ORIGINAL RESEARCH PAPER
Volume - 13 | Issue - 05 | May - 2024 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

LAPAROSCOPIC CHOLECYSTECTOMY AFTER PERCUTANEOUS CHOLECYSTOSTOMY : ASSESSING FEASIBILITY AND SAFETY.

General Surgery

Dr. Priya Gupta* Zen Multispeciality Hospital, Chembur, Mumbai *Corresponding Author
Dr. Vishakha Kalikar Zen Multispeciality Hospital, Chembur, Mumbai
Dr. Avinash Supe Zen Multispeciality Hospital, Chembur, Mumbai
Dr. Roy Patankar Zen Multispeciality Hospital, Chembur, Mumbai

ABSTRACT

Acute calculous cholecystitis is one of the most common surgical entities seen in practice and laparoscopic cholecystectomy is the gold standard surgical procedure for its treatment. According to the Tokyo guidelines , Grade 3 cases present with organ dysfunction and hence Percutaneous cholecystostomy (PCT) has been recommended as a bridge to surgery to control sepsis when a patient is unfit for surgery or has a high ASA grading and the ones who do not respond to antibiotics. Successful laparoscopic cholecystectomy after percutaneous cholecystostomy can be safely carried out without the need for conversion to open surgery with a thorough knowledge of the biliary anatomy, surgical modifications such as subtotal cholecystectomy and access to advanced imaging system and procedures such as intravenous indocyanine green and intra-operative ERCP.

KEYWORDS

INTRODUCTION:

The overall prevalence of cholelithiasis is around 10 to 15 percent with some difference across countries, majority being asymptomatic(1). Acute cholecystitis (AC) is the first presentation of 10-15 percent patients with gallstone disease(2). It is one of the most common surgical entities seen in practice and laparoscopic cholecystectomy is the gold standard surgical procedure for its treatment. According to the Tokyo guidelines(3), Grade 3 cases present with organ dysfunction and hence Percutaneous cholecystostomy (PCT) has been recommended as a bridge to surgery to control sepsis when a patient is unfit for surgery or has a high ASA grading and the ones who do not respond to antibiotics. In the case of acute calculus cholecystitis (ACC), cholecystectomy is needed after a patient is stabilized with percutaneous cholecystostomy.

MATERIALS AND METHODS:

Data of all the patients who underwent a percutaneous cholecystostomy for acute cholecystitis from 1st January 2015 to 1st January 2023 at a tertiary care centre in Mumbai was collected retrospectively. Patients lost to follow-up after PCT or were excluded from the study. A total of 63 patients had undergone percutaneous cholecystostomy during the study period, out of which 60 were included in the study.

RESULTS:

Over the study period, 34 patients (56.7%) were males, 26 patients (43.3%) were females, the average age being 69.3 years (range: 36 years- 88 years).The most common comorbidities were diabetes mellitus and hypertension in 32 (53.3%) and 30 (50%) patients respectively (Figure 1). 18 patients had ischemic heart disease. Other comorbidities included interstitial lung disease, bronchial asthma, hypothyroidism and chronic kidney disease.

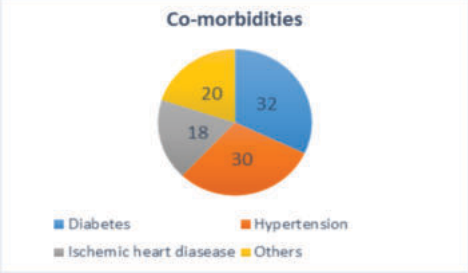

Figure 1: Co-morbidities in the patients

Blood work-up including a complete blood count, serum creatinine and liver function test was done in all the patients. A baseline ultrasonography of the abdomen was done to diagnose acute cholecystitis. Further imaging such as magnetic retrograde cholangiopancreatography (MRCP) or a contrast-enhanced computed tomography (CE-CT) were selectively done. Endoscopic retrograde cholangiopancreatography (ERCP) with common bile duct (CBD) stent placement for choledocholithiasis was done in 3 patients.

Out of 60 patients, 33 patients presented with septic shock with multiorgan dysfunction requiring initial ICU stay and aggressive medical management. The most common cause for PCT placement in our study was deterioration of general condition due to failure to respond to medical treatment with intravenous antibiotics. Out of 60 patients of PCT, 41 patients had ACC with a perforated gallbladder, 9 patients had ACC, 6 patients had ACC with empyema gall bladder and 4 patients had acute acalculous cholecystitis (Figure 2).

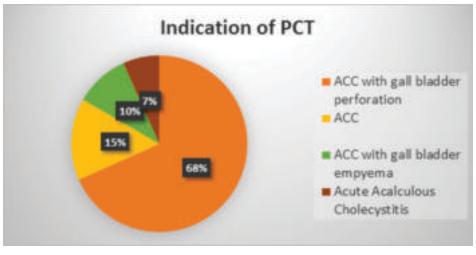

Figure 2: Indications of PCT

Duration of stay in hospital at the time of PCT insertion ranged from 4 days to 34 days (median 7 days).Patients were followed up in the out-patient clinic, weekly. The decision for the timing of cholecystectomy was based on patient and clinical parameters like no further episodes of acute cholecystitis, normal total leucocyte count and liver function test, USG abdomen showing resolution of pericholecystic fluid and wall edema.

Laparoscopic cholecystectomy was performed after an average of 41.1 days (from 10 days to 72 days) after the PCT. All 60 patients underwent laparoscopic cholecystectomy, using standard 4 ports with use of one extra 5mm port in 27 patients (Figure 3, 4).

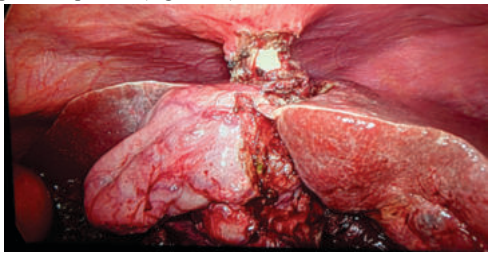

Figure 3: Intra-op view of PCT tube during laparoscopic cholecystectomy

Figure 4: After removal of PCT tube during laparoscopic cholecystectomy

Intra-operative indocyanine green (ICG) was given 3 hours prior to surgery to help delineate the biliary tree (Figure 5).

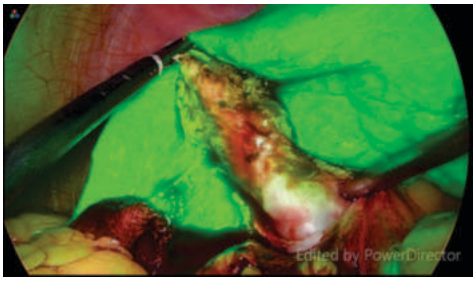

Figure 5: Intra-operative use of ICG

Complete cholecystectomy was done in 42 patients. In view of difficult anatomy due to adhesions and frozen Calot's triangle, reconstituting subtotal cholecystectomy was done in 18 patients. Conversion to open cholecystectomy was required in none of the patients. The specimen was extracted in an Endo bag from the umbilical port to prevent port site bile contamination.

3 patients underwent intra-operative ERCP with CBD stenting in view of frozen Calot's. 26 patients had an abdominal drain placed in the gall bladder fossa and was removed after an average of 3.1 days (ranging from 2 to 5 days). The post-operative duration of hospital stay ranged from 2 to 33 days (median 3 days). No deaths or reinterventions were needed at 30 days.

All patients were followed up for a period of 8 weeks. 3 patients had a SSI which was managed conservatively.

DISCUSSION:

Percutaneous cholecystostomy (PC) is a minimally invasive procedure done under local anaesthesia, for decompression and drainage of the gallbladder, in patients with AC with or without severe sepsis, who are considered to be high risk candidates for emergency surgery. Conservative management of acute cholecystitis, with percutaneous cholecystostomy and subsequent elective cholecystectomy, following appropriate preoperative assessment and preparation, is a safe alternative to early cholecystectomy.

Technical success for PC in literature ranges from 95 to 100%(4), failures resulting from thick biliary aspirate and difficulty in access. Failure to access the gallbladder occurs in patients with decompressed gallbladders, impacted stones, and thickened gallbladder wall. The total rate of major and minor complications ranges from 2.4 to 16% of cases[4,5]. In our series, we report a 100% technical success rate in insertion of a percutaneous catheter. As biliary infection or sepsis may be present before intervention, it becomes difficult to evaluate the rate of complications of PCT.

Woodward et al(6). observed that interval cholecystectomy is associated with increased operative complications when performed within 1 month of PCT or 8 weeks after PCT placement. Thus they conclude that 4 to 8 weeks is the most favourable timing for interval cholecystectomy. Giannopoulos S et al(7) studied a group of 112 patients who underwent LC after a median of 65 days (48-96.5) days after PCT. Average time interval in our study was about 6 weeks (41.1 days).

Abdelsaid K et al (8) proposed that percutaneous cholecystostomy by itself can be used as a definitive therapy in a study group of 126 patients. 36 percent of this cohort underwent a laparoscopic cholecystectomy.

As per TOKYO guidelines 2018(3), risk factors associated with increased operative time and conversion to open surgery include gallbladder wall thickness >4-5 mm, male patient >60 years of age, acute cholecystitis, ASA score etc.

Intra-operative use of real-time ICG fluorescence cholangiography facilitates improved visualization and identification of the biliary tree anatomy and is thus employed for increasing the safety of laparoscopic cholecystectomy(9). In literature, rate of conversion of laparoscopic cholecystectomy to open cholecystectomy after PCT ranges from 23%-45% (10,11) but with the use of ICG to delineate the biliary anatomy, we present a 0% conversion rate to open cholecystectomy.

Strasberg et al(12) have proposed subtotal cholecystectomy as a bail-out surgery to avoid bile duct injury in cases of complicated gall bladder. Two types- "reconstituting" and "fenestrating" types have been described. In our series, we performed subtotal cholecystectomy-reconstituting type in 16 patients due to frozen Calot's and unclear biliary anatomy.

Reported rates of bile duct injury in cases of interval cholecystectomy after PCT range from 7.7% to 10%(13,14), we report 7.5% incidence of minor bile duct injuries involving lateral wall of the CBD. ERCP is an essential tool in management of bile duct injury as it allows the identification of the site of bile leak and also allows internal biliary drainage if the diagnosis of minor bile duct injury is confirmed(14). ERCP is recommended as first-line therapy for postoperative biliary leaks(15). Success rate of ERCP in minor bile duct injuries ranges from 87.1%-100%(16).

The limitations of this study being that it is a retrospective study and a small sample size.

CONCLUSION:

Successful laparoscopic cholecystectomy after percutaneous cholecystostomy can be safely carried out without the need for conversion to open surgery. A thorough knowledge of the biliary anatomy, surgical modifications such as subtotal cholecystectomy and access to advanced imaging system and procedures such as intravenous indocyanine green and intra-operative ERCP would aid in reducing the post-operative morbidity and mortality.

Funding: Nil

Conflict of interests: None

Acknowledgement: I would like to thank Dr. Hardik Lathiya (Department of Radiology, Zen Multispeciality Hospital, Chembur, Mumbai) for his support and help in tracing the patients who have undergone PCT at our centre.

REFERENCES

1. Lammert F, Gurusamy K, Ko CW, Miquel JF, Méndez-Sánchez N, Portincasa P, et al. Gallstones. Nat Rev Dis Primers. (2016) 2:16024. doi: 10.1038/nrdp.2016.24
2. Shaffer EA. Epidemiology and risk factors for gallstone disease: Has the paradigm changed in the 21st century? Curr Gastroenterol Rep. 2005;7(2):132–40.
3. Tokyo Guidelines 2018: surgical management of acute cholecystitis: safe steps in laparoscopic cholecystectomy for acute cholecystitis. Go Wakabayashi, Yukio Iwashita, Taizo Hibi et al. First published: 02 November 2017, https://doi.org/10.1002/jhbp.517
4. Yeo C S, Tay V W, Low J K, Woon W W, Punamiya S J, Shelat V G. Outcomes of percutaneous cholecystostomy and predictors of eventual cholecystectomy. J Hepatobiliary Pancreat Sci. 2016;23(1):65–73
5. Katabathina V S, Zafar A M, Suri R. Clinical presentation, imaging, and management of acute cholecystitis. Tech Vasc Interv Radiol. 2015;18(4):256–265
6. Steven G. Woodward, Arturo J. Rios-Diaz, Richard Zheng et al. Finding the Most Favorable Timing for Cholecystectomy after Percutaneous Cholecystostomy Tube Placement: An Analysis of Institutional and National Data. https://doi.org/10.1016/j.jamcollsurg.2020.10.010
7. Giannopoulos S, Makhecha K, Madduri S, Garcia F, Baumgartner TC, Stefanidis D. Cholecystectomy After Percutaneous Cholecystostomy for Acute Cholecystitis: Experience and Outcomes in an Academic Practice. The American SurgeonTM. 2023;0(0). doi:10.1177/00031348231157834
8. Abdelsaid K, Hassan M, Jayasankar B, Jeilani M, Ali H, Abdul Aal Y. Percutaneous Cholecystostomy in Severe Acute Cholecystitis: An Observational Study From a Single Institute. Cureus. 2023 Feb 2;15(2):e34539. doi: 10.7759/cureus.34539. PMID: 36743905; PMCID: PMC9893171.
9. Obonna GC, Obonna MC. Role of Indocyanine Green in Laparoscopic Cholecystectomy. World J Lap Surg 2020; 13 (1):1-3. DOI: 10.5005/jp-journals-10033-1388
10. Al-Jundi W, Cannon T, Antakia R, Anoop U, Balamurugan R, Everitt N, Ravi K. Percutaneous cholecystostomy as an alternative to cholecystectomy in high risk patients with biliary sepsis: a district general hospital experience. Ann R Coll Surg Engl. 2012; 94(2):99–101. doi.org/10.1308/0035884 12x13171221501302.

11. Flexer SM, Peter MB, Durham-Hall AC, Ausobsky JR. Patient outcomes after treatment with percutaneous cholecystostomy for biliary sepsis. Ann R Coll Surg Engl. 2014;96(3):229–33. doi.org/10.1308/0035 88414x13814021679799.
12. Strasberg, Steven M. MD, FACSa,*; Pucci, Michael J. MD, FACSc; Brunt, Michael L. MD, FACSb; Deziel, Daniel J. MD, FACSd. Subtotal Cholecystectomy–"Fenestrating" vs "Reconstituting" Subtypes and the Prevention of Bile Duct Injury: Definition of the Optimal Procedure in Difficult Operative Conditions. Journal of the American College of Surgeons 222(1):p 89-96, January 2016. | DOI: 10.1016/j.jamcollsurg.2015.09.019
13. Mizrahi I, Mazeh H, Yuval JB, Almogy G, Bala M, Simanovski N, Ata NA, Kuchuk E, Rachmuth J, Nissan A, Eid A. Perioperative outcomes of delayed laparoscopic cholecystectomy for acute calculous cholecystitis with and without percutaneous cholecystostomy. Surgery. 2015;158(3):728–35. doi.org/10.1016/j.surg.2015.05.005.
14. de'Angelis, N., Catena, F., Memeo, R. et al. 2020 WSES guidelines for the detection and management of bile duct injury during cholecystectomy. World J Emerg Surg 16, 30 (2021). https://doi.org/10.1186/s13017-021-00369-w
15. Chathadi KV, Chandrasekhara V, Acosta RD, Decker GA, Early DS, Eloubeidi MA, et al. The role of ERCP in benign diseases of the biliary tract. Gastrointest Endosc. 2015;81(4):795–803. https://doi.org/10.1016/j.gie.2014.11.019.
16. Dumonceau JM, Tringali A, Papanikolaou IS, Blero D, Mangiavillano B, Schmidt A, et al. Endoscopic biliary stenting: indications, choice of stents, and results: European Society of Gastrointestinal Endoscopy (ESGE) Clinical Guideline - Updated October 2017. Endoscopy. 2018;50(09):910–30.