

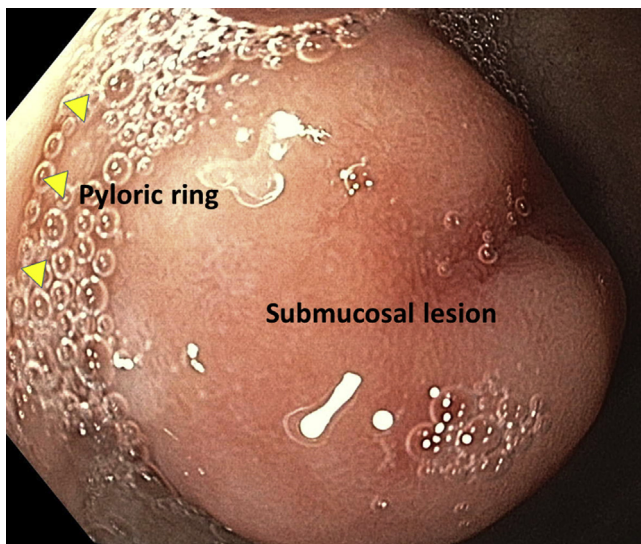


## Endoscopic submucosal dissection of a large duodenal neuroendocrine tumor adjacent to the pyloric ring

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Endoscopic submucosal dissection (ESD) in the duodenum is technically difficult because of the thinner duodenal wall and poor maneuverability of the endoscope resulting from the sharp angulation of the duodenum.<sup>1</sup> Although well-differentiated nonfunctional duodenal neuroendocrine tumors (NETs) that are limited to the mucosa/submucosa,  $\leq 10$  mm, can be endoscopically removed, the optimal management of duodenal NETs 10 to 19 mm is still controversial. Published studies have reported the utility of ESD for removal of duodenal NETs measuring  $\leq 10$  mm in

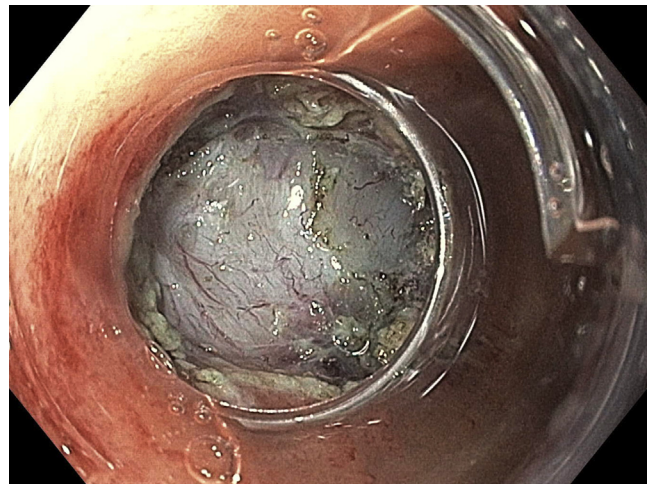
diameter. Reports on treatment with ESD for tumors  $>10$  mm in size are very limited.<sup>2-5</sup> Here, we report the case of a large submucosal lesion in the duodenal bulb that was adjacent to the pyloric ring. The saline solution immersion technique and a short-type small caliber-tip transparent hood cap were used, which helped us to successfully expose the narrow submucosal space and open the cutting edge of the mucosa (Video 1 available online at [www.VideoGIE.org](http://www.VideoGIE.org)).



**Figure 1.** 1.5-cm subepithelial duodenal lesion in the anterior wall of the duodenal bulb, located within 1 to 2 mm from the pyloric ring.



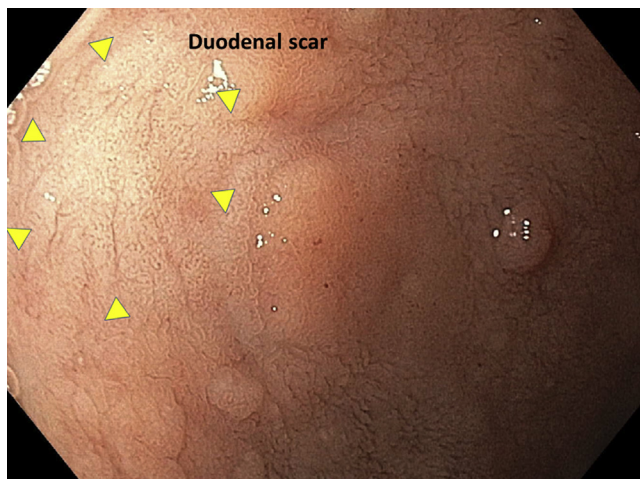
**Figure 2.** EUS view showing a 15.5- x 11.8-mm hypoechoic lesion in the duodenal bulb arising from the submucosal layer.



**Figure 3.** Mucosal defect after endoscopic submucosal dissection showing no evidence of perforation or bleeding.



**Figure 4.** Resected specimen measuring 1.5 cm in diameter.



**Figure 5.** Repeated endoscopic view at 6-month follow-up visit showing a well-healed duodenal scar in the previously performed endoscopic resection site.

A 62-year-old man who was morbidly obese (body mass index 62), with multiple comorbid conditions, was found to have a 1.5-cm subepithelial duodenal lesion in the anterior wall of the duodenal bulb, within 1 to 2 mm from the pyloric ring, during surveillance endoscopy for Barrett's esophagus (Fig. 1). EUS showed a 15.5- × 11.8-mm hypoechoic lesion in the duodenal bulb arising from the submucosal layer (Fig. 2). Pathologic examination showed a well-differentiated NET. CT of the abdomen and pelvis with intravenous contrast material did not show any evidence of lymph node involvement or distant metastasis. After multidisciplinary discussion, the recommendation was to attempt endoscopic resection because of the patient's underlying medical comorbidities. He underwent an attempted EMR, which was aborted because of nonlifting, and the patient was referred for advanced endoscopic resection. Because of the larger size and location of the lesion, the use of close-then-cut endoscopic full-thickness resection such as with a full-thickness resection device, in which the large over-the-scope clip could have potentially closed the pylorus and caused pyloric stricture, a decision was made to pursue ESD.

The procedure was performed with the patient under general anesthesia. The area around the lesion was injected with a mixed solution of hetastarch and methylene blue. ESD was technically challenging, given that the proximal end of the lesion was in close proximity to the pylorus and the narrow submucosal space. The mucosal incision was started from the proximal site of the lesion with the use of a 1.5-mm DualKnife (Olympus America, Center Valley, Pa, USA). Using a short-type ST hood (Fujifilm Co, Tokyo, Japan) and saline solution immersion technique, we successfully exposed the narrow submucosal space, and a hook knife was used to allow precise dissection and avoid muscle injury. The tumor was completely dissected from the duodenal wall in en bloc fashion (Fig. 3). No muscular injury was noted.

The resected specimen measured 1.5 cm in diameter (Fig. 4). The total procedural time was 90 minutes. The patient was admitted for observation, and the postprocedural course was uneventful. He was discharged on a 4-week course of proton pump inhibitor.

The final pathologic analysis showed a well-differentiated NET (World Health Organization grade 1) involving the duodenal submucosa, without lymphatic invasion. There was an area of cautery artifact. Otherwise, the margins were negative for neoplasm. Ki-67 showed a low proliferation index within the tumor cells (<3%). Repeated endoscopy 6 months later showed a well-healed duodenal scar, and the biopsy specimens were negative for neoplasm (Fig. 5).

In conclusion, ESD can be considered for a duodenal NET (lesion size 10-19 mm) that would otherwise not be amenable to EMR or full-thickness resection. Saline solution immersion technique and use of an ST hood facilitate the procedure by means of the floating effect of the opening of the mucosal flap against gravity, and they allow an easier approach to the narrow space between the lesion and the pyloric ring.

## DISCLOSURE

*Dr Kalloo is a founding member, equity holder, and consultant for Apollo Endosurgery. Dr Ngamruengphong is a consultant for Boston Scientific. All other authors disclosed no financial relationships.*

*Abbreviations: ESD, endoscopic submucosal dissection; NET, neuroendocrine tumor.*

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