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ORIGINAL RESEARCH

Timing Matters: Evaluating Early Versus Delayed Laparoscopic Cholecystectomy in Gallstone Pancreatitis

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ABSTRACT

Background: Gallstone-induced acute pancreatitis, a significant cause of morbidity and mortality, necessitates laparoscopic cholecystectomy to prevent recurrence. However, the optimal timing of surgery remains debated. This study compares outcomes of laparoscopic cholecystectomy during index admission versus delayed surgery. **Methods:** A 12-month prospective observational study at Himalayan Institute of Medical Sciences, Dehradun, included 46 patients undergoing laparoscopic cholecystectomy for gallstone pancreatitis. Patients were categorized into index admission (n=36) and delayed surgery (n=10) groups. Data on demographics, clinical presentations, surgery, complications, and outcomes were analyzed. **Results:** Among 46 patients (67.39% female, mostly in the 4th–5th decades), there was no significant difference in operative time (56.72 vs. 53.22 minutes) or difficulty. Delayed surgery resulted in longer hospital stays (10.44 vs. 6.48 days; p = 0.029) and higher unplanned readmissions (40%). Post-operative complications were minimal, with no bile duct injuries or retained CBD stones. **Conclusion:** Index admission laparoscopic cholecystectomy is safe, reduces hospital stays, and lowers recurrent biliary events, supporting its preference over delayed surgery.

Keywords: Gallstone, pancreatitis, laparoscopy, cholecystectomy, recurrent biliary symptoms, hospital stay.

INTRODUCTION

Acute pancreatitis is an acute inflammatory condition of the pancreas which can progress to a systemic inflammatory response syndrome with severe morbidity and mortality in 20% of patients (1, 2). Acute pancreatitis owing to gall stone still remains a challenge to doctors despite obtaining the highest standards of care in the present period. Gallstones contribute for 30-50% cases as an etiological factor(3).

The primary management of gallstone pancreatitis is supportive care. Effective management of gallstone pancreatitis to avert recurrence necessitates cholecystectomy to eliminate the source of gallstones. Selective endoscopic retrograde cholangiography and bile duct clearance in cases of stones, along with cholecystectomy, constitute the current therapy approach for individuals with acute biliary pancreatitis. (4) The technique of biliary decompression with ERCP and endoscopic sphincterotomy enables the surgeon to schedule a deferred laparoscopic cholecystectomy for gallstones. The timing of laparoscopic cholecystectomy in cases with acute pancreatitis remains contentious (5).

The dilemma of the optimal timing for cholecystectomy in individuals with gallstone pancreatitis has persisted since the 1980s (6). The existing guidelines for the management of gallstone pancreatitis are derived from these limited investigations (7). The British Society of Gastroenterologists (BSG) and the American Gastroenterological Association (AGA) recommend that all patients eligible for surgery, irrespective of severity, should receive cholecystectomy during the initial admission, or, if not possible, within 2 weeks (BSG) or no later than 2–4 weeks (AGA) post-discharge (8). Recently, early intervention within the initial 72 hours of acute cholecystitis has emerged as the standard of treatment to prevent readmission from recurring bouts of this illness (9). Recent studies

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advocate for laparoscopic cholecystectomy in individuals following an episode of acute mild biliary pancreatitis, even within the same hospitalisation, to prevent recurrence episodes(10).

The evaluation of laparoscopic cholecystectomy in gallstone pancreatitis provides substantial insights into its complexity and the influence of time on patient outcomes. Early cholecystectomy is typically preferred, especially in mild instances, due to its association with decreased length of hospital stay and lower morbidity and fatality rates. The subsequent sections detail the principal findings from the literature.

With this background this study aims to evaluate the difficulties of performing laparoscopic cholecystectomy in cases of gallstone pancreatitis and to determine the effect of the timing of the procedure on patient outcomes.

METHODOLOGY

This prospective observational study was conducted over a 12-month period in the Department of Surgery at the Himalayan Institute of Medical Sciences, Dehradun. Ethical clearance was obtained from the institutional ethical committee, and written informed consent was taken from all participants. The study included 69 patients diagnosed with gallstone-induced pancreatitis admitted during the study period. Of these, 46 patients who underwent laparoscopic cholecystectomy constituted the final study sample. Patients with pancreatitis due to other causes, those unfit for surgery, those who refused surgery, or those who left against medical advice were excluded from the study.

Data collection involved recording patient demographics, clinical presentation, diagnostic findings, management strategies, and complications. Gallstone-induced pancreatitis was confirmed through clinical evaluation, serum amylase levels, and ultrasonography, with additional imaging such as CT scans or MRCP used when required. The severity of pancreatitis was graded using the Revised Atlanta Criteria, while post-operative morbidity was assessed using the Clavien-Dindo scoring system. The treatment protocols, including laparoscopic cholecystectomy or ERCP, were analyzed for indications, duration, and complications. Length of hospital stay and post-operative complications were also documented.

Patients were followed up at six-week intervals, during which clinical examinations, liver function tests, and imaging studies were performed to detect any residual complications, including retained CBD stones, pseudocysts, or fluid collections. Data were managed using Microsoft Excel and analyzed with SPSS version 19. Both parametric and non-parametric statistical tests were applied, and differences in percentages were evaluated using $\chi 2$ analysis and Fisher's exact test where appropriate.

RESULTS

A total of 69 patients with gallstone-induced pancreatitis were admitted during the study period, of which 46 underwent laparoscopic cholecystectomy and were included in the analysis. Among these, 36 patients (78.3%) underwent cholecystectomy during their index admission, while 10 patients (21.7%) had delayed surgery after 4-6 weeks. The decision regarding the timing of surgery was surgeon-dependent. The average total hospital stay was significantly shorter in the index cholecystectomy group (6.48 days) compared to the delayed group (10.44 days). However, 40% of patients awaiting delayed cholecystectomy experienced recurrence of symptoms requiring unplanned readmissions.

The severity of pancreatitis was predominantly mild (82.6%), with no cases of severe pancreatitis undergoing surgery. Jaundice was observed in 56.5% of patients, necessitating imaging via MRI with MRCP in 19 cases to evaluate CBD status. Only one patient had a CBD stone, requiring ERCP with stone retrieval and stent placement. Post-operative complications were minimal, with only one major complication noted in the index cholecystectomy group involving conversion to open surgery due to dense adhesions. This patient also experienced a surgical site infection and incisional hernia but recovered after extended management.

The study highlights that laparoscopic cholecystectomy performed during the index admission is associated with reduced hospital stay and fewer complications related to symptom recurrence compared to delayed surgery. There was no significant difference between the two groups in operative difficulty, conversion rates, or post-operative recovery. These findings support the feasibility and benefits of early laparoscopic cholecystectomy in patients with mild to moderate gallstone-induced pancreatitis.

Table 1: Comparison if Index cholecystectomy with Delayed cholecystectomy

Parameters	Index (n=36)	Delayed (n=10)	P value
Operating time (in minutes)	56.72±19.51	53.22±23.92	0.646
Total stay (days)	6.48±5.09	10.44±2.55	0.029
Post-operative stay (days)	2.72±4.51	3.0±2.17	0.863
Difficult LC	9	2	0.833
Conversion to open surgery	1	0	

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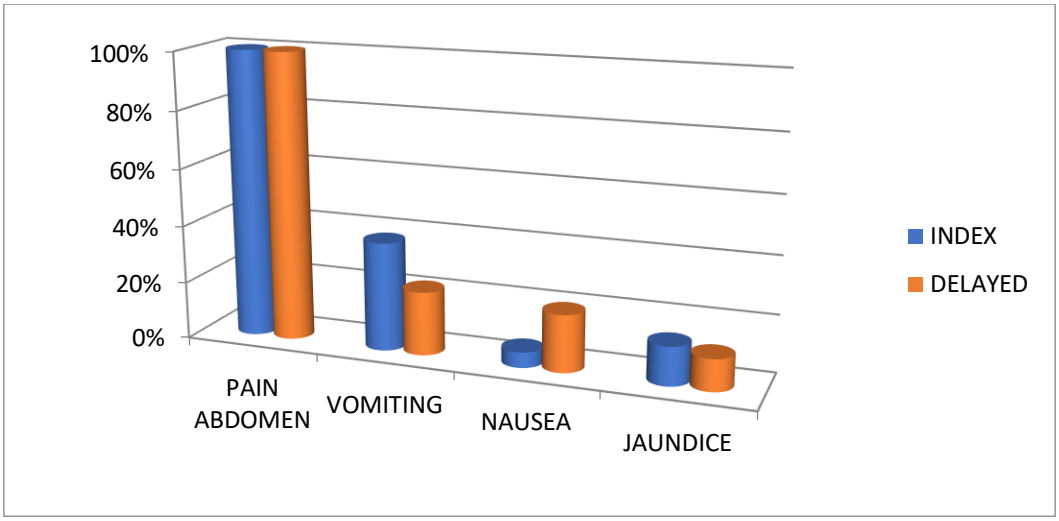

Figure 1: Common presenting complaints

DISCUSSION

This study involved 46 individuals receiving laparoscopic cholecystectomy due to gallstone-induced pancreatitis. The demographic characteristics of these patients resemble those of those with symptomatic cholelithiasis. A predominance of female patients in their 40s is anticipated. Multiple authors (7, 11) examining gallstone pancreatitis have documented a comparable patient profile. There was a female predominance, comprising 67.39% of the cases diagnosed with gallstone pancreatitis that had laparoscopic cholecystectomy. The bulk of cases, or 39.13% of the total, are within the 31 to 40 year age range. Nebiker et al. (7) examined data from 1,185 individuals who underwent cholecystectomy, of which 112 had surgery due to gallstone pancreatitis. The majority of female patients were found in the index and interval surgery groups, comprising 66% and 55%, respectively (7).

During this study period, it was observed that 66.6% of patients admitted with a diagnosis of gallstone pancreatitis ultimately had cholecystectomy. The other patients were inoperable due to factors such as inadequate overall health, refusal of operation, or failure to attend the scheduled cholecystectomy. Comparable data has been referenced by Johnstone et al. in a multicenter assessment conducted across seven British institutions, wherein a total of 523 individuals with gallstone pancreatitis were discovered over a three-year period, of which 363 (69%) had cholecystectomy (8).

This study underscores the growing application of imaging modalities in patients with gallstone pancreatitis for diagnosing pancreatitis and assessing the CBD in individuals with jaundice. A CT scan of the abdomen was performed on 3 individuals, whereas MRI of the abdomen with MRCP was conducted on 26 patients. Conversely, the studies conducted by Falor et al. (12) and Johnstone et al. (8) did not demonstrate a comparable prevalence of MRI abdomen with MRCP utilisation. In these trials, patients who received early cholecystectomy were more likely to receive an intraoperative cholangiogram to exclude choledocholithiasis. Jhonstone et al. (8) found that among 523 individuals with gallstone pancreatitis, 164 (31%) had ERCP to evaluate the CBD status. Nebiker et al. (7) documented CBD stones in 13 of 99 patients, with 2 in the index surgery group and 11 in the delayed surgery group, a difference that was statistically insignificant. MRCP was utilised in 31% of index patients and 54% of delayed cases, with 16% and 36% of these cases, respectively, necessitating ERCP. Conversely, our analysis revealed that MRCP was utilised in 45.65% of index cases and 13.04% of delayed instances, with ERCP required in 4.34% of patients in both groups, demonstrating no statistical significance.

The average operating time was 56.72 minutes for the index cholecystectomy group and 53.22 minutes for the delayed group, with no statistically significant difference seen. One patient necessitated a transition to open surgery. The mean overall hospital duration was 6.48 days in the index group and 10.44 days in the delayed group. While the variation in hospital duration was not statistically significant in this study, other research, including that by Al-Qahtani et al., (13) revealed a markedly shorter hospital stay for the index group (5.4 days compared to 10.4 days), highlighting the advantages of early surgical intervention in reducing morbidity and healthcare expenditures.

Post-operative complications were noted in 11 patients, predominantly Grade I problems (Clavien-Dindo classification), with two instances of more severe complications (Grade IIIa and IVa) in the index group. These findings correspond with the current literature, including research by Perez et al. (14) and Falor et al., (12) which also indicated no substantial disparity in post-operative complication rates between the index and delayed cholecystectomy cohorts.

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Index cholecystectomy diminished the likelihood of recurrent biliary symptoms, observed in 40% of patients awaiting delayed operation in this trial. This recurrence rate surpasses that documented by Nebiker et al. (7) (13%), Johnstone et al. (8) (11%), and Al-Qahtani (13) (17%). Notwithstanding apprehensions regarding possible late complications such pseudocysts or infected pancreatic collections following early surgery, merely one patient in the index group (2.7%) necessitated further intervention for peri-pancreatic infection. This study's findings endorse early cholecystectomy as a safe and effective method, resulting in shorter hospitalisations without elevating surgical complexity or complication rates.

CONCLUSION

In this current research, out of 46 patients undergoing laparoscopic cholecystectomy for gallstone pancreatitis, a majority were female (67.39%), with most cases occurring in the 4th and 5th decades of life. Among them, 36 underwent surgery during their index admission, while 10 had delayed surgery after 4-6 weeks. No significant differences were observed in operative time or difficulty between the groups. However, delayed surgery was associated with a significantly longer hospital stay (p=0.029) and a higher rate of unplanned readmissions due to recurrent biliary symptoms or pancreatitis (40%). Complications were minimal, with only one major post-operative issue (prolonged ileus) and no bile duct injuries or retained CBD stones. These findings support laparoscopic cholecystectomy as a safe and effective approach in managing gallstone pancreatitis, with early surgery offering the advantage of reduced hospital stays and fewer recurrences.

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