

Retrospective Study of Clinical Outcome in 25 Patients of Common Bile Duct Calculi

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ABSTRACT

Introduction: Management of common bile duct stones (CBDS) presents a surgical challenge since it is the major cause of hepatobiliary morbidity and complications. The aim of the study was to evaluate the best line of treatment for CBD stone and complications related to every approach.

Material and Methods: This retrospective study includes patients with CBDS who were treated with conservative treatment or endoscopic stone extraction followed by laparoscopic cholecystectomy (LC). Primary outcome was successful clearance of common bile duct and secondary outcomes were complications, total cost and hospital stay.

Results: Out of 25 patients, 13 were treated by ERCP (Endoscopic Retrograde Cholangio Pancreatography) and 12 by Conservative approach. There was complete clearance of CBDS in 10 (76%) cases out of 13, in the endoscopic retrograde cholangiopancreatography (ERCP) group and in the remaining 3 patients, the Common bile duct stone was removed by the trans-cystic exploration. In the conservative group, there was complete clearance of CBDS in 8 (66%) cases, and in the remaining 4 (33%) patients, the common bile duct stone was removed by the transcystic exploration.

Conclusion: Management of CBDS represents a surgical challenge. CBDS increases the technical difficulty of ERCP and increases the risk of PEP. Conservative management of CBDS avoids the risks associated with ERCP and is also effective in clearing CBDS so one should consider a conservative line of treatment in CBDS in order to decrease the cost and avoid unnecessary ERCP.

Keywords: ERCP, CBD Stone Outcome, GB Stone, Obstructive Jaundice

INTRODUCTION

Common bile duct stone, also called as choledocholithiasis, is the presence of stones in the common bile duct. Gallstone disease leads to 1.8 million ambulatory care visits and greater than 700 000 cholecystectomies yearly.¹ Gallstone disease is the second most common reason that leads to hospital admissions, although only 15% of them have symptoms.² Choledocholithiasis is one of the complications of gallstones. Stones in the common bile duct occur due to the passage of gallstones through the cystic duct into the CBD.³

They may originate in the common bile duct also. About 1 in 10 patients undergoing cholecystectomy for gallstones have common bile duct stones and among them 3.8% have symptoms related to common bile duct stones after cholecystectomy during the first year.⁴

Complications of common bile duct stone include⁵:

- Obstructive jaundice

- Acute cholecystitis
- Gallstone Ileus
- Primary Sclerosing Cholangitis
- Biliary cirrhosis

Thus, the management of common bile duct becomes very crucial to prevent further complications.

The clinical presentation is

- abdominal pain
- jaundice,
- nausea,
- vomiting,
- fever,
- cholangitis,
- pancreatitis, and
- elevated levels of bilirubin or
- liver enzymes.
- Clay-colored stool

Patients need investigation following the detection of dilated common bile duct or a stone in the common bile duct, or both. Many Clinical models have been proposed for prediction of common bile duct stones.⁸

The best predictors of common bile duct stones were⁷

1. Cholangitis, and
2. Ultrasound evidence of stones in the common bile duct
3. Preoperative jaundice and

Other predictors include:

1. A dilated common bile duct on ultrasound,
2. Hyperbilirubinemia
3. Jaundice.

Modest predictors¹⁰ included

1. An elevated alkaline phosphatase level,
2. Hyperamylasemia.
3. Cholecystitis and
4. Pancreatitis,

For the purpose of evaluation of common bile duct stones in patients with gallstone disease involves stratifying their

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probability of having a stone in the common bile duct to:

1. low (< 10%),
2. intermediate (10%–50%) or
3. high (> 50%)

These include:

1. Intravenous cholangiography and
2. Endoscopic retrograde cholangiopancreatography (ERCP)
3. Magnetic resonance cholangiopancreatography
4. Endoscopic ultrasonography

For example, in a retrospective study of 1097 patients who underwent laparoscopic cholecystectomy, Tham et al⁸ found that only doing preoperative ERCP to patients with an elevated bilirubin level (> 34 µmol/L) or evidence of stones on ultrasonography or computed tomography (CT) would have decreased the count of unnecessary ERCPs by a factor of half.⁸

Stratification points for CBD stone prediction:

1. ERCP – if extremely high probability,
2. MRCP if high,
3. laparoscopic cholecystectomy with intraoperative cholangiography if Intermediate,
4. Laparoscopic cholecystectomy without intraoperative cholangiography if low probability.^{9,10}

Treatment Options

The most commonly used treatment method is ERCP, with cannulation of duct with high clearance rates.¹¹

Historically, Open surgical exploration of the common bile duct was combined with intraoperative cholangiography to treat common bile duct stones. The surgical removal of common bile duct stones, whether open or laparoscopic is seldom performed and it is usually reserved for patients in whom ERCP has failed.

Laparoscopic CBD exploration is another choice but is performed by few due to lack of technical expertise. A Cochrane meta-analysis¹² reviewed 13 RCTs with 12 predefined outcomes in different scenarios. Following are the findings:

1. ERCP versus open surgery: Open CBD exploration of found to be superior to ERCP for achieving the stone clearance.¹²
2. Pre-or postoperative ERCP versus Laparoscopic Cholecystectomy: Laparoscopic CBD stone clearance was found to be as effective as preoperative and postoperative ERCP.¹²
3. Pre-versus intraoperative ERCP: Intraoperative ERCP at the time of laparoscopic cholecystectomy was found to be less costly than preoperative ERCP and had decreased morbidity.¹²

Contraindications

Absolute contraindications:

1. Patient refusal to undergo the procedure;
2. Unstable cardiopulmonary, neurologic, or cardiovascular status; and
3. Existing bowel perforation.

Relative Contraindication

- Structural abnormalities of stomach, esophagus and biliary tree were taken as relative contraindications

Study aimed to study various methods for detection of common bile duct stone, to study various sequale and local complications of choledocholithiasis and to compare the clinical outcomes of various treatment modalities for choledocholithiasis including pre-operative ERCP followed by cholecystectomy, post-operative ERCP following cholecystectomy and conservative management.

MATERIAL AND METHODS

The study has been undertaken of due clearance from ethical committee of Shri M.P Shah Medical college. Retrospective Study was done in the Department of General Surgery in a large teaching public health hospital for a period of one year. Study was conducted on 25 Cases.

Inclusion Criteria

- Patient presenting with
 - 1 Right upper quadrant pain
 - 2 Complain of Nausea and vomiting after fatty meal
- Patients who give informed consent

Exclusion Criteria

As such there is no exclusion criteria but in patients were excluded from the study.

- Those who do not give consent
- Patients with uncorrected coagulopathies.

Methods

- All patients with inclusion criteria were admitted. A detailed history of the symptoms like Right upper quadrant pain
- Complain of
 - Jaundice
 - Fever
- Right upper quadrant pain will be resorted to Ultrasonography (B Mode) for detecting Bile duct stones and gallstones.
 - Collection of blood for biochemical investigation was done for estimating: haemoglobin, total and differential counts, serum bilirubin, SGPT, Alkaline phosphatases, serum blood urea nitrogen, serum total proteins, serum creatinine, coagulation profile.
 - X-Ray chest and abdomen, will be done in all cases and findings will be noted.
 - MRCP (Magnetic retrograde cholangio pancreatography) for the intermediate to high risk patients.
 - CECT Abdomen will be done according to stratification algorithm in selected patients to look for the common bile duct pathology.

A Retrospective Study was undertaken among 25 patients that have been detected with common bile duct calculi by USG or CECT abdomen, in which comparison of the outcome was done for those patients that have undergone preoperative

ERCP followed by Laparoscopic or Open cholecystectomy or managed conservatively without undergoing any operative intervention. These clinical outcomes were compared and conclusion was derived regarding the best treatment modality for common bile duct calculi. Also various complications of Common bile duct were studied.

ERCP

Equipment

ERCP was performed using Karl Storz Silver Scopoduodenoscope with albarran unit with 140 degree angled wide telescope.

Procedure

Duodenoscope is inserted through the mouth to the upper esophagus. It is entered by gentle forward pressure and clockwise movement. The esophagus is intubated blindly with gentle forward pressure and slight clockwise torque. When it passes the gastroesophageal junction, a half clockwise turn was made and followed to lesser curvature. It is then inserted into the second part of the duodenum. Two maneuvers in succession are performed: first turn the large wheel anticlockwise and the small wheel clockwise, thus deflecting the tip of the scope up and right, then withdraw it

Sex	No.	Percentage
Male	12	48%
Female	13	52%

Table-1: Sex Distribution

Presentation	No. of patents	Percentage
Abdominal Pain	22	88%
Jaundice	18	72%

Table-2: Presentation

		Conservative	ERCP
No. of developing Pancreatitis	Patients	0	2(15.2%)

Table-3:

	Conservative	ERCP
Adhesion		
Presence of pus in gall bladder	4(33%) 1(8.33%)	8(61%) 2(15.3%)
Hospital Stay(days)	5(4-10)	
Recurrent biliary symptoms after 1 year	0	6(5-12) 1(7.6%)
Recurrent CBDS	0	0
Recurrent Cholangitis	0	
Pancreatitis	0	1(7.6%) 2

Table-4:

	Conservative	Ercp
Success rate of CBD clearance	8 (67%)	6(46%)
Useless procedure	3(25%)	3(23%)
Serum Amylase	60(32-110)	90(21-1100)
No. of patients developing pancreatitis	0	2(15.3%)
Median S. Bilirubin	1(0.5-2)	1(0.5-7)
Median WBC Count	7400 (6000 - 15000)	7800 (3000 - 16000)
IOC : Clear CBD	8(67%)	10(76%)
IOC: Residual	4(33%)	3(24%)
No. of pts with early LC	7(87.5%)	8(61%)
No. of pts with delayed LC	1(12.5%)	2(39%)
Conversion rate	4(33%)	3(23%)
Adhesion	4(33%)	8(61%)
Presence of pus in gall bladder	1(8.33%)	2(15.3%)
Hospital Stay (days)	5(4-10)	6(5-12)
Recurrent biliary symptoms after 1 year	0	1(7.6%)
Recurrent CBDS	0	0
Recurrent	0	1(7.6%)
Cholangitis		
Recurrent pancreatitis	0	0

Table-5: Discussion of various complications and outcome OF CBD stone

50–70 cm from the incisors to reduce the gastric loop. The major papilla will now be seen. It consists of a frenulum, a hood, infundibulum and orifice. The major papilla is then classified depending on its appearance. Cannulation of the major papilla is done now. Catheter is flushed with dye to prevent entry of air and after optimal positioning, appropriate amount of dye injected under fluoroscopy guidance.

STATISTICAL ANALYSIS

The study data was analyzed with help of Microsoft Excel (2007) and Epi Info 7 software.

RESULT

In this study 25 patients had been selected and following observations were made. Table 1 shows gender distribution of the patients.

Out of 25, 22 patients had abdominal pain and 18 patients suffered from jaundice. 12 patients were kept conservative and 13 patients were subjected to ERCP (Table 2).

Two patients suffered from Post ERCP pancreatitis 7 patients were subjected to early laparoscopic cholecystectomy in conservative

group while 8 patients from ERCP group (Table 3).

As shown in Table-4, 4 patients developed adhesions in conservative group compared to 8 patients in ERCP group.

DISCUSSION

There are many options available for the extraction of CBDS (Common bile duct stone), including preoperative ERCP before LC, intraoperative ERCP during LC, laparoscopic CBD exploration, open CBD exploration, and postoperative ERCP.

Many studies have reported that 40%–60% of preoperative ERCP is useless due to the stone passing spontaneously, failed CBDS removal, and residual stones.¹³ Laparoscopic cholecystectomy with intraoperative ERCP is an alternative option for treatment of gallstones and CBDS. CBDS passed spontaneously from the papilla in 10%–90% of cases.¹⁵ The ideal management of CBDS is dependent on surgical team experience and availability of instruments and endoscopies at the hospital. A single-step procedure obviously has advantages over a two-step procedure.¹⁶ CBD stone increases the difficulty level of ERCP and has been reported to increase the risk of PEP (Post ERCP Pancreatitis). Despite recent advances in ERCP accessories and techniques, the rate of post-ERCP morbidities has remained unchanged over recent years.¹⁷

Preoperative ERCP is effective treatment for CBDS extraction in most cases, but only 10%–60% of patients will have CBDS on ERCP.¹⁸ Even with strict selection criteria, >10% of pre-operative ERCP are normal, and the possibility of occurrence of post-ERCP pancreatitis varies between 1% and 13.5%.¹⁹ Unnecessary pre-ERCP can be avoided in many cases by managing CBDS with conservative treatment, which is effective in most of cases. This conservative management avoids the risks inherent in ERCP and unnecessary preoperative ERCP. PEP (Post ERCP Pancreatitis) is the most frequent complication after

ERCP, with the incidence ranging from 5% to 40%.²⁰ PEP is a major cause of morbidities and consumption of hospital resources, and it may lead to patient mortality in severe cases. Multivariate analysis revealed that young patients aged <35 years old, a CBD diameter >10 mm, and the number of pancreatic cannulations were independent risk factors for the development of PEP.¹⁹ In the current study, PEP was noted significantly more in the ERCP group than it was in the conservative group. In all cases, pancreatitis was self-limiting by conservative treatment. In many studies, CBDS passed spontaneously from the papilla in 10%–90% of cases. In the study by Collin et al., an IOC catheter was placed and left transcystic when CBDS were found.¹⁴ In the present study, in the conservative group, complete clearance of CBD occurred in 38 (76%) cases, while 12 (24%) cases failed to pass the stone spontaneously. In the ERCP groups, 19 (38%) patients passed the stone spontaneously (i.e., the ERCP was unnecessary). Laparoscopic CBD exploration (LCBDE) via choledochotomy and the transcystic duct approach has been widely used with promising results, but it needs surgical experience, instruments, and a choledochoscope. It is also time-consuming, requires a longer learning curve, is difficult in large impacted stone, and has a morbidity rate of about 4%–16%.²¹ Choledochotomy would be avoided in ducts <10mm measured at the time of IOC and severely inflamed friable tissues leading to a difficult dissection. LC and intraoperative ERCP is a single treatment for the management of CBDS that decreases unnecessary ERCP and reduces the need for further surgery following failure of ERCP, thereby decreasing the length of hospital stay and associated costs. Increasing efforts to decrease the number of unnecessary ERCPs using MRCP and endoscopic ultrasound are being undertaken. In this study, recurrent biliary symptoms developed significantly in the ERCP group after 1 year of follow-up in five (10%) cases, and no patients developed recurrent symptoms in the conservative group. Recurrent cholangitis is a common presentation in the form of fever, right hypochondrial pain, and mild jaundice, which is treated by antibiotics (third generation cephalosporin).

CONCLUSION

Management of CBDS presents a surgical challenge. CBD increases the difficulty level of ERCP and increases the risk of PEP (Post ERCP pancreatitis). The conservative management of CBDS in borderline CBD not only avoids the risks inherent in ERCP and unnecessary preoperative ERCP, but is also effective in the clearance of the stone. The hepatobiliary surgeon should consider a conservative line of treatment in CBDS in borderline CBD in order to decrease the cost and avoid unnecessary preoperative ERCP.

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