



# Using the Rendezvous Technique Through Choledochoduodenostomy for Malignant Biliary Obstruction

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## ABSTRACT

Endoscopic transpapillary biliary stenting via endoscopic retrograde cholangiopancreatography is the preferred therapy for benign and malignant distal biliary obstruction. In cases of failed endoscopic retrograde cholangiopancreatography, endoscopic ultrasound-guided choledochoduodenostomy has been shown to be as effective as percutaneous methods with an improved safety profile. Despite its efficacy, it is complicated by stent occlusion in 9%-26% of cases. To our knowledge, this is the first case in which biliary obstruction was relieved by performing a rendezvous procedure utilizing a pre-existing choledochoduodenostomy.

## INTRODUCTION

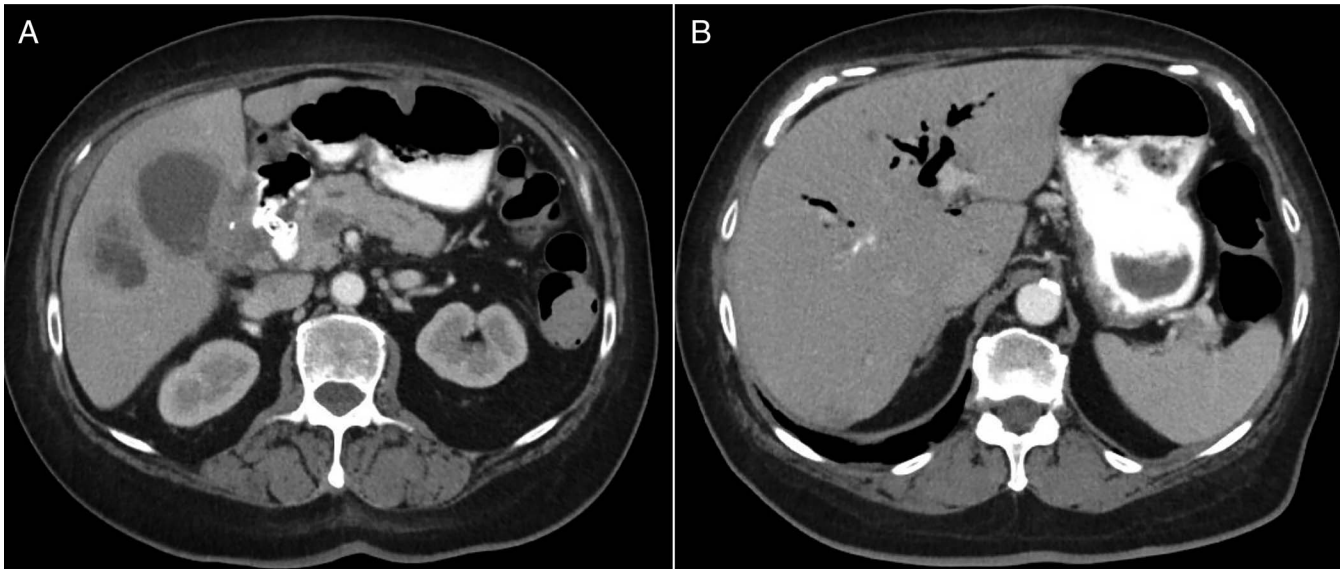
Malignant distal biliary obstruction (MDBO) results from intrinsic or extrinsic bile duct compression by either a primary tumor, commonly pancreatic adenocarcinoma or cholangiocarcinoma, or metastatic disease.<sup>1</sup> Unfortunately, most cases are unresectable at the time of presentation. Therefore, palliation with biliary drainage is often utilized to improve quality of life and reduce the risk of serious complications including cholangitis.

Current guidelines favor endoscopic retrograde cholangiopancreatography (ERCP) for transpapillary biliary drainage.<sup>2</sup> However, this technique can fail when the papilla is inaccessible due to tumor obstruction or altered anatomy. In such cases, percutaneous transhepatic biliary drainage (PTBD) and endoscopic ultrasound-guided choledochoduodenostomy (EUS-CD) serve as alternative management strategies. EUS-CD has demonstrated comparable effectiveness to PTBD while exhibiting lower rates of adverse events, reduced need for reintervention, and improved quality of life without the need for drain management.<sup>1,3-5</sup> Recent multicenter randomized controlled studies, including the ELEMENT trial and DRA-MBO trial, have suggested that EUS-CD be adopted as an alternative first-line therapy for biliary drainage in MDBO given its similar rates of clinical success, technical success, and adverse events to ERCP.<sup>6,7</sup>

Despite the proven efficacy of EUS-CD, stent occlusion remains a challenge, occurring in 9%-26% of cases.<sup>4,8-10</sup> In our case, a novel approach utilized the preexisting CD to perform a rendezvous procedure, successfully relieving biliary obstruction. This technique represents a promising development in the management of cases of EUS-CD complicated by stent occlusion.

## CASE REPORT

A 77-year-old Native Hawaiian woman with metastatic colon cancer with liver, duodenal, and pancreatic metastases on palliative chemotherapy presented with fever, painless jaundice, and vomiting. On presentation, she was febrile at 101 °F and blood pressure was 101/57 mm Hg. Laboratory results showed a white blood cell count of  $17.9 \times 10^3/\mu\text{L}$  (normal  $4.0\text{--}11.0 \times 10^3/\mu\text{L}$ ), procalcitonin of 31.21 ng/mL (normal  $<0.05$  ng/mL), alkaline phosphatase of 551 U/L (normal 32–91 U/L), and total bilirubin of 4.5 mg/dL (normal



**Figure 1.** (A) Unchanged choledochoduodenostomy stent located between the common bile duct and proximal duodenum. (B) Extensive pneumobilia associated.

0.3–1.0 mg/dL). Blood cultures grew *Escherichia coli* and *Enterobacteriales*. Computed tomography demonstrated stable biliary duct dilation with distal obstructive mass.

Endoscopy revealed a known intraluminal malignant duodenal mass in the D1-D2 area infiltrating the ampulla. Although the duodenoscope was able to be passed beyond the mass, ERCP failed because of the difficulty in cannulating the distorted ampulla due to the mass and associated bleeding. EUS showed common bile duct dilation up to 19 mm. EUS-guided rendezvous was attempted unsuccessfully due to difficulty in determining if the guide wire was advancing through the ampulla or tumor. Given the failed ERCP and EUS-guided rendezvous techniques, EUS-CD was then performed with successful placement of an 8 × 8 mm lumen-apposing metal stent (LAMS), facilitating drainage of dark-colored bile. The patient clinically improved, liver enzymes decreased, and she was discharged.

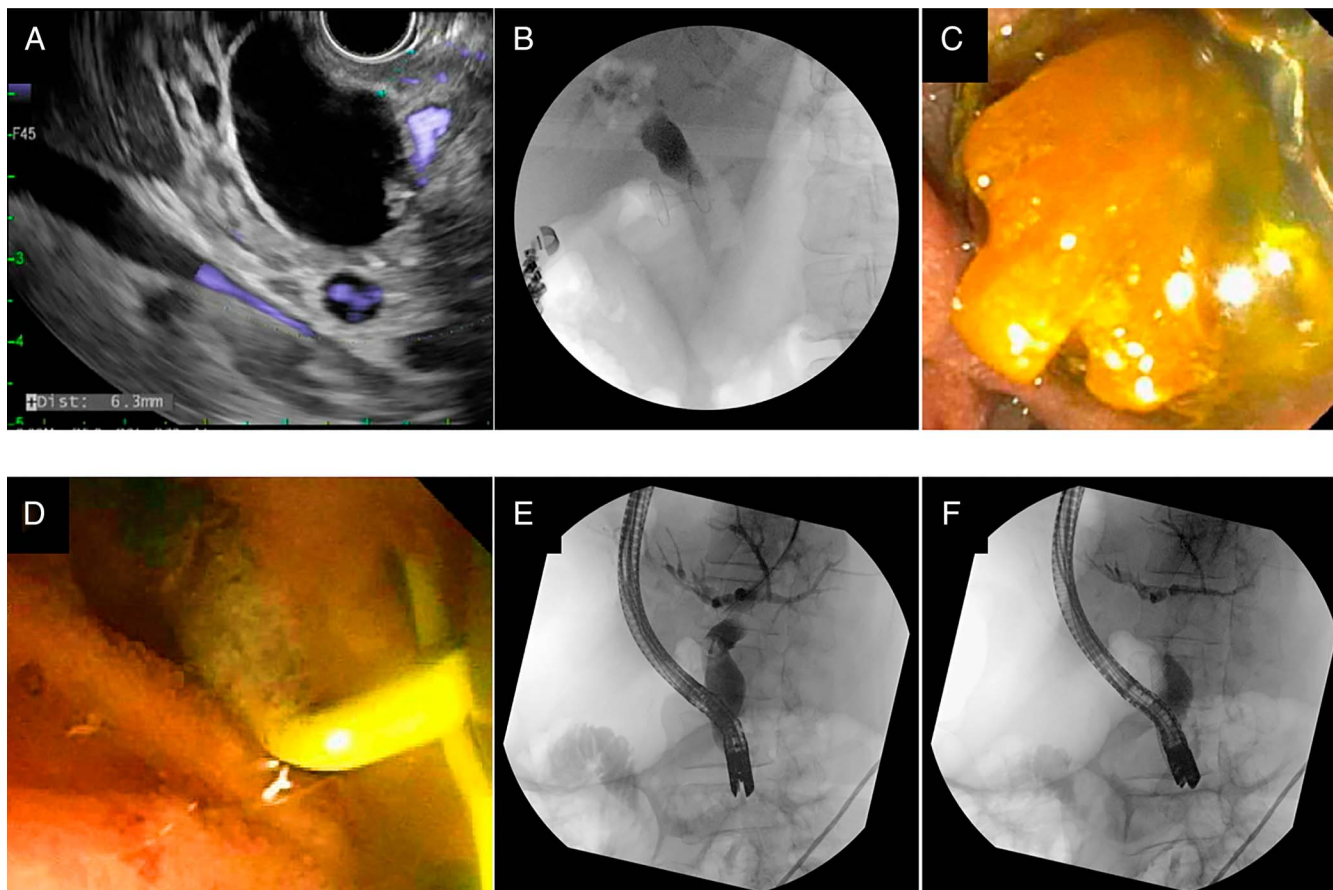
Five months later, she returned with worsening fatigue and elevated liver enzymes in a cholestatic pattern (alkaline phosphatase of 937 U/L from 277 U/L and total bilirubin of 1.3 from 0.8 mg/dL 2 weeks prior). Repeat computed tomography revealed disease progression, and the CD was visualized with associated pneumobilia (Figure 1). Endoscopy using a side-viewing duodenoscope showed CD stent occlusion with food debris. Scout films showed the stent remained in the proper position. CD cannulation was performed, and a guidewire was passed antegrade through the ampulla into the duodenum. Using the wire at the ampulla as a guide, the common bile duct (CBD) was then cannulated using a 0.035-inch guidewire. The antegrade guidewire was subsequently removed, and biliary sphincterotomy was performed. The cholangiogram showed distal CBD stricture with upstream dilation. A 10 mm × 6 cm

uncovered metal stent was placed in the CBD, but the distal part was not maximally flared so a second 10 × 4 mm uncovered metal stent was placed to bridge the distal aspect of the first stent. The CD stent was left in place following the procedure. The liver enzymes subsequently improved, and the patient continued to do well 8 months postprocedure.

## DISCUSSION

EUS-CD, introduced by Giovannini et al in 2001, has emerged as an alternative therapy for relieving MDBO in cases where ERCP fails because of tumor infiltration/inaccessible papilla, surgically altered anatomy, or rarely cannulation failure.<sup>11</sup> EUS-CD typically involves placing tubular plastic stents or covered self-expanding metal stents. However, these were originally designed for transpapillary biliary stenting and therefore have drawbacks when used for EUS-CD. Plastic stents have a small luminal diameter and may be complicated by biliary leakage or stent clogging. Conversely, covered self-expanding metal stents are larger in luminal diameter and are resistant to bile leakage, still they remain prone to migration given their lack of an antimigration system. LAMS, also referred to as an AXIOS stent (Boston Scientific, Natick, MA), has been designed for multiple purposes including biliary drainage, and a recent meta-analysis suggested that it was superior to conventional stents (95% vs 87%, respectively).<sup>12</sup> LAMS, with a dumbbell-shaped design and perpendicular flanges, minimizes migration risk.<sup>8</sup> Despite this advantage, 9%–26% of EUS-CD with LAMS are complicated by stent occlusion, owing at least in part to this dumbbell shape with widened ends that increase the likelihood of stent occlusion.<sup>4,8–10</sup>

In our patient, the EUS-CD was occluded by food debris as shown in Figure 2. Instead of resorting to PTBD, a novel



**Figure 2.** (A) EUS imaging demonstrating CBD. (B) Fluoroscopic view demonstrating successful deployment of lumen-apposing metal stents to complete EUS-CD. (C) Endoscopic view of food debris blocking the CD. (D) Endoscopic view of a wire passing through the CD and coming out of the CBD. (E) Fluoroscopic view of distal CBD stricture with upstream dilation. (F) Fluoroscopic view of CD and successful placement of uncovered metal stent. CBD, common bile duct; CD, choledochoduodenostomy; EUS, endoscopic ultrasound.

approach involved cannulating the CD, guiding a wire through the CBD through a rendezvous approach through the ampulla, and placing 2 stents antegrade without ever cannulating the pancreatic duct. This technique, to our knowledge, represents the first use of its kind in restoring biliary drainage and may prove valuable in managing recurrent biliary obstruction resulting from occluded CD stents.

## DISCLOSURES

**Author contributions:** A. Fiedler is responsible for the overall composition, edits, and submission and is the article guarantor. B. Dhindsa critically revised the manuscript for important intellectual content. B. Dhindsa, I. Bhat, and S. Singh were directly responsible for the patient and managed the clinical case. The authors reviewed and approved the final version of the manuscript.

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