



General Surgery

A CLINICAL STUDY AND MANAGEMENT OF COMMON BILE DUCT STONES

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**ABSTRACT** Cholelithiasis may be associated with CBD stones in few cases (approx 7%). CBD stones may present with pain abdomen, Jaundice and fever. CBD stones may be treated with minimal invasive methods like ERCP. If failed open surgical management with T tube closure can be performed.

**KEYWORDS :** CBD Stones, ERCP, Jaundice

**INTRODUCTION**

Cholelithiasis is a common surgical problem which makes cholecystectomy one of the most frequently performed surgical procedures.

Common bile duct stones are present in approximately 5% of the patients undergoing elective cholecystectomy and 10% of patients with acute cholecystitis. No single blood test or combination of blood tests can predict whether or not a CBD stone is present. Intraoperative cholangiography is a gold standard for diagnosis, but CBD stones can be diagnosed preoperatively with ultrasound, ERCP or MRCP.

**METHODOLOGY**

The present study was carried out on patients between November 2016 and November 2018, admitted in Government General Hospital Kurnool. 30 patients were taken into the study.

**Inclusion Criteria:**

- 1) All the cases of Common bile duct stones with the patient's age >12years.
- 2) Pre-op USG diagnosis of ductal dilation >8mm with or without CBD stones. Multiple stones in gall bladder with dilated cystic duct.
- 3) CBD stones complicating as obstructive jaundice, cholangitis, pancreatitis.

**Exclusion Criteria**

- 1) Patient age ≤ 12yrs.
- 2) CBD <8mm without stone

**OBJECTIVES OF THE STUDY**

- To study various modes of presentation of CBD stones
- To study the incidence of asymptomatic and symptomatic CBD stones with reference to complications, if any.
- To study different modalities of treatment in common bile duct stones.

**RESULTS**

**TABLE -1 : Age Distribution with gender**

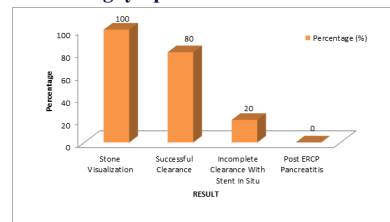
Age in years	Male	Female	Total
< 35	1	1	2(10%)
35 – 44	2	3	5 (16.6%)
45 – 54	2	5	7 (23.3%)
55 – 65	5	7	12 (40%)
>65	1	3	4 (13.3%)
Total	11 (36.6%)	19 (63.33%)	30 (100%)

**TABLE 2 : Incidence of CBD Stone in Relation to GB Stone Incidence.**

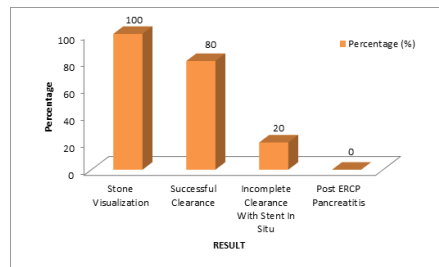
Type of Stone	Number of cases
GB Stones	451
CBD Stones	30

CBD Stone cases as a 7.05 % of GB Stone cases

**Graph-1 : Presenting symptoms**

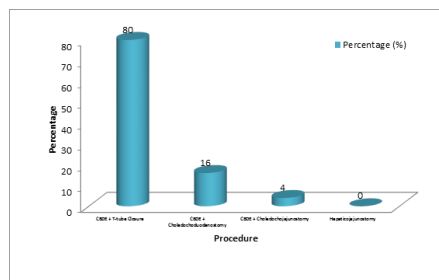


**Graph-2 : ERCP**

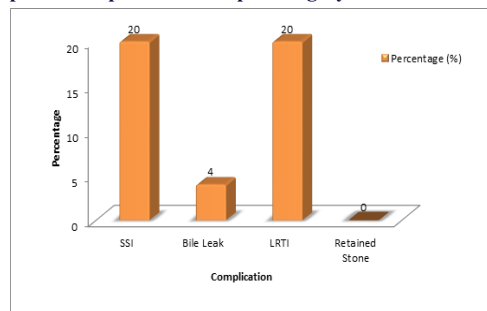


**TREATMENT**

**Graph-3 : Open Surgery**



**Graph-4 : Complications of Open Surgery**



## DISCUSSION

Common bile duct stones are present in approximately 5% of patients undergoing elective cholecystectomy and 10% of patients with acute cholecystitis. No single blood investigation or combination of blood investigations can predict whether or not a common bile duct stone is present. Intraoperative cholangiography is the gold standard of diagnosis but CBD stone can be diagnosed preoperatively with ultrasound, ERCP, or magnetic resonance cholangiopancreatography. If choledocholithiasis is diagnosed preoperatively, several different modalities can be utilized. The factors that determine the optimal approach include patient's age and condition, the presence of jaundice or cholangitis and size of the duct and stone.

The study was conducted in the Department of General Surgery under Kurnool medical college, Government general hospital. We have the essential infrastructure for open surgical management for CBD stones but very limited endoscopic infrastructure.

The present study has been carried out on patients who were admitted with CBD stones, to Department of General Surgery (Government General Hospital Kurnool) from November 2016 to November 2018.

35 patients were admitted during the study period. 5 patients were excluded from the study because they did not meet inclusion criteria. Thus, 30 patients were finally included in the study. Detailed clinical history and examinations were performed in all cases. Diagnosis of CBD stone was arrived at on the basis of abdominal ultrasonography and blood investigations. Selected cases were subjected to ERCP based on their merit.

### Age Incidence

Age of the patients varied from 27 to 72 yrs. Patient with age beyond 65 yrs were only included for demographic data and the management protocol. In men, the average age was 51.81 and in women, the average age was 53.15. Combined average was 52.48.

### SEX INCIDENCE

The female to male ratio was 1.72. According to Gerard RM 34 (2000), the female to male ratio was 1.72.

### Duration of Hospital Stay

Mean duration of stay was 13.26 days. This was because of biliary enteric drainage were done on a T-tube choledochotomy closure in all except cases which underwent complete stone clearance by ERCP.

### Presenting Symptoms

Pain was the most common symptom 28 (93.3 %) of patients complained about it. It varied from mild intermittent pain suggesting of biliary colic to severe pain radiating to back suggesting of acute pancreatitis in 2 cases(6.6%) ; associated with fever and chill suggesting of cholangitis in 11 cases(36.6%). Jaundice was present in 17cases (56.6%).

### Past History

3 patients (10%) had documented past history of jaundice relieved by temporary biliary stent before inclusion in our study. 6 patients (20%) had recurrent attacks of fever with chill and rigor, suggesting cholangitis.

The most common combined medical illness was DM (26.6%) followed by HTN (23.3%)

### ANALYSIS OF LAB INVESTIGATIONS

#### SERUM TOTAL BILIRUBIN

Mean serum total Bilirubin was 2.8 and 95% confidence interval 2.55-2.95

#### ALKALINE PHOSPHATASE

The mean value of Alkaline Phosphatase was 235.6 with 95% confidence interval of 233.4-237.6. Alkaline phosphatase was elevated in all patients with the highest percentage of value 56.6% (17 patients) occurring between 150 – 250 IU/L.

### ANALYSIS OF IMAGING MODALITIES

#### ABDOMINAL ULTRASONOGRAPHY :

##### Gall Bladder

Gall bladder was seen in 29 of the 30 patients. The gall bladder was thickened in 29 patients (96.6%) and either had stones or sludge.

### CBD

All patients had CBD ductal diameter of greater than or equal to 8 mm. Mean CBD diameter was 12.22 mm. The largest diameter recorded was 23 mm.

### BILE CULTURE

Bile was routinely cultured. It showed E.coli in 60% (18 patients), Klebsiella in 23.3% (7patients), Enterococcus in 3.3% (1 patients) and no growth in 13.3% (4 patients).

### ERCP

ERCP is available in our institution. A total of 5 patients were subjected to ERCP under the following indications:

Acute cholangitis with features of sepsis – 2 cases(40%)

Acute gall stone pancreatitis – 1 case(20%)

Post cholecystectomy CBD stones – 1 case (20%)

Patient with CBD stones with minimally dilated CBD (8 to 9 mm) carrying greater morbidity on open exploration – 1 case

Study	% successful clearance
Suresh chandu 201447	71.4%
VRM Rao et al 201648	100%
Present study	80%

Out of 30 patients, 5 patients underwent ERCP (16.6%). ERCP was successful in clearing CBD of stones in 4 cases (80%). In one case temporary stent was introduced due to incomplete clearance in which open CBD exploration was carried out. One patient underwent Laparoscopic cholecystectomy but was converted to open CBD exploration. The total number open CBDE was 25(83.3%).

### OPEN CBD EXPLORATION:

S.No.	Procedure	Present study
1	CBDE +T-tube closure	20 (80%)
2	CBDE+ transduodenal sphincteroplasty	0 (0%)
3	CBDE + Choledocho- duodenostomy	4 (16%)
4	CBDE+choledocho- jejunostomy.	1 (4%)
5	Hepaticojejunostomy	0 (0%)

### CONCLUSION

The management of CBD stones has been subject to much debate during the past several years, especially with the advent of new laparoscopic techniques and greater expertise of endoscopic procedures.

This study was undertaken to get a clinical perspective of CBD stones in the milieu of GB stones and to determine the optimal approach for the management with the age of the patient, general condition, complicating factors, availability of endoscopy and minimally invasive procedure, determining the algorithm of treatment.

The end result of our study was the developing of a management protocol in our setting.

CBD stones were present in 7.05% of gall bladder stone cases encountered. There was a steady rise of incidence of CBD stones beyond the age of 55 yrs with female patients outnumbering the males. Patients spent an average of 13.26 inpatient days for the treatment of CBD stones.

Pain ranging from mild biliary colic to severe pain of acute pancreatitis was the most common symptom followed by jaundice. CBD stones complicated itself in the form of cholangitis and biliary pancreatitis in our cases.

Elevated bilirubin was a positive predictor of CBD stones in 90% of the cases. Elevated alkaline phosphatase was a further confirmatory index of cholestasis.

Transabdominal ultrasonography was the imaging modality commonly used to detect CBD stones, as it was cost efficient, easily available, able to detect gall bladder stones in all our cases and CBD stones in 93.3% of our cases. It was also used to measure CBD diameter which helped us to individualize the management based on it. ERCP was used very selectively due to the need for referral to other institutions for the same. Patients with CBD stones with acute biliary pancreatitis, cholangitis needing immediate decompression of CBD, patient who had already undergone cholecystectomy and patients with

minimally dilated CBD where open exploration would have carried greater morbidity were subjected to ERCP.

Bile culture in our cases revealed E.coli as the most common organism, but in relation to complications in terms of post-op wound infection, cholangitis- klebsiella, enterococcus out numbered E.coli.

Our most common treatment modality was open CBD exploration with closure of choledocotomy on T-tube being the most common procedure.

Biliary enteric drainage in the form of choledochoduodenostomy, choledochojunostomy was done in selective cases. Open CBD exploration was the last resort for failed minimally invasive treatment, like ERCP and lap CBD exploration. The benefit of open CBD exploration exceeded its morbidity with zero mortality in well chosen cases.

To conclude, there can be no definite algorithm for the management of CBD stones as the patients' age, underlying general condition being the only standardizable factor with facilities for endoscopic, laparoscopic management being variably available from institution to institution and hence, necessitating tailoring the management of CBD stones depending upon the Institution's resources.

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