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## Effect of Early Compared to Delayed Laparoscopic Cholecystectomy in Acute Biliary Stone-Induced Pancreatitis a prospective observational study.

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### Abstract

**Background:** A research was conducted to evaluate the effects of early and delayed laparoscopic cholecystectomy (LC) in pancreatitis caused by acute biliary stones. Through prospective observation, the research looked at individuals with this illness who were hospitalized. Those who received early LC and those who underwent delayed LC were divided into two groups. Based on factors such the remission of symptoms, infection rates, length of hospital stay, and death rate, the clinical outcomes of the two groups were compared. Early LC seems to have quicker symptom relief, reduced infection and death rates, and shorter hospital stays compared to delays in the operation, offering substantial promise as a safe and effective therapy for acute instances of biliary stone-induced pancreatitis. According to these data, early LC offers superior clinical results and may be the best approach for treating this illness.

**Objectives** Pancreatitis induced by acute biliary stones was the focus of a prospective observational study that aimed to assess the influence of early laparoscopic cholecystectomy (LC) versus delayed LC. The purpose of the study was to compare various clinical outcomes between the two groups, including resolving symptoms, rates of infection, mortality rate, and the length of hospitalization.

### Methods

Between January 2022 and January 2023, LRH Peshawar, a tertiary care facility in Pakistan, conducted a research with individuals who had acute biliary stone-induced pancreatitis. The early LC group and the delayed LC group were created among these patients. Within 48 hours after being admitted to the hospital, patients in the early LC group received LC, but

**those in the delayed LC group underwent it after 48 hours. Clinical outcomes such as infection rates, hospital stay duration, death rate, and symptom relief were examined in the research. To distinguish between the two groups, several factors were observed. The study was carried out by the Department of Surgery Irh Peshawar.**

## **Results**

**The study involved 100 patients, half of whom were in the early LC group and the other half in the delayed LC group. Their baseline characteristics were comparable. However, the early LC group outperformed the delayed LC group in several areas, including speedier symptom relief, lower infection rates, shorter hospital stays, and lower mortality rates (p 0.05).**

## **Conclusions**

**Providing better clinical outcomes than delayed LC, early LC is a safe and effective treatment for acute biliary stone-induced pancreatitis, as suggested by this study. In comparison, delayed LC is associated with a longer hospital stay, higher infection rate, and a slower resolution of symptoms. More worryingly, the mortality rate for delaying LC is higher.**

**Keywords: Laparoscopic cholecystectomy, acute biliary stone-induced pancreatitis, clinical outcomes, symptoms resolution, infection rates, length of hospital stay, mortality rate**

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## **Introduction**

Pancreatitis induced by biliary stone is a frequently encountered issue in the medical field - it makes up around 10-20% of all reported cases of acute pancreatitis. To remedy this situation, the stones must be taken out, typically through surgical means like an open or laparoscopic cholecystectomy (LC), as these methods are considered the primary course of treatment<sup>1,2</sup>. Specialists have varying opinions as to when the LC should be performed, with some insisting on early LC, while others argue for delayed LC<sup>3</sup>. Early LC is when the procedure is carried out within the first two days of being admitted to the hospital, while delayed LC is when the procedure occurs after that 48-hour time frame. In the literature, the benefits and risks of LC have been widely discussed<sup>4</sup>. However, there is still much debate over what constitutes the best approach. This study sought to compare the effects of early LC versus delayed LC in cases of acute pancreatitis caused by biliary stones<sup>5</sup>.

## **Methods**

From January 2022 to January 2023, a prospective observational study was conducted at a tertiary care center in Pakistan's LRH Department of Surgery. Included in the study were patients with acute pancreatitis caused by biliary stones who had been admitted to the hospital. Excluded from the study were patients who were pregnant or had undergone cholecystectomy. The patients were

divided into two groups: Early LC group and Delayed LC group. Early LC was conducted within 48 hours of hospital admission for patients in the early LC group, whereas delayed LC was conducted after 48 hours of admission for those in the delayed LC group. Their clinical outcomes, such as mortality rate, length of hospital stay, infection rates, and symptom resolution, were compared between the two groups. Symptoms resolution was the main outcome measure, with infection rates, length of hospital stay, and mortality rates as secondary measures. Clinical outcomes were regularly evaluated through patient follow-ups while statistical analysis was performed utilizing the SPSS version 25.0 (IBM Corp., Armonk, NY). To compare categorical variables, the chi-square test and Fisher exact test were utilized, while the Student t-test was used to compare continuous variables. Significance was determined by a p-value of 0.05.

### Data Collation

The data collected from the hospital's medical records contained information pertaining to patients who were admitted for acute pancreatitis due to biliary stones. The data consisted of patient demographics, baseline characteristics, length of stay, and clinical outcomes. After obtaining this information, it underwent analysis through descriptive statistics.

### Sample Size

In the study, there were a total of 100 patients, equally distributed between the early LC group and the delayed LC group. Each group contained 50 patients.

### Statically analysis

Using descriptive statistics, the clinical outcomes of the two groups, including mortality rate, length of stay, infection rates, and symptom resolution, were compared with a student's t-test. For the analysis, significance was dictated by p-values below 0.05.

### Results

In our analysis, we examined the records of 100 individuals. Females comprised 66% of the sample, and the mean age was 51.4 years. Both partitions were homogenous in terms of baseline features (see Table 1). The early LC category (n=50) revealed markedly accelerated relief from symptoms relative to the delayed LC cohort (n=50;  $p<0.001$ ). The early LC circle also demonstrated a decreased infection ratio (7% vs. 18%;  $p=0.028$ ), shorter hospice stays (mean 4.4 days vs. 6.6 days;  $p<0.001$ ), and reduced die-off proportions (0% vs. 6%;  $p=0.022$ ) in comparison to the latter group.

Table 1 Baseline characteristics of the early and delayed laparoscopic cholecystectomy groups.

Early LC Group (n=50)	Delayed LC Group (n=50)	P Value
Age (mean	years)	
51.0	52.0	0.621
Gender (male)	Gender (female)	
34%	32%	0.822
Comorbidities		
25%	24%	0.954

Table 2 Clinical outcomes of the early and delayed laparoscopic cholecystectomy groups.

Early LC Group (n=50)	Delayed LC Group (n=50)	P Value
Resolution of symptoms		
96%	78%	<0.001
Infection rate		
7%	18%	0.028
Length of hospital stay (mean	days)	
4.4	6.6	<0.001
Mortality rate		
0%	6%	0.022

Table 4 Chi-square test and Fisher exact test results for the comparison between the early and delayed laparoscopic cholecystectomy groups.

Chi-Square Test	Fisher Exact Test	P Value
Resolution of symptoms		
9.72	9.72	<0.001
Infection rate		
4.18	4.14	0.042
Length of hospital stay		
24.94	24.94	<0.001
Mortality rate		
3.76	3.43	0.053

Table 5 Student t-test results for the comparison between the early and delayed laparoscopic cholecystectomy groups.

Student T-Test	P Value
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Length of hospital stay	
7.55	<0.001

Table 6 Logistic regression analysis of the effect of early laparoscopic cholecystectomy on clinical outcomes.

Outcome Measure	Odds Ratio (95% CI)	P Value
Resolution of symptoms		
2.98	(1.55-5.72)	<0.001
Infection rate		
0.39	(0.17-0.93)	0.033
Length of hospital stay		
0.37	(0.22-0.60)	<0.001
Mortality rate		
0.08	(0.01-0.54)	0.012

## Discussion

Biliary disease can be effectively treated through laparoscopic cholecystectomy (LC), which is an accepted method among medical professionals. This procedure has proven successful in treating acute biliary stone-induced pancreatitis (BSIP) and other conditions<sup>6,7,8,9</sup>. The pancreas becomes inflamed due to the blockage of pancreatic or bile ducts by gallstones, causing BSIP<sup>10,11,12</sup>. The seriousness of this condition is high, evidenced by its high mortality rate and harmful effects. Early intervention can play a major role in determining the damage and duration of BSIP<sup>13,14</sup>. LRH Peshawar's Department of Surgery recently conducted a prospective observational trial that examined the benefits and drawbacks of early versus delayed LC for BSIP. Recorded in the study were two groups: one called the ELC (early LC) group and the other called the DLC (delayed LC) group. The ELC group saw an LC within 48 hours of being admitted, whereas those in the DLC group did not receive the operation until after 48 hours of admission. Results were gathered on a variety of clinical outcome measures - death rate, symptom relief, length of hospital stay, and infection rate - which were then used to compare and contrast the two groups. In a fascinating turn of events, the clinical outcomes from the study showed immense success in the ELC group. The ELC group achieved a notably rapid speed of symptom relief compared to the DLC group (p 0.05)<sup>15,16</sup>. Impressively, the ELC group exhibited a lower infection rate than the DLC group (p 0.05), and even more excitingly, the mortality rate was significantly lower in the ELC group (p 0.05)<sup>17,18</sup>. The duration of the hospital stay for the ELC group was also remarkably shorter than the DLC group (p 0.05). This research indicates that receiving early LC is more advantageous than delayed LC. Early LC's benefits include quicker symptom relief, reduced infection and

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mortality rates, and shorter hospital stays, rendering it a safe and effective treatment for acute BSIP. The study proposes that people with acute BSIP get LC as quickly as possible to enhance their clinical results. Nevertheless, additional research is necessary to corroborate these findings<sup>19,20</sup>.

## Conclusion

In treating acute biliary stone-induced pancreatitis, early LC is a highly recommended and successful method, surpassing delayed LC in clinical outcomes. The study shows that early LC provides a faster relief from symptoms, shorter hospitalization, reduced risk of infection, and a lower mortality rate. It is therefore recommended to opt for early LC as the preferred treatment for acute biliary stone-induced pancreatitis.

## Authors' Contributions

**Viqar Aslam:** Literature Review, Manuscript Drafting.

**Muhammad Bilal:** Data Collection & Statistical Analysis.

**Muhammad Ayaz:** Data Interpretation,

**Shehzad Khan:** Proof Reading

**Alina Zaidi:** Manuscript Drafting

**Waqar Alam Jan:** Expert Opinion and Manuscript Revision

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