

Outcomes of interval laparoscopic cholecystectomy done after percutaneous transhepatic cholecystostomy – A retrospective observational study.

¹Snehal Deotale, Senior Resident, Department of General Surgery, Seth GSMC & KEM Hospital, Mumbai, Maharashtra, India.

²Bhushan Kumar A. Thakur, Associate Professor, Department of General Surgery, Seth GSMC & KEM Hospital, Mumbai, Maharashtra, India.

³Yogesh Takalkar, Associate Professor, Department of General Surgery, Seth GSMC & KEM Hospital, Mumbai, Maharashtra, India.

Corresponding Author: Bhushan Kumar A. Thakur, Associate Professor, Department of General Surgery, Seth GSMC & KEM Hospital, Mumbai, Maharashtra, India.

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Abstract

Background: The percutaneous transhepatic gallbladder drainage is a widely accepted treatment modality in the management of acute cholecystitis. This reduces inflammation of the gallbladder, avoiding septicemia and improving the general condition in high-risk patients. Cholecystectomy can then be safely performed when patients general condition improves. But this interval cholecystectomy has challenges of its own.

Aim: To study the surgical outcomes of interval cholecystectomy done after percutaneous transhepatic cholecystostomy.

Method: Both retrospective and prospective data of 31 patients was collected had who undergone cholecystostomy followed by interval cholecystectomy. Feasibility and operative difficulties encountered during interval laparoscopic cholecystectomy were noted.

Result: Of the 31 patients, 14 (45%) were aged 55 and above, 18 patients (58%) were females. Average duration between cholecystostomy and interval cholecystectomy was 6 weeks. Intraoperative difficulties such as adhesions was found in all 31 patients (100%), difficulty in dissection of calot’s triangle in 27 patients (87.1%), difficulty in dissection of gall bladder fossa in 28 patients (90.3%). 3 of 31 (9.6%) cases were converted from lap to open. Intraoperative complications such as excessive bleeding (16.1%), bile duct injury (3.2%) were seen. Abdominal drain was used in 12 patients (38.7%). Postoperative bile leak and subhepatic fluid collection was seen in 2 patients. Mean duration of hospital stay was 3 days.

Conclusion: The above study gives statistics regarding the intraoperative difficulties, postoperative complications in a case of cholelithiasis with a previous attack of cholecystitis in a tertiary care hospital which

can be used for future references in designing management policies.

Keywords: Interval cholecystectomy, cholecystostomy, cholecystitis.

Introduction

Since its introduction in 1987, laparoscopic cholecystectomy has become the treatment of choice for most patients with symptomatic cholelithiasis¹. However, about 20% of patients requiring cholecystectomy present with acute cholecystitis and the safety of laparoscopic cholecystectomy in these patients has been questioned². Although laparoscopic cholecystectomy is less invasive than conventional surgery and early laparoscopic cholecystectomy is economically, cosmetically, physically, and psychologically beneficial, it is associated with a high incidence of conversion to open cholecystectomy. The gall bladder in cases of acute cholecystitis is enlarged owing to the oedema and congestion^{3,4}. Occasionally, haemorrhages of the wall or varying degrees of mucosal necrosis occurs⁵. Gangrenous cholecystitis is one of the more severe forms of acute cholecystitis and is encountered in 2% to 39% of patients with acute cholecystitis⁶⁻⁸. After the initial description of ultrasound guided percutaneous cholecystostomy in a patient with gall bladder empyema in the year 1980, this technique has been increasingly employed. Percutaneous cholecystostomy has been traditionally used to manage acute cholecystitis in cases involving severe comorbidities in which an emergency cholecystectomy would increase the risk of mortality⁹⁻¹¹. Percutaneous cholecystostomy can be used as an immediate treatment in cases with severe comorbidities and in elderly or critically ill patients, and cholecystectomy can be safely performed when patients condition improves¹². The effect of preoperative percutaneous transhepatic gall

bladder drainage on the efficacy of laparoscopic cholecystectomy for patients with complicated acute cholecystitis has not been determined nor has the effect of interval between percutaneous transhepatic gall bladder drainage has been studied extensively.

Methods

This study is carried out at GSMC and KEM hospital in the department of General Surgery. Both retrospective and prospective data of 31 patients was collected who had undergone cholecystostomy followed by interval cholecystectomy.

Inclusion criteria

1. Age above 18 years
2. Patients in whom cholecystostomy was done previously and now posted for elective laparoscopic cholecystectomy
3. Patients who give consent

Exclusion criteria

1. Patients unfit for general anaesthesia
2. Patients who do not give consent

Methodology

For Retrospective

1. No consent was taken from the patients
2. Their data was taken from their files

For Prospective

1. Patients undergoing percutaneous laparoscopic cholecystostomy in emergency setting or on elective basis were enrolled in the study post procedure.
2. These patients were followed up and details of interval laparoscopic cholecystectomy was collected during surgery till suture removal.
3. Informed written consent was taken from the patients
4. Details of cholecystostomy was noted
5. Outcomes of interval laparoscopic cholecystectomy were assessed using following parameters such as time interval between cholecystostomy and cholecystectomy,

no. of laparoscopic cases converted to open, operative difficulties, intraoperative complications, drain use, mean operative time, duration of hospital stay and postoperative complications.

6. Data obtained was compiled on a MS Office Excel Sheet (v 2010). Data was subjected to statistical analysis using Statistical package for social sciences (SPSS v 21.0, IBM). Descriptive statistics like percentage and frequency for categorical data has been depicted

Results

Table 1 shows age wise distribution of patients. Maximum patients (14) were in the range of more than 55 years followed by 41-55 years (9 patients).

Table 1: Age wise distribution of patients

Age range	Frequency	Percentage
<25	1	3.2
25-40	7	22.6
41-55	9	29
>55	14	45.2
Total	31	100

Table 2 shows sex wise distribution of patients. Females were more than males with the percentage of 58.1

Table 2: Sex wise distribution of patients

		Frequency	Percentage
Valid	1 Male	13	41.9
	2 Female	18	58.1
	Total	31	100.0

Table 3 shows the interval between cholecystostomy and cholecystectomy. Maximum duration was 8 weeks and minimum was 3 weeks. Average duration was 6 weeks.

Table 3: Interval between cholecystostomy and cholecystectomy

Duration in weeks	Frequency	Percentage
3	3	9.7
4	4	12.9

5	7	22.6
6	11	35.5
7	3	9.7
8	3	9.7
Total	31	100.0

Table 4 shows operative difficulties during interval lap cholecystectomy post cholecystostomy. Adhesions were encountered during lap cholecystectomy in all 31 patients. Difficulty in dissection of calot’s triangle was encountered in 27 patients (81%). Difficulty in dissection was gall bladder fossa was encountered in 28 patients (90.3%).

Table 4: Operative difficulties during interval lap cholecystectomy post cholecystostomy

Operative Difficulty	Present		Absent		Total
	Frequency	Percentage	Frequency	Percentage	
Adhesions	31	100	0	0	100
Difficulty in dissection of calots	27	87.1	4	12.9	100
Difficulty in dissection of Gall bladder fossa	28	90.3	3	9.7	100

Table 5 shows conversion rate of lap cholecystectomy to open cholecystectomy. 3 out of 31 surgeries were converted from laparoscopic to open.

Table 5: Conversion rate of lap cholecystectomy to open cholecystectomy

Lap converted to open	Frequency	Percentage
Yes	3	9.6
No	28	90.4
Total	31	100

Table no 6 shows intraoperative complications encountered during interval cholecystectomy post cholecystostomy. 5 out of 31 patients (11%) had excessive bleeding during surgery. 1 patient (3.2%) had bile duct injury while no patient had bowel injury. Abdominal drain was placed in 12 patients (38.7%)

Table no 6: Intraoperative complications encountered during interval cholecystectomy post cholecystostomy

Intraoperative complication	Present		Absent		Total
	Frequency	Percentage	Frequency	Percentage	
Excessive bleeding	5	11	26	89	100
Bile duct injury	1	3.2	30	96.8	100
Bowel injury	0	0	31	100	100
Abdominal drain use	12	38.7	19	61.3	100

Table 7 shows postoperative complications seen during interval cholecystectomy post cholecystostomy. 2 out of 31 (6.5%) patients had postoperative bile leak, 2 patients (6.5%) had subhepatic fluid collection while 1 patient (3.2%) had postoperative surgical site infection.

Table 7: Postoperative complications

Postoperative complication	Present		Absent		Total
	Frequency	Percentage	Frequency	Percentage	
Postoperative bile leak	2	6.5	29	93.5	100

Subhepatic fluid collection	2	6.5	29	93.5	100
Surgical site infection	1	3.2	30	96.8	100

Table 8 shows the mean duration of hospital stay post interval cholecystectomy. Minimum duration is 3 days and maximum is 20 days.

Table 8: Mean duration of hospital stay

Duration of stay (in days)	Frequency	Percentage
3	16	51.6
4	12	38.7
6	1	3.2
7	1	3.2
20	1	3.2
Total	31	100.0

Discussion

Since it was first reported by Redder in 1980¹⁶ for the treatment of suppurative cholecystitis, the percutaneous transhepatic gallbladder drainage has gained wide acceptance in the management of acute cholecystitis and its treatment efficacy has been increasingly accepted by researchers. It has been established that early laparoscopic cholecystectomy is the preferred option in the management of AC in patients fit for surgery.^{17,18} Also the technical advances and increased experience have gradually motivated surgeons to use laparoscopic surgery for cases of acute calculous cholecystitis.⁶⁻⁸ Early laparoscopic surgery is preferred because of the possibility of technical difficulties, operation time, hospital stay, and medical costs.^{19,20} But laparoscopic cholecystectomy is associated with a significantly higher risk of open conversion and biliary tract injury.²¹ Also, postoperative morbidity is 71% after conversion to open

cholecystectomy in patients with gangrenous cholecystitis.⁸

The mortality rate of 3.4% has been reported for open cholecystectomy for acute cholecystitis.²² The updated 2013 Tokyo guidelines²³ state that among high-risk patients with Grade II (moderate) and III (severe) AC, immediate biliary drainage via PC should be performed. This reduces inflammation of the gallbladder, avoiding septicemia and improving the general condition in the high-risk patient.²⁴ It has also been proposed as definitive treatment in high risk surgical patients.²⁵ The aim and rationale of percutaneous transhepatic gallbladder drainage is to alleviate symptoms and relieve sepsis of acute cholecystitis. This is achieved by relieving the gallbladder tension through external drainage under local Anesthesia in combination with antibiotic therapy.²⁶ In this study we assessed the outcomes of interval laparoscopic cholecystectomy done after cholecystostomy.

Gallbladder drainage can be performed via two routes, the transperitoneal and transhepatic approach (PTGBD). The transhepatic approach through the bare area of the GB was the most commonly used in the majority of published series to prevent catheter dislodgement and bile leakage.^{27,28} But the study by Sanjay et al²⁹ suggests that the transperitoneal route should be used when the gall bladder is grossly distended and adherent to the abdominal wall, or when transhepatic route is difficult due to unfavourable anatomy. We also used the transhepatic route for gall bladder drainage in all 31 patients.

In the present study with 31 patients, 18 were females (58.1%) similar to the study by Paran et al¹⁴. In our study maximum patients i.e.14 out of 31 (45.2%) were aged more than 55 years.

The timing of delayed laparoscopic cholecystectomy after percutaneous transhepatic cholecystectomy is

controversial. Patients treated with laparoscopic cholecystectomy within 72 hours after percutaneous transhepatic cholecystostomy may have a shorter mean hospital stay and lower hospital costs than those who underwent laparoscopic cholecystectomy more than 72 hours after cholecystostomy, but the latter subjects may have lower frequency of complications and shorter operative time.⁵ The average duration between cholecystostomy and interval cholecystectomy was 6 weeks in our study similar to the study by Zarour et al³⁰. Another controversial issue is whether to remove the cholecystostomy catheter during or before delayed laparoscopic cholecystectomy. In the present study we did not remove the catheter until delayed laparoscopic cholecystectomy was done to decrease the risk of recurrent acute cholecystitis after catheter removal because of cystic duct obstruction. Besides, patients with complete relief of symptoms may postpone the scheduled operation after catheter removal, and the risk of subsequent admission because of gall stones in 50% in one year.³¹ Furthermore, tract formation may require 2-3 weeks before the catheter is removed safely. The decision about the timing of cholecystectomy after percutaneous transhepatic cholecystostomy and catheter removal may be affected by institutional policy, surgical judgement, and experience.

Most of the patients in this study showed difficulties during surgery such as adhesions or difficulty in adhesions of Calot's triangle or gall bladder wall fossa as the gall bladders are small and contracted due to the initial acute inflammation causing dense adhesions and fibrosis around the gall bladder.

When laparoscopic cholecystectomy is performed on patients with severe cholecystitis, the rate of conversion to open surgery is usually seen to be high. Therefore, percutaneous transhepatic gall bladder drainage may

have decreased the conversion rate as it helps to allow the severe inflammation to subside. A conversion rate of 0% was reported for laparoscopic cholecystectomy performed 3 months after laparoscopic tube cholecystostomy.³² The combination of USG guided percutaneous trans hepatic gall bladder drainage and laparoscopic cholecystectomy was a safe and effective treatment for patients with acute suppurative cholecystitis as seen in the study by Watanbe et al.³³ In this study, in 3 patients (9.6%) laparoscopic procedure was converted to open cholecystectomy which is similar to the results of Paran et al¹⁴, who showed that conversion to open surgery in patients who underwent laparoscopic cholecystectomy after percutaneous transhepatic cholecystostomy at 6 weeks to 9 months after admission was 8%. In contrast it was found in the study by Kim et al²⁷ that when percutaneous transhepatic gall bladder drainage was performed on patients with severe underlying disease, the frequency of complications and the rate of conversion to open surgery did not differ from that of similar patients who did not have percutaneous transhepatic gall bladder drainage.

5 out of 31 patients (16.12%) had perioperative complications such as severe bleeding or bile duct injury as opposed to 4.3% seen in study by I. W. Han et al⁵. Similarly abdominal drain was used in 28 patients (38.7%) in our study while in the study by Karakayali et al¹ abdominal drain was used in 19% of their study population.

The complication rate associated with laparoscopic cholecystectomy performed for acute cholecystitis ranges from 3% to 40%.^{6,8} Elder et al reported that the postoperative complication rate is 16% for acute cholecystitis and 21% and 22% for patients with empyema or gangrenous cholecystitis, respectively. Postoperative complications such as bile leak, subhepatic

fluid collection or surgical site infection was seen in 3 patients (9.6%) while in the study by Hyung et al³ such complications were seen in 5.3% of the patients and in the study by El Gendi et al³⁴ in 2.7% study population. Average duration of hospital stay was 3-4 days in our study as opposed to 6 days in the study by H. O. Kim et al³.

Conclusions

Percutaneous transhepatic biliary drainage helps in resolution of acute gall bladder inflammation and enabled definitive surgery to be delayed in patients with severe cholecystitis or those at high risk.

But this interval cholecystectomy has challenges of its own. The above study gives statistics regarding the intraoperative difficulties,

postoperative complications in a case of cholelithiasis with a previous attack of cholecystitis treated with percutaneous transhepatic gall bladder drainage followed by interval laparoscopic cholecystectomy in a tertiary care hospital which can be used for future references in designing management policies.

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