

# Percutaneous- and EUS-guided gastroenterostomy for malignant afferent limb syndrome

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Malignant afferent limb syndrome (ALS) is a rare adverse event that can occur after pancreaticoduodenectomy. Patients can be seen with a range of clinical conditions, including obstructive jaundice, cholangitis, nonbilious vomiting, and acute abdominal pain.<sup>1</sup> Patients with malignant ALS are often poor surgical candidates.<sup>1</sup> Endoscopic decompression provides a safe and effective alternative to surgical bypass. Here, we report a unique case of malignant ALS, in which we used a pre-existing internal/external biliary drain to assist in creating an EUS-guided gastroenterostomy.

## CASE

A 66-year-old woman was referred to our center for an indeterminate biliary stricture. Initial CT scans were negative for any identifiable mass or lesions. The patient subsequently underwent an ERCP with cholangioscopy, and intraductal biopsy testing revealed a poorly differentiated pancreatic adenocarcinoma. She underwent a pylorus-preserving Whipple procedure. However, because of extensive and underappreciated tumor involvement of the proximal extrahepatic bile duct and the inability to obtain negative frozen section margins to the level of the hepatic duct confluence, the hepaticojejunostomy was created with a margin-positive bile duct.

Consequently, the patient developed a bile leak requiring a percutaneous internal/external biliary drain. A high-grade stricture of the hepaticojejunostomy, presumably from residual tumor, precluded removal of the percutaneous biliary drain. Hence, the patient required serial drain exchanges and upsizes. One year later, the patient presented with severe abdominal pain, nonbilious vomiting, fatigue, and malaise. CT images (Fig. 1) demonstrated an obstructed afferent limb at the level of the biliary-enteric anastomosis. The decision was made to pursue an endoscopic decompression (Video 1, available online at [www.VideoGIE.org](http://www.VideoGIE.org)).

## PROCEDURE

First, an endoscope was used to identify the obstructed segment of the afferent limb (Fig. 2A). This was not traversed. We injected a mixture of saline solution,

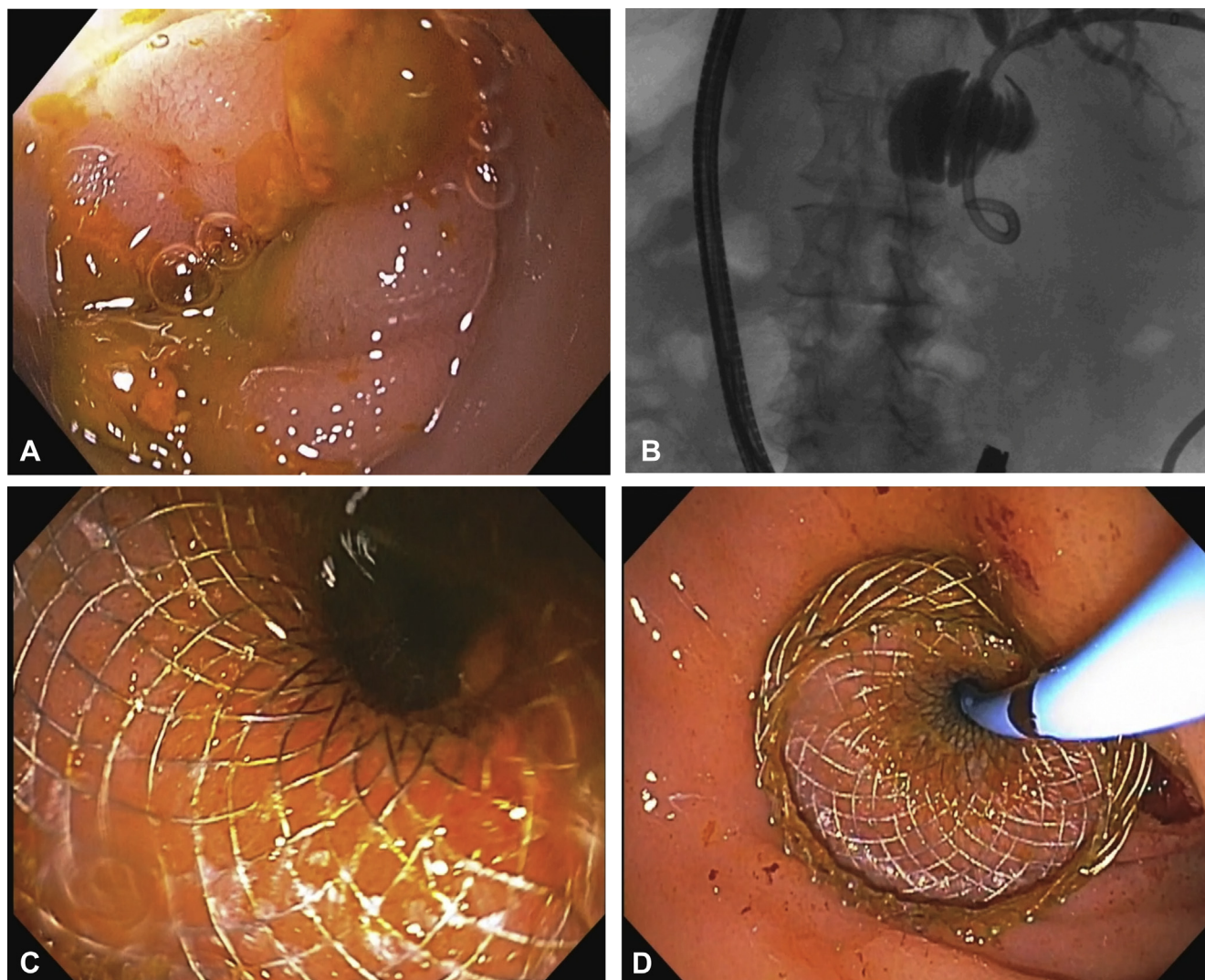
contrast, and methylene blue through the biliary drain into the afferent limb. Although a small amount of methylene blue was seen distal to the obstruction, contrast was stagnant on fluoroscopy (Fig. 2B). The decision was made to create an EUS-guided gastroenterostomy. We used a linear echoendoscope and a transgastric approach to identify the distended afferent limb. A 19-gauge FNA needle was used to puncture the loop of intestine, and frank bile was aspirated. The 19-gauge needle was then exchanged for a cautery-enhanced lumen-apposing metal stent, which was successfully deployed. Immediate biliary drainage was noted (Fig. 2C). To prevent food obstructing the lumen of the lumen-apposing metal stent, a double-pigtail stent was also inserted (Fig. 2D).

## OUTCOME

The procedure was successful, and the patient was discharged on the subsequent day after resolution of her symptoms. Four weeks later, the percutaneous biliary drain was removed and exchanged for a fully covered internal metal biliary stent. Repeat CT scans (Fig. 3) demonstrated durable decompression and significant pneumobilia.



**Figure 1.** CT scan during initial diagnosis demonstrating obstruction of afferent limb.



**Figure 2.** **A**, Endoscopic view of the obstructed segment of the afferent limb. **B**, Fluoroscopic view of the injection of methylene blue contrast into the afferent limb via the biliary drain. **C**, Endoscopic view of the deployment of the lumen-apposing metal stent. **D**, Placement of a double-pigtail stent through the lumen-apposing metal stent to mitigate occlusion from food.

## DISCUSSION

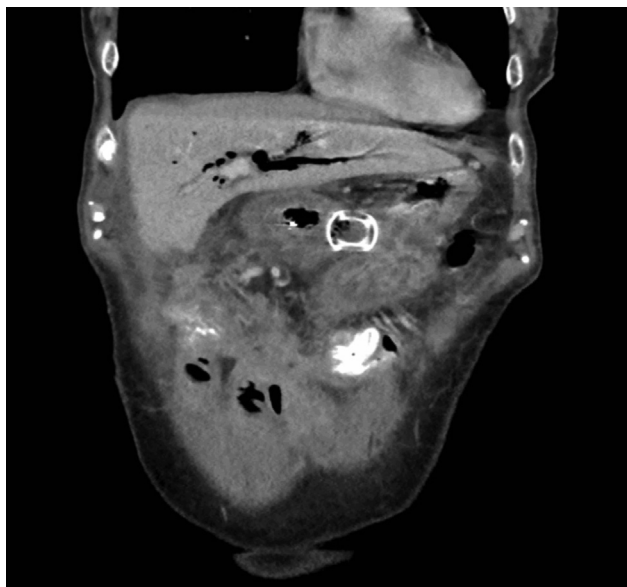
EUS-guided gastroenterostomy is an effective therapy for malignant ALS. Several case reports have demonstrated the efficacy of endoscopic self-expanding metal stent placement as a therapeutic strategy among these patients.<sup>2-4</sup> However, as demonstrated by our case, in patients with complete or even partial obstruction, enteral stent placement may not be optimal. In such patients, when surgery poses a significant risk of morbidity, construction of a gastroenterostomy using a lumen-apposing

metal stent is an efficacious option. Unique to our case, the use of an existing internal/external biliary drain to opacify and distend the afferent limb augmented the technical success of this procedure.

## DISCLOSURE

*Dr Smith is a consultant for US Endoscopy. All other authors disclosed no financial relationships.*

*Abbreviation: ALS, afferent limb syndrome.*



**Figure 3.** CT scan 30 days after stent deployment demonstrating durable decompression and pneumobilia.

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