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Navigational tunnel technique for gastric peroral endoscopic pyloromyotomy: getting straight to the point (pylorus)

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Background and Aims: Gastric peroral endoscopic pyloromyotomy (G-POEM) is emerging as a treatment option for patients with gastroparesis. The most technically difficult part of the procedure is creating a submucosal tunnel in the gastric antrum, which can be directionally challenging. We describe a novel navigational tunneling method that guides submucosal dissection in the direction of the pylorus and helps to identify the pyloric landmarks.

Methods: Consecutive patients from September to December 2020 who underwent G-POEM for symptomatic gastroparesis were included. All cases were confirmed by prolonged gastric emptying study. The navigational tunnel technique was performed as follows: (1) mucosal cautery markings were made to outline the tunnel starting 3 to 4 cm proximal to the pylorus, (2) submucosal injection was done at the level of the pylorus and extended backward to the incision point, and (3) submucosal dissection was carried out after the prior submucosal injection straight to the pylorus.

Results: Six patients with gastroparesis underwent G-POEM with the navigational tunneling technique. The average time for submucosal injection was 2 minutes and 42 seconds, and the average tunnel time was 15 minutes and 36 seconds. There were no adverse events. All patients reported significant improvement (50%-85%) in symptoms.

Conclusions: This novel navigational tunneling technique appears to guide and facilitate G-POEM by providing a visual path for submucosal dissection straight to the pylorus. It may increase efficiency, decreasing the need to repeatedly exit the tunnel to check direction and preventing nonproductive wandering. It may also help identify the pyloric ring within the tunnel. (VideoGIE 2022;7:82-4.)

INTRODUCTION

Gastric peroral endoscopic pyloromyotomy (G-POEM) is emerging as a treatment option worldwide for select patients with refractory gastroparesis.¹⁻⁴ Adverse events may occur up to 14% of the time, with lower rates among experienced endoscopists, supporting the performance of G-POEM in expert centers.^{5,6} Technical challenges include ensuring that tunneling is done in the right direction toward the pylorus and identifying the pyloric ring at the end of the tunnel. Unlike esophageal POEM, where the direction of the submucosal tunnel is straight down, creating a submucosal tunnel in the gastric antrum can be more directionally challenging. We describe a novel navigational tunneling method⁷ for G-POEM that guides the submucosal dissection in the direction of the pylorus and helps to identify the pyloric landmarks (Video 1, available online at www.giejournal.org).

PROCEDURE TECHNIQUE

Mucosal cautery markings were made to outline the perimeter of the tunnel, starting 3 to 4 cm proximal to

the pylorus (incision site) and then leading to the pylorus. The navigational tunnel was then created by submucosal injection of 1% carboxymethylcellulose (Refresh artificial tears; Allergan, Dublin, Ireland) with methylene blue starting at the pylorus and with subsequent contiguous injections extending backward to the proximal markings, which represent the entry point. These injections resulted in a continuous submucosal lift with the desired tunnel configuration.

Using a cautery knife with a high-pressure water jet system, we performed the mucosal incision, and the endoscope was eased into the preformed navigational tunnel. Submucosal dissection was carried out using preciseSECT Effect 5.6 (Erbe VIO3, Tubingen, Germany). Minimal injection is required within the preformed tunnel, and simply following the blue allows for predictable navigation straight to the pylorus. When this approach is used, the pyloric ring is readily identifiable. There is no need to repeatedly exit the tunnel to make sure you are not straying off course; only a 1-time confirmation is made by visualizing the submucosal fluid extension on the duodenal side before myotomy. For a more thorough and robust opening, we prefer to do a double myotomy (7 o'clock and then 5 o'clock)

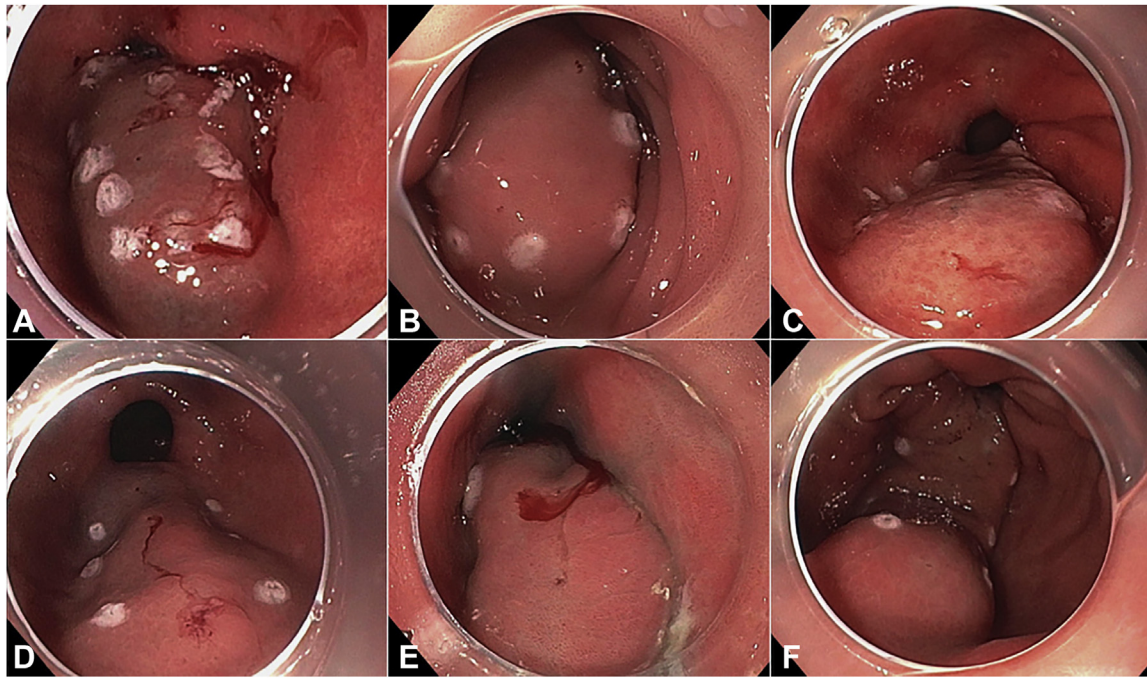


Figure 1. Tunnel appearance and angulation for 6 patients. **B, D, E,** Patients had steep angulation owing to J-shaped stomachs.

with 1 of these extended 1.5 cm proximally in the prepyloric antrum.

CASE SERIES

Six consecutive patients between September and December 2020 underwent G-POEM for the treatment of symptomatic gastroparesis confirmed by prolonged gastric emptying study. Patients reported symptoms of nausea, vomiting, satiety, bloating, and distension, with elevated scores on the Gastroparesis Cardinal Symptom Index. G-POEM with the navigational tunnel technique was used for all cases (Fig. 1). The average time for submucosal injection was 2 minutes and 42 seconds, and the average tunnel time was 15 minutes and 36 seconds. All patients were monitored for a 23-hour observation period and discharged home the next day. There were no adverse events. All 6 patients reported 50% to 85% improvement in their preprocedure symptoms. We do not routinely use a gastric emptying study after the procedure unless there are ongoing symptoms.

CONCLUSION

This novel navigational tunneling technique appears to guide and facilitate the G-POEM procedure by providing a visual path for submucosal dissection straight to the pylorus. It may increase efficiency by decreasing the need to repeatedly exit the tunnel to check direction and pre-

vent nonproductive wandering. Before introducing this technique, the average time for submucosal dissection was 25 to 30 minutes, which has now been reduced by almost 50%. The technique may also help identify the pyloric ring within the tunnel by accentuating the circular muscle structure with blue coloring on the duodenal side. This novel navigational tunnel technique is easy to learn and can be readily implemented to improve efficiency and overcome the technical challenges of G-POEM.

DISCLOSURE

Dr Chang is a consultant for Olympus, Endogastric Solutions, Medtronic, Cook Medical, Pentax, and ERBE. Dr Samarasena has ownership in Docbot; is a consultant for Medtronic, Conmed, Neptune Medical, Microtech, Olympus, Pentax, US Endoscopy, and Motus; is a lecturer for Medtronic, Conmed, Mauna Kea Technologies, and Olympus; and has an educational grant from Cook Medical. All other authors disclosed no financial relationships.

Abbreviation: G-POEM, gastric peroral endoscopic pyloromyotomy.

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