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Clinical Presentation And Management Of Choledocholithiasis Department Of General Surgery, Nri General Hospital,Mangalgiri.

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ABSTRACT: BACKGROUND AND OBJECTIVES: Choledocholithiasis complicates the working and management of cholelithiasis necessitating additional diagnostic procedures, increasing morbidity and mortality. CBD stones generally remain asymptomatic but when symptoms start appearing, cause a lot of suffering.There are various treatment modalities available presently. The objective of our study was to study thevarious modes of clinical presentations and different modalities of treatment in common bile duct stones. MATERIALS AND METHODS: 86 Patients were prospectively studied from August 2018 to August 2020 as in-patients in NRI General Hospital. RESULTS: CBD stones had bimodal distribution with no much sex predisposition and presented from subclinical jaundice to complications in the form of biliary pancreatitis and cholangitis. USG abdomen with LFT was able to diagnose majority of the CBD stones preoperatively. Per operative cholangiogram was used selectively in case USG was inconclusive, ERCP was used in patients presenting with severe obstructive jaundice, pancreatitis, cholangitis, minimal CBD ductal dilation. Open exploration was the main focus with a wide variety of procedures performed according to specific indications. CONCLUSION: CBD was probably due to neglected gall bladder stones. CBD stones can occur from occult asymptomatic stones only with altered LFT to symptomatic presentation in the form of cholangitis, pancreatitis. USG abdomen was inexpensive and easily available imaging modality to diagnose CBD stones with per operative cholangiogram being needed in minority of the cases. While ERCP was good in treating complications of CBD stones and early stages of the disease; the more advanced stage of the disease with gross CBD ductal dilation and multiple stones open CBD exploration were more productive.

I. INTRODUCTION

CBD stones continue to pose a significant problem both to the patient and the surgeon . They increase the morbidity of a patient undergoing cholecystectomy from less than 5% to as much as 20% and almost zero mortality to as high as 30% .[1] Recent times have thrown up a fair share of controversy in the management of this condition both due to technological innovations and cost reduction pressures . [2]The aim in CBD stone disease, as in any benign disease is to discover a therapeutic algorithm with minimal morbidity , no mortality and at reasonable cost.[2,3] This can be achieved only by a thorough understanding of the disease and also the available diagnostic and treatment modalities. The liver, gall bladder and bile ducts arise as a ventral bud (Hepatic diverticulum) from the most caudal part of foregut. Hepatic diverticulum extends into the septum transversum and expands the ventral mesentry.

The extrahepatic biliary passages consist of the right and left hepatic ducts, the common hepatic duct, the cystic duct, and the common bile duct or choledochus. The common bile duct enters the second portion of the duodenum through a muscular structure, the sphincter of Oddi. The length of the CBD varies from 5 to 15 cms depending upon the position of the entrance of the cystic duct. The duct is divided arbitrarily into 4 parts : 1) Supraduodenal - length of 2 - 5 cm 2) Retroduodenal – length of 1 - 3.5 cm 3) Pancreatic – average length of 3 cm 4) Intraduodenal – average length of 1.1 cm. The upper portion is supplied by the cystic artery. The lower portion is supplied by a branch from posterosuperior pancreaticoduodenal and retroduodenal artery. The upper portion drains via the cystic vein into the hepatic vein. An Epicholedochal venous plexus on the CBD helps the surgeon identify the CBD .[4]

The CBD drains into pericholedochal nodes which in turn drain into preaortic nodes around the celiac and superior mesenteric artery. Both sympathetic and parasympathetic (vagal)

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fibres derived from the celiac plexus reach the biliary tract. Complete vagotomy does not impair bile output but it appears to result in a permanently enlarged GB .[5]

There are two types of CBD stones present 1) Primary CBD stones 2) Secondary CBD stones. Primary CBD stones form within the bile ducts and usually are of brown pigment variety, Which are lower in cholesterol content and higher in bilirubin content . These are associated with biliary stasis and bacteria.[6] In brown pigment stones , bile infection appears to be the initial event leading to stone formation .[7] Secondary CBD stones originate in the gallbladder and migrate through the cystic duct . Of these, 75% are cholesterol stones and 25% are black pigment stones. The formation of black pigment stones is associated with haemolytic disorders, cirrhosis, ileal resection , prolonged fasting and total parenteral nutrition [8](TPN). A variety of diagnostic modalities are available for the patient with suspected disease of the gallbladder and the bile ducts. In 1924 the diagnosis of gallstones was improved significantly by the introduction of oral cholecystography by Graham and Cole. For decades it was the mainstay of investigation for gallstones. In the 1950s biliary scintigraphy was developed, as well as intrahepatic and endoscopic retrograde cholangiography, allowing imaging of the biliary tract. Later ultrasonography, computed tomography (CT), and magnetic resonance imaging (MRI) vastly improved the ability to image the biliary tract.

When patients with suspected diseases of the gallbladder or the extrahepatic biliary tree are evaluated, a complete blood count and liver function tests are routinely requested. Biochemical parameters include,s erum bilirubin,serum alkaline phosphatase,gamma-glutamyl transpeptidase,serum transaminases,prothrombin time and serum proteins. An ultrasound is the initial investigation of any patient suspected of disease of the biliary tree. Ultrasound will show stones in the gallbladder with sensitivity and specificity of >90%.

ERCP has traditionally been considered the gold standard for imaging the biliary system, particularly if therapeutic intervention is planned. It can demonstrate the cause of biliary obstruction, and helps in making a diagnosis based on the morphology of the biliary and pancreatic ducts. In the evaluation of CBD stones, Frey et al, noted that ERCP had a sensitivity of 90%, a specificity of 98%, and an accuracy of 96%.[9]MRCP has recently been developed as another non-invasive means of imaging the biliary tract. MRCP can diagnose CBD obstruction with sensitivity of 90%, a specificity of 100% and an overall diagnostic accuracy of 97%. The main advantage is that it allows for direct imaging of biliary tract without the need for contrast or an invasive procedure. Helical CT (hCT) and helical CT cholangiography (hCTC) uses slip ring technology with oral or intravenous contrast to acquire volumetric data in a single breath-hold for high-quality three-dimensional reconstructions of the acquired image. It has the ability to opacify up to third-order intrahepatic bile ducts, and evaluate extra-ductal structures in different phases (arterial, portal, parenchymal). intraoperative cholangiography- It is the gold standard diagnosis but CBD stone can be diagnosed preoperatively with ultrasound, ERCP, or magnetic resonance cholangiopancreatograph.[10] The management of choledocholithiasis with or without cholangitis depends upon many variables which include: 1) Patients general and medical condition 2) Detection of stones in relation to cholecystectomy –prior,during or after cholecystectomy. 3) Experience of the surgeon 4) Availability and skill of endoscopists, interventional radiologists. Open Surgical Management: Palpation of the CBD is often underestimated but is the most reliable indicator for choledochotomy, having an accuracy of 98% if a stone is judged palpable.[11] TransduodenalSphincterotomy (TDS) is employed when the common duct is less than 1.5cm in diameter in a young, low risk patient with a solitary impacted ampullary stone. In Choledochoduodenostomy A dilated duct is the sine quo non for this procedure. It should not be performed with ducts less than 1.4cm in diameter and a duct narrower than 1.2 cm is an absolute contraindication. [12]Choledochojejunostomy is an alternative to choledochoduodenostomy, can be done with either a loop or Roux – en Y configuration of Jejunum.Another popular intervention is endoscopic stone retrieval by endoscopic spinchterotomy or balloon sphinchteroplasty followed by stone retrieval with fogarty balloon, dormia basket,mechanical or shock wave lithotripsy. Endoscopic papillary balloon dilation of the ampullary orifice was proposed for the removal of common bile duct stones and the possible prevention of theoretical and largely unproven long-term complications related to the destruction of the sphincter mechanism. Laparoscopic exploration of the CBD enables appropriate patients to undergo complete management of the calculous biliary tact disease with one invasive procedure. [13]This modality of treatment is ideal for patients with CBD stones identified during intra op cholangiography or in

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patients with suspected CBD stone managed at centers where laparoscopic CBD explorations are routinely performed.

II. METHODOLOGY

SOURCE OF DATA: Patients admitted under various surgical units from August 2017 to August 2019, at NRI General Hospital, Guntur . Only the cases of CBD stones are studied in detail according to the proforma given.. METHOD OF COLLECTION OF DATA This is a study of 86 patients who presented with CBD stones between August 2017 to August 2019 and subsequently underwent intervention. All these patients have been thoroughly assessed both preoperatively and postoperatively. Complications were documented. Photographic documentation has been done wherever possible. Where patients underwent surgical intervention, any tissue removed was subjected to histopathological examination.

III. OBSERVATIONS & RESULTS

Eighty six patients were involved in this clinical study in whom intervention with surgery or endoscopy or both was necessary to relieve the jaundice. AGE AND SEX DISTRIBUTION: The age varied from 20 years to 80 years. The age and sex based analysis is given below.

Table 1

AGE DISTRIBUTION	MALE	FEMALE
21-30	03	02
31-40	08	07
41-50	04	08
51-60	10	16
61-70	11	08
71-80	03	06

INCIDENCE OF PRESENTING SYMPTOMS Jaundice: It was present in 56 cases (65.1%). Pain abdomen: It was present in 34 cases (39.5%). Itching: Present in 10 (12.5%) cases. Dyspepsia/Nausea/Vomiting: Present in 12 (13.9%) cases. Bowel habits:Steatorrhoea was present in 01 (1.1%) cases. Incidental finding : on USG abdomen 16 (18.6%) cases. Fever :Present with fever in 10 (11.6%) cases.

SYMPTOMS	CASES	PERCENTAGE
JAUNDICE	56	65.1
PAIN ABDOMEN	34	39.5
INCIDENTAL FINDING ON USG	16	18.6
DYSPEPSIA/NAUSEA	12	13.9
ITCHING	10	11.6
FEVER	10	11.6
STEATORRHEA	01	1.1

Past history: Out of 86 cases 18 cases had pat history of biliary colic. 24were found to be hypertensive. 36 were found to be diabetic. Personal history: Out of 86 cases 15 males were found to be chronic alcoholics, 12 were chronic smokers. Family history: No relevant family history of jaundice, congenital disease, etc. could be obtained from any of these patients. General physical examination: 10 patients were found to be ill nourished. Scratch marks were seen in 10 cases. Per abdomen: Out of 86 cases tenderness at right hypochondriac region present in 20 cases. Gall bladder is not palpable in any of the cases.

INVESTIGATIONS: Hemoglobin varied between 6-13 gm%. Total count varied between 5000-14000. All the components in differential count were within normal limits. ESR was raised in 10 cases. Serum bilirubin was elevated in 76(88.3%) cases. The total bilirubin was between 2-16mg%, the direct portion being the predominant one. Serum albumin was between 2-4g/dl. Alkaline phosphatase was elevated in 76(88.3%) cases. It varied from upper limit of normal to about 5 times the upper limit. SGOT and SGPT were mildely raised in 70 (81.3%) cases.

Diagnosis of CBD stones based on clinical history, USG abdomen findings , and raised serum bilirubin, alkaline phosphatise (ALP) and transaminases (ALT,AST). In dealing with a case of CBD stones the surgeon should have good knowledge of the anatomy of biliary tree, physiology of bile metabolism and pathophysiological changes occuring in liver secondary to obstruction. Out of 86 patients 80 patients underwent ERCP and 6 underwent MRCP. Out of 80 patients who underwent ERCP 1) In 65

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patients stone retrieval was possible , after stone retrieval stenting was done. 2) In 15 patients stone retrieval could not be done , of these stenting was done to facilitate biliary drainage. Out of 15 patients 10 patients had large stone (> 15mm) and 5 had impacted stone. Complications encountered while doing ERCP are minor papillary bleeding in 2 cases and pancreatitis in 2 cases. Laparoscopic cholecystectomy was done in average period of 1 to 5 months after endoscopic stone retrieval in 56 patients. 33 Repeated ERCP was done in 2 patients .For 1 patient after a period of 1 month, and for other after 1year. Stent was removed during follow up period after laparoscopic cholecystectomy. Open CBD exploration was done in 20 cases and laparoscopic CBD exploration done in 1 case. Out of these 20 cases, ERCP was done for 15 cases and the remaining cases underwent MRCP. Indications for open CBD exploration: 1) Multiple duct stones with dilated ducts. 2) Large stones with dilated ducts. 3) Irretrievable intra hepatic stones. Only choledocholithotomy and T-tube placement done in 5 cases, in which ERCP was done for 3 cases and others cases underwent MRCP. In these 3 cases stent was removed and T tube placed. Indications in patients for ERCP were: • For 2 cases-multiple stones with dilated ducts. • For 1 case- large stone with dilated duct. Indications in patients, underwent MRCP were: • Multiple stones. Choledochoduodenostomydone in 12 cases in which 10 cases went through ERCP and 2 cases underwent MRCP. Diameter of CBD in all these cases varies from 15-22mm with average diameter 17mm. Indications in patients for whom ERCP was done were: • Multiple stones and dilated ducts for 7 cases. • Large stones and dilated ducts for 2 cases. • 1 case as it is elderly in age. 34 Indications in patients underwent MRCP were: • A known case of chronic pancreatitis . • An elderly patient. Choledochojejunostomy done in 2 cases for both of which ERCP was done. Indication: • Large impacted stone. Hepaticojejunostomydone in 1 case which underwent MRCP. Indication: • Stone at the level of hepatic duct. Laparoscopic choledocholithotomy done in 1 case and MRCP was done for this. MRCP shows choledocholithiasis with single stone of size 11mm at the level of supraduodenal part of the CBD. • Complications like minor papillary bleeding, pancreatitis , biliary peritonitis, bilioma, cholangitis were observed in our study.

IV. DISCUSSION:

According to AnketChhoda et al study and our study,gender related differences among males and females in the incidence of choledocholithiasis is 47.5:46.2 and 40:46 respectively. Dee-ho lee et al study was done in patients presenting with various symptoms in post laproscopiccholecystectomy cases while our study contrast to them, done in pre operative cases but presenting with similar complaints.According to Dee-ho lee et al study,patients presenting with abdominal pain and fever were more when compared to ours with figures 74.1% & 55.6% in the former while the latter has 39.5 &11.6% respectively. Patients presenting with jaundice according to our study almost tripled compared to their study. According to Doo-ho lee et all study no patients were complaining about nausea dyspepsia and vomiting.However 13.9% of people with regards to our study were presenting with similar complaints. Increase in serum bilirubin and aminotransferase levels according to Elsen GM et al study and our study is almost similar with percentage of 70 - 90% and 80- 90% respectively. While Laszlolakatos study shows slight lower levels, compared to other two with64-72% . Study conducted by Rabago LR et al and Bove A et al stone retrieval was possible in 88.2% and 92.3% of cases. However our study shows slight decline in retrieval rate with 81.25% only. Upadhyaya et al study USG was able to identify the level in 83.50% and cause in 77% cases in the study. Other studies have reported a variation of 27- 95% in detecting level and 18 – 85% in detecting the cause of obstruction. CT was able to detect both the level and the cause in 85.71% of the cases. Other studies have reported a variation of 80%-97% in detecting the level and 63%-94% in detecting the cause of obstruction.[14-17] In V Upadhyaya et al study MRCP was able to detect the level of obstruction in 95.45% and the cause in 87.50% cases. Other studies have also reported very good results with ability to detect the level ranging from 85% to 100%.[18-22]

In this study MRCP had the best results in detecting the level and cause of biliary obstruction. With its excellent diagnostic capabilities, it has certainly carved a niche for itself in the non-invasive evaluation of the patient with obstructive jaundice.

V. CONCLUSION:

In our study there was a steady rise inincidence of CBD stones beyond age of 50 yrs.As per our results, jaundice and pain were the most common symptoms. Elevated direct bilirubin was a positive predictor of biliary obstruction in 96.7% of the cases. Elevated Alkaline Phosphatase was a further confirmatory index of cholestasis. Bile duct surgery was accompanied by significant morbidity

and mortality. With recent advances in support to care, the numbers are decreasing which was evident even in this study. Complications like minor papillary bleeding, pancreatitis , biliary peritonitis, bilioma, cholangitis were observed in our study.Even in this era of laparoscopy, places where latest technology and expertise are not available, open procedures are still safe, feasible and single-stage option for management of biliary obstruction with good results in terms of morbidity and mortality. Early management of CBD stones whether by ERCP or open CBD exploration or Laparoscopic CBD exploration is essential for the better outcome .

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