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MANAGEMENT OF CBD STONES

General Surgery

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ABSTRACT

INTRODUCTION: Common bile duct stones occur in 3 to 14.7 % of all the patients for whom cholecystectomies were performed. If CBD stones are diagnosed preoperatively, several different treatment modalities can be utilized The gold standard investigation for CBD stones is Intraoperative cholangiography; CBD stones can also be preoperatively diagnosed with Ultrasound, ERCP, or MRCP.

MATERIALS AND METHODS: Patients admitted under various surgical units from December 2018 to June 2020, at Alluri Sitarama Raju Academy of Medical Sciences, Eluru.A study was carried out on 30 patients were admitted with choledocholithiasis . All these patients have been assessed both preoperatively and postoperatively Complications have been documented. Where patients underwent surgical intervention, any tissue removed was subjected for histopathological examination

RESULTS: There was a steady rise of incidence of CBD stones beyond age of 50-60yrs.
Abdominal pain was the most common symptom followed by jaundice.

- Elevated bilirubin was a positive predictor of CBD stones in 95% of the cases.
- Transabdominal ultrasonography was the imaging modality commonly used to detect CBD stones
- T- Tube cholangiogram was used for confirmation

CONCLUSION: Bile duct surgery was accompanied by significant morbidity and mortality, with recent advances in support to care; the numbers are decreasing. Early management of choledocholithiasis without the onset of jaundice is the ultimate goal for the benefit of the patient.

KEYWORDS

CBD STONES,MRCP,ERCP,SENSITIVITY,SPECIFICITY

INTRODUCTION:

Common bile duct stones occur in 3 to 14.7 % of all the patients for whom cholecystectomies were performed. In 6% to 15% of patients with symptomatic cholelithiasis, common bile duct stones are present. Whereas patients who had cholecystectomy for acalculous biliary disease, 1 -2% are found to have common bile duct stones[1]

No single investigation or a group of haematological investigations can predict the presence of CBD stones. The gold standard investigation for CBD stones is Intraoperative cholangiography; CBD stones can also be preoperatively diagnosed with Ultrasound, ERCP, or MRCP.

If CBD stones are diagnosed preoperatively, several different treatment modalities can be utilized. The factors that determine the optimal approach include the patient's age and general condition. It is also important to consider the local expertise of the Surgeon and the gastroenterologist in managing CBD stones. Hence the algorithm for managing these patients will vary from one locale to another. There are specific indications that mandate CBD open exploration, and therefore, the practising Surgeon must be well trained in various techniques.

Most of the times stones in the CBD may be silent, the development of symptoms is potentially serious; ascending cholangitis, obstructive jaundice, acute pancreatitis are all associated with serious morbidity and at times, mortality which need immediate attention

- To study various modes presentation of CBD stones.
- To study the incidence of asymptomatic and symptomatic CBD stones.
- Comparison of preoperative imaging with operative diagnosis of CBD stones.
- To study different treatment modalities in CBD stones.

Methodology:

A. Source Of Data:

Patients admitted under various surgical units from December 2018 to June 2020, at Alluri Sitarama Raju Academy of Medical Sciences, Eluru.

Only the cases of choledocholithiasis are studied in detail according to the proforma given.

A study was carried out on these patients.30 patients were admitted with choledocholithiasis and were studied in detail.

B. Method Of Collection Of Data:

This is a study of 30 patients who presented with choledocholithiasis between from December 2018 to June 2020 who subsequently underwent surgical intervention. All these patients have been thoroughly assessed both preoperatively and postoperatively as per the proforma. Complications have been documented. Photographic documentation has been done wherever possible. Where patients underwent surgical intervention, any tissue removed was subjected for histopathological examination.

Inclusion Criteria:

- All the cases of Common bile duct stones with the patient's age >12 years.
- Pre-op USG diagnosis of duct dilatation >8mm with or without CBD stones.
- CBD stones complicating as obstructive jaundice, cholangitis.

Exclusion Criteria:

- Patient age < 12 yrs.
- CBD <8mm without stone on usg

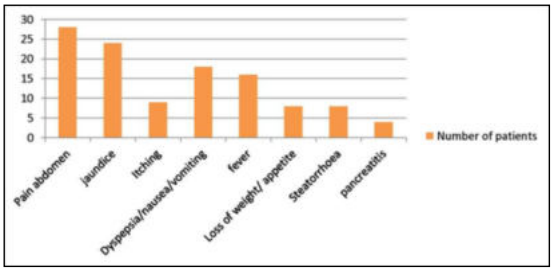
Observations And Results:

A prospective clinical descriptive study consisting of 30 patients was taken in this study to evaluate clinical presentations, laboratory parameters, and the different modes of treatment for common bile duct stones.

Table 1: Age And Sex Distribution:

Age of distribution	Male	Female	Total
<30 years	1 (3.33%)	1 (3.33%)	2 (6.66%)
30 - 40 years	2 (6.66%)	3 (10%)	5 (16.6%)
40 - 50 years	2 (6.66%)	5 (16.6%)	7 (23.3%)
50 - 60 years	5 (16.6%)	7 (23.3%)	12 (40%)
>60 years	1 (3.33%)	3 (10%)	4 (18.3%)
Total	11 (36.6%)	19 (63.6%)	30 (100%)

Mean	48.27%	51.10%	50.06%



Graph -1: Incidence Of Presenting Symptoms

Table 2: Past History

symptom	Number	%
Jaundice	3	13.3%
Fever	8	26%
DM	9	30%
HTN	8	26.6

Family History:
No relevant family history of jaundice, congenital diseases, malignancy, etc., was given by any of the patients.

General And Physical Examination:
Out of 30 patients, 24 were jaundiced, and pallor was present in 13 patients.

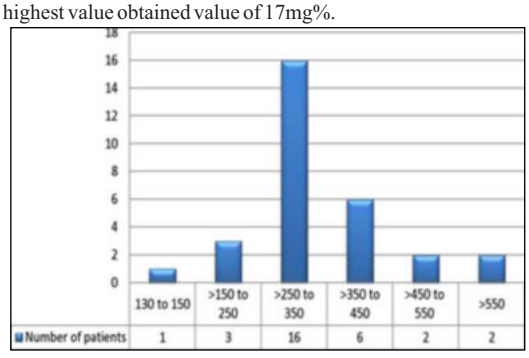
Per Abdomen:
No organomegaly, right hypochondriac tenderness was present in 13 cases and in epigastrium in 8 cases. Free fluid was present in none.

Table 3: Laboratory Findings
Total Bilirubin

Total bilirubin	Number of patients	%
<1	1	3.33%
>1 to 2	2	6.66%
>2 to 4	8	26.6%
>4 to 6	7	23.3%
>6	12	40%

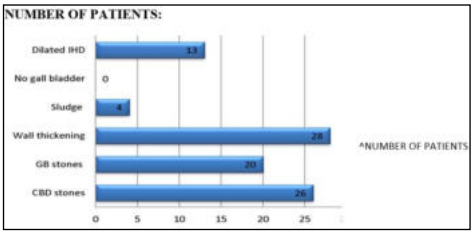
Mean = 5.95 S.D =3.816

26(86.66)patients had clinical evidence of jaundice (icterus) because their total bilirubin values exceeded the clinical threshold of 2.5mg%. Most of the patients in this study had values between 2 to 4 mg%, and the highest value obtained value of 17mg%.



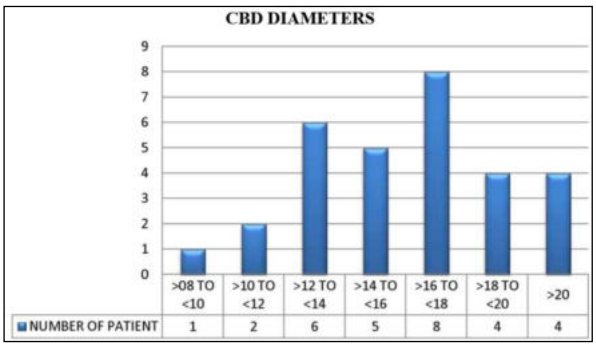
Graph -2: Alkaline Phosphate
Most patients had values between 251 to 250 IU/L.

Radiology Studies:
Abdominal Ultrasonography was the main diagnostic procedure in this study



Graph -3: Ultrasound Findings
NUMBER OF PATIENTS:^NUMBER OF PATIENTS

Graph -4: Ultrasound Abdomen Cbd Diameter
Cbd Diameters



Cbd Caliculi As In Ultrasound Of Abdomen

Twenty-seven patients(90%) had sonological evidence of stones in the CBD. 3(10%) cases had false-negative sonology of the CBD for stones, which was confirmed with per operative cholangiogram in 2 cases and by MRCP in one case. Solitary cylindrical calculus of CBD stones was seen in 1 case(3.33%).

Table 4: Per Operative Cholangiogram

Preclearance pre-operative cholangiogram	Number (n = 3)
Stone visualized	3
Stone not visualized	0
specificity	100%

Table: 5

Post clearance per operative cholangiogram	
Filling defect (stone)	0
Flow into duodenum	3
specificity	100%

Per operative, cholangiogram was used in 3 cases with negative USG for CBD stones and had a specificity of 100%. However, per operative cholangiogram was false positive in zero cases in post exploration cholangiogram bringing its specificity to 100% in this scenario.

Table: 6: Ercp

Results	N =21	%
Stone visualization	21	100%
Successful clearance	18	85.71%
Incomplete clearance with a stent in situ	3	14.28%
Post ERCP pancreatitis	1	1.81%

ERCP had a success of clearing the CBD of all the stones in (18)85.71% of the cases. It failed in 3 cases (14.28%) for which a temporary stent was left followed by open CBD exploration.1 patient(1.8%) developed post ERCP pancreatitis.

Table: 7: Open Surgery

Procedure	Number (N=10)	%
Open CBD exploration + T-tube closure	8	80%
CBD exploration choledochoduodenostomy	1	10%
Lap converted to open CBD exploration + T-tube closure	1	10%

Ten patients (33.33 %) were subjected to open CBD exploration, which also includes three failed cases of ERCP. Nine patients (30%) underwent CBDE with T-tube closure. One patient (3.3%) underwent choledochoduodenostomy. In 4 patients (13.33%), the CBD diameter was more than 20mm. No hepaticojejunostomy or choledochojejunos to my was performed for any patients in my study

Table: 8: Complications Of Open Surgery

Complications	Number (N=10)	%
SSI	2	10
Bile leak	1	10
LRTI	1	10

Retained stones	0	0

Mortality- 0% Morbidity- 40%

Two patients (20%) developed an infection of the surgical wound as a result of contamination from the biliary tract. Bile leak was seen in 1 patient (10%) due to T-tube dislodgement. One patient (10%) developed a lower respiratory tract infection (LRTI).

Table: 9: Laparoscopic Cbd Exploration

Procedure	No of patients(N=3)	%
Transductal CBDE + T-tube	2	66.6%
Transcystic CBDE	0	0
Lap converted to open CBDE	1	33.33%

In this study, 2 cases (66.6%) had a successful laparoscopic clearance of the CBD following laparoscopic cholecystectomy. 1 case, though underwent successful laparoscopic cholecystectomy, had to have open CBD exploration due to an unfavourable anatomy.

DISCUSSION:

Intraoperative cholangiography is the gold standard investigation of diagnosis, but CBD stone can be diagnosed preoperatively with ultrasound, ERCP, or magnetic resonancecholangiopancreatography.[2]

The incidence of CBD stone in the milieu of cholelithiasis was 10.714%. According to Gerard RM [3], the overall incidence of CBD stones was 8% of the cases with cholelithiasis

A maximum number of patients was seen in age groups between 50 - 60 years (40%), followed by age group of 40-50

The female to male ratio was 1.73. According to Gerard RM[3] (2000).

According to Wani NA et al. [4]., 94% had pain in the right upper abdomen.

According to Acosta JM et al.[5]. (1974), gall stones are responsible for 50% of all cases of pancreatitis

Analysis Of Lab Investigations:

Serum Total bilirubin. According to Lawrence [6], et al. (2003) which says that absolute level usually remains under 10 mg/dl and most are in the range of 2 - 4 mg/dl. Also, in all cases, the direct (conjugated) fraction exceeded indirect, which is also in accordance with Lawrence [6] et al. (2003).

Alkaline Phosphatas. Even in cases where total bilirubin was normal 2 cases (6.66%), there was an elevation of alkaline phosphatase which is in accordance with Lawrence et al. [6]

Presenting Symptoms And Clinical Signs:

Pain abdomen (93.3 %) was the main presenting symptom in the present study as compared to Jaundice in other studies. In the study of Agrawal et al. [56]. and Nadkarni et al.[7] dyspepsia/nausea/ vomiting was the other major presenting symptom. In our study, it was Jaundice, dyspepsia/nausea/vomiting and fever with chills and rigors.

A palpable and sometimes visibly enlarged gall bladder suggests carcinoma pancreas. Warren et al. (1983) reported a 28.3% incidence in his studies. Calculus jaundice is not usually associated with enlargement of the gall bladder due to previous inflammatory fibrosis (Courvoisier's sign). *c~7* Nadkarni et al. (1981)[7] reported a 42.3% incidence of the palpable gall bladder in his study.

The Ultrasonic Diagnosis Of Choledocholithiasis

The ultrasound scan picked up 86% and 93% of cases of choledocholithiasis in MesterenkoIuA et al. study and present study respectively.

CBD: Mulholland MW et al. (2006) which states that if bile duct diameter is less than 8 mm, CBD stones are exceedingly rare, whereas a diameter greater than 10 mm in a jaundiced patient predicts CBD stones in more than 90% of cases.

MRCP: In our, all 3 cases with negative usg for CBD stones are detected by MRCP, which is confirmed by choledochoscopy/ ERCP bringing the specificity 100%.

Our indication for MRCP was:

Abdominal USG negative for CBD stones, but history suggestive of CBD stones (serum bilirubin more than 3mg%, elevated serum amylase, history of cholangitis, pancreatitis).

ERCP: The Specificity of ERCP in confirming CBD stones was 100%, which compares with that of Frey[8] et al. (1982) of 98%. Sensitivity could not be determined as ERCP was only selectively used. The success of ERCP in clearing the CBD of stones was 18 out of 21 cases (85.71%), which is in agreement with Freeman[9] M et al. (1996)

CONCLUSION:

There was a steady rise of incidence of CBD stones beyond age of 50-60yrs.

- Pain ranging from mild biliary colic to severe pain of acute pancreatitis was the most common symptom followed by jaundice.
- Complications of Choledocholithiasis were Cholangitis and Biliary pancreatitis in my study.
- Elevated bilirubin was a positive predictor of CBD stones in 95% 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 88% of our cases.
- It was also used to measure CBD diameter, which helped us to individualize the management based on it.
- T- Tube cholangiogram was used for confirmation of complete clearance of CBD stones postoperatively in order to ensure distal biliary tree patency into the duodenal second part.

Bile duct surgery was accompanied by significant morbidity and mortality, with recent advances in support to care; the numbers are decreasing. Early management of choledocholithiasis without the onset of jaundice is the ultimate goal for the benefit of the patient.

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