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Etiological Spectrum of Obstructive Jaundice: "Our Experience in Two University Hospitals in Yemen"

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ABSTRACT

Background: Obstructive jaundice is a surgical emergency with preoperatively uncertain diagnosis. Its early diagnosis and treatment is important to avoid fatal complications.
Objective: to determine the etiology of obstructive jaundice.
Patients and methods: The data of patients, who were operated for obstructive jaundice at department of Surgery in Sana'a University Hospital and Thamar University Hospital between January 2004 and December 2008, were prospectively analyzed in relation to the causes of obstructive jaundice. The study included 134 patients (91 females and 43 males). Their ages varied from 8-90 years.
Results: Among 9 underlying causes of obstructive jaundice, the common bile duct stones were the most common cause, 68 patients (50.7%). Malignancies of pancreas and hepatobiliary tract came in the second place, 33 patients (24.6%), followed by 13 patients with stenosis of papilla of Vater (9.7%) and benign strictures of extrahepatic biliary ducts, 10 patients (7.4%).
Ascaris in common bile duct was found in 3 patients. Mirrizi's syndrome was found in 2 patients. Obstruction due to ruptured hydatid cyst was found in 2 patients. Two patients had amoebic liver abscesses One patient had pancreatic pseudocyst.
Conclusion: Obstructive jaundice of Yemeni patients in our series was most often due to common bile duct stones followed by malignancy of pancreas and hepatobiliary tract. Cancer of the pancreas was the most common malignant cause. Rare causes such as ascaris in common bile duct was detected. Cooperation between surgeon and radiologist is highly recommended

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INTRODUCTION

Jaundice in general is being defined as an increase in the concentration of bilirubin in the serum leading to yellowish discoloration of the skin and sclera [1]. However, obstructive jaundice implies partial or complete mechanical obstruction of the flow of the bile into the intestinal tract [2, 3]. The most common causes of obstructive jaundice are common bile duct stones and malignancies of pancreas and biliary ducts [3, 4, 5, 6, 7]. Rare causes of obstructive jaundice include acquired disorders (worms, scarring from previous surgical procedures, bile duct inflammations) and congenital anomalies such as Choledochal cyst, biliary atresia, localized strictures and stenosis, compression of the extrahepatic bile ducts by vascular abnormalities and the stenosis of the ampulla of Vater [7]

While most of studies [3, 4, 6, 8] reported hepatobiliary and pancreatic malignancies as the most common cause of obstructive jaundice, other studies [5] gave priority for common bile duct (CBD) stones to be the most common cause of obstructive jaundice. Unlike jaundice due to stones in CBD that is usually painful and intermittent with sudden onset, jaundice due to malignancy is painless and progressive with gradual onset.

The early diagnosis and timely treatment of obstructive jaundice is of a great importance, since pathological changes [purulent cholangitis or secondary biliary cirrhosis] may occur if obstruction is not relieved [1, 2, 9]. Therefore, the early surgical intervention may prevent development of such pathological complications. Our study is to determine the underlying causes of obstructive jaundice among Yemeni patients operated in two university hospitals between 2004 and 2008.

PATIENTS AND METHODS

One hundred forty four patients with obstructive jaundice were admitted to the Department of Surgery in Sana'a University Al-Kuwait hospital (123 patients) and Thamar University Al-Wahdah hospital (21 patients) between January 2004 and December 2008. There were 97 females and 47 males with mean age at 50.4 years. Ten patients of this number were excluded from the study because they died during preoperative period before surgical intervention was carried out due to advanced malignancies of the pancreas and hepatobiliary tract.

Therefore, the study included 134 patients. There were 91 females (68%) and 43males (32%) cases with age groups varying from 8 to 90 years with mean age of 50.2 years.

The diagnosis of obstruction was based on history, clinical examination and investigation which included liver function test (LFTs) and imaging methods (abdominal sonography, abdominal CT and ERCP). Intraoperative finding and results of histopathology were used either to confirm or to correct preoperative diagnosis.

The types of surgical procedure performed depended upon the nature of obstructive jaundice and intraoperative finding.

Operative procedures:

The surgical treatment of obstructive jaundice was performed depending on the cause and extension of the disease, general condition and age of the patient and experience of the surgical staff. For benign causes such as CBD stones and benign strictures, cholecystectomy and choledocho-duodenostomy or choledocho-jejunostomy, transduodenal papillosphincterotomy was carried out. Amoebic abscesses and ruptured hydatid cysts were

managed by cavity drainage. In cases of hydatid cysts T-Tube was inserted in CBD after the clearance of CBD lumen from daughter cysts and debris. Endoscopic retrograde papillosphincterotomy and stones extraction from CBD was used as late as 2005. Eleven patients (8.2%) with stone in CBD were managed by this modern method.

Hepaticojejunostomy was mostly performed for cholangiocarcinomas. Whipple's procedure (pancreatoduodenectomy+partial gastrectomy) was performed for pancreatic malignancy with gastric outlet obstruction. Two cases of obstructive jaundice due to malignancy of the pancreas with bad condition were managed just by cholecystostomy. Transhepatic drainage was applied for cases of inoperable hepatocellular carcinoma.

Explorative laparotomy was performed for advanced and irresectable malignancies.

RESULTS

The most common cause of obstruction of hepatobiliary ducts was common bile duct stones. Out of 134 patients, 68 patients (50.7 %) had jaundice due to stones in CBD. There were 46 females and 22 males with mean age at 39 years. Malignancy cases came in the second place in 33 patients (24.6 %). There were 23 females and 10 males with mean age at 54 years. Among these malignant cases, 16 patients had cancer of the pancreas to occupy the first place (48% of malignant cases, or 12% of all cases) followed by hepatocellular malignancy in 6 patients (18% of malignant cases, or 4.4 % of all cases). Cancer of the gallbladder comes in the last place before advanced inoperable cancer of the stomach. Distribution of malignancy causing obstructive jaundice is shown in (Table 1).

Thirteen patients (9.7%) were diagnosed as stenosis of papilla of Vater. These cases had mildly dilated common bile duct and increased preoperative LFTs, but neither stones in common bile duct, nor tumors or strictures were found. Preoperative sonography of extrahepatic biliary ducts in this group failed to reveal the causes of obstruction. It wrongly reported stones or sludge in CBD.

Table 1: Distribution of malignancies causing obstructive jaundice.

	Type of malignancy	Male	Female	Total	%
1	Malignancy of pancreas	4	12	16	%12
2	Hepatocellular malignancy	2	4	6	%4.4
3	Cholangiocarcinoma	1	3	4	%3
4	Periampullary carcinoma	1	3	4	%3
5	Cancer of the gallbladder	1	1	2	%1.5
6	Advanced gastric cancer (inoperable(	1	0	1	%0.7
	T o t a l	**10**	**23**	**33**	**%24.6**

Ten jaundiced patients have benign strictures of extrahepatic biliary tree that cause obstructive jaundice (7.4%). Out of these 10 cases, 7 cases were caused by iatrogenic injury to extrahepatic ducts during previous operation for gallstones. Out of 7 iatrogenic cases, 2 cases have complete injury of right hepatic duct and five cases had postoperative strictures of common bile duct. Six of 7 iatrogenic cases were sent to our hospital from smaller hospitals. The remaining 3 cases had primary strictures of common bile duct.

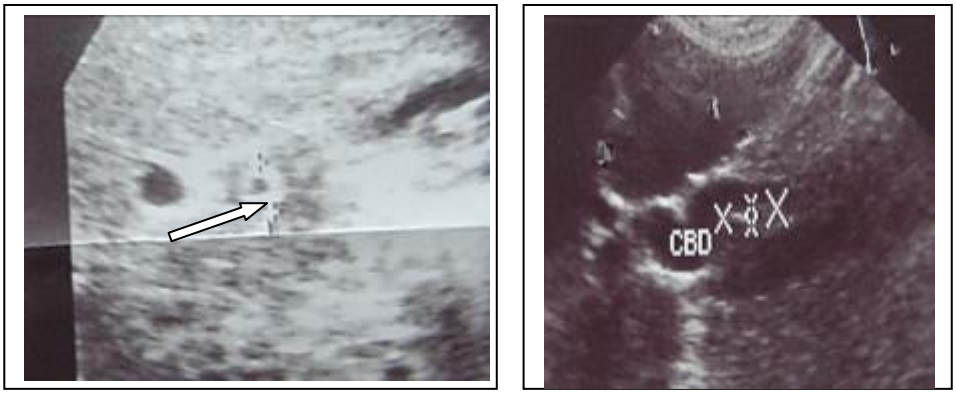
Three patients (2.2%) with jaundice had worms (Ascaris) in their common bile ducts (one female and 2 young male patients). No marked dilatation of biliary tree was found in this group Fig 1.

Two patients (1.4%) had Mirrizi's syndrome as a cause of obstructive jaundice.

Another cause of obstructive jaundice in this study was ruptured hydatid cysts that obliterated hepatic ducts and CBD in two patients (1.4%) Fig2.

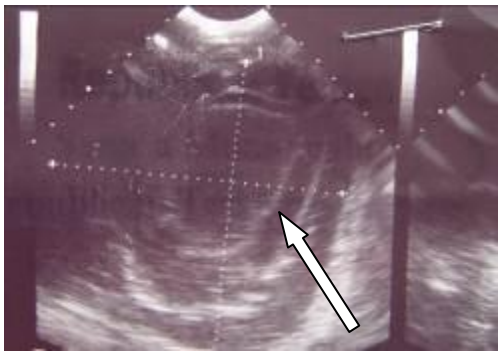
Two patients (1.4%) had big amoebic abscesses of the liver. The largest one is about 21x14cm and occupying almost the entire right hepatic lobe Fig 3.

One case with posttraumatic pseudocyst of the pancreas was found to be the cause of obstruction of biliary duct in one 8-year-old child. The causes of biliary obstruction in our study are shown in (Table2).



a) Transverse view "bull's eye" (b) Longitudinal shadow in CBD

Figure (1): ultrasound finding: Ascaris in common bile ducts.



Arrow: detached laminated membrane

Figure (2): Ultrasound finding: Ruptured liver hydatid cyst Causing obstructive jaundice

Fig. 3: Ultrasound finding: Liver amoebic abscess

Regarding operative mortality and complications, 11 patients (8 %) died postoperatively within 2 weeks. There were 6 females and 5 males with mean age at 61.4 years. The majority of them succumbed to their primary diseases. As for operative complications, there were 9 (6.7%) cases with wound infection (5 females and 4 males); 5 females and 2 males (5.2%) had bile leakage that was conservatively dealt with and 6 patients (4.4%) with Chest infection. Sixteen patients (12%) had diarrhea; they were 9 females and 7 males. Immediate postoperative mortality is shown in (Table 3).

Table (2): The causes of biliary obstruction.

	Cause of obstructive jaundice	Male	Female	Total	%
1	Common bile duct stones	22	46	68	%50.7
2	Malignancy	10	23	33	%24.6
3	Stenosis of papilla of Vater	4	9	13	%9.7
4	Benign strictures of extrahepatic biliary tree	2	8	10	%7.4
5	Ascaris in CBD	2	1	3	%2.2
6	Mirrizi's syndrome	1	1	2	%1.4
7	Liver hydatid cyst	0	2	2	%1.4
8	Liver abscesses	1	1	2	%1.4
9	Pseudopancreatic cyst	1	0	1	%0.7
	Total	**43**	**91**	**134**	**%100**

Table (3): Immediate postoperative mortality

	Type of malignancy	Male	Female	Total%
	Inoperable hepatocellular carcinoma	1	2	3 %2.2
	Inoperable gastric cancer	1	0	1 %0.7
	Inoperable pancreatic cancer	2	3	5 %3.7
	Cholangiocarcinoma	1	1	2 %1.4
	T o t a l	**5**	**6**	**11 %8**

DISCUSSION

Obstructive jaundice has wide variation of etiology; it is not therefore a definitive diagnosis at the time of presentation. The obstructive jaundice syndrome is now common and its prevalence has increased with female preponderance [5]. Unlike obstructive jaundice due to stones in CBD that is usually painful with sudden onset and intermittent course, the jaundice due to malignancy has gradual and painless onset and it is progressive in course [6, 7].

In the literature, the most common cause of obstructive jaundice is malignancy of pancreas and biliary ducts [3, 4, 6, 7, 8, 10]. Muhammad S. et al [3] reported 54.17% of their patients having malignant causes of obstructive jaundice. Sharma MP et al [4] reported that 75.3% of their patients had malignancies of pancreas and hepatobiliary.

In our study, the most common cause of obstructive jaundice was stones in common biliary ducts (50.7%) followed by malignancy (24.6%). Grandic et al [5] reported similar findings. In our study, common bile duct stones are the most common cause of obstructive jaundice due to the nature of the jaundice, low health awareness among our patients and

lack of adequate equipments of our health institutions. Regarding the nature of the jaundice, patients suffering from stones in CBD usually search for medical service urgently because of sudden and painful onset of their complaint. They seek medical help earlier and usually receive treatment at the beginning of their complaint. In contrast, patients with obstructive jaundice due to malignancy have insidious and painless onset of their complaint. Thus they don't seek medical help as early as those with CBD stones. Most of these patients therefore present with an inoperable disease [11]. The patients mostly die before reaching the hospital or they die during preoperative period. This fact is apparent in our study: 10 patients with malignancy were excluded from the study because they died during preoperative period.

Stenosis of papilla is the second common cause of postcholecystectomy syndrome after missed stones in CBD [12] . It is postulated that stenosis of papilla is usually resulted from repeated injury of papilla and Oddi's sphincter during the passage of small stones through papilla to the duodenum or due to inflammation of the duodenum or pancreas [12, 13]. In our study, 13 patients (9.7 %) had benign stenosis of the papilla of Vater to become the third common cause of obstructive jaundice after CBD stones and malignancy. Surprisingly, there were no stones in common bile duct that might cause obstructive jaundice despite preoperative ultrasound reported either stones or sand sludge in CBD in all these cases. Therefore, stenosis of papilla can be explained in our study by repeated episodes of inflammation of papilla and its surroundings followed by healing by fibrous stenosing non-elastic tissue.

One further cause of obstructive jaundice was benign strictures of extrahepatic biliary ducts. An iatrogenic injury of biliary ducts is more likely to happen during simple cholecystectomy rather than during complicated cholecystectomy[12]. Undue self-confidence of the surgeon during simple cholecystectomy, insufficient approach and inappropriate lightening of operative field, bad assistance and inappropriate anesthesia, structural anomaly in Calot's triangle and impatience of the surgeon may lead to technical mistakes and iatrogenic injury of biliary ducts.

In our study, 10 patients (7.4%) had benign strictures of extrahepatic biliary ducts. Unfortunately, 7 of these patients with obstructive jaundice had iatrogenic injury of extrahepatic biliary ducts during previous operations. Only one case occurred in our department, while others were transferred to our hospital from smaller peripheral hospitals. It is postulated that bad assisting increases possibility of injury of surrounding structures. It is not uncommon that our surgeons perform cholecystectomy alone and sometime do CBD exploration just with scrubbing nurse assistance. This inevitably leads to iatrogenic injury to surrounding structures.

Ascaris lumbricoides is the most common nematode found in the human gastrointestinal tract with a greater prevalence in developing tropical and subtropical countries [13,14]. It normally inhabits the small intestine and have propensity to migrate through the ampulla of Vater to lodge in the gallbladder and biliary tract [15] and may give rise to serious conditions such as biliary colic, acute cholecystitis, acute pancreatitis, acute cholangitis and hepatic abscess [16,17,18].

The cause of obstructive jaundice in 3 of our patients (2.2%) was the presence of ascaris in common bile duct. Manzor Salim [19] reported higher percentage at (10.26%). It is attributed to the high incidence of parasites infestation in our developing country probably due to low socioeconomic conditions and poor sanitation. Since there was no dilatation of

CBD, we managed these cases by milking the worms to the duodenum followed by postoperatively albendazole tab 400mg as a daily single dose for 3 consecutive days. We did not try to extract worms through choledochotomy in order to avoid the possibility of worms' immigration to the peritoneal cavity through stitches.

Another etiological factor of obstructive jaundice is amoebic cysts and abscesses in the liver. Amoebiasis is the infection of the human gastrointestinal tract by Entamoeba histolytica, a parasite that is capable of invading the intestinal mucosa and may spread to other organs; mainly the liver usually in right lobe [20]. Amoebic Liver Cyst (ALC) might be infected to become Abscess (ALA) [21]. It is usually solitary in (30% - 70%) of patients and large enough to produce compression syndrome and obstructive jaundice [20, 21]. Amoebiasis is common in Asia, Africa, South America and the Middle East, probably because of poor sanitation and low socioeconomic conditions [21, 22]. In our study there were 2 cases (1.4%) of ALA that were compressing upon the biliary ducts and produced a feature of obstructive jaundice. They were managed surgically by open drainage. Amoebicidal Metronidazole was postoperatively given in 500mg tid for 10 days. However, one ALA case developed a biliary leak through the drainage site that stopped spontaneously within 2 weeks.

In the literature, the Mirrizi's syndrome is frequently used to describe a rare entity consisting of an anatomic variation of the cystic duct or neck of the gallbladder, an impacted gallstone in the cystic duct, and a benign mechanical obstruction of the hepatic duct causing jaundice and cholangitis [23].

In our study we found 2 patients with obstructive jaundice due to Mirrizi's syndrome (1.4 %).

Alam A.M et al [24] reported almost a similar (1.6%) finding among 60 patients who underwent cholangiography for obstructive jaundice.

Hydatid disease may affect any organ of the body; and liver is involved most commonly. The rupture of the cyst is a serious complication [17]. After cyst rupture into the biliary system, daughter cysts and membranes pass into biliary ducts producing obstructive jaundice. We found 2 cases (1.4%) of obstructive jaundice due to rupturing liver hydatid cysts into biliary tree. Both cases were managed surgically. An excision of the dome, evacuation and drainage of cyst cavity was performed. Cholecystectomy and T-Tube insertion in the common bile duct was performed. Albendazole tab was given in 600 mg in 2 divided doses for 2 months. The clinical outcome was good except one patient who developed wound infection.

The less common cause of obstructive jaundice is pseudo-cyst of the pancreas. Usually pseudo-cyst of pancreas is regarded a complication of pancreatitis. However, pancreatitis in our country is very rare. Our case of one 11 year-old young patient had history of trauma to the abdomen one year ago. Therefore, we attribute this finding to that trauma rather than to pancreatitis.

CONCLUSION

Stones of common and hepatic bile ducts are the most common cause of obstructive jaundice in our study. In the second place come malignancies of pancreas and hepatobiliary tract. The cancer of the pancreas was the most common malignant cause of obstructive jaundice.

Cooperation between surgeon and radiologist to diagnose the underlying cause of obstructive jaundice and identify its location should be a routine practice, and has a priority because the outcome of surgical treatment of obstructive jaundice depends on the stage of the disease at the time of presentation. The early surgical intervention therefore prevents developing fatal complications especially in malignant cases.

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طيف أسباب اليرقان الإنسدادي
"تجربتنا في مستشفيين جامعيين في اليمن"

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ملخص

يُعد انسداد القنوات الصفراوية حالة جراحية طارئة يصعب تحديد أسبابها قبل إجراء العملية الجراحية ، والتشخيص المبكر لتلك الأسباب وبالتالي العلاج المبكر للحالة يقلل من المضاعفات الخطيرة المحتملة.

هدفت هذه الدراسة إلى معرفة الأسباب المختلفة لانسداد القنوات الصفراوية.

المرضى وطرق البحث:

تم دراسة وتحليل المعلومات المتعلقة بالمرضى الذين خضعوا لعمليات جراحية بسبب انسداد القنوات الصفراوية في قسمي الجراحة العامة بمستشفى الوحدة الجامعي بجامعة ذمار ومستشفى الكويت الجامعي بجامعة صنعاء وذلك في الفترة من يناير 2003 وحتى ديسمبر 2008 بهدف معرفة وتحديد أسباب انسداد القنوات الصفراوية. شملت الدراسة 134 مريضا (91 من الإناث و 43 من الذكور) وتراوحت أعمارهم من 8 إلى90سنة.

النتائج:

تم تحديد 9 أسباب لانسداد القنوات الصفراوية ، وان حصوات القنوات الصفراوية هي أكثر الأسباب وجودا حيث سببت انسداد تلك القنوات عند 68 مريضا (50.7%). كما إن سرطان البنكرياس والكبد والقنوات الصفراوية قد تسبب في انسداد القنوات الصفراوية عند 33 مريضا (24.6%) يتصدرها سرطان البنكرياس. في المرتبة الثالثة تأتي تضيق "بؤبأة فاتر" لدى 13 مريضا (9.7%) ثم تضيقات القنوات الصفراوية لدى 10 مرضى (7.4%). كما تسببت دودة الإسكارس في انسداد القنوات الصفراوية عند 3 مرضى، ميريز سيندروم عند 2مرضى، و تسببت الأكياس المائية في الكبد والأميبية عند حالتين من المرضى، أما الأكياس الكاذبة للبنكرياس فقد تسببت في انسداد القنوات الصفراوية عند حالة واحدة.

الخلاصة:

هناك تسعة عوامل تسببت في انسداد القنوات الصفراوية في دراستنا، وتعتبر حصوات القنوات الصفراوية السبب الرئيس، ثم سرطان البنكرياس والكبد والقنوات الصفراوية حيث يأتي سرطان البنكرياس في المقدمة. ومن الأسباب النادرة لانسداد القنوات الصفراوية وجود دودة الإسكارس في تلك القنوات.

ننصح بالتعاون والتكامل بين الجراح وأخصائي الأشعة لتحديد ومعرفة الأسباب قبل إجراء التدخل الجراحي.

الكلمات الدالة:اليرقان الإنسدادي- انسداد القنوات الصفراوية- الأسباب.