Endoscopic techniques to detect gastroesophageal junction in peroral endoscopic myotomy

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Peroral endoscopic myotomy (POEM) is now considered a first-line treatment modality for patients with achalasia.[1] POEM is an attractive option for both physicians and patients because it is less invasive than laparoscopic Heller's myotomy and more definitive than endoscopic balloon dilation. POEM is done as follows.[2] Creation of a submucosal cushion 10 cm above the gastroesophageal junction (GEJ) is followed by making a mucosal incision to form the opening of the tunnel. Next, a tunnel is created with submucosal dissection till 2 to 3 cm below the GEJ. Myotomy is then done in a proximal to distal direction. Selective myotomy, cutting of the circular muscle fibers only, is usually performed at the beginning of the myotomy. Full-thickness myotomy, cutting of both circular and longitudinal muscle fibers, then is performed 2 cm above and 2 cm below the cardia. After ensuring adequate myotomy and crossing the GEJ, the tunnel opening is closed with hemoclips (Fig. 1) (Video 1, available online at www.giejournal.org).

Identification of the GEJ during POEM is sometimes challenging, especially in patients with sigmoid esophagus, previous attempts of dilation, or previous myotomy. Technical failure is usually because of failure to reach the GEJ and completely cut it.

A few methods are usually used together to identify the GEJ from the tunnel side.[3] First, the depth of insertion of the endoscope from the incisors is

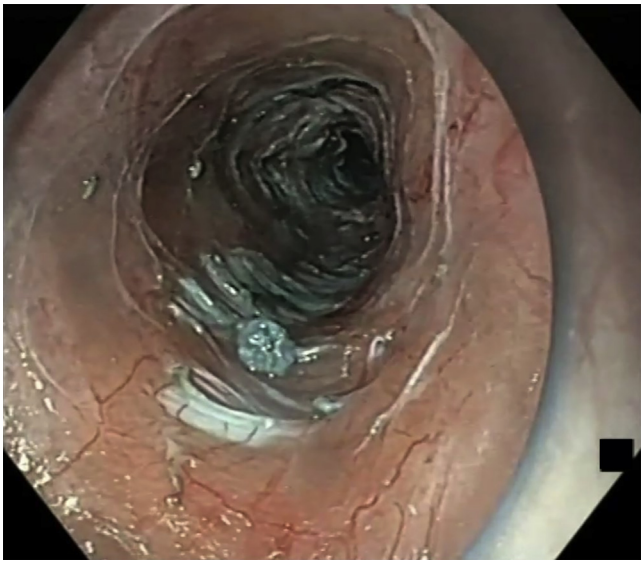

Figure 2. Tunnel creation during peroral endoscopic myotomy showing narrow lumen at the end of the gastroesophageal junction.

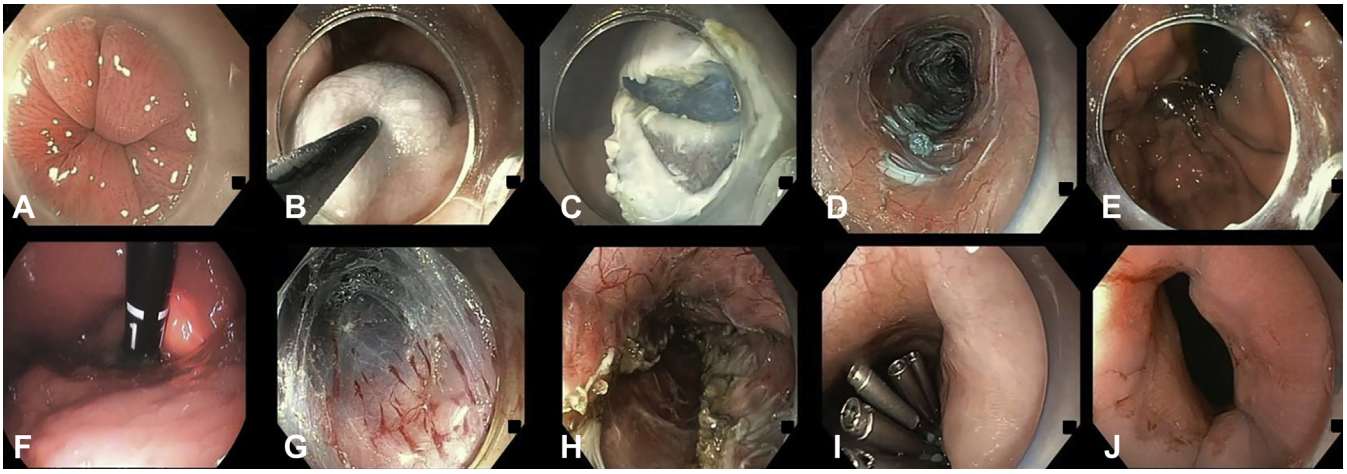

Figure 1. Video still images explaining the steps of peroral endoscopic myotomy. **A,** Identification of tight cardia. **B,** Creation of submucosa bleb. **C,** Forming the tunnel opening. **D,** Creation of the tunnel. **E,** Blue sign. **F,** Ultra-slim endoscope showing the light of the first endoscope. **G,** Palisade vessels. **H,** Full-thickness myotomy. **I,** Closure of the tunnel opening with clips. **J,** Wide cardia after peroral endoscopic myotomy.

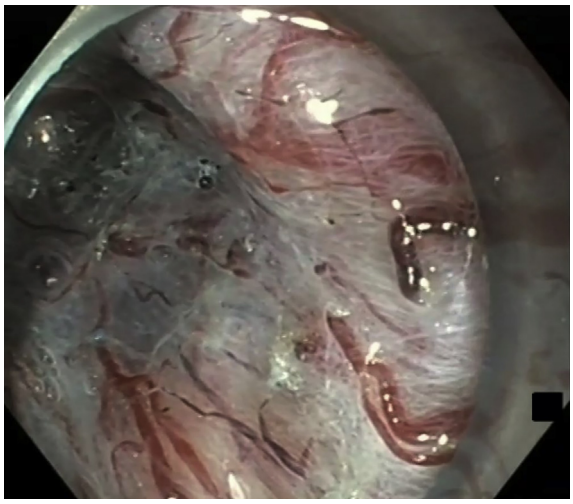

Figure 3. Palisade vessels indicating the gastroesophageal junction during peroral endoscopic myotomy.

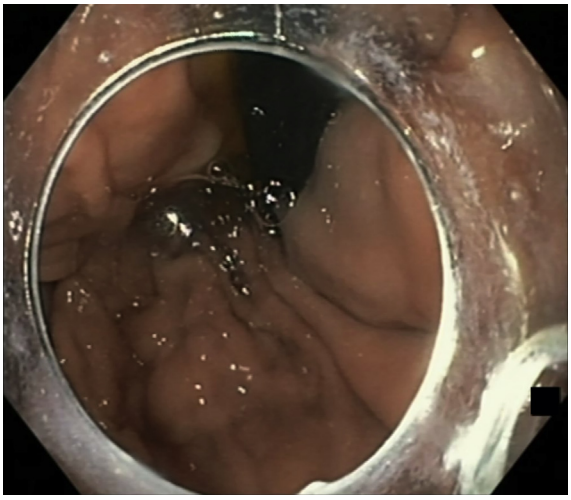

Figure 4. Blue bulge on retroflexion to detect the gastroesophageal junction during peroral endoscopic myotomy (blue sign).

recorded before starting the tunneling. Second is the appearance of palisade vessels, characteristic of the cardia (Fig. 2). Third, the submucosal space narrows, with increasing resistance to the endoscope passage, followed by a sense of release after the endoscope passes to the wider gastric submucosal space (Fig. 3). Fourth, is the identification of a blue bulge (methylene blue used in dissection) on retroflexion of the scope in the fundus of the stomach which is called the blue sign (Fig. 4).

Precise identification of the GEJ is crucial in performing adequate myotomy, which directly affects the clinical response and reduces the risk of recurrence. Here, we present the use of a second endoscope to detect the transillumination of the first endoscope in the tunnel.[4,5] We used the ultra-slim gastroscope (EG_16K10, Pentax, Tokyo, Japan); it is 5.4 mm in diameter with a 2-mm working channel. The ultra-slim gastroscope is introduced through the oral cavity; then, on retroflexion, the light of the first endoscope in the tunnel is seen clearly below the GEJ (Fig. 5) (Video 1).

This transillumination technique can be done with a single-handed method, in which a single endoscopist pushes the ultra-slim endoscope, or a 2-handed method, in which one endoscopist holds the primary endoscope and fixes it while another pushes the ultra-slim endoscope (Fig. 6) (Video 1, available online at www.giejournal.org).

DISCLOSURE

All authors disclosed no financial relationships.

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

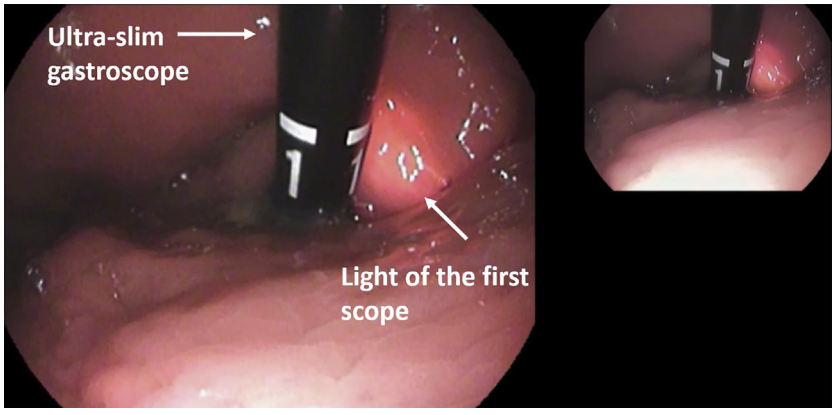

Figure 5. Use of the ultra-slim gastroscope to detect transillumination of the first endoscope.

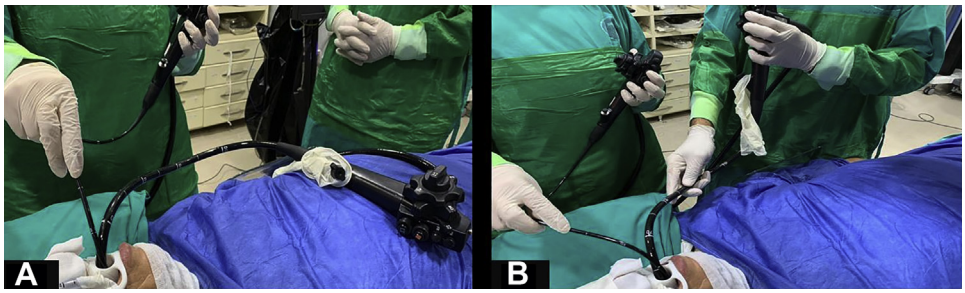

Figure 6. Performing the double-endoscope transillumination technique. **A,** Using the single-handed method. **B,** Using the 2-handed method.

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