

Abstract
Background: To compare the timing of laparoscopic cholecystectomy and injury to common bile duct (CBD) and frequency of failure (conversion rate from laparoscopic to open cholecystectomy) of early urgent versus delayed urgent laparoscopic cholecystectomy in acute cholecystitis.

Methods: In this randomized controlled trial 110 patients, diagnosed as acute cholecystitis were divided into two groups for laparoscopic cholecystectomy. Those who were operated within 72 hours of admission to hospital were labeled as Early urgent laparoscopic cholecystectomy (EUC) group whereas those undergoing surgery after 72 hours to 02 weeks’ time were considered as Delayed urgent laparoscopic cholecystectomy group (DUC). Conversion rate from laparoscopic to open cholecystectomy and injury to CBD were compared in two groups.

Results: Out of 55 patients enrolled as EUC group, 51 were female and 4 were male patients. Mean age was 39.91 ± 10.17 years where as in DUC group, there were 45 female and 10 male patients in a total of 55 patients, and the mean age was 39.76 ± 11.23 years. Conversion rate from laparoscopic surgery to open cholecystectomy was 5.45 % (03 patients) and 12.72 % (07 patients) in EUC and DUC groups respectively. The overall conversion rate was 9.09%. Obscure anatomy and adhesions were the cause of conversion. There was no statistical significance between conversion rates of the two groups. (p = 0.185). There was no bile duct injury detected in EUC group whereas 03 patients had a bile leak in their drains detected on first post-operative day, and was managed conservatively. None of these patients required surgical intervention. No statistical significance was found between the CBD injury in two groups. (p = 0.079)

Conclusion: Acute cholecystitis should be managed by laparoscopic cholecystectomy regardless of the time elapsed since the start of symptoms. There is no statistical significance of CBD injury or conversion rate from laparoscopic to open cholecystectomy associated with the timing of surgical intervention in the case of acute cholecystitis.

Key Words: Acute cholecystitis, laparoscopic cholecystectomy, CBD injury, conversion rate.

Introduction
Acute cholecystitis is seen more often in females and gall stones are the causative factor in majority of the cases. Definitive treatment is cholecystectomy and with the advancement of minimal invasive surgery, laparoscopic cholecystectomy has been considered as a gold standard for the management of acute cholecystitis. The optimal timing when to perform laparoscopic cholecystectomy is still under debate. Many surgeons recommend early surgery whereas others are in favor of delayed surgery.1

Laparoscopic cholecystectomy for symptomatic gallstones is usually performed after the acute cholecystitis episodes settles because of fear of higher morbidity and conversion from laparoscopic to open cholecystectomy during acute cholecystitis. Those who are managed conservatively, after an initial attack of acute cholecystitis can have additional attacks of pain or inflammation which are common.2

Though laparoscopic cholecystectomy is a procedure of choice for symptomatic gall stones, acute cholecystitis was a contraindication to laparoscopic cholecystectomy in the past because of the greater risk of injury to the bile duct.3 By the passage of time, as the laparoscopic surgery advanced, and the skills of laparoscopic surgeons evolved it was possible to do laparoscopic cholecystectomy even for the management of acute cholecystitis. Evaluation is required to decide at what optimal safe time, surgeon should intervene in the management of acute cholecystitis.
In randomized and prospective trials comparing early laparoscopic cholecystectomy with a delayed procedure as well as in meta-analyses of these trials, early treatment has consistently been associated with shorter overall hospitalization. Although many surgeons recommend early laparoscopic cholecystectomy in acute cholecystitis, debate still exists regarding its optimal timing. By the improvement of operative skills in laparoscopic surgery, timings of when to operate a case of acute cholecystitis is studied and advocated to do laparoscopic cholecystectomy within 72 hours of symptoms.

During surgical management of acute cholecystitis conversion of laparoscopic surgery to open procedure is an important impediment. Various studies done in recent past showed no difference in conversion rate when timing of laparoscopic surgical intervention is compared in case of acute cholecystitis. One of predictors of the need for conversion includes duration of symptoms of more than a range of 72 to 96 hours.

**Patients and Methods**

The study was conducted at the surgical unit I, Holy Family Hospital, Rawalpindi, from April 2009 to October 2009. Patients diagnosed as acute cholecystitis (n=110), were divided into 2 groups (55 in each group) to undergo laparoscopic cholecystectomy. Fifty five patients undergoing early urgent laparoscopic cholecystectomy (EUC) and 55 undergoing Delayed urgent laparoscopic cholecystectomy were evaluated. All patients presenting with acute cholecystitis between age 20 to 50 years and ASA class I and II were included. Patients presenting with features of acute cholecystitis and having comorbid illnesses like Chronic liver disease, previous upper abdominal surgery and clinical suspicion of other causes of acute abdomen like acute appendicitis, were excluded.

Patients were considered as case of acute cholecystitis if they had at least two of the three parameters positive, i.e., tender right hypochondrium, raised total leucocyte count (>11000) and wall thickness of gall bladder >4 mm on ultrasound. Laparoscopic cholecystectomy performed within 72 hours of admission to hospital was considered as Early Urgent laparoscopic cholecystectomy (EUC). Laparoscopic cholecystectomy after 72 hours to 02 weeks of admission to hospital was considered as Delayed Urgent laparoscopic cholecystectomy (DUC). Injury to common bile duct (CBD) was detected as: Spillage of bile from CBD per operatively, post operatively bile seen in the drain and any collection in the gall bladder fossa, detected by ultrasound and confirmed by ultrasound guided aspiration of bile. Frequency of failure (conversion rate) was the rate of conversion from laparoscopic to open cholecystectomy.

All patients were randomly assigned to either early urgent laparoscopic cholecystectomy (EUC) group i.e. Group A or delayed urgent laparoscopic cholecystectomy (DUC) group i.e. Group B, by lottery method. Patients were rehydrated with lactated Ringer’s solution, given one gram (1G) ceftriaxone IV preoperatively and at the time of induction of anesthesia, 50mg of ranitidine IV and analgesic agents consisting of paracetamol and diclofenac sodium. The injury to common bile duct (CBD) was detected either by spillage of bile from CBD per operatively, detection of bile in the drain post operatively or by detecting fluid in gall bladder fossa on ultrasound that was confirmed by the ultrasound guided aspiration of bile. All qualitative data (common bile duct injury and frequency of failure i.e. conversion rate) was compared by chi square test in both groups. A p-value of less than 0.05 was considered statistically significant.

**Results**

Patients were in the age group of 20 to 60 years. Mean age of patients in EUC group was 38.91 years whereas of DUC group was 39.76 years. There were 55 patients in each group, 4(7.3%) male and 10(18.2%) female patients in EUC group and 10(18.2%) male and 45(81.8%) female patients in DUC group respectively. Patients converted to open cholecystectomy in case of early urgent laparoscopic cholecystectomy were 3(5.45%), whereas cases converted to open surgery in the delayed urgent laparoscopic cholecystectomy group were 7(12.72%).

| Table 1- Mean age, gender distribution, conversion rate and CBD injuries in two groups. |
|----------------------------------------|-----------------|-----------------|----------|
| Early Urgent Cholecystectomy (n=55) | Delayed Urgent Cholecystectomy (n=55) | p-value |
| Mean Age | 38.91 | 39.76 | 0.185 |
| Male | 4(7.3%) | 10(18.2%) | 0.185 |
| Female | 51(92.7%) | 45(81.8%) | p=0.079 |
| Conversion Rate | 3(5.45%) | 7(12.7%) | 0.185 |
| CBD Injury | 0(0.00%) | 3(5.45%) | p=0.079 |

In all the cases, obscure anatomy and adhesions were the cause of conversion. There was no excessive bleeding or bowel injury in any of the patients. In this study, there was no Common bile duct (CBD) injury detected in Early urgent laparoscopic cholecystectomy...
perform it in second week as the inflammatory process leads to adhesions and makes the dissection very difficult.18

Definition of early laparoscopic cholecystectomy is still unsettled.19 A few authors have placed patients who are operated within 72 hours duration of start of symptoms as early cholecystectomy whereas others have performed laparoscopic cholecystectomy within 01 week of start of symptoms and labeled it as early laparoscopic cholecystectomy.12 Tzovaras G et al conducted performed laparoscopic surgeries for acute cholecystitis as early as start of symptoms. They divided the patients into three groups according to the timing of surgery: (1) within the first 3 days, (2) between 4 and 7 days and (3) beyond 7 days from the onset of symptoms. The conversion rate for the whole cohort of patients was 4.6%. There was no significant difference in the conversion rate between the three groups.19 A study conducted in Japan by Uchiyama K et al, advocated early laparoscopic cholecystectomy within 72 hours of onset of symptoms to decrease conversion rates from laparoscopic to open surgery.8 Sher Mohammad et al, from Chandka Medical College, Pakistan reported 6% conversion rate in 100 consecutive patients of acute cholecystitis.20 Laparoscopic cholecystectomy can be safely performed irrespective of time elapsed from start of cholecystitis. Although conversion rate is high when surgery is performed after 3 days but even then there is no statistical significance of conversion rate between the various groups divided on basis of timings.21-23

In present study, the high overall conversion rate (9.09%) in comparison to other studies done in various part of the world is suggestive of a learning curve in performing laparoscopic cholecystectomy in acute cholecystitis. It is recommended that centers where laparoscopic surgery is in evolving phase, initially laparoscopic cholecystectomy should be performed on cases of chronic cholecystitis or biliary colic. Once the results are up to a desired level regarding conversion rate and biliary tract injury, then acute cases should be intervened.

Regarding biliary tract injuries, in our study we experienced 03 cases of biliary leak that were detected as bile in the drain on first post-operative day. All the three cases were reported in DUC group and were managed conservatively as minor leaks (<300ml day). None of these patients required any surgical intervention. Comparing this minor biliary leak (overall 2.72%, 3/110 patients) with the comparatively high conversion rate of 9.09%, it is obvious that whenever the operating surgeon was in doubt about the anatomy of Calot's triangle, converting procedure to open cholecystectomy is safe. The CBD injury in laparoscopic cholecystectomy for acute cholecystitis ranges from 0-3%24, 25. The CBD injury (overall bile leak 2.72%) was comparable to the results of various studies.9,20,26

Other parameters, like operation time/ anesthesia time, post-operative hospital stay, total hospital stay, patients satisfaction, cost effectiveness, which were not a part of this study also need to be addressed as there is a significant less operative time and total hospital stay associated with early laparoscopic cholecystectomy when performed within 72 hours of start of symptoms27.

In our setup, where all the health facilities are government based, and as our hospitals are already overburdened, there must be initiatives taken which result in increased turnover of patients, shorter overall hospital stay and cost effectiveness.
Conclusion

1. Delayed laparoscopic cholecystectomy, for acute cholecystitis, beyond 72 hours does not increase the risk of CBD in jury and failure of laparoscopic procedure i.e. conversion to open cholecystectomy, provided the patient is fit for surgery, technical facilities are available and the surgeons are well trained.

References

14. Hussain A, Mahmood HK, Dulk K. Laparoscopic cholecystectomy can be safely performed in a resource-limited setting: the first 49 laparoscopic cholecystectomies in Yemen. JSLS. 2008;12:71-76
26. Al-Mullhim AA. Laparoscopic cholecystectomy is feasible and safe in acute cholecystitis. JSLS. 1999; 12: 56-60