



Surgery

RETROSPECTIVE STUDY OF DIFFERENT APPROACHES TO MANAGEMENT OF CHOLEDOCHOLITHIASIS AMONG PATIENTS ADMITTED IN TERTIARY CARE HOSPITAL

Dr Rohan Ariwala Senior Resident, New Civil Hospital, Surat.
Dr Amit Patel Assistant Professor, New Civil Hospital, Surat.
Dr Devendra Chaudhary Associate Professor, New Civil Hospital, Surat.

ABSTRACT A common entity in Western societies, gallstones are found in approximately 15% of adults. CBD stones have been noted in 10–15% of patients with cholelithiasis, and this incidence increases with age. Such patients present with biliary colic, bile duct obstruction, bilirubinuria (or tea-colored urine), pruritus, acholic stools, jaundice. Various diagnostic modalities used were ultrasonography, CT scan, MRCP. The treatment options available were ERCP and surgical biliary drainage. Here we have studied various modes of presentation of CBD calculi, identified various treatment options available for the disease and determine its outcomes, determined the effectiveness of our surgical treatment by studying recurrence or various complications and identified the treatment modality associated with the least hospital stay.

KEYWORDS : Gall Bladder stones, Cholelithiasis, Choledocholithiasis, ERCP, MRCP, Choledochoduodenostomy, Choledochojunostomy

INTRODUCTION

More than 70% of gallstones are formed by precipitation of cholesterol and calcium, with pure cholesterol stones accounting for only a small (<10%) portion. Asymptomatic bile duct stones may be found incidentally during evaluation of patients with suspected gallstones. Patients with choledocholithiasis may present with biliary colic, bile duct obstruction, bilirubinuria (or tea-colored urine), pruritus, acholic stools, jaundice. However, the biliary obstruction usually is incomplete. There may be nausea and vomiting with intermittent or constant epigastric or right upper quadrant pain. Bile duct obstruction secondary to stones often is accompanied by bacterial sepsis. Complications of choledocholithiasis include acute pancreatitis and cholangitis, although a majority of stones will pass spontaneously. The factors that decide treatment are size of the stone, size of the duct, post cholecystectomy status of the patient, drainage tube in CBD, location of the stone, multiple intrahepatic stones, presence of stricture, risk assessment of the patient-age, cholecystitis, pancreatitis, associated systemic diseases such as cirrhosis of liver.

Management algorithm for patients based on probability of choledocholithiasis

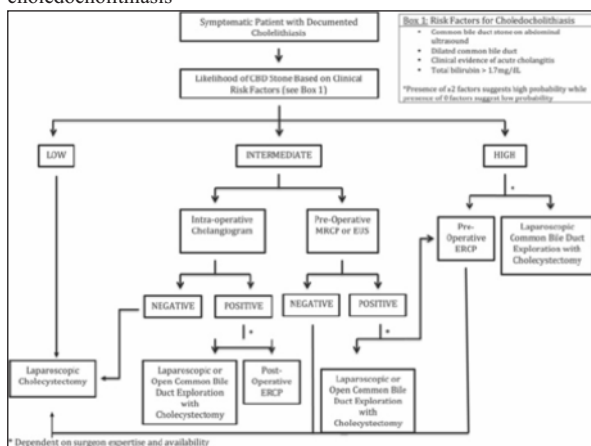


Figure 1(1)

AIMS & OBJECTIVES

To determine various modes of presentation of CBD calculi. To identify various treatment options available for the disease and determine its outcomes. To determine the effectiveness of our surgical treatment by studying recurrence or various complications.

MATERIALS AND METHODS

A retrospective observational study was undertaken in the surgical wards of tertiary care centre, South Gujarat. (New Civil Hospital,

Surat) during the study period from May 2018 to May 2020. 50 cases were studied by collecting the case files of choledocholithiasis patients admitted in the surgical wards of New Civil Hospital, Surat, Gujarat, after taking due permission. The inclusion criteria were Patients with common bile duct calculi managed in department of general surgery at NCH, Surat in last 3 years, age group 16 to 80 years, with or without other comorbid conditions. The exclusion criteria were patients not in the predetermined age group and incomplete case sheets.

After taking permission from the medical superintendent of the institution, case papers of 50 patients who fulfilled the inclusion and exclusion criteria, were collected from the medical record section of the hospital. Case records of patients were chosen based on the clinical diagnosis of choledocholithiasis where the diagnosis was further confirmed by the presence of calculi in common bile duct using ultrasound/ CT scan/ MRCP study. Findings of Demographic data, Clinical presentation, Investigations, Intra Op- procedure findings, Post Op morbidity / complications, outcome were collected. All data was compiled and result analyzed.

Treatment algorithm for patients with documented choledocholithiasis based on time of diagnosis

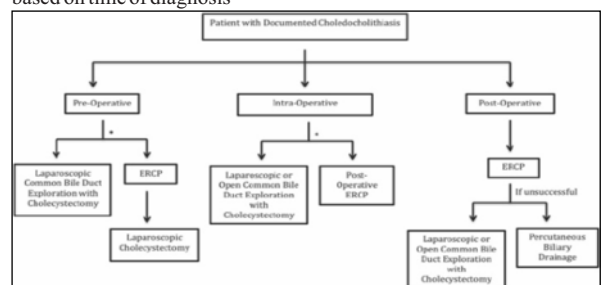


Figure 2(1)

RESULT AND ANALYSIS

The analysis of 50 cases of CBD stones treated in surgical department in a tertiary care hospital from May 2018 to January 2020 was done.

Table 1

Age	Number of patients	Percentage
11 to 20	0	0
21 to 30	8	16.0
31 to 40	10	20.0
41 to 50	6	12.0
51 to 60	10	20.0
61 to 70	12	24.0
71 to 80	4	8.0
81 to 90	0	0.0

Maximum no of the patient in the study belonged to 61 to 70 age group. The incidence and prevalence of Cholelithiasis tend to increase with age. However, total 18 patients in the study (36%) were from a younger age group i.e., less than 40 years.

Out of 50 patients 18 were males and 32 were females. In the present study, incidence of female patients is more than male patients as female patients have increased tendency to develop hypertriglyceridemia leading to increased risk. This predisposes females to development of GB calculi and secondary cholelithiasis.

Table 2

Complains	Number of patients	Percentage
Abdominal Pain	50	100
Vomiting	12	24
Fever	3	6
Jaundice	7	14
Nausea	2	4
Backache	1	2
Pruritus	1	2

CBD stones irritate mucosal lining of biliary tree and its movement produces colic pain associated with vomiting/ nausea. Due to obstruction of flow of bile there is infection which leads to fever, jaundice and clay colored stool. In our study most of patient with CBD stones had complaints of Abdominal pain in 100 % patients followed by Vomiting in 24% and Jaundice in 14% cases.

In present study USG abdomen was most commonly used. It was used in detecting stones in 96% patient while CT abdomen and MRCP was used in 22% and 12 % patients respectively. Ultrasound has user bias, so its sensitivity may vary. However, due to its easy availability, it is preferred first line investigation.

Table 3

Procedures performed	Number Of Patients	Percentage
ERCP + Laparoscopic cholecystectomy	33	66
Laparoscopic CBD exploration	0	0
Open CBD exploration with choledochenterostomy	16	32
Observation only	1	2

Most of the patients having smaller single CBD stones could be managed by ERCP, in our study 62 % of the patients. Other patients were managed by open intervention in 32 % cases.

Most of the patients were managed by ERCP followed by laparoscopic cholecystectomy. Patients in whom ERCP couldn't retrieve stone, underwent open CBD exploration with choledochenterostomy, performed in 32% of the cases. None of the patients was undertaken for Laparoscopic CBD exploration.

Table 4

Complications	Patients	Percentage
Pancreatitis	1	2
Bleeding	0	0
Infection (Cholangitis)	4	8
Perforation	0	0
Retained stones	2	4
Bile leak	2	4
Wound infection	13	26
Sepsis	1	2

In present study patients who underwent open or laparoscopic surgery for CBD stone, of them 13 patients had wound infection, 1 had pancreatitis, 4 had cholangitis, 2 had bile leak, all of which was managed conservatively. 1 patient had sepsis following bile leak which expired.

Table 5

Complications in Open approach	Patients	Percentage
Wound infection	9	56.25
Cholangitis	1	6.25
Retained stones	1	6.25
Complications in ERCP + Laparoscopic cholecystectomy	Patients	Percentage
Wound infection	2	6.45

Pancreatitis	1	3.23
Cholangitis	2	6.45
Retained stones	1	3.23
Bile leak	2	6.45

In our study it was found that wound infection was common in open methods since 9 patients out of 16 had this complication compared to 2 with ERCP + Laparoscopic cholecystectomy out of 31. Cholangitis and pancreatitis were also found more in patients treated by ERCP and Laparoscopic cholecystectomy.

DISCUSSION

Common bile duct (CBD) stones continue to pose a significant problem both to the patient and the surgeon. Recent times have thrown up a fair share of controversy in the management of this condition both due to technological innovations and cost-reduction-pressures. The aim in CBD stone disease, as in any benign disease is to discover a therapeutic algorithm with minimal morbidity, no mortality and at reasonable cost.

The incidence of gallstones increases with age across all ethnic groups, and it is very low among infants and children. Most of the patients in our study belonged to 21 to 40 age group which is the most at risk population. Incidence is higher in this age group implicating early hereditary metabolic factors and co-morbidities and mostly exposed to hyper-triglyceridemia and also relatively higher incidence of gallbladder hypomotility and gallstones.

Female preponderance of our study matches other studies also. The female preponderance reflects that female have higher tendency for developing gallstones, surpassing males in the incidence of gallstones and the chance of having surgery by 2 : 1 or 3 : 1 in most studies.

The clinical features in our study like pain in right hypochondrium (100%), vomiting (12%), fever (3%) and jaundice (7%) are most common.

According to our study , ultrasonography was used in 96% patients to diagnose cholelithiasis.

Computed tomography (CT) scanning has low sensitivity in the detection of bile duct stones and is used primarily to document biliary dilation or to exclude other causes of biliary obstruction. It was used in 22% patients to identify CBD calculi.

MRCP provides excellent anatomic detail of the biliary tree and is also advantageous in detecting cholelithiasis as seen in our study comparable to other studies.

Two groups of interventions have significant roles in management of CBD stones

- (1) pre-operative ERCP with endoscopic biliary sphincterotomy (EST) with stone extraction with stent placement and Laparoscopic cholecystectomy
- (2) surgical bile duct clearance and cholecystectomy with or without choledochenterostomy.

Table 6

ERCP with Laparoscopic cholecystectomy	
COMPLICATION	PRESENT STUDY
RETAINED STONES	4%
BLEEDING	0%
CHOLANGITIS	8%
BILE LEAK	4%
SEPSIS	4%
PANCREATITIS	2%
WOUND INFECTION	26%

Postoperative complications occurred in our study. The most common postoperative complication was wound infection which was seen in 26%.

Table 7

Open choledochotomy with Choledoch-enteric anastomosis	
COMPLICATION	PRESENT STUDY
PANCREATITIS	3.23%
WOUND INFECTION	6.45%
INFECTION(CHOLANGITIS)	6.45%
BILE LEAK	6.45%
RETAINED STONES	3.23%

Complications that include postprocedural pancreatitis, wound infection, cholangitis, bile leak and retained stones are not uncommon.

ERCP has an overall complication rate of 10% and a mortality rate less than 0.5%.

CONCLUSION

There are options for clearance of CBD which include endoscopic retrograde cholangiopancreatography (ERCP) with papillotomy and stone extraction prior to cholecystectomy or common bile duct exploration combined with cholecystectomy.

Endoscopic method is highly sensitive and specific for choledocholithiasis with the added benefit of being therapeutic also. Endoscopic method has a success rate of approximately 80–90% for ductal clearance with proper expertise. Reasons for failure include large or impacted stones, duodenal diverticula, altered gastric or duodenal anatomy and intrahepatic stones. Following biliary clearance with ERCP, it is generally recommended to proceed with subsequent cholecystectomy to prevent the occurrence of recurrent episodes of symptomatic cholelithiasis. When choledocholithiasis is detected on table or there is slippage of stones in to CBD intraoperatively, a decision should be made between common bile duct exploration at the time of cholecystectomy and post-operative ERCP, which is dependent on local availability of surgical and endoscopic expertise.

Laparoscopic common bile duct exploration combined with cholecystectomy is a feasible and effective option as a single-stage procedure for the management of choledocholithiasis if expertise & facilities are available.

In my study, none of the patients underwent laparoscopic common bile duct exploration due to non-availability of equipment.

Open choledocholithotomy with cholecystectomy is done if laparoscopic surgical or endoscopic expertise is not available.

Open techniques have their own risks of wound infection, septicaemia.

This study, however, has some limitations like

- Small sample size. Small sample is associated with bias which may alter the result. With larger sample size, the bias is nullified and the result obtained is closer to the actual value.
- The facility and expertise for Laparoscopic CBD exploration, which is mainstay of treatment in management of CBD calculus, was unavailable in the tertiary care hospital where this study was conducted. One major arm of management (Laparoscopic CBD exploration) was not present in the study.
- Difficulty was observed on collecting data since source did not have complete information. Therefore, it limited the scope of analysing the data of the study.

REFERENCES

1. Narula VK, Fung EC, Overby DW, Richardson W, Stefanidis D. Clinical Spotlight Review: Management of Choledocholithiasis sages.org/publications/guidelines/clinical-spotlight-review-management-of-choledocholithiasis.
2. de Silva WSL, Pathirana AA, Wijerathne TK, Gamage BD, Dassanayake BK, de Silva MM. Epidemiology and disease characteristics of symptomatic choledocholithiasis in Sri Lanka. *Annals of Hepato-Biliary-Pancreatic Surgery*. 2019;23(1):41.
3. Costi R, Gnocchi A, di Mario F, Sarli L. Diagnosis and management of choledocholithiasis in the golden age of imaging, endoscopy and laparoscopy. *World Journal of Gastroenterology*. 2014;20(37):13382–401.
4. Petrescu I, Bratu AM, Petrescu S, Popa B v., Cristian D, Burcos T. CT vs. MRCP in choledocholithiasis jaundice. *Journal of medicine and life*. 2015;8(2):226–31.
5. Molvar C, Glaenzler B. Choledocholithiasis: Evaluation, treatment, and outcomes. *Seminars in Interventional Radiology*. 2016 Dec 1;33(4):268–76.
6. Barrett KE, Barman SM, Boitano S, Brooks HL, York N, San C, et al. Ganong's Review of Medical Physiology. 2012.