Open Access ORIGINAL ARTICLE

Safety and Efficacy of Early Cholecystectomy in Acute Biliary Pancreatitis

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ABSTRACT

Objective: This study was done to assess the safety and efficacy of early Cholecystectomy in mild to moderate Acute Biliary pancreatitis in own surgical setup.

Methodology: This descriptive study was done in surgical unit 1, Fauji Foundation Hospital Rawalpindi from 1st January 2019 to 31st December 2022. Total 70 patients diagnosed as having mild or moderate acute biliary pancreatitis were included in study. Patients having severe acute biliary pancreatitis, multi-organ dysfunction syndrome and pre-existing severe medical co-morbidity were excluded from study. After informed consent early cholecystectomy either laparoscopic or open was performed by senior consultant surgeon within 2-4 days of admission. Post-operatively patient subjective feeling of pain, intravenous analgesia and hospital stay were recorded. Post-operative complications were documented. Data was analysed on SPSS version 26.

Results: The age range was from 28 to 72 years with a mean of 45.2 ± 11.86 years. Majority of patients were of mild severity 44(62.9%), while 26(37.1%) cases were of moderate severity. Laparoscopic cholecystectomy was performed in 28(40%) cases and open cholecystectomy was done in 38(54.28%) cases. Post-operative pain numerical scale mean was 4.31 ± 1.55. The duration of requirement of post-operative intravenous analgesia was mean 37.02 ± 18.12 hrs. Mean hospital stay of patients was 5.95 ± 1.39 days. Among post-operative complications, the most frequent was post prandial dyspepsia 10(14.3%) cases followed by surgical site infection 6(8.6%) cases, recurrent pancreatitis in 4(5.7%) cases, pseudocyst formation 2(2.9%) cases, lobar pneumonia 1(1.4%) case and recurrent biliary sepsis in 1(1.4%) case.

Conclusion: Early cholecystectomy is a safe surgical procedure in mild to moderate biliary pancreatitis. It shortens the course of illness, prevents complications and reduces hospital stay.

Key words: Cholelithiasis, Acute biliary pancreatitis, cholecystectomy, safety, Efficacy

Authors' Contribution:
[1,2]Conception; Literature research; manuscript design and drafting; [2]Critical analysis and manuscript review; [2]Data analysis; Manuscript Editing.

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Article info:
Received: April 15, 2023
Accepted: November 20, 2023

Cite this article. Zaidi HA, Taimur M, Naqvi S, Smiullah, Attiq N. Value of early Cholecystectomy in acute biliary pancreatitis. J Islamabad Med Dental Coll. 2023; 12(4): 298-304. DOI: https://doi.org/10.35787/jimdc.v12i4.982

Funding Source: Nil
Conflict of interest: Nil

Introduction

Acute pancreatitis associated with gall stone disease is increasingly seen in our surgical set up. It has indeed become a great departmental and institutional challenge to manage these cases on account of large number of cases, associated complications and long hospital stay of the patients. Association with gall stones, alcohol and other factors have been described with varying proportions.[1] Biliary pancreatitis accounts for more than 90% cases of pancreatitis in our institution. The remaining cases are of idiopathic origin and alcohol

associated disease is virtually unseen here. Cholecystectomy and removal of stones from the biliary tree remains the ultimate goals of management, not only to treat the disease but also to prevent the complications and recurrence of pancreatitis.[2,3]

Whereas there is little argument on cholecystectomy as the definitive treatment in biliary pancreatitis, the optimal timing of cholecystectomy has been much debated.[4] Conventional surgical management dictates delayed cholecystectomy after stabilization of general physical state and normalization of laboratory values. This is based on the belief that early surgery may increase complications.[5] Most of the cases of acute biliary pancreatitis present with mild and moderate disease but severe disease and systemic complications develops in a significant number of patients.[6] Conservatively treated patients have a high rate of re-admission with recurrent pancreatitis.[7] The conventional approach to treat biliary pancreatitis thus may be regarded as unfeasible on the basis of morbidity, cost and long suffering of the patients. A number of studies conclude that early cholecystectomy in mild and moderate pancreatitis appears to be beneficial in terms of patient's significant symptomatic relief early recovery, less complications, shorter hospital stays and overall lower cost.[8,9,10] In severe biliary pancreatitis the recommendations are generally more in favour of initial conservative treatment and care of organ function but selected cases may merit early surgery.[11] This study makes an endeavor to objectively address the outcome of early cholecystectomy in gall stone pancreatitis in our own set up and describes its safety and efficacy for our routine departmental practice.

Methodology

This descriptive study was carried out from 1st January 2019 to 31st December 2022 at Surgical Unit 1, Fauji Foundation Hospital, Rawalpindi. Ethical approval was obtained from Ethical review committee. A total of 70 patients were included in study. Patients aged 20 years and older, females as well males who were admitted in surgical unit-1 and diagnosed to have mild or moderate acute biliary pancreatitis were selected for the study. Exclusion criteria included patients less than 20 years of age, pancreatitis not associated with gall stones, cases of severe pancreatitis with multi organ dysfunctions, pneumonia, pleural effusion, renal failure and disseminated intravascular coagulation (DIC). Cases of pancreatitis with complications like pancreatic necrosis and abscesses that required emergency surgery on their own merit were also excluded from study. Cases of severe pre-existing medical co morbidity, and prior major surgery of any type were also excluded from the study. All patients had a detailed history and clinical examination. Diagnosis of acute biliary pancreatitis was made on the basis of clinical symptoms and signs of pancreatitis, elevated serum amylase or lipase level and findings of imaging studies. The classification of severity of the disease was based on Revised Atlanta classification of pancreatitis.[12] Mild acute pancreatitis was defined as the disease with no organ failure or local or systemic complications. Moderately severe acute pancreatitis was defined by the presence of transient organ failure, local complications or exacerbation of co-morbid disease.[12]

Patients underwent Cholecystectomy either laparoscopically or by open procedure within 48 to 96 hours after admission. The operations were performed by one of the senior consultant surgeons. Post-operatively *patient's subjective feeling of pain was* measured by numerical scales of 1-10. Post-operative patients *need for intravenous analgesics, local or systemic complications and* hospital stay were recorded. All data was collected on proforma. Statistical analysis was performed using the SPSS software version 26. Means and standard deviation were calculated for quantitative variables like age, post-operative pain numerical scale, post-operative

intravenous analgesic requirement of patients and hospital stay. Frequencies and percentages were calculated for qualitative variables like gender of patients, nature of surgical procedures, severity of pancreatitis and post-operative complications.

Results

Out of 70 patients, 65(92.9%) were females and 5(7.1%) were males. The age range was from 28 to 72 years with a mean of 45.2 ± 11.86 years. Majority of patients were of mild acute pancreatitis 44(62.9%), while 26(37.1%) cases were graded as moderately severe acute pancreatitis (Table 1). The average time interval from diagnosis of acute biliary pancreatitis to early cholecystectomy was 2- 4 days with median 3 days. ERCP was advised in 8(11.4%) cases prior to cholecystectomy for suspected CBD calculi. Laparoscopic cholecystectomy was performed in 28(40%) cases while open cholecystectomy was done in 38(54.28%) cases. Cholecystectomy with choledochotomy and T-tube placement was done in 4(5.71%) cases (Table 2). Post-operative mean pain numerical scale was 4.31 ± 1.55. The mean duration of requirement of post-operative intravenous analgesia was 37.02 ± 18.12 hrs (Table 3). Majority of the patients (93%) were managed with intravenous NSAID's for pain. Mean hospital stay of patients was 5.95 ± 1.39 days. Frequencies of post-operative complications were post prandial dyspepsia 10(14.3%), surgical site infection 6(8.6%), recurrent pancreatitis 4(5.7%), pseudocyst formation 2(2.9%), lobar pneumonia 1(1.4%) case and recurrent biliary sepsis in 1(1.4%) (Table 4).

TABLE 1: Severity of pancreatitis (n=70)

Classification of pancreatitis	Frequency	Percent
Mild acute pancreatitis	44	62.9
Moderate acute pancreatitis	26	37.1
Total	70	100

TABLE 2: Surgical procedure done in patients (n=70)

Surgical Procedures	Frequency	Percent
Laparoscopic Cholecystectomy	26	37.1
Open Cholecystectomy	34	48.6
ERCP and Cholecystectomy	6	8.6
Cholecystectomy and Choledochotomy	2	2.9
ERCP Cholecystectomy and Choledochotomy	2	2.9
Total	70	100.0

TABLE 3: Surgical gains after early cholecystectomy in acute biliary pancreatitis (n=70)

	N	MIN	MAX	MEAN	Std. Dev
Post-operative pain numerical scale (1-10)	70	2	8	4.31	1.556
Duration of post-operative i/v analgesia in hrs	70	24	72	37.02	18.12
Patient mobilization out of bed in days	70	1	3	1.32	.58
Hospital stays in days	70	5	10	5.95	1.39

TABLE 4: Post-operative complications in patients (n=70)	
Post-operative complications	**Frequency**
Surgical site infection	6
Lobar Pneumonia	1
Recurrent biliary sepsis	1
Recurrent pancreatitis	4
Post prandial dyspepsia	10
Pseudocyst formation	2
Per op haemorrhage requiring transfusion	2
None	44
Total	70

Discussion

A large number of gall stone diseases and an ever-increasing number of gall stone associated complications like gall stone pancreatitis seen in our department warrant a departmental review in our treatment strategies. An early cholecystectomy is a logical solution. Like early cholecystectomy in acute cholecystitis, the trend is growing in favour of early surgical intervention in acute biliary pancreatitis.[13] The old conventional practice of conservative treatment followed by planned elective cholecystectomy has many issues and limitations and the practices need to be changed. There is strong clinical evidence that early cholecystectomy in mild and moderate cases of pancreatitis can be carried out safely and with no advantage of delaying the cholecystectomy [14]. Johnstone M, described a significant reduction in the complication rate, total hospital stays and cost of treatment.[15] Iqra Zulfiqar and colleagues concludes in their study that early cholecystectomy significantly minimizes 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.[16] These aspects are of special importance for hospitals in developing countries with a large dependent population and long waiting operation lists and our study strongly supports this observation favouring early cholecystectomy in Biliary pancreatitis. Fu-Ping Zhong also concludes in his study that early laparoscopic cholecystectomy is safe and effective for patients with mild acute gall stone pancreatitis, but the indications and contraindications must be strictly adhered to.[17] In our study the majority of patients were of mild pancreatitis (62.9%), followed by moderate disease (37.1%). There are reservations for early cholecystectomy in severe pancreatitis.[18] We support early intervention in all mild to moderate cases viewing the clinical benefits in terms of improved patient wellbeing, less need for analgesia, control of systemic inflammatory response, prevention of complication and halting the prolonged course of disease. Musarrat Hussain and colleagues in a recent local study have also positively concluded in favor of early laparoscopic surgery and our study supports their findings of early recovery, lesser complications and shorter hospital stay associated with early cholecystectomy in acute biliary pancreatitis.[19]

Most of the studies recommend laparoscopic cholecystectomy but adapting the practice of routine laparoscopy in every patient in our own setup has many limitations.[9,14] Most of our cases 38(54.28%) underwent open surgery and only 28(40%) cases were treated by laparoscopic cholecystectomy. This is primarily due to limited the facilities, long lists and a selective approach towards laparoscopy. We observed equivalent overall results with open and laparoscopic procedures. Average operative time in our study was 90 minutes which is comparable with study done by Satishkumar R describing average operation time of 85 minutes which is almost same for both early as well as for late cholecystectomy.[20] Iqra Zulfiqar and colleagues describe the average operating time in early cholecystectomy group as 60-75 minutes.[16]

ERCP has a definitive role in pancreatitis with CBD calculi.[21] In our study 8(11.4%) cases of CBD calculi

along with cholelithiasis were advised therapeutic ERCP for stone retrieval and were subsequently managed by open cholecystectomy within seventy-two hrs. In 4(5.71%) cases of CBD calculi, open cholecystectomy with Choledochotomy was performed without prior ERCP, to avoid undue delay in the definitive treatment due to long waiting list of cases with gastroenterologists.

Remarkable patient subjective feeling of improvement and relief of pain is the hallmark of early cholecystectomy with minimal requirement of intravenous analgesia.[22] In our study most of the patient were managed with intravenous diclofenac sodium as per patients need and patient postoperative analgesia requirement. In our patients the post-operative mean pain score on numerical scale (1-10) was 4.31. These results are comparable to a study done by DU-Jiang Yang et.al[23] Total hospital stays in our study ranged from 5 - 10 days with mean 5.9 days and is almost comparable with findings of Riquelme F[24]. A significant shorter length of hospital stays along with shorter need for medication, hospital services and saving of hospital resources is undoubted after early cholecystectomy in acute pancreatitis. Gross reduction of known pancreatitis associated local and systemic complications, like prevention of SIRS, organ failure, local abscess formation, and pseudo cyst formation are virtually unseen in cases of mild to moderate pancreatitis. In our study there was only 1(1.4%) case who developed lobar pneumonia and 2(2.9%) cases developed pseudocyst in post-operative period. Risk of recurrent biliary pancreatitis during same admission or discharge after conservative treatment and planned interval cholecystectomy is well known.[25] Early cholecystectomy significantly reduces this risk. In our study 4(5.7%) patients suffered mild symptoms of recurrent pancreatitis. A high re-admission rate and associated high cost of treatment in cases of pancreatitis treated in conventional manners is a wellknown.[26] In our study only 6(8.6%) cases of surgical site infection and 1(1.4%) case of recurrent pancreatitis required re-admission after the surgery for symptomatic treatment. These observations are comparable to the studies by Moody N and colleagues [27,] and Berger S *et.al*[1,28] Abbas *et.al* in their study concluded that surgical intervention in the form of cholecystectomy is the treatment of choice; however, to do surgical intervention in the setting of acute pancreatitis is not devoid of complications like prolonged hospital stays, surgery duration and recurrence.[29] With the available clinical evidence, we see no reason or advantage to delay the cholecystectomy in mild and moderate biliary pancreatitis and support the views of Simone Guadagni *et a*l favouring early surgical intervention.[30]

Conclusion

Early cholecystectomy is a safe surgical procedure in mild to moderate biliary pancreatitis. It shortens the course of illness, prevents complications and reduces the hospital stay.

References

1. Matta B, Gougol A, Gao X, Reddy N, Talukdar R, Kochhar R et.al. Worldwide Variations in Demographics, Management, and Outcomes of Acute Pancreatitis. Clin Gastroenterol Hepatol. 2020; 18(7): 1567-1575. https://doi.org/10.1016/j.cgh.2019.11.017.
2. Jee SL, Jarmin R, Lim KF, Raman K. Outcomes of early versus delayed cholecystectomy in patients with mild to moderate acute biliary pancreatitis: A randomized prospective study. Asian Journal of Surgery. 2018; 41(1): 47-54. https://doi.org/10.1016/j.asjsur.2016.07.010.
3. Hameed T, Khan AZ, Shah I, Khan AQ, Ahmad M. Factors Leading to Acute Pancreatitis in Tertiary Care Hospitals in Pakistan – A Multicenter Study. https://doi.org/JRMC.2018;22(1): 50-53.
4. Davoodabadi A, Beigmohammadi E, Gilasi H, Arj A, Taheri Nassaj H. Optimizing cholecystectomy time in moderate acute biliary pancreatitis: A randomized clinical trial study. Heliyon. 2020; 6(2): e03388. https://doi.org/10.1016/j.heliyon.2020.e03388.

5. Mageed SAA, Helmy MZ, Redwan AA. Acute mild gallstone pancreatitis: timing of cholecystectomy. Int Surg J. 2019; 6(4): 1051-1055. DOI: http://dx.doi.org/10.18203/2349-2902.isj20191250.
6. Leppäniemi A, Tolonen M, Tarasconi A, Segovia-Lohse H, Gamberine E, Kirkpatrick AW *et al.* 2019 WSES guidelines for the management of severe acute pancreatitis. World J Emerg Surg. 2019; 14(27): 1-20. https://doi.org/10.1186/s13017-019-0247-0.
7. Bogan BD, McGuire SP, Maatman TK. Readmission in acute pancreatitis: Etiology, risk factors, and opportunities for improvement. Surg Open Sci. 2022; 10: 232-237. https://doi.org/10.1016/j.sopen.2022.10.010.
8. Akram M, Arsalan M, Kumar V, Ahmed M, Rizwan M, Iqbal W et.al. Outcome of Laparoscopic Cholecystectomy in Acute Pancreatitis Secondary to Gallstones: A Prospective Observational Study from Pakistan. Liaquat National Journal of primary care 2022; 4(1): 17-21. https://doi.org/10.37184/lnjpc.2707-3521.4.15
9. Abou-Sheishaa MS, Burham WA, Abbas AE, Dawoud IE, Shaker MA. When to do Laparoscopic Cholecystectomy in Mild Acute Biliary Pancreatitis, Early or Late? Ann Emerg Surg. 2018; 3(1): 1031. https://doi.org/10.1016%2Fj.heliyon.2020.e03388
10. Prasanth J, Prasad M, Mahapatra SJ, Krishna A, Prakash O, Garg PK et.al. Early Versus Delayed Cholecystectomy for Acute Biliary Pancreatitis: A Systematic Review and Meta-Analysis. World J Surg. 2022;46(6):1359-1375. https://doi.org/10.1007/s00268-022-06501-4.
11. Mannan F, Gill RC, Sohail AA, Alvi R, Ahmad K. Acute necrotizing pancreatitis: Has conservative management replaced surgery? Perspective from a tertiary care centre in Pakistan: Annals of Medicine and Surgery. 2021; 63(3): 1-7. https://doi.org/10.1016/j.amsu.2021.02.005.
12. Banks PA, Bollen TL, Dervenis C, Gooszen HG, Johnson CD, Sarr MG et.al. Acute pancreatitis classification working group. Classification of acute pancreatitis-2012: revision of the Atlanta classification and definitions by international consensus. Gut. 2013; 62(1):102-11. https://doi.org/10.1136/gutjnl-2012-302779
13. Walayat S, Baig M, Puli SR. Early vs late cholecystectomy in mild gall stone pancreatitis: An updated meta-analysis and review of literature. World J Clin Cases. 2021; 9(13): 3038–3047. https://doi.org/ 10.12998/wjcc. v9.i13.3038.
14. Wang L, Yu Hf, Guo T, Xie P, Zhang ZW, Yu Yh. Early *Versus* Delayed Laparoscopic Cholecystectomy for Acute Cholecystitis with Mild Pancreatitis. CURR MED SCI.2020; 40: 937–942. https://doi.org/10.1007/s11596-020-2275-0.
15. Johnstone M, Marriott P, Royle TJ et al. The impact of timing of cholecystectomy following gallstone pancreatitis. Surgeon.2014;12(3):134-140. https://doi.org/10.1016/j.surge.2013.07.006
16. Sakthivel S, Hanif A, Mansoor MM, Khalid I, Almesri AA, Zulfiqar I. Assessment of the early and delayed cholecystectomy in patients with acute biliary pancreatitis. Journal of Population Therapeutics and Clinical Pharmacology. 2023; 30(19):491–497. https://doi.org/10.53555/jptcp.v30i19.3686
17. Zhong FP, Wang K, Tan XQ, Nie J, Huang WF, Wang XF. The optimal timing of laparoscopic cholecystectomy in patients with mild gallstone pancreatitis: A meta-analysis. Medicine.2019;98(40): e17429. https://doi.org/10.1097/MD.0000000000017429.
18. Dedemadi G, Nikolopoulos M, Kalaitzopoulos I, Sgourakis G. Management of patients after recovering from acute severe biliary pancreatitis. World J Gastroenterol. 2016;22(34):7708-17. https://doi.org/10.3748/wjg. v22.i34.7708.
19. Hussain M, Alam J, Muhibullah, Zahid MJ, Wahid U. Outcomes of Early Vs. Delayed Laparoscopic Cholecystectomy in Acute Biliary Stone-Induced Pancreatitis a Prospective Observational Study. P J M H S. 2023; 17(1): 704-706. https://doi.org/10.53350/pjmhs2023171704
20. Satishkumar R, Aneukethan J. The ideal timing of cholecystectomy for mild gallstone pancreatitis. Int Surg J. 2020; 7(1): 253-257. https://dx.doi.org/10.18203/2349-2902.isj20195980.
21. Kundumadam S, Fogel EL, Gromski MA. Gallstone pancreatitis: general clinical approach and the role of endoscopic retrograde cholangiopancreatography. Korean J Intern Med 2021;36(1):25-31. https://doi.org/10.3904/kjim.2020.537.
22. Lyu YX, Cheng YX, Jin HF, Jin X, Cheng B, Lu D. Same-admission versus delayed cholecystectomy for mild

acute biliary pancreatitis: a systematic review and meta-analysis. BMC Surg. 2018;18(1):111. https://doi.org/10.1186/s12893-018-0445-9.

23. Yang DJ, Lu HM, Guo Q, Lu S, Zhang L, Hu WM. Timing of Laparoscopic Cholecystectomy After Mild Biliary Pancreatitis: A Systematic Review and Meta-Analysis. J Laparoendosc Adv Surg Tech A. 2018;28(4):379-388. https://doi.org/10.1089/lap.2017.0527.
24. Riquelme F, Marinkovic B, Salazar M, Martínez W, Catan F, Uribe-Echevarría S et.al. Early laparoscopic cholecystectomy reduces hospital stay in mild gallstone pancreatitis. A randomized controlled trial. HPB (Oxford). 2020;22(1):26-33. https://doi.org/10.1016/j.hpb.2019.05.013.
25. Aksoy F, Demiral G, Ekinci Ö. Can the timing of laparoscopic cholecystectomy after biliary pancreatitis change the conversion rate to open surgery? Asian J Surg. 2018; 41:307–312. https://doi.org/10.1016/j.asjsur.2017.02.001
26. Ragnarsson T, Andersson R, Ansari D, Persson U, Andersson B. Acute biliary pancreatitis: focus on recurrence rate and costs when current guidelines are not complied. Scand J Gastroenterol. 2017;52(3):264-269. https://doi.org/10.1080/00365521.2016.1243258.
27. Moody N, Adiamah A, Yanni F, Gomez D. Meta-analysis of randomized clinical trials of early versus delayed cholecystectomy for mild gallstone pancreatitis. Br J Surg. 2019; 106:1442–1451. https://doi.org/10.1002/bjs.11221
28. Berger S, Taborda, Vidarte CA, Woolard S, Morse B, Chawla S. Same-Admission Cholecystectomy Compared with Delayed Cholecystectomy in Acute Gallstone Pancreatitis: Outcomes and Predictors in a Safety Net Hospital Cohort. South Med J. 2020;113(2):87-92. https://doi.org/10.14423/smj.0000000000001067
29. Abbas MH, Niazi NA, Nazir M, Ur Rasid H, Awaisi SA, Anwar S. Acute Biliary-Pancreatitis: is early Cholecystectomy Safe? PJMHS. 2022; 16(4): 48-49. https://doi.org/10.53350/pjmhs2216448
30. Guadagni S, Cengeli I, Palmeri M, Bastiani L, Bertolucci A, Modesti M, et al. Early cholecystectomy for non-severe acute gallstone pancreatitis: easier said than done. Minerva Chir. 2017; 72:91-7. https://doi.org/ 10.23736/S0026-4733.16.07176-5.