ORIGINAL ARTICLE

# Same-session EUS-directed transgastric interventions: from tissue acquisition to choledochoduodenostomy

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## BACKGROUND

Endoscopic treatment of biliopancreatic diseases in patients with altered anatomy is still challenging, and EUS-directed transgastric intervention (EDGI) represents a valid option for patients with altered anatomy, especially for those who have undergone bariatric surgery. EDGI consists of re-creating a connection between the gastric pouch and the excluded stomach using a lumen-apposing metal stent (LAMS) to reach the pancreatobiliary area.[1] Then, through the LAMS, a broad range of diagnostic and therapeutic endoscopic procedures can be performed, including ERCP (EUS-directed transgastric ERCP [EDGE]). Although the feasibility and the efficacy of EDGI has been demonstrated,[2] it is still unclear how to optimize the technical efficacy and increase the safety of this challenging procedure. Above all, whether all the procedures should be done in 2 different sessions or during the same one is still an object of debate because of the risk of LAMS migration. To date, there are several reports about the same-session EDGE procedure, at least using fixing devices. However, few data are available regarding same-session EUS-guided interventional procedures, which may have the advantage of using the echoendoscope for the entire procedure and avoiding multiple passages through the LAMS. Here we describe a case of same-session EDGI procedures that include an EUS-guided tissue acquisition and biliary drainage.

## CASE PRESENTATION

A 56-year-old woman with a history of obesity, treated with a single-anastomosis gastric bypass in 2016, was admitted to our hospital for sudden onset of jaundice, abdominal pain, and itch. Biochemistry revealed high levels of bilirubin and CA 19-9 (Table 1). Magnetic resonance imaging and MRCP showed a hypointense irregular mass of pancreatic head (maximum diameter of 30 mm) with duodenal infiltration and dilation of intrahepatic and extrahepatic biliary ducts, with a common bile duct of 20 mm (Figs. 1 and 2); multiple liver metastases were also documented. The patient was excluded from a percutaneous tissue sampling because of the small dimensions of the liver metastases; therefore, because of the presence of incoercible itch, she was referred for endoscopic tissue acquisition and biliary drainage. In the case of altered anatomy and Roux-en-Y gastric bypass, numerous methods of access to the excluded stomach are possible, although these methods are generally burdened by adverse events (AEs) and suboptimal success. Possible methods are device-assisted enteroscopy, laparoscopic-assisted transgastric endoscopy, and EUS-guided antegrade therapy with hepaticogastrostomy. EDGI represents a novel and safe option for these patients if practiced with expert hands.

### Endoscopic procedure

The procedure was performed with the patient under general anesthesia, using a therapeutic linear echoendoscope (EG-58OUT; Fujifilm, Milan, Italy) (Video 1, available online at www.videogie.org). Preoperative quinolones–based antibiotic prophylaxis was administered. The papilla of Vater was not reachable owing to the altered anatomy. Because the patient needed a pathologic diagnosis of the pancreatic mass and concomitant jaundice relief, we decided to perform a same-session EDGI procedure: the excluded stomach was identified, punctured with a 19-gauge needle (Expect Slimline; Boston Scientific, Marlborough, Mass, USA), and dilated, with injection of 300 mL of saline and contrast (Fig. 3). Under EUS and fluoroscopic guidance, a fistula was created between the gastric pouch and the excluded stomach using a 20- × 10-mm LAMS. The LAMS was then dilated to 20 mm, and no fixation was performed (Fig. 4). Then, through the LAMS, the echoendoscope was advanced into the gastric antrum, and a balloon dilation of the pylorus was needed to reach the duodenal bulb.

A hypoechoic mass of the head of the pancreas was visualized. The pancreatic lesion showed a predominantly blue pattern with small green areas at qualitative elastography assessment; this finding was consistent with the suspected

*Abbreviations: AE, adverse event; EDGE, EUS-directed transgastric ERCP; EDGI, EUS-directed transgastric intervention; LAMS, lumen-apposing metal stent.*



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**TABLE 1. Trend of biochemical test at admission and after the procedure**

| Biochemistry | Admission | One week after EDGI | One month after EDGI |
|---|---|---|---|
| Total bilirubin (mg/dL) | 10.4 | 6.4 | 1.2 |
| Conjugated bilirubin (mg/dL) | 8.3 | 5.6 | 1 |
| GGT (U/L) | 142 | 138 | 215 |
| ALP (U/L) | 427 | 306 | 393 |
| CA 19-9 (mcg/L) | 828 | NA | 9655 |

*ALP*, Alkaline phosphatase; *EDGI*, EUS-directed transgastric intervention; *GGT*, gamma-glutamyl transferase; *NA*, not applicable.

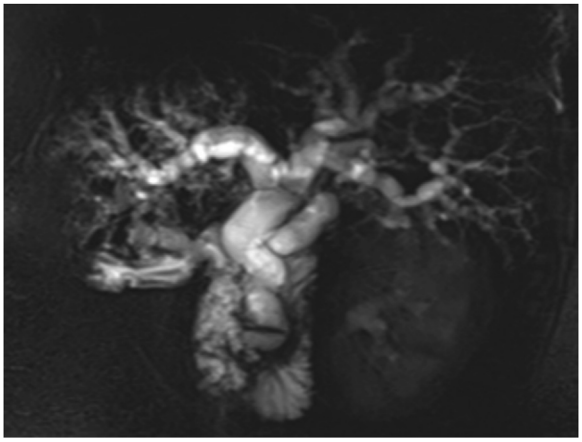

**Figure 1.** Severe dilation of biliary tree.

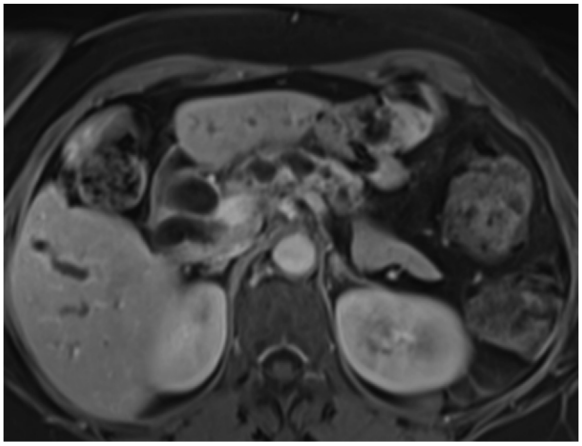

**Figure 2.** Dilation of the main pancreatic duct.

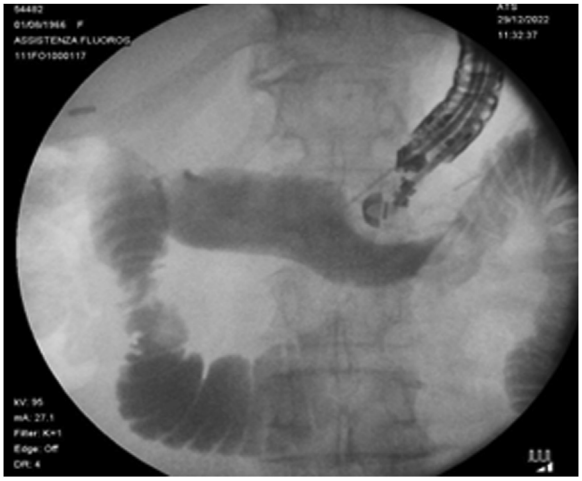

**Figure 3.** Puncture and irrigation of the excluded stomach.

**Figure 4.** Pneumatic dilation of lumen-apposing metal stent.

malignant pancreatic cancer. Tissue sampling was performed using a 22-gauge Franseen-tip needle (Acquire; Boston Scientific). After 3 needle passages, macroscopic on-site evaluation was considered adequate for pathologic diagnosis. Because of the rigidity of the duodenum owing to tumor infiltration and the advanced stage of the diseases, we decided to perform an EUS-guided choledochoduodenostomy, without attempting ERCP. Under EUS view, the common bile duct was dilated to 20 mm, and after the exclusion of interposed vessels, a 6- × 8-mm LAMS (Boston Scientific) was deployed, obtaining adequate biliary drainage. The final fluorography documented both LAMSs correctly positioned (Fig. 5). The total procedure duration time was 50 minutes. No AEs occurred during the procedure. Figure 6 shows EUS-directed transgastric interventions with EUS-guided choledochoduodenostomy.

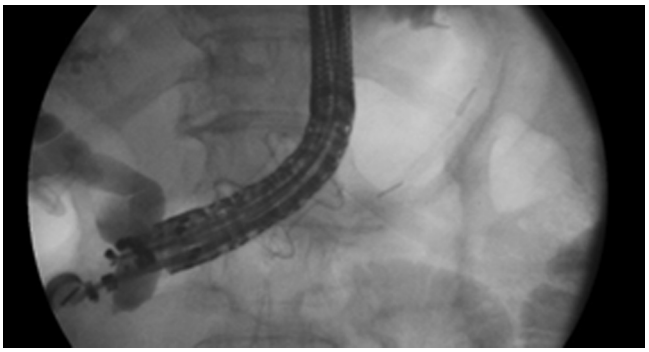

**Figure 5.** Deployment of double lumen-apposing metal stent.

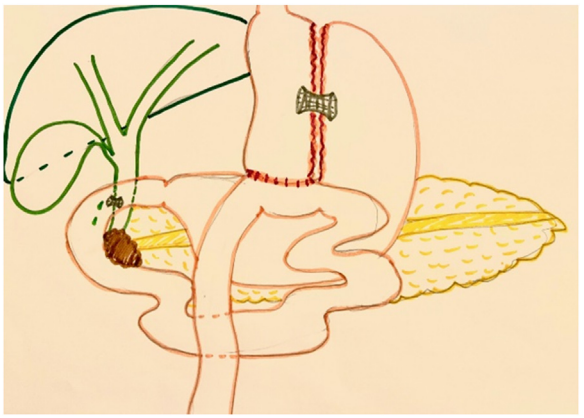

**Figure 6.** EUS-directed transgastric interventions with EUS-guided choledochoduodenostomy.

## Follow-up

The patient did not experience procedure-related late AEs, and she was discharged after 3 days. EUS-guided biopsy confirmed the diagnosis of pancreatic duct adenocarcinoma, and the patient started chemotherapy 20 days later. Because the patient experienced a weight loss due to the diseases, the transgastric LAMS was left in place, as we aimed to maintain an open route in case of the need for future reinterventions. At 90 days of follow-up, the patient is asymptomatic and continues chemotherapy; she did not experience procedure-related AEs, and she had complete resolution of pruritus. No stent disfunction has been observed during follow-up.

## CONCLUSIONS

To our knowledge, this is the first video case of same-session EDGI from tissue acquisition to choledochoduodenostomy. In our opinion, EDGI is effective and safe. Same-session EDGI allows quick jaundice and symptom resolution and earlier initiation of chemotherapy, and in our experience, it does not increase AEs. Pyloric dilation might be helpful to facilitate the progression of the scope and reach the duodenum through the LAMS.

## DISCLOSURE

Dr Binda is a paid lecturer for Boston Scientific, Steris, Q3 Medical, and Fujifilm. The other authors disclosed no financial relationships relevant to this publication.

## REFERENCES

1. Kedia P, Kumta NA, Widmer J, et al. Endoscopic ultrasound-directed transgastric ERCP (EDGE) for Roux-en-Y anatomy: a novel technique. Endoscopy 2015;47:159-63.
2. Ghandour B, Shinn B, Dawod QM, et al. EUS-directed transgastric interventions in Roux-en-Y gastric bypass anatomy: a multicenter experience. Gastrointest Endosc 2022;96:630-8.