

ORIGINAL RESEARCH

Laparoscopic cholecystectomy as a safe and effective treatment for acute cholecystitis: A prospective study in Eastern Indian population

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ABSTRACT

Objective: The purpose of this study was to see laparoscopic cholecystectomy was feasible and safe in patients with severe acute cholecystitis.

Introduction: Laparoscopic cholecystectomy is gaining much more importance since it is accepted increasingly as the treatment of choice in the elective management of symptomatic cholelithiasis. Initially, the presence of empyema or severe gall bladder inflammation was considered a contraindication to this technique. Nevertheless, laparoscopic cholecystectomy for acute cholecystitis has been reported with a varied degree of technical success in limited series.

Methodology: The present study comprised 380 patients with acute cholecystitis of both genders. This prospective and observational study was carried out over a two-year period, from July 2018 to June 2020 after receiving approval from the institutional ethical committee and permission from the heads of the departments. The consent was taken from all enrolled patients. Data such as name, age, gender, etc. was recorded. Till the mid-1990s, this laparoscopic cholecystectomy was the gold standard approach to surgery for symptomatic gallstone disease. Prospective documentation was maintained on all patients regarding investigations, operations, complications, and early follow-up. Out of 380 patients, 95 patients with acute pain had been admitted as emergencies. Forty-eight patients who had been settled for a conservative approach were discharged and were admitted later for interval cholecystectomy. Forty-seven patients underwent surgery on their very first admission. 35 of them had developed clinical and laparoscopic evidence of acute cholecystitis.

Results: The operative findings at laparoscopy are tabulated in the table. In patients with perforation or local abscess formation, or both, thorough peritoneal lavage with saline was performed before dissection. A modified approach to the surgery might be needed quite often. Deliberate puncture and aspiration of a tensely distended gall bladder helped the retraction in 10 cases, and retrosection dissection with removal of the gall bladder fundus first was used in three cases. In a major anatomical anomaly of the biliary tree, a cystic duct arising from the right hepatic duct was observed in one patient who had undergone laparoscopic cholecystectomy. Patients who were undergoing successful laparoscopic cholecystectomy required a median postoperative stay in the hospital for

two days (range 1-6). This excluded the patient with acute renal transplant rejection and aortic valve incompetence. Despite recovering from laparoscopic cholecystectomy, she required a prolonged stay in the hospital and eventually died 72 days after the laparoscopic cholecystectomy. She had been considered unfit for aortic valve replacement surgery. Patients who had a laparoscopic cholecystectomy returned to normal activities after a median of seven days (range, 2–21) after discharge from the hospital.

Conclusion: To conclude, the data presented suggests that patients suffering from acute cholecystitis should undergo laparoscopic cholecystectomy during the initial admission, especially within 72 hours of symptoms, without added risk of conversion or complications. It is better, less morbid, less painful and avoids another hospital admission.

Keywords: Gall stones, laparoscopic cholecystectomy, acute cholecystitis

INTRODUCTION

With the advantages of less pain, a shorter hospital stay, and a faster recovery period, laparoscopic cholecystectomy (LC) has now replaced open cholecystectomy (OC) as the main choice for cholecystectomy. Despite the fact that multiple trials have indicated that LC is safe and helpful for acute cholecystitis (AC)^{1,2}, there is still controversy about whether it is beneficial for acute cholecystitis^{3,4}. If there are no contraindications to the operation, LC is advised for patients with AC soon after the onset. The treatment benefit, however, is dependent on the severity of the AC and the patient's ability to tolerate emergency surgery. Percutaneous transhepatic gallbladder drainage was originally reported in the early 1980s and was suggested in several guidelines to treat gallbladder disease^{3,5}. In recent years, laparoscopic cholecystectomy has been accepted as the treatment of choice in the elective management of symptomatic cholelithiasis. The presence of empyema or severe inflammation of the gall bladder was initially regarded as a contraindication to this technique.⁶ In uncomplicated cholelithiasis, intraabdominal endoscopy, which is commonly used for gynecologic operations, can be safely extended for cholecystectomy. Thirty-six patients had a coelioscopic cholecystectomy with only minimal complications. The primary benefits are cosmetic preservation, postoperative pain reduction, reduced hospital stay, and early return to regular activity.⁷ Nevertheless, laparoscopic cholecystectomy for acute cholecystitis has been reported with a varied degree of technical success in limited series.^{8,9} Since the introduction of laparoscopic surgery, we have tried laparoscopic cholecystectomy in almost all the patients who presented with symptomatic gall stones, even when acute inflammation is suspected or present. This group formed the basis of the present study. All those emergency patients underwent laparoscopic cholecystectomy within 72 hours of their admission to the hospital. Intravenous antibiotics were started before the procedure and continued till the surgeon's decision. As a result, low-dose subcutaneous heparin should be given to all patients as prophylaxis against venous thromboembolism.

OBJECTIVE

The purpose of this study was to see if laparoscopic cholecystectomy was feasible and safe in patients with severe acute cholecystitis.

METHODOLOGY

The present study comprised 380 patients with acute cholecystitis of both genders. This prospective and observational study was carried out over a two-year period, from July 2018 to June 2020, at the Department of Surgery, All India Institute of Medical Science, Patna, Bihar (India), and the Department of Surgery, Katihar Medical College and Hospital, Katihar,

Bihar (India), after receiving approval from the institutional ethical committee and permission from the heads of the departments. Consent was taken from all enrolled patients. Data such as name, age, gender, etc. was recorded. Till the mid-1990s, this laparoscopic cholecystectomy was the gold standard approach to surgery for symptomatic gallstone disease. 380 consecutive operations have been attempted since 1991, with only 7 failures. Prospective documentation was maintained on all patients regarding investigations, operations, complications, and early follow-up. Out of 380 patients, 95 patients with acute pain had been admitted as emergencies. Forty-eight patients who had been settled for a conservative approach were discharged and were admitted later for interval cholecystectomy. Forty-seven patients underwent surgery on their very first admission. 35 of them had developed clinical and laparoscopic evidence of acute cholecystitis. This group formed the basis of the current study. The remaining 12 patients had acute pain, but they showed little evidence of inflammation. All those emergency patients underwent laparoscopic cholecystectomy within 72 hours of their admission to the hospital. Intravenous antibiotics were started before the procedure and continued till the surgeon's decision. As a result, low-dose subcutaneous heparin should be given to all patients as prophylaxis against venous thromboembolism. Out of 35 patients, all the patients had undergone ultrasound examinations preoperatively, which showed the presence of gall stones. There was a thickening of the wall in 27 patients. The common bile duct was dilated in 9 patients. Preoperative liver function tests revealed abnormalities in 18 patients and a small increase in WBC count in 23 patients. For the study purpose, 18 women and 17 men with an age range of 26–85 years (median 64y) were included. The mean body mass index of women was 29 kg/m²(17.4–33.2) and that of men was 23.8 kg/m² (19.5–29.6). Under general anaesthesia, laparoscopic cholecystectomy was performed under laparoscopy cannulas as described by *Reddick and Olsen*.⁵ In patients who had undergone previous extensive abdominal surgery, an alternative initial insufflation site was used, usually in the right or left upper hook technique described by *Dobois et al.*² or bluntly using a suction instrument. A detailed prospective record was maintained for each patient, which included preoperative, operative, and postoperative data. Regular follow-up took place two and six weeks after the operation.

RESULTS

The operative findings at laparoscopy are tabulated in the table. In patients with perforation or local abscess formation, or both, thorough peritoneal lavage with saline was performed before dissection. A modified approach to the surgery might be needed quite often. Deliberate puncture and aspiration of a tensely distended gall bladder helped the retraction in 10 cases, and retrosection dissection with removal of the gall bladder fundus first was used in three cases. In a major anatomical anomaly of the biliary tree, a cystic duct arising from the right hepatic duct was observed in one patient who had undergone laparoscopic cholecystectomy. The median operation time for laparoscopic cholecystectomy patients was 90 minutes (range 60–185). Patients were advised to start oral fluids as soon after the operation as they felt able to drink them. Postoperative intravenous backup was required for a median of 24 hours (range 0–4 days). Antibiotics were continued for hours (a range of 0–4 days). Antibiotics were continued but discontinued in all patients by 48 hours. No reported mortality in the first 30 days. There were complications such as acute urinary retention in patients after open surgery and umbilical wound infection, which required oral antibiotic treatment in three patients. Patients who were undergoing successful laparoscopic cholecystectomy required a median postoperative stay in the hospital for two (range 1–6) days. This excluded the patient with acute renal transplant rejection and aortic valve incompetence. Despite recovering from laparoscopic cholecystectomy, she required a prolonged stay in the hospital and eventually died 72 days after the laparoscopic cholecystectomy. She had been considered unfit for aortic valve replacement surgery.

Patients who had undergone laparoscopic cholecystectomy returned to normal activities after a median of seven days (range 2–21) after discharge from the hospital. Principal findings: laparoscopic cholecystectomy in 35 patients with complicated acute gallbladder disease.

Operation findings	No. of patients
Abdominal adhesions	14
Empyema	21
Perforations	05
Adhesions to gall bladder	26
Localised necrosis	15
Severe inflammation	35
Anatomical anomaly	01



P1: Picture showing Calot's triangle dissection,



P2: Picture showing porta after division of cystic duct and cystic artery



P3: Picture showing clipping of cystic duct,



P4: Picture showing dissected Calot's triangle

DISCUSSION

Over the past decades, acute cholecystitis was a contraindication to laparoscopic cholecystectomy because of the inflammation and adhesions associated with the condition of acute cholecystitis were technically prohibitive to performing a sufficiently safe laparoscopic

operation.^{11,12} As evolution emerged over a period of time in the medical field, it led to an immense experience in performing laparoscopic surgery with reduced operative time as well as conversion and complication rates.¹³ Patients recover rapidly from the procedure, usually with dramatic resolution of symptoms, and seem to enjoy the same benefits as those undergoing elective surgery. In the present study, we had a mean operating time of 90 minutes with a range of 60–185 minutes with no reported cases of mortality. Earlier, laparoscopic cholecystectomy had a longer operative time when compared to the traditional open method, and the conversion rates were reported to be 6% to 60%, but the learning curve showed a decreasing trend in the hands of a skilled surgeon.¹⁴ The surgeon should be aware of the complications that have been associated with the laparoscopic procedure and should take maximum care to prevent bile duct injury, which sometimes leads to serious complications.¹⁵ There was no common bile duct infection in this study. It was easier to dissect during the episode of inflammation, i.e., early stages of acute cholecystitis, which created an oedematous plane in the submucosa of the gallbladder, thus facilitating the dissection from the liver bed.¹⁶ The surgeon should never hesitate to convert to open cholecystectomy to prevent severe complications if the anatomy of Calot's triangle remains unclear despite accurate dissection. There was a study by *Unger et al.* who reported success in 51 of 55 patients considered by the surgeon to have acute inflammation, although only nine patients had severe disease.¹⁰ In our study series, conversion to open surgery was unavoidably required in two patients out of 35 (6%), comparing favourably with the conversion rates in a series of elective surgeries.^{15,16} We have shown that laparoscopic surgery may be performed safely in severe, complicated cholecystitis with minimal morbidity when surgeons have sufficient experience and confidence. The recovery rate is rapid from the procedure, usually with dramatic resolution of symptoms, and seems to enjoy the same benefits as those undergoing elective surgery. In our experience, about 10% of patients with symptomatic gall stones require emergency surgery for acute cholecystitis when they fail to settle on conservative management. Almost 25% of the patients with symptomatic gallstone disease present acutely, and this trend may be increasing gradually.¹⁷ Acute cholecystitis constitutes an important and increasing proportion of the surgical workload. We think that these patients should not be denied the benefits of laparoscopic cholecystectomy in centres with appropriate experience.

CONCLUSION

The data presented suggests that patients suffering from acute cholecystitis should undergo laparoscopic cholecystectomy during the initial admission, especially within 72 hours of symptoms, without added risk of conversion or complications. It is better, less morbid, less painful and avoids another hospital admission. In most patients with severe acute cholecystitis, laparoscopic cholecystectomy is feasible, with little risk of injury to surrounding tissues and significant benefits. When appropriate surgical expertise is available, it is recommended that laparoscopic cholecystectomy be attempted in these patients

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