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A study on aetiopathogenesis and management of common bile duct stones in southern part of Odisha, India

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Abstract
Common bile duct stones (CBD) are found in 6 to 12% of patients with stones in the gallbladder. The incidence increases with age. These may be silent and are often discovered incidentally. The most common presentation is fever, epigastric or right upper quadrant pain, and jaundice. These classic symptoms are present in about two thirds of patients. Main complications of choledochal stones are cholangitis, gallstone pancreatitis and obstructive jaundice. The purpose of this study is to evaluate the incidence and aetiopathogenesis of Common Bile Duct stone in Southern part of Odisha, India.

Keywords: common bile duct, cholangitis, choledochoduodenostomy

Introduction

Common bile duct stones are found in 6 to 12% of patients with stones in the gallbladder. The incidence increases with age. About 20 to 25% of patients above the age of 60 with symptomatic gallstones have stones in the common bile duct as well as in the gallbladder [1].

The vast majority of ductal stones are formed within the gallbladder and migrate down the cystic duct to the common bile duct. These are classified as secondary common bile duct stones, in contrast to the primary stones that form in the bile ducts [1].

Women are three times more likely to develop gallstones than men and first degree relatives of patients with gallstones have a twofold greater prevalence [1].

There has been a remarkable shift in the trend of gallstone disease from the middle aged, fertile, fat, females to young asthenic females in their twenties [2].

The prevalence of gallbladder stones varies widely in different communities in India. The North Indians having 2-4 fold higher prevalence as compared with those among South Indians. Furthermore, there is a predominance of cholesterol gallstones among the north Indians and that is reflected both in gallbladder as well as CBD stones analysis, including the CBD stones not accompanied by a demonstrable stone in the gallbladder. In contrast, South Indians have a predominance of pigment gallstones both in the gall bladder and CBD [3].

These may be silent and are often discovered incidentally. The pain caused by a stone in the bile duct is very similar to that of biliary colic caused by impaction of a stone in the cystic duct. Nausea and vomiting are common. The symptoms may be intermittent, such as pain and transient jaundice caused by a stone that temporarily impacts the ampulla but subsequently moves away, acting as a ball valve. A small stone may pass through the ampulla spontaneously with resolution of symptoms [1].

Main complications of choledochal stones are cholangitis, gallstone pancreatitis and obstructive jaundice.

In Cholangitis the most common presentation is fever, epigastric or right upper quadrant pain, and jaundice. These classic symptoms, well known as *Charcot's triad*, are present in about two thirds of patients. The illness may progress rapidly with septicemia and disorientation, known as *Reynolds' pentad* (e.g., fever, jaundice, right upper quadrant pain, septic shock and mental status changes) [1].

The mechanism by which small gallstones migrating down the common bile duct, past the pancreatic duct junction and into the duodenum, cause acute pancreatitis is not clear. It was proposed that a gallstone transiently lodged in the distal common channel of the ampulla of Vater allowed bile to reflux into the pancreatic duct. Sometimes occult microlithiasis is probably responsible for up to half of those with idiopathic acute pancreatitis [1].

Obstructive jaundice occurs when a stone migrates from the gall bladder into the common bile duct (secondary CBD stones) or primary CBD stones obstruct CBD [4].

It is generally recommended to treat choledocholithiasis when it is discovered. Options include open CBD and laparoscopic CBD exploration and postoperative endoscopic or percutaneous transhepatic stone extraction. In the current state of evolving techniques, and in the absence of definitive prospective randomized trials guiding the management of patients with choledocholithiasis, the technical expertise of the local physicians is a major determining factor in CBD stone management [5, 6].

CBD stone management includes CBD exploration with stone extraction combined with a drainage procedure. CBD exploration can be done through supraduodenal, transduodenal or transcystic approach. Biliary enteric drainage procedures include transduodenal sphincterotomy, Choledohcoduodenostomy and Choledochojejunostomy [7].

The purpose of this study is to evaluate the incidence and aetiopathogenesis of CBD stone in Southern part of Odisha, various clinical presentations and various modalities of treatment, so as to minimize morbidity and mortality and providing the patient with the best chance of satisfactory outcome.

Aims of the study

1. To evaluate age, sex incidence and most common aetiological factors for CBD stone disease.
2. To illustrate varying clinical presentations.
3. To study various modes of management adopted in our institution.

Materials

The above study was conducted on patients attending surgical Out Patient Department, Emergency Department as well as patients admitted to surgical wards of MKCG Medical College and Hospital, Berhampur from the period of August 2014 to July 2016. Out of all cases a total of 29 cases were recorded for comparison and conclusive study.

Methods

Approval from ethical clearance committee was obtained.

All the patients admitted to surgical ward were subjected to

- Questionnaires and clinical examination
- Routine and special investigations
- Treatment modality, once the definitive diagnosis of choledocholithiasis was established.
- Post-operative observation of patients for any complications.

Inclusion criteria

All patients diagnosed to have choledocholithiasis.

Exclusion criteria

- All patients with only cholelithiasis and acalculous cholecystitis.
- Patients those who refused admission.

Results

Table 1: Age and Sex Distribution

Age group	Male	Female	Total	Percentage
15-20	-	-	-	-
21-30	1	2	3	10.3
31-40	2	4	6	20.6
41-50	4	1	5	17.2
51-60	4	5	9	31
>60	-	6	6	20.6
Total	11	18	29	100

Table 2: Clinical Profile

Clinical profile		No. of cases	Percentage
Diet	Vegetarian	11	37.9
	Non-vegetarian (Mixed)	18	62.1
Lifestyle/Physical activity	Sedentary	15	51.7
	Moderate	11	37.9
	Heavy	3	10.3
Built	BMI <18.5 (Underweight)	1	3.4
	18.5-24.99(Normal weight)	5	17.2
	25 – 29.99 (Overweight)	13	44.8
	>25 (Obese)	10	34.4
Comorbid medical illness	Diabetes Melitus	13	44.8
	Hypertension	16	55.1
	Dyslipidemia	14	48.2

Table 3: Clinical presentation

Symptoms	No. of cases	Percentage
Pain	25	86.2
Fever	15	52.7
Jaundice	19	65.5
Dyspepsia, Nausea, Vomiting	10	34.4
Itching	3	10.3
Clay coloured stool	10	34.4

Table 4: Type of surgery

Surgery	No. of cases	Percentage
Cholecystectomy+ CBDE & T tube drainage	4	13.7
Cholecystectomy+ choledochoduodenostomy	25	86.2
Cholecystectomy+ choledochojejunostomy	-	-

Table 5: Operative complication

Complication	No. of cases	Percentage
Intra-operative		
Bleeding	4	13.7
Bowel injury	-	-
Post-operative		
Bleeding	-	-
Bile leak	-	-
Pulmonary complications	5	17.2
Prolonged ileus	5	17.2
Wound infection	4	13.7

Discussion

The results of the study have been compared with results reported by Girard RM *et al* (2000) [8], Nandkarni *et al* (1981) [9], M.H.K Crumplin *et al* (1985) [10] and Agarwal *et al* (1974) [11]. Maximum number of patients were seen in age group between 51- 60yrs (30%), which is in accordance with the study conducted by Gerard *et al* (2000) where maximum incidence was seen in age group between 50-59 yrs (20.1%). The female to male ratio is 1.63. This is similar to that of Gerard *et al* with a ratio of 1.72.

Out of all 44.8% cases were suffering from diabetes mellitus, 55.1% hypertension and 48.2% dyslipidemia.

Table 6: Comparison of symptoms

Symptoms	Present Study	Agarwal *et al*	Nandkarni *et al*
Pain	86.2	79.1	53.8
Fever	52.7	12.5	53.8
Jaundice	65.5	100	100
Dyspepsia	34.4	70.9	88.5
Itching	10.3	50	73.1
Clay coloured stool	34.4	41.7	92.3

Pain was the most common symptom in 86.2 % of cases in our study in comparison to jaundice in rest of the 2 studies. The other major symptoms in studies of Agarwal *et al* and Nandkarni *et al* were dyspepsia, nausea and vomiting. In our study Jaundice, fever, dyspepsia were the common presenting symptoms next to pain. Majority of CBD calculi patients presented with Obstructive jaundice (65.5%). Rest presented with features of cholangitis and acute pancreatitis.

In Girard *et al* series 92.8% patients underwent CBDE + T Tube drainage and patients underwent 3% CBDE +choledochoduodenostomy. Similarly in M.H.K Crumplin *et al* series 36% patient underwent CBDE + T tube drainage and underwent 36% CBDE+choledochoduodenostomy. In rest patients Trans Duodenal Sphincterotomy (TDS) was done. In our study CBDE+ T tube drainage was done in 13.7 % cases and CBDE + Choledochoduodenostomy done in 86.2% cases.

Pre-operative preparation of patients with CBD stone and obstructive jaundice took around 5 days, hence average duration of hospital stay was 12 days.

Post operatively during second week T tube cholangiogram was performed in 4 cases. It was found to be normal in all cases with no evidence of residual calculi and hence removed.

Intraoperative bleeding was seen in 13.7% cases, pulmonary complications and prolonged ileus in 17.2 % cases and wound infection in 13.7% cases. Intraoperative bleeding was controlled by pringles manoeuvre and then carefully dissecting out the bleeding vessel and ligating it. Bleeding from liver bed was controlled by coagulation or application of local styptics and pressure. Pulmonary complications were managed with aggressive resuscitation, chest physiotherapy and early ambulation. Post operative ileus was managed with prolonged ryles tube aspiration and early ambulation. Wound infection was managed with appropriate dressing and antibiotics according to culture sensitivity report.

There were no mortality in our series as compared to Mc sherry (1989) – 0.6-4% [12] and Girard *et al* (2000) 0.3-1.6%. However no mortality in open cbd exploration (Pappas *et al*, 1990) [13] and endoscopic (Shival, 1989) [14], laparoscopic CBD exploration (Petelin, 1993) [15] have been recorded which is in agreement with our study.

Conclusion

- In southern part of odisha maximum incidence of common bile duct stone is seen in eldery age group with a female preponderance.
- In this study CBD stones are seen more in overweight individuals and in patients suffering from Diabetes Melitus, Hypertension, Dyslipidemia.
- A higher incidence is seen in patients having sedentary lifestyle and those consuming mixed indian diet (non-vegetarian).
- The varying clinical presentation ranges from most common pain in right hypochondrium and epigastrium to fever, jaundice, dyspepsia, nausea, itching and passage of clay coloured stool.
- CBD exploration with choledochoduodenostomy was the main modality of management opted.
- No mortality was seen in this study.

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