

Safety and Feasibility of Laparoscopic Cholecystectomy in Acute Cholecystitis

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ABSTRACT

Objective: To have an audit of the outcome of laparoscopic cholecystectomy for acute cholecystitis at a tertiary care centre.

Study Design: An observational study.

Place and Duration of Study: Department of Surgery, Prime Teaching Hospital, Peshawar Medical College, Peshawar, KPK, Pakistan, from January 2011 to December 2015.

Methodology: Patients with acute cholecystitis undergoing laparoscopic cholecystectomy were evaluated for conversion rate, morbidity and hospital stay. Early laparoscopic cholecystectomy was defined as done within the same hospital admission.

Results: In 83 patients, male to female ratio was 1:1.6 with a median age of 46 years (IQR 15). The median interval between the onset of symptoms and time of surgery was 5 days (IQR 3). Majority of cases (80%) were performed after 72 hours of their presentation as acute cholecystitis. Conversion rate from laparoscopic to open cholecystectomy was 8.4% (7/83 cases), because of difficult dissection and unclear anatomy at the Calot's triangle. Median duration of hospital stay was 2 days (IQR 1). Morbidity rate was 9.6% (8/83 cases), all occurring in late presentations; port-site infection being the commonest (n=6, 7%), followed by port-site hernia and post-cholecystectomy pancreatitis (n=1 each).

Conclusion: Laparoscopic cholecystectomy is quite safe in acute cholecystitis with a low conversion rate, bile duct injuries, and hospital stay.

Key Words: *Laparoscopic cholecystectomy (LC), Early laparoscopic cholecystectomy (ELC), Delayed laparoscopic cholecystectomy (DLC).*

INTRODUCTION

Acute cholecystitis is a common problem and constitutes a major proportion of hospital admission and elective surgery world-wide. Surgical management of acute cholecystitis as well as the exact timing of laparoscopic cholecystectomy, when opted as the treatment modality, still remains controversial.

In the past, laparoscopic cholecystectomy (LC) in patients with acute cholecystitis used to be contraindicated since studies conducted in that era reported higher complication rates, a prolonged operation time, and higher conversion rates to open surgery.^{1,2} In early 1990s, the preferred and commonly practised mode of treatment for acute cholecystitis was conservative treatment followed by delayed laparoscopic cholecystectomy (DLC).²

Recent studies suggest that it is quite safer to operate within first 72 hours. This early laparoscopic cholecystectomy is now reported to have no difference in

complications and conversion rates compared to DLC in cases of acute cholecystitis, provided the operating person is an experienced surgeon and has good laparoscopic skills.^{3,4}

The current audit was aimed to determine the outcome of laparoscopic cholecystectomy in cases of acute cholecystitis, irrespective of its timing of presentation.

METHODOLOGY

After formal approval from Institutional Review Board, this clinical audit was conducted from January 2011 to December 2015; on patients treated for acute cholecystitis at Department of Surgery, Prime Teaching Hospital, Peshawar Medical College, Peshawar KPK, Pakistan.

For the purpose, a case was labelled as acute cholecystitis, if three of the following six clinical, radiological and laboratory parameters were present: (i) pain in the upper abdomen for more than 12 hours, (ii) tenderness in the right upper quadrant, (iii) positive clinical Murphy's sign, (iv) body temperature above 37°C, (v) WBC count equal or more than 10 x 10⁹/L with left shift, and (vi) sonographic signs of acute cholecystitis (e.g. gall bladder wall thickness, wall edema, pericholecystic edema, presence of calculi in GB, and positive sonographic Murphy's sign).

Standard four-port laparoscopic cholecystectomy was performed by an experienced laparoscopic surgeon with the assistance of resident medical officer. Data was

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retrieved from patient's records of the hospital. A detailed proforma was designed in MS Excel and data including patient demographics, presenting symptoms, laboratory and sonographic findings, time from onset of the pain to operation, type of surgery, duration of operation, conversion rate to open cholecystectomy, complications, and length of hospital stay, were recorded.

Early laparoscopic cholecystectomy was defined as that done in the same admission after the onset of symptoms. Delayed laparoscopic cholecystectomy was defined as the patient with acute cholecystitis, treated conservatively with antibiotics, discharged from hospital, and electively readmitted for laparoscopic cholecystectomy after two months.

All the patients who were diagnosed as acute cholecystitis according to defined criteria, and underwent laparoscopic cholecystectomy during the same admission, were included in the study.

Those patients who had laparoscopic cholecystectomy for symptomatic gall stones without acute cholecystitis, and those who had delayed laparoscopic cholecystectomy for acute cholecystitis, were excluded from the study.

The data was analysed in Statistical Package for Social Sciences (SPSS version 20.0). Median with interquartile range (IQR) were calculated for continuous data, while frequencies with percentages were calculated for categorical data.

RESULTS

Eighty-three patients underwent laparoscopic cholecystectomy during the study period. Male to female ratio was 1:1.6 (32 males and 51 females). Median age was 46 years (IQR 15). Majority of patients were Pakistani nationals (85.5%, n=71), while rest 14.5%, (n=12) were from Afghanistan.

The median interval between the onset of symptoms and time of surgery was 5 days (IQR 3), with 20.5% (n=17/83) cases performed within the first 72 hours of presentation.

The median operation time was 75 minutes (IQR 30). Median WBC count was $14 \times 10^9/L$ (IQR 6). The median duration of hospital stay was 2 days (IQR 1). Conversion rate from laparoscopic to open cholecystectomy in our series was 8.4% (7/83 cases). The common reason for conversion was difficult dissection and unclear anatomy at the Calot's triangle (n=6, 7.2%). One patient was converted to open surgery due to primary haemorrhage.

Drain was placed in four cases, three cases were converted from laparoscopic cholecystectomy to open cholecystectomy, and one case was a gangrenous gall bladder operated laparoscopically. Peroperative status of the gall bladders and histopathology results is given in Table I.

Table I: Status of the gall bladder peroperatively and histopathology results.

Peroperative status of gall bladder	Number of cases (N=83)	Percentage %
Acute cholecystitis	40	48.2%
Acute on chronic cholecystitis	16	19.3%
Empyema gall bladder	12	14.5%
Mucocele	10	12%
Gangrenous gall bladder	03	3.6%
Mirizzi's syndrome	02	2.4%
Acute cholecystitis	62	74.7%
Acute on chronic cholecystitis	16	19.3%
Acute gangrenous cholecystitis	03	3.6%
Chronic cholecystitis	02	2.4%

Morbidity rate was 9.6% (8/83 cases), with all being late presentations. Postoperative infra-umbilical port site infection occurred in 7% of the cases. Port site hernia developed in one patient. One patient with gallstone pancreatitis on 10th postoperative day, was readmitted, managed conservatively, and settled. No intra-abdominal bleed, bile leak, bile duct injury, gut injury, chest infection, urinary tract infection or ileus were recorded in patient after the procedure.

DISCUSSION

Acute cholecystitis was considered one of the contraindications for laparoscopic cholecystectomy in the initial days of laparoscopic surgery, as this was believed that it carries a higher risk when performed in patients with acute cholecystitis.^{5,6} However, with increased experience in the laparoscopic skills, LC in acute cholecystitis became safe with all the advantages of laparoscopic surgery.⁷

The optimal time for ELC still remains controversial.^{8,9} Multiple studies demonstrated the safety and low conversion rate of ELC performed within 72 hours from the onset of symptom.^{10,11} Some recent studies have concluded that ELC within 7 days is equally safe.^{4,12} In the present study, ELC was performed up to 10 days (median 5 days) from the onset of symptoms and comparable results were found regarding the conversion rate, complications and hospital stay.

In this series, it was observed that with increased experience in laparoscopic skills, much better and improved results of LC in acute cholecystitis can be achieved. It also reduces the conversion rate. This observation is contrary to the study conducted by Bender *et al.*, which states that increased experience in laparoscopic skills does not improve the results of LC in acute cholecystitis and it does not reduce the conversion rate.¹³

Many of these cases required gallbladder decompression: and in one case, ligation of cystic duct by intra corporal knots was performed. The results of this audit are also supported by other reports which suggest that LC in

acute cholecystitis should be performed by surgeons with extensive experience in elective LC, and who are able to perform different laparoscopic technique such as insertion of additional operating ports, gallbladder decompression, fundus-first dissection, and pre-tied loop for cystic duct ligation.^{14,15}

There was not a single case of bile duct injury in this group. Laparoscopic cholecystectomy in patients with acute cholecystitis was previously considered to carry a higher risk for bile duct injury.^{16,17} However, with increasing experience in LC, major bile duct injury during ELC for acute cholecystitis is becoming a rare occurrence.^{3,14}

Acute inflammation and edema at the bed of gallbladder and Calot's triangle usually facilitates the dissection. Although the inflammatory hyperemia increases the rate of intraoperative bleeding, we found hydro-dissection very useful for the removal of gallbladder from liver with minimal risk of intraoperative bleeding. None of the patients required blood transfusion.

Being a complete treatment in single admission, ELC for acute cholecystitis has demonstrated a significant reduction in the total length of hospital stay, expenses for medications and hospital costs,¹⁸ as compared to two hospital admission in cases of DLC. In this study, the length of hospital stay for ELC was significantly reduced with a median stay of 2 days.

Delayed laparoscopic cholecystectomy carries multiple disadvantages like the risk of failure of conservative treatment, a worse outcome in terms of longer operative time, and higher conversion rate due to delayed intervention, and the gallstone-related morbidity before the scheduled admission for surgery. Significant risk of developing gallstone-related complications have been reported.¹⁹ Patients awaiting cholecystectomy for longer than 12 weeks, has a significantly increased risk of gallstones-related complications like acute pancreatitis, acute cholecystitis, acute cholangitis and obstructive jaundice.²⁰

CONCLUSION

Early laparoscopic cholecystectomy for patients with acute cholecystitis was found to be a safe procedure irrespective of its timing from the onset of symptoms, when performed by an experience laparoscopic surgeon. There was no increase in conversion rate, bile duct injuries or hospital stay.

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