



E-ISSN: 2616-3470  
P-ISSN: 2616-3462  
© Surgery Science  
www.surgeryscience.com  
2019; 3(2): 73-76  
Received: 14-02-2019  
Accepted: 18-03-2019

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## Clinical profile of patients with common bile duct stones attending tertiary care hospital

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**DOI:** <https://doi.org/10.33545/surgery.2019.v3.i2b.16>

### Abstract

The management of patients with known bile duct stones as well as gallbladder stones will vary between countries and between institutions. Factors that influence decision making processes within institutions include the availability of experienced surgeons and endoscopists, costs of hospitalization, costs of endoscopic and laparoscopic equipment, and patient preference. Patients were subjected for the different procedures namely ERCP, open or laparoscopic CBD exploration, or combination of one or more above mentioned procedures, depending upon the need and or the indications. In this study ultrasound abdomen detected the presence of common bile duct (CBD) stones in 55 of 60 patients, accounting for 91.6%. Size of the stone was mentioned 55 patients, whereas in 5 patients no mention was made regarding the size. Out of 55 patients 17 patients had single stone in the CBD whereas 38 patients were found to have multiple calculi. CBD dilatation was found in 53 patients, out of which no mention was made about the size of duct in 3 patients, 16 patients were found to have duct dilatation of less than 10mm and rest 34 patients showed duct dilatation of more than 10mm. In 06 patients no duct dilatation was found and in 1 patient USG findings were inconclusive.

**Keywords:** bile duct stones, gallbladder stones, ERCP

### Introduction

Symptomatic cholelithiasis is a common medical problem, which makes cholecystectomy one of the most frequently performed surgical procedures in the world. Choledocholithiasis complicates the workup and management of cholelithiasis, necessitates additional diagnostic and therapeutic procedures, and adds to the morbidity and mortality of gallstone disease. Common bile duct stones are the most important cause of obstructive jaundice and cholangitis. Approximately 11% of patients with gall bladder stones will have associated common bile duct stones at the time of operation. <sup>1</sup>Between 5 to 7% of common bile duct stones found at operation may be unsuspected by preoperative evaluation. Management of choledocholithiasis has been the subject of much debate over the past several years, especially with the advent of new laparoscopic techniques and greater experience with endoscopic procedures <sup>[2]</sup>.

The management of patients with known bile duct stones as well as gallbladder stones will vary between countries and between institutions. Factors that influence decision making processes within institutions include the availability of experienced surgeons and endoscopists, costs of hospitalization, costs of endoscopic and laparoscopic equipment, and patient preference. In many Western countries, patients expect laparoscopic surgery and the associated benefits such as reduced pain, a shorter duration of hospitalization, and a more rapid return to full activity. In contrast, open operations are likely to remain standard treatment in many developing countries as endoscopic services are limited and laparoscopic equipment is expensive <sup>[3, 4]</sup>.

Laparoscopic cholecystectomy and laparoscopic exploration of the bile duct appear to be the procedures of choice in institutions where surgeons have high success rates for extraction of bile duct stones<sup>3</sup>. In this setting, residual stones can be managed by endoscopic sphincterotomy and stone extraction. For surgeons with lower success rates for laparoscopic stone extraction (currently the majority), decisions in individual patients will be made on the basis of clinical and radiological findings. For example, preoperative endoscopic sphincterotomy and stone extraction will often be preferred in patients with jaundice, cholangitis, or large bile duct stones. Such patients may be at higher risk for complications such as biliary fistulae if there is failure of laparoscopic stone extraction <sup>[5]</sup>.

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For many surgeons in developing countries, standard therapy will be open operation with cholecystectomy and exploration of the bile duct. If surgery is difficult and residual stones seem likely, options include a choledocho-duodenostomy or operative sphincteroplasty at the time of surgery or post-operative endoscopic sphincterotomy with stone extraction.

Cholesterol stones arise exclusively in the gall bladder and are composed of cholesterol ranging from 100% pure (which is rare) down to around 50%. Pure cholesterol stones are pale yellow, round to ovoid, and have a finely granular, hard external surface, which on transection reveals a glistening radiating crystalline palisade. With increasing proportions of calcium carbonate, phosphate and bilirubin, the stones exhibit discoloration and may be lamellate and gray- white to black on transection. Stones composed largely of cholesterol are radiolucent. Sufficient calcium carbonate is found in 10 to 20% of cholesterol stones to render them radio-opaque [6].

**Methodology**

**Inclusion criteria**

All patients with the evidence of common bile duct stones undergoing

- ERCP
- Open CBD exploration
- Laparoscopic CBD exploration

**Exclusion criteria**

- Patients with CBD strictures.
- Patients with CBD stones with periampullary carcinoma post cholecystectomy statues.

The data was collected in a proforma approved by the guide. The diagnosis was made with relevant clinical history, physical examination, relevant investigations–Liver function tests, ultrasound–abdomen, endoscopic retrograde cholangiogram, CT-scan abdomen. All patients were worked up for the therapeutic procedures with all routine lab investigations, ECG, chest Xray and fitness for the procedure was taken from the physicians where ever necessary.

Patients were subjected for the different procedures namely ERCP, open or laparoscopic CBD exploration, or combination of one or more above mentioned procedures, depending upon the need and or the indications.

All patients were kept nil per oral for 6hours before the therapeutic procedures. All patients received single dose of antibiotics before the above mentioned procedures. ERCP was done under local anaesthesia (Xylocaine 4%) with sedation (Inj. Midazolam) where as General anaesthesia was employed for surgical intervention.

Patients subjected for endoscopic procedure underwent ERCP and extraction of stones with or without sphincterotomy. Stones were extracted using balloon or baskets. Stenting was done if required.

Patients subjected for surgical intervention underwent either open or laparoscopic CBD exploration .CBD closure was performed primarily with ante grade stenting or with T-tube .Some patients underwent Trans duodenal sphincterotomy/ plasty or choledocho-duodenostomy.

All patients were monitored closely for post ERCP and post-surgical complications. Patients were kept nil per oral for 4 hours following endoscopic procedure and for day or two for post-surgical procedures depending upon the patient’s condition. All patients received post-operative antibiotics and were continued for a longer period in patients having developed

complications. Analgesics and routine post-operative care was given for all patients.

All patients with T-tube in situ underwent T-tube cholangiogram between 10<sup>th</sup>-14<sup>th</sup> post op days. T-tube was removed after confirming the patency of the bile duct. Patients were observed for bile leak and necessary measure were taken depending upon the need. Patients with biliary stent in situ were advised stent removal 4 to 6 weeks after the procedure.

Patients were discharged when fit and were asked for regular follow up. Advice regarding the diet was given at the time of discharge. The age and sex distribution, clinical presentation, diagnostic modalities, different therapeutic modalities and associated complications- morbidity and mortality were all evaluated and compared with standard published literature.

**Results**

**Table 1:** Age and sex distribution

Age	Male	Female
21-40	07	10
41-60	14	14
61-80	06	09
Total	27	33

CC-0.094 P value-0.765

In this study of 60 cases 33 female patients and 27 male patients were diagnosed of having common bile duct stones. The maximum distribution was seen in the age group of 41 to 60, accounting for 46.7%.The youngest patient being 22 year old and the oldest being 75 years old. It was observed that the occurrence of CBD stones was more in females compared to males, ratio being 1.5 to 1.

**Table 2:** Symptoms

Symptoms	No. of Patients	Chi-Square	p- value
Pain	58	52.267	0.000
Jaundice	46	17.067	0.000
Fever	09	29.400	0.000
High Colored Urine	35	1.667	0.197
Clay Colored Stools	03	48.600	0.000
Loss Of Weight/Appetite	05	41.667	0.000
Pruritis	15	15.000	0.000
Vomiting	23	3.267	0.071

In the study of 60 patients, pain was the predominant symptom found in 58 patients accounting for 96.7 %, whereas 46 patients presented with jaundice accounting for 76.7%. 8 patients presented with classical Charcot’s triad of pain, jaundice, fever (15%). 9 patients presented with fever and loss of weight/ appetite being the least common symptom observed in 5(8.3%) patients. The other symptoms being history of passing high colored urine, clay colored stools and pruritis seen in 35(58%), 3(5%), 15(25%) respectively. 23(38.3%) patients presented with vomiting.

**Table 3:** Signs

Signs	No. of Patients	Chi-Square	p-value
Icterus	56	45.067	0.000
Temperature	10	26.667	0.000
Tenderness-Rt. Hypochondriac	55	41.667	0.000
Hepatomegaly	02	52.267	0.000

In this study Icterus and Tenderness (right hypochondriac

region) predominated, elicited in 55 out of 60 patients accounting for 91.7%. 2 patients had hepatomegaly (3.3%). Although 10 patients presented with fever, but elevated body temperature was recorded in 8 patients (16.7%).

In this study liver function tests were found elevated in all 60 patients, but special mention was made towards the alkaline phosphatase, as a marker for obstructive jaundice which was found elevated in 56 of 60 patients, accounting for 93.3%.

**Table 4:** Ultrasound abdomen findings

USG-Findings	No. of Patients
CBD stone absent	01
CBD stone present	55
Size of stone <10mm	29
Size of stone-10 to 20mm	20
Size of stone>10mm	06
Single stone	17
Multiple stones	38

In this study ultrasound abdomen detected the presence of common bile duct (CBD) stones in 55 of 60 patients, accounting for 91.6%. Size of the stone was mentioned 55 patients, whereas in 5 patients no mention was made regarding the size. Out of 55 patients 17 patients had single stone in the CBD whereas 38 patients were found to have multiple calculi. CBD dilatation was found in 53 patients, out of which no mention was made about the size of duct in 3 patients, 16 patients were found to have duct dilatation of less than 10mm and rest 34 patients showed duct dilatation of more than 10mm. In 06 patients no duct dilatation was found and in 1 patient USG findings were inconclusive.

**Table 5:** USG Findings

USG-Findings	No. of Patients
Duct dilatation	03
Duct dilatation<10mm	16
Duct dilatation>10mm	34
Inconclusive	01
No dilatation	06

## Discussion

In this study of 60 cases 33 female patients and 27 male patients were diagnosed of having common bile duct stones. The maximum distribution was seen in the age group of 41 to 60, accounting for 46.7%. It was observed that the occurrence of CBD stones was more in females compared to males, ratio being 1.5 to 1

In a series of 2455 patients of choledocholithiasis by Wani *et al* [7] the male to female sex ratio was 1:4.4 and maximum incidence was in the age group of 31–40 years.

Although the maximum occurrence of CBD stones in our study was between 41–60 years, a decade later as was observed in the study by Wani *et al* [7], but matched with the same study regarding the female preponderance.

The incidence of common bile duct stone ranges from 6 to 12%. The classical presentation of choledocholithiasis is a triad of jaundice, pain in abdomen and fever with or without chills as described by Charcot in 1877.

In the study of 60 patients, pain was the predominant symptom found in 58 patients accounting for 96.7 %, whereas 46 patients presented with jaundice accounting for 76.7%. 8 patients presented with classical Charcot's triad of pain, jaundice, fever (15%). 09 patients presented with fever (15%) and loss of

Weight/ appetite being the least common symptom observed in 5(8.3%) patients. The other symptoms being history of passing high colored urine, clay colored stools and pruritis seen in 35(58%), 3(5%), 15(25%) respectively. 23(38.3%) patients presented with vomiting.

In a series of 2455 patients of choledocholithiasis by Wani *et al* [7] the symptoms were pain in abdomen 94.90%, fever with rigors 13.44% and jaundice 43%.

According to Lahey Clinic study (1958) of choledocholithiasis, pain occurred in 95% of patients, fever in 50% of patients and jaundice in 43% of patients. The results of our study almost matches with the study in which pain was the predominant symptom accounting for 96.7%, fever in 15% less than the study. However jaundice was observed in 76.7% higher than that of Wani *et al* and Lahey clinic study.

Liver function tests may be entirely normal in patients with common bile duct stone (Lille Moe, 1995) [8]

In this study liver function tests were found elevated in all 60 patients, but special mention was made towards the alkaline phosphatase, as a marker for obstructive jaundice which was found elevated in 56 of 60 patients, accounting for 93.3%. The levels above 140IU/dl were taken as elevated.

Approximately 5% Of patients with normal serum liver enzymes will harbor common bile duct stone at time of cholecystectomy [9]

Lille Moe *et al* (1995) [30] found common bile duct stone in 33% patients when serum bilirubin was greater than 1.2 mg/dl.

Serum alkaline phosphatase is also a useful indicator and incidence of common bile duct stone is 46% when serum alkaline phosphatase is above 200 IU/L.

Today USG is the best noninvasive cheap and easily available investigation.

In this study Ultrasound abdomen detected the presence of common bile duct (CBD) stones in 55 of 60 patients, accounting for 91.6%.

In his series of 2455 patients, Wani *et al* [7] has performed USG in 73.72% patients of common bile duct calculi.

Sensitivity of USG in detecting common bile duct calculi can be increased between 80% to 100%, when endoscopic ultrasound is done [10].

Amouyal *et al* (1995) found endoscopic ultrasonography (EUS) to have sensitivity and specificity of 100% in common bile duct stone detection.

Overall USG is only 55 to 88% accurate in documenting the presence or absence of common bile duct stones

Overall sensitivity of detecting CBD stones in our study is 91.6% which is higher than the study of Tierny *et al*. The endoscopic ultrasonographic facilities are not available at our hospital hence no comments are made over its sensitivity.

CT scan abdomen was not routinely employed for the diagnosis of CBD stones in our study. Only in 3 patients CT scan abdomen was advised and in both cases CBD stones were detected.

## Conclusion

In this study of 60 cases the maximum age distribution of common bile duct stones was seen in the age group of 41 to 60. It was observed that the occurrence of CBD stones was more in females compared to males, ratio being 1.5 to 1.

Pain was the predominant symptom accounting for 96.7 % and jaundice in 76.7%. Patients presenting with classical Charcot's triad accounted for 15%. The other symptoms being history of passing high colored urine, clay colored stools and pruritis seen in 58%, 5%, 25% respectively.

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