ORIGINAL ARTICLE

Outcome of Laparoscopic Cholecystectomy in Patients of Acute Cholecystitis

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ABSTRACT

Objective: To assess the outcome of laparoscopic cholecystectomy (LC) in the treatment of acute cholecystitis.

Study Design: Quasi experimental study.

Place and Duration of Study: The study was conducted at Surgical Unit I, Department of General Surgery, Pakistan Institute of Medical Sciences, Islamabad from 1st Jan 2013 to 31st Dec 2018.

Materials and Methods: All those patients who reported within 72 hours of onset of symptoms of acute calculus cholecystitis were included. Patients of acute pancreatitis, choledocholithiasis, with comorbids and previous abdominal surgery were excluded. Three port LC was performed in patients of acute cholecystitis after diagnosis by consultant skilled surgeon. Data were collected in a proforma that included demographics of the patient, operative findings, operating time, intra- or post-operative complications and duration of hospital stay. Data was collected and SPSS version 20 was used for analysis.

Results: Total 143 patients of acute calculous cholecystitis were studied with 38 males and 105 females. The mean age of patients was 46.23 years ranged from 22 to 76 years. The mean operative time was 68.1 ± 25.31 minutes with conversion rate of 2.1%. The overall rate of complication was 24.5 per cent and no serious bile duct injury was noted in any patient. Bleeding (5.6%) and biliary injury (2.1%) were intraoperative complications. Port site infection (6.3%), chest infection (3.5%) and biliary leak (2.8%) were major postoperative complications. The mean total hospital stay was 4.16 (3–8 days).

Conclusion: Laparoscopic Cholecystectomy can be performed safely in patients with acute calculous cholecystitis within 72 hours of the onset of symptoms.

Key Words: *Acute Cholecystitis, Biliary injury, Cholelithiasis, Laparoscopic Cholecystectomy, Post site infection.*

Introduction

Gall stone disease has a worldwide prevalence of 10 – 15% and around 20 percent of patients with cholelithiasis present with acute calculus cholecystitis.[1] Laparoscopic cholecystectomy (LC) has been accepted as the gold standard in treating chronic symptomatic cholecystitis calculus since 1992.[2] However LC was not previously considered as a preferred treatment in patients with acute cholecystitis. Conservative management was done followed by elective cholecystectomy after 6 – 8 weeks of interval time. Surgeons had concerns regarding increased complication rate and high chances of conversion. Initially laparoscopic cholecystectomy was performed in selected cases, but with advances in instrumentation, improved visualization due to new cameras, increased knowledge of the hepato-biliary anatomy and improved surgical skills, surgeons began performing laparoscopic cholecystectomy even in acute cholecystitis, which was initially considered a relative contraindication.[3]

LC for the surgical treatment of patients with acute cholecystitis remains debatable,[4, 5] in particular the timing of LC with respect to inflammation, oedema and Calot's triangle adhesions. More complications like excessive bleeding, increased chance of common bile duct injury and conversion are known to be associated with LC for the treatment of acute cholecystitis.[6] Nevertheless, some surgeons recommended early LC as preferred treatment for acute cholecystitis, with increased experience and improvement of the instruments.[7] Several randomized controlled trials Comparison of early LC (performed within 7 days of symptoms onset) with delayed LC (usually performed 4 to 6 weeks after symptoms onset) reported benefits with early LC of

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shorter hospital stay, decreased cost and same level of clinical safety with no major morbidity or mortality discrepancy.[8] However sample size of the trials was not big except Gutt et al who recently reported a randomized controlled multicenter trial of 618 patients.[9] With this emerging supportive data, still only a minority of surgeons are performing early LC in patients with acute cholecystitis.

Once the surgeons had experience in laparoscopic surgery, early LC for acute cholecystitis in the western countries became popular in the 1990's. Tokyo Guidelines 2018 (TG13) of Japanese Society of Hepato-Biliary-Pancreatic Surgery stated that the ideal management for acute cholecystitis due to cholelithiasis is early LC, mainly before 72 h of the symptom onset.[10] Few studies showed that urgent LC should be the first choice therapy for AC in patients who are fit for operative intervention.[11,12]

The purpose of this study is to evaluate the surgical outcomes of LC for acute calculous cholecystitis within 72 h of symptom onset, as this subject is less addressed in our local setup. Keeping in consideration the results of recent research favouring early LC in acute cholecystitis, this trial is planned with the purpose of evaluating the outcome of LC in patients with acute cholecystitis. The objective of the study is to assess the outcome of LC in the treatment of acute cholecystitis in terms of difficulty of procedure, operative time, duration of hospital stay and incidence of complications.

Materials and Methods

This interventional Quasi experimental study was conducted in Surgical Unit I, department of General Surgery, PIMS, Islamabad from 1st Jan 2013 to 31st Dec 2018. Sample size of 143 patients with acute cholecystitis due to cholelithiasis was calculated by using WHO formula taking power of study = 80 and selected by convenient sampling. Study was conducted after taking approval from hospital ethical committee. Patients were included for inclusion after having written informed consent.

Patients who presented within 72 hours of symptoms of acute cholecystitis in emergency department were included in the study. Diagnosis of acute calculus cholelithiasis was made by either senior postgraduate, senior registrar or assistant professor using clinical, laboratory and radiological findings. Right hypochondrium tenderness with positive Murphy's sign, leukocytosis, oedematous distended and/or thickened gall bladder, presence of stones and pericholecystic fluid on ultrasound examination were the criteria considered for acute cholecystitis. Patients with choledocholithiasis, previous abdominal surgery, acute pancreatitis and comorbid like hypertension, heart disease, diabetes were excluded from the study.

Patients underwent LC on first available list within 72 hours by consultant surgeon skilled in laparoscopy and was performed using three ports. The study parameters in terms of difficulty in dissection during surgery, operating time, intraoperative and postop complications, postoperative hospital stay, and need to convert to open cholecystectomy were studied.

Data were collected and entered in a pre-designed proforma that included demographics of the patient, operative findings, operative time, intra- or post-operative complications and hospital duration. The Social Sciences Statistical Package (SPSS version 20) was used for the entry and analysis of the collected data. Descriptive statistics for both qualitative and quantitative data was determined. The mean and standard deviation was determined for quantitative factors, such as age and gender. We estimated the frequency and percentages of qualitative data such as gender, difficulties in dissection and the need for open surgery conversion.

Results

Among 143 patients with acute calculous cholecystitis, 38 were males and 105 were females with a ratio of males and females of 1:3.1. The mean age of patients was 46.23 years, ranged from 22 to 76 years. Majority of patients belonged to fourth and fifth decade. Patients' demographics and preoperative clinical data is presented in table I. Ultrasound findings are shown in table II.

The mean operative time was 68.1 ± 25.31 minutes. Laparoscopy was successful in 140 cases, and three cases were converted into open cholecystectomy. The reasons for conversion were unclear and distorted anatomy of Calot's triangle due to thick dense adhesions, edema and exudates, bile leakage from cystic duct with suspicion of injury to common bile duct, and unexplained bleeding. Three patients had biliary injury, two to common hepatic duct and one to accessary duct in gall bladder fossa, during surgery and were managed preoperatively.

Operative and postoperative data was shown in table III.

There was no death in this study. The overall complication rate was 24.5 per cent and no major bile duct injury occurred in any patient.

Postoperative pain was experienced with variable degree of intensity. Visual analog scale (VAS) was used to measure pain intensities. 81 (56.6%) patients had mild pain, 54 (37.8%) had moderate pain, and eight (5.6%) had severe pain as calculated by VAS. The average duration of hospital stay was 4.16 (3–8 days).

Table I: **Patient's Demographics and Preoperative Clinical Data (N=143)**

Data	Frequency	Percentage/Range
Age (years)	43.26 ± 11.28	22 – 76
Gender		
Male	38	26.5
Female	105	73.4
Pain		
Pain right hypochondrium	131	91.6
Epigastric pain	106	74.1
Referred pain	117	81.8
Nausea and vomiting	124	86.7
Positive Murphy's Sign	136	95
Palpable tender mass	23	16

Table II: Pre-Operative Ultrasound Findings

Findings	Frequency	Percentage
Thick wall gall bladder	121	84.6
No of stones		
Single	24	17
Multiple	113	79
Sludge	06	04
Pericholecystic fluid	101	70.6
Empyema gall bladder	07	4.9
Mirizzi's syndrome	03	2.1

Table III: **Operative and Post-Operative Data (n=143)**

Data	Frequency	Percentage / Range
Operative time (min)	68.1 ± 25.31	35 – 116
Intraoperative complications		
Bleeding	08	5.6
Biliary injury	03	2.1
Conversion to open technique	03	2.1
Drain		
Patients with drain	89	62.2
Duration	1.18 ± 2.9	1 – 4
Postoperative complications		
Biliary leak	04	2.8
Port site infection	09	6.3
Chest infection	05	3.5
Wound haematoma	02	1.4
Prolonged ileus	04	2.8
Hospital stay (days)	4.16 ± 1.76	3 – 8

Discussion

The application and timing of LC in patients of acute cholecystitis is still controversial, despite of guidelines published that advocate early LC during same hospital admission.[13] Recently, few studies indicate that LC is feasible and considered safe for acute cholecystitis with various complications and conversion rates.[14,16] But are these complications and conversions appropriate to surgeons and especially patients who are at the end of suffering? Therefore, further studies are required to obtain definitive results. With this background and intent, we studied the outcome of LC in acute cholecystitis as well as evaluating feasibility and safety in our local setting.

Mean age of patients in this study was 43.26 ± 11.28 (22 – 76 years), which is in consistent with the regional studies[8,17] but less than the European studies (58 years).[18,19]

In the present study, the mean operating time was 68.1min (35 – 116) that is comparable to other studies.[2,20] we started LC in patients of acute cholecystitis after many years of experience of LC in cholelithiasis; so less operative time is possibly due to increase in skills and gaining more confidence. Jarrar M S et al stated that the length of the operation for delayed LC group was significantly longer than for the early LC group (97 minutes versus 82.17 minutes, p=0.003).[21]

LC was successfully completed in 140 patients and only three cases were converted to open cholecystectomy. This conversion rate of 2.1% is in consistent with Rehman et al[22] (2.4%) and Abdelkader M et al[1] (2%) but less than reported by Farooq A et al[2] (5%). Reasons for conversion to open were difficult anatomy and bleeding. The inflammation associated with acute cholecystitis results in an oedematous plane around the gall bladder, which promotes the dissection. This feature was observed in almost all cases therefore,

dissection in majority of these cases was easy, associated with lesser needs to convert to open cholecystectomy. The ease of dissection also resulted lesser mean operative time and low morbidity. The patients had lesser severity of postoperative pain and nausea/vomiting episodes.

Laparoscopic cholecystectomy is more likely to be successful within the 72 hours following the onset of symptoms and operation in the next available elective list. This approach is associated with lesser incidence of major complications.[23] We agree that several main technical aspects need to be taken into account when conducting laparoscopic surgery for acute cholecystitis. We used some modifications to handle these technical difficulties, like decompression of the gall bladder, use of retrieval bag, subhepatic drain and widening of epigastric wound.

The overall complication rate was 24.5% that is comparable to rate reported by other researchers.[16,18] Intraoperative two patients with bleeding and one with bile duct injury were converted to open cholecystectomy.

Limitations of the study are less sample size and single centered study. Future studies are recommended as randomized control trials for outcome of early versus late LC in patients of acute calculus cholecystitis to strengthen the evidence of beneficial effect of LC in acute cholecystitis.

In summary, recent literature favors laparoscopic cholecystectomy in acute cholecystitis, although the timing of operation is debatable. Evidence suggests that LC within 72 hours of onset of symptoms is both safe and cost effective.[24] Patients with acute cholecystitis who are discharged without undergoing surgery may have a high risk of presenting with gall stone complications. So early LC in patients of acute cholecystitis is a favorable option in experienced hands.

Conclusion

Laparoscopic Cholecystectomy can be performed safely in patients with acute calculus cholecystitis in expert hands and should be done within 72 hours of the onset of symptoms. It is more effective in terms of patient safety, less operative time, and less duration of hospital stay without increase in morbidity or mortality.

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