

Original Article

Early Versus Interval Cholecystectomy in Mild Acute Biliary Pancreatitis. A Retrospective Study in Tertiary Care Hospital

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ABSTRACT

Objective: To determine the adequacy of early cholecystectomy (EC) versus interval cholecystectomy (IC) in terms of recurrence, duration of hospital admission, and perioperative complications after mild acute biliary pancreatitis (MABP).

Methodology: An observational study was conducted in the general surgery department of Holy Family Hospital, Rawalpindi from August 2017 to July 2020. Data was collected retrospectively. All the admitted patients having MABP the patients' demographic profile, clinical findings, diagnostic investigations, timing of cholecystectomy, operating surgeons, operative time, biliary complications, intraoperative bleeding, conversion rate, duration of admission, and recurrence were reviewed. Patients presented with abdominal pain, vomiting, jaundice, or fever. The diagnosis was confirmed on the basis of a CT scan of the abdomen showing an inflamed pancreas and stones in the gallbladder. Outcomes were compared and reviewed between the two groups.

Results: In this research proposal, 263 patients admitted were analyzed. EC was performed were discharged after conservative management and followed up after 12 weeks for interval laparoscopic cholecystectomy (IC). It was observed in patients of IC (EC 2 [1.2%] vs IC 7[7%]; p value <0.01) while duration of hospitalization was prolonged as compared to patients of EC 5.53+0.58 days vs IC 5.82+0.78 days, p value <0.001).

Conclusion: EC performed after MABP is associated with shorter duration of hospitalization and reduced recurrence with similar rate of perioperative complications.

Keywords: Mild Acute biliary pancreatitis (MABP), recurrence, early laparoscopic cholecystectomy(EC), interval laparoscopic cholecystectomy(IC).

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Introduction

Acute pancreatitis is an inflammatory condition of the pancreas. It is characterized by increased levels of pancreatic enzymes in the blood. There are many etiological factors causing acute pancreatitis. Cholelithiasis is the major cause of acute pancreatitis. Patients typically present with upper abdominal pain with or without vomiting. Diagnosis is initially made on the basis of four fold increase in serum amylase levels and is confirmed by contrast enhanced CT scan (CECT) of

abdomen. CECT scan also defines the severity of biliary pancreatitis.

Globally the incidence of acute pancreatitis is increasing and becoming a major burden on surgical floor of the hospitals.^{1,2} Worldwide cholelithiasis constitutes 40% of the cases of acute pancreatitis.² In Pakistan, cholelithiasis is the major etiological factor of acute pancreatitis with a frequency of 70 – 80%.^{4,5} The risk of recurrent biliary events is 30-fold higher after the first attack than general population.⁶ In many studies early cholecystectomy is considered as the definitive management in mild acute

biliary pancreatitis as it reduces recurrence and duration of hospitalization with no difference in perioperative and postoperative morbidity.^{7,8}

Conventionally interval cholecystectomy (IC) was considered as the definitive management of gallstone pancreatitis. It was believed that the risk of perioperative complications was greater in patients of early cholecystectomy (EC). But the recent studies suggest that the risk of such complications is equal in both treatment modalities. In EC due to inflammatory response and in IC due to dense fibrotic adhesions, the conversion rate from laparoscopic to open cholecystectomy and operative time is the same. Similarly the incidence of intraoperative bleed and biliary injuries is equal. In recent clinical trials, it is also concluded that patients of IC presented with recurrence before the appointed time of cholecystectomy. As a result, the duration of hospital admission is prolonged in such patients. But in patients of EC this risk is very low as they have been operated on the same hospital admission. EC is also cost effective for patients with mild acute biliary pancreatitis because the surgery is performed during the same admission, so the number of patients admitted due to recurrence is very low.

The term "early cholecystectomy" is elaborated by different international guidelines. According to international guidelines (IAP), the patient must undergo cholecystectomy as he recovers from the first attack.⁹ The American guidelines (ACG) recommend it during the same admission⁷ whereas the British guidelines (BSG) recommend surgery during the same admission or within the next 2 weeks.¹⁰

The objective of this research proposal is to determine the adequacy of early cholecystectomy (EC) versus interval cholecystectomy (IC) in terms of recurrence, duration of hospital admission, and perioperative complications after mild acute biliary pancreatitis (MABP). The rationale of this study is to establish the definitive timing of surgery in mild acute biliary pancreatitis so that the recurrence rate can be reduced. Furthermore, financial costs can be reduced by shortening the length of hospital stay. The burden of our overloaded tertiary care hospitals due to recurrent admissions can be reduced by modifying the timing of surgery from the conventional methods.

Methodology

An observational study was designed and data collected retrospectively. After endorsement from the ethical

committee number 04/IREF\RMU\2020]. Clinical files and records of 290 patients admitted in general surgery department, Holy family hospital Rawalpindi from August 2017 to July 2020 having MABP were retrieved. T Sample size was calculated by WHO calculator. Power of test was 80, level of significance 5, P1 was 0.042, P2 was 0.181. at least 80 cases in both groups. In my study there were 163 cases in group 1 and 100 cases in group 2.

The presenting symptom was upper abdominal pain with or without vomiting. Diagnosis was made by the presence of gallstones and inflammation of pancreas on abdominal CT scan.^{4,5} The inclusion criteria was

- 1) Ranson's score <3.
- 2) Mild inflammation of pancreas on abdominal CT scan.

The exclusion criteria was

- 1) Deranged serum alkaline phosphatase levels.
- 2) Underwent endoscopic retrograde cholangiopancreatography (ERCP).
- 3) Peripancreatic fluid collections on abdominal CT scan.
- 4) Patients who lost to follow up.

All the patients received initial management through inpatient department of general surgery, holy family hospital, Rawalpindi. This included oxygen inhalation, intravenous analgesia, fluid and electrolyte replacement and oral feeding on clinical improvement. Operations were performed by qualified laparoscopic surgeons of same seniority. Patients underwent EC during same admission were followed up postoperatively by the operating surgeons for 6 months. Patients who received interval cholecystectomy (IC) were discharged after successful conservative management and operated 12 weeks after initial management. They were also followed up by the surgeons who managed them in the hospital for a period of 6 months. All the clinical files and medical records were scanned to obtain information about the demographic profile and outcomes of surgery. We followed criteria of American college of gastroenterology for EC and defined EC as cholecystectomy during the initial hospitalization and index admission for the mild acute biliary pancreatitis. IC was defined as cholecystectomy 12 weeks after initial conservative treatment of mild acute biliary pancreatitis.

Data was entered and analyzed in SPSS version 22 software. Quantitative variables like age, hospital stay and operative time were expressed as mean and standard deviation. Qualitative variables like gender, presenting

symptoms and recurrent biliary events were expressed as percentages. Recurrent biliary events and length of hospital stay was compared between 2 groups by chi-square test and independent sample t-test respectively. Effect modifiers like age, DM, BMI, ASA and comorbid were controlled by stratification. A P-value < 0.05 was considered statistically significant.

Results

Out of 290 patients admitted, 27(9.3%) patients did not follow up and were therefore excluded from our study. Two hundred sixty three (90.6%) patients were thus analyzed; 163(62%) patients underwent early cholecystectomy (EC) and 100(38%) patients were admitted after 12 weeks for interval cholecystectomy (IC). Patients' demographic profile and presenting complaints are shown in Table I. Their mean age was 40.1±5.9 years. The study population had a female predominance with 220 (83.6%) patients being females. Majority of the patients (71%) had a BMI between 25 to 29.9kg/m². The presenting symptom was upper abdominal pain in 85% of the cases, while the remaining cases also had a complain of vomiting along with upper abdominal pain.

The outcomes of EC and IC are shown in Table II. Recurrent biliary events were observed in 2 (1.2%) patients of EC, both presenting with obstructive jaundice 3 and 5 months after cholecystectomy. They were successfully managed with endoscopic retrograde cholangiopancreatography (ERCP) with or without endoscopic sphincterotomy (ES). It was observed that 7 (7%) patients of IC readmitted with recurrence of acute pancreatitis 3, obstructive jaundice 2, acute cholecystitis 1, and cholangitis was 1. They were all operated

successfully during readmission. Total length of hospital stay was 5.53±0.58 days for patients who underwent EC and 5.82±0.78 days for patients who underwent IC.

Both EC and IC showed similar results in the operating time, conversion rate and perioperative complications. 11(8.3%) cases converted to open cholecystectomy due to dense fibrotic adhesions and edema. As a result, the anatomy was distorted at the triangle of safety, resulting in bleeding and biliary complications. 6 (5.2%) patients had biliary injuries intraoperatively. One patient from IC group had complete transection of the common bile duct during surgery for which hepaticojejunostomy was performed. Five patients (2 from EC and 3 from the IC group) had avulsion of the cystic duct during surgery, which was managed intraoperatively. 23(16%) patients 18(11%) from EC and 5(5%) from the IC group developed intraoperative bleeding which was secured during surgery and none of them required blood transfusion.

Discussion

The timing of surgery in acute biliary pancreatitis has always remained a subject of discussion. In severe acute

Table II Outcomes in relation to timing of cholecystectomy

Outcomes	Early Cholecystectomy	Interval Cholecystectomy	P-value
Operative time	64.31±2.52	64.49±1.67	0.52
Conversion rate	7 (4.3%)	4 (4%)	0.91
Intraoperative bleeding	18 (11%)	5 (5%)	0.09
Biliary complications	2 (1.2%)	4 (4%)	0.14
Length of hospital stay	5.53±0.58	5.82±0.78	0.001
Recurrent biliary events	2 (1.2%)	7 (7%)	0.01

Table I: Patient demographics in relation to timing of cholecystectomy

Parameters	Early Cholecystectomy (n= 163)	Interval Cholecystectomy (n= 100)	P- value	
Age	39.75±5.83	40.7±5.99	0.23	
Gender	Female	134 (82.2 %)	86 (86%)	0.42
	Male	29 (17.8%)	14 (14%)	
BMI (kg/m ²)	18.5-24.9	32 (19.6%)	19 (19%)	0.41
	25-29.9	118 (72.4%)	68 (68%)	
	30-34.9	13 (8%)	13 (13%)	
ASA	I	89 (54.6%)	49 (49.5%)	0.10
	II	70 (42.9%)	42 (42.4%)	
	III	4 (2.5%)	8 (8.1%)	
Diabetes mellitus	33 (20.2%)	20 (20%)	0.96	
Hypertension	35 (21.5%)	24 (24%)	0.63	
COPD	6 (3.7%)	7 (7%)	0.23	
Symptoms	Upper abdominal pain	140 (85.9%)	83 (83%)	0.53
	Upper abdominal pain and vomiting	23 (14.1%)	17 (17%)	

biliary pancreatitis, interval cholecystectomy is the treatment of choice in older as well as recent studies. But the trends of surgery for mild acute biliary pancreatitis has been changed during the last decade. Early studies recommend delayed cholecystectomy for mild acute biliary pancreatitis. Kelly³ in his study, observed that the conversion rate from laparoscopic to open cholecystectomy was greater in early cholecystectomy. This was mainly due to difficult dissection as a result of inflammation and edema. Moreover, there were more perioperative complications observed in patients of early cholecystectomy.

It was an older concept to delay laparoscopic cholecystectomy in MABP as a result of perioperative complications but the recent studies show no difference in perioperative morbidity^{8,13-16} All the international guidelines now recommend early cholecystectomy in mild biliary pancreatitis in order to reduce recurrence with no difference in perioperative complications.^{7,9,10}

In an RCT conducted by Mohammad A. Omer¹⁵, patients of mild acute biliary pancreatitis were randomized prospectively into EC and IC group. He concluded that the perioperative complications were equal in both groups (P-value 0.67).

Shir Li Jee in his study, concluded that the rate of conversion from laparoscopic to open cholecystectomy was similar in both groups P-value >0.99, showed a significant difference in recurrence between early and interval cholecystectomy during his study i.e. 44% and 0% respectively.¹⁴ He also observed that 27% of the recurrence occurred earlier 14 days after discharge. So cholecystectomy should be performed during the index admission.

In our study, 2 (1.2%) patients of EC presented with recurrent biliary events, while 7 (7%) patients of IC had recurrence. These results were comparable with a study done by Hamad Hadi Al-qahtani.¹³ He observed 21(17.65%) patients readmitted with recurrence before the appointed time of IC while only 3(1.12%) patients of EC presented with recurrence.

In our study, the duration of hospital admission was 5.53 ± 0.58 days for patients who underwent EC and 5.82 ± 0.78 days for patients who underwent IC. All the patients of EC were completely treated in same admission, while those of IC required two admissions for complete recovery. During the first admission, they were managed conservatively and cholecystectomy was performed later

during the second admission. These results were comparable with many studies.¹³⁻¹⁶

Shir Li Jee et al¹⁴ found that 24% of patients were readmitted due to recurrence in a prospective study. As a result duration of admission and cost of hospitalization was high, which would be only prevented if surgery was performed earlier (EC).

In another study by Mohammed A. Omar¹⁵, EC had a shorter total length of hospital stay than IC (4.4 ± 1 vs. 6.9 ± 2.6, p=0.03) which was comparable to our results.

A meta-analysis was conducted by Fu-ping Zhong et al¹⁷ to compare the effectiveness between EC and IC in mild acute biliary pancreatitis. He included 19 studies in the meta-analysis and concluded that early cholecystectomy is associated with reduced recurrent biliary events and is cost effective as it shortens the overall length of hospital stay. He also concluded that perioperative and postoperative morbidity ratios were the same among both groups.

Conclusion

Early cholecystectomy is safe and effective in mild acute biliary pancreatitis in terms of complications and financial cost.

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