



ORIGINAL ARTICLE

Comparison of outcomes of index and interval laparoscopic cholecystectomy in mild biliary pancreatitis.

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ABSTRACT... Objective: To compare the outcomes of index and interval laparoscopic cholecystectomy in mild biliary pancreatitis in terms of duration of hospital stay. **Study Design:** Randomized Controlled Trial. **Setting:** Surgical Unit 1, Holy Family Hospital, Rawalpindi. **Period:** January 2023 till June 2023. **Methods:** Patients were being admitted with acute biliary pancreatitis and undergoing either index or interval cholecystectomy. BISAP scoring system was used for severity of ABP and mild cases were included. Study outcomes in both groups (index and interval cholecystectomy) were determined. For quantitative variables mean and standard deviation were calculated. Frequency and percentages were used to describe qualitative variables. **Results:** Total of 70 patients divided into two groups were included in this study. Mean age of the study population was 40.44+/-7.90 years. Fifty-three percent of the population had BMI in the overweight category. Mean BISAP score was 1.11+/-0.80. All of the patients included in the study had mild acute pancreatitis. The length of hospital stay was significantly associated with timing of surgery with p-values 0.045. **Conclusion:** The surgical outcomes of index and interval cholecystectomy in acute mild biliary pancreatitis are comparable. However, early cholecystectomy has shorter duration of hospital stay.

Key words: Acute Biliary Pancreatitis, Index Cholecystectomy, Interval Cholecystectomy.

INTRODUCTION

Acute pancreatitis is a significant health issue worldwide. It ranks as the third most frequent gastrointestinal reason for urgent hospital admission. Gallstone or sludge are responsible for half of all acute pancreatitis cases; the acute biliary pancreatitis (ABP).¹ ABP is a clinical condition associated with high morbidity (15%–50%) and mortality (2%–5%) rates.² After the episode of acute pancreatitis, patients may undergo repeated bouts of biliary pancreatitis or other biliary incidents, for example acute cholecystitis, common bile duct obstruction, cholangitis or biliary colic. To mitigate the risk of repeated biliary incidents, global guidelines advocate for cholecystectomy following biliary pancreatitis. Neglecting to administer definitive treatment can have fatal consequences.¹ In case of severe acute biliary pancreatitis involving

local and systemic complications such as MOF (multiorgan dysfunction); studies recommend with consensus that surgery should be delayed to let the inflammatory process settle down. However, in mild to moderate biliary pancreatitis, there is still debate regarding the optimal timing of the procedure.³

Some reports have demonstrated that the greater number of specialists opt for an interval cholecystectomy that is 6 to 12 weeks after discharge as opposed to index cholecystectomy that is performed either within 48 hours or within the same hospital admission. Surgeons prefer to postpone surgery until the acute inflammatory process has settled so that the procedure can be made safe.^{3,4} The concept of delaying surgical intervention in acute biliary pancreatitis arose from randomized trials that indicate

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increased morbidity and mortality when surgery was conducted within 48 hours of admission.⁵ Nevertheless, this policy is being challenged in latest studies.

Recent studies have suggested that index cholecystectomy does not increase complications stemming from a more challenging dissection and moreover prevents repeated attacks of pancreatitis and other possible problems associated with cholecystitis.^{4,6} According to recently published RCT, the mean hospital stay was 8 (6-10) days with early surgery and 9 (8-11) days with late surgery ($p=0.002$).⁷ In another trial the mean hospital stay was 5 ± 1.5 days with early surgery and 3 ± 3.3 days with late surgery ($p<0.05$).⁸ The average hospital stay for early cholecystectomy was 1.67 ± 0.89 days and for delayed group was 4.38 ± 1.48 days ($p<0.05$).⁹

The purpose of this study was to evaluate the results of index and interval laparoscopic cholecystectomy in mild biliary pancreatitis in terms of duration of hospital stay. Despite of a number of studies being performed to establish guidelines regarding timing of surgery in acute mild biliary pancreatitis, there is no consensus of time of surgery till date. To the best of our knowledge, no such research has been done in Pakistan, which points to a need for a randomized controlled trial to see the efficacy of cholecystectomy timing. Therefore, this study is to compare both methods and is crucial for the better management of the disease as well. It can help future surgeons to decide the best plan for their patients.

OPERATIONAL DEFINITIONS

Index Cholecystectomy

Cholecystectomy is done in the same admission prior to discharge. Hospital stay is calculated from day of admission to day of discharge.

Interval Cholecystectomy

Cholecystectomy is delayed for variable time (6-10 weeks) to enable the inflammation to subside. Hospital stay is counted from the first day of admission to the day of first discharge and then

added to the number of days of readmission.

Mild Biliary Pancreatitis

Mild biliary pancreatitis is defined as a Bedside Index of Severity in Acute Pancreatitis (BISAP) score of 0 to 2, and no manifestation of organ failure.

METHODS

It was a randomized comparative trial, carried out in Surgical Unit-1, Holy Family Hospital, Rawalpindi. The duration of study was six months of data collection from January 2023 till June 2023. By using openepi.com, sample size of 70 cases was calculated; 35 in each group with 5% level of significance, 90% power of study and mean hospital stay i.e. 5 ± 1.5 days with early surgery and 3 ± 3.3 days with late surgery.⁸ It was a consecutive non probability sampling.

Inclusion Criteria

- Age 14 to 60 years
- Both genders
- Patients diagnosed with mild gallstone pancreatitis (as per operational definition).

Exclusion Criteria

- Those suffering from concomitant choledocholithiasis, empyema gallbladder, pregnancy (as per medical record), alcohol or drug abuser.
- Patients with pancreatic or liver malignancy, metastatic disease (on medical record).

Data Acquisition

The research was started after seeking acceptance from the ethical review board (07/ IREF/RMU/2021) of the Rawalpindi medical university. Seventy patients who fulfilled selection criteria were included in the study. Informed consent was taken in writing. Basic information like name, age, gender, BMI, history of smoking, diabetes, hypertension, dyslipidemia, anemia, attacks of pancreatitis, and BISAP score were noted. Patients were randomly divided in two groups by using a random number table. In group A, patients went through early laparoscopic cholecystectomy i.e. within 24 hours of presentation. In group B, patients had

late laparoscopic cholecystectomy i.e. after 24 hours of presentation after clinical resolution of symptoms. Standard 4 port laparoscopic cholecystectomy was in all patients with single dose IV antibiotic prophylaxis. All procedures were done by a consultant surgeon with assistance from a researcher. Operative time and intra operative blood loss were noted. Following surgery, patients were transferred to post-surgical wards and remained under observation until discharge. At the time of discharge, total duration of hospital stay was taken into account. All this information was recorded in Performa.

Data Analysis Plan

Data was analyzed by SPSS Version 22. Means and standard deviations were calculated for quantitative variables like age, BMI, duration of pancreatitis, BISAP score, operative time, blood loss, hospital stay. For qualitative variables like gender, history of smoking, diabetes, hypertension, dyslipidemia, anemia, f/h pancreatitis, frequency and percentage were calculated. Both groups were compared for mean duration of hospital stay by using the independent sample t test. P-value ≤ 0.05 was considered as significant. Data was stratified for age, gender, BMI, duration of pancreatitis, BISAP score, history of smoking, diabetes, hypertension, dyslipidemia, anemia, f/h pancreatitis, operative time, blood loss. P-value ≤ 0.05 was considered as significant.

RESULTS

Total of 70 patients divided into two groups were included in this study. More than half of the patients i.e., 62% of the total study population were females. Mean age of the study population was 40.44 \pm 7.90 years. Fifty-three percent of the population had BMI in the overweight category. Four percent of the patients had class I obesity. Considering the smoking history, 74.6% of the patients had no history of smoking in their lifetime. Half of the study population had co-morbid such as diabetes and hypertension. Sixty-two percent of the patients were diabetic and 58% were hypertensive whereas 37% of the patients had dyslipidemias. One third of the study population was anemic (35.7%). Mean BISAP score was 1.11 \pm 0.80. All of the patients

included in the study had mild acute pancreatitis. Intraoperative blood loss was determined and 74% of the patients had IOP blood loss less than 50ml. Whereas 21% had blood loss between 50-100ml. The patients were divided into two groups. Group A included the patients who underwent the same admission laparoscopic cholecystectomy. Group B comprised of the patients who had delayed surgery. In case of same admission surgery; the intraoperative blood loss and the duration of surgery were prolonged. Whereas the patients who underwent delayed surgery had lesser intraoperative blood loss. However, there was no statistically significant difference between the two groups. The mean duration of hospital stay was 3.6 \pm 1.12 days in case of index cholecystectomy as compared to 5.2 \pm 1.76 days in interval cholecystectomy. The length of hospital stay was significantly shorter in index cholecystectomy with p-values 0.045.

Duration of hospital stay

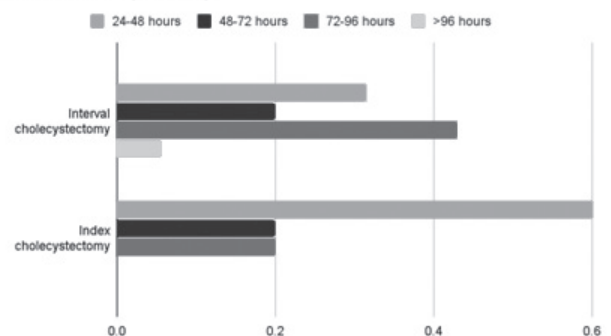


Figure-1. Bar diagram representing comparison of duration of hospital stay between two study groups.

DISCUSSION

The management of acute biliary pancreatitis includes cholecystectomy which can either be done at the time of admission with pancreatitis or after a certain interval.¹⁰ Regardless of the time of surgery, cholecystectomy is deemed necessary in pancreatitis to avert the recurrence of pancreatitis and mitigate the risk of other severe complications. Conservative management of biliary pancreatitis without cholecystectomy is associated with 25-30% possibility of getting similar attacks.¹⁰ The risk of developing recurrent pancreatitis is greater for patients planned for interval cholecystectomy in contrast to patients undergoing index cholecystectomy.¹² The

timing of surgery after diagnosis of acute biliary pancreatitis has remained controversial over the years. As a general rule many guidelines recommend index cholecystectomy in mild pancreatitis and interval cholecystectomy in moderate to severe pancreatitis.¹²

However, there is variation in defining the index or interval cholecystectomy. In many tertiary care centers index cholecystectomy is performed at the same admission whereas in others it is performed after 2 weeks of acute attack. This study was done to compare the surgical outcomes after index and interval cholecystectomy with index cholecystectomy being performed in the same admission and interval at 4-6 weeks after acute attack. This study suggests that there is no significant difference of intraoperative blood loss and operative time between index and interval cholecystectomy for acute mild biliary pancreatitis. Considering duration of postoperative hospital stay, index cholecystectomy is associated with shorter hospital stay.

The optimal timing of cholecystectomy in patients with acute biliary pancreatitis is still controversial. Many studies and guidelines state that the surgery should be delayed at least 4 weeks after acute attack of biliary pancreatitis.¹³ During this interval, inflammation is allowed to settle down so cholecystectomy can be done safely.¹³ These recommendations are based mainly on higher incidence of iatrogenic injuries in index cholecystectomy as compared to interval cholecystectomy. However, in most of the studies patients had moderate to severe pancreatitis including those patients who underwent ERCP as well. In cases of moderate to severe pancreatitis, it is justified to wait 4-6 weeks for surgery so as to reduce the inflammatory phlegmon and reduce the intraoperative complications. However, in mild acute biliary pancreatitis, studies show that there is no significant difference between surgical outcomes of the two groups but there is shorter duration of hospitalization in patients undergoing index cholecystectomy.¹⁴ This is consistent with the results of this study. There is still room for further studies to demonstrate the comparison of surgical outcomes of interval and index

cholecystectomy in patients with moderately severe acute pancreatitis and those undergoing certain procedures such as ERCP for biliary decompression. In cases of mild acute biliary pancreatitis index cholecystectomy should be preferred as it is associated with shorter hospital stay and surgical outcomes such as intraoperative blood loss and duration of surgery are the same.

CONCLUSION

The outcomes of index and interval cholecystectomy in acute mild biliary pancreatitis are comparable. However, early cholecystectomy has significant shorter duration of hospital stay.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

SOURCE OF FUNDING

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.




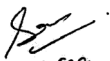

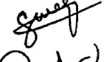

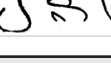
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3	Gohar Rasheed	Proof reading and article contribution.	
4	Sarmad Arslan	Data compilation.	
5	Sumaira Ashraf	Discussion writing.	
6	Sara Malik	Discussion writing.	
7	Syed Waqas Hassan	Result writing.	
8	Rubina Shehzad	Discussion writing.	
9	Jahangir Sarwar Khan	Overall review of article.	