

# Clinical Spectrum of Presentation of Obstructive Jaundice in Inflammation, Stone Disease, and Malignancy

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## Abstract

**Introduction:** The initial evaluation of obstructive jaundice involves distinguishing intrahepatic and extrahepatic biliary obstruction. Clinical data such as history, physical examination, and laboratory tests have been shown to accurately identify up to 90% of patients whose jaundice is caused by extrahepatic obstruction.

**Aim:** The aim of the study is etiological spectrum, treatment outcome of obstructive jaundice.

**Materials and Methods:** This prospective observational study was conducted in the Department of General Surgery, Tirunelveli Medical College Hospital. Patients of any age or sex admitted with complaints of jaundice, clinically and biochemically diagnosed to have obstructive jaundice were included in the study.

**Results:** Choledocholithiasis accounts for about 22% of the overall etiology of obstructive jaundice and about 73.3% of the benign causes. Periampullary carcinoma appears to be the most common cause accounting for 34% of malignancies. Mortality due to the disease is 3% morbidities are 6% in overall population included in the study. Most of them who had malignant cachexia also had ascites.

**Conclusion:** The most common benign etiology was choledocholithiasis. Ultrasonography of the abdomen is very accurate in diagnosing the presence of obstruction to the biliary tree, easily available, and cost-effective but operator dependant. Computed tomography abdomen is reliable in confirming the diagnosis and determining the level of obstruction.

**Key words:** Cholestasis, Gallstones, Klatskin tumor, Obstructive jaundice

## INTRODUCTION

Disorders of the biliary tract affect a significant portion of the worldwide population, and the overwhelming majority of cases are attributable to cholelithiasis (gallstones). In the United States, 20% of persons older than 65 years have gallstones, and 1 million newly diagnosed cases of gallstones are reported each year.<sup>1</sup> Biliary obstruction refers to the blockage of any duct that carries bile from

the liver to the gallbladder or from the gallbladder to the small intestine. This can occur at various levels within the biliary system. The major signs and symptoms of biliary obstruction result directly from the failure of bile to reach its proper destination.<sup>2</sup> The clinical setting of cholestasis or failure of biliary flow may be due to biliary obstruction by mechanical means or by metabolic factors in the hepatic cells. For the sake of simplicity, the primary focus of this article is mechanical causes of biliary obstruction, further separating them into intrahepatic and extrahepatic causes. Stone disease is the most common cause of obstructive jaundice.<sup>3</sup> Gallstones may pass through the common bile duct (CBD) and cause obstruction and symptoms of biliary colic and cholecystitis. Larger stones can become lodged in the CBD and cause complete obstruction, with increased intraductal pressure throughout the biliary tree. Mirizzi syndrome is the presence of a stone

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impacted in the cystic duct or the gallbladder neck, causing inflammation, and external compression of the common hepatic duct and thus, biliary obstruction. Of biliary strictures, 95% are due to surgical trauma and 5% are due to external injury to the abdomen or pancreatitis or erosion of the duct by a gallstone. Stone disease is the most common cause of biliary strictures in patients who have not undergone an operation.<sup>4</sup> A tear in the duct causes bile leakage and predisposes the patient to a localized infection. In turn, this accentuates scar formation and the ultimate development of a fibrous stricture. Primary pancreatobiliary tract cancers and other local cancers that can cause compression of the biliary tract (e.g, liver, gallbladder) account for approximately 80,000 new cancer cases and an estimated 58,000 deaths in the United States.<sup>5</sup> Despite advances in diagnosis and treatment, the 5-year survival rate of the most commonly encountered malignancies, pancreatic cancer, and cholangiocarcinoma, remains dismal at <5%.<sup>6</sup> Malignant biliary tract obstruction can also arise from gallbladder, duodenal, and ampullary cancers; metastatic cancers; or malignant lymphadenopathy.<sup>7</sup>

**Aim**

The aim of the study is etiological spectrum, treatment outcome of obstructive jaundice.

**MATERIALS AND METHODS**

This prospective observational study was conducted in the Department of General Surgery, Tirunelveli Medical College Hospital. Institutional review board approval and informed consent from patients were obtained. Patients of any age or sex admitted with complaints of jaundice and clinically and biochemically diagnosed to have obstructive jaundice were included in the study.

**RESULTS**

The study comprised 50 patients with obstructive jaundice. The most common age group affected with obstructive jaundice in my study is 50-60 years. There is a male preponderance with about 56% of the affected patients being male (Table 1). Among 50 cases studied, 15 cases had a benign etiology and 35 cases had a malignant etiology accounting for 70%. This shows the high morbidity and mortality of the disease (Table 2).

The most common complaint was yellowish discoloration of skin and sclera accounting for 54%. Some patients had two chief complaints in combination such as abdominal pain and vomiting in malignancies (Table 3).

Cholelithiasis accounts for about 22% of the overall etiology of obstructive jaundice and about 73.3% of the benign causes (Table 4).

Periampullary carcinoma appears to be the most common cause accounting for 34% of malignancies (Table 5).

All the cases showed dilatation of intrahepatic biliaryradicles. About 64% of cases had CBD dilatation in ultrasonography (USG). Both itrevealed intrahepatic biliary radical (IHBR) and CBD dilatation was present in 24 cases in USG (Table 6).

**Table 1: Distribution of age group**

Age group	Number of patients (%)
<30	2 (4)
31-40	6 (12)
41-50	12 (24)
51-60	19 (38)
61-70	8 (16)
>71	3 (6)

**Table 2: Distribution of etiology of patients**

Etiology	Number of patients (%)
Benign	15 (30)
Malignant	35 (70)

**Table 3: Distribution of symptoms**

Symptoms	Number of patients (%)
Jaundice	27 (54)
Abdominal pain	20 (40)
Vomiting	19 (38)
Abdominal distension	3 (6)
Itching	2 (4)
Loss of appetite	1 (2)

**Table 4: Distribution of benign etiology**

Benign etiology	Number of patients (%)
Cholelithiasis	11 (22)
CBD stricture	3 (6)
Choledochal cyst	1 (2)

CBD: Common bile duct

**Table 5: Distribution of malignant etiology**

Malignant etiology	Number of patients (%)
Periampullary carcinoma	12 (24)
Carcinoma head of pancreas	7 (14)
Liver secondaries with portal hepatitis nodes	6 (12)
Cholangiocarcinoma	5 (10)
D2 duodenal carcinoma	2 (4)
Klatskin tumor	2 (4)
Gallbladder carcinoma	1 (2)

Computed tomography (CT) abdomen both plain and contrast was done for all cases. It identified the etiology of obstruction in all the 50 cases. Other features such as ascites and lymphadenopathy were also noted. Thus, CT has better accuracy in identification of cause than USG (Table 7).

Mortality due to the disease is 3% of morbidities and 6% in overall population included in the study. Most of them who had malignant cachexia also had ascites (Table 8).

About 25 cases were treated surgically accounting for 50%. Other 32% were given palliative therapy in the form of chemotherapy and 2 cases received ascitic fluid tapping (Table 9).

About 44% cases were treated with triple bypass for biliary drainage and gastrointestinal drainage. 44% were treated with choledocholithotomy and choledochoduodenostomy for stone disease (Table 10).

Most of the cases were inoperable accounting for about 35% and they were treated with palliative therapy. Operated cases presented with other complications (Table 11).

## DISCUSSION

The most common age group affected with obstructive jaundice appears to be 50-60 years of age accounting to about 38% and the mean age group affected is 52.5 years - youngest being 20 years and eldest being 85 years. The next most common age group appears to be 40-50 years and 60-70 years with 24% and 16%, respectively. Thus, it appears to be a disease of elderly age group. The most commonly affected sex is male. In my study, among the 50 cases, 28 patients are male accounting to about 56%. Malignant disease appears to be most common in elderly males. About 22 cases, among 28 are affected by malignant obstructive jaundice. The ratio of male:female appears to be 1.3:1 in our setup. This correlates with the study of Verma *et al.*<sup>8</sup> in which the male:female ratio was 1.3:1 (56%:44%) and the most commonly affected age group was 50-60 years (mean age affected 50.4 years). The most common chief complaint appears to be yellowish discoloration of skin and sclera, i.e., jaundice in about 54% of patients. The next most common complaint is abdominal pain accounting to about 40%. Some patients have two complaints in combination such as abdominal pain and vomiting. Among the 8 cases with abdominal pain and vomiting, 5 are due to malignant etiology indicating outlet obstruction and 3 are due to benign etiology. Abdominal pain is present in most of the cases with stone disease. This goes with Siddique *et al.*<sup>9</sup> study

**Table 6: USG features**

Sign	Number of patients (%)
CBD dilatation	30 (64)
Growth	14 (30)
Stones	3 (6)

CBD: Common bile duct, USG: Ultrasonography

**Table 7: CT abdomen**

Sign	Number of patients (%)
Biliary tract dilatation	9 (30)
Ascites	10 (33)
Lymphadenopathy	11 (37)

CT: Computed tomography

**Table 8: Morbidity and mortality caused by obstructive jaundice**

Morbidity and Mortality	Number of patients (%)
Cachexia	25 (29)
Ascites	31 (36)
Liver secondaries	13 (15)
Anorexia	8 (9)
Goo	5 (6)
Cholangitis	2 (2)
Death	3 (3)

**Table 9: Treatment given**

Treatment	Number of patients (%)
Surgery	25 (50)
Palliative treatment	16 (32)
Referral	6 (12)
Non-compliance	3 (6)

**Table 10: Type of surgery**

Surgery	Number of patients (%)
Triple bypass	11 (44)
Choledocholithotomy and choledochoduodenostomy	11 (44)
Other bypass procedures	3 (12)

**Table 11: Treatment complications**

Complications	Number of patients (%)
Uneventful	24 (48)
Inoperability	13 (26)
Biliary gastritis	8 (16)
Wound infection	4 (8)
Death	1 (2)

where abdominal pain was most common in benign disease (accounting to 51.66%). Abdominal distension is present in patients with ascites with advanced malignancy. Itching is present in 4% of cases and indicates deposition of bile

salts and bile pigments in nerve endings. These patients were treated with cholestyramine which acts as a bile acid sequestrant. The other complaint is loss of appetite which indicates mucosal edema of the gastrointestinal tract and growth causing outlet obstruction. Among the 50 cases studied 35 have malignant etiology accounting to about 70%. Only 30% have a benign etiology. This indicates the high morbidity and mortality of the disease. Most of the cases presented with advanced malignancy and most of the cases were elderly males. This correlates with accuracy to the study of Siddique *et al.*<sup>9</sup> who have stated that malignancy was the most common cause (occurring 56.6% of the patients in his study). The most common benign etiology appears to be choledocholithiasis accounting for about 22% of the overall etiology and 73.3% of the benign etiology. Among the 11 cases with choledocholithiasis, 8 cases were females indicating the high prevalence of stone disease in females. 3 cases presented with benign stricture. 2 had distal CBD stricture; among which one underwent triple bypass and one underwent biliary bypass. One had a history of previous surgery and had a proximal CBD stricture and was referred to higher center as hepatic bypass could not be done in our setup. One patient was diagnosed to have choledochal cyst and was referred to higher center for further management. The most common malignant etiology appears to be periampullary carcinoma in my study. About 24% of the malignant etiology and 34% of the overall etiology of obstructive jaundice appears to be periampullary carcinoma. Among the 12 cases, 5 were treated with triple bypass and rest 7 were treated with palliative therapy. The next most common malignancy appears to be carcinoma head of pancreas. Among the 7 cases, 4 underwent triple bypass and 3 received palliative chemotherapy. Liver secondaries with porta hepatis nodes were found to be the cause in 6 cases accounting to 12%. Among them, 2 had primary in the stomach and received palliative chemotherapy. One had primary in the breast and received palliative chemoradiotherapy. Rest 3 had unknown primary. They were treated with Tru-cut biopsy and appropriate chemotherapy according to the histology. Among the 5 cases with cholangiocarcinoma 1 was treated with surgery. 2 cases with duodenal carcinoma were treated with gastrointestinal bypass surgery. Other causes for malignant obstructive jaundice are Klatskin tumor and gallbladder carcinoma accounting to 4% and 2%, respectively. USG of abdomen was done in all cases. Intra hepatic biliary radicles dilatation in all cases and CBD dilatation in 64% of cases. 24 cases showed dilatation of both IHBR and CBD. Thus, ultrasound has a high sensitivity in diagnosing the presence of obstruction to biliary tree and helps in confirmation of diagnosis. However, results are operator dependant. Among the 35 cases with malignant disease USG was able to detect the

growth in 14 cases, and among the 15 cases with benign disease, USG was able to detect the presence of stones in CBD in 3 cases. According to Bonheur *et al.*<sup>10</sup> study, US is the procedure of choice for the initial evaluation of cholestasis and for helping differentiate extrahepatic from intrahepatic causes of jaundice. Even Assi *et al.*<sup>11</sup> study stated that - USG should be the first and best initial imaging procedure in patients who have obstructive jaundice. CT Abdomen with both plain and contrast was done in all cases. It was able to diagnose the presence of obstructive jaundice and etiology of obstruction to biliary tree in almost all cases. It was able to diagnose the presence of ascites in 10 cases and lymphadenopathy in 11 cases. Thus, CT was found to be more sensitive and specific than USG. According to Bonheur *et al.*<sup>10</sup> study - traditional CT scan is usually considered more accurate than US for helping determine the specific cause and level of obstruction. The important morbidity of the disease was found to be malignant cachexia found in 25 among the 35 cases with malignant etiology. Ascites was present in about 36% cases. Most of the cases with malignant cachexia had ascites. Most of them had controlled ascites. 2 cases had uncontrolled ascites and underwent repeated tapping. The next most common morbidity is liver secondaries due to advanced malignancy. 13 cases had this complication even at the time of presentation. Among them, 6 cases had liver secondaries with porta hepatis nodes causing obstruction to biliary tree with primary elsewhere and rest had primary in the biliary tree such as periampullary region, head of pancreas, and Klatskin tumor with liver secondaries occurring due to advancement of disease. The other morbidities are anorexia, gastric outlet obstruction, and cholangitis. Mortality occurred in 3 cases. One with cholangiocarcinoma - patient underwent triple bypass and patient expired post-operatively. One with advanced carcinoma head of pancreas. Patient received palliative chemotherapy. One with metastatic carcinoma breast with liver secondaries and porta hepatis nodes. Patient received palliative chemoradiotherapy and patient expired. The mortality rate is 6% of the cases. About 50% were treated with surgery indicating the availability of surgical therapy for the disease. However, many received only bypass procedures as surgical treatment due to the severity of the disease. 11 cases were treated with triple bypass; another 11 were treated with CBD exploration and choledochoduodenostomy for stone disease; 3 cases were treated with other types of bypass procedures for D2 duodenal carcinoma and biliary stricture. About 32% received palliative treatment such as chemotherapy, radiotherapy, and ascitic fluid tapping. Another 12% were referred to higher center, and 6% were non-compliant to treatment.

About 44% cases were treated with triple bypass for biliary drainage and gastrointestinal drainage. 44% were treated

with choledocholithotomy and choledochoduodenostomy for stone disease. 12% were treated with other bypass procedures. Most common complication was inoperability as most patients presented to our hospital with advanced malignancy such as periampullary carcinoma, CA head of pancreas, cholangiocarcinoma, and porta hepatis nodes and were given only palliative therapy. 16% presented with biliary gastritis post-operatively and were treated with sucralfate syrup. 8% had wound infection and were treated with culture, sensitivity, and appropriate antibiotics. 48% were discharged with good general condition. 13 cases which were operated did not have any complications. Verma *et al.*<sup>8</sup> study has stated that -malignant obstructive jaundice is predominant in males compared to females. Benign obstruction is seen at a comparatively younger age group compared to malignant. Bhargava *et al.*<sup>12</sup> study proved the same that ultrasound was found to be the preliminary investigation of choice for the diagnosis of the presence of obstruction and to some extent the level of obstruction.

## CONCLUSION

Obstructive jaundice was found to affect male population most commonly and most commonly elderly age group with 50-60 years being 38% affected in my study. Malignancy was found to most commonly affect elderly male patients. The most common complaint was found to be jaundice in about 54%. Abdominal pain was the most common complaint in benign stone disease which affected females more. The most common etiology was found to be malignancy affecting about 70% of cases. Periampullary carcinoma was the most common malignancy accounting for 24% of the overall etiology. The most common benign etiology was choledocholithiasis with 73.3% of the benign etiology. USG of the abdomen is very accurate in diagnosing the presence of obstruction to the biliary tree, easily available, and cost-effective but operator dependant. CT abdomen is reliable in confirming the diagnosis and determining the

level of obstruction. In malignancies, it gives information also about the operability of the tumor. The most common morbidity is malignant cachexia and ascites. Mortality rate in my study is about 6% all with advanced malignancy even at the time of presentation. 48% of the cases did not have any treatment complications among which 13 cases were treated by surgery. Thus, surgery is the best modality of treatment in all operable cases at the time of presentation, and bypass procedures have less post-operative morbidity and mortality.

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