

A STUDY OF OBSTRUCTIVE JAUNDICE WITH FOCUS ON PREDICTIVE FACTORS FOR OUTCOMESrinidhi M¹, Ramesh Hosmani²**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: BACKGROUND AND OBJECTIVES: Obstructive jaundice is a problem frequently encountered by general surgeons. A clear understanding of the etiology, presentation and management is a prerequisite for the management of obstructive jaundice. There is a need to identify the risk factors which may predict outcome. Hence, a detailed study of the various causes of obstructive jaundice and their management is of paramount importance. **METHODS:** A Prospective observational study was undertaken to investigate the pattern of clinical presentation, diagnosis and management of the different causes of obstructive jaundice. About 21 consecutive patients with symptoms and signs of obstructive jaundice were included in the study. Cases were admitted, examined, investigated and operated during the period of Nov 2010 to Aug 2012. **RESULTS & CONCLUSION:** The highest age incidence of obstructive jaundice was in the 50 - 80 years with maximum incidence in the 6th decade. There was an increased incidence in female i.e. M: F=1:2.5. Most common cause of obstructive jaundice is choledocholithiasis, followed by periampullary carcinoma. Among periampullary carcinoma, Ca head of pancreas and Ca Ampulla of Vater are the common causes. Jaundice is the most common presentation of surgical jaundice followed by pain abdomen, nausea/vomiting, itching, loss of weight and fever. Ultrasonography was the investigation of choice in our hospital. It is cheap, safe and reliable. Early diagnosis and management helps to reduce the mortality and morbidity rate. ERCP is comparatively as good as Open exploration of CBD and Choledochoduodenostomy for CBD calculi. Good survival benefit in cases of malignant obstructive jaundice depends on detecting the disease early in its course. It was noted on statistical analysis of malignant cases that the values of direct bilirubin levels were significantly higher in those patients who expired postoperatively compared to surviving patients. Hence these parameters can be considered as those which may predict perioperative outcome as well as long term survival. The levels of total bilirubin and alkaline phosphatase did not show significant difference.

KEYWORDS: Obstructive jaundice, Choledocholithiasis, Periampullary carcinoma, surgical jaundice, extrahepatic bile duct obstruction, mortality, predictive factors.

INTRODUCTION: Jaundice refers to the yellowish discoloration of the skin, sclera and mucous membrane due to increased bilirubin concentration in the body fluids.¹ The term Jaundice is derived from the French word 'Jaunisse'; Jaune in French meaning Yellow.² Obstructive jaundice is a condition occurring due to a block in the pathway between the site of conjugation of bile in liver cells and the entry of bile into the duodenum through the ampulla. The block may be intrahepatic or extrahepatic in the bile duct.^{3,4}

Obstructive jaundice is a problem frequently encountered by general surgeons. It is very important to differentiate the medical causes of jaundice from the obstructive or surgical causes.

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A clear understanding of the etiology, presentation and management is a prerequisite for the management of obstructive jaundice. Hence, a detailed study of the various causes of obstructive jaundice and their management is of paramount importance.

This study is also a tribute to the many pioneering surgeons including, but not limited to, Alessandro Codivilla, Allen Whipple, Cesar Roux, Graham & Cole, Oskar Sprengel, Walther Kaush and many other great surgeons who made seminal contributions to surgery in general and Biliary surgery in particular.

METHODS: A Prospective observational study was undertaken to investigate the pattern of clinical presentation, diagnosis and management of the different causes of obstructive jaundice.

About 21 consecutive patients with symptoms and signs of obstructive jaundice were included in the study. Cases were admitted, examined, investigated and operated during the period of Nov 2010 to Aug 2012.

RESULTS: The findings of the study are as follows:

1. The occurrence of surgical jaundice was maximum in the 50 - 70 year age group, with maximum incidence in the sixth decade. (47.6%).
2. Females were more commonly affected than males in this study, with M: F ratio 1: 2.5
3. Icterus was present in all 21 patients (100%). Pain abdomen (90%) and jaundice (90%) was more in malignant condition whereas; pain abdomen (91%), loss of appetite (73%), nausea/vomiting (64%) and jaundice (46%) were the common features in benign conditions. High coloured urine (80%) and loss of weight (60%) was common in malignancy.
4. High values of serum bilirubin, alkaline phosphatase, decrease levels of albumin were seen in both benign conditions as well as malignancy.
5. USG was the cheapest and non-invasive investigation used for diagnosis of obstructive jaundice.
6. Most common cause of obstruction was CBD calculi (47.6%), followed by periampullary carcinoma (42.8%), then by CBD benign stricture and Ca Gall bladder (4.8% each). Out of the 9 patients of periampullary carcinoma, 4 patients had carcinoma of the head of the pancreas; 4 patients had carcinoma of the ampulla of vater, 1 patient had distal cholangiocarcinoma.
7. For CBD calculi, most of them underwent Open cholecystectomy with Choledochoduodenostomy (60%); others underwent CBD exploration with cholecystectomy (10%) and ERCP with removal of calculi (20%). When the three procedures were compared the results were good. One patient with spontaneously passed out CBD calculus underwent open cholecystectomy (10%).
8. For CBD benign stricture, one patient underwent definitive treatment (Open cholecystectomy with Roux en Y hepaticojejunostomy).
9. For malignancy both operative/non-operative palliative procedures were:
 - ERCP with stenting.
 - PTBD.
 - Open cholecystectomy with Roux en Y hepaticojejunostomy.
 - Gastrojejunostomy & Choledochojejunostomy.

Survival rate was 50% during the follow up period of 6 months.

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10. Resectional procedures for malignancy

- Whipples procedure in 5 patients
- Extended cholecystectomy in 1 patient

Survival rate was 50% during the follow up period of 6 months.

11. ERCP and MRCP have helped to diagnose the pathology earlier and hence early intervention.

12. ERCP intervention for CBD calculi and its use as palliative drainage with stenting in both benign and malignancy has helped to prevent complications.

13. The values of serum Total bilirubin, direct bilirubin and alkaline phosphatase were analysed to find factors which play a key role in predicting the outcome. The level of direct bilirubin was significantly increased in those patients of malignant obstructive jaundice who expired compared with surviving patients.

14. Thus direct bilirubin may be considered as factor which predicts post-operative outcome and long term survival in patients with malignant obstructive jaundice.

DISCUSSION: Obstructive or Surgical jaundice remains a challenge to surgeons especially when it is due to malignant causes.

The materials for the clinical study were collected from cases admitted in our Hospital. Number of cases studied were 21 over a period of one year.

A Prospective observational study was undertaken to investigate the pattern of clinical presentation, diagnosis and management of the different causes of obstructive jaundice.

The age group varied from 35 years to 65 years, the average age was 53 years, and 76.2% of patients are between the age group of 50 – 70 years. Of the 11 cases of benign extra hepatic biliary tract disease which included the age range was between 35– 65 years with a mean age of 51.7 years. The age range for malignant cases was between 43 -65 years; mean age was 54.6 years

There were 6 (28.6%) male and 15 (71.4%) female in our study with female predominance at sex ratio 1:2.5

	Nadkarni⁵ et al 26 cases	Kar et⁶ al 129cases	Agarwal⁷et al 24 cases	Present study 21 cases
CBD stones	9	32	10	10
CBD benign stricture	1	4	1	1
Malignancy of pancreas/CBD/ GB	14	93	11	10
Others	2	-	2	-

Table 1: Causes of obstructive jaundice in Indian studies

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Symptoms	Benign n = 11	Malignant n = 10	Total n = 21	Significance (p value)	Odds ratio (For malignant)
Jaundice	5 45.5%	9 90%	14 66.7%	0.031	10.8
Pain abdomen	10 90.9%	9 90%	19 90.5%	0.943	0.9
Mass abdomen	1 9.1%	1 10%	2 9.5%	0.943	1.11
Itching	2 18.2%	6 60%	8 38.1%	0.049	6.75
High Coloured urine	4 36.4%	8 80%	12 57.1%	0.043	7
Clay Coloured stools	1 9.1%	5 50%	6 28.6%	0.038	10
Nausea/Vomiting	7 63.6%	2 20%	9 42.9%	0.0435	0.14
Fever	4 36.4%	4 40%	8 38.1%	0.863	1.17
Loss of appetite	8 72.7%	8 80%	16 76.2%	0.696	1.5
Loss of weight	2 18.2%	6 60%	8 38.1%	0.049	6.75

Table 2: Clinical presentation in obstructive jaundice causes

In malignant jaundice the most common symptoms were jaundice 90% and pain abdomen 90%.

In benign surgical jaundice the commonest symptom was pain abdomen 91%, loss of appetite 73%, nausea vomiting 64%, jaundice 46%.

- Jaundice was seen in 14 patients (66.7%). The duration of jaundice varied from 10 days to 1 year. About 7 cases (33.3%) had jaundice of less than 1 month duration. Jaundice was seen in 45.5% of benign cases and 90% of malignant cases with significant statistical difference of $p = 0.031$.
- Pain abdomen was present in 19 cases (90.5%). The pain was felt in the right hypochondrium in 9 cases (42.9%), epigastrium and the right hypochondrium in 8 cases (38.1%); diffusely in 2 cases (9.5%). Pain was recurrent in 9 cases (42.9%) and continuous with minor fluctuation in intensity in 12 cases (57.1%). Pain abdomen in benign is 90.9% and malignant is 90% with no significant statistical difference
- Loss of appetite was observed in 16(76.2%) cases with no significant difference between benign and malignant conditions
- Dark urine was seen in 12 cases (57.1%).It was observed in 36.4% of benign cases and 80% malignant cases with a significant p value of 0.043
- Loss of weight was seen in 8(38.1%) cases. It was noted in 18.2% of benign and 60% of malignant cases with a significant p value of 0.049

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- Fever in 8 cases (38.1%) cases with no significant difference between benign and malignant conditions
- Itching was noticed in 8 cases (38.1%). It was noted in 18.2% of benign and 60% of malignant cases with a significant p value of 0.049
- Pale coloured stool was seen in 6 cases (28.6%). It was noted in 9.1% of benign and 50% of malignant cases with a significant p value of 0.038.
- Mass abdomen in 2 cases (9.5%) with no significant difference between benign and malignant conditions.
- Pallor was present in 80.9% patients with no significant difference between benign and malignant causes.
- Icterus was present in all patients. Icterus was present in all patients.

INVESTIGATIONS: In this study, the values of total bilirubin, direct bilirubin and alkaline phosphatase were raised in both benign and malignant conditions. There was no statistically significant difference between benign and malignant conditions.

USG abdomen was carried out on all patients as a standard imaging technique for investigation on a patient presenting with jaundice. USG was successfully used as a cheapest non-invasive tool to know the cause and level of obstruction in 86% of the patients.

USG was unable to diagnose two cases of choledocholithiasis and one case of benign CBD stricture. The limitation of this diagnostic test was its high operator dependence. However, USG could identify all patients with malignant causes.

On USG, dilated CBD was noted in 90% of malignant disease, and 90.9% in benign cause, distended gall bladder was noted in 70% of malignant cause and 18.2% in benign cause, dilated biliary radicles were noted in 90% of malignant disease and 72.7% of benign disease.

TREATMENT: The various approaches adopted to treat CBD calculi are shown in Table 2.

Operative procedures/Non-operative procedures	Number (n=10)	%	Mortality
Cholecystectomy and Choledochoduodenostomy	6	60	-
ERCP & removal of calculi	2	20	-
ERCP+ CBD exploration, T Tube	1	10	-
Cholecystectomy	1	10	-

Table 3: Operative/non-operative procedures for CBD calculi

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	CBD exploration, T Tube Drainage		Choledochoduodenostomy		ERCP stenting/ Sphincterotomy	
	Uchiyama et al ^[8]	Present study	Uchiyama et al	Present Study	Uchiyama et al	Present Study
No. of Patients	87	1	44	6	82	2
No. of recurrent patients	9	0 (6mnts)	0	0 (6 mnts)	8	0 (6 mnts)
Recurrence Rate (%)	10.3	0	0	0	9.8	0

Table 4: Comparison of CBD exploration & T Tube Drainage, Choledochoduodenostomy and ERCP stenting/ sphincterotomy for choledocholithiasis

In this study, no recurrences were documented with any of the three methods i.e. CBD exploration & T tube drainage, Choledochoduodenostomy and ERCP stenting/ sphincterotomy during the 6 months follow up period. Hence we can infer that Choledochoduodenostomy and ERCP sphincterotomy have similar results in the management of choledocholithiasis as shown in Table 3.

One patient was diagnosed to have a benign stricture of distal CBD

He underwent open cholecystectomy with Roux-en-Y hepaticojejunostomy.

During 6 months of follow up patients were healthy with no attack of fever, chills or jaundice

Table 4 shows the various management approaches adopted for patients with malignant surgical jaundice.

Operative procedures/Non-operative procedures	Number (n=10)	%	Mortality	Survival
ERCP and Stenting	1	10	1	-
PTBD	1	10	1	-
OC, Roux-en-Y HJ	1	10	-	1
GJ & CDJ	1	10	-	1
ERCP sphincterotomy + Whipples procedure	1	10	-	1
Whipple's procedure	4	40	3	1
Extended cholecystectomy	1	10	-	1

Table 5: Operative/non-operative procedures for malignancy

Follow up and Mortality: In the benign causes of obstructive jaundice, all patients with choledocholithiasis and one patient with benign stricture were healthy at the end of 6 months.

In malignant jaundice, 1 patient of periampullary carcinoma and 1 patient of cholangiocarcinoma who had underwent Whipples procedure expired in the post-operative period. 1 patient of periampullary carcinoma who underwent Whipple's procedure expired during the course of follow up.

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Two patients with periampullary carcinoma who had underwent PTBD and ERCP stenting also expired.

All the patients were followed up to 6 months.

The value of direct bilirubin was found to be significantly increased in those patients with malignant jaundice who expired compared to surviving patients. Total bilirubin and alkaline phosphatase values were not significantly different as shown in Table 5.

Mean Values	Patients who expired	Surviving patients	P value
Total bilirubin	16.06 + 5.7	7.9 + 5.96	>0.05
Direct bilirubin	10.28 + 3.9	4.04 + 3.3	<0.05
Alkaline Phosphatase	370.4+ 114.4	237.2 + 64.2	>0.05

Table 6: Comparison of biochemical values between expired and surviving patients

Thus, direct bilirubin was the key factor which determined post-operative and long term survival in patients with malignant obstructive jaundice.

CONCLUSION: Obstructive jaundice is commonly seen in the age group of 50-70 years; with females being affected more than males in the present study. The most common cause in the present study was choledocholithiasis, followed by periampullary carcinoma.

Among the periampullary carcinomas; Carcinoma head of pancreas and Carcinoma Ampulla of Vater are the common causes. Jaundice was the most common presentation followed by pain abdomen, nausea/vomiting, itching, loss of weight and fever. USG was successful to know the cause and level of obstruction in 86% of the patients.

ERCP sphincterotomy is comparatively as good as CBD exploration & T tube drainage and Choledochoduodenostomy for CBD calculi.

Good survival benefit in cases of malignant obstructive jaundice depends on detecting the disease early in its course and early management.

Direct bilirubin is the key factor which determines postoperative as well as long term survival in patients with malignant obstructive jaundice. The levels of total bilirubin and alkaline phosphatase were not statistically significant in determining the outcome.

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