

Endoscopic ultrasound-guided choledochoduodenostomy using a lumen apposing metal stent for acute cholangitis

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ABSTRACT

We present the case of a 51-year-old woman with a history of uterine cancer who presented to the emergency room with a clinical picture of acute cholangitis. An abdominal ultrasound and a computed tomography scan were performed, revealing a gigantic lymphadenopathy mass compressing the common bile duct and the duodenum. After failure to perform an endoscopic retrograde cholangiopancreatography (ERCP) due to a modified anatomy, we performed an endoscopic ultrasound-guided choledochoduodenostomy (EUS-CDS) and placed a Hot AXIOS 10Fr/10 mm stent with efficient biliary drainage. In addition, we inserted a duodenal uncoated 120/22 mm expandable metallic stent. EUS-CDS presents a valid alternative in patients with failed ERCP and should be considered as an important option for rapid biliary decompression in patients with acute cholangitis.

Keywords: Endoscopic ultrasound, choledochoduodenostomy, acute cholangitis, lumen apposing metal stent

INTRODUCTION

Endoscopic retrograde cholangiopancreatography (ERCP) is considered as the main therapeutic option for biliary drainage (1). However, cannulation failure may be encountered due to duodenal or biliary invasion, altered anatomy, or technical difficulties. With options such as percutaneous drainage or surgery, endoscopic ultrasound (EUS) access of the common bile duct (CBD) has become a significant alternative due to its less invasive nature (2). Moreover, lumen apposing metal stent (LAMS) is validated for pseudocyst drainage and has been associated with newly introduced EUS therapeutic techniques (3,4). EUS-guided biliary drainage with a LAMS may fulfill the challenges encountered in failed ERCP situations and also provide a strong incentive for research of new therapeutic modalities.

We present a case of malignant duodenal obstruction with dilation of the biliary tract, with failed ERCP procedure. We highlight the therapeutic challenges encountered in such cases and the relevance of EUS-guided LAMS placement as a palliative alternative.

CASE PRESENTATION

A 51-year-old woman presented to the emergency room with jaundice, fever, abdominal pain, nausea, and vomit-

ing. Her medical history revealed a locally advanced uterine neoplasm, for which she underwent both oncological treatment and surgery.

Laboratory findings showed cholestatic syndrome (alkaline phosphatase: 1219 U/L, gamma-glutamyl transferase: 238 U/L, total bilirubin: 21 mg/dL, and direct bilirubin: 19 mg/dL), leukocytosis (40,000/ μ L), and severe anemia. Abdominal ultrasonography (Acuson S2000, Siemens Medical Solutions, Mountain View, CA, USA) revealed dilated intrahepatic biliary ducts and inhomogeneous hypoechoic mass of 10/8.5 cm situated in the retroperitoneum that appeared to compress the duodenum. In addition, an abdominal tomography confirmed a gigantic lymphadenopathy mass with extension into the inferior vena cava and aorta and involvement of the duodenal wall and pancreas (Figure 1).

Owing to tumor invasion and compression on the second duodenum, ERCP was not eligible. Therefore, a different palliative approach was found to be suitable. We decided to perform an EUS-guided choledochoduodenostomy (EUS-CDS) using a hot tip fully covered expandable metal stent (Boston Scientific, Xlumen Inc., Mountain View, CA, USA). The procedure was performed with a

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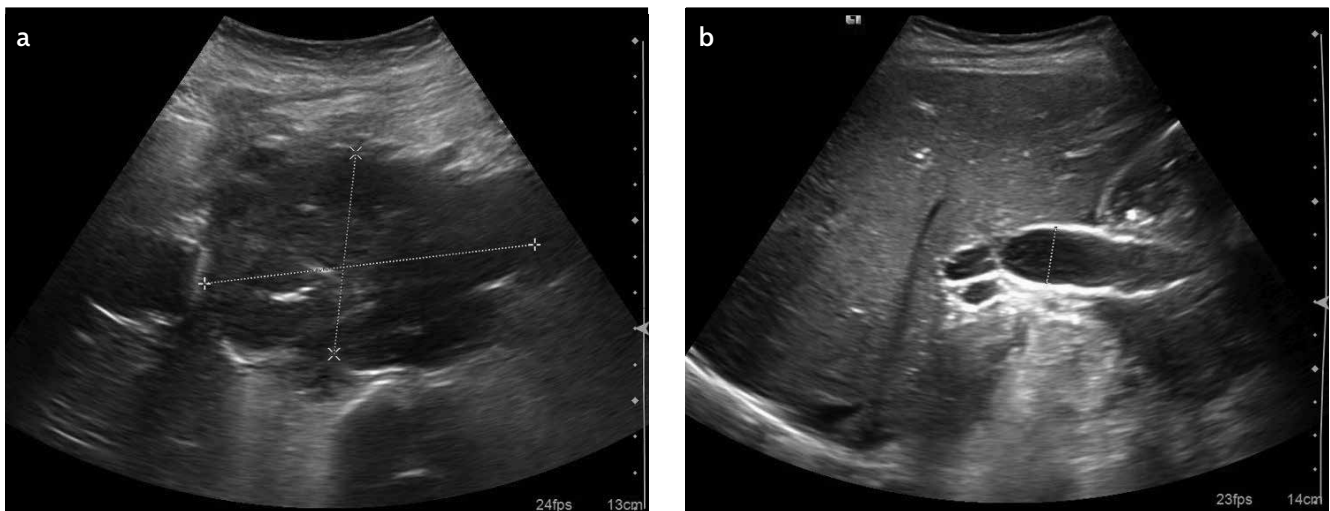


Figure 1. a, b. Abdominal US image of the giant lymphadenopathy mass that compresses the duodenum (a); abdominal US image of the dilated CBD (b)



Figure 2. a-c. EUS imaging of the dilated CBD (a); EUS-guided puncturing of the CBD wall with the tip of the needle located inside the CBD (b); EUS-guided deployment of a Hot AXIOS stent, with the arrow pointing to the distal flange released within the CBD (c)

linear echoendoscope (GF-UCT 180; Hitachi Aloka Pro-Sound F75, Japan), from a bulbar position, upstream of the duodenal stenosis. On EUS imaging, the CBD was easily identified and punctured with a 19 G fine needle aspiration, followed by 10 mL of bile aspiration. Through the needle, a 0.035-inch Jagwire Guidewire was inserted to enable a safe direction for the AXIOS stent. Using cut energy (ERBE ICC 200), a fistulous channel was created, and the distal flange was released and retracted on the CBD wall to allow it to solder with the digestive tract wall, followed by the release of the proximal flange on direct endoscopic view. An efficient biliary drainage was immediately observed. No complications occurred during the procedure (Figure 2).

Consecutively, 2 days after an upper endoscopy was attempted in order to solve the duodenal stenosis. The length of the stenosis was measured using a contrast medium on fluoroscopic view, and a duodenal uncoated 120/22 mm expandable metallic stent (Garson Flextent, Changzhou, China) was then inserted.

On the next day, biological signs significantly reduced bilirubin level to 7 mg/dL, and the feeding process was progressively instated. The patient was followed up on the next month with no stent dislodgment or other complications (Figure 3).

DISCUSSION

ERCP prevails as the main technique for biliary drainage in patients with obstructive jaundice, whereas in case of failure, surgery remains to be the main alternative. However, this alternative is related to frequent complications and eventually leads to external drainage that may be even more uncomfortable for the patient (5). Acute cholangitis represents a major emergency due to risks of bacterial translocation and requires immediate biliary drainage to avoid severe organ damage.

Accessing the BD under EUS guidance is a valid option that was first reported by Giovannini et al. (6). Evolving as a minimally invasive access method for the biliary tract, EUS-BD has been assessed so far in two endoscopic

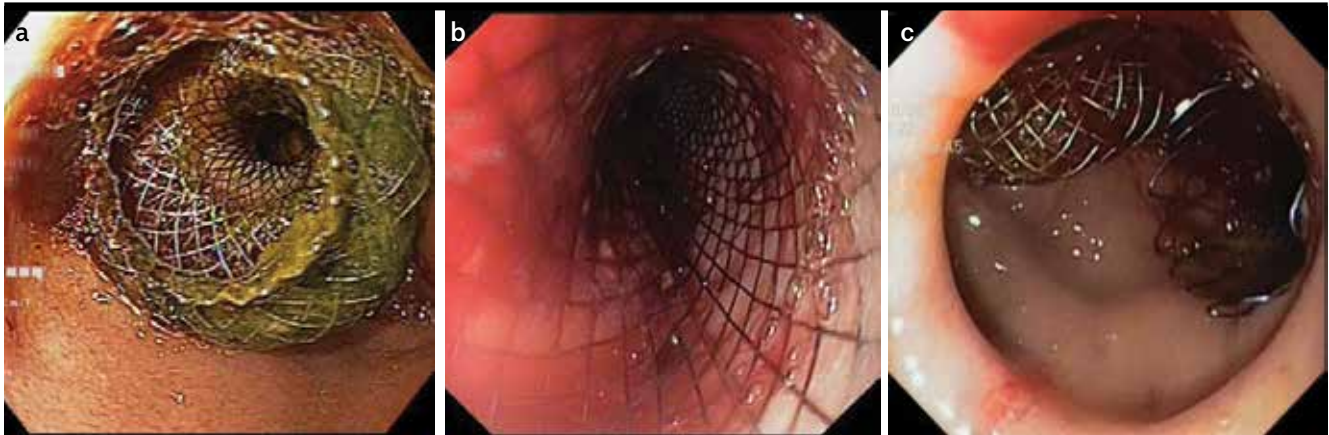


Figure 3. a-c. Direct endoscopic view of the proximal flange of a Hot AXIOS stent (a); direct endoscopic view of the proximal part of the duodenal stent (b); endoscopic view of the double stenting intervention through the pylorus (c)

settings: EUS hepaticogastrostomy and EUS-CDS (7). Theoretically, these procedures may be performed with both plastic and metal stents. In recent years, the newly introduced fully covered self-expandable metallic stent appears to be more effective as it reduces potential risks, such as pneumoperitoneum, cholangitis, stent occlusion, or bile leakage (8).

There are few studies regarding the EUS access of the biliary tract. To our knowledge, a standard technique has not been established yet. A recent meta-analysis comparing EUS approaches, without considering the type of stent used, considers both as efficient, and that they should be selected according to the encountered anatomy (9). Additionally, a multicenter study including 19 patients with malignant disease has used a fully covered LAMS on EUS-CDS with a 95% jaundice improvement 7 days after the procedure (10).

Our case presented with acute cholangitis and required rapid intervention. After excluding ERCP and taking into account that the patient was not eligible for surgery, we created a significant fistulous tract that should be maintained in position. Focusing on the fact that there is an absence of adherences between the bowel and the bile duct, which may generally lead to either bile leakage or pneumoperitoneum when performing the anastomosis, we decided to use the AXIOS stent. EUS-guided procedures with this type of stent have been suggested between the bowel wall and different organs (3,4). The main advantage is the fact that its flanges assure an apposition of both walls, and it also does not require many accessory changes. Furthermore, wall puncturing is performed under EUS imaging to avoid a vascular path or other structures.

Another key feature in this case was the double stenting intervention, biliary and duodenal. The second step, which included duodenal stent insertion, was performed under fluoroscopic guidance with technical success.

With its advantages and challenges, EUS interventions have evolved over the past years to become a growing trend in therapeutic endoscopy. EUS-CDS with a fully covered metal stent is an attractive method and a welcome development in patients where ERCP may not be performed. However, larger cohort studies and new apposing stents should be designed and tested before embedding this technique as a general EUS procedure.

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