Peroral endoscopic myotomy in a patient with failed Heller's myotomy by use of a novel bipolar radiofrequency device

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A 35-year-old woman presented with symptoms of dysphagia, regurgitation, and occasional chest pain for the previous 6 years. She was known to have type II achalasia and gave a history of laparoscopic Heller's myotomy without fundoplication about 5 years earlier. Subsequently, she underwent pneumatic balloon dilatation (single session, 35 mm) for recurrent symptoms about a year after the Heller's procedure. The present evaluation revealed a high integrated relaxation pressure and significant stasis on a timed barium swallow study. After initial evaluation, peroral endoscopic myotomy (POEM) was offered to the patient. A posterior orientation (~5 o'clock) was chosen to avoid encountering submucosal fibrosis resulting from the previous Heller's myotomy. POEM was performed with the standard technique by use of a therapeutic channel (3.7 mm) endoscope (GIF-1TH190; Olympus, Tokyo, Japan). In brief, the steps of the POEM procedure included (1) submucosal injection followed by mucosal incision about 8 cm above the gastroesophageal junction (GEJ) (Figs. 1 and 2); (2) submucosal tunneling, which extended up to 3 cm below the GEJ (Fig. 3); (3) myotomy starting from 2 cm below the mucosal incision (Figs. 4 and 5); and (4) closure of the incision with endoclips (Fig. 6). Coagulation of the vessels was achieved by use of the same device (Fig. 7) (Video 1, available online at www.VideoGIE.org).

In this case, we used a new electrosurgical device to perform the entire procedure (Speedboat-RS2; Creo Medical Ltd, Chepstow, Wales, UK). This novel device is boat

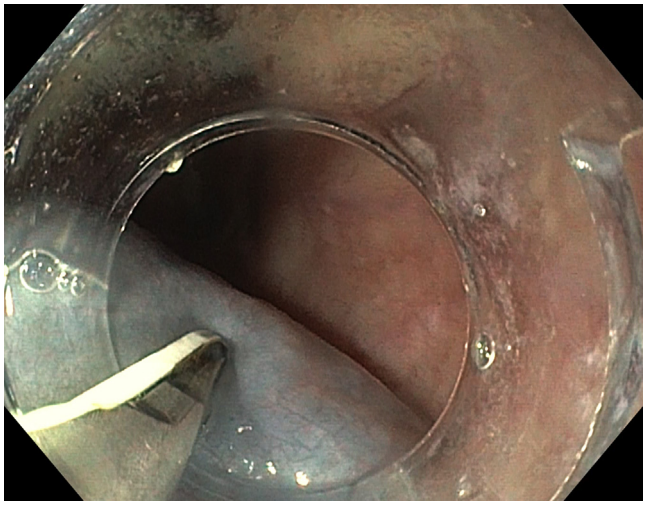

Figure 2. Mucosal incision by use of the same device in lateral position, showing the lateral cutting edge of the device.

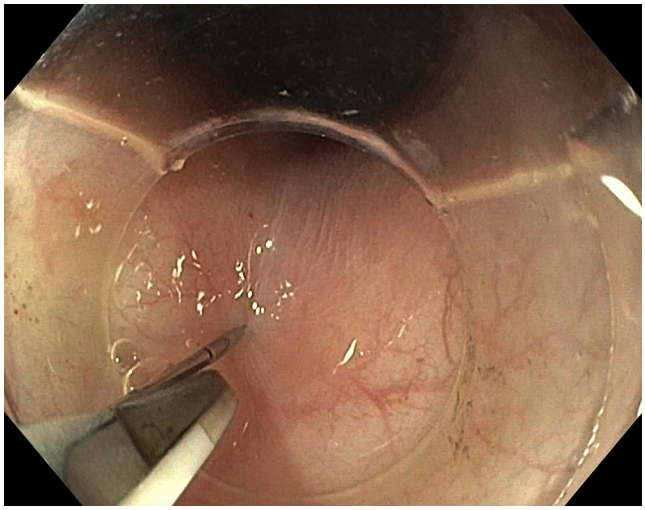

Figure 1. Submucosal injection by use of a novel device with integrated needle system.

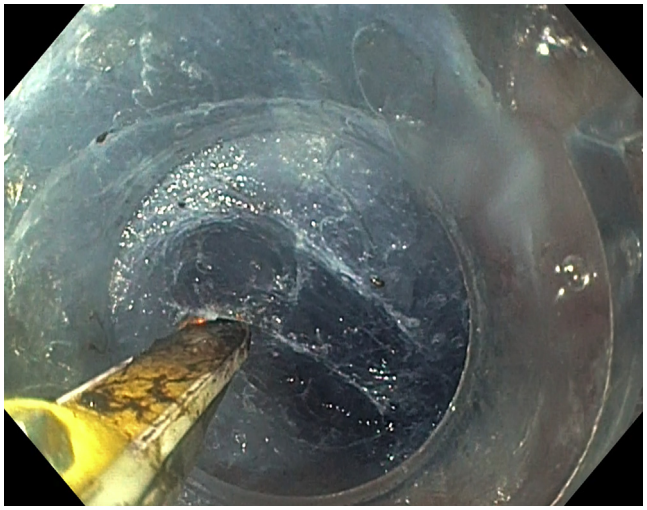

Figure 3. Submucosal tunneling with radiofrequency cutting energy.

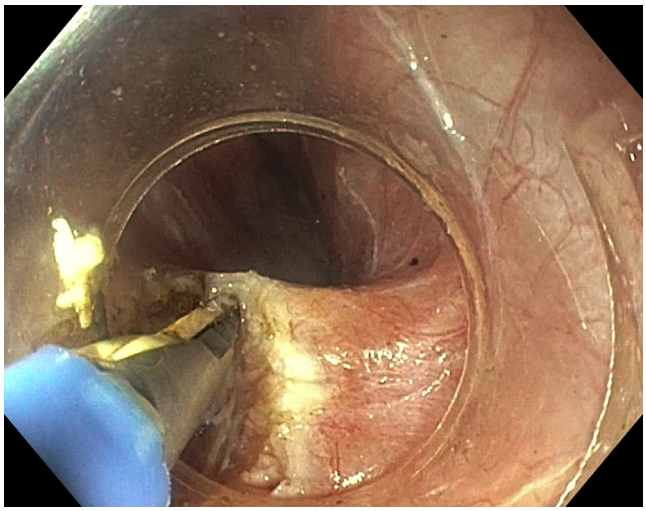

Figure 4. Myotomy performed with similar settings and the same device.

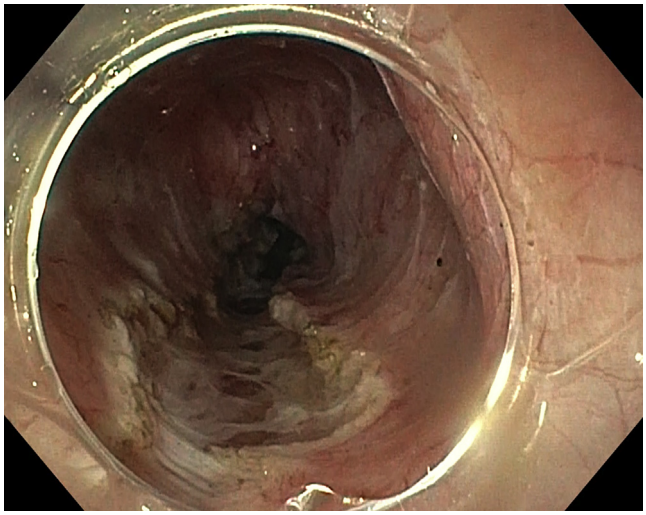

Figure 5. Endoscopic view after completion of myotomy showing minimal visible charring.

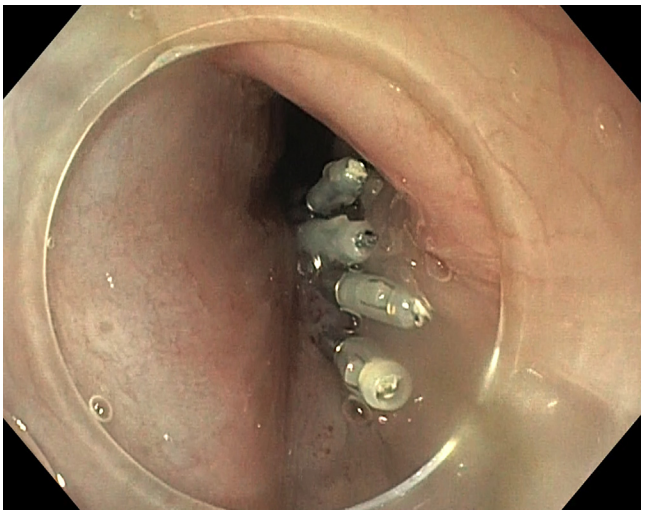

Figure 6. Closure of mucosal incision with multiple endoclips.

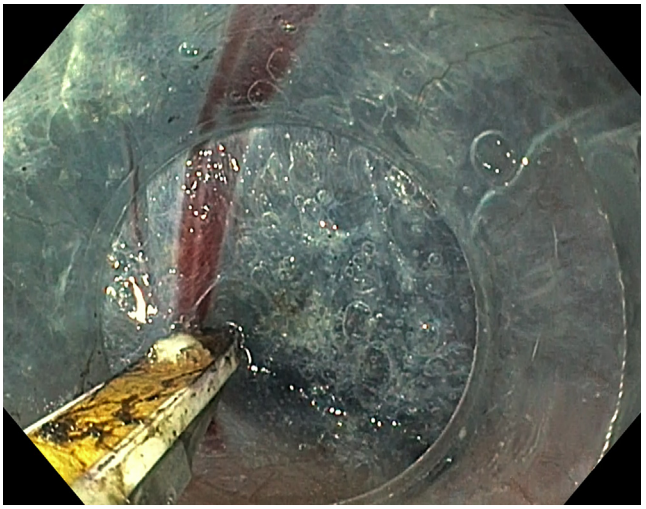

Figure 7. Coagulation of the vessel with microwave energy using the same multifunctional device.

shaped, with curved bipolar electrodes on the sides. The device uses bipolar radiofrequency energy for cutting (400 kHz and 35W) and microwave for coagulation (frequency 5.8 GHz, power setting 10 W). The major advantage of this device includes bipolar cutting and a protective hull, which helps in avoiding inadvertent injury to the mucosa as well as the muscle. The device can be rotated to optimize cutting and coagulation. In addition, the integrated injection needle allows for completion of the procedure with the same device. In the present case, the entire procedure (from mucosal incision to closure of the incision) was accomplished in 56 minutes. There was no mucosal injury. Intraprocedural accumulation of retroperitoneal CO_2 was noticed but did not require an active intervention. Significant improvement was noticed in the patient's clinical symptoms (Eckardt score 0) and in the flow of barium across the GEJ during the timed barium swallow study.

POEM has emerged as a safe and effective technique for the management of achalasia and other nonachalasia motility disorders. Although the technique of POEM has largely remained unchanged since its initial description by Inoue et al,[1] several types of electrosurgical knives have been used to perform this procedure. Crucial modifications in the electrosurgical knives, like integration of the waterjet function, have enabled endoscopists to complete the procedure in a quicker and safer fashion.[2] Because the majority of the knives are monopolar devices, the risk of inadvertent mucosal or muscular injury remains a concern, especially at the GEJ, where mucosa and muscle are in close approximation.[3]

In this video, we demonstrate the first use of a new bipolar device to perform the POEM procedure. The entire procedure can be accomplished by use of the same device without the requirement to change the accessories for

submucosal injection or coagulation of vessels. The use of this novel device has been recently described for endoscopic submucosal dissection in a patient with a large colonic polyp.[4] In that case, endoscopic submucosal dissection was performed with the tunneling technique, and there was no apparent muscle damage or charring after completion of the procedure.[4] Similarly to that case, we encountered minimal charring after completion of the procedure (Fig. 5).

ACKNOWLEDGEMENT

Supported by a Robert W. Summers grant from the American Society for Gastrointestinal Endoscopy.

DISCLOSURE

All authors disclosed no financial relationships relevant to this publication.

Abbreviations: GEJ, gastroesophageal junction; POEM, peroral endoscopic myotomy.

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https://doi.org/10.1016/j.vgie.2019.12.009