# A clinical Study of Obstructive Jaundice Due to Biliary Calculi And Its Management

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## Abstract

**Introduction:** Jaundice can be classified into prehepatic, hepatic or post hepatic. Out of these, the post hepatic jaundice caused by obstruction to the outflow of bile, also known as obstructive or surgical jaundice is the most relevant to surgeons. Materials and methods: it is a prospective study done over 100 cases of obstructive jaundice. **Results**: Highest frequencies (33%) were observed in the age group of 31-40 years with male and female ratio 1: 3.7. Serum bilirubin level in calculous obstructive jaundice cases < 4(mg%) was observed in 60% of the cases. USG detected stone in 90 patients out of a total of 100(90%). Cholecystectomy with Choledocholithotomy and T-tube Drainage was done in 47% cases. Conclusion: For proper management clinical evaluation of obstructive jaundice due to biliary calculi in adults is essential.

***Keywords****: Pain abdomen; Cholecystectomy; Ultrasonography; Choledocholithotomy.*

## Introduction

The word jaundice or icterus is the yellowish staining of the skin, sclera and mucous membrane by deposition of a bile pigment named bilirubin in these tissues.[1]

Jaundice, caused by elevation of the serum bilirubin level, can be demonstrated in the sclera, the frenulum of the tongue, or the skin. Serum bilirubin levels above 2.5 mg/dl are necessary to detect scleral icterus routinely, and levels above 5 mg/dl will be manifested as cutaneous jaundice.[2]

Jaundice or cholestasis can be classified into prehepatic, hepatic or post hepatic. Out of these, the post hepatic jaundice caused by obstruction to the outflow of bile, also known as obstructive or surgical jaundice is the most relevant to surgeons. Obstructive jaundice is not a definitive diagnosis and early evaluation to establish the aetiology of the cholestasis is crucial to avoid secondary pathological changes (e.g. Secondary biliary cirrhosis) if the obstruction is not relieved.[3]

Obstructive jaundice occurs due to intra or extrahepatic obstruction to biliary outflow. It should be differentiated from intrahepatic cholestasis in hepatocytes or biliary canaliculi (non-obstructive) and the bile conduits within the liver (obstructive form). Both these forms of cholestasis have a similar pathophysiological basis and biochemical changes and it is crucial to differentiate these two, as the extrahepatic cholestasis is potentially amenable to surgical correction.

The present work is an attempt to study and evaluate the clinical aspect of obstructive jaundice due to biliary calculi in adults with special reference to its management in the light of the review of pieces of literature, as obstructive jaundice due to CBD stone is quite common in our region.

## Materials and Methods

This prospective study was carried out in the department of general surgery, Guwahati Medical College and Hospital, Guwahati from 1st July 2016 to

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30th June 2017. Out of all surgical admissions, 100 cases of obstructive jaundice with USG proved calculi in CBD or suspected of calculi of different age group were selected randomly.

A detailed history and clinical examination were done and appropriate investigations recorded. Patients were assessed pre-operatively and later subjected to surgery or endoscopic procedure depending on the need. Post-operatively patient condition was assessed and complications were documented. Patients were followed up for a mean period of three months where patients underwent surgical or endoscopic intervention.

## Results

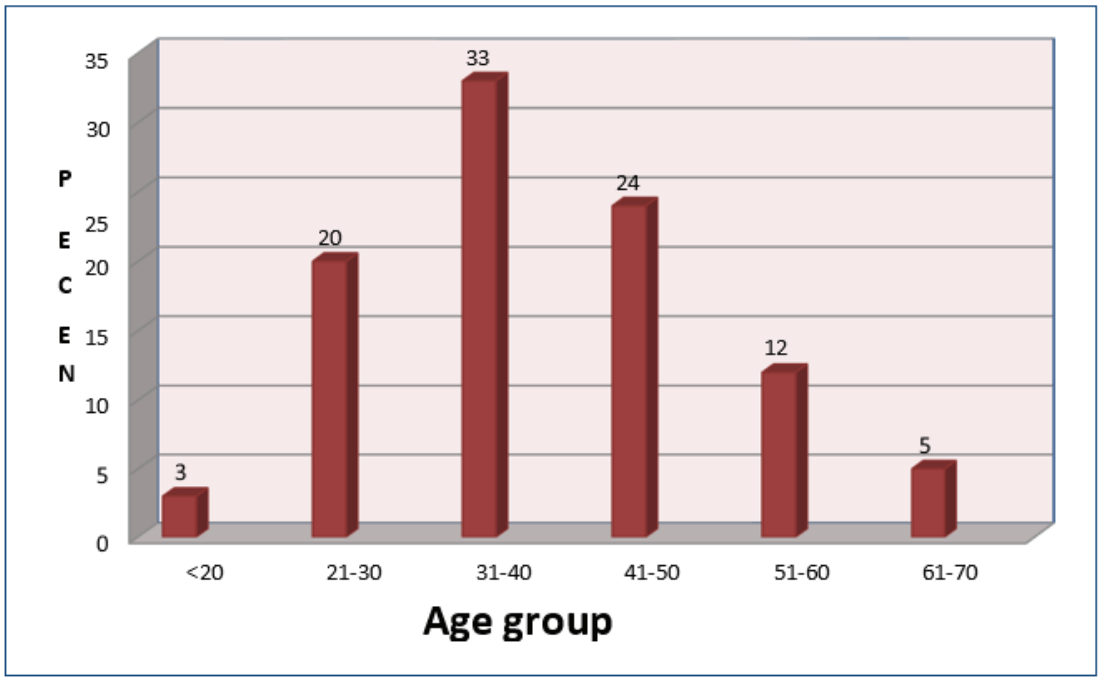


**Fig. 1 Age incidence of obstructive jaundice due to choledocholithiasis**

**Table 1** reflects the sex-wise distribution of obstructive jaundice cases due to choledocholithiasis. The male and female ratio was 1:3.7.

**Table 1 Sex incidence of obstructive jaundice due to choledocholithiasis**

| Sex | Number of cases | Percentage (%) | Ratio (male: female) |
|---|---|---|---|
| Male | 24 | 24.00 | 1: 3.7 |
| Female | 76 | 76.00 | |
| Total | 100 | 100.00 | |

The presence of biliary colic associated with intermittent abdominal pain, fever with chills and rigour and intermittent jaundice (**Charcot's Triad**), was found in 22 cases out of 100 patients (22%) of calculous obstructive jaundice in the present study.

The clinical features of obstructive jaundice due to choledocholithiasis were narrated in **Fog. 2**.

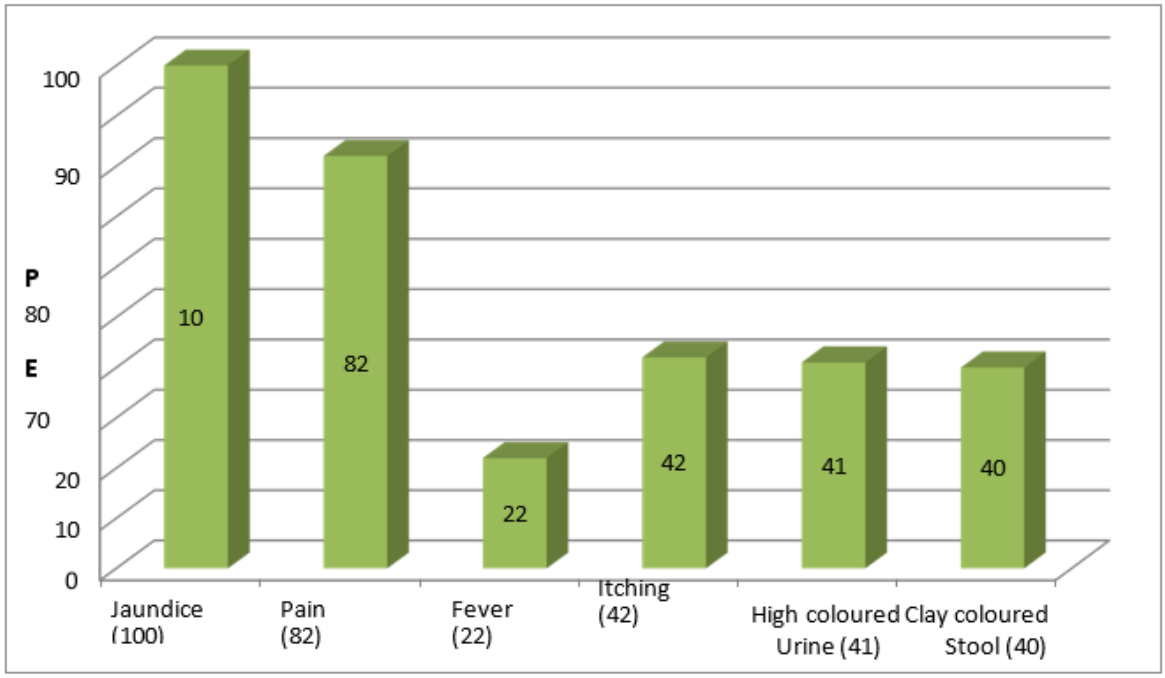


**Fig. 2 Clinical features of obstructive jaundice due to choledocholithiasis**

**Table 2** Shows serum bilirubin level in calculous obstructive jaundice cases. Its level < 4(mg%) was observed in 60% of the cases.

**Table 2 Serum bilirubin level in calculous obstructive jaundice cases**

| Serum bilirubin level | No of cases | Percentage (%) |
|---|---|---|
| < 4(mg%) | 60 | 60 |
| 4 -10(mg%) | 29 | 29 |
| >10(mg%) | 11 | 11 |

In the present study 63 out of 100 patients (63%) showed a high value of serum alkaline phosphatase. Serum gamma-glutamyltransferase (GGT) level was higher in 96% of cases. A total of 22 patients showed raised total leukocyte count (TLC) along with other features of cholangitis. However, the serum albumin level was within the normal range in 94 patients with a mean value of 3.94 gm%.

USG detected stone in 90 patients out of a total of 100(90%). In 4% of patients, USG showed GB stone with CBD normal in diameter without any stone and rest 6% patients showed GB stone with dilatation of CBD without visible calculi in CBD as shown in **Table 3**.

**Table 3 Findings of Ultrasonography of the cases**

| USG finding | No of Patients | Percentage (%) |
|---|---|---|
| GB stone or sludge +CBD stone | 40 | 40 |
| Only CBD stone | 40 | 40 |
| GB stone or sludge+Normal CBD | 4 | 4 |
| GB stone or sludge + Dilated CBD | 6 | 6 |
| Postcholecystectomy status, Residual Stone in CBD | 10 | 10 |
| Total | 100 | 100 |

The different procedures adopted in the present study for calculous obstructive jaundice is shown in **Table 4**.

**Table 4 Procedures employed in this present study of calculous obstructive jaundice**

| Diagnosis | Procedure undertook | No of cases | Percentage (%) |
|---|---|---|---|
| Cholelithiasis with Choledocholithiasis or only choledocholithiasis/Retained stone | ERCP followed by Lap cholecystectomy/ERCP | 34 | 34 |
| Cholelithiasis with Choledocholithiasis / choledoch olithiasis | Cholecystectomy with Choledocholithotomy and T-tube Drainage | 47 | 47 |
| Cholelithiasis with choledocholithiasis (CBD >1.5 cm) | Cholecystectomy with choledocholithotomy & Choledochoduodenostomy | 12 | 12 |
| Cholelithiasis with choledocholithiasis (CBD > 1.5 cm) | Cholecystectomy with choledocholithotomy & Chole dochojejunostomy | 2 | 2 |
| Cholelithiasis with Impacted stone in CHD, LHD | Cholecystectomy with Hepaticojejunostomy | 1 | 1 |
| Choledocholithiasis (single calculus, normal CBD diameter) | Cholecystectomy, CBD Exploration and Primary Closure | 4 | 4 |
| **Total** | **-** | **100** | **100** |

## Discussion

In the present study, the youngest patient was 18 years of age and the eldest was 72 years, with the mean age being 38.78 years which is contrary to Way et al.,[4] who in their study observed that the incidence of common bile duct stones causing obstructive jaundice was highest amongst the age of 61-70 years of age. Baker et al.,[5] in their study found the age for calculus obstruction to be in the range of 51-60 years of age. In the same study, the male to female ratio of 1:3.8 was revealed supporting the present results. Women are three times more likely to develop gallstones than men as reported by Nakeeb et al.[6]

Rubin et al.,[7] in their series of 60 patients of choledocholithiasis found this triad in 26.6% of cases and Leung JW et al.,[8] in 21% of patients are in support with the current study.

Various authors reported incidence of different clinical features of obstructive jaundice due to biliary calculi consistent with the current study are given in **Table 5**.

**Table 5 Clinical features of obstructive jaundice as reported by different authors**

| Clinical features | Prabhakar A et al.9 | Agarwal et al.10 | Anand et al.11 | Phillipo Chalya et al.12 | Nageeruddin Shaik et at.13 | Present study |
|---|---|---|---|---|---|---|
| Jaundice | 60 | 100 | 53.6% | 58.6 | 100 | 100 |
| Pain abdomen | 100 | 79.1 | 71.4 | 17.2 | 95 | 85 |
| Itching | 50 | 50 | 39.28 | 43.1 | 35 | 42 |
| Fever | 14 | 12.5 | 10.71 | - | 25 | 22 |
| Nausea/Vomiting/ dyspepsia | 70 | 70.9 | 35.71 | - | 50 | 37 |
| Loss of appetite/ weight | 50 | - | 32.14 | 56.9 | 30 | 50 |
| High coloured urine | 60 | - | 39.28 | - | - | |
| Clay-coloured stools | 40 | 41 | 32.14 | - | 10 | 42 |

Total serum bilirubin was higher to 5.68+0.473 mg/dl (Mean+SD) in the current study is in support of Elzeiny Mmet et al.,[14] and Kumar PN et al.[15] The mean conjugated serum bilirubin level in the present study was 4.16+0.471 mg/dl agree Prabhakar A et al.,[9] and Elzeiny Mmet et al.[14]

Western authors Mullen et al., and Lygidakis[16] found high values of serum alkaline phosphatase (ALKP) in 53% and 36% of patients with cholelithiasis which is almost similar to our study. The study of Prabhakar S et al.,[17] and Elzeiny Mmet et al.,[14] support the current findings of ALKP level, i.e., 292.86+12.358 IU/L.

The high level of (mean) Gamma Glutamyl Transferase (GGT), i.e., 233 of the present study agree Peng WK et al.,[18] and Anciaux ML et al.[19] Also, the mean serum albumin level of 3.94 gm% of the present study is in support of Anand S et al.,[11] and Kumar PN et al.[15]

In our study, USG of abdomen detected biliary calculi in 90 out of 100 patients screened and thus showed a sensitivity of 90%. Stones were also found during interventions in these 90 patients. Thus showing the specificity of 100%, which is similar to the studies of Caddy GR et al.,[20] M Sugiyama et al.,[21] and Blumgart.[22]

Since the introduction of laparoscopic cholecystectomy and endoscopy, preoperative ERCP has become the standard approach for patients with suspected CBD stones.[23] In all patients who were considered fit for ERCP were counselled for ERCP first. But in 40 patients only, ERCP could be done due to lack of patient's compliances.

In 47 cases where moderately dilation of common bile duct with multiple stone or sludge or fragmented stone, choledocholithotomy along with T-tube drainage was done. The rubber T-tube was secured in place by 3-0 chromic catgut and kept in place for 8-12 days. In one study by Anand S et al.,[11] 41% of patients were treated with T-tube while this procedure was performed in 33% patients in a study by Kumar PN et al.[15] In the present series of study, this procedure was performed in 47% of patients, showing the value is close to the other studies.

In the remaining 12 cases where multiple stones or biliary sludge was found, along with hugely dilated (>1.5 cm) common bile duct, Choledochoduodenostomy after removal of the stone was done. A wide enough (at least 2.5cm) anastomosis between the common bile duct and duodenum was done, so that free entrance and progress of bile were possible and any stasis or stone formation was avoided. Maingots found that the size of stoma of more than 2 cm is essential for the success of the operation.

In two patients Choledochojejunostomy was done as it was difficult to mobilize the duodenum. In one patient with impacted stone in CHD and Left Hepatic duct Hepaticojejunostomy done.

Drainage of the sub-hepatic area was done in all the cases with Abdominal safe tube drain brought out through a stab wound on the right flank. The drain was removed after 2-3 days after ensuring that the drain output was almost negligible.

All the patients were followed up for the first time after one week, thereafter two weekly for three months. No complication developed during the follow-up period. In four patients post ERCP complications developed, which were treated conservatively and discharged and lap cholecystectomy was done after six weeks. In those patients ERCP stents were placed, the stents were removed along with one removal after 6 weeks by the endoscopic method. Those patients came during the last quarter of the study period they could not be followed up completely.

The percentage of surgical site infection reported by Lygidakis[16] was 8.9%. In the present series, seven patients out of 66 cases operated developed surgical site infection postoperatively (10.6%). One (1.51%) patient developed bile leakage after removal of T-tube which is comparable with other studies. Bile leak was found in 1.51% of cases in the present study which was similar to the study of Gharaibeh KI et al.,[24] Wills VL et al.,[25] and Maghsoudi H et al.[26]

One study by TCK Tham et al.,[27] found post ERCP complications as pancreatitis occurred in nine of 208 patients(4.5%), haemorrhage in two(1%), and fever in one (0.5%).[27] According to Blumgart, acute pancreatitis, 1.5% to 5.4%; cholangitis, 1% to 2.7%.[28] In the present study, acute pancreatitis was in 5% and cholangitis was in 5% of patients, which is very close to the above studies.

The study shows that statistically there is no significant difference between endoscopic treatment and open surgical treatment of obstructive jaundice due to choledocholithiasis (p-value 0.8328).

## Conclusion

The common presentation of surgical jaundice is jaundice and the common cause of surgical jaundice is CBD calculi. USG remains the cheapest, safest and most reliable diagnostic tool in the management of surgical jaundice. Endoscopic treatment and open surgical

treatment both are equally good treatment modality in the management of obstructive jaundice.

**Ethical Clearance**: Taken.

**Conflict of Interest**: None.

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