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Original research article

Open Surgical Approach for Choledocholithiasis – Our Experience in Tertiary Care Center

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Abstract
Background: Common bile duct stones occur in 7-12 % of all the patients with symptomatic cholelithiasis. In this study, we are presenting our experience of dealing with common bile duct and gallbladder stones by open surgical methods. The objective of the study was to study the open surgical approach to common bile duct and gallbladder calculi.
Methods: The study comprised of 22 out of 71 patients admitted for choledocholithiasis in surgical wards at AIMSR, Hyderabad from October 2018 to October 2022 who underwent open surgical approach. Rate of CBD clearance, post op bile flow, hospital stay and morbidity were assessed.
Results: Out of the 22 cases, 18 cases were subjected to open Cholecystectomy, CBD exploration and T-tube drainage, 2 patients underwent choledochoduodenostomy, one case choledochojejunostomy was performed and in one case hepaticojejunostomy was done due to CBD stricture. All 22 cases survived and were followed up for combined hospital stay, expenses, CBD clearance and morbidity related to anesthesia and surgery.
Conclusion: Open surgical approach remains a feasible and excellent option for patients with choledocholithiasis in view of CBD clearance, post op bile flow, hospital stay, morbidity in the absence of advance technical facilities and expertise
Keywords: choledocholithiasis, Open common bile duct exploration, case series

Introduction

Common bile duct stones (CBDS) are one of the medical conditions that may require surgical intervention. Primary stones are formed in CBD and biliary tree itself and secondary stones are from gallbladder that passes through cystic duct to CBD. CBDS account for nearly 3-14.7% of all cases for whom cholecystectomies are performed. There are various modalities of treatment

and competing technologies and approaches for diagnosing and managing CBDS and gallbladder stones. Laboratory tests like LFT can be used to screen CBDS and elevated serum bilirubin, alkaline phosphatase reflect biliary obstruction but they are not highly sensitive in detecting CBDS in 25-63% of patients. Ultra sonogram is sensitive in detecting CBDS in 25-63% and it has 95% specificity. ERCP has sensitivity of 92-95% and specificity of 90-98%. MRCP has an overall specificity of 97% for demonstrating CBDS. The treatment options for CBDS are laparoscopic/ open CBD exploration with Cholecystectomy, ERCP + CBD stenting followed by laparoscopic Cholecystectomy, endoscopic electro hydraulic lithotripsy (EHL), extra corporeal shock wave lithotripsy (ESWL), dissolving solutions and laser lithotripsy.
Several randomized control studies showed superior outcomes for standard open surgical procedures as compared to endoscopic (ERCP/ES) treatment for CBDS and gallbladder stones. Although the success rate for stone clearance for isolated ERCP treatment is up to 97.7%, another 11% of these patients require two or more ERCPS. This method is associated with morbidity and mortality rate of 5-11% and 0.7-1.2% respectively. The complications of ERCP include bleeding, duodenal perforation, cholangitis, pancreatitis and bile duct injury. Moreover ERCP is technically not possible in 3-10% of the cases.

Endoscopic balloon dilatation of papillae has been advocated as an alternative method to ES. The procedure is easier with less bleeding and less disruption of function of Sphincter of Oddi in comparison to ES, However endoscopic biliary drainage is less successful than ES and hence it is reserved for those with coagulopathy and who are at risk for infection. Short term biliary stenting followed by ES or surgical treatment is advocated. Surgical treatment of CBDS and gallbladder stones can be done either by laparoscopic common bile duct exploration (LCBDE) or by open surgical methods with T tube drainage. When LCBDE and postoperative ERCP fail, the surgeon must use the open approach.

Martin et al reported that open surgery is more successful with a lesser mortality than ES. There are generally few options for open exploration; one of the commonly practiced options is exploration of the CBD, T-tube drainage combined with cholecystectomy. Other options are choledochoenterostomy or sphincterotomy.

Choledochoenterostomy for CBDS is usually reserved for CBD diameter greater than 1.5 cm in diameter. These patients usually have good long term results without recurrence of jaundice or cholangitis. Another option is choledochojejunostomy with Roux-en-Y loop.
Today management of CBDS and gallbladder stones is a complicated procedure. USG and ERCP are routine diagnostic modalities in most of the centers. The other non invasive modalities are MRCP or CT.
Pre and postoperative ERCP with ES can be used as alternative method. Electro hydraulic lithotripsy, extracorporeal shockwave lithotripsy, laser lithotripsy and dissolving solutions have special indications.
Here we emphasize on open approach as the excellent option for patients with choledocholithiasis in view of CBD clearance, post op bile flow, hospital stay, total expenses and morbidity in the absence of advance technical facilities and laparoscopic or endoscopic expertise

METHODS

Type of study: Case series
Study population: patients who were operated with open approach for common bile duct and gallbladder stones
Sample size: 22

Ethical considerations: Informed consent was taken from each and every patient who was being operated with open approach after explaining them about the nature of the study.

Inclusion criteria

- Diagnosed cases of common bile duct stones with failed ERCP attempt.
- Diagnosed cases of common bile duct stones with stone size of more than 1.5 cm
- Diagnosed cases of common bile duct stones who opted for open approach due to economical constraints.
- Patients willing to participate in the study.

Exclusion criteria

- Diagnosed cases of common bile duct stones who underwent other forms of treatment apart from open approach.
- Diagnosed cases of common bile duct stones with associated suspicious malignant pathology.
- Patients not willing to give consent for the participation in the study.

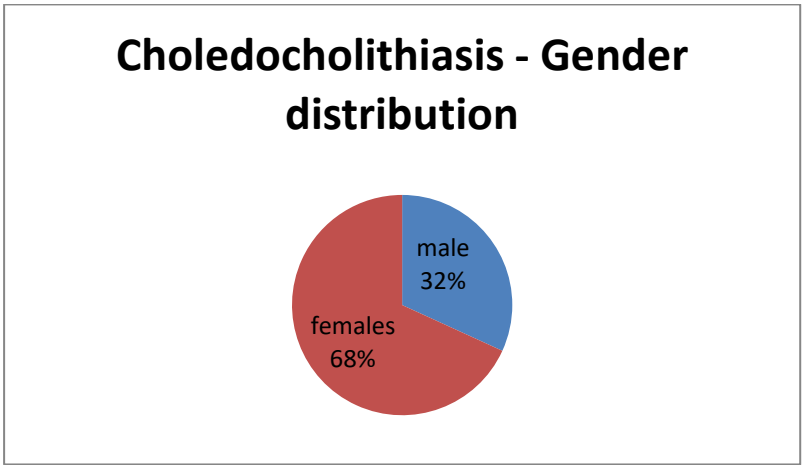
The present study aims to analyze the results of patients who underwent open surgical procedures. Patients with CBD and gallbladder calculi admitted in surgical wards at AIMSR during the period from October 2018 to October 2022 were included in the study. Out of the 22 cases of CBDS and gallstones admitted, Initially, detailed history and thorough clinical examination was carried out and recorded. All necessary investigations were done which were required for the patients for diagnosing CBDS and gallstones and preparation for the procedure.

Statistical analysis

The data was entered in the Microsoft Excel Worksheet and analyzed using proportions.

RESULTS

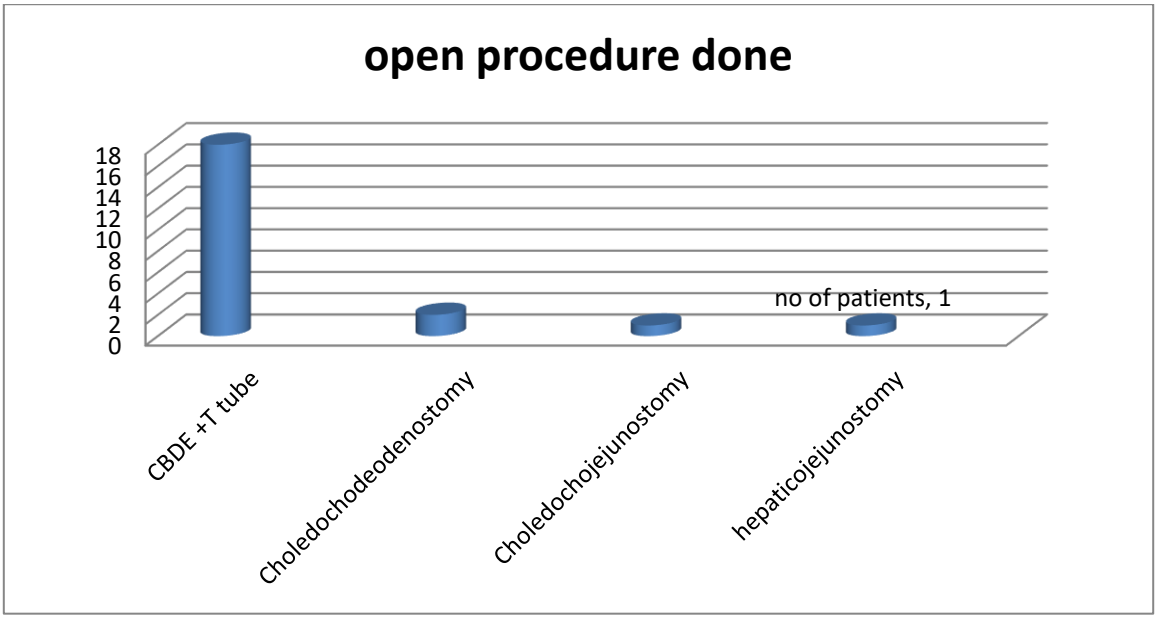
Patients were from all age groups and either gender were included.



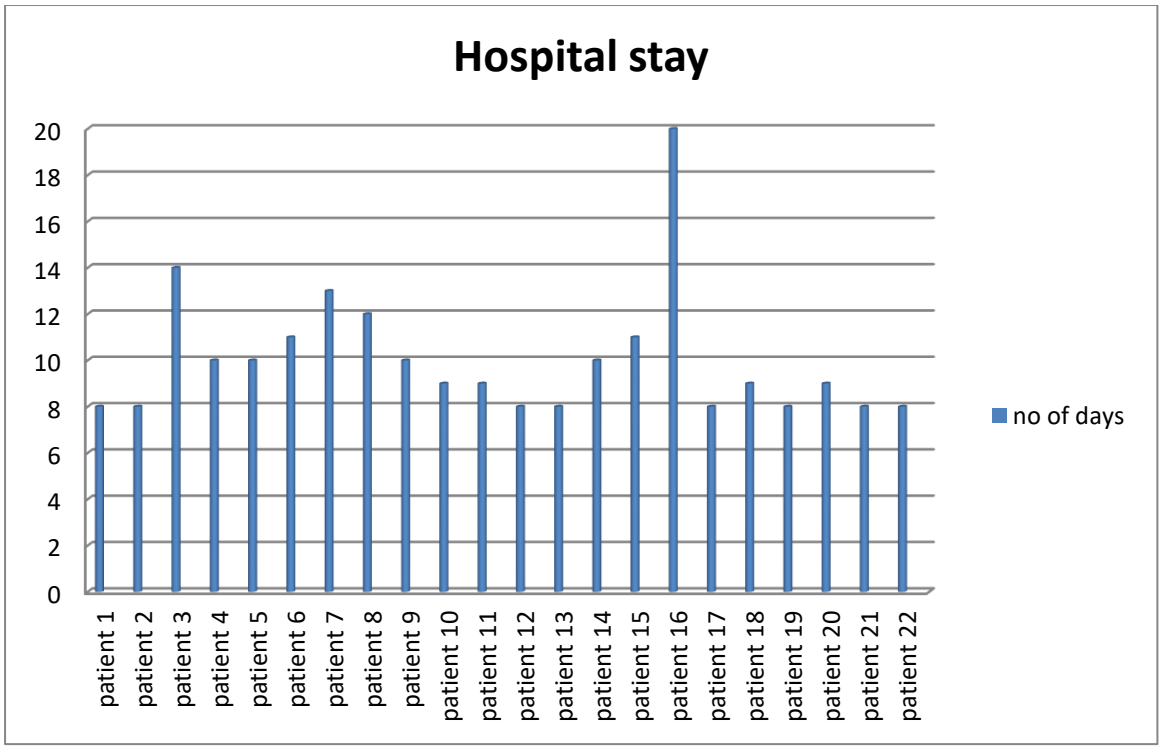
The workup included liver function tests, USG and CT abdomen with contrast. LFT showed elevated alkaline phosphatase, direct bilirubin was elevated and serum gamma glutamyl transpeptidase were raised.

USG of the abdomen was done in all cases and was suggestive of dilated CBD > 7mm.

Totally 22 cases of CBDS and gallbladder stones were treated surgically with open approach. In 18 cases Cholecystectomy, CBD exploration and T- tube drainage was done. In 2 cases, choledochoduodenostomy was done. In 1 case associated with CBD stricture, stone extraction with hepaticojejunostomy was done.



All the operated cases had good postop biliary outflow, assessed by serial LFT and abdominal ultrasound focusing on extra hepatic biliary apparatus at 3 months, 6 moths and 1 year. Average hospital stay for patient was 10 +/- 2 days. All patients survived. One case had subhepatic abscess which was treated with USG guided pigtail drainage.



DISCUSSION

Bile duct stones are found in 7–20% of patients with symptomatic gallstones. The coexistence of common bile duct stones with cholelithiasis essentially increases the morbidity, mortality, and expenses of patients with gallstones. CBDS are one of the medical conditions which may necessitate surgical intervention.

Symptoms and signs of CBDS are highly variable. It can range from patients being completely asymptomatic to complications such as cholangitis or pancreatitis. The prevalence of asymptomatic CBDS ranges between 5.2- 12% as per study done by Rooseland and T.B. Glomsaker. In this study all the patients were symptomatic. The commonest symptoms were pruritis and obstructive jaundice. Cholangitis and pancreatitis are two serious complications. In cholangitis the classic symptoms of Charcot's triad may be encountered. Similar symptoms were noticed in the present study.

LFT is used to screen CBDS. Elevated serum direct bilirubin and alkaline phosphatase typically indicates biliary obstruction but these are neither highly sensitive nor highly specific for CBDS. Our study also supports the same [87.09% (elevated direct bilirubin), 90.3% (elevated alkaline phosphatase)]. In the literature, ultra sonogram of abdomen is specific in 95% of the cases as reported by M. Sugiyoma and Y. Atomi study. In this present series there was 98.38% specificity in diagnosing CBDS with ultrasonogram of abdomen. Laparoscopic cholecystectomy and laparoscopic CBD exploration is often described as gold standard, however cannot be practiced everywhere due to lack of equipment and expertise. In India economics constraints also dictate performing this specific test. Martin et al reported open surgery as being more successful and a lower mortality than ERCP and CBDS. In the present series 22 cases were approached by open method. CBD exploration with T-tube drainage and cholecystectomy was the method employed in most (18 cases) of the cases. The advantage with open method is definite removal of stones and least complications. in our study, it was achieved for all the cases. When CBD greater than 1.5 cm in diameter, the option is choledocho enterostomy and was done in 2 cases. choledocho duodenostomy is a side to side anastomosis and was done in 2 cases. None of these cases the sump syndrome was observed. Recurrence of CBDS after endoscopic sphincterotomy is reported in a good number of cases (6-21%) resulting from denovo primary stone formation or recurrent secondary migration of stones from gallbladder, which was not seen in our study on 4 years follow-up . Hence surgery was the only option in such situations. Post operative complications rate is lowest with surgery vis-à-vis endoscopic methods.

CONCLUSION

Management of CBDS is a complicated procedure for the treating surgeon The recommended procedures for patients with CBDS are laparascopic/ open CBD exploration with cholecystectomy, ERCP combined with endoscopic sphincterotomy followed by laparoscopic cholecystectomy. Other newer methods like electro hydraulic lithotripsy, laser lithotripsy, extracorporeal shockwave lithotripsy and dissolving solutions have special indications in selected cases and more clinical trials are required in this area. Hence, according to our study, open surgical approach remains as a excellent option when other modalities have failed and in view of CBD clearance, post op bile flow, hospital stay, morbidity in the absence of advance technical facilities and expertise.

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