Section: TB & Respiratory

Original Research Article

CHOLEDOCHODUODENOSTOMY AS A DEFINITIVE PROCEDURE FOR MULTIPLE CHOLEDOCHOLITHIASIS IN RESOURCE LIMITED CENTRE: A RETROSPECTIVE STUDY

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Abstract

Background: Choledochoduodenostomy is better procedure as compared to only choledocholithotomy with T-tube drainage in case of multiple common bile duct stones in resource limited center where endoscopic retrograde cholangiopancreaticography (ERCP) and other endoscopic and percutaneous approach for stone clearance is limited. **Aim:** The study aim to assess these surgical procedures in resource limited center. **Material & Methods:** We analyzed 68 patients who underwent open CBD exploration with T-tube insertion and choledochoduodenostomy from January 2021 to June 2023. **Results:** Out of 68 patients with median age of 59, there were 22 patient undergone open CBD exploration with T-tube drainage and 34 patients underwent open CBD exploration with choledochoduodenostomy with most of the postoperative complications seen with t-tube drainage patients as compared to patients of choledochoduodenostomy and also average length of hospital stay was seen less in patient with choledochoduodenostomy as compared to T-tube drainage. **Conclusion:** Open choledochoduodenostomy is an excellent option with very low mortality and morbidity in patients mostly elderly with multiple CBD stones in resource limited centers.

INTRODUCTION

Obstructive Jaundice due to choledocholithiasis is a common surgical condition in our part of the world with prevalence of 10-18% in patients with symptomatic gall stone disease.[1,2] CBD stones can be silent or can give symptoms ranging from biliary colic to obstructive jaundice, cholangitis, septic shock and even death.[3] CBD stones are potentially serious condition.

Many treatment options are available for the management of patients with CBD stones depending on co morbidities, timing of diagnosis of CBD stones (pre, per, post exploration) as well as medical facilities, and resources available, and affordability by patients.[4-6]

We did a retrospective study on 68 patients with CBD stones who underwent Open CBD exploration and with T- tube drainage or choledochoduodenostomy.

MATERIALS AND METHODS

After approval from the Institutional Ethical Committee, this tertiary care center based retrospective observational study was conducted on 68 patients with obstructive jaundice due to multiple CBD stones admitted in OPDs and emergency of Department of General surgery, Rajendra Institute of Medical Sciences, Ranchi from January 2021 to June 2023.

Inclusion Criteria

- Patient aged more than 18 years including both male and female.
- Patient with multiple CBD stones, intrahepatic duct stones, impacted stones and ampullary stenosis and distal CBD stricture.

Exclusion Criteria

- Patients with malignancy
- Patients with uncontrolled co morbidities

Methods of Data Collections

All patients admitted with clinical diagnosis of multiple CBD calculus, especially packed intrahepatic duct stones, recurrent CBD stones in elderly, impacted stones, ampullary stenosis, duodenal diverticulum and those with second or third operations for CBD stones in an elderly were taken into account of this study. A detailed data was

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collected from our records using OT notes and BHT (bed head tickets) where detailed information was written about the data needed. In our records detailed written informed consents were obtained from patients regarding procedures, surgeries, complications and researches.

The recorded data included distributions of CBD stones according to site, age, level of bilirubin, socioeconomic status, type of operations done like choledochoduodenostomy, CBD exploration with T-tube in-situ, and post-operative complications like wound infections, cholangitis, anastomotic dehiscence, sepsis, bleeding, and death respectively, postoperative hospital stay per days, patient outcome and lastly follow-up data.

Mortality was defined as all deaths occurring within 30 days of operation or during the hospitalization if it exceeded 30 days. Morbidity was defined as any adverse outcome that occurred after operation but before discharge. Adverse outcomes that occurred before operation and continued in the postoperative period were not characterized as morbidities.[7]

Statistical Analysis

The data was tabulated in MS-Excel version 2023. Data pertaining to number and site of CBD stones was compared and represented as a bar graph and proportions were calculated. Similarly, data pertaining to distribution of CBD stones which was compared with age of patients, socioeconomic status, and level of bilirubin represented as bar graph and proportions were collected. And in the same way length of hospital stay and post-operative complication after choledochoduodenostomy and CBD exploration with T-tube insertion was compared and represented as bar graph and proportions were collected.

RESULTS

After proper work up and investigation patient were planned for CBD explorations. The following observations were made.

Distributions of CBD stones (68 cases): - All 68 patients were properly investigated and exact location and nature of CBD stones were identified. Multiple CBD stones including large stones >2.5 cm was in 38 cases, multiple intrahepatic duct stones in 12, recurrent CBD stone in 8, impacted stone in 8 and ampulla of vater stones in 2 cases. [Figure A]

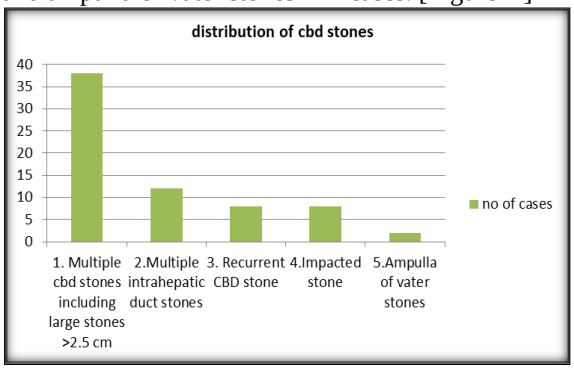

Figure A: Distribution of CBD stones (68 cases)

Distribution of CBD stones according to age of patients:- In the present study mean age of the patients were 59 years ranging from 18-88 years. Mainly 7 groups were made on the basis of age. Maximum number of cases were in 59-68 years age group (n=26) followed by 18 cases in 49-58 years, 10 cases in 39-48 years of age group. No cases were in 18-38 years of age group. [Figure B]

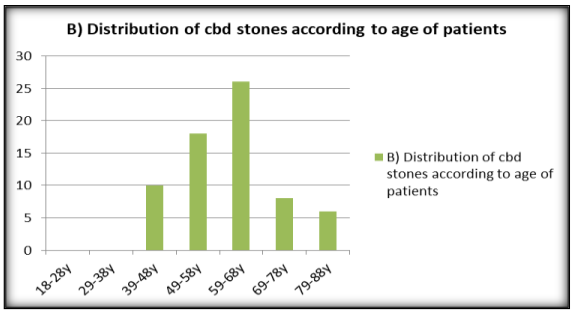

Figure B: Distribution of CBD stones according to age of patients

Distribution of CBD stones as per socioeconomic status:- In our study maximum number of cases belongs to low socioeconomic status (n=40, 58.8%) followed by middle (n=24, 35.2% and 4 (5.8%) cases were in high socioeconomic status group. [Figure C]

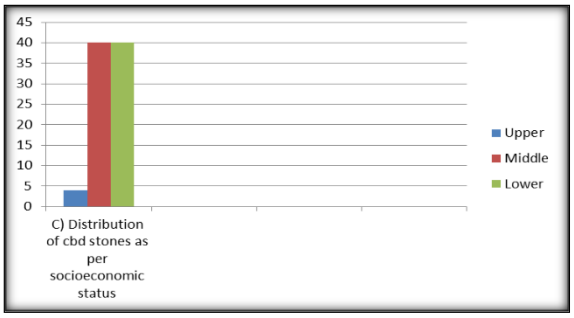

Figure C: Distribution of CBD stones as per socioeconomic status

Distribution of CBD stones as per level of bilirubin: All patients were divided into 5 groups as per bilirubin level. Among 68 cases, 28 cases (41.1%) were in bilirubin level 6-10 mg% followed by 20 cases (29.0%) in 11-15 mg% and 12 cases (17.6%) in 1-5 mg% of bilirubin level. No cases were in 21-25 mg% bilirubin level. Figure D]

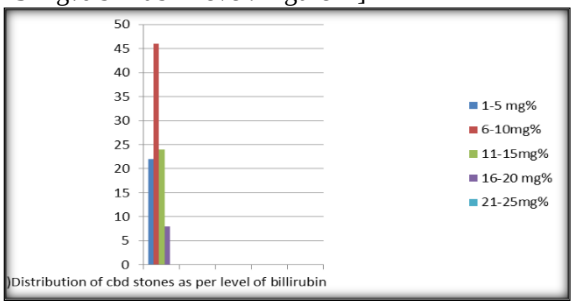

Figure D: Distribution of CBD stones as per level bilirubin

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Distribution of number of different operations for CBD stones:- out of 68 cases, 22 cases were subjected to open CBD exploration with T-tube drainage, open CBD exploration with choledochoduodenostomy in 34 cases and Transduodenal sphincteroplasty in 12 cases.

Average length of hospital stay: In this study, average length of hospital stay for the patients underwent choledochoduodenostomy was 8 days and for those in which choledocholithotomy with T-tube insertion done was 14 days. [Figure E]

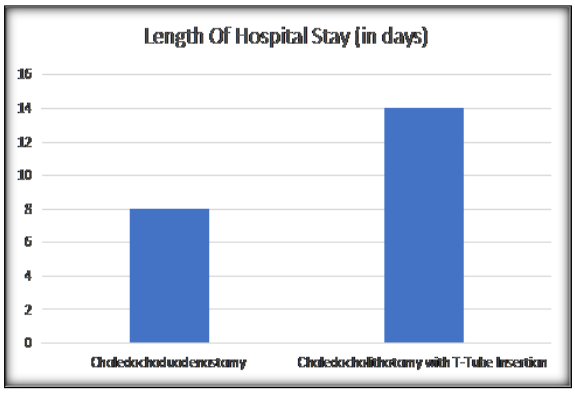


Figure E: Length of hospital stay after procedures

Post-operative complications after choledochoduodenostomy:- Wound infections were observed in 14 cases who underwent choledochoduodenostomy followed by 6 cases having cholangitis. Complications like anastomotic dehiscence, sepsis and bleeding were not seen in any of the patients. Out of 34 cases, mortality was observed in 4 cases (11.76%). [Figure F]

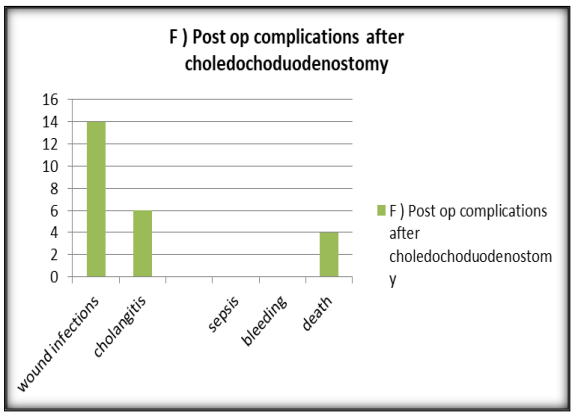
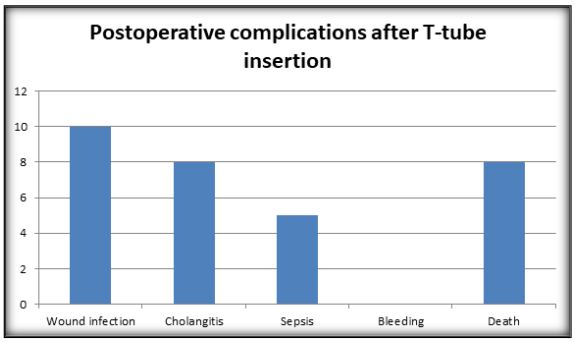


Figure F: Postoperative complications after choledochoduodenostomy

Post-operative complications after T-tube insertion:- Among 22 cases with T-tube insertion, wound infections was observed in 10 cases followed by 8 cases had cholangitis and sepsis in 5 cases. Bleeding was not observed in any of them. Mortality was in 8 cases (36.03%). [Figure G]



Figurine G: Postoperative complications after T-tuber insertion

DISCUSSION

Many small CBD stones pass spontaneously and can be asymptomatic. Biliary colic, Jaundice, cholangitis, pancreatitis etc. can be presentation of CBD stones.CBD stones are potentially serious condition and so it is important to identify them and ensure its clearance.[3]

Transabdominal ultrasonography was most common modality used in initial evaluation but it has about 50%-80% sensitivity in detecting CBD stones. In patients with indeterminant risk for CBD stones. MRCP was used as it is non-invasive and has less morbidity as compared to ERC. Blood tests including LFT were done.[8]

Many treatments options are available for Management of patients with CBD stones including laparoscopic CBD exploration, Endoscopic sphincterotomy (ES), Percutaneous transhepatic cholangiography and open surgical CBD exploration. These options are used in individual cases depending upon factors like age of patients, comorbidities, timing of diagnosis of CBD stones (pre, post or intraoperative diagnosis). The level of health care resources available is also a major determinant of which technique to choose.[4-6]

Many less developed health care systems which has limited infrastructure, endoscopic and percutaneous approach to stone clearance either limited or absent then open CBD exploration is a valid option. Abnormal LFT, Cholangitis, palpable stones or stone on peroperative cholangiogram as well as history of jaundice, pancreatitis are indications for CBD exploration.[9]

In developed countries where access to laparoscopic, endoscopic, and radiological expertise are available some patients still will be needing an open approach to CBD exploration like patients with large impacted stones, those with prior gastric resection, duodenal diverticula, those with Mirizzis syndrome, biliary enteric fistula, and those with high suspicion of biliary carcinoma etc.

When performing exploration for retained CBD stones, stones can be completely removed through open choledocholithotomy with either T-tube placement or primary closure but overall failure rate

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of this procedure is 3% and others report failure rate of even 18-30%.

Three types of CBD operations were performed in our centre-Choledocholithotomy with T-tube drainage or primary closure, choledocholithotomy with side to side choledochoduodenostomy and transduodenal sphincteroplasty.[9,10]

Average stay of patients was 8-10 days. The only reliable method to confirm complete CBD clearance of stones per operative are choledochoscopy or cholangiography.[8] As in our centre, we lack these facilities and post-operative endoscopic sphincterotomy is also not available for residual or recurrent CBD stone. Moreover, endoscopic sphincterotomy [ES] affordability by these patients is too big a restrain.

Biliary enteric drainage at CBD exploration should be done if stricture or stenosis of distal CBD or sphincter of Oddi is present and CBD is dilated to >2 cm. Transduodenal sphincteroplasty is preferred for ducts smaller than 1.5 cm.

Side to side choledochoduodenostomy in situations where CBD is more than 1.5 cm offer better biliary decompression. Morbidity of choledochoduodenostomy is also less than that of transduodenal sphincteroplasty.

Selective use of biliary enteric drainage is very much indicated in patients with multiple CBD stones in dilated duct in elderly patients and in those with large impacted stones in dilated duct or presence of irretrievable intrahepatic duct stones, ampullary duct stones or impacted ampullary stones.[7,12-14]

Choledochoduodenostomy is safe and simple operation with low morbidity and mortality even in elderly patients.[14]

CONCLUSION

In parts of world where resources like ERCP, PTBD, EUS, Choledochoscopy, costly infrastructures still lacking due to one reason or another, patients with multiple CBD stones, especially packed intrahepatic duct stones, recurrent CBD stones in elderly, impacted stones, ampullary stenosis, duodenal diverticulum and those with 2nd 3rd operation for CBD stones especially in elderly. Open choledochoduodenostomy is an excellent option with very low mortality and morbidity. So, we strongly recommend choledochoduodenostomy procedure in resource limited health centres in above scenario.

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