



Successful D-POEM after failed surgical myotomy and diverticulectomy

Andrew Ross Leopold, MD,¹ Raymond E. Kim, MD^{2,3}

BACKGROUND

Peroral endoscopic myotomy with diverticulotomy (D-POEM) is feasible for management of achalasia with an epiphrenic diverticulum (ED).¹⁻³ In a study of 14 patients with ED and underlying motility disorders with isolated lower esophageal sphincter (LES) POEM, all had postoperative Eckardt score improvement.⁴ Diverticulotomy is second-line treatment.⁴⁻⁷

Infection, malignancy, and diverticulectomies may cause esophagopleural fistulas (EPFs).⁸ Management is done surgically and endoscopically.^{9,10}

Endoscopic functional lumen imaging probe (endoFLIP) can confirm successful POEM in patients with achalasia.¹¹

This is a video case report (Video 1, available online at www.VideoGIE.org) of 2 patients with type II achalasia, ED, and symptoms refractory to Heller myotomy and diverticulectomy (HMD) who underwent D-POEM.

PATIENTS AND METHODS

A single endoscopist performed D-POEM and endoFLIP. This study has institutional review board exemption (11/18/20) (HP-00091338). Patients had general anesthesia and received antibiotics. No pneumothoraces occurred.

Case 1

The patient was a 60-year-old woman with type II achalasia, ED, gastric tube placement, failed HMD, and metastatic breast cancer who presented for dysphagia. Preoperative barium esophagram (BE) showed an ED and an EPF (Fig. 1A). Endoscopy (GIF-HQ190; Olympus, Tokyo, Japan) localized the EPF and ED (Fig. 1B and C). Pre-D-POEM endoFLIP with a 16-cm balloon (Medtronic, Minneapolis, Minn, USA) demonstrated achalasia (Fig. 2A).

The incision was made 35 cm from the incisors at 7 o'clock with a triangle tip knife (KD640-L; Olympus). Mucosotomy tunneling proceeded 5 cm toward the ED at 3 o'clock. Intratunnel ED localization was challenging with a 5-cm tunnel.

An increase in end-tidal pCO₂ prompted EPF repair with argon plasma coagulation (ESG-300 and APU-300; Olympus) and endoscopic sutures (OverStitch; Apollo Endosurgery, Austin, Tex, USA), resolving respiratory compromise (Fig. 3A). Mucosotomy and tunneling were performed again 1 cm from the ED at 3 o'clock and continued past the LES to the gastric cardia. ED and LES myotomy were done (Figs. 3B, 4A and B). Post-D-POEM endoFLIP demonstrated achalasia resolution (Fig. 2B). Endoscopic suturing afforded secure mucosal closure (procedure duration: 3 hours 28 minutes). BE showed no leak or aspiration (Fig. 3C). The patient remained on

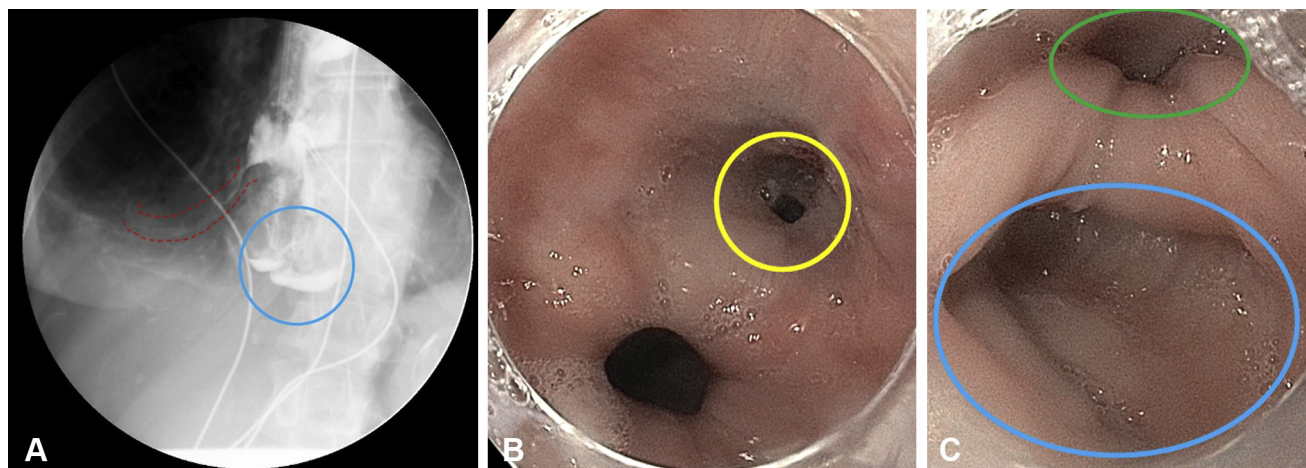


Figure 1. A, Preoperative barium swallow demonstrating both the esophageal diverticulum retaining contrast (blue circle), as well as contrast leak from the esophagus into the pleural space (between the red dotted lines) in case 1. B, Endoscopy shows the esophagopleural fistula (yellow circle). C, Endoscopy showing the distal part of the esophagus (green circle) and the esophageal diverticulum (blue circle).

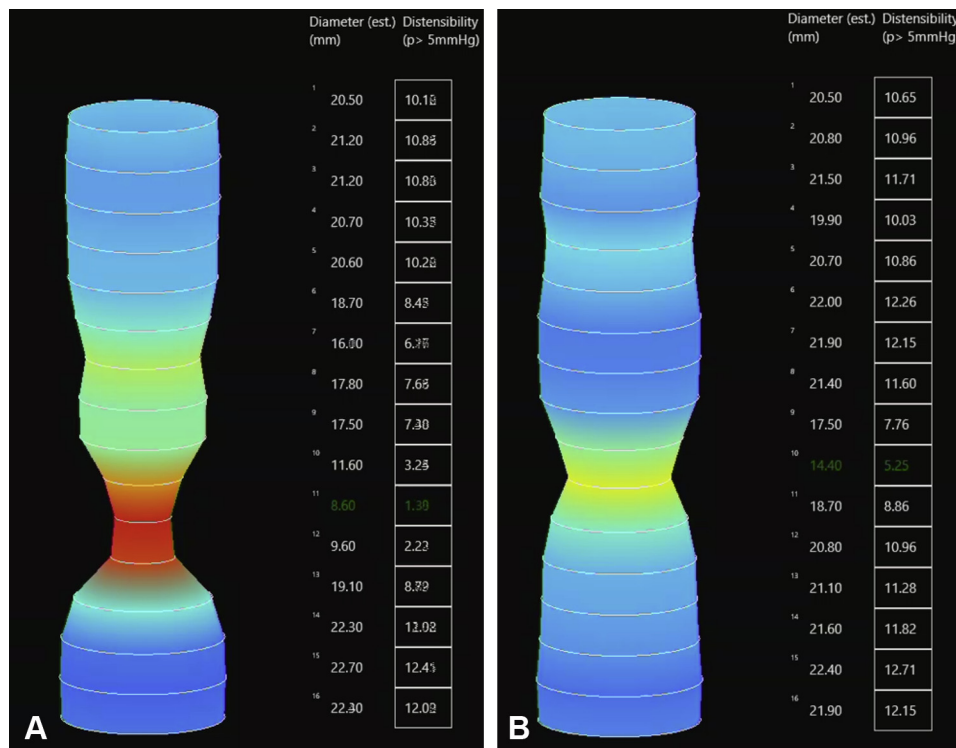


Figure 2. EndoFLIP topography of case 1 at a volume of 60 mL. **A**, Pre-POEM distensibility index and diameter. **B**, Post-POEM distensibility index and diameter.

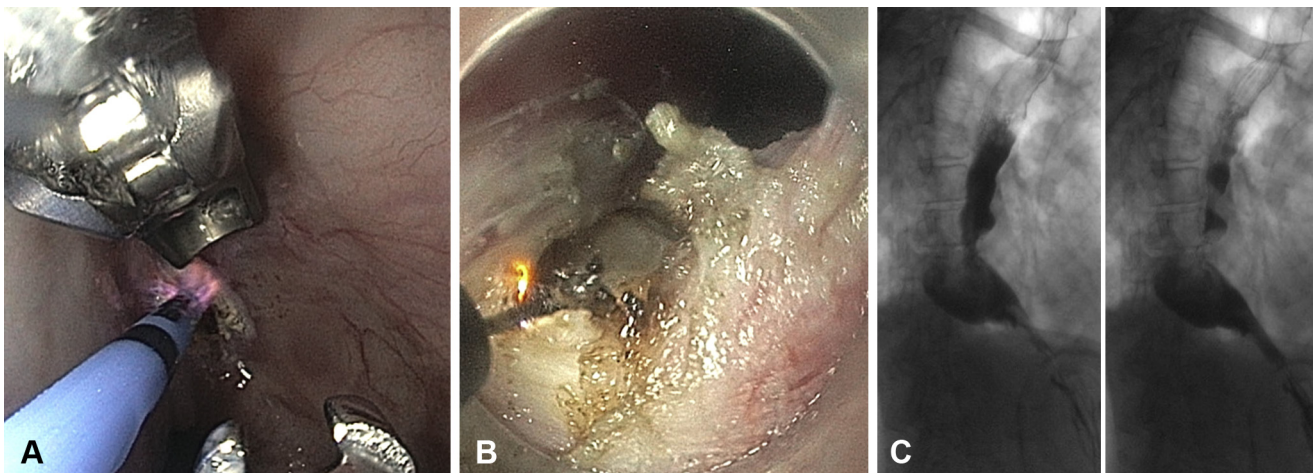


Figure 3. **A**, Treatment of the esophageal to pleural fistula in case 1 with argon plasma coagulation. **B**, Diverticulotomy. **C**, Post-POEM and diverticulotomy barium swallow.

a full diet with improved symptoms for 3 months, before death from metastatic breast cancer.

Case 2

The patient was a 67-year-old man with type II achalasia, ED, and failed HMD who presented with dysphagia and weight loss. Preoperative BE showed a large ED causing barium tablet impaction (Fig. 5A). Complicated anatomy

from a slipped fundoplication wrap led to deferment of PEG tube placement.

Endoscopy visualized the ED at 38 cm at 3 o'clock (Fig. 5B). Pre-D-POEM endoFLIP with an 8-cm balloon demonstrated achalasia (Fig. 6A). Mucosotomy was done at 5 o'clock, 37 cm from the incisors, into the gastric cardia, where myotomy was performed (Figs. 7A, 8A and B). Post-D-POEM endoFLIP demonstrated achalasia

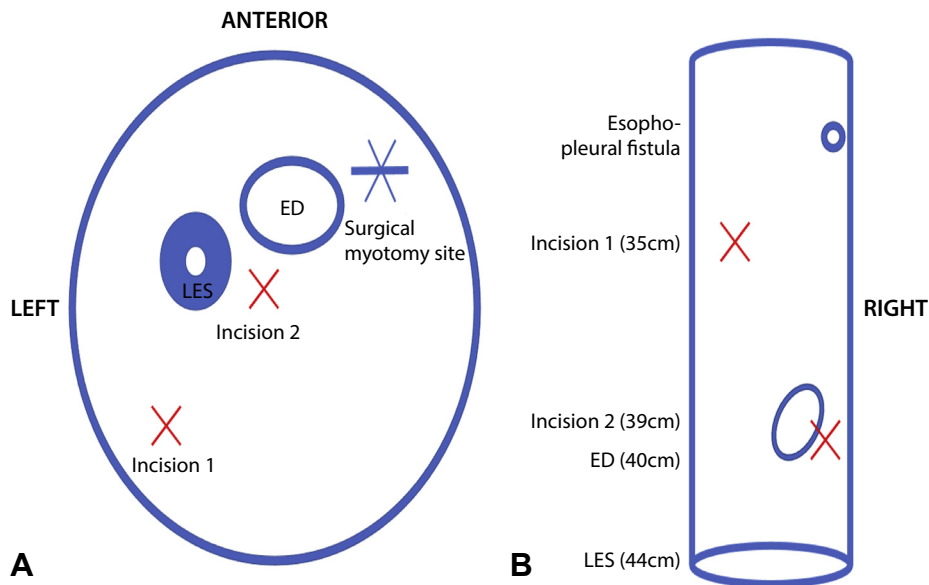


Figure 4. **A**, Endoscopic view with anterior and left orientation labeled. **B**, Anterior view with right side labeled.

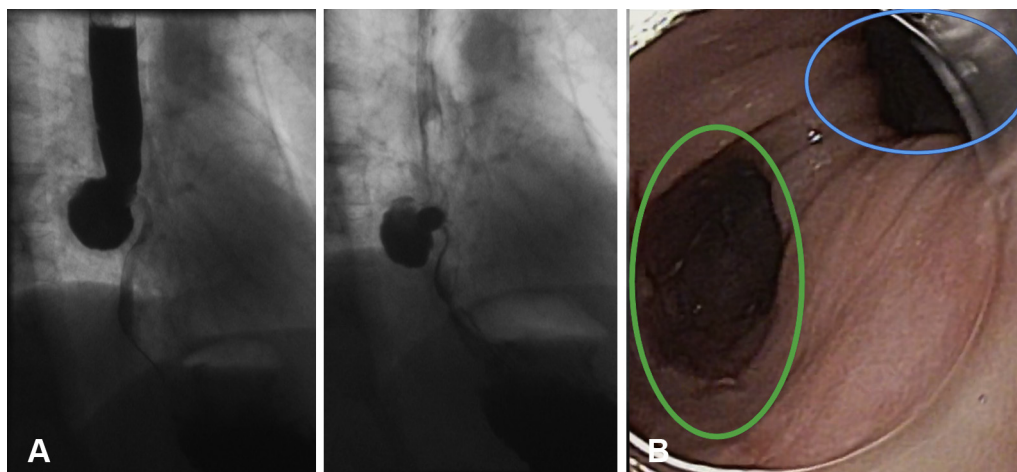


Figure 5. **A**, Preoperative barium esophagram of case 2 showing impaction of the barium tablet in the esophageal diverticulum, as well as a narrow distal portion of the esophagus. **B**, Endoscopy showing the distal part of the esophagus (*green circle*) and the esophageal diverticulum (*blue circle*).

resolution (Fig. 6B). Endoscopic suturing afforded secure closure (procedure duration: 2 hours 46 minutes).

The patient had gained weight with dysphagia resolution at 6-month follow-up. BE demonstrated no tablet impaction (Fig. 7B).

CONCLUSIONS

Patients with achalasia and ED who failed HMD achieved drastic symptom improvement with ED and LES myotomy. EndoFLIP demonstrated procedural success.

Symptoms can manifest because of achalasia or ED. Myotomy location should be determined based on patient-specific factors.

In case 1, the patient had a poor prognosis from metastatic cancer; there was aversion to repeat procedures. In case 2, the BE showed tablet impaction at the ED. Evidence of ED obstruction suggested treatment would require D-POEM. Although postoperative BE showed ED contrast persistence, the tablet was no longer impacted.

Mucosotomy with ED proximity decreases the technical difficulty of ED localization. Although a longer tunneling

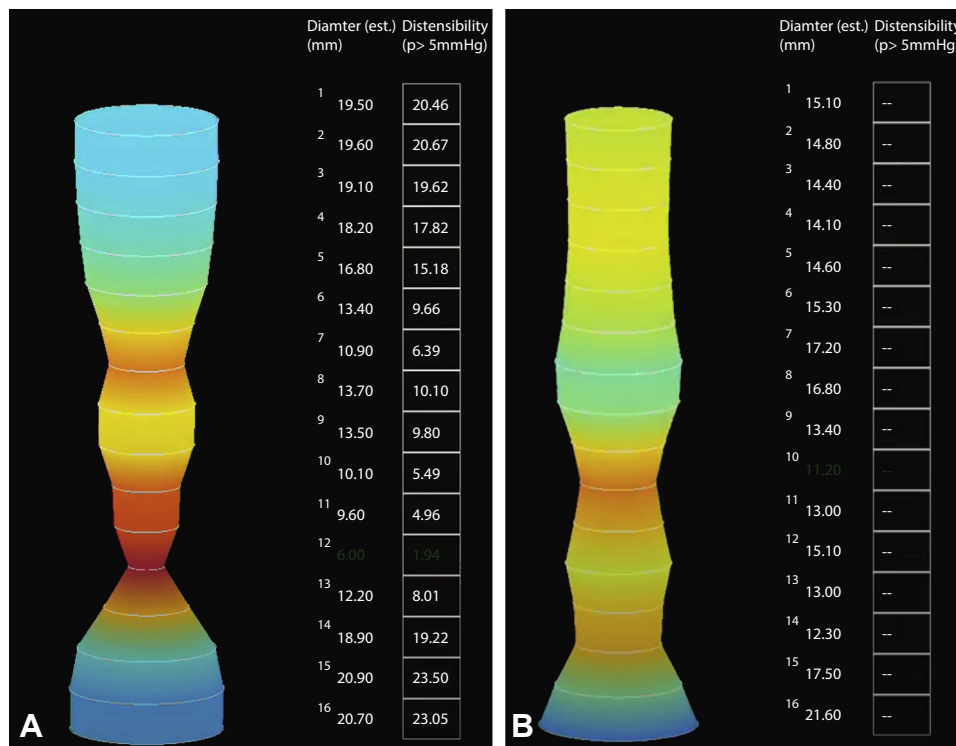


Figure 6. **A**, Pre-POEM endoFLIP demonstrating achalasia. **B**, Post-POEM endoFLIP demonstrating an ability of the lower esophageal sphincter to relax.

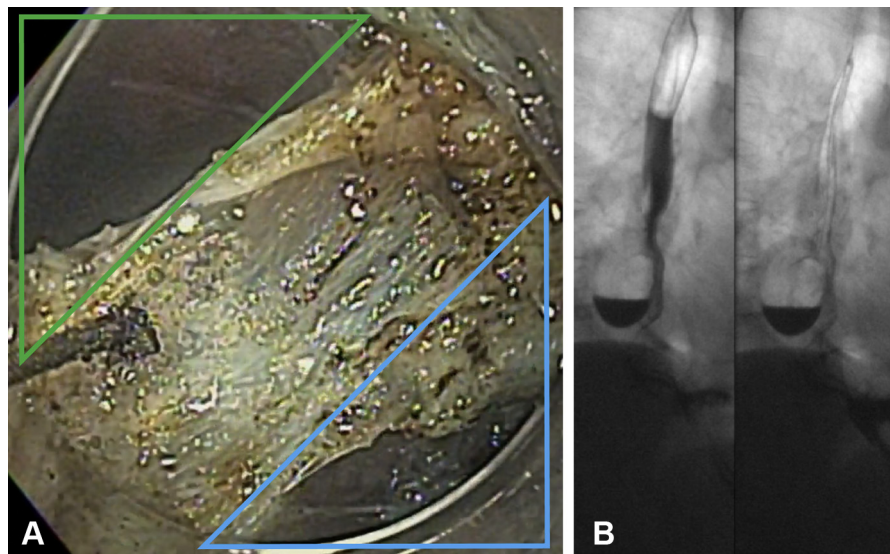


Figure 7. **A**, Diverticulotomy, with the *green triangle* highlighting the distal part of the esophagus and the *blue triangle* highlighting the esophageal diverticulum. **B**, Postoperative barium esophagram showing easy passage of contrast past the diverticulum and into the stomach.

channel may decrease esophageal leak risk, endoscopic suturing can likewise ensure secure closure.

An endoscopic method managed EPF, an adverse event of HMD. Immediate EPF closure is favored to prevent respiratory compromise. Patients with achalasia and ED who fail HMD should be considered for D-POEM.

DISCLOSURE

All authors disclosed no financial relationships.

Abbreviations: BE, barium esophagram; D-POEM, peroral endoscopic myotomy with diverticulotomy; ED, epiphrenic diverticulum; endoFLIP,

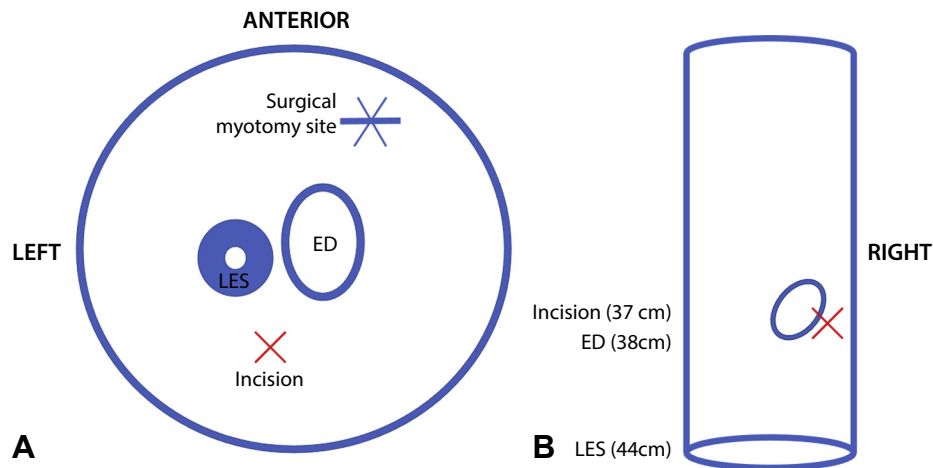


Figure 8. **A**, Endoscopic view with anterior and left orientation labeled. **B**, Anterior view with right side labeled.

endoscopic functional lumen imaging probe; EPF, esophagopleural fistula; HMD, Heller myotomy and diverticulectomy; LES, lower esophageal sphincter.

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University of Maryland Medical Center, Department of Internal Medicine, Baltimore, Maryland (1), University of Maryland Medical Center, Department of Gastroenterology, Baltimore, Maryland (2), University of Maryland Medical Center Midtown Campus, Department of Gastroenterology, Baltimore, Maryland (3).

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<https://doi.org/10.1016/j.vgie.2022.02.008>