Extra-Hepatic Biliary Obstruction - A Cross-Sectional Study to Assess the Various Benign and Malignant Causes for Obstructive Jaundice among Patients Attending Trivandrum Medical College

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ABSTRACT

BACKGROUND

Extra-hepatic biliary tract obstruction can be due to a number of conditions. Most causes are due to stones in the common biliary duct or due to malignant obstruction. Malignant causes include carcinoma head of pancreas, periampullary carcinoma and cholangiocarcinoma. Besides calculus and malignant obstruction, benign and malignant strictures can also cause obstruction of extra hepatic biliary ducts. The objectives of the study were to describe the clinical profile of patients presenting with extra-hepatic biliary obstruction and to assess the known aetiological factors.

METHODS

The research was designed as a hospital based cross-sectional study in the general surgery wards of our institution from 2016 to 2017. All individuals who were diagnosed to have extra-hepatic biliary obstruction by imaging were included in the study.

RESULTS

Among the 66 cases studied, majority were due to malignancies and gall stones. The malignancies included carcinoma head of pancreas, periampullary carcinoma, cholangiocarcinoma and Klatskin's tumour. Miscellaneous causes were bile duct stricture, cholelithiasis with biliary sludge and annular pancreas. For the malignant cases, Whipple surgery and its pylorus-preserving variant were the most common surgical procedures carried out. Biliary bypass procedures were also carried out in some patients. For patients with common bile duct (CBD) stones, cholecystectomy, choledocholithotomy and choledochojejunostomy were done.

CONCLUSIONS

Malignant causes of jaundice are more common than benign causes. Secondary stones are the commonest cause of non-malignant biliary obstruction. Jaundice is more severe and associated with pruritis and more intolerable and persistent in malignancy. Surgical bypass procedures give good palliation for obstructive jaundice.

KEY WORDS

Bile Ducts, Choledocholithiasis, Cholestasis, Extra Hepatic, Pancreatic Cancer, Periampullary Cancer

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BACKGROUND

Biliary as well as duodenal obstruction is a common complication in patients with pancreatobiliary malignancies. Obstructive jaundice with accompanying duodenal obstruction is commonly caused by perampullary malignancy, pancreatic head carcinoma, cholangiocarcinoma, malignant duodenal tumour or sometimes by lymph node metastasis. The other major share of obstructive jaundice is contributed by stones occluding the common bile duct. Biliary and duodenal obstruction leads to cholestasis with subsequent hepatic insufficiency.

In most cases, diagnosis of a case of obstructive jaundice is based on clinical, biochemical, imaging and endoscopic techniques. In obstructive jaundice, there is often elevation in serum alkaline phosphatase, gamma-glutamyl transpeptidase, and serum bilirubin levels. When there is no prior biliary intervention, patients commonly present with jaundice when their serum bilirubin level goes above 3 mg / dL. But in some instances diagnosis may be difficult and exploratory laparotomy and even intra-operative radiological techniques may be needed for proper management. CA 19 - 9 is the most frequently studied biomarker in screening for pancreatic cancer and has a reported sensitivity of 79 % and specificity of 82 %.¹ However, CA 19 - 9 has the drawback of being frequently elevated in other gastrointestinal cancers (cholangiocarcinoma, gastric cancer, colorectal cancer, oesophageal cancer and hepatocellular cancer) and even benign processes (acute cholangitis and pancreatitis).^{2,3}

Multiple imaging modalities have been used to diagnose and evaluate the extent of obstructive jaundice. Exclusive diagnostic modalities include trans-abdominal ultrasound, helical computed tomography (CT) scan, and magnetic resonance imaging (MRI) or magnetic resonance cholangiopancreatography (MRCP). Newer modalities that offer options for both diagnosis and therapeutic interventions include endoscopic ultrasound (EUS), endoscopic retrograde cholangiopancreatography (ERCP), and percutaneous transhepatic cholangiopancreatography (PTC).

Patients with advanced obstructive jaundice are often critically ill. Subsequently, proper pre-operative preparation, appropriate surgery and careful post-operative management are essential for successful outcome of the cases and prevention of serious complications. Exploration of the disease presentation and the pathophysiology can give a proper idea about these patients and the disease process. With this background, we tried to study the cases of obstructive jaundice managed in the surgical wards of our institution. Government Medical College Trivandrum is a tertiary level teaching hospital in the southern part of Kerala and caters to the specialised health needs of a large number of population. The primary objective of the study was to describe the clinical profile of patients presenting with extra-hepatic biliary obstruction among the in-patients of the Department of General Surgery in our hospital. The secondary objectives were to assess the proportions of known aetiological factors associated and also the methods of treatment of extra-hepatic jaundice.

METHODS

The research was designed as a hospital based cross-sectional study. All individuals with extra-hepatic jaundice as shown by

imaging in our surgical wards were taken as the study population. Patients less than 13 years were excluded for homogeneity. Census type sampling was employed for recruiting cases. The study was carried out for a period of 15 months, from May 2016 to September 2017. Prior to starting the study, clearance was obtained from institutional review board and ethics committee.

Informed consent was obtained from all patients and recorded. The patients were enquired in detail about their symptomatology and the responses were entered into a structured questionnaire. Also, relevant information on the patients' examination findings and laboratory investigations was entered into the structured proforma. The patients were followed up till their treatment and till discharge. All relevant treatment details were recorded in the proforma.

Study variables included name, age, gender, history of previous surgeries, laboratory values, contrast-enhanced computed tomography (CECT) abdomen findings, intra-operative findings and histopathological findings. The data was entered into Microsoft Excel sheets and subsequently used for analysis. All statistical analysis was done with 'Epi Info' software by CDC, Atlanta. All values were given as means and percentages as relevant. It was decided to set statistical significance at a P value lower than 0.05, wherever relevant.

RESULTS

At the end of the study, we had 66 patients to analyse. Out of 66 patients, 33 were between the age group of 41 - 60 years of age. Youngest patient was 27 years old and the oldest was 78 years of age. Male to female ratio was almost equal, with slight preponderance in males.

Jaundice was the main symptom seen among 55 % of patients followed by pain in abdomen and loss of weight. 55 % of the patients had associated history of smoking, ethanol consumption or both. 55 % patients presented with icterus. 45 % patients had either palpable hepatomegaly or palpable gall bladder. 12 % of them had only hepatomegaly.

50 % of the patients were having anaemia with haemoglobin lower than 11 gm %. 14 % patients had total bilirubin less than 2.5 mg / dl while 52 % had bilirubin more than 5 mg / dl. Among the 66 patients, liver enzymes, namely serum glutamic-oxaloacetic transaminase (SGOT) and serum glutamic-oxaloacetic transaminase (SGPT) were elevated in 65 % and 60 % respectively. Alkaline phosphatase (ALP) was normal among 33 % and elevated more than 600 in 15 %. Serum total protein was less than 6 mg / dl and serum albumin less than 3 mg / dl in 26 % and 29 % of the patients respectively. Serum CA 19 - 9 was found to be elevated among 49 % of the patients and elevated to more than 10 times of normal in 18 %.

15 % of the patients had lesions in ampulla or periampullary area in upper gastrointestinal (GI) endoscopy. On radiological imaging, pancreatic malignancy topped the chart followed by perampullary malignancy and cholelithiasis with choledocholithiasis. Among the patients diagnosed with extra-hepatic biliary obstruction, 67 % patients were diagnosed with malignant causes. Pancreatic malignancy constituted the highest with 29 % patients, followed by perampullary and cholangiocarcinoma constituting 26 % and 11 % respectively. Among the benign diseases, cholelithiasis with

choledocholithiasis constituted the highest with 12 % of patients. Congenital cause namely annular pancreas constituted 1 among 66 cases.

77 % of patients were treated with surgical procedure and the 11 % were treated medically with drugs and endoscopic stenting. Among the patients treated with surgical procedure, 45 % underwent curative surgical procedure and rest of them underwent palliative procedure. Choledochojunostomy with gastrojejunostomy were done in 27 % of the patients. Classic Whipple procedure and its pylorus-preserving pancreaticoduodenectomy variant (PPPD) were done in 26 % patients. Bile duct stenting was done in 17 % patients.

Procedure	Frequency	Percent (%)
Cholecystectomy	4	6.1
Cholecystectomy + CBD exploration	1	1.5
Cholecystectomy + CBD exploration + Choledochoduodenostomy	4	6.1
Classic Whipple	1	1.5
PPPD	16	24.2
Cholecystojejunostomy + gastro-jejunostomy	18	27.3
Choledcho-jejunostomy	3	4.5
Roux-en-Y loop surgery	1	1.5
Frey's + cholecystectomy + choledcho jejunostomy	1	1.5
Stenting	11	16.7
Others	6	9.1
Total	66	100

Table 1. Frequency of Surgical Procedures

Diagnosis	Frequency	Percent %
Periampullary	17	25.8
HOP / CA pancreas	19	28.8
Cholangiocarcinoma	7	10.6
GB ca	1	1.5
CBD stricture	5	7.6
CBD stone	2	3
GB stone / polyp	4	6.1
GB and CBD stone	8	12.1
Congenital	1	1.5
Others	2	3
Total	66	100

Table 2. Frequency of Various Diagnosis

DISCUSSION

Malignant biliary tract obstruction (MBTO) can arise from pancreatic, gallbladder, duodenal, ampullary and hepatic cancers; metastatic cancers; or malignant lymphadenopathy. Symptoms of obstructive jaundice specifically pruritus can adversely impact quality of life and subsequently promote hepatic dysfunction. Development of MBTO in malignancies may lead to poor outcomes including cholangitis, delay in proper treatment (including chemotherapy or surgery) and also increased mortality.

In spite of the advances in surgery and chemotherapy, pancreatic ductal adenocarcinoma has a dismal five-year survival rate of around 6 %, and biliary obstruction is known to correlate with decreased survival rates.⁴ Around two-thirds of patients have some degree of biliary obstruction when they get diagnosed with pancreatic cancer.⁵ In fact, jaundice is often the presenting symptom in up to 90 % of pancreatic cancers involving the head of the gland.⁶ This manifests as scleral icterus or yellow appearance of the skin. Pruritus, pale stools, dark urine, right upper quadrant discomfort and nausea are the other common symptoms. Other nonspecific symptoms pointing towards malignancy might include weight loss, anorexia and also night sweats.

Specific symptoms indicative of pancreatic cancer include dull epigastric pain with radiation to the back (caused by

pancreatic duct obstruction), palpable gall bladder, generalised weakness and dyspepsia (due to gastric outlet obstruction as well as malabsorption from reduced pancreatic enzymes), early satiety, new onset diabetes mellitus or episodes of acute pancreatitis.⁷ Symptoms suggestive of cholangiocarcinoma include abdominal pain (mostly right upper quadrant), pruritus, weight loss and fatigue.⁸ Perihilar and distal common bile duct lesions tend to present predominantly with jaundice.⁹

Bilioduodenal strictures are classified according to the location as well as relative timing of duodenal obstruction. Type I strictures have duodenal obstruction located proximal to the papilla.¹⁰ Type II and III bilioduodenal strictures have the location of duodenal obstruction situated at or distal to the duodenal papilla, respectively. Bilioduodenal stenosis is classified according to the degree of duodenal obstruction as well as the relative timing of obstruction. In case of mild degree of duodenal obstruction, biliary cannulation is usually possible using a slim duodenoscope or after gentle dilatation of the stenosis. However, duodenal obstruction of a significant degree necessitates prior placement of an enteral stent.

One of the most common causes of benign biliary stricture is iatrogenic (post-surgical anastomotic stricture). Other reasons for strictures include post-traumatic, congenital, inflammatory, ischemic and idiopathic. In patients who have undergone biliary reconstruction after surgery for malignancy, it is often challenging to differentiate between anastomotic strictures and tumour recurrence.

Biliary intervention procedures play an important role in the management of patients with benign as well as malignant obstructive jaundice. The procedures include a variety of interventions including percutaneous transhepatic biliary drainage (PTBD) with or without stent placement, percutaneous transhepatic cholangiography (PTC), bile duct stone extraction and bile duct biopsy. In case of malignant bile duct obstruction, these interventions can be used for palliation of symptoms including anorexia and pruritus.¹¹ It can also facilitate to prevent toxicity in some chemotherapy regimens by allowing total bilirubin levels to drop to acceptable levels.¹² Biliary drainage is also performed routinely pre-operatively by some surgeons but its use in this context is controversial.¹³

Biliary stents have gained prominence in achieving biliary decompression over the past few decades. Recent studies show increased role for self-expandable metal stents (SEMS) compared to plastic stents.¹⁴ Endoscopic biliary stent placement is technically successful in over most of the attempted cases.¹⁵ For this reason, endoscopic retrograde cholangio-Pancreaticography (ERCP) together with biliary stent placement has now come to be accepted as the optimum standard of care in situations where biliary decompression is warranted. Another option is Endoscopic ultrasound-guided biliary drainage (EUS-BD) which can be achieved by multiple techniques including EUS-guided rendezvous, EUS-guided choledochoduodenostomy (EUS-CDS), and EUS-guided hepatic gastrostomy (EUS-HGS).¹⁶ Also, surgical biliary bypass can be used as an appropriate treatment for patients in whom life expectancy exceeds six months.¹⁷

Regarding surgical management, only 15 % to 20 % of patients are considered surgically resectable at diagnosis.¹⁸ Classically, the curative resection for cancers in the head of the pancreas was performed through pancreatoduodenectomy (Whipple procedure), which is a major surgical procedure

involving removal of the pancreatic head, duodenum, gallbladder, common bile duct, gastric antrum, and the first 15 cm of jejunum. This procedure was later modified into a version that retains the stomach in situ, called pylorus-preserving pancreaticoduodenectomy (PPPD). Meta-analyses comparing the techniques have found the two techniques to be equivalent in morbidity, mortality and overall survival.¹⁹ Operating time and blood loss are often significantly less in the pylorus-preserving pancreaticoduodenectomy variant. Palliative surgical drainage is often prompted by obstructive jaundice, which is often accompanied by gastric outlet obstruction that precludes endoscopic biliary drainage. Cholecystojejunostomy and cholecystoenterostomy are the commonly performed procedures, though hepaticojejunostomy is shown to be superior to both.²⁰

CONCLUSIONS

Extra-hepatic biliary obstruction is a challenging disease from both diagnostic and management points of view. Multiple diagnostic and therapeutic modalities are available and almost all patients can have their obstruction relieved through curative or palliative treatment options. Endoscopic, radiologic and surgical approaches remain as complementary techniques and not as competitive modalities. Choice of procedure should ideally be selected based on the location and type of biliary obstruction, local expertise, patient's performance status and patient's preference.

Data sharing statement provided by the authors is available with the full text of this article at jemds.com.

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