Lumen-apposing metal stents (LAMSs) have gained popularity in a variety of clinical scenarios. Whereas LAMSs were initially used to drain pancreatic fluid collections, several off-label uses have been developed, including EUS-guided access to facilitate ERCP in patients with surgically altered anatomy. The duodenal switch procedure is a bariatric surgical procedure that induces weight loss by combining a sleeve gastrectomy with an intestinal bypass. This procedure renders the ampulla nearly inaccessible to conventional endoscopic access. Alternative options are challenging at best, because surgically assisted ERCP requires small-bowel access for endoscopic entry and balloon-assisted enteroscopy is limited by the long length of the pancreaticobiliary limb and the need for retrograde access, given that the enteroenterostomy is often close to the ileocecal valve. We describe the use of a LAMS to obtain biliary access and facilitate ERCP in a patient with duodenal switch anatomy.

A 70-year-old woman with a history of duodenal switch procedure for the treatment of medically complicated obesity presented to an outside hospital with right upper-quadrant pain and elevated liver chemistry results. CT revealed findings concerning for an ampullary lesion. She underwent percutaneous transhepatic biliary drainage (PTBD) with resolution of the biliary obstruction. Distal bile duct biopsy specimens were obtained by digital single-operator cholangioscopy passed through the PTBD access site. Examination of the biopsy specimens reportedly demonstrated high-grade dysplasia; however, biopsy specimens were unable to be obtained for repeated review. The patient was referred to our institution for additional evaluation and treatment. After repeated cross-sectional imaging and consultation with a hepatobiliary surgeon, additional endoscopic evaluation was recommended because of the ongoing concerns about a distal bile duct mass lesion. Initially, we obtained repeated cholangioscopy-directed biopsy specimens from the distal bile duct using access through the PTBD site; however, histologic evaluation demonstrated chronic inflammation without evidence of malignancy. Given the ongoing concern for malignancy, direct visualization of the ampulla was thought to be necessary (Video 1, available online at www.VideoGIE.org).

Figure 1. Fluoroscopic image demonstrating antegrade passage of the digital single-operator cholangioscope through the percutaneous transhepatic biliary drainage tract to obtain distal bile duct biopsy specimens.

Figure 2. Endosonographic image showing deployment of the lumen-apposing metal stent into the small bowel during creation of the gastroenterostomy.
To aid in creation of the EUS-guided gastroenterostomy, we infused a combination of saline solution, methylene blue, and contrast material through the PTBD catheter to distend and identify the small-bowel lumen of the pancreaticobiliary limb (Fig. 1). A therapeutic channel, linear-array echoendoscope preloaded with an LAMS was advanced to the midbody of the gastric sleeve, where the dilated small bowel was identified. Using the freehand technique, we deployed the cautery-enhanced LAMS under endoscopic and fluoroscopic guidance, creating the gastroenterostomy (Fig. 2). The patient was given a single dose of ampicillin/sulbactam 3 g intravenously. Two weeks later, the patient returned for transgastric ERCP. The therapeutic channel gastroscope was advanced in retrograde fashion in the pancreaticobiliary limb, and the biliary drain was identified exiting the ampulla (Fig. 3). Biliary cannulation was achieved, and the PTBD catheter was removed. An occlusion cholangiogram (Fig. 4) demonstrated no significant pathologic changes at the distal bile duct, and gross visual inspection was unremarkable. Distal bile duct biopsy specimens were obtained with large-capacity forceps. The PTBD catheter was not replaced. The gastroscope was withdrawn, and the LAMS was removed. Histologic evaluation again demonstrated no evidence of malignancy. The patient remains clinically well more than 1 year after the procedure and has no further evidence of biliary obstruction.

In conclusion, patients with duodenal switch anatomy, in whom pancreaticobiliary disease develops, present a unique diagnostic and therapeutic challenge because of the inability to gain easy access to the ampulla. The main technical difficulty in this case was reliably identifying the pancreaticobiliary limb before LAMS placement.
In our case, we were fortunate that we could use the indwelling PTBD catheter to help define the pancreatico-biliary limb. In this patient, EUS-guided gastroenterostomy permitted endoscopic evaluation of the ampulla and fluoroscopic evaluation of the distal bile duct in a minimally invasive fashion.

**DISCLOSURE**

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*Abbreviations: LAMS, lumen-apposing metal stent; PTBD, percutaneous transhepatic biliary drainage.*

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