Original Article

Role of Laparoscopic Cholecystectomy in Early Management of Acute Calculous Cholecystitis

Amir Iqbal Memon[1*], Shazmah[1], Agha Taj Mohammad[1], Tarnum Naz[1], Aisha Masroor Bhatti[1], Hitesh Kumar[1]

ABSTRACT

OBJECTIVE: To demonstrate the results of early laparoscopic cholecystectomy in patients having acute calculous cholecystitis undergone surgery, primarily focusing on hospital stay and postoperative complications to biliary injury and port site infection.

METHODOLOGY: This observational study was conducted at surgical department Unit-II, Liaquat University Hospital Jamshoro/Hyderabad and Minimal Invasive Surgical Center from July 2018 to June 2019 with a Non-probability, consecutive sampling technique. Patients of acute calculous cholecystitis, irrespective of sex between 15-60 years, who need admission for laparoscopic cholecystectomy were included. Calculous acute cholecystitis, hepatitis B and C+ve, coagulopathy, patients below the age of 15 years and above 60 years, gall bladder cancer, acute pancreatitis, choledocholithiasis and previous abdominal surgery."

RESULTS: 138 patients, 127(92.02%) female and 11(7.91%) male. The mean age was 41.13±4.50 years. Presented with RHC pain 77(55.79%), RHC along with epigastrium pain 61(44.20%), nausea & vomiting 41(29.71%), dyspepsia 29(21.01%) and fever 38(27.53%). Ultrasound revealed single stone 39(28.26%), multiple stones 99(71.73%), impacted stone at gallbladder neck in 26(18.84%), thick wall gallbladder in 69(50%), pericholecystic fluid in 101(73.18%) and mucocele 13(9.42%) patients.

Complications were biliary injury 2(1.44%), bleeding in 7(5.07%), port site infection or abscess 3(2.17%), conversion to open surgery 5(3.62%), injury to organs and mortality0% patients. Mostly patients discharged on 3rd postoperative day 75(54.34%), followed by 2nd postoperative days 53(38.40%) patients."

CONCLUSION: Early laparoscopic cholecystectomy in acute cholecystitis is possible, safe, cost-effective and requires shorter hospital stay without affecting the morbidity and mortality if surgical intervention is done within 72 hours of the onset of symptoms.

KEYWORDS: Acute calculous cholecystectomy, early laparoscopic cholecystectomy, delayed laparoscopic cholecystectomy.

INTRODUCTION

Laparoscopic cholecystectomy has now become the gold-standard treatment for cholelithiasis. There is growing evidence in support of early laparoscopic cholecystectomy (LC) for acute cholecystitis[1-3]. Acute cholecystitis, as a significant complication of gallstones, is diagnosed in 10% to 35% of patients admitted for cholecystectomy[4,5]. Two approaches are available for the treatment of acute cholecystitis. The first approach is early (within seven days of onset of symptoms) laparoscopic cholecystectomy (LC) in the same hospital admission. The second approach is to keep the patient on conservative treatment, which is successful in about 90% of the cases. Then, delayed cholecystectomy is performed in the second hospital admission after an interval of 6–12 weeks[6]. The studies[7-10] found a significant advantage of early LC in reducing hospital stays and lowering costs. Most surgeons consider early LC as the optimum treatment for acute cholecystitis[11,12]. Several randomized and non-randomized studies have documented the feasibility and safety of early LC for acute cholecystitis in experienced hands[13]. Early cholecystectomy for gallstone disease is merely exemplary towards early recovery and reduces complications associated with gallstone disease[14]. The rationale of this study is to evaluate preoperative and postoperative complications and benefits in terms of early recovery and hospital stay when the acutely inflamed gall bladder is removed laparoscopically instead of conservative management followed by elective removal."

METHODOLOGY

This observational study was carried out from July 2018 to June 2019, and a sample of 138 cases came from surgical Unit II Hyderabad/Jamshoro and Minimal Invasive Surgical Center with calculous cholecystitis. Patients were chosen via a non-probability, consecutive sampling technique. All diagnosed patients of acute calculous cholecystitis, irrespective of sex, between 15 to 60 years of age, who need hospital admission for operative intervention

[1]*Department of Surgery, Liaquat University of Medical & Health Sciences, Jamshoro, Sindh-Pakistan.*
***Corresponcence:** dramiriqbalmemon@gmail.com*
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(laparoscopic cholecystectomy) were enlisted in the study. Acalculous acute cholecystitis, patients with hepatitis B and C+ve, coagulopathy and patients younger than 16 years of age and older than 60 years, patients with gall bladder ca, acute pancreatitis, choledocholithiasis, and patients with previous abdominal surgery all were excluded.

Data collection: Patients who came to surgical Unit II Hyderabad/Jamshoro and Minimal Invasive Surgical Center with features of acute calculous cholecystitis were diagnosed after history and relevant abdominal examination and confirmed by ultrasound abdomen. Those who fulfilled the criteria were enlisted and informed, and written consent was obtained after explaining the procedure, benefits, and complications. Data was put in the proforma containing biodata, history, clinical examinations and relevant investigations. After the patient had anaesthesia, fitness was kept on the following available list. Conventional 4-port laparoscopic cholecystectomy was performed. Any complication during surgery related to the biliary tree was entered in proforma. Collected data, analyzed with (SPSS) software, 22.0 version. Age was measured by mean and standard deviation as quantitative variables. Frequency and percentages were calculated for sex, complications, mortality and hospital Stay. Effect modifiers like age, sex, complications, mortality, and hospital stay were used. Stratification using student's t-test."

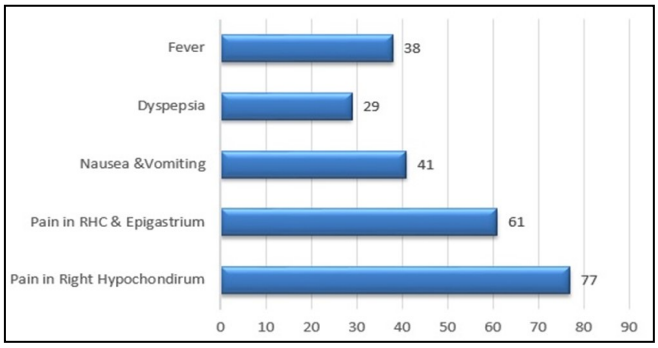
RESULTS

Of 138 patients, 127(92.02%) were female and 11 (7.91%) were male. Age ranges from 15 to 60 years. The mean age was 41.13±4.50 years.

Patients symptoms

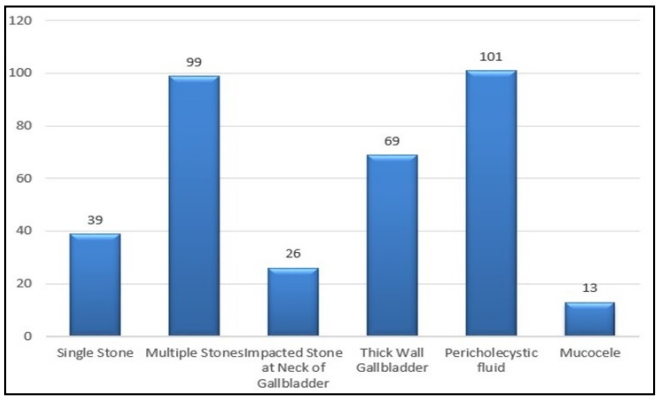
Usually, the presentation was RHC pain in 77 (55.79%), RHC associated with epigastrium pain in 61 (44.20%), nausea & vomiting in 41(29.71%), dyspepsia 29(21.01%) and fever in 38(27.53%) of cases (**Chart I**).

CHART I: PATIENTS SYMPTOMS



Ultrasound Findings: The ultrasound findings were solitary calculus 39(28.26%) and multiple calculi (stones) 99(71.73%) cases, calculi at gallbladder neck in 26(18.84%) patients, thick wall gallbladder in 69 (50%) patients, pericholecystic fluid in 101(73.18%) patients and mucocele in 13(9.42%) patients. **Chart II**.

CHART II: ULTRASOUND FINDINGS



Complications after surgery: The complications seen in this study were biliary injury in 2(1.44%) patients, bleeding in 7(5.07%) patients, port site infection or abscess in 3(2.17%) patients, conversion to open surgical procedure in 5(3.62%) patients, injury to organs and mortality reported zero percentage (**Table I**).

Hospital stay: Stay varies up to 6 days. Mostly patients discharged on 3rd day, 75(54.34%) cases followed by 2nd day, 53(38.40%) cases. It was longer, about 4-6 days in 6(4.34%) patients. The patients who developed complications after surgery or laparoscopic conversion to open surgery had a longer stay. The mean hospital stay was 2.51±0.37 days. (**Table II**) Hospital Stay (n=138)

TABLE I: COMPLICATIONS AFTER SURGERY

Complications after Surgery	No. of patients (n=138)	Percentage (%)
Biliary injury	2	1.44
Bleeding	7	5.07
Port site infection or abscess	3	2.17
Conversion to open surgical procedure	5	3.62
Injury to organs	0	0
Mortality	0	0

TABLE II: HOSPITAL STAY

Hospital stay	No. of patients	Percentage %
1 day	4	2.89
2 day	53	38.40
3 day	75	54.34
>4 day	6	4.34
Total	138	100

DISCUSSION

Acute inflammation of the gall bladder is termed acute cholecystitis. It is due to gallstones in 90-95% of cases and is the most common reason for emergency cholecystectomy[15].

Essenhigh, in 1966, initially prescribed early surgical intervention for acute cholecystitis. Multiple studies and randomized trials have been done and favour early surgical intervention with the diagnosis of acute cholecystitis. Early surgical intervention is prescribed for cases presented within 72 hours of an acute attack of pain to operate during the edema phase of acute inflammation, in comparison to late intervention as opposed due to the hypervascular phase, abscess formation, necrosis, and leads to scarring[16]. In this study, we favour surgical intervention within 72 hours of onset of symptoms.

In his study, Mohan H 2005[17] reported that 925 cases were females and 148 were males, out of 1100 total cases. Memon MR et al.[18] revealed the age variation in his research to 45 years.

Presenting features in our study were RHC pain 77 (55.79%), RHC pain associated with epigastric pain 61(44.20%), nausea & vomiting 41(29.71%), dyspepsia 29(21.01%) and fever in 38(27.53%) of cases. Moreover, Laghari AA 2008[19], in his study, reported that the frequent presenting complaints are upper abdominal pain either in the right hypochondrium (51.67%) or in the right hypochondrium and epigastric (29.17%) or epigastric pain (19.17%)."

A radiological assessment like ultrasound is a first-line diagnostic investigation of modality for patients presenting with abdominal pain[20]. Ultrasound can diagnose cholelithiasis, cholidocholelithiasis and dilation of biliary ducts. In our study, radiological findings were solitary calculus (stone) in 39(28.26%) patients. In contrast, multiple calculi in 99(71.73%) patients, calculi impacted at the gallbladder neck in 26 (18.84%) patients, thick wall gallbladder in 69(50%) patients, pericholecystic fluid in 101(73.18%) patients and mucocele in 13(9.42%) patient. Ji W et al.[21] reported multiple calculi (stones) in 69.71%, gallbladder wall thickness in 41.67% and multiple adhesions in 35% of cases."

The laparoscopic cholecystectomy procedure is technically challenging; many conditions can be complex, including acute cholecystitis, empyema gall bladder, gangrenous cholecystitis, porcelain gall bladder and intrahepatic gall bladder[22]. Apart from these, there are many other cases where it is challenging for laparoscopic cholecystectomy. These include previous laparotomy and postoperative adhesions, portal hypertension, cirrhosis of the liver and surgery in a pregnant patient[22]. Bile leakage is one of the major postoperative complications. Biliary complications, including bile leakage after cholecystectomy, are a significant cause of morbidity and extended hospital stays[23]. Though the reported figure of operative bile duct injuries is much lower than the actual incidence, a recent audit of 1522 laparoscopic cholecystectomies performed in Thailand revealed a bile duct injury rate of 0.59% [24]; this biliary injury rate is nearer to that found in our study 2 (1.44%). This study found bleeding from the port site in 3(5.07%), and the results compared with Malik AM et al.[25] study, reported bleeding from the port site in 13(0.5%) cases. In this study, the frequency of port site infection was observed in 2.17% of cases, while Shindholimath VV 2003[26] observed port site infection was 6.3%."

This study observed 5(3.62%) patients who underwent laparoscopic converted open cholecystectomy procedure because the reasons for higher conversion may have been the presence of empyema GB. In a study by Goyal V 2017[27], the conversion rate for acute cholecystitis was 5.8%. However, conversion rates of 6.5%-35% have been reported in literature[28-30]. Our study's conversion to open surgical process rate was within the acceptable conversion rate. Hence, our study favours the positive results of early laparoscopic cholecystectomy for acute cholecystitis during emergency admission, which is safe and associated with low morbidity. According to Tokyo guidelines, to decrease the complications of gallstone disease, we have to observe surgical difficulty appropriately and standardize the treatment options accordingly[32].

CONCLUSION

Early laparoscopic cholecystectomy in acute cholecystitis is possible, safe, and cost-effective. It requires a shorter hospital stay without affecting morbidity and mortality if performed within 72 hours of the onset of symptoms.

Ethical permission: Liaquat University of Medical & Health Sciences, ERC letter No. LUMHS/REC/-615.

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Data Sharing Statement: The corresponding author can provide the data proving the findings of this study on request. Privacy or ethical restrictions bound us from sharing the data publicly.

AUTHOR CONTRIBUTION

Memon AI: Main idea & scope, drafting, final approval
Shazmah: Data collection, analysis
Mohammad AT: Data collection
Naz T: Data analysis
Bhatti AM: Data analysis & reconcile
Kumar H: Data collection

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