



Lesser curve approach to gastric peroral endoscopic myotomy: a case series

Danny Issa, MD, Kartik Sampath, MD, Qais Dawod, MD, Marwan Azzam, MD, Reem Z. Sharaiha, MD, David Carr-Locke, MD

Background and Aims: Gastric peroral endoscopic myotomy (GPOEM) is a promising treatment for refractory gastroparesis. Initially, endoscopists performed GPOEM along the greater curve of the stomach. We, herein, present a novel modification with a lesser curve approach that offers the advantages of shorter tunnel and possibly better myotomy.

Methods: Three patients with refractory gastroparesis underwent GPOEM by use of the lesser curve approach. Two of the patients had a prior GPOEM by the traditional greater curve approach. All procedures were performed with the patient under general anesthesia. The specific tools used for incision, dissection, and myotomy are described. The patients were followed up closely, and the gastroparesis cardinal symptom index (GCSI) was calculated before, and 4 weeks after, the procedure.

Results: The pyloric ring was exposed very well with the lesser curve approach. The mean procedure time was 48 ± 12 minutes. No immediate or late adverse events were observed. All patients had significant improvement in the GCSI 4 weeks after GPOEM, with resolution of gastroparesis symptoms. The mean follow-up time was 6 months.

Conclusion: The lesser curve approach to GPOEM provides an excellent exposure to the pyloric ring and can be used as a primary or a salvage technique for the treatment of refractory gastroparesis. (VideoGIE 2019;4:532-4.)

Gastroparesis (GP) is a syndrome of delayed gastric emptying in the absence of obstruction. The available medical treatment is far from ideal, and most patients have refractory and often debilitating symptoms. As the disease progresses, neuronal hypertrophy and fibrosis develop, leading to significant pyloric dysfunction. Recently, pylorus-directed endoscopic therapy, such as gastric peroral endoscopic myotomy (GPOEM), has been proposed as a promising option for refractory GP, although it remains in its early phase.^{1,2} Studies have shown success rates of 80% in relieving symptoms, in addition to a significant improvement in quality of life and gastric emptying after GPOEM.³ Initially, endoscopists performed GPOEM along the greater curvature of the stomach. The lesser curve approach we discuss here is a newer modification that provides a shorter tunnel to the pylorus and achieves optimal orientation for submucosal dissection and myotomy (Videos 1 and 2, available online at www.VideoGIE.org). The mucosal blood flow within the lesser curve of the antrum is the smallest in the stomach, which hypothetically translates to a smaller bleeding risk.⁴

We describe 3 patients with refractory GP for whom a lesser curve GPOEM was performed. The first patient was

a 66-year-old woman in whom GPOEM performed 18 months earlier by the greater curve approach had failed. A gastric emptying study revealed 15% emptying at 4 hours. The second patient was a 28-year-old woman with end-stage renal disease. The third patient was a 69-year-old woman with severe sarcoidosis who had undergone GPOEM by the greater curve approach 4 years earlier, but experienced a recurrence of symptoms. All patients exhibited classic symptoms of GP and had no response to medical therapy. Each procedure was performed with the patient in the supine position under general anesthesia, by use of a standard gastroscope fitted with a clear distal cap. An Endoflip (Medtronic GI Solutions, Sunnyvale, Calif, USA) catheter was placed across the pylorus to measure the diameter and distensibility of the pylorus (Fig. 1). Approximately 3 cm proximal to the pylorus, along the lesser curve, a submucosal injection of 0.9% saline solution with methylene blue was made. A transverse mucosal incision was made to create an entry point into the submucosal space with an IT2 or Dual knife (Olympus Corporation, Center Valley, Pa, USA), with Endocut Q current effect 3, interval 1, period 1, soft coag effect 2 (Erbe, Marietta, Ga, USA). The submucosal

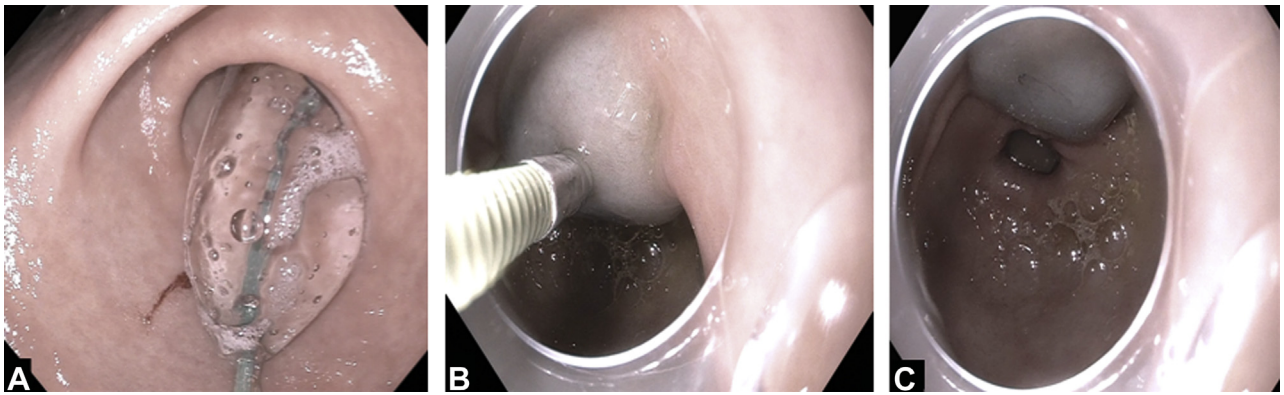


Figure 1. **A**, Endoflip catheter placed across the pylorus to measure the distensibility. **B**, Submucosal injection with 5 mL methylene blue and normal saline solution. **C**, Bleb created to allow mucosal incision.

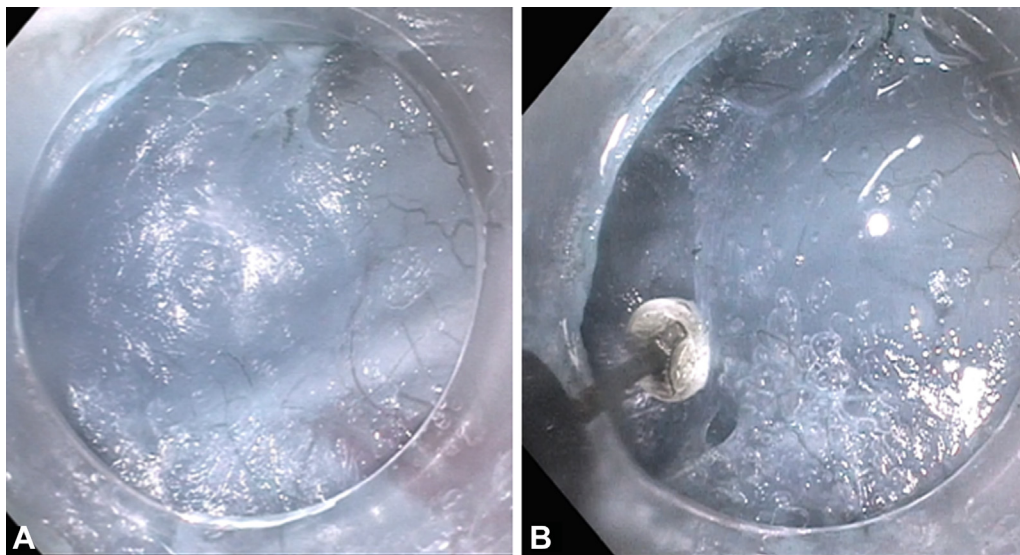


Figure 2. **A**, A short tunnel was created. **B**, The submucosal space was injected and dissected.



Figure 3. Pyloric ring well exposed at the end of the tunnel.

space was dissected, and vessels or bleeding were treated with coagulation (Fig. 2). Dissection was continued to the pyloric ring (Fig. 3). The position was confirmed by removing the gastroscope from the tunnel and advancing it to the duodenum, where a blue discoloration was seen. Full-thickness myotomy of the pylorus was performed with the IT2 knife (Fig. 4). After myotomy, the mucosal entry site was closed with Duraclips (ConMed Corporation, Utica, NY, USA). All patients tolerated the procedure well and were admitted for observation. The mean total procedure time was 48 ± 12 minutes. Two patients were discharged the following day. The third experienced stridor secondary to an intubation-related vocal cord injury and required monitoring. There was significant improvement in the Gastroparesis Cardinal Symptom Index 4 weeks after GPOEM compared with the preprocedure score for all 3 patients (2.5 vs 0.22, 2.8 vs 0.22, and 3 vs 1.8, respectively)

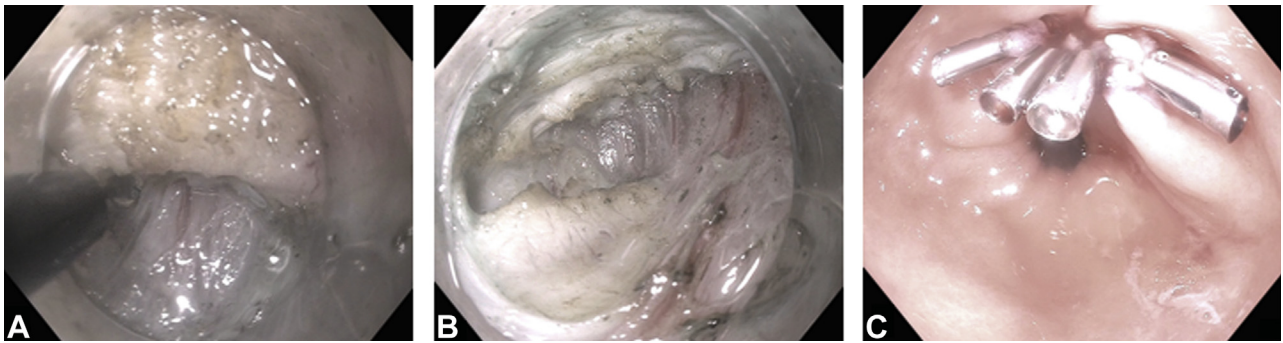


Figure 4. **A**, Myotomy started at the pyloric ring. **B**, Full-thickness myotomy of the circular and longitudinal muscle fibers. **C**, Complete closure of the incision site with hemoclips.

TABLE 1. Gastroparesis Cardinal Symptom Index before and after GPOEM

Patient	Before GCSI	4 weeks after GCSI
1	2.5	0.22
2	2.8	0.22
3	3.0	1.8

GPOEM, Gastric peroral endoscopic myotomy; GCSI, Gastroparesis Cardinal Symptom Index.

(Table 1). The mean follow-up time was 6 months, and all patients tolerated a regular diet and were in good condition at their follow-up visits.

GPOEM with use of the lesser curve approach is technically feasible and can be used as a primary or salvage treatment for persistent GP after an initial greater curve myotomy. In each patient of this case series, the pyloric ring was easily exposed with the modified approach, and the procedure duration was relatively short. Further controlled studies are needed to determine the optimal approach for this promising endoscopic procedure.

DISCLOSURE

Dr Sbaraiha is an advisor to Boston Scientific, Olympus, Apollo, and Medtronic. Dr Carr-Locke receives royalties from Steris and Telemed, is an advisor to Boston Scientific, and is a patent holder with Valentx, Ergogrip, and Screwire. All other authors disclosed no financial relationships relevant to this publication.

Abbreviations: GP, gastroparesis; GPOEM, gastric peroral endoscopic myotomy.

REFERENCES

1. Khashab MA, Ngamruengphong S, Carr-Locke D, et al. Gastric per-oral endoscopic myotomy for refractory gastroparesis: results from the first multicenter study on endoscopic pyloromyotomy (with video). *Gastrointest Endosc* 2017;85:123-8.
2. Malik Z, Kataria R, Modayil R, et al. Gastric per oral endoscopic myotomy (G-POEM) for the treatment of refractory gastroparesis: early experience. *Dig Dis Sci* 2018;63:2405-12.
3. Mekaroonkamol P, Dacha S, Wang L, et al. Gastric peroral endoscopic pyloromyotomy reduces symptoms, increases quality of life, and reduces health care use for patients with gastroparesis. *Clin Gastroenterol Hepatol* 2019;17:82-9.
4. Kamada T, Kawano S, Sato N, et al. Gastric mucosal blood distribution and its changes in the healing process of gastric ulcer. *Gastroenterology* 1983;84:1541-6.

Division of Gastroenterology and Hepatology, Weill Cornell Medicine/New York, Presbyterian Hospital, New York, New York, USA.

Copyright © 2019 American Society for Gastrointestinal Endoscopy. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

<https://doi.org/10.1016/j.vgie.2019.06.007>

If you would like to chat with an author of this article, you may contact Dr Issa at dani87-md@hotmail.com.