

Prospective Study on the Etiological Spectrum and Diagnostic Evaluation of Obstructive Jaundice in a Tertiary Care Hospital

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ABSTRACT

Background: Obstructive jaundice results from impaired bile flow due to benign or malignant conditions. Prompt differentiation of the underlying etiology is essential to plan definitive treatment and reduce associated morbidity and mortality.

Methods: A prospective observational study was conducted in the Department of General Surgery at Pt. J.N.M. Medical College & Dr. B.R.A.M. Hospital, Raipur. A total of 50 patients diagnosed clinically and radiologically with obstructive jaundice were enrolled over a period of one year. Clinical history, physical examination, liver function tests, ultrasonography, contrast-enhanced CT, and MRCP were performed. Surgical findings and histopathological reports were used to confirm diagnosis wherever applicable.

Results: The most common presenting complaint was yellowish discoloration of the sclera (100%), followed by dark-colored urine (90%) and pruritus (70%). The age group most affected was 51–70 years, and males slightly outnumbered females (56% vs 44%). Malignancy was the most common cause of obstruction (60%), with periampullary carcinoma (40%) being the predominant malignant etiology, followed by carcinoma head of the pancreas (30%). Benign causes accounted for 40%, predominantly choledocholithiasis (70% of benign). Ultrasonography revealed CBD dilatation in 80% and detected stones in 30% of patients. Histopathological examination confirmed clinical diagnosis in 90% of surgical cases.

Conclusion: Malignant causes of obstructive jaundice are more frequent in older adults and often present at an advanced stage. Clinical evaluation supported by imaging can help identify the underlying cause, but histopathology remains the gold standard. Early diagnosis is vital for appropriate therapeutic intervention.

Key-words: Obstructive jaundice, Malignant, Benign, Histopathology, Ultrasonography

INTRODUCTION

Obstructive jaundice is a clinical condition resulting from mechanical blockage of bile flow from the liver to the duodenum. This leads to the accumulation of conjugated bilirubin in the bloodstream, manifesting as yellowish discoloration of the skin and sclera ^[1]. The obstruction may occur at any level of the biliary system and can cause by either intrahepatic or extrahepatic pathology ^[2]. Patients typically present with classical symptoms such as jaundice, pruritus, dark-colored urine, pale stools, and

right upper abdominal pain ^[3]. In advanced stages or delayed presentation, features of cholangitis, malabsorption, or hepatic dysfunction may also be observed. However, there is considerable overlap in presentation between benign and malignant causes, making diagnosis challenging ^[4].

Benign causes include choledocholithiasis, biliary strictures, and chronic pancreatitis, with choledocholithiasis being the most frequently encountered ^[5]. Malignant etiologies include periampullary carcinoma, carcinoma of the head of the pancreas, cholangiocarcinoma, and carcinoma of the gallbladder. These are commonly seen in older individuals and often present late due to nonspecific early symptoms ^[6].

Liver function tests typically reveal raised levels of total and direct bilirubin, alkaline phosphatase, and

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transaminases, especially in malignant cases [7]. Ultrasonography (USG) remains the first-line imaging modality due to its non-invasive nature, availability, and cost-effectiveness. In inconclusive cases, contrast-enhanced computed tomography (CECT) and magnetic resonance cholangiopancreatography (MRCP) provide superior anatomical detail [8]. Despite these advances, histopathological examination remains the gold standard for confirming malignancy and guiding treatment [9].

This study was undertaken to evaluate the clinicopathological spectrum of obstructive jaundice in patients presenting to a tertiary care center, to identify common etiologies and correlate clinical, biochemical, radiological, and pathological findings.

MATERIALS AND METHODS

Study Design and Setting- This prospective observational study was conducted in the Department of General Surgery at Pt. J.N.M. Medical College & Dr. B.R.A.M. Hospital, Raipur, for over one year. A total of 50 patients diagnosed with obstructive jaundice were enrolled after obtaining informed consent.

Inclusion Criteria

- ✓ Patients aged above 18 years
- ✓ Both male and female patients
- ✓ Clinical and radiological features suggestive of obstructive jaundice

Exclusion Criteria

- ✓ Patients diagnosed with hemolytic jaundice
- ✓ Patients with incomplete clinical or investigative data
- ✓ Patients unwilling to provide informed consent

Methodology

Detailed clinical history and physical examination were performed for all patients. Laboratory investigations included liver function tests (total and direct bilirubin, ALP, AST, ALT), renal parameters, and complete blood counts. All patients underwent ultrasonography (USG) as the initial imaging modality. Contrast-enhanced computed tomography (CECT) and magnetic resonance cholangiopancreatography (MRCP) were selectively performed based on clinical judgment and USG findings. Surgical intervention was performed where indicated. Operative findings and histopathological examination of biopsy or resected specimens were used to confirm diagnosis, especially in malignant cases. Patients who

were managed conservatively were followed up with biochemical and imaging correlation.

Statistical Analysis- Data were compiled using Microsoft Excel. Descriptive statistics were used. Continuous variables were expressed as mean±standard deviation and categorical variables as percentages. Comparisons between benign and malignant groups were made using appropriate statistical tests [3].

RESULTS

A total of 50 patients with obstructive jaundice were included in this study. The age of the patients ranged from 25 to 75 years, with the highest number of patients (40%) in the 51–60 years age group (Table 1). Males comprised 56% (n=28) and females 44% (n=22), with a male-to-female ratio of 1.27:1 (Table 2).

Table 1: Age Distribution of Patients with Obstructive Jaundice

Age distribution	Number of patients
14-20	0
21-30	0
31-40	1
41-50	3
51-60	12
61-70	16
>70	4

Table 2: Age and Gender Distribution of Study Participants

Age Group (Years)	Male (n, %)	Female (n, %)	Total (n, %)
14–20	0 (0%)	0 (0%)	0 (0%)
21–30	0 (0%)	0 (0%)	0 (0%)
31–40	1 (2%)	0 (0%)	1 (2%)
41–50	2 (4%)	3 (6%)	5 (10%)
51–60	11 (22%)	7 (14%)	18 (36%)
61–70	12 (24%)	9 (18%)	21 (42%)
>70	2 (4%)	3 (6%)	5 (10%)
Total	28 (56%)	22 (44%)	50 (100%)

The chart depicts the prevalence of symptoms including jaundice (100%), dark-colored urine (90%), pruritus (70%), and abdominal pain (60%) among the study cohort (Fig. 1).

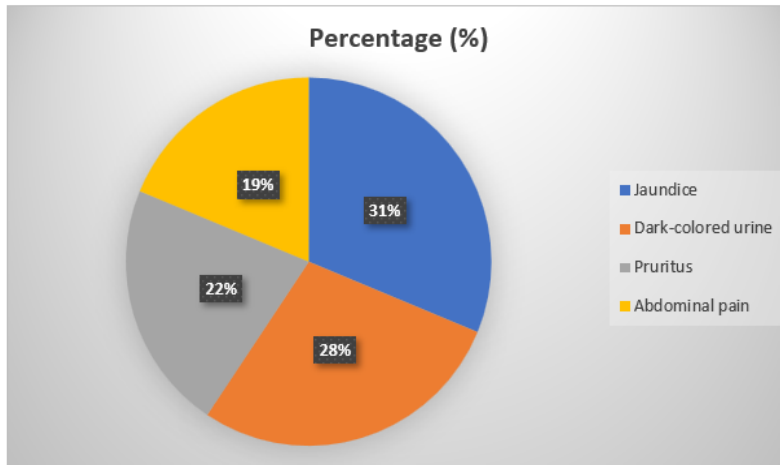


Fig. 1: Clinical Presentation of Patients with Obstructive Jaundice

Table 3 shows the clinical presentation of patients with obstructive jaundice. All patients (100%) had yellowish discoloration of the sclera and skin. Dark-colored urine, pruritus, and abdominal pain were also common. Additionally, 77.8% of patients reported the presence of pain and absence in 22.2% of cases.

Table 3: Clinical Presentation and Symptoms of Patients

Symptom	Number of Cases	Percentage (%)
Yellowish discoloration (Jaundice)	36 (100%)	100
Dark-colored urine	32	90
Pruritus	25	70
Abdominal pain	22	60
Pain Present	28	77.8
Pain Absent	8	22.2

Biochemical analysis showed elevated total bilirubin (mean±SD: 15.4±6.8 mg/dL) and alkaline phosphatase (mean±SD: 450±150 IU/L) levels (Table 4).

Table 4: Biochemical Parameters (Total Bilirubin, ALP, etc.)

Parameter	Mean±SD	Range
Total Bilirubin (mg/dL)	15.4±6.8	5.8–30
Direct Bilirubin (mg/dL)	9.2±4.5	2.5–20
Alkaline Phosphatase (IU/L)	450±150	200–800
Alanine Aminotransferase (IU/L)	85±40	30–180
Aspartate Aminotransferase (IU/L)	70±35	25–160

Ultrasonography revealed common bile duct dilatation in 80% of patients, and stones were detected in 30% (Table 5). Contrast-enhanced computed tomography (CECT) and magnetic resonance cholangiopancreatography (MRCP) were performed in selected cases, identifying masses and strictures.

Table 5: Ultrasonography and Imaging Findings

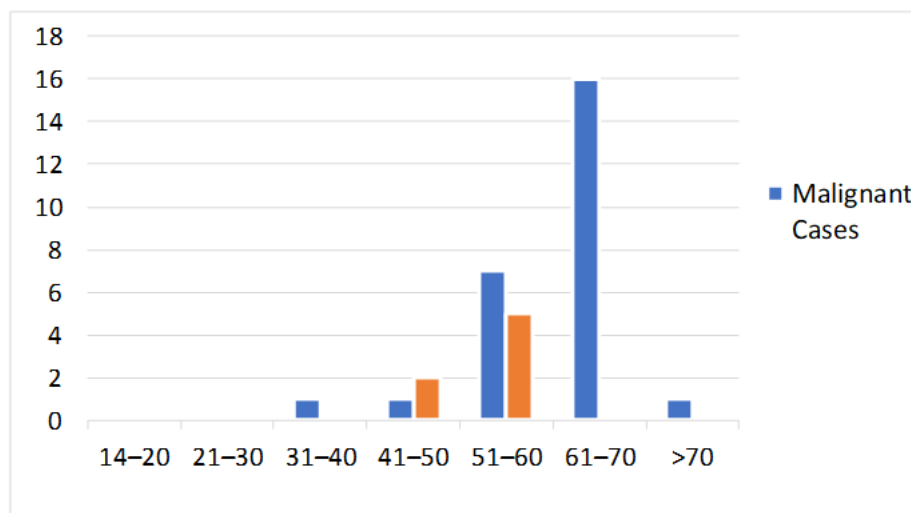
Finding	Number of Patients	Percentage (%)
Common Bile Duct (CBD) Dilatation	40	80
Presence of CBD Stones	15	30
Gallbladder Wall Thickening	10	20
Periampullary Mass on Imaging	12	24
Biliary Stricture	8	16
Pancreatic Mass	9	18

Malignant causes were responsible for 60% (n=30) of cases; periampullary carcinoma was the most frequent malignant pathology (40%), followed by carcinoma head of the pancreas (30%) (Table 6, Fig.

2). Benign causes constituted 40% (n=20), with choledocholithiasis accounting for 70% of these cases.

Table 6: Etiological Classification of Obstructive Jaundice (Benign vs Malignant)

Etiology	Number of Cases	Percentage (%)
Malignant	30	60
- Periampullary carcinoma	12	40 (of malignant)
- Carcinoma head of pancreas	9	30 (of malignant)
Benign	20	40
- Choledocholithiasis	14	70 (of benign)
- Other benign causes	6	30 (of benign)

**Fig. 2:** Chart Showing Benign vs Malignant Causes

Histopathological examination confirmed the diagnosis in all operated patients, with a concordance rate of 90% between clinical/radiological and pathological diagnoses.

DISCUSSION

Obstructive jaundice remains a significant diagnostic and therapeutic challenge due to its varied etiologies, overlapping clinical presentations, and the need for prompt differentiation between benign and malignant causes. In the present study conducted on 50 patients, a predominance of malignant causes (60%) over benign (40%) was observed, which aligns with findings from earlier Indian studies, particularly in tertiary care settings where advanced disease is often encountered at presentation^[10].

The mean age of patients was between 51–70 years, with the 61–70-year group showing the highest incidence of malignant etiologies. This supports previous literature suggesting that malignant obstructive jaundice is more prevalent in older individuals, possibly due to late detection or progression of underlying carcinomas^[11,12].

Clinically, all patients in our study presented with jaundice, while 90% had dark urine and 70% reported pruritus—classical features consistent with cholestatic patterns of obstruction. These findings were in concordance with the observations by Verma *et al.*^[13] and Meyer and Rothenbacher^[14], who reported similar symptom prevalence in obstructive jaundice cases.

Benign etiologies were dominated by choledocholithiasis (70% of benign cases), particularly affecting middle-aged females. This pattern matches with known demographic distributions of gallstone disease and is comparable to findings reported in earlier studies by Sharma and Kumar^[15] and Rastogi *et al.*^[11].

Among the malignant cases, periampullary carcinoma (40%) and carcinoma of the head of the pancreas (30%) were the most frequent. Carcinoma gallbladder also contributed significantly to the malignant spectrum and was notably higher in female patients, as also observed in studies by Koenigsberg and Lukes^[16].

Biochemical evaluation revealed significantly elevated total bilirubin and ALP levels in malignant cases, underlining the importance of these markers in initial suspicion and stratification. Similar trends have been emphasized by Bandey and Singh in their comparative studies on obstructive jaundice biochemistry^[12].

Imaging findings showed that ultrasonography (USG) detected CBD dilatation in 80% of cases and gallstones in 30%, which makes it a valuable first-line investigation. However, it showed limitations in identifying the exact

site or cause of malignant obstructions. CT and MRCP were superior in delineating mass lesions and assessing operability, echoing conclusions drawn by Kehlet and Wilmore regarding multimodal imaging in biliary pathology^[10].

Histopathological correlation showed 90% concordance with clinical and radiological findings, reaffirming its role as the definitive tool in diagnostic confirmation and therapeutic decision-making. This is supported by El-Radaideh *et al.*, who also emphasized the high reliability of histopathology in biliary malignancies^[17].

Notably, percutaneous transhepatic biliary drainage (PTBD) was the only feasible intervention in 77.8% of malignant cases in our cohort, reflecting the advanced stage at which many patients presented and their inoperability. This highlights the pressing need for public awareness and early screening programs for biliary tract malignancies^[11,18].

LIMITATIONS

The limitations of our study include a relatively small sample size and a lack of long-term outcome data, particularly regarding survival or post-treatment quality of life. Nonetheless, the data provides strong insight into the diagnostic algorithm and pathology trends of obstructive jaundice in the Indian population.

CONCLUSIONS

Obstructive jaundice remains a major surgical problem with malignancy as the predominant cause in older patients. Early and accurate diagnosis through a combination of clinical evaluation, biochemical tests, imaging modalities, and histopathology is vital for optimal patient management. This study emphasizes the importance of early differentiation between benign and malignant causes to guide appropriate treatment strategies and improve patient outcomes.

CONTRIBUTION OF AUTHORS

One author has only contributed to this article.

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