

Original Research Article

Management of common bile duct calculi in a tertiary care hospital in North East India

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ABSTRACT

Background: Common bile duct calculi are frequently encountered in patients with cholelithiasis. Treatment ranges from endoscopic retrograde cholangiopancreatography (ERCP) to various surgical treatment modalities done either by laparoscopic or open techniques.

Methods: This was a retrospective cross-sectional study carried out in General Surgery department of NEIGRIHMS Hospital from April 2014 to March 2020. Patients attending the hospital with choledocholithiasis during the time period have been included in the study.

Results: A total of 82 patients were included in the study. The prevalence of common bile duct (CBD) calculi in patients attending NEIGRIHMS Hospital with symptomatic gallstone diseases was 5.16%. Treatments ranged from primary CBD closure or T-tube drainage after CBD exploration either by laparoscopic techniques, choledocho-duodenostomy and ERCP. Bile peritonitis in 9 patients and retained stone were observed in some patients who were managed accordingly. No mortality was seen in any patient.

Conclusions: The number of patients with CBD calculi and symptomatic gallstone disease attending NEIGRIHMS Hospital is less and standard of care is provided to the patients with acceptable morbidity and mortality.

Keywords: CBD calculi, T-tube drainage, Primary CBD closure, Choledocho-duodenostomy, ERCP

INTRODUCTION

Common bile duct (CBD) calculi are found in approximately 10-20% of symptomatic patients with cholelithiasis.¹ Most of the stones are secondary stones forming in the gallbladder or intrahepatic, but some can form primarily in CBD due to infections or bile stasis.² Patients with CBD calculi may remain asymptomatic or may present with cholangitis, pancreatitis, biliary colic and obstructive jaundice.³

European society of gastrointestinal endoscopy (ESGE) has recommended removal of all CBD calculi irrespective of symptoms in patients who are otherwise fit enough to tolerate the intervention.⁴

Various effective techniques are available for treating CBD calculi. Single stage laparoscopic cholecystectomy along with CBD exploration or the two stage laparoscopic cholecystectomy along with pre and post-operative endoscopic retrograde cholangiopancreatography (ERCP) are the most popular and effective techniques currently available.^{1,5,6}

After CBD exploration either by laparoscopic or open techniques, the CBD is either closed primarily or closed over T-tube. Jing et al in their meta-analysis opined that primary duct closure alone or with biliary stent drainage is superior to CBD closure over T-tube.³ Choledocho-duodenostomy (CD) after CBD exploration is an effective and safe treatment which reduces the chances of missed or residual CBD stones significantly.⁷

The present study was undertaken to find the point prevalence of CBD calculi in patients with symptomatic gallstone diseases from this part of India and also to study the various techniques being adopted to manage such patients.

METHODS

Retrospective cross-sectional study of patients managed in NEIGRIHMS hospital from April 2014 to March 2020.

The aim of this study was to study the patient characteristics and management profile of patients presenting with common bile duct calculi.

Necessary ethical approval was obtained from the Institute Ethics Committee.

Inclusion criteria

All patients with CBD calculi managed in NEIGRIHMS hospital during the study period were included in the study.

The following parameters were included in the study: CBD diameter, procedure performed after choledochotomy - primary closure (PC) or closure over T-tube or CD or ERCP, retained stones, complications - bile peritonitis or any other, subsequent procedures if any, does patient have haemoglobin E trait or other haemolytic disorders and follow-up. The patients who underwent T-tube drainage (TTD) were discharged with the T-tube in situ and the patients were called back for T-tube cholangiogram around 10 to 14 days. If the cholangiogram study was normal then the T-tube was removed usually between 14 to 21 days. Patients were followed up to around 3 months.

The descriptive statistics for continuous variables have been shown in percentages and as means with standard deviations.

RESULTS

A total of 82 patients with common bile duct calculi were managed during the time period. Total cholecystectomies performed during the time period including these patients with CBD calculi was 1589. So the point prevalence of CBD calculi in patients presenting with symptomatic gallstone disease in NEIGRIHMS hospital is 5.16%. The following procedures were performed for the patients: TTD in 45 patients (16 by laparoscopic and 29 by open), CD in 17 patients, primary CBD closure (PC) in 13 patients (4 by laparoscopic and 9 by open), ERCP in 7 patients (Figure 1). Patient characteristics are shown in Table 1. Number of ERCPs performed was less as the procedure started in NEIGRIHMS hospital just few months back only.

Most of the patients belonged to age group 25 to 55 years of age, the youngest patient was 22 years old and the oldest patient was 67 years old (Figure 2).

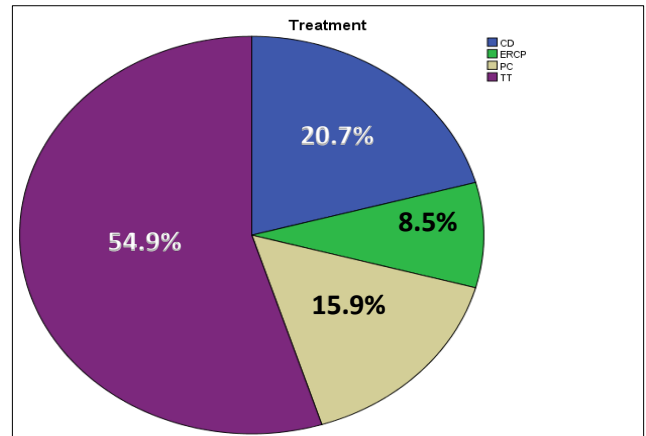


Figure 1: Pie chart distribution of treatments done.

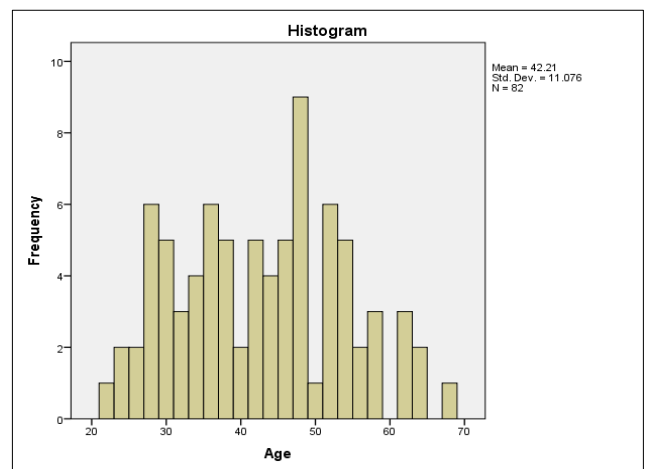


Figure 2: Age distribution of patients.

Table 1: Patient characteristics.

Clinical parameter	Values
Gender distribution (82)	Males - 22 Females - 60
Age	Mean - 42.21±11.076 Median - 42.50
Retained stones (5)	TTD - 3 ERCP - 2
Bile leakage/peritonitis (9)	TTD - 4 PC - 2 CD - 3
Reoperation (4)	Retained stone after TTD - 1 Bile leakage after CD - 2 Bile leakage after TTD - 1
USG guided percutaneous drainage (6)	TTD - 3 PC - 2 CD - 1
Diabetes mellitus	7
Haemoglobin E trait/beta thalassemia	5
Postoperative wound infections	9

Patients with normal or mildly dilated CBD were planned for ERCP and T-tube drainage (Table 2). CD was performed when the CBD diameter was around 15 millimetre and above in patients with multiple stones and in patients with haemolytic disorders. Primary CBD closure was performed in patients with CBD diameter >11 mm but <14 mm. Retained stones were found in 3 patients in the T-tube drainage group and 2 patients in the ERCP group. Patients with retained stones after T-tube drainage were managed with ERCP and the patients who had retained stones after ERCP were managed surgically as the stones were impacted and larger in sizes.

Table 2: Mean CBD diameter in millimetre (mm).

Procedure	Diameter in mm±SD
T-tube drainage	9.322±0.990
Choledocho-duodenostomy	15.382±1.673
Primary CBD closure	12.192±0.693
ERCP	6.786±0.393

The mean length of hospitalisation (Table 3) except ERCP group was more or less similar as most patients preferred to be discharged after suture removal only. The length of hospitalisation was significantly longer in those patients who developed bile peritonitis postoperatively (Table 4) which was statistically significant (p value 0.001). No mortality was noted in any patient.

Table 3: Length of hospitalisation in days.

Procedure	Days±SD
T-tube drainage	6.33±2.780
Choledocho-duodenostomy	7.82±4.419
Primary CBD closure	6.85±4.525
ERCP	3.57±0.535

Table 4: Length of hospitalisation in days in patients with bile peritonitis or without bile peritonitis.

Bile peritonitis	Hospitalization in days±SD
No (73)	5.47±1.435
Yes (9)	14.78±4.324

DISCUSSION

The prevalence of CBD calculi among patients with symptomatic gallstone disease is 5.16% in NEIGRIHMS hospital. CBD calculi are found in 11-25% of patients with cholelithiasis, and in approximately 10% of symptomatic gallstone patient undergoing cholecystectomy.⁸⁻¹¹

ESGE recommends limited sphincterotomy with endoscopic dilatation using large balloon as the first-line approach to remove difficult CBD calculi and even the use of cholangioscopy-assisted intraluminal lithotripsy (electrohydraulic or laser) for difficult bile duct stones.

Laparoscopic cholecystectomy should be performed within 2 weeks of performing ERCP to prevent conversion rate and the risk of recurrent biliary events.⁴ But in NEIGRIHMS hospital, ERCP has been started only recently and since most of the patients were financially constrained, they were not able to go for ERCP to other centres. Hence TTD after CBD exploration either by laparoscopic or open techniques was the most commonly performed procedure. Nearly 54.9% of patients underwent TTD after CBD exploration. Primary CBD closure either by laparoscopic or open techniques and CD were also performed in some patients.

4 (8.9%) patients developed bile peritonitis following removal of T-tube. 1 patient had to be re-operated for persistent bile leak. Bile peritonitis was also seen in 2 (15.38%) patients who underwent primary closure of CBD after exploration. Hence it was found that patients who underwent primary CBD closure had more chances of developing bile peritonitis in comparison to patients undergoing TTD (OR=1.864, 95% CI 0.301-11.54) and was statistically significant (p value 0.02). However, Shakya et al in their prospective randomized study have reported lesser complication rate for primary CBD closure as compared to T-tube drainage.¹² Similar view was also opined by Leida et al.¹³ The greater number of biliary complications in the present study may be due to lesser sample size of patients who underwent primary CBD closure.

The stone clearance rate of CBD by laparoscopic CBD exploration in the present study was 100% as against 71.43% for ERCP. 2 patients (12.5%) had bile peritonitis following T-tube removal. Koc et al in their prospective randomized study found an efficacy rate of 96.5% for laparoscopic CBD exploration as against 94.4% for ERCP.¹⁴ The complication rate for laparoscopic CBD exploration in their series was also lesser at 7%. Along with more experience in laparoscopic CBD exploration, the complication rate will come down.

Retained stones were also detected in 3 (6.7%) patients who underwent T-tube drainage after CBD exploration in the present study. One patient was re-operated and ERCP was done for the remaining two patients. Ali et al reported a higher residual stone rate of 16.28% in their series.⁷ Patients who underwent CD did not have any incidence of residual stones similar to Ali et al but 3 patients in the present series developed biliary peritonitis due to anastomotic leakage.⁷ Two patients had to be re-operated and the other patient underwent ultrasonographic percutaneous tube drainage. All patients recovered without any further complications. Most of the patients were followed up for up to 3 months and no patient had any feature of biliary strictures.

CONCLUSION

In this retrospective study, a total of 82 patients with CBD calculi were managed in NEIGRIHMS hospital. The

prevalence of CBD calculi in NEIGRIHMS hospital was found to be 5.16% which is much lesser than most of the series. Treatments included ranged from primary CBD closure or TTD after CBD exploration either by laparoscopic or open techniques, CD and ERCP. Retained stones were more common in patients managed by TTD and ERCP. Bile peritonitis considerably prolonged the hospitalisation time. To conclude common bile duct calculi can be managed by a variety of techniques and the choice depends on the experience of the treating surgeon and patient characteristics.

Limitations of the study

The sample size was small and a meaningful comparison between the various sub-groups was not possible.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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