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Original Research Article

Study of laparoscopic cholecystectomy in gallstones induced pancreatitis

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ABSTRACT

Background: Many general surgeons still harbor a notion that laparoscopic cholecystectomy in patients with acute gallstone induced pancreatitis has a higher morbidity. The timing of cholecystectomy in these patients is a matter of debate. Aim of the study was to assess the degree of difficulty, the timing of laparoscopic cholecystectomy (LC), and the complications of surgery in patients of gall stone pancreatitis subjected to laparoscopic cholecystectomy.
Methods: 69 patients were diagnosed with gall stone induced pancreatitis over a period of 12 months and 46 underwent laparoscopic cholecystectomy. After an acute attack of pancreatitis the procedure was performed on index admission or was delayed for an interval of 3 to 4 weeks, thereby dividing the study sample into two on the basis of timing of surgery. The severity of pancreatitis was graded according to the Revised Atlanta criteria.
Results: All the patients who underwent laparoscopic cholecystectomy had either mild or moderate severity of pancreatitis. Comparing the two groups with regard to timing of cholecystectomy, no statistically significant difference was noted in operating time, difficulty in surgery, conversion rate to open procedure or post-operative stay.
Conclusions: Laparoscopic cholecystectomy in patients with gallstone induced pancreatitis does not attribute any additional risk and does not have increased morbidity nor is there any increase risk of conversion.

Keywords: Gallstone induced pancreatitis, Laparoscopic cholecystectomy, Morbidity

INTRODUCTION

Acute pancreatitis is an acute inflammatory disease of the pancreas which can lead to a systemic inflammatory response syndrome with significant morbidity and mortality in 20% of patients.[1] Gallstones account for 30-50% cases as an etiological factor.[2] It is proposed that a gallstone lodged in the ampulla occludes both the common bile duct (CBD) and the pancreatic duct thereby forming a common channel that allows reflux of bile into the pancreatic duct and due to activation of pancreatic enzymes leads to pancreatitis.[3]

Initial treatment of gall stones pancreatitis is supportive. Definite treatment of gall stones pancreatitis to prevent recurrence requires cholecystectomy to remove source of gall stones. Selective endoscopic retrograde cholangiography, clearing the bile duct in case of stone and cholecystectomy comprise the current treatment modality in patients with acute biliary pancreatitis.[4] The modality of biliary decompression with ERCP and endoscopic sphincterotomy allows the surgeon to plan a delayed laparoscopic cholecystectomy for gallstones. Timing of laparoscopic cholecystectomy in acute pancreatitis is controversial.

The surgical decision is divided between early surgery within same admission or a delayed operation, after 6 weeks. Early laparoscopic cholecystectomy in mild to moderate acute pancreatitis certainly decreases hospital

stay, total cost, is safe, and protects patient from recurrent episode of pancreatitis, biliary colic, acute cholecystitis and obstructive jaundice whereas delayed cholecystectomy allows recovery from physiological insult of pancreatitis i.e. reducing acute inflammation, making it easier to perform laparoscopic cholecystectomy and possibly lowering the conversion rate.[5]

With this background, we planned this study to assess the level of difficulty in performing laparoscopic cholecystectomy in the setting of gallstone pancreatitis and to ascertain the impact of the timing of cholecystectomy on patient's outcome.

METHODS

This prospective observational study was conducted in the Department of General Surgery, Himalayan Institute of Medical Sciences, Swami Rama Himalayan University, Dehradun over the period of 12 months after approval from institutional ethical committee and a written informed consent of patients undergoing surgery.

Out of 69 patients admitted in the hospital with confirmed diagnosis of gall stone induced Pancreatitis, 46 patients who underwent laparoscopic cholecystectomy constituted the study sample. Patients who were diagnosed with Pancreatitis due to any other causes or idiopathic Pancreatitis, unfit for surgery and those who refused for surgery or left against medical advice were excluded from the study. Gallstone pancreatitis was diagnosed by clinical presentation, serum amylase, and ultrasound depiction of gallstones.

Further imaging such as a CT scan of abdomen was done to confirm pancreatitis or MRCP was done in patients presenting with jaundice to assess for the presence of CBD stone. The severity of pancreatitis was graded and recorded according to the Revised Atlanta criteria.[6] The timing of LC was as per the decision of treating surgeon. The timing of surgery, degree of difficulty, conversion rate to open cholecystectomy was noted. LC was considered difficult if operating time exceeded 90 minutes or the operating surgeon has deemed it a difficult procedure. Length of hospital stay was also recorded with each patient being followed up at 6-week interval. In follow up visit patient underwent clinical examination along with LFT and imaging by ultrasound to detect any retained CBD stone, pseudo cyst, fluid collection, or any other complication. Morbidity was classified and recorded according to Clavien Dindo scoring system.[7]

Statistical analysis

Statistical analysis was done on SPSS version 19. For qualitative data non-parametric tests and for quantitative data parametric tests were performed. Differences in percentages were calculated using $\chi 2$ analysis and Fisher exact test where appropriate. The p-value <0.05 was considered significant.

RESULTS

Among 46 patients undergoing LC 36 underwent operation in their index admission after acute symptoms were resolved. While 10 patients were discharged and called for LC after an interval of 4 to 6 weeks. The number of females (67.39%) was almost double the number of males (32.60%) and median age of patients being in the 4th decade of life. Analyzing the severity, majority of patients (82.6%) developed mild grade of pancreatitis followed by moderate grade accounting for 17.4% of the total cases. Most common presenting complaint was abdominal pain followed by jaundice, vomiting and nausea. The diagnosis of pancreatitis was established based on clinical presentation and elevated serum amylase level in 27 patients. The mean serum amylase was 946.6±116.44 units/L. In the other 19 patients the serum amylase level was equivocal and diagnosis of pancreatitis was established with the help of imaging (solely USG abdomen in 7 patients, USG + CT abdomen in 2 patients and USG + MRI abdomen with MRCP in 10 patients). Jaundice was present in 26 patients (T. Bil >1.5mg/dL).

Table 1: Comparison of index cholecystectomy with delayed cholecystectomy.

Parameters	Index (n=36)	Delayed (n=10)	P value
Operating time (in minutes)	56.72±19.51	53.22±23.92	0.646
Total stay (days)	6.48±5.09	10.44±2.55	0.029*
Post-operative stay (days)	2.72±4.51	3.0±2.17	0.863
Difficult LC	9	2	0.833
Conversion to open surgery	1	0	0.758

Unpaired 't' test; P- value <0.05* Significant

There was no statistically significant difference between the two groups with regard to operating time (P = 0.646), difficulty in surgery (P = 0.833), conversion rate to open procedure (P = 0.758) or post-operative stay (P = 0.863). However, there was a significant difference in the total length of hospital stay (P <0.05) which was found to be prolonged in patients who had a delayed cholecystectomy (mean±SD: 10.44±2.55) as compared to cholecystectomy performed on index admission (mean±SD: 6.48±5.09) (Table 1).

Only two patients developed major complications post operatively in which cholecystectomy was performed on index admission in the form of surgical site infection and prolonged post-operative ileus. Additional procedure in the form of percutaneous epigastric drain placement under sonological guidance had to be performed in another patient from index cholecystectomy group who

had developed a peri-pancreatic fluid collection post operatively.

In the delayed cholecystectomy group (10 patients), 4 had to be re-admitted earlier than scheduled as they developed recurrent biliary symptoms. No patient in either group was diagnosed with a pseudocyst.

DISCUSSION

In our study there was a female preponderance in the cases diagnosed with gallstone pancreatitis with majority of the cases falling under 31 to 40 year age group. Similar results were obtained by Wani et al regarding demographic profile in their study.[8]

This study also highlights the increasing use of imaging techniques in patients with gallstone pancreatitis for establishing the diagnosis of pancreatitis and for evaluating the CBD in patients with jaundice. A CT scan of abdomen was done in 3 patients and MRI abdomen with MRCP in 26. In contrast the studies reported by Falor et al and Johnstone et al have not shown such an extensive use of MRI abdomen with MRCP.[9,10] In these studies if a patient underwent early cholecystectomy then he / she was more likely to have an on table cholangiogram to rule out choledocholithiasis. Johnstone et al reported that out of 523 patients of gallstone pancreatitis 164 (31%) underwent ERCP for assessing the CBD status. The addition of MRCP in patients with elevated serum bilirubin helps in clarifying the CBD status and a potentially morbid invasive procedure such as ERCP is avoided.

Nebiker et al, in their study revealed 13 out of 99 patients with gallstone pancreatitis had CBD stone, 2 in index cholecystectomy and 11 in delayed surgery group which was statistically insignificant. They also reported need for MRCP in 31% and 54% of the cases in group 1 and group 2 respectively. Out of which 16% and 36% warranted need for ERCP in each group.[11] In contrast, in this study MRCP was done in 45.65% patients of index surgery while 13.04% patients in delayed surgery group.

In this study jaundice at the time of admission was noticed in 56.5% of patients, 23.9% of patients had a serum bilirubin of more than 3 mg/dL. All of these patients had resolution of jaundice spontaneously without any need for ERCP. Neither did any of these patient require intra-operative cholangiography as the preoperative MRCP had shown a clear CBD. The use of ERCP in patients with gallstone pancreatitis with jaundice has been reported to be of 29% by Johnstone et al and 17% by Falor et al.[9,10] In the present study ERCP was needed only in 1 patient (2.17%) with preoperatively diagnosed CBD stone on MRCP. Surprisingly this patient had no jaundice (serum bilirubin less than 1.5). The MRCP was done in this patient in view of dilated CBD reported in ultrasonographic findings. The implication is that most of the gallstones entering the CBD have passed on into the duodenum spontaneously after triggering the attack of pancreatitis.

No significant difference was seen in operating time or level of difficulty between index and delayed cholecystectomy group. Similar results were found in a study done by Al-Qahtani et al where-in they analyzed the medical records of 386 patients retrospectively, over a period of 10 years. They reported an average operating time of 65.1 minutes and 60.5 minutes amongst those assigned in index and delayed surgery group, respectively. Conversion rate was found to be 4.1% and 3.6% respectively. Also, average total hospital stay was found to be 5.4 days in index surgery group while it was 10.4 in delayed surgery group, which was significant on statistical analysis.[12] Early surgery is thus beneficial in terms of lesser hospital stay and this can translate into lesser treatment cost for the patient. There are two studies, one by Hershkovitz et al and the other by Rai et al which showed no significant difference in the length of hospital stay.[13,14]

A total of 11 patients had post-operative complications in some form, comprising both the groups'. Most of it being prolonged post-operative pain (Grade I-Clavin Dindo classification). However, 2 patients developed Grade IIIa and Grade IVa complication. Both the patients recovered in due course of time and were discharged under satisfactory condition. Both of these patients were from index surgery group. However, the statistical analysis did not reach any significance (P value <0.163). Perez et al in their meta-analysis of almost 580 articles regarding the timing of cholecystectomy observed that ten of 207 (4.83%) in the early cholecystectomy group showed some type of complication, and 19 of 429 (4.42%) in the late cholecystectomy group.[15] As reported by these authors there is no difference in post-operative complication rate of index versus delayed cholecystectomy. A finding which is also borne out by the present study.

Proponents of early cholecystectomy argue that if cholecystectomy is delayed, these patients have a risk of recurrent biliary symptoms before they undergo the scheduled delayed cholecystectomy. In this study 40% of the patients planned for a delayed cholecystectomy had recurrence of symptoms. Recurrent biliary symptoms/pancreatitis has been reported in patients who were waiting for delayed cholecystectomy at a rate of 13% by Nebiker et al, 11% by Johnstone et al and 17% by Al-Qahtani.[10-12]

On the other hand, proponents of delayed cholecystectomy argue that if an early cholecystectomy is undertaken then patient may have a future need of repeat surgery due to late complications of pancreatitis such as pseudocyst or infective pancreatic collection. In this study future need for additional procedure was seen in only one patient (2.7%), who required a percutaneous drainage procedure for infected peri-pancreatic collection. Index cholecystectomy, in this study does not

translate into increased operative difficulty or increased complications. These patients have a benefit of a shortened length of hospital stay.

CONCLUSION

There is no significant difference in intra-operative difficulty or post-operative complications amongst patients who are taken up for early or delayed cholecystectomy, following gallstone pancreatitis. However, cholecystectomy when delayed adds up to the total hospital stay of the patient which in-turn is responsible for increase in hospital expense. There is risk of recurrent biliary symptoms in the waiting period if cholecystectomy is delayed.

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