Frequency of malignant biliary strictures in Upper Egypt: a pilot study

Adnan A. Mohamed[a], Ahmed M. Ali[b], Mahmoud R. Shehata[b], Wael A. Elsewify[c], Salah Maklad[d]

Departments of [a]Tropical Medicine and Gastroenterology, [b]General Surgery, Faculty of Medicine, Assiut University, Departments of [c]Internal Medicine, [d]Radiodiagnosis, Faculty of Medicine, Aswan University, Aswan, Egypt

Correspondence to Wael Abd Elgwad Elsewify, MD, Lecturer of Internal Medicine, Department of Internal Medicine, Faculty of Medicine, Aswan University, Aswan, 81528, Egypt. Tel: +201001657295; Fax: +20973480449; e-mail: waelelsewify@yahoo.com

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Background and aim
Biliary strictures are challenging clinical condition for gastroenterologists, radiologists, and surgical specialists. We aimed to find out the frequency of malignant biliary strictures in our institutions.
Patients and methods
This prospective study included 44 patients with biliary strictures who had undergone endoscopic retrograde cholangiopancreatography (ERCP) and magnetic resonance cholangiopancreatography (MRCP) in Aswan and Assiut University Hospitals.
Results
Thirty two patients (72.7%) had malignant strictures where distal stricture was the most frequent (68.8%) followed by hilar (25%) then mid and long segment strictures (3.1% each).
Conclusion
The vast majority of indeterminate biliary strictures are malignant (72.7%), so all indeterminate bile duct strictures in patients with obstructive jaundice should be considered malignant unless a benign etiology is definitively identifiable.

Keywords:
biliary strictures, ERCP, MRCP

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Introduction

Biliary stricture is a fixed narrowing of a focal segment of the bile duct that results in proximal biliary dilatation and clinical features of obstructive jaundice. A wide spectrum of hepatobiliary and pancreatic diseases, both benign and malignant, can result in the development of biliary strictures. Benign causes of bile duct strictures include iatrogenic causes, acute or chronic pancreatitis, choledocholithiasis, primary sclerosing cholangitis, immunoglobulin G4-related sclerosing cholangitis, liver transplantation, recurrent pyogenic cholangitis, Mirizzi syndrome, acquired immunodeficiency syndrome cholangiopathy, and sphincter of Oddi dysfunction. Malignant causes include cholangiocarcinoma, pancreatic adenocarcinoma, and periampullary carcinomas. Rare causes include biliary inflammatory pseudotumor, gallbladder carcinoma, hepatocellular carcinoma, metastases to bile ducts, and extrinsic bile duct compression secondary to periportal or peripancreatic lymphadenopathy [1].

At the time of diagnosis, majority (80–90%) of malignant strictures are noncurable. Common clinical presentations include obstructive jaundice, anorexia, weight loss, and pruritus. Raised alkaline phosphatase, bilirubin, serum transaminases, and prothrombin time are the usual laboratory abnormalities [2].

Various imaging modalities including ultrasonography (US), computed tomography, endoscopic US, magnetic resonance cholangiopancreatography (MRCP), and endoscopic retrograde cholangiopancreatography (ERCP) are helpful in the diagnosis of malignant biliary strictures. However, ERCP is considered as the gold standard in the diagnosis of biliary strictures and also has the advantage as a therapeutic modality [3].

Patients and methods

After approval of the Ethical Committee of the Faculty of Medicine in Assuit and Aswan University, we conducted a hospital-based study to evaluate the frequency of malignant biliary strictures among those with indeterminate bile duct strictures over a period of 10 months from February 2018 to December 2018. Patients with indeterminate bile duct strictures were prospectively enrolled and underwent ERCP.

Patients

Inclusion criteria

Patients presented with obstructive jaundice and were confirmed by cholangiogram to be due to biliary stricture.

Exclusion criteria

The following were the exclusion criteria:

(1) Extrahepatic cholestasis other than common bile duct (CBD) stricture.
(2) Patients with history of traumatic or iatrogenic bile duct injury (including biliary surgery within the last 6 months).

Each patient underwent the following:

(1) Full history taking and clinical examination.
(2) Laboratory investigations:
    (a) Liver function tests: total and direct bilirubin, aspartate transaminase, alanine transaminase, alkaline phosphatase, and prothrombin concentration.
    (b) Complete blood count (red blood cells, platelet, and white blood cells count).
(3) Imaging: US, MRI, and MRCP.
    All US examinations were performed by using LOGIQ E9, GE Healthcare (Yorba Linda CA, USA) machine with curved-array transducer (6 MHz). All patients were prepared by fasting for at least 6 h before US examination.
    All MRI studies (MRCP and postcontrast MRI follow up) were performed with a 1.5-Tesla unit (GE Medical Systems, Milwaukee, Wisconsin, USA) using eight-channel phased-array cardiac body coil. The imaging protocol consisted of axial and coronal single shot spin echo T2-weighted images (TR/TE=700–45900/70–145 ms, slice thickness {ST}=3–5 mm, field of view {FOV}= 24–36 cm, and matrix=150–400×160–393), nonbreathhold, respiratory-triggered, heavily T2-weighted turbo spine echo images (1010-44088/ 155–975 ms, 3–5 mm, 160–280 mm, 148–256×76–256), and three-dimensional (3D) MRCP (1200–2100/650 ms, 2 mm, 280 mm, 140–256×130–170). The original coronal images of 3D-MRCP were reconstructed with a maximum intensity projection algorithm using postprocessing reformatting software. The extrahepatic central biliary ducts (including the right, left, and common hepatic ducts), CBD, and gallbladder were best shown through the upper procedures.
(4) ERCP was carried out in the usual standard manner for all patients.

Patients' preparation

Before the procedure

(1) Every patient was fasting for at least 8 h before endoscopic procedure.
(2) Before the examination, past history and coagulation profile of the patient were confirmed.
(3) 20 mg *N*-butylscopolammonium bromide was administrated slowly intravenously (20 mg/1 ml; Buscopan, manufactured by Memphis Co. for pharmaceutical and chemical industries Giza –ARE –GCR 19717 (under licence of boehringer Ingelheim)); if there was any contraindication or suspicious history for contraindication, it is not given.
(4) Measurement of patient's blood pressure and heart rate was recorded before the start of the procedure.
(5) Intravenous propofol was given for sedation.

During the procedure

(1) ERCP was done in prone position.
(2) Continuous cardiorespiratory monitoring was done during the procedure.

ERCP procedure

ERCP was performed using side-viewing endoscope (Pentax ED-3440T/A01350; Pentax, Tokoyo, Japan) to diagnose or confirm biliary stricture and biliary drainage if indicated. The disposable DASH-480 (Howell DASH Direct Access System Cookmedical, Bloomington, IN, USA) was used to cannulate the ampulla of Vater in a conventional way, then a 0.035 or 0.025 inch guide wire (Jag wire, 450 cm, Microvasive; Boston Scientific Corp., Watertown, Mass, USA) was introduced into the intrahepatic bile duct beyond the narrowed region, and then cholangiography was done.

After the procedure

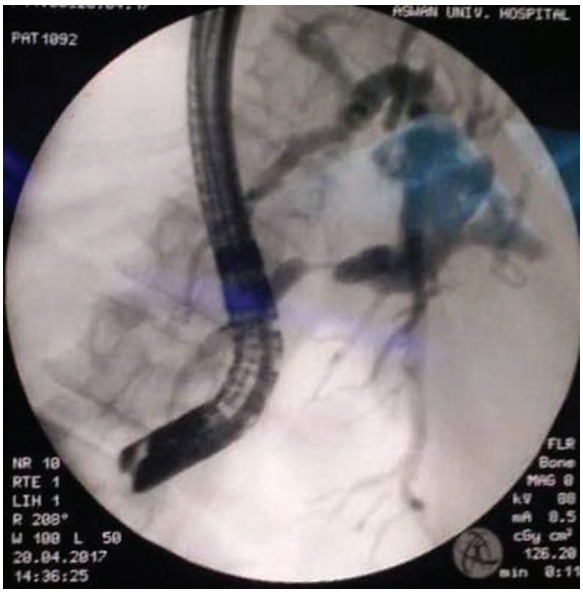
(1) Oral intake was prohibited for 2 h.
(2) Follow-up was done for 24 h on inpatient basis for the development of any complications.

Follow-up

We used the following criteria as gold standard for diagnosis of malignancy:

(1) Histopathological diagnosis by surgical excision of the lesion.
(2) Follow-up radiological assessment to detect locoregional infiltration or metastases by postcontrast MRI, using gadopentate

Figure 1



Mid-common bile duct stricture. The patient was diagnosed by laboratory investigations and follow-up as having cholangiocarcinoma.

Table 1 Characteristic data of the studied population

Personal characteristics	*n*=44 [*n* (%)]
Age (mean±SD) (years)	58.84±13.42 (37–85)
<50	13 (29.5)
50–60	10 (22.7)
60–70	9 (20.5)
≥70	12 (27.3)
Sex	
Male	17 (38.6)
Female	27 (61.4)
Type of biliary strictures	
Benign	12 (27.3)
Malignant	32 (72.7)

dimeglumine (Gd-DTPA) (Magnevist, Schering, Germany), after at least 6 month.

(3) Death of the patient owing to clinical deterioration of the disease.

Results

Among 48 patients who were enrolled in the study, four were excluded because of loss of follow-up. Thus, 44 patients were included in data analysis, where their mean age was 58.84±13.42 years and the majority was females (27, 61.4%). The most frequent age group is that less than 50 years (29.5%) followed by that greater than or equal to 70 years (27.3%), where those with age 60–70 years had the least frequency (20.5%) (Table 1).

Definitive diagnosis of the stricture as benign or malignant relied on surgical pathology (three cases) or clinical-radiological follow-up greater than 6 months (41 cases, Fig. 1). Among the 44 studied population, 32 were diagnosed to have malignant strictures; of them, nine (28.1%) were males and 23 (71.9%) were females, with mean age of 62.1 years. On the contrary, the remaining 12 (27.3%) patients had benign strictures and their mean age was 49.1 years (Table 1).

Table 2 Site of biliary stricture using MRI-magnetic resonance cholangiopancreatography and ERCP

Site of stricture	MRI-MRCP (*n*=44) [*n* (%)]	ERCP (*n*=44) [*n* (%)]
Distal	30 (68.2)	32 (75)
Mid	3 (6.8)	3 (6.8)
Hilar	8 (18.2)	8 (15.9)
Long segment	1 (2.3)	1 (2.3)
No stricture	2 (4.5)	0

ERCP, endoscopic retrograde cholangiopancreatography; MRCP, magnetic resonance cholangiopancreatography.

Table 3 Site of malignant stricture among the study population according to the follow-up data

Site of stricture	(*n*= 32) [*n* (%)]
Distal	22 (68.8)
Mid	1 (3.1)
Hilar	8 (25.0)
Long segment	1 (3.1)

Thirty (68.2%) patients had distal stricture in MRI, whereas MRI failed to detect biliary stricture in two patients, in whom ERCP confirmed the presence of distal stricture (Table 2).

In our study, the most common site of malignant stricture is distal (22 patients, 68.8%) followed by hilar (eight patients, 25%) followed by mid and long segment stricture (3.1% patient for each) (Table 3).

Discussion

Biliary strictures are challenging clinical condition for gastroenterologists, radiologists, and surgical specialists. We aimed to find out the frequency of malignant biliary strictures in our institution. In our study, most biliary structures were malignant. All bile duct strictures in patients with obstructive jaundice should be considered malignant unless a benign etiology is definitively identifiable [4].

Of this study population, 32 (72.7%) patients were diagnosed to have malignant strictures, comprising nine (28.1%) males and 23 (71.9%) females. These results matched with that of a study of Tummala *et al.* [5], showing that up to 30% of biliary strictures can be benign. Moreover, our data were consistent with Al-Mofleh and Abdulrehman [6] who reported that

57% of the biliary strictures were malignant. However, our data did not agree with Bain *et al.* [2] who mentioned that 29 of 31 patients had biliary strictures, of which 15 were malignant. This difference may be owing to the smaller sample size of his study.In our study, the most common site of malignant stricture is distal (68.8%) followed by hilar (25%) followed by mid and long segment stricture (3.1% for each). This high incidence of distal strictures reflects the multiple etiologies that can cause distal stricture which can be considered under the broad category of periampullary carcinomas. Periampullary carcinomas include cancers arising from the distal CBD immediately adjacent to the ampulla of Vater, cancers of the ampulla of Vater, head of pancreas, and the duodenal bulb [7].

These data were compatible with Gonda *et al*. [8] who found that 43% of biliary strictures were malignant, and 70% of these were distal biliary strictures.

Our data also correlate with that of Al-Mofleh and Rashed [9], who retrospectively reviewed 1000 ERCP files of patients at the Gastroenterology Unit, King Khalid University Hospital, in Riyadh, KSA, from March 1998 through to August 2002, and found 72 patients having malignant biliary strictures. They found that stricture site was 48.6% distal, 27.7% hilar, and 23.6% mid stricture.

Conclusion

In conclusion, most indeterminate biliary strictures are malignant (72.7%), so all indeterminate bile duct strictures in patients with obstructive jaundice should be considered malignant unless a benign etiology is definitively identifiable.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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