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Original Research Article

Timing of laparoscopic cholecystectomy following ERCP and its complications: an analytical cross-sectional study from Central India

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ABSTRACT

Background: Endoscopic retrograde cholangiopancreatography (ERCP) followed by laparoscopic cholecystectomy represents the standard treatment for patients with choledocholithiasis associated with gallstone disease.[1] However, the optimal timing of laparoscopic cholecystectomy after ERCP remains controversial.
Methods: The study included 50 patients who underwent ERCP followed by laparoscopic cholecystectomy. This is an analytical cross-sectional study was conducted in the Department of General Surgery at Government Medical College and General Hospital, Nagpur, over a period of two years from January 2023 to January 2025. Patients were divided into early (within 72 hours) and delayed (6-8 weeks) groups, each comprising 25 patients. The study was conducted after obtaining approval from the Institutional Ethics Committee**,** and all patients provided informed consent prior to inclusion. Demographic profile, operative time, conversion to open surgery, postoperative complications, recurrent hospital visits, and duration of hospital stay were analyzed descriptively.
Results: The mean age was 52.8 years with 22 females and 28 males. Mean operative time was shorter in the early group (1.4 hours) compared with the delayed group (2.1 hours). Conversion to open surgery occurred in one delayed-group patient. Postoperative complications were observed in three patients in each group, with one mortality in the early group. Recurrent hospital visits were higher in the delayed group (3.48 vs 1.92). Mean hospital stay was shorter in the early group.
Conclusions: Early laparoscopic cholecystectomy following ERCP appears safe and is associated with shorter operative time, fewer recurrent biliary admissions, and reduced hospital stay without increased complications. Early surgery should be preferred whenever feasible.

Keywords: ERCP, Laparoscopic cholecystectomy, Timing, Choledocholithiasis, Gallstone disease

INTRODUCTION

Endoscopic retrograde cholangiopancreatography (ERCP) with clearance of common bile duct stones followed by laparoscopic cholecystectomy is the standard management for choledocholithiasis and prevents recurrent biliary events.[1] Traditionally, delayed cholecystectomy has been practiced to allow inflammation and edema to subside.[2] However, exposes patients to recurrent biliary colic, cholangitis, pancreatitis, repeated hospital admissions, and increased operative difficulty due to fibrosis and adhesions.[3] Recent clinical studies increasingly support early laparoscopic cholecystectomy, demonstrating reduced hospital stay, fewer recurrent symptoms, and comparable complication rates.[4] Nevertheless, variability in real-world practice persists, particularly in resource-limited settings.The present study presents early versus delayed laparoscopic

cholecystectomy after ERCP in terms of operative outcomes, complications, and hospital utilization in a tertiary care centre in Central India.

METHODS

This analytical cross-sectional study was conducted in the Department of General Surgery at Government Medical College and General Hospital, Nagpur over a period of two years from January 2023 to January 2025. Fifty adult patients with cholelithiasis and choledocholithiasis who underwent successful ERCP followed by laparoscopic cholecystectomy were included.

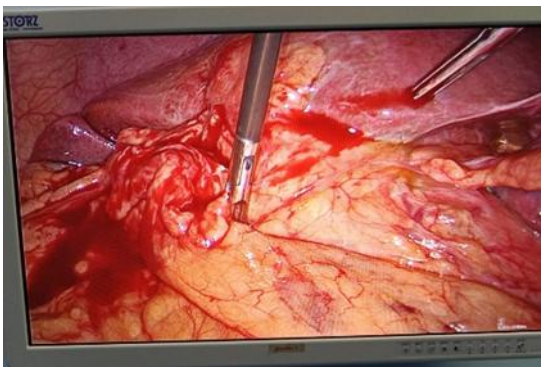

Figure 1: Difficult laparoscopic cholecystectomy.

Figure 2: Dense omental adhesions in late cholecystectomy.

Patients were divided into two groups:

Early group

Laparoscopic cholecystectomy within 72 hours of ERCP (n=25).

Delayed group

Laparoscopic cholecystectomy after 6–8 weeks (n=25).

Patients with biliary malignancy, previous upper abdominal surgery, or severe comorbid illness precluding laparoscopy were excluded. The study was conducted after obtaining approval from the Institutional Ethics Committee, and all patients provided informed consent prior to inclusion. Outcome measures included operative time, conversion to open surgery, postoperative complications, mortality, recurrent hospital visits due to biliary symptoms, and duration of hospital stay. Data were analyzed descriptively using mean values, frequencies, and percentages. No inferential statistical testing was performed.

RESULTS

A total of 50 patients were analyzed. The mean age was 52.8 years, with 28 males and 22 females. Abdominal pain was the most common presenting symptom, occurring alone or with fever, jaundice, or vomiting.

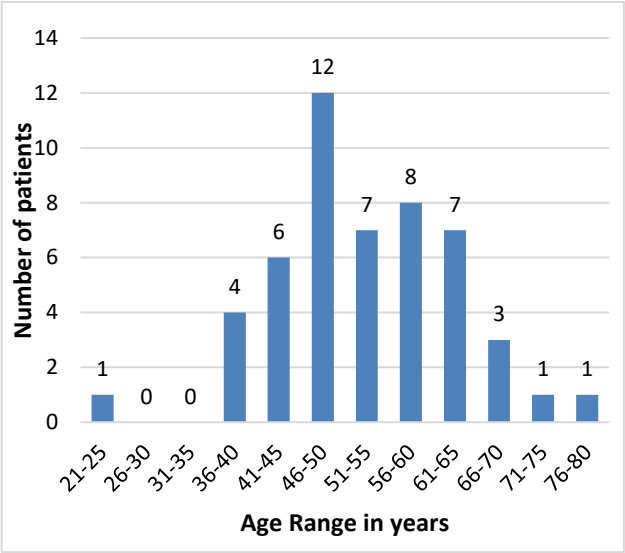

Figure 3: Age distribution.

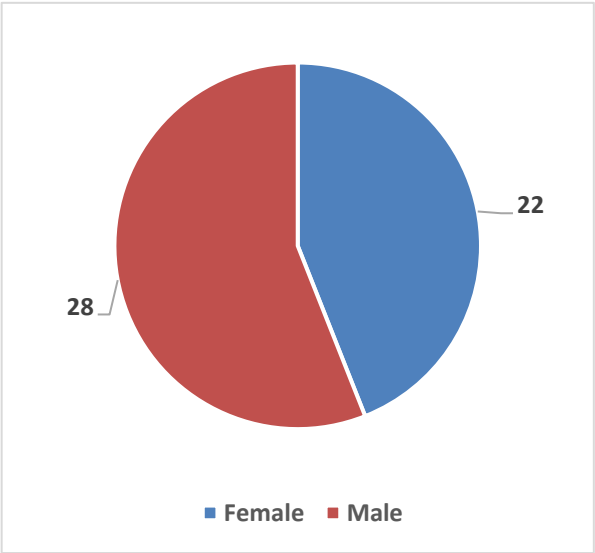

Figure 4: Gender distribution.

The mean operative time was shorter in the early group (1.4 hours) compared with the delayed group (2.1 hours),

suggesting relatively greater operative difficulty in delayed surgery. Conversion to open cholecystectomy was required in one patient in the delayed group, while no conversions occurred in the early group. Postoperative complications occurred in three patients in each group. One mortality was recorded in the early group due to postoperative sepsis, whereas no mortality occurred in the delayed group.

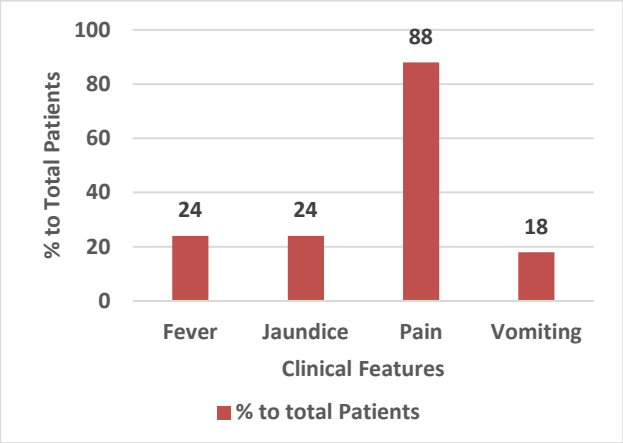

Figure 5: Distribution of clinical features.

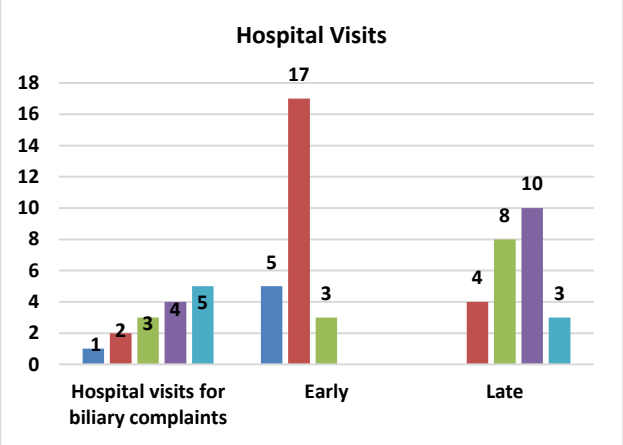

Figure 6: Hospital visits between early and late laparoscopic cholecystectomy.

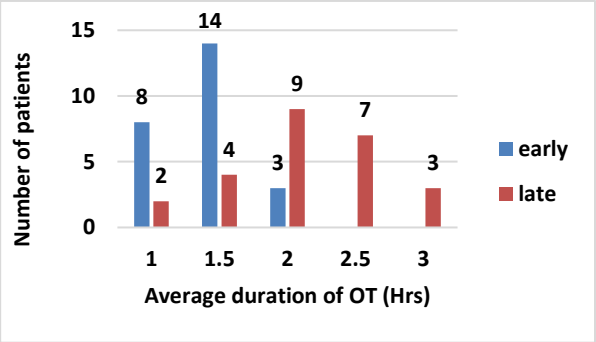

Figure 7: OT duration between two groups.

Recurrent hospital visits for biliary symptoms were more frequent in the delayed group (average 3.48) compared with the early group (1.92). The mean hospital stay was shorter in the early group (2.54 days) than in the delayed group (2.96 days).

Table 1: Complications of early and late laparoscopic cholecystectomy.

Laparoscopic cholecystectomy	Early	Late
Complications	**Number of patients**	**Number of patients**
Nil	22	22
Wound infection, fistula formation	1	1
Post op bilioma	1	1
Patient mortality	1	1

DISCUSSION

The present study demonstrates that early laparoscopic cholecystectomy following ERCP is associated with improved perioperative outcomes compared to delayed surgery, particularly in terms of operative duration, recurrent hospital visits, and overall healthcare utilization.

A key finding of this study is the shorter operative time in the early group, reflecting reduced operative difficulty. ERCP induces local inflammation and edema in the hepatobiliary region; when surgery is delayed, this inflammation progresses to fibrosis and dense adhesions, particularly in Calot's triangle, making dissection more technically challenging.[5,6] Similar observations have been seen in previous studies, where delayed cholecystectomy was resulting in increased adhesions and operative complexity.[5-7] The higher conversion rate observed in the delayed group further supports this finding. Dense adhesions and distorted anatomy increase the likelihood of conversion to open surgery, as noted in multiple studies.[8,9] Early cholecystectomy preserves anatomical planes and reduces the need for conversion.

An important clinical observation is the increased number of recurrent hospital visits in the delayed group, reflecting the risk of biliary events such as biliary colic, cholangitis, or pancreatitis during the waiting period. Previous studies and meta-analyses have consistently shown that delaying cholecystectomy after ERCP increases recurrent biliary complications.[3,10,11] The shorter hospital stay in the early group observed in this study is consistent with existing literature. Early cholecystectomy decreases repeated admissions and overall treatment duration, which is especially beneficial in resource-limited settings.[12,13] Meta-analyses have demonstrated that early LC significantly reduces total hospital stay without increasing complication rates.[4,14]

In terms of postoperative complications, comparable rates were observed between the two groups, suggesting that early surgery does not increase morbidity. This finding is supported by several studies concluding that early LC is as safe as delayed LC.[2,15] Another important aspect is the prevention of recurrent biliary pathology. Following ERCP, the gallbladder remains a source of stone formation and biliary obstruction; early removal eliminates this risk and prevents emergency readmissions.[16] Current international guidelines increasingly recommend early or same-admission cholecystectomy after ERCP whenever feasible.[17,18] However, delayed surgery continues in many centers due to certain constraints. Overall, the findings support early laparoscopic cholecystectomy after ERCP as a safe, effective, and resource-efficient approach

Limitations

The study is limited by its small sample size and single-centre design. As a descriptive comparative study, causal relationships cannot be definitively established. Larger multicenter prospective studies are required.

CONCLUSION

Early laparoscopic cholecystectomy after ERCP is safe and feasible and studies suggest it is associated with shorter operative time, fewer recurrent biliary admissions, and reduced hospital stay without increasing postoperative complications. Early surgery should be considered the preferred approach whenever possible and when the expertise is available.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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