# Efficacy of ERCP in Case of Choledocholithiasis and Incidence of Pancreatitis

*Zoncy Darji*, Nina M Shah***

**Abstract :**

ERCP has largely replaced open and laparoscopic surgery in management of common bile duct stones. After endoscopic procedure pancreatitis is the most common complication. The purpose of this study was to know effectiveness of ERCP and its complications. In this study, conducted at CIVIL Hospital Ahmedabad during May 2018 to October 2020, total 50 patients underwent ERCP with choledocholithiasis with or without gall stone disease. Out of 50 patients, number of females being 29(58%), maximum distribution found in age group 41 to 60. Out years of 50, successfully stone removed in 44(88%) patients and sphincterotomy done in 45(90%) patients and stenting done in all 50 patients. Out of 50, patients underwent ERCP 4(8%) developed pancreatitis. ERCP is important modality for diagnosis and removal of common bile duct stones and only few patients developed different complications including pancreatitis.

**Keywords :** Choledocholithiasis, ERCP, Pancreatitis

## Introduction:

For surgeons, common bile duct stones have been one of the biggest challenges since long. CBD Stones or choledocholithiasis, are generally asymptomatic, and are seen in up to 10% of patients undergoing investigation.[1]

Migration of gallstones into the common bile duct is largely responsible for complications such as biliary colic, choledocholithiasis, cholangitis, and biliary pancreatitis. ERCP has largely replaced open or laparoscopic surgeries; it is optimal for elderly and high-risk patients. It is highly sensitive and specific for diagnosis and therapeutic procedure for management of choledocholithiasis. ERCP started in March 1969 in Japan and first sphincterotomy was performed and stone extracted in 1973. This brought down the morbidity and mortality rates. Various complications occur with endoscopic procedures and the most frequent being pancreatitis and other complications are haemorrhage at the site of sphincterotomy, perforation which is a rare complication.

When stone passes through ampulla into duodenum, it may cause temporary rise in pancreatic duct pressure, which causes inflammation and secondary pancreatitis. In our study, ERCP was performed in all cases of choledocholithiasis. This study is mainly to know the effectiveness of ERCP and its associated complications.

## Methods:

This was the prospective study of 50 cases of common bile duct stones admitted in the CIVIL Hospital Ahmedabad during the study period of May 2018 to October 2020.

**Inclusion Criteria:** Adult patients with Choledocholithiasis with/without gallstone disease

**Exclusion Criteria:** Acute cholangitis/cholecystitis, malignancy, previous ERCP, previous biliary diversion surgery, congenital anomalies of pancreas

The diagnosis was made with relevant clinical history, physical examination, investigations like liver function test, ultrasound of abdomen CT abdomen and MRCP in cases where diagnosis is in query. All patients worked

* Senior Resident,
** Professor & Head of Unit,
General Surgery Department,
B J Medical College, Civil Hospital, Ahmedabad,
Gujarat, India
**Correspondence :** Dr. Zoncy Darji
**E-mail :** zoncydarji21@gmail.com

up for therapeutic procedure ERCP with all routine lab investigations, ECG, chest X ray and fitness for the procedure was taken from physician wherever necessary.

All patients were kept nil by mouth for 6 hours before procedures and received single dose of antibiotic. ERCP was done under local anaesthesia xylocaine (4%) with sedation (Inj Midazolam). Patients subjected for ERCP, stone extracted by either balloon or by basket with or without sphincterotomy and stenting was done in almost all cases. Few patients subjected to cholecystectomy within 24 hours of ERCP depending on different unit's protocol.

All patients were kept nil by mouth for 24 hours or more following the procedure depending upon patient's condition, all have received pre ERCP antibiotic and all patients were also monitored for post ERCP complications. All patients received post procedure antibiotics and analgesics. Patients were discharged depending upon the general condition and whether cholecystectomy was done or not.

**Results:**

A study was conducted from May 2018 to October 2020 including 50 patients having common bile duct stones at CIVIL hospital Ahmedabad. Following observations were made.

**Table 1: Distribution of cases according to Age and Sex of the patients**

| Age(years) | Male | Female |
|---|---|---|
| <20 | 1 | 0 |
| 21-40 | 4 | 8 |
| 41-60 | 10 | 12 |
| 61-80 | 5 | 9 |
| >80 | 1 | 0 |
| Total | 21(42%) | 29(58%) |

In this study of 50 cases, 29 female patients were diagnosed of having common bile duct stones. The maximum distribution was seen in the age group of 41 to 60 years. The youngest patient was 13 years old and the oldest was 85 year old. It was observed that occurrence of CBD stones was more in case of females then in males.

In the study of 50 patients, pain was predominant symptoms found in 46 patients accounting for 92%, whereas 40 patients presented with jaundice accounting for 80%. 13 Patients presented with pain, fever, and jaundice (Charcot's triad) accounting 26%. 15 patients presented with fever (30%), 7 patients presented with loss of appetite and 6 patients with loss of weight account for14% and 12% respectively are being less common symptoms. The other symptoms being history of passing high coloured urine and clay-coloured stools and pruritus seen in 32(64%), 4(8%),7(14%) respectively. 22(44%) patients presented with vomiting.

In this study icterus and tenderness (Right hypochondriac region) predominated, elicited in 44 out of 50 patients both accounting for 88%. 2 patients have Hepatomegaly (4%). Although 15 patients presented with fever, but elevated body temperature was recorded in 11 patients (22%).

**Table 2: Distribution of patients according to number of stones**

| | |
|---|---|
| Single stone | 21 |
| Multiple stones | 29 |

In this study liver function tests were found elevated in all 50 patients. But as alkaline phosphatase is a marker of obstructive jaundice and that is elevated in 44 patients accounting 88%. Out of 50 patients, 23(46%) patients had stone sized <10mm, 25(50%) patients had stone sized 10 to 20 mm and only 2(4%) patients had stone sized >20 mm. 3 In this study out of 50 patients 21(42%) patients had single stone and 29(58%) patients had multiple stones. In present study sphincterotomy was performed with some additional procedure. In two patients having stone larger than 2 cm, both found near ampulla and extraction was done with sphincterotomy with balloon sweep. Ultrasound detected CBD stones in 30 patients out of 50, accounts

for 60%, whereas remaining patients detected of having CBD stones on either CT or MRCP.

Stones larger than 20 mm removed with mechanical lithotripter. Out of 50,(ERCP successful stone removed in 44(88%) patients and sphincterotomy done in) 45 (90%) patients and stenting done in all patients. In present study out of 6 patients with incomplete removal of stone, 5 patients were found to have multiple stones. Only 1 patient was having single stone.

**Table 3: Distribution of patients according to size of stones**

| Findings | No of patients |
|---|---|
| Size of stone < 10 mm | 23 |
| Size of stone 10-20 mm | 25 |
| Size of stone > 20mm | 2 |

**Hospital stay:**

Out of 50 patients, 40 patients had hospital stay of less than 10 days, four patients with pancreatitis had average 14 days of hospital stay. Two patients underwent CBD exploration & had length of stay 20 and 25 days; only one patient had cholangitis and septicemia and stayed for 28 days, and ICU stay was also included.

**Cholecystectomy:**

Cholecystectomy performed in 21 patients out of 50 and in 2 patients CBD exploration required and found to have residual stone which was removed during surgery and in those patients choledochoduodenostomy done.

Factors which support spontaneous postoperative passage of CBD stones include a single small stone, no significant distal CBD stricture, duodenal filling during cholangiogram, the serum bilirubin not rising since the ERCP and the gastroenterologist feeling an adequate sphincterotomy has been performed. Studies have shown that a stone greater than 2 cm or multiple stones are significantly more difficult to clear with ERCP and sphincterotomy, so we would not rely on repeat postoperative ERCP for stone clearance nor would we necessarily expect these to pass spontaneously.

**Table 4: Distribution of patients according to Finding of ERCP**

| During ERCP | No of patients | % of patients |
|---|---|---|
| Difficult cannulation | 2 | 4% |
| Successful removal of all stones | 4 | 88% |
| Sphincterotomy | 45 | 90% |
| Stenting | 50 | 100% |
| Incomplete extraction of stones | 6 | 12% |

**Table 5: Distribution of patients according to post ERCP Complication**

| Complications | No of patients | % of patients |
|---|---|---|
| Pancreatitis | 4 | 8% |
| Haemorrhage | 1 | 2% |
| Perforation | 0 | 0% |
| Cholangitis | 1 | 2% |

Therefore, if we detect a residual stone greater than 2 cm or multiple stones during intraoperative cholangiography, we are inclined to convert to open CBD exploration if laparoscopic CBD techniques have failed.

**Discussion:**

In a study done by Wani et al,[2] maximum incidence of choledocholithiasis was seen in age group of 31 to 40 years and male to female sex ratio was 1:4.4. Maximum occurrence of CBD stones in present study was between 41 to 60 years, but the sex ratio is matched, suggesting female preponderance. In a study done by Wilcox et al[3] 52 patients out of 61 had abdominal pain (85.2%), 69.2% had nausea and 30.7% complained of vomiting. In present study abdominal pain was commonest symptom at 92%.

In Lillemoe et al[4] patients with alkaline phosphatase more than 200 IU/L, 46% patients found to have CBD

stone. According to Saltztein et al,[5] level of bilirubin and alkaline phosphatase were collectively accurate predictor of CBD stone. Alkaline phosphatase was the most important in predicting Common Bile Duct stones, of all the liver function test according to Robertson et al and Lacaine et al.[6–7] Whereas in studies like Edward et al[8] the best predictor for choledocholithiasis was elevated bilirubin, in which 12 out of 13 patients having elevated bilirubin had CBD stones. In present study level of alkaline phosphatase were elevated in 88% of patients.

Sensitivity of ultrasound in detection of common bile duct stones in present study is 60%, whereas in study done by Nebiker et al[9] sensitivity ranges from 33% to 55%, this wide range of sensitivity is explained with subjectiveness of ultrasound. In present study out of 50 patients, 48(96%) had duct dilatation, out of which 14 patients (28%) had duct diameter between 6 and 10 mm and patients having duct diameter ≥10 mm were 34 (68%). Whereas in Edward et al[8] out of 9 patients having dilated biliary system on ultrasound only 2 patients had CBD stone, similarly CBD stone can be absent in patients with dilated ductal system (False negative rate 63%).

According to study done by Lauri et al[10] stone with size <10mm successfully removed with endoscopy sphincterotomy alone, whereas stone with size >15mm were removed only in 12% of patients, they all required additional procedures like stenting, mechanical lithotripsy, and surgery. In Leese et al[11] incidence of different complications were acute pancreatitis (1.5-5.4%), sepsis (1-2.7%), perforation (0.3-1%), acute haemorrhage (2-2.9%). In present study incidence of pancreatitis was 8% and it is most common complication after ERCP.

In Edward at al[8], 23% of patients had residual CBD stone, out of them 75% of patients had successful removal of stone with trans cystic laparoscopic technique, for remaining patients repeat endoscopy or open surgeries were performed. In Yang et al[12], 24% patients were found to have residual CBD stone detected on cholangiography during cholecystectomy, even though stones were removed during endoscopic procedure.

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