

A Prospective Comparative Study to Evaluate the Outcomes of Early Cholecystectomy Versus Interval Cholecystectomy In Gallstone Induced Mild Pancreatitis

Dr Kushal Choksi

Post-graduate student, Department of Surgery, Faculty of medicine and health sciences SGT university, Budhera, Gurugram, Haryana, India.

Dr Ramendranath Talukdar

Professor, Department of Surgery, Faculty of medicine and health sciences SGT university, Budhera, Gurugram, Haryana, India.

Dr NeeruKapur

Associate Professor, Department of Radio-Diagnosis, Faculty of medicine and health sciences SGT university, Budhera, Gurugram, Haryana, India.

Corresponding Author Dr Kushal Choksi

Abstract:

Introduction: Early cholecystectomy is advocated in gallstone induced mild pancreatitis over interval cholecystectomy, to reduce the recurrent attacks of pancreatitis. This study was done to assess the outcomes of early cholecystectomy and interval cholecystectomy in gallstone induced mild pancreatitis. **Material and Methods:** Thirty patients of gallstone induced pancreatitis were included in the study. Out of which Group 1 had 15 patients, who underwent early cholecystectomy, i.e., cholecystectomy within same admission. Remaining 15 patients in Group 2 underwent interval cholecystectomy i.e., cholecystectomy after 6 weeks of subsiding of initial attack of pancreatitis. The duration of surgery, length of hospital stay, intraoperative complications, rate of conversion and recurrent attacks of pancreatitis were assessed in both groups. **Results:** More intraoperative complications were present in early cholecystectomy group. Operative time and conversion rates were more with early cholecystectomy group ($93.33 \pm 29.44\%$ vs. $69.67 \pm 12.32\%$, p -value: 0.008) and (6.7% vs. 0%, p -value: <0.05). Length of hospital stay and recurrent attacks of pancreatitis were more with interval cholecystectomy group (13.27 ± 4.18 vs. 7.93 ± 3.39 days, p -value:0.001) and (26.7% vs. 0%, p -value:0.013), respectively. **Conclusion:** Early cholecystectomy is a safe and feasible option in mild biliary pancreatitis

Keywords: Early cholecystectomy, interval Cholecystectomy, gallstone pancreatitis, recurrent pancreatitis, operative time.

Date of Submission: 06-01-2023

Date of Acceptance: 20-01-2023

I. Introduction:

The global burden of acute pancreatitis has seen an increase of 62.9% from 1990 to 2019. Incidence of acute pancreatitis in India, in 2019 was 618862.3, which was highest in the world. Additionally, death due to pancreatitis was also highest in India, which was 20455.9.^[1] Gallstones is the main aetiology of pancreatitis accounting for 42% cases, followed by alcohol 21% and 18% idiopathic pancreatitis.^[2] The recommendations of IAP and AGA have opined in favour of early cholecystectomy for mild biliary pancreatitis, and adherence to these guidelines had decreased the episodes of recurrent attacks of pancreatitis. The proportion of same-admission cholecystectomy has decreased from 48.7% in 2004 to 46.9% in 2009 to 45% in 2014. This non adherence to treatment has increased the rate of recurrence and total health care expenditure.^[3] Hence, the current study was done to evaluate the outcomes of early versus interval cholecystectomy in gallstone induced mild pancreatitis.

II. Material And Methods:

Prospective comparative study was done in Surgery department of SGT University for a period of 24 months, where 30 patients with diagnosis if gallstone induced mild pancreatitis, were included in the study using snow ball sampling and convenient sampling methods. All patients above 18 years of age with diagnosis of mild biliary pancreatitis were included, and pregnant patients, patients with chronic pancreatitis, severe pancreatitis,

and cholangitis were excluded. Patients were divided in two groups, **Group 1 (Early group)** had 15 patients, who underwent early cholecystectomy i.e.: cholecystectomy during same admission and **Group 2 (Interval group)** had 15 patients, who underwent interval cholecystectomy i.e.: cholecystectomy during subsequent admissions. Post operatively, patients were followed-up for 3 months. Recurrent attacks of pancreatitis, reason of interval cholecystectomy, rate of conversion, intraoperative complications, length of hospital stay and duration of operation among the two groups were studied.

III. Results:

In our study 30% patients were male and 70% were female. Majority of patients were in age group of 20-40 years. Epigastric pain (83.3%) was the most common symptoms, followed by pain radiating to back (73.3%), vomiting (70%) and fever (23.3%). Mean temperature was raised in patients undergoing early cholecystectomy (99.45±2.03 vs. 98.87±1.11). During examination, majority of patients had right hypochondrium tenderness (60%), followed by epigastric tenderness (53.3%), palpable lump/ gallbladder (23.3%) and jaundice and anaemia (3.3% each).

Table 1: Difference in various parameters among study group

Parameters	Early group	Interval group
Total Leucocyte Count (TLC)	12606±4935.37	11480±5846.21
3-fold rise of serum amylase	46.6% (n=7)	60% (n=9)
3-fold rise of serum lipase	53.3% (n=8)	67.7% (n=10)
MCTSI: 0-2 (mild)	100% (n=15)	33.3% (n=5)
MCTSI: 4-6 (moderate)	0%	66.7% (n=10)
Revised Atlanta criteria: Mild pancreatitis	100% (n=15)	40% (n=6)
Revised Atlanta criteria: Moderate pancreatitis	0%	60% (n=9)

Among the reasons for interval cholecystectomy, moderate pancreatitis was the major reason (46.7%), followed by requirement of ERCP in (26.7%), 20% cases were deferred due to surgeons' discretion, 6.7% had pseudocyst formation and 6.7% uncontrolled diabetes.

Table 2: The operative difficulties among the study group are listed in table below:

Difficulty	Group 1 (Early)		Group 2 (Interval)		p value
	N	%	N	%	
Mild Adhesions	8	53.33	8	53.33	1
Dense Adhesions	7	46.67	0	0.00	<0.01
Bile Spillage/ Rupture of Gallbladder	6	40.0	2	13.33	>0.05
Bleeding	3	20.00	1	6.67	>0.05
Intrahepatic Gallbladder/ gallbladder adhered to liver bed	3	20.00	0	0.00	0.41
Short Cystic Duct	2	13.33	2	13.33	1
Thickened Gallbladder wall	2	13.33	0	0.00	0.62
Distended Gallbladder	2	13.33	2	13.33	1
Wide Cystic Duct	1	6.67	1	6.67	1
No intraoperative difficulty	0	0.00	6	40.00	<0.01

There was no significant statistical difference among the study groups regarding operative difficulties. Except for dense adhesions in early cholecystectomy group (p-value <0.01) and absence of intraoperative difficulty among interval cholecystectomy group (p-value <0.01)

Table 3: Operating time, length of stay and recurrent attack of pancreatitis

Variables	Group 1 (Early)	Group 2 (Interval)	p value
Time taken for surgery (in min) [Mean ± SD]	93.33 ± 29.44	69.67 ± 12.32	0.008
Duration of hospital stay (in days) [Mean ± SD]	7.93 ± 3.39	13.27 ± 4.18	0.001
Recurrent attack of pancreatitis	0	26.7% (n=4)	0.013
Laparoscopic to Open conversion	6.7%	0%	<0.05

The operating time was more in early cholecystectomy group (p value = 0.008). Length of stay was more in interval cholecystectomy group (p value = 0.001). Recurrent attacks of pancreatitis were present in interval cholecystectomy group (p value = 0.013)



Figure 1: liver, gallbladder adhered to anterior abdominal wall in early cholecystectomy for gallstone pancreatitis



Figure 2: Liver dissected from anterior abdominal wall

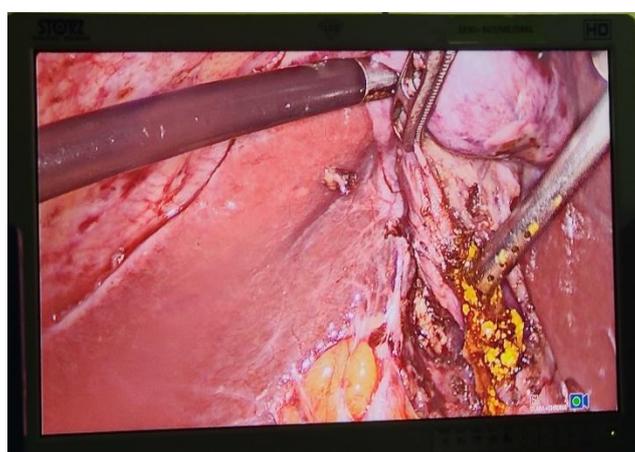


Figure 3: Rupture of cystic duct with bile and stone spillage

IV. Discussion:

Early cholecystectomy significantly reduced the length of stay and reduced incidences of recurrent pancreatitis. But due to more intraoperative difficulties, operative time was also more and chances of conversion were also more.

Intraoperative difficulties were more with early group. More dense adhesions (46.67% vs. 0%), more instances of bile spillage and gallbladder rupture (40% vs. 13.3%), more bleeding (20% vs 6.67%) and more cases with intrahepatic gallbladder were encountered with early cholecystectomy than interval cholecystectomy.

Moreover, interval group had 6 patients with no intraoperative difficulty. Findings of study by Naoman showed that early cholecystectomy had more instances of gallbladder rupture (17.5% vs. 12.5%) and more instances of bleeding from liver bed (7.5% vs. 2.5%).^[4] A study by Aziz M, concluded more having more instances of gallbladder perforation (20% vs. 13.3%) and bleeding (10% vs. 3.3%) in early cholecystectomy group.^[5] Similar deductions were reached in a study by Aksoy, where empyema of gallbladder (40% vs. 8%), more cases with oedematous Calot's triangle (20% vs. 12%) and more bile spillage (3.3% vs. 0%) was found in early cholecystectomy group.^[6]

In our study operative time was more in early group (93.33±29.44 vs. 69.67±12.32, p-value: <0.05), findings of this study were consistent with study done by Aziz M, where operative time in early group was more (67±15.62 vs. 57±11.58, p-value: 0.01).^[5] Another study by Lyushowed similar results [72.18 ±29.63 (min) vs. 69.54 ±32.19 (min)].^[7]

In our study, length of hospital stay was lesser with early cholecystectomy group (7.93 ± 3.39 days vs. 13.27 ± 4.18 days, p-value: <0.05). Our results are consistent with a study done by Lyu, where interval cholecystectomy had longer length of stay (13.29 ±4.51 vs. 10.86 ±3.21 days, p = 0.001).^[7] Similar deductions were drawn by Khiali in his study where length of stay was less with early group (4.56 vs. 12.10 days).^[8]

Conversion rate in our study was 6.67% with early group and 0% in interval cholecystectomy group. Our findings are similar to a study done by Aksoy, where more conversion rates were present in early cholecystectomy group (40% vs 28.7%).^[6]

Recurrent attack of pancreatitis was absent in early group and present in 26.6% of patients of interval group. The results were statistically significant with value of p equal <0.05 in current study. Similar findings were reported by Lyu, where more instances of repeated attacks were present in delayed group (7 vs 0, p value: 0.04).^[7] In a recent meta-analysis, high level evidence suggested that early cholecystectomy reduced recurrent attack of pancreatitis in comparison to interval cholecystectomy (RR 0.21, 95% CI 0.09 to 0.51, I² = 0%).^[9]

Limitations of our study was, non-availability of ERCP facilities in our institute, because of which many patients had to be referred outside and were lost to follow-up. Hospital readmissions could be reduced if ERCP was available in our institute.

V. Conclusion:

Early cholecystectomy significantly reduced occurrence of recurrent pancreatitis, which subsequently decreased hospital readmissions, total length of stay and overall expenditure of the patients of gallstone induced pancreatitis. Even though, early cholecystectomy was associated with increased operative difficulties, increased operating time and higher chances of open conversion, it could still be performed without any increase in morbidity and mortality among the patients. Hence early cholecystectomy is a feasible option and can be performed safely among patients of gallstone induced mild pancreatitis.

References:

- [1]. Li, C., Jiang, M., Pan, C., Li, J., and Xu, L. (2021). The global, regional, and national burden of acute pancreatitis in 204 countries and territories, 1990–2019. *BMC Gastroenterology*, 21(1), 1-12.
- [2]. Zilio, M. B., Eyff, T. F., Azeredo-Da-Silva, A. L., Bersch, V. P., and; Osvaldt, A. B. (2019). A systematic review and meta-analysis of the aetiology of acute pancreatitis. *HPB*, 21(3), 259-267.
- [3]. Boshnaq, M. H., Merali, N., El Abbassy, I. H., Eldesouky, S. A., and; Rabie, M. A. (2016). Financial burden secondary to delay in cholecystectomy following mild biliary pancreatitis. *Journal of Investigative Surgery*, 30(3), 170-176.
- [4]. Noaman, A., Choudhary, M., and Suman, B. (2021). Outcomes of early versus delayed cholecystectomy in patients with mild to moderate acute biliary pancreatitis: A randomised prospective study. *European Journal of Molecular and Clinical Medicine*, 8(4), 1860-1867.
- [5]. Al-Aziz El Sayed, M. A., Zidan, A. M., El Sherbiny, A., Abdndu, M. E. (2021). Early versus delayed laparoscopic cholecystectomy in mild acute biliary pancreatitis. A comparative study. *Asian Journal of Surgery*, 44(7), 1026-1030.
- [6]. Aksoy, F., Demiral, G., and Ekinici, Ö. (2018). Can the timing of laparoscopic cholecystectomy after biliary pancreatitis change the conversion rate to open surgery? *Asian Journal of Surgery*, 41(4), 307-312.
- [7]. Lyu, Y., Cheng, Y., Wang, B., Zhao, S., and Chen, L. (2022). Safety of early same-admission laparoscopic cholecystectomy for acute mild biliary pancreatitis. A retrospective study for acute pancreatitis. *Videosurgery and Other Miniinvasive Techniques*, 17(1), 150-155.
- [8]. Khiali, R., Ammari, S., Nait, N. S., Draï, K., Ladada, A., Haicheur, E. H., and Taieb, M. (2022). Early versus Delayed Cholecystectomy after Mild to Moderate Acute Biliary Pancreatitis: Results of a Comparative Prospective Study. *World Journal of Surgery and Surgical Research*, 5(1), 1-3.
- [9]. Prasanth, J., Prasad, M., Mahapatra, S. J., Krishna, A., Prakash, O., Garg, P. K., and Bansal, V. K. (2022). Early versus delayed cholecystectomy for acute biliary pancreatitis: A systematic review and meta-analysis. *World Journal of Surgery*, 46(6), 1359-1375.

Dr Kushal Choksi, et. al. "A Prospective Comparative Study to Evaluate the Outcomes of Early Cholecystectomy Versus Interval Cholecystectomy In Gallstone Induced Mild Pancreatitis." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 22(1), 2023, pp. 42-45.