



Endosonographic Biliary Drainage, The Last Resort: A Case Report

Nader Roushan¹, Goli Siri¹ and Ali Niksirat^{2*}

¹Department of Internal Medicine, Division of Gastroenterology, Tehran University of Medical Sciences, Tehran, Iran

²Department of Internal Medicine, Tehran University of Medical Sciences, Tehran, Iran

Abstract

Endoscopic ultrasound-guided biliary drainage (EUS-BD) has emerged as a new approach to biliary drainage in last two decades, and has become particularly popular in tertiary endoscopic centers. EUS-BD is a safe, effective, feasible procedure for biliary drainage with an acceptably low level of adverse effects. It can be used as the preferred procedure in patients with biliary obstruction who had failed endoscopic retrograde cholangiopancreatography. In this article we report a successful application of EUS-BD method in a patient with biliary obstruction.

Keywords: Endoscopic ultrasound; Biliary drainage; Periampullary neoplasm

Introduction

Approach to the patient with jaundice generally begins with an evaluation of liver function tests including serum aminotransferases, bilirubin and alkaline phosphatase (ALP) [1,2].

Cholestasis is dominant rising in ALP; it is generally followed by liver sonography. Intrahepatic cholestasis, usually caused by disease, is indicated if the biliary ducts are not dilated. Extrahepatic cholestasis or obstructive jaundice is indicated when bile ducts are dilated; this is usually due to an obstructive cause such as a stone, neoplasm or stricture, and intervention is required to relieve the obstruction. Obstructive jaundice is one of the adverse effects of pancreatic or biliary carcinoma [3,4]. The intervention to remove the obstruction could be done by endoscopy, interventional radiology or surgery according to patient condition, etiology and the stage of obstructive lesion.

Periampullary neoplasms (including pancreatic cancer, distal cholangiocarcinoma, duodenal wall cancer and ampullary cancer) cause obstruction at the distal of the common bile duct (CBD) [5]. In comparison to other tumors, patients with ampullary cancer are more likely to present with symptoms in the early stages of tumor growth; if ampullary cancer is diagnosed, surgical resection is the best treatment. If surgery is impossible due to poor patient condition, less invasive approaches to biliary drainage, including endoscopic retrograde cholangiopancreatography (ERCP) and percutaneous transhepatic biliary drainage (PTBD), should be considered [6,7].

Endoscopic ultrasound-guided biliary drainage (EUS-BD) has emerged in the last two decades as a new approach in biliary drainage, and is becoming popular in tertiary endoscopic centers as way to accomplish biliary drainage [8].

EUS-BD is composed of three techniques: 1) EUS-guided transluminal biliary drainage, including choledochoduodenostomy and hepaticogastrostomy; 2) EUS-*rendezvous*; and 3) EUS-*antegrade* approach [9]. In this article we report the first successful application of EUS-BD in a patient with biliary obstruction in our country (Iran).

Case Presentation

A 53-year old male, a known case of diabetes mellitus and cryptogenic cirrhosis, was admitted to our gastroenterology ward with complaints of jaundice, itching, abdominal distension and significant weight loss. Laboratory tests were performed, and a sonography revealed a thickening of the gall-bladder wall and sludge, with increased size of the CBD up to 15 mm, a suspicious mass at the head of pancreas and remarkable ascites. An EUS was performed and a 4 cm ampullary mass was confirmed. The analysis of ascites fluid showed a high serum albumin-ascites gradient (SAAG) and low protein. The other laboratory tests are shown in Table 1.

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*Correspondence:

Ali Niksirat, Department of Internal Medicine, Tehran University of Medical Sciences, Tehran, Tel: +98-9111459518;
E-mail: ali.niksirat@yahoo.com

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Table 1: Patient's laboratory results.

White blood cell	11.3 × 10 ⁹ /L	Platelet	275 × 10 ⁹ /L
Bill total	14.1 mg/dl	SGOT(AST)	165 U/L
Bill Direct	10.7 mg/dl	SGPT (ALT)	260 U/L
BS	370 mg/dl	ALP	1747 U/L
Na	132 mg/dl	Prothrombin time (PT)	13 seconds
CA 19-9	119.4 U/ml	INR	1
Total protein	6.5 mg/dl	Ascites fluid protein	2 mg/dl
Serum Albumin	3.5 mg/dl	Ascites fluid Albumin	1.6 mg/dl

With a suspicious ampulla of Vater adenocarcinoma, he was candidate for surgery, but due to his decompensated cirrhosis, surgery was impossible. His Child-Pugh score was 9. Due to ascites, PTBD was contraindicated. Thus ERCP was attempted. There were three rows of esophageal varices and a 4 cm × 2 cm ulcerous tumoral mass in the second portion of the duodenum. The cannulation failed but a biopsy was taken (which later confirmed the diagnosis of ampulla of Vater adenocarcinoma). Thus a choledochoduodenostomy under EUS guidance was performed as the last resort.

Method

The procedure was performed by Dr. N. Roushan under EUS guidance without fluoroscopy. The echoendoscope was a Pentax Epki-7000 linearscope. CBD was identified with EUS as an anechoic space adjacent to the duodenum. After the use of Doppler ensuring no intervening vessel, a 19-gauge FNA (fine needle aspiration) needle (Endoflex Company) was passed through duodenal wall to the CBD, and bile was aspirated using a suction syringe (Endoflex Company) at the needle end, ensuring that the tip of the needle was inside the CBD. A 0.035 mm guide wire (Endoflex Company) was inserted into the CBD, and the needle withdrawn, leaving the guide wire in place. Then the tract was dilated using a 5/9 French biliary dilator (Endoflex Company) over the guide wire. Finally a 6 cm fully covered metal stent (Endoflex Company) was inserted in CBD, with the end of the stent penetrating nearly 2 cm inside the duodenum. After the stent was fully released, bile freely streamed to the duodenum. The correct position of the stent was confirmed by several slices of an abdominal CT scan. The patient's condition was good. We visited the patient one month after EUS-BD and again one month ago. He was in healthy condition and the jaundice had been resolved.

Discussion

In conditions of biliary obstruction such as periampullary neoplasms, the first-line therapy for biliary drainage is the use of ERCP with stent placement because of its safety and accuracy [9-14]. Its success rate is more than 90%, but it fails in some situations such as periampullary tumor infiltration, upper intestinal obstruction or surgically altered anatomy [9,11-13,15].

In our patient, ERCP was attempted as the first-line therapy. A 4 cm × 2 cm ulcerous mass was seen in the site of the ampulla of Vater. Because of the tumor size and disorganization of the ampulla of Vater, stent placement was impossible. Other interventions, including percutaneous transhepatic biliary drainage (PTBD) or surgery, are alternative methods for biliary drainage after failed ERCP [9,10,13], although surgical intervention and PTBD are associated with mortality and morbidity risk [10,13,14].

Due to decompensated cirrhosis in our patient, surgery was not

**Figure1:** Abdominal CT scan after EUS-CDS.

feasible, nor PTBD was feasible, due to the presence of moderate to severe ascites, as peri-hepatic ascites contraindicate PTBD [11,12].

Ultimately, endoscopic ultrasound-guided choledochoduodenostomy (EUS-CDS) was performed.

The first use of EUS-BD was reported by Giovannini et al. in 2001 [13,15]. The EUS-CDS is performed by creating a fistula between the duodenum and extrahepatic bile duct [12,15,16]. Determination of the etiology of extrahepatic cholestasis, which may not be possible by ERCP, can be accomplished using EUS [12].

The indications of EUS-BD include: a) failed ERCP, b) inaccessibility of the ampulla of Vater because of tumor involvement, c) contraindications for PTBD such as ascites and d) disorganized anatomy [12,16]. The contraindications are coagulopathy state and instability of hemodynamics [13]. Our patient had indications of EUS-BD and did not have any contraindications.

In one study the technical and clinical success rates for EUS-BD were 93% and 98% respectively and the adverse effect rate was 16% [16]. Other studies have reported success rates of 98.2% and 73-97% [11,13].

The benefits of this technique include: less invasiveness, high safety, low costs and reduced days of hospitalization compared with surgery and PTBD [10-13,15]. Patients' quality of life may be influenced by external drainage because of cosmetic problems [16].

Also, EUS-CD requires less time to perform than PTBD (30-45 min versus 30-120 min) [11].

The complications of EUS-CDS include: bile leakage (as the main risk), infection, pneumoperitoneum, biloma, bleeding, abdominal pain, perforation and stent dislodgement [12,16], although none was observed in our patient.

In conclusion, EUS-BD is a safe, effective, feasible and promising procedure to accomplish biliary drainage with an acceptably low rate of adverse effects [13-16]. It can be used as the preferred procedure in patients with biliary obstruction who had failed ERCP.

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