RESEARCH PAPER

Comparative Assessment of Postoperative Outcomes in Patients Undergoing Elective Laparoscopic Cholecystectomy With Versus Without Drain Placement: An Observational Study

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Abstract

Background: Laparoscopic cholecystectomy is the standard treatment for symptomatic gallstone disease. The routine use of drains after surgery remains controversial, with conflicting evidence regarding their role in preventing postoperative complications.

Aim: To compare postoperative outcomes in patients undergoing elective laparoscopic cholecystectomy with and without drain placement.

Materials and Methods: This hospital-based observational study was conducted at Meenakshi Medical College Hospital, Kanchipuram, over one year. A total of 60 patients undergoing elective laparoscopic cholecystectomy were included and divided into two groups: drain group (n = 30) and no-drain group (n = 30). Outcomes assessed included postoperative pain using Visual Analogue Scale, postoperative complications, duration of hospital stay, and recovery. Statistical analysis was performed using SPSS, and a p value < 0.05 was considered statistically significant.

Results: Postoperative pain was significantly higher in the drain group at 6 and 24 hours ($p = 0.001$). The duration of hospital stay was also significantly longer in the drain group (3.8 ± 1.2 vs 2.4 ± 0.9 days; $p = 0.001$). There was no significant difference in postoperative complications between the two groups ($p > 0.05$).

Conclusion: Routine drain placement after elective laparoscopic cholecystectomy does not reduce postoperative complications and is associated with increased pain and longer hospital stay. Selective use of drains may be considered based on intraoperative findings.

Keywords: Laparoscopic cholecystectomy, drain placement, postoperative outcomes, gallstone disease, hospital stay, observational study.

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Introduction

Laparoscopic cholecystectomy is the gold standard treatment for symptomatic gallstone disease and is one of the most commonly performed surgical procedures worldwide. It offers several advantages over open surgery, including reduced postoperative pain, shorter hospital stays, faster recovery, and improved cosmetic outcomes. Despite its widespread acceptance, certain aspects of perioperative management, such as the routine use of drains, remain controversial [1].

Traditionally, surgical drains have been used following abdominal procedures to detect early postoperative complications such as bleeding or bile leakage and to prevent fluid accumulation. In the context of laparoscopic cholecystectomy, drains are often placed in the subhepatic space with the intention of reducing

postoperative complications and facilitating early detection of adverse events [2].

However, the routine use of drains in uncomplicated laparoscopic cholecystectomy has been increasingly questioned. Several studies have suggested that drain placement may not provide significant benefits and may instead be associated with increased postoperative pain, risk of infection, delayed mobilization, and prolonged hospital stay. Additionally, drains may act as a foreign body and contribute to patient discomfort and anxiety [3].

On the other hand, some surgeons advocate selective drain placement, particularly in cases with intraoperative difficulties, bile spillage, or suspected bleeding. The decision to use a drain often depends on intraoperative findings and surgeon preference rather than standardized guidelines [4].

The available literature presents conflicting evidence regarding the necessity of drains after laparoscopic cholecystectomy. While some studies have reported no significant difference in postoperative complications between patients with and without drains, others have suggested that avoiding routine drain placement may lead to improved patient outcomes and faster recovery [5–6].

Understanding the impact of drain placement on postoperative outcomes is essential for optimizing surgical practice and improving patient care. Evaluating these outcomes in an observational setting provides valuable insights into real-world clinical scenarios where treatment decisions are based on surgical judgment.

Therefore, the present study was undertaken to compare postoperative outcomes in patients undergoing elective laparoscopic cholecystectomy with and without drain placement in an observational study setting.

Materials and Methods

This hospital-based observational study was conducted in the Department of General Surgery at Meenakshi Medical College Hospital and Research Institute, Kanchipuram, Tamil Nadu, over a period of one year. The study aimed to compare postoperative outcomes in patients undergoing elective laparoscopic cholecystectomy with and without drain placement.

A total of 60 patients diagnosed with symptomatic gallstone disease and scheduled for elective laparoscopic cholecystectomy were included in the study. Patients aged between 18 and 65 years were considered eligible. Patients with acute cholecystitis, empyema gallbladder, gallbladder perforation, choledocholithiasis, previous upper abdominal surgery, or significant comorbid conditions were excluded from the study.

All patients underwent detailed preoperative evaluation including history taking, clinical examination, and necessary laboratory investigations. Diagnosis was confirmed using ultrasonography of the abdomen.

Based on intraoperative decision and surgeon preference, patients were managed either with drain placement (Group A) or without drain placement (Group B). No randomization was performed, as this was an observational study.

All procedures were performed using standard laparoscopic techniques under general anesthesia. In Group A, a drain was placed in the subhepatic space at the end of the procedure, whereas in Group B, no drain was used. Postoperative management was similar in both groups.

The outcomes assessed included postoperative pain using Visual Analogue Scale, incidence of postoperative complications (such as wound infection, bile leak, and intra-abdominal collection), duration of hospital stay, and time to return to normal activities.

All data collected during the study were systematically entered into Microsoft Excel and subsequently analyzed using Statistical Package for the Social Sciences (SPSS) software. Descriptive statistics including mean, standard deviation, frequencies, and percentages were used to summarize the variables. Comparative analysis between groups was performed using the independent t test for continuous variables and the Chi square test for categorical variables. A p value of less than 0.05 was considered statistically significant.

Results

A total of 60 patients undergoing elective laparoscopic cholecystectomy were included in the study, with 30 patients in the drain group and 30 patients in the no-drain group.

Table 1: Demographic Characteristics of Study Participants (n = 60)

Variable	Drain Group (n = 30)	No-Drain Group (n = 30)	p value
Mean age (years)	45.2 ± 11.3	44.6 ± 10.8	0.82
Male	12 (40%)	13 (43.3%)	0.79
Female	18 (60%)	17 (56.7%)	

The mean age and gender distribution were comparable between the two groups. There was no statistically significant difference (p = 0.82 for age and p = 0.79 for

gender), indicating that both groups were similar at baseline.

Table 2: Postoperative Pain Scores (VAS)

Time	Drain Group	No-Drain Group	p value
6 hours	5.6 ± 1.2	3.8 ± 1.0	0.001
24 hours	4.2 ± 1.1	2.9 ± 0.9	0.001

Postoperative pain scores were significantly higher in the drain group at both 6 and 24 hours compared to the no-drain group. The differences were statistically significant (p = 0.001), indicating increased discomfort associated with drain placement.

Table 3: Postoperative Complications

Complication	Drain Group	No-Drain Group	p value
Wound infection	4 (13.3%)	2 (6.7%)	0.38
Bile leak	1 (3.3%)	1 (3.3%)	1.00
Intra-abdominal collection	2 (6.7%)	1 (3.3%)	0.55
No complications	23 (76.7%)	26 (86.7%)	-

Postoperative complications were slightly higher in the drain group; however, the differences were not statistically significant (p > 0.05), indicating comparable safety between the two approaches.

Table 4: Duration of Hospital Stay

Parameter	Drain Group	No-Drain Group	p value
Mean stay (days)	3.8 ± 1.2	2.4 ± 0.9	0.001

The duration of hospital stay was significantly longer in the drain group compared to the no-drain group

Discussion

The present observational study evaluated postoperative outcomes in patients undergoing elective laparoscopic cholecystectomy with and without drain placement. The findings demonstrated that routine drain placement did not provide significant clinical benefit and was associated with increased postoperative pain and prolonged hospital stay.

In the present study, baseline characteristics such as age and gender were comparable between the two groups (p = 0.82 and p = 0.79), indicating homogeneity and reducing potential confounding. Similar observations were reported by Gurusamy KS et al [8], who emphasized that comparable baseline characteristics are essential for valid comparison in surgical outcome studies.

Postoperative pain was significantly higher in the drain group at both 6 hours and 24 hours (p = 0.001). This finding suggests that the presence of a drain contributes to increased discomfort in the immediate postoperative period. Similar results were reported by Petrowsky H et al [9], who observed increased postoperative pain in patients with drains following abdominal surgery.

The present study also demonstrated that the duration of hospital stay was significantly longer in the drain group (3.8 ± 1.2 days) compared to the no-drain group (2.4 ± 0.9 days), with a statistically significant difference (p = 0.001). This finding is consistent with Tzovaras G et al [10], who reported that routine drain placement prolongs hospitalization without improving outcomes.

With regard to postoperative complications, no statistically significant difference was observed between the two groups (p > 0.05). The incidence of wound infection, bile leak, and intra-abdominal collection was comparable. Similar findings were reported by Sharma A et al [11], who concluded that drains do not significantly reduce postoperative complications after laparoscopic cholecystectomy.

The use of drains has traditionally been justified for early detection of complications such as bile leakage or bleeding. However, the present study did not demonstrate any significant advantage in this regard. This observation is supported by Gurusamy KS et al [12], who reported that routine drainage does not reduce the risk of postoperative collections or bile leaks.

Furthermore, the presence of a drain may act as a foreign body, increasing the risk of infection and delaying recovery. Lewis RT et al [13] highlighted that drains may not prevent complications but can contribute to patient discomfort and morbidity.

The findings of the present study support the concept of avoiding routine drain placement in uncomplicated laparoscopic cholecystectomy. Selective use of drains may be considered in specific situations such as intraoperative complications or suspected bile leakage. Jani K et al [14] emphasized that drains should be used selectively rather than routinely.

Recent studies have consistently demonstrated that routine drainage offers no additional benefit. Gurusamy KS et al [15] and Petrowsky H et al [16] concluded that omitting drains can lead to better postoperative outcomes without increasing complication rates.

Overall, the findings of the present study suggest that routine drain placement after elective laparoscopic cholecystectomy is not necessary and may be associated with increased postoperative pain and

longer hospital stay without significant reduction in complication

Conclusion

The present observational study demonstrated that routine drain placement after elective laparoscopic cholecystectomy does not provide significant clinical benefit. Patients in the drain group experienced significantly higher postoperative pain ($p = 0.001$) and longer duration of hospital stay ($p = 0.001$) compared to the no-drain group. The incidence of postoperative complications was comparable between the two groups ($p > 0.05$), indicating that omission of drain does not increase the risk of adverse outcomes. These findings suggest that routine use of drains may be unnecessary in uncomplicated cases, and their use should be reserved for selected situations based on intraoperative findings.

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