VIDEO CASE REPORT

Endoscopic submucosal dissection and submucosal tunneling endoscopic resection for obstructive lipomas of the foregut and hindgut

Georgios Mavrogenis, MD,[1] Fateh Bazerbachi, MD,[2] Ioannis Tsevgas, MD,[3] Dimitrios Zachariadis, MD[3]

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.[1] Large lipomas (>2-4 cm) may cause symptoms such as bleeding, abdominal pain, obstruction, or intussusception.[1-16] 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[16] and endoscopic approaches have been described,[1-15] 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.[3] A more conservative approach is the unroofing technique,[3] 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[3] and has a high rate of recurrence.[2] Lately, there is a trend to remove lipomas by placing a detachable loop at their base.[2,4,5] 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,[6] standard ESD,[7-12] or submucosal tunneling endoscopic resection (STER).[13-15,17] 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.[14] In this video production (Video 1, available

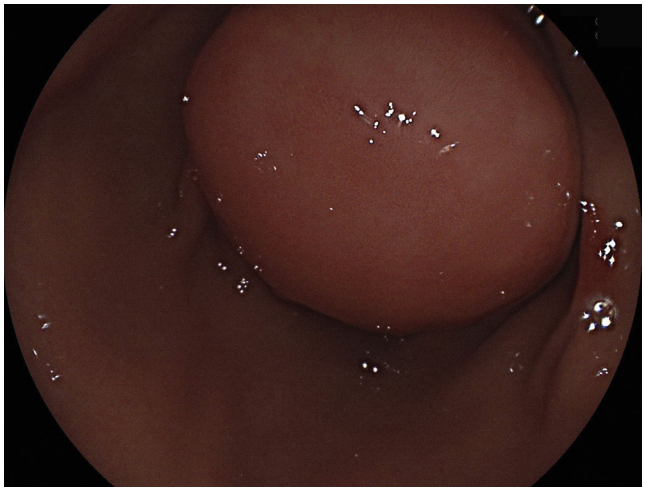

Figure 1. Submucosal mass of the antrum obstructing the passage toward the bulb in Patient 1.

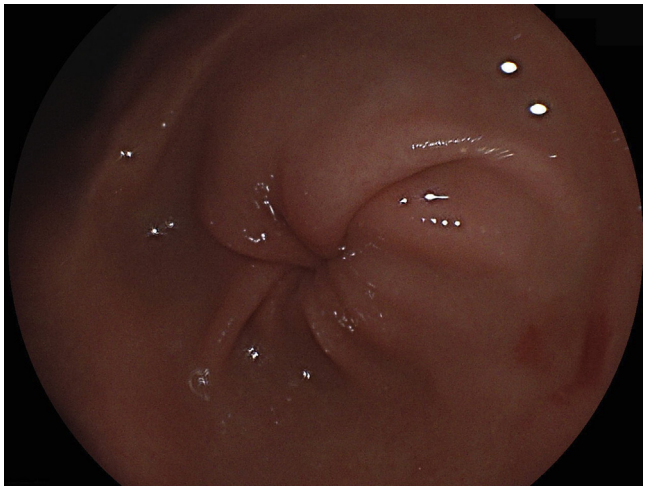

Figure 2. The lesion was mobile and moved between the bulb and the antrum in Patient 1.

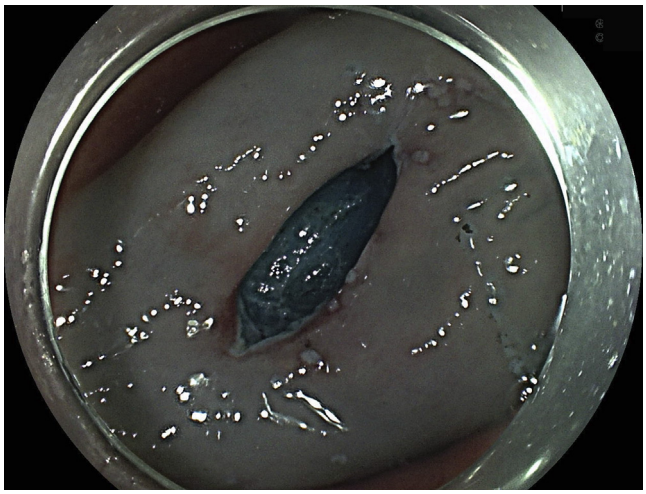

Figure 3. Creation of an entrance at the lesser curvature of the antrum close to the pylorus in Patient 1.

Figure 5. Resected specimen from Patient 1.

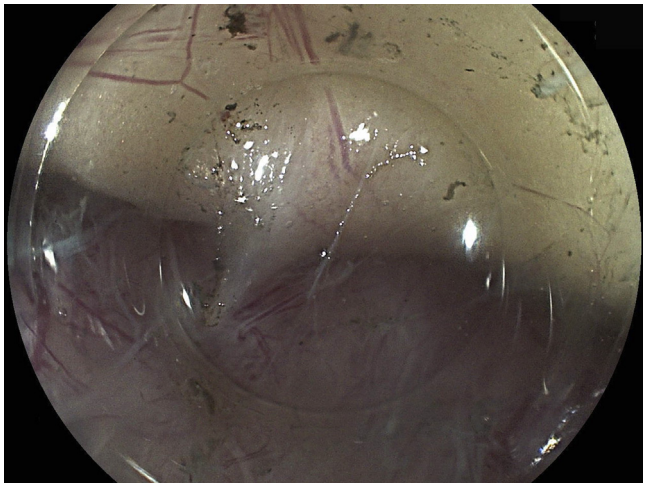

Figure 4. Progressive enucleation of the lipoma in Patient 1.

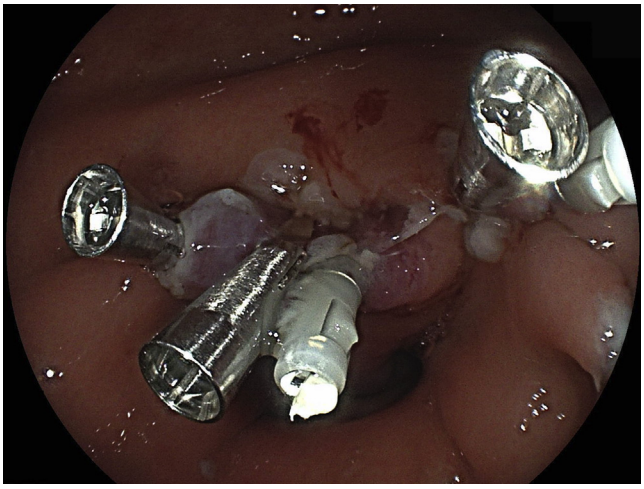

Figure 6. Closure of the entrance in Patient 1.

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 (DualKnifeJ 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

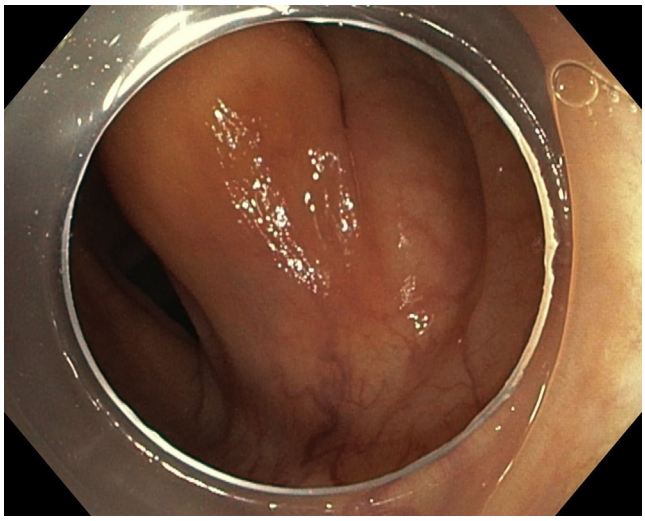

Figure 7. Lipoma of the transverse colon in Patient 2.

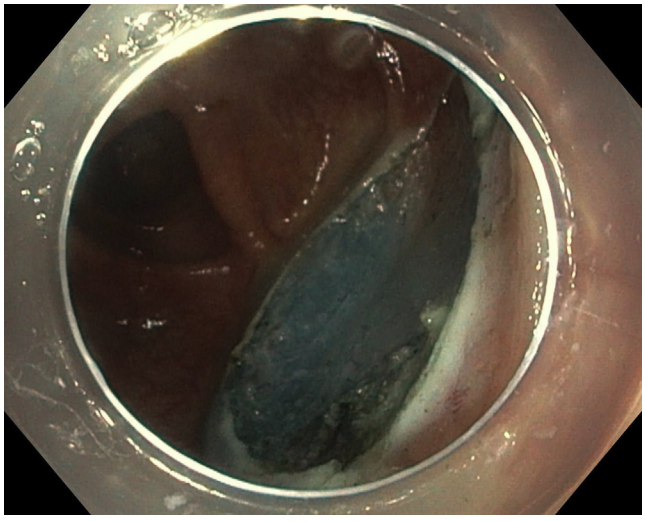

Figure 8. En bloc resection in Patient 2.

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.

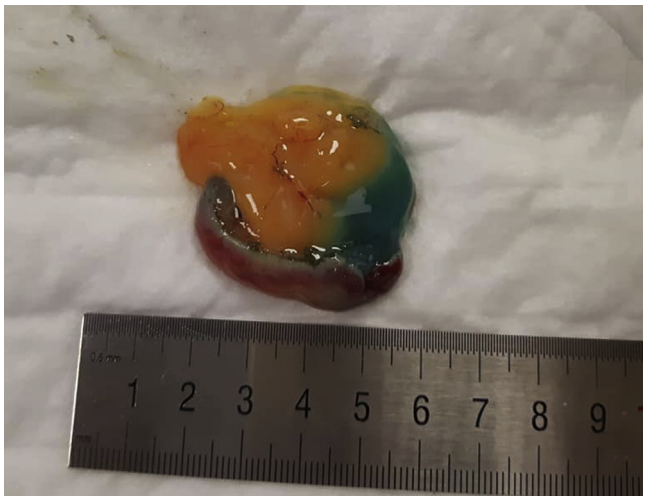

Figure 9. Resected specimen from Patient 2.

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.

REFERENCES

1. Wu C, Yang JF, Tan Q, et al. En bloc resection of a large symptomatic duodenal lipoma by endoscopic submucosal dissection. VideoGIE 2017;2:182-4.
2. Lee KJ, Kim GH, Park DY, et al. Endoscopic resection of gastrointestinal lipomas: a single-center experience. Surg Endosc 2014;28:185-92.
3. Lorenzo D, Gonzalez JM, Benezech A, et al. Endoscopic resection of giant GI lipoma: a case series. VideoGIE 2016;1:43-6.
4. Lee S-H, Park J-H, Park DH, et al. Endoloop ligation of large pedunculated submucosal tumors (with videos). Gastrointest Endosc 2008;67:556-60.
5. Ivekovic H, Rustemovic N, Brkic T, et al. Endoscopic ligation ("loop-and-let-go") is effective treatment for large colonic lipomas: a prospective validation study. BMC Gastroenterol 2014;14:122.
6. Agarwal A, Chen YI, Bukhari M, et al. Endoscopic resection of gastric lipoma with a hybrid technique of unroofing and loop ligation. VideoGIE 2017;2:172-3.
7. Lee JM, Kim JH, Kim M, et al. Endoscopic submucosal dissection of a large colonic lipoma: report of two cases. World J Gastroenterol 2015;21:3127-31.
8. Aslan F, Akpinar Z, Cekic C, et al. En bloc resection of a 9 cm giant gastro-duodenal lipoma by endoscopic submucosal dissection. Dig Liver Dis 2015;47:88-9.
9. Ichinose M, Hikichi T, Kanno Y, et al. A case of gastric lipoma resected by ESD with difficulty in preoperative diagnosis. Fukushima J Med Sci 2017;63:160-4.
10. Ingason AB, Theodors A, Agustsson AS, et al. Giant gastric lipoma successfully remoed by ESD: case report and systematic review. Scand J Gastroenterol 2018;53:1018-4.
11. Noda H, Ogasawara N, Tamura Y, et al. Successful ESD of a large terminal ileal lipoma. Case Rep Gastroenterol 2016;10:506-11.
12. Lee JM, Kim JH, Kim M, et al. Endoscopic submucosal dissection of a large colonic lipoma: report of two cases. World J Gastroenterol 2015;21:3127-31.
13. Xie H, Zhang H, Wang X, et al. Submucosal tunneling and endoscopic resection of a huge gastric lipoma. Am J Gastroenterol 2017;112:1219.
14. Chiu PWY, Yip HC, Teoh AYB, et al. Per oral endoscopic tumor (POET) resection for treatment of upper gastrointestinal subepithelial tumors. Surg Endosc. Epub 2019 Jan 2.
15. Aihara H, Storm AC, Thompson CC. Successful removal of an esophageal submucosal tumor by the submucosal tunneling endoscopic resection technique. VideoGIE 2016;1:2-3.
16. Cappell MS, Stevens CE, Amin M. Systematic review of giant gastric lipomas reported since 1980 and report of two new cases in a review of 117110 esophagogastroduodenoscopies. World J Gastroenterol 2017;23:5619-33.
17. Mavrogenis G, Ntourakis D, Tsevgas I, et al. Submucosal pocket-assisted enucleation of gastric submucosal lesions. Ann Gastroenterol 2017;30:466.

Department of Gastroenterology, Mediterraneo Hospital, Athens, Greece (1); Department of Gastroenterology, Mayo Clinic, Rochester, Minnesota, USA (2); Department of Gastroenterology, Mediterraneo Hospital, Athens, Greece (3).

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