

ROLE OF EARLY LAPAROSCOPIC CHOLECYSTECTOMY IN ACUTE CHOLECYSTITIS

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Abstract Introduction: Acute cholecystitis is one of the most common surgical emergencies worldwide. Early laparoscopic cholecystectomy (ELC), performed within 72 hours of symptom onset, has been increasingly recommended over delayed surgery. However, concerns remain regarding operative difficulty, conversion rates, and complications. This study evaluates the safety and efficacy of early laparoscopic cholecystectomy in acute cholecystitis. **Materials and Methods:** A prospective observational study was conducted on 120 patients diagnosed with acute calculous cholecystitis. Patients underwent laparoscopic cholecystectomy within 72 hours of admission. Demographic data, operative time, intraoperative findings, conversion rates, postoperative complications, and length of hospital stay were recorded. Statistical analysis was performed using SPSS version 25. A p -value <0.05 was considered significant. **Results:** Among 120 patients, 70 (58.3%) were female and 50 (41.7%) were male. The mean operative time was 75 ± 18 minutes. Conversion to open surgery occurred in 8 (6.7%) cases. Postoperative complications were observed in 10 (8.3%) patients, with surgical site infection being the most common. The mean hospital stay was 3.2 ± 1.1 days. No mortality was recorded. **Conclusion:** Early laparoscopic cholecystectomy is a safe and effective treatment for acute cholecystitis, associated with low conversion rates, minimal complications, and shorter hospital stay. It should be considered the standard of care in hemodynamically stable patients.

Keywords: Acute cholecystitis; Early laparoscopic cholecystectomy; Conversion rate; Surgical outcomes; Minimally invasive surgery.

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INTRODUCTION

Acute cholecystitis is an acute inflammatory condition of the gallbladder, most commonly caused by cystic duct obstruction secondary to gallstones¹. It accounts for a significant proportion of emergency surgical admissions globally². The pathophysiology involves bile stasis, gallbladder distension, bacterial colonization, and inflammatory mediator release, which may progress to gangrene or perforation if untreated³.

Traditionally, acute cholecystitis was managed conservatively during the acute phase with antibiotics followed by interval cholecystectomy after 6-8 weeks⁴. This delayed approach was based on concerns that early surgery during inflammation would increase operative difficulty and complication rates⁵. However, advancements in laparoscopic techniques and perioperative care have challenged this paradigm⁶.

The Tokyo Guidelines (2018) recommend early laparoscopic cholecystectomy within 72 hours of symptom onset for Grade I and II acute cholecystitis⁷. Early surgery reduces recurrent attacks, prevents disease progression, and decreases overall healthcare costs⁸. Multiple randomized controlled trials and meta-analyses have demonstrated that early surgery is associated with shorter hospital stay without increasing morbidity or mortality⁹.

Laparoscopic cholecystectomy has become the gold standard for gallstone disease due to reduced postoperative pain, early mobilization, minimal wound complications, and shorter recovery period¹⁰. In acute inflammation, dense adhesions, edematous tissues, and unclear anatomy may increase the risk of bile duct injury¹¹. Therefore, surgical

expertise and careful dissection techniques such as the critical view of safety are essential¹².

Recent studies emphasize that early laparoscopic cholecystectomy reduces readmission rates and avoids complications related to recurrent biliary colic or pancreatitis¹³. Moreover, delayed surgery exposes patients to risks of interval attacks and emergency readmissions¹⁴.

Despite growing evidence favoring early intervention, some surgeons remain cautious due to concerns about conversion rates and operative difficulty¹⁵. However, contemporary literature suggests that conversion rates are comparable between early and delayed procedures when performed by experienced surgeons¹⁶.

This study aims to evaluate the outcomes of early laparoscopic cholecystectomy in patients presenting with acute cholecystitis, focusing on operative time, complications, conversion rate, and hospital stay.

MATERIALS AND METHODS

This prospective observational study was conducted in the Department of General Surgery of a tertiary care hospital over 18 months.

Study Design

A total of 120 consecutive patients diagnosed with acute calculous cholecystitis were included

Inclusion Criteria

- Age 18–70 years
- Clinical diagnosis of acute cholecystitis (right upper quadrant pain, fever, positive Murphy's sign)
- Ultrasonographic evidence of gallstones with gallbladder wall thickening (>3 mm)
- Symptom duration <72 hours
- Hemodynamically stable patients

Exclusion Criteria

- Acalculous cholecystitis

• Pregnancy

Suspected gallbladder malignancy

- Severe cardiopulmonary comorbidity
- Grade III (severe) cholecystitis with organ dysfunction
- Previous upper abdominal surgery

Surgical Procedure

All patients received intravenous antibiotics preoperatively. Standard four-port laparoscopic cholecystectomy was performed under general anesthesia. Critical view of safety was achieved before clipping and dividing the cystic duct and artery. Subtotal cholecystectomy was performed when anatomy was unclear.

Parameters Studied

Primary outcomes included:

- Operative time
- Conversion rate

• Postoperative complications

Secondary outcomes included:

- Length of hospital stay
- Mortality

Statistical Analysis

Data were analyzed using SPSS version 25. Continuous variables were expressed as mean ± SD. Categorical variables were expressed as percentages. Chi-square test was applied. A p-value <0.05 was considered statistically significant.

RESULTS

Table 1: Demographic Distribution

Variable	Number (n=120)	Percentage
Male	50	41.7%
Female	70	58.3%
Mean Age	44.6 ± 12.3 yrs	—

Female predominance was observed, consistent with higher gallstone prevalence in women.

Table 2: Operative Time

Operative Time	Number	Percentage
<60 min	30	25%
60–90 min	70	58.3%
>90 min	20	16.7%

Majority required 60–90 minutes, indicating moderate technical difficulty.

Table 3: Intraoperative Findings

Finding	Number	Percentage
Edematous GB	65	54%
Empyema	20	16.7%
Gangrenous	10	8.3%
Adhesions	25	20.8%

Edematous gallbladder was most common, typical in early intervention.

Table 4: Conversion Rate

Outcome	Number	Percentage
Completed laparoscopically	112	93.3%
Converted to open	8	6.7%

Low conversion rate indicates feasibility of early surgery



Table 5: Postoperative Complications

Complication	Number	Percentage
SSI	5	4.2%
Bile leak	3	2.5%
Bleeding	2	1.6%
Total	10	8.3%

Complication rate was low and manageable conservatively.

Table 6: Hospital Stay

Duration	Number	Percentage
2–3 days	80	66.7%
4–5 days	30	25%
>5 days	10	8.3%

Majority discharged within 3 days, demonstrating early recovery.

DISCUSSION

The present study demonstrates that early laparoscopic cholecystectomy is safe and effective in managing acute cholecystitis. The female predominance aligns with global epidemiological trends¹⁷. The mean operative time of 75 minutes is comparable to studies by de Mestral et al.¹⁸ and Pisano et al.¹⁹.

The conversion rate of 6.7% in our study is within the reported range of 5–10%²⁰. Early surgery avoids fibrosis associated with delayed intervention, which may actually reduce technical difficulty²¹. Previous meta-analyses have confirmed no significant difference in bile duct injury between early and delayed surgery²².

Postoperative complications were minimal (8.3%), comparable to findings by Roulin et al.²³. Early surgery reduces total hospital stay and healthcare expenditure²⁴. Our mean hospital stay of 3.2 days supports evidence that early intervention shortens overall treatment duration²⁵.

The Tokyo Guidelines strongly recommend early laparoscopic cholecystectomy in Grade I and II acute cholecystitis, provided surgical expertise is available⁷. Our findings further validate this recommendation.

Limitations include single-center design and lack of delayed comparison group.

Nevertheless, results strongly support early intervention as standard management.

CONCLUSION

Early laparoscopic cholecystectomy is a safe, feasible, and effective treatment for acute cholecystitis. It is associated with low conversion rates, minimal complications, and shorter hospital stay. Early intervention should be adopted as standard care in eligible patients.

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