



ASSESSMENT OF THE EARLY AND DELAYED CHOLECYSTECTOMY IN PATIENTS WITH ACUTE BILIARY PANCREATITIS

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ABSTRACT

Background and Aim: Gallstone-related pancreatitis is a frequently encountered complication. Majority of individuals suffer from mild disease but progress to severe pancreatitis in 20% cases, elevating the likelihood of significant complications in recurring episodes. The present study aimed to compare the early versus delayed cholecystectomy in acute biliary pancreatitis patients.

Patients and Methods: A prospective randomized study was carried out on 80 acute biliary pancreatitis patients in the general surgery wards of several tertiary units in the United Kingdom from April 2022 to December 2022. De-identified patient data was obtained in this multi-centric study. Patients were categorized into two groups; Group-A (early cholecystectomy) and Group-B (late cholecystectomy). Peri-operative complications, surgery duration, recurrent biliary events, conversion rate, and total hospital stay were evaluated and compared in both groups. SPSS version 27 was used for descriptive statistics.

Results: The overall mean age of group-A and group-B was 40.82±14.62 and 46.38±16.64 years respectively. Majority of patients belonged to 31 to 50 years (35% (n=14) in early vs. 32.5% (n=13) in late group). Abdomen pain was the most prevalent presented complaint 100% (n=40) found in both groups. The pre and post-operative laboratory parameters such as ALT, ALP, and total bilirubin in early vs. late were 41.05±15.82 vs. 32.71±16.98, 182.42±62.63 vs. 112.06±18.72, and 1.05±0.58 vs. 0.64±0.14 respectively. About 80% (n=32) patients of early cholecystectomy took 60 to 75 minutes for intervention as compared to 75% (n=30) patients of late cholecystectomy 75 to 90 minutes. Mean hospital stay of early and late cholecystectomy group was 7.49±2.69 and 15.42±6.64 days respectively.

Conclusion: Early cholecystectomy significantly minimize the duration of surgery, risk of postoperative complications, recurrent biliary events, duration of surgery, and hospital stay in acute biliary pancreatitis as compared to late cholecystectomy.

Keywords: Acute biliary pancreatitis, early cholecystectomy, late cholecystectomy

INTRODUCTION

Gallstone disease stands out as the primary factor behind acute pancreatitis, contributing to as much as 75% of cases in developed nations [1]. Following an episode of biliary pancreatitis, individuals may encounter recurring incidents such as biliary pancreatitis, cholangitis, obstruction of the common bile duct (CBD), or biliary colics [2, 3]. The cornerstone of treatment to avert the recurrence of biliary events involves cholecystectomy and the biliary tree stones removal [4]. Majority of ABP cases are characterized by mild to moderate symptoms. Nevertheless, 10-20% of patient's progress to severe pancreatitis, a condition related to elevated morbidity and mortality rates [5]. In cases where patients exhibit clinically severe pancreatitis, the timing of cholecystectomy is intentionally delayed until the tenacity of these complications, typically occurring around 6 weeks later. However, for mild to moderate cases of ABP, international guidelines advocate for early cholecystectomy [6, 7].

Several recently published nonrandomized studies focused on cholecystectomy to be performed during the same hospitalization for acute biliary pancreatitis (ABP) [8, 9]. The reasoning behind choosing immediate cholecystectomy over interval cholecystectomy is rooted in its potential to decrease the incidence of recurrent biliary events, including recurrent biliary pancreatitis, biliary colic, symptomatic choledocholithiasis, and acute cholecystitis. Zhong et al. [10] reported that elevated recurrence risk usually appeared post discharge within 4 weeks. About 13.4% experienced a recurrence of ABP while awaiting the procedure due to delay in cholecystectomy. An earlier study compared the effectiveness of early cholecystectomy over delayed cholecystectomy and reported that former is safe and efficient when performed within 48 hours of admission and maintain the laboratory parameters within normal range. Moreover, the early cholecystectomy group showed a lower hospital stay [11]. Cholecystectomy for patients experiencing clinically severe pancreatitis is intentionally postponed until the resolution of these local complications, usually occurring around 6 weeks later [12]. The primary objective of the current study is to fill existing knowledge gaps by examining and comparing outcomes as well as the duration of hospital stays between early and delayed cholecystectomy in acute biliary pancreatitis patients.

METHODOLOGY

A prospective randomized study was carried out on 80 acute biliary pancreatitis patients of several tertiary units in the United Kingdom from April 2022 to December 2022. De-identified patient data was obtained in this multi-centric study. Patients were categorized into two groups; Group-A (early cholecystectomy) and Group-B (late cholecystectomy). Patients of mild to moderate acute biliary pancreatitis (ABP) presenting in casualty and outpatient departments (OPD), as well as patients undergoing laparoscopic cholecystectomy (LC) for acute biliary pancreatitis (ABP) were enrolled. Patients who did not undergo surgery but open cholecystectomy, individuals with severe pancreatitis, those with significant preexisting medical comorbidities that contraindicate cholecystectomy, and pregnant were excluded. The diagnosis of acute biliary pancreatitis (ABP) relied on the clinical presentation, which included abdominal pain, at times radiating to the patient's back, accompanied by or without jaundice, and occasionally associated with vomiting. This diagnostic process was further supported by a comprehensive patient history, including details regarding prior similar episodes, admissions, and/or interventions, followed by a thorough examination of laboratory and radiological investigations. All patients underwent preoperative evaluation, which encompassed a comprehensive process involving detailed history-taking, clinical examination, and basic laboratory investigations. Peri-operative complications, surgery duration, recurrent biliary events, conversion rate, and total hospital stay were compared in both groups.

SPSS version 27 was used for descriptive statistics. Continuous variables were presented as Mean \pm SD (standard deviation), while categorical variables were conveyed as frequencies and percentages. To compare categorical variables, the Chi-square test was employed. For continuous variables, the independent t-test was conducted, with statistical significance set at $p < 0.05$.

RESULTS

The overall mean age of group-A and group-B was 40.82 ± 14.62 and 46.38 ± 16.64 years respectively. Majority of patients belonged to 31 to 50 years (35% (n=14) in early vs. 32.5% (n=13) in late group) as illustrated in Figure-1. Abdomen pain was the most prevalent presented complaint 100% (n=40) found in both groups. The pre and post-operative laboratory parameters such as ALT, ALP, and total bilirubin in early vs. late were 41.05 ± 15.82 vs. 32.71 ± 16.98 , 182.42 ± 62.63 vs. 112.06 ± 18.72 , and 1.05 ± 0.58 vs. 0.64 ± 0.14 respectively. About 80% (n=32) patients of early cholecystectomy took 60 to 75 minutes for intervention as compared to 75% (n=30) patients of late cholecystectomy 75 to 90 minutes. Mean hospital stay of early and late cholecystectomy group was 7.49 ± 2.69 and 15.42 ± 6.64 days respectively. Presenting complaints compared in early and late cholecystectomy groups as depicted in Figure-2. Comparison of different clinical parameters (pre- and post) in both groups are shown in Table-I. Table-II represents the comparison of duration of surgery (minutes) and intra-operative complications in both groups. Hospital stay and post-operative complications are compared in both groups as shown in Table-III.

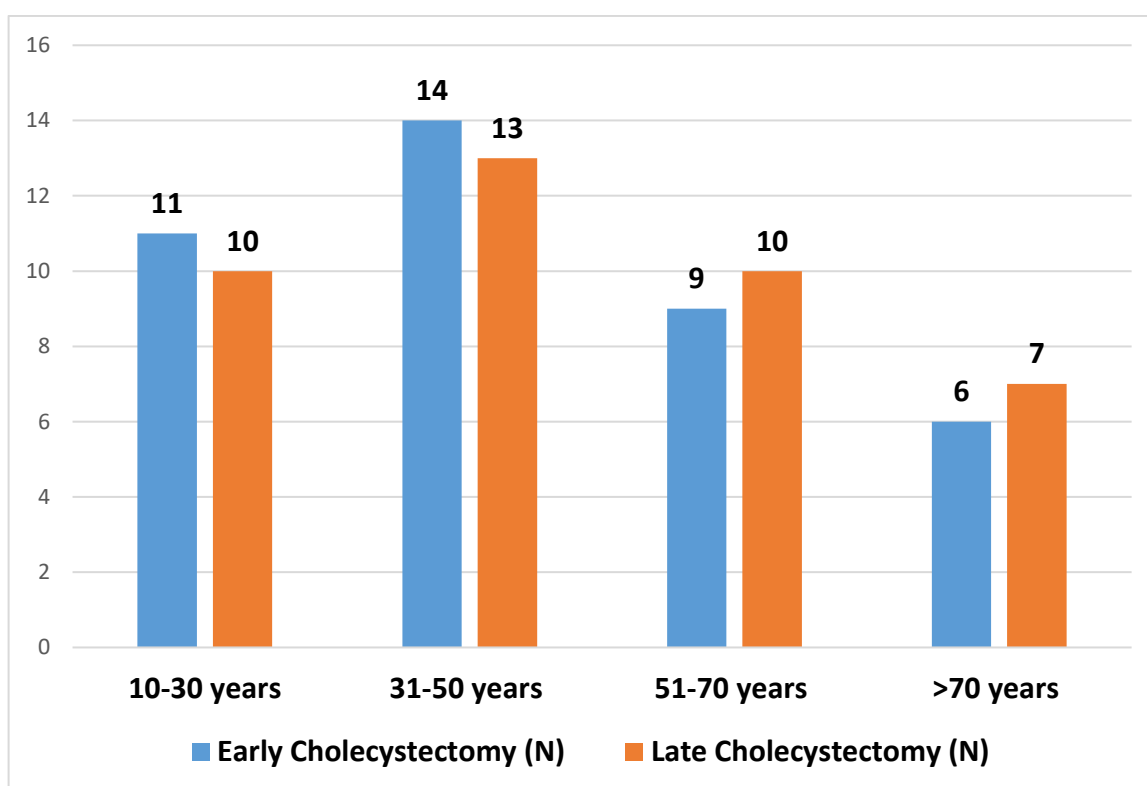


Figure-1 Patient's distribution based on their age groups (N=80)

Table-I Comparison of different clinical parameters (pre- and post) in both groups

Variables	Group-A (EC)	Group-B (LC)
ALT	41.05 ± 15.82	32.71 ± 16.98
ALP	182.42 ± 62.63	112.06 ± 18.72
AST	55.62 ± 18.3	41.51 ± 25.64
LIPASE	529.34 ± 87.65	94.67 ± 15.82
Total bilirubin	1.05 ± 0.58	0.64 ± 0.14

EC: Early cholecystectomy, LC: Late cholecystectomy

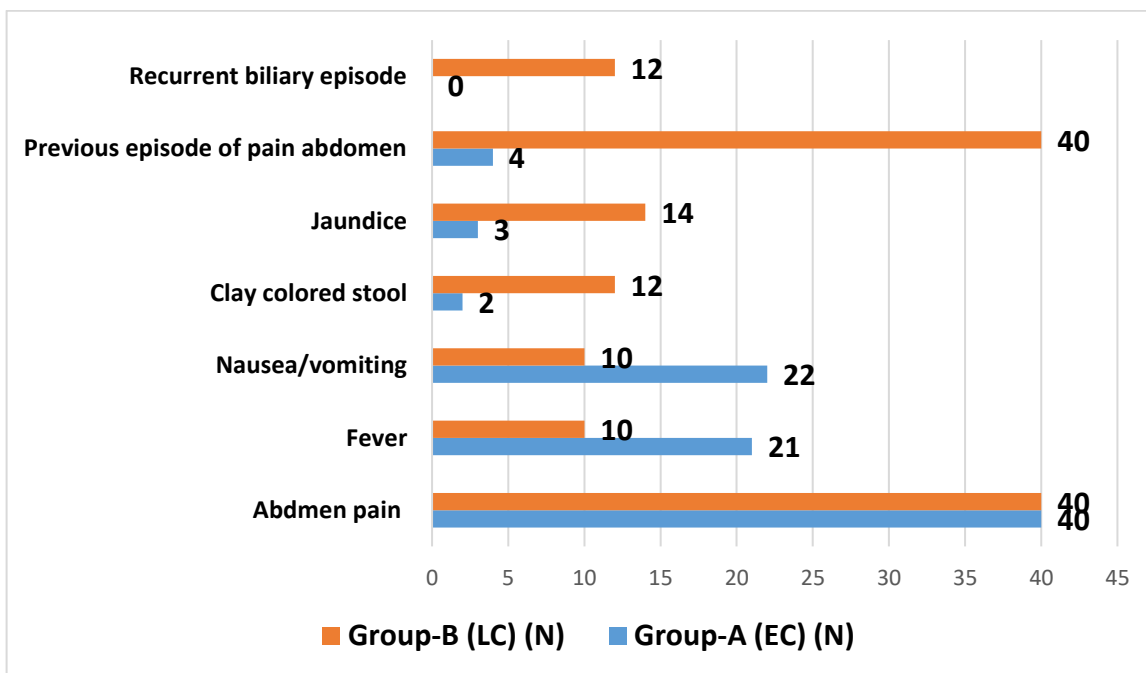


Figure-2 Comparison of presenting complaints in both groups (N=80)

Table-II comparison of duration of surgery (minutes) and intra-operative complications in both groups (N=80)

Variables	Group-A (EC) N (%)	Group-B (LC) N (%)
Duration of Surgery (mints)		
Mean value	72.78 ± 8.52	83.09 ± 7.89
60-75	32 (80%)	6 (15%)
76-90	6 (15%)	30 (75%)
91-105	2 (5%)	4 (10%)
Intra-operative complications		
Dissection issues	5 (12.5%)	7 (17.5%)
Bleeding	7 (17.5%)	12 (30%)
Bulky pancreas	19 (47.5%)	1 (2.5%)
Dense adhesions	9 (22.5%)	13 (32.5%)
GB Empyema	0	4 (10%)
GB Fibrosed	0	3 (7.5%)

Table-III Hospital stay and post-operative complications are compared in both groups

Variables	Group-A (EC) N (%)	Group-B (LC) N (%)
Hospital stay (Days)		
Mean value	7.49±2.69	15.42±6.64
<7	17 (42.5%)	5 (12.5%)
8-15	19 (47.5%)	24 (60%)
16-30	4 (10%)	11 (27.5%)
Post-operative complications		
Fever	11 (27.5%)	31 (77.5%)
Abdomen Pain	6 (15%)	18 (45%)
Atelectasis	0	8 (20%)
Bleeding	0	2 (5%)
biliary leak	0	1 (2.5%)
Need for readmission	0	2 (5%)

DISCUSSION

The optimal timing for cholecystectomy in acute biliary pancreatitis patients has been a subject of ongoing debate. A widely accepted practice involves delaying cholecystectomy for patients admitted with severe ABP until local complications have resolved, typically occurring around 6 weeks [13]. Yuan et al. [14] concluded that endoscopic sphincterotomy (ES) and interval cholecystectomy in cases of severe acute biliary pancreatitis (ABP) are associated with minimal morbidity and low readmission rates. Numerous studies have been published that provide pertinent information for establishing the cholecystectomy optimal timing mild ABP patients. Consequently, existing guidelines differ in their recommendations regarding the ideal timing of cholecystectomy [15-18].

Recurrent biliary events can manifest as recurring pancreatitis, biliary colic, cholecystitis, or even choledocholithiasis. Cholecystectomy serves as a preventive measure against these potential future biliary events. Previously, there was a belief that early cholecystectomy might yield suboptimal results due to peri-pancreatic edema and operative challenges, potentially leading to an increase in peri- and postoperative morbidity [19, 20]. Perioperative complications observed during laparoscopic cholecystectomy (LC) included intraoperative bleeding, challenging dissection, a bulky pancreas, dense adhesions, and bile leak. These complications can result in an extended intraoperative duration, conversion from laparoscopic to open approach, and, in some instances, inefficient removal of the gallbladder, leading to a subtotal cholecystectomy. These findings resemble previous studies [21-23].

The duration of surgery was computed from the introduction of the first port to the closure of the skin incision. The mean duration of surgery was notably longer in the late group compared to the early group. This difference may be attributed to the presence of dense adhesions in the late group, coupled with complications related to the gallbladder and recurrent biliary events, which complicated the biliary structures largely. The delayed intervention resulted in more frequent attacks, and patients in this group typically presented later. In comparison to similar data, our study yielded comparable results, with a higher duration observed in the late group [24, 25].

Postoperative complications following laparoscopic cholecystectomy (LC) encompass fever, atelectasis, biliary leak, bleeding, and pain at the operative site or elsewhere in the abdomen, recurrence of biliary events, surgical site infection (SSI), postoperative ileus, and biliary colic. A comparison with the existing literature reveals comparable findings, with higher postoperative complications noted in the late group in our study. This implies that early LC significantly reduces postoperative complications compared to late LC in cases of mild to moderate pancreatitis [26, 27]. Subjects in the late group exhibited a prolonged duration of stay during the index admission. The mean duration of hospital stays for the early group was significantly lower compared to the late group study subjects. This data aligns with similar findings in other studies and literature, suggesting that patients in the late group tend to have significantly longer hospital stays compared to the early group. This underscores the notion that early laparoscopic cholecystectomy minimizes the duration of hospital stays in acute biliary pancreatitis patients [28-30].

CONCLUSION

Early cholecystectomy significantly minimize the duration of surgery, risk of postoperative complications, recurrent biliary events, duration of surgery, and hospital stay in acute biliary pancreatitis as compared to late cholecystectomy.

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