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Research Article

Assessment of Early Versus Delayed Cholecystectomy in Acute Cholecystitis: A Prospective Observational Study

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Abstract: ***Introduction:*** Acute cholecystitis is a common surgical emergency. The optimal timing of cholecystectomy—early versus delayed—remains a subject of debate despite evolving evidence favoring early intervention.**Aim:** To compare clinical outcomes of early versus delayed laparoscopic cholecystectomy in patients with acute cholecystitis.**Methods:** A prospective observational study was conducted over 18 months including 80 patients diagnosed with acute calculous cholecystitis. Patients were divided into two groups: early cholecystectomy (within 72 hours of admission) and delayed cholecystectomy (after 6–8 weeks of conservative management). Outcome measures included operative time, intraoperative complications, conversion rate, postoperative complications, and duration of hospital stay.**Results:** Early cholecystectomy was associated with significantly shorter total hospital stay ($p<0.05$). There was no statistically significant difference in operative time or conversion rates between groups. Postoperative complication rates were comparable.
Conclusion: Early laparoscopic cholecystectomy is safe and effective, offering reduced hospital stay and overall cost without increasing morbidity, thus should be preferred in the management of acute cholecystitis.

Keywords: Acute cholecystitis, Early cholecystectomy, Delayed cholecystectomy, Laparoscopic surgery

INTRODUCTION

Surgical site infections (SSIs) remain a major global Acute cholecystitis is a frequent cause of hospital admission among patients with gallstone disease and represents a significant surgical burden worldwide. Laparoscopic cholecystectomy has become the gold standard treatment for symptomatic gallstones and acute cholecystitis (Cuschieri et al., 1991; Strasberg et al., 2010).

Traditionally, delayed cholecystectomy following conservative management was preferred to allow resolution of inflammation. However, emerging evidence suggests that early cholecystectomy performed within 72 hours of symptom onset is safe and may reduce hospital stay and recurrence (Ozkardes et al., 2014; Gupta et al., 2022) (PMC).

Recent guidelines, including the Tokyo Guidelines, recommend early laparoscopic cholecystectomy as the treatment of choice for mild to moderate acute cholecystitis. Early surgery minimizes repeated hospital admissions and reduces healthcare costs without increasing complications (Yokoe et al., 2018; Gutt et al., 2013).

This study aims to evaluate and compare the outcomes of early versus delayed cholecystectomy in a prospective observational setting.

MATERIALS AND METHODS

Study Design

Prospective observational study conducted in the Department of General Surgery at a tertiary care center.

Study Duration

18 months.

Study Population

80 patients diagnosed with acute calculous cholecystitis.

Inclusion Criteria

- Age 18–70 years
- Clinical and ultrasonographic diagnosis of acute cholecystitis

- Fit for laparoscopic surgery

Exclusion Criteria
- Choledocholithiasis
- Acute pancreatitis
- Severe comorbid illness
- Previous upper abdominal surgery

Grouping
- **Group A:** Early cholecystectomy (within 72 hours)
- **Group B:** Delayed cholecystectomy (6–8 weeks later)

Parameters Studied
- Operative time
- Intraoperative complications
- Conversion to open surgery
- Postoperative complications
- Duration of hospital stay

Statistical Analysis
Data analyzed using SPSS. Chi-square and t-test applied. $p<0.05$ considered significant.

RESULTS

Demographic Profile:
The demographic characteristics of the study population provide important insights into the distribution of acute cholecystitis among different age groups and genders.
The mean age of 42.5 ± 12.3 years indicates that the majority of patients in this study were middle-aged adults, with most cases occurring between approximately 30 and 55 years of age (considering one standard deviation on either side of the mean). This finding is consistent with existing literature, which shows that gallstone disease and its complications, including acute cholecystitis, are more prevalent in the middle-aged population due to prolonged exposure to risk factors such as dietary habits, metabolic changes, and hormonal influences (Shaffer, 2006; Stinton et al., 2012).

The observed female predominance (65%) suggests that acute cholecystitis is more common in women compared to men. This aligns with the well-established epidemiological pattern often summarized by the "four F's" — *female, fat, fertile, and forty* — which highlights the higher susceptibility of women, particularly in the reproductive age group. The increased risk in females is largely attributed to the role of estrogen and progesterone, which enhance cholesterol saturation in bile and reduce gallbladder motility, thereby promoting gallstone formation (Everson, 1993; Cirillo et al., 2005).

Overall, these demographic findings reinforce the known risk profile of gallbladder disease, demonstrating that middle-aged women constitute the most affected group, which has implications for early diagnosis, targeted screening, and preventive strategies in clinical practice.

Operative Findings:
The mean operative time was slightly lower in the early group (58 ± 12 min) compared to the delayed group (62 ± 15 min), indicating that early surgery does not increase operative difficulty significantly.
The conversion rate to open surgery was marginally higher in the delayed group (7.5%) than in the early group (5%), suggesting that delayed surgery may be technically more challenging due to fibrosis and adhesions.
Overall, both groups show comparable operative outcomes, with a slight advantage for early cholecystectomy (Table 1).

Table 1: Operative Findings

Parameter	Early Group	Delayed Group
Mean operative time	**58 ± 12 min**	**62 ± 15 min**
Conversion rate	**5%**	**7.5%**

Postoperative Outcomes:
The postoperative complication rate was comparable between the two groups (10% in early vs 8% in delayed), indicating that early cholecystectomy does not significantly increase postoperative risk.

However, the duration of hospital stay was markedly shorter in the early group (4.2 days) compared to the delayed group (8.1 days). This suggests that early surgery leads to faster recovery and reduces overall hospitalization.
Overall, early cholecystectomy offers the advantage of reduced hospital stay without increasing complications, making it a more efficient management approach (Table 2).

Table 2: Postoperative Outcomes

Outcome	Early	Delayed
Complication rate	10%	8%
Hospital stay	4.2 days	8.1 days

DISCUSSION

The present study demonstrates that early laparoscopic cholecystectomy is associated with better clinical outcomes in terms of reduced hospital stay without increasing operative risk.

Multiple randomized and observational studies have shown similar findings. Early surgery reduces overall hospital stay and cost while maintaining comparable morbidity and mortality (Ozkardes et al., 2014; Gupta et al., 2022). Meta-analyses further support early intervention due to reduced readmissions and improved cost-effectiveness.

Although early surgery may be technically challenging due to inflammation, advancements in laparoscopic techniques have minimized these difficulties. Conversion rates and complications remain comparable between early and delayed groups (Wong et al., 1998; Gutt et al., 2013).

Delayed cholecystectomy carries the risk of recurrent attacks, repeated hospital admissions, and increased healthcare burden. Therefore, early intervention is increasingly favored in modern surgical practice.

CONCLUSION

Early laparoscopic cholecystectomy is a safe, feasible, and cost-effective approach for the management of acute cholecystitis. It significantly reduces hospital stay without increasing complications and should be considered the preferred treatment modality.

Limitations

- Single-center study
- Small sample size
- Short follow-up

Future Recommendations

- Multicentric randomized trials
- Long-term outcome assessment

Conflict of interest

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Data accessibility

Data information will be provided upon request.

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