GI lipomas are rare, benign, submucosal tumors that are usually asymptomatic. The most common location for these lesions is the colon (64%), whereas duodenal lipomas account for only 4% of GI lipomas. Large lipomas (>2-4 cm) may cause symptoms such as bleeding, abdominal pain, obstruction, or intussusception. They typically present as a smooth, slightly yellow, rounded polyp, with a stalk or a broad-based attachment. Diagnosis can be confirmed by EUS, CT scan, or magnetic resonance imaging. There is no standardized treatment for symptomatic lipomas, and both surgical and endoscopic approaches have been described, depending on the size and location of the lesion and on the availability of advanced endoscopic techniques.

Lipomas with a long and thin stalk are suitable for snare resection. For larger lesions, snare resection should be performed with caution because the adipose tissue is an inefficient conductor of electric current, and prolonged cutting may lead to perforation. A more conservative approach is the unroofing technique, which consists of opening the superior half of the lipoma with a snare. Then it is possible to either leave the contents exposed or remove the adipose tissue with a snare or biopsy forceps. This technique is safe and easy; however, it may fail in cases with a large or long stalk and has a high rate of recurrence. Lately, there is a trend to remove lipomas by placing a detachable loop at their base. This technique leads to ischemia and shedding of the tumor a few days later. Application of the “loop and let go technique” eliminates the risk of perforation or bleeding. For lipomas with a broad base, where the placement of an endoloop is not feasible, a variety of endoscopic submucosal dissection (ESD)-derived techniques can be applied, such as circumferential incision and placement of an endoloop, standard ESD, or submucosal tunneling endoscopic resection (STER). The main advantage of STER compared with ESD is that the site of resection is covered by intact overlying mucosa; thus, in case of muscular damage or perforation, the site of the resection is sealed. However, the application of STER has been described for sessile lesions <3 to 4 cm, located in the esophagus, gastric body, and antrum. There is only 1 published report of STER in the duodenum for a small submucosal tumor. In this video production (Video 1, available...
online at www.VideoGIE.org), we present step by step resection of an obstructive duodenal and colonic lipoma by means of STER and ESD, respectively.

**PATIENT 1: STER FOR DUODENAL LIPOMA**

A 35-year-old man presented with a 6-month history of postprandial epigastric pain and nausea. Gastroscopy revealed a 3-cm soft subepithelial mass that originated from the duodenal bulb and prolapsed into the antrum (Figs. 1 and 2). EUS showed a hyperechoic homogenous mass that originated from the submucosal layer of the duodenum, consistent with a lipoma. The mass had a broad base, preventing the application of endoscopic loop ligation, so the STER technique was applied. A mixture of hydroxyethyl starch (500 mL) with methylene blue (1 mL) and epinephrine (1 mg) was injected above the pylorus. Thereafter, a horizontal incision was made with a needle-type knife (DualKnife® 1.5 mm; Olympus, Tokyo, Japan) (Fig. 3). Then, a submucosal pocket was created at the lesser curvature of the antrum and was extended all along the length of the superior wall of the duodenal bulb. The anatomic landmark of the pyloric ring was identified at the beginning of the tunnel. The endoscope was advanced between the superior pole of the lesion and the duodenal wall. When necessary, additional submucosal injection of normal saline solution was performed with the knife. Dissection of the superior part of the lesion was followed by dissection of the left and right lateral borders.

Dissection of the inferior (Fig. 4) and posterior part of the lesion was achieved with a blunt-tip knife (ITKnife...
nano; Olympus) to diminish the risk of perforation resulting from poor visualization or from tangential access. In addition, a tapered tip cap (ST Hood; Fujifilm, Tokyo, Japan) was used to push the endoscope into the tight space between the mass and the underlying duodenal mucosa. The ceramic tip of the knife was gently pushed into the loose submucosal tissue, and then it was moved laterally or pulled toward the endoscope. Finally, the lesion was completely resected (Fig. 5), and the specimen was retrieved with a basket. Inspection of the duodenal bulb showed a bluish discoloration of the superior duodenal wall that corresponded to the inferior wall of the tunnel. Examination of the submucosal tunnel did not show any sign of perforation. At the end of the procedure, small incisions were made around the edges of the entrance of the tunnel. These superficial defects allowed clip grip for traction and apposition. The mucosal defect was partially closed by using 2 clips. Complete closure was achieved with additional clips (Fig. 6). The patient was discharged after 24 hours and had an uneventful recovery. At 10 months of follow-up, the patient remained asymptomatic, and endoscopy showed a smooth passage of the gastroscope to the duodenum.

PATIENT 2: ESD FOR COLONIC LIPOMA

The second patient was a 50-year-old woman with a 2-year history of intermittent abdominal pain. Colonoscopy disclosed a lipoma of the transverse colon that partially obstructed the bowel lumen (Fig. 7). Owing to the broad base of the lesion, we decided to proceed to ESD. Coagulation dots were placed 5 mm distally to the base of the lesion to avoid injury of the muscle layer. A mixture of hydroxyethyl starch, methylene blue, and epinephrine was used for submucosal injection. Thereafter, the anterior part of the stalk was incised and dissected (FlushKnifeBT 1.5 mm; Fujifilm). Dissection was relatively easy because of the absence of large vessels. Gradually, a yellow submucosal mass emerged from the submucosal space. Incision of the posterior part of the lipoma was performed with the patient in a retroflexed position. Eventually, the entire lesion was dissected (Figs. 8 and 9). At the end of the procedure the artificial ulcer was closed with hemostatic clips. The patient had an uneventful recovery and remained asymptomatic at follow-up 2 months later.

In conclusion, this video presents the application of STER and ESD in the resection of symptomatic broad-based GI lipomas. This technique could be applied for selected cases of lipoma when the placement of a detachable loop is not technically feasible.
DISCLOSURE

All authors disclosed no financial relationships relevant to this publication.

Abbreviations: ESD, endoscopic submucosal dissection; STER, submucosal tunneling endoscopic resection.

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