Closure of a persistent esophagopleural fistula assisted by a novel endoscopic suturing system

Gastrointestinal fistulas may be successfully managed endoscopically [1]. Novel endoscopic techniques for full thickness tissue approximation may serve as adjuvants for assisting fistula closure [2, 3]; an example is a flexible endoscopic suturing system [4]. We describe a case of a chronic esophageal fistula, treated previously with endoscopic clipping and esophageal stenting, which was successfully managed using a novel endoscopic suturing system [5].

A 66-year-old woman presented with a 3-month history of a chronic esophagopleural fistula secondary to Boerhaave syndrome. The fistula was initially drained by thoracostomy and subsequently treated with endoscopic clipping and esophageal stenting, which was successfully managed using a novel endoscopic suturing system [5].

A contrast examination depicted a 3-month esophagopleural fistula despite attempted closure with endoscopic clipping and stent placement. The chest drain (yellow arrow) was injected and fills a space around the esophagus, particularly in the region of the stent (white arrows), identifying a communication with the esophageal lumen. The clips found at the lower part of the image are from a previous cholecystectomy.

Fig. 1. Contrast examination depicting a 3-month esophagopleural fistula despite attempted closure with endoscopic clipping and stent placement. The chest drain (yellow arrow) was injected and fills a space around the esophagus, particularly in the region of the stent (white arrows), identifying a communication with the esophageal lumen. The clips found at the lower part of the image are from a previous cholecystectomy.

Endoscopic closure of the fistula was performed using a novel endoscopic suturing device (Overstitch; Apollo Endosurgery, Austin, Texas, USA) [Fig. 2, Video 1] inserted through an esophageal overtube. A double-channel endoscope (Olympus GIF 2T160; Olympus, Center Valley, Pennsylvania, USA) fitted with the suturing device was advanced to the distal esophagus. Placement of a three-stitch running 3.0 polypropylene suture was successful at closing the fistula, and initial contrast instillation demonstrated no leak. Additionally, a partially covered stent was placed to cover the sutured defect. The stent was removed 4 weeks later, and a follow-up esophagogram showed a contrast leak, although the fistula was smaller (5 mm), and the flow less extensive.

A second suturing procedure was planned to seal the remaining fistula opening [Fig. 3], starting with Argon plasma coagulation of the orifice of the fistula, followed by 10 mL human fibrin glue injection (Tisseel; Baxter, Westlake Village, California, USA). The fistula was closed again with three interrupted polypropylene 2.0 sutures using the suturing device in the same fashion as described.
previously. There was no contrast extravasation post suturing, and it was elected not to place a stent. The total procedure time was 90 minutes (20 minutes for the actual suturing procedure).

Follow-up endoscopy and contrast examination of the esophagus after the second suturing procedure showed complete fistula closure (Fig. 4 and Fig. 5).

**Video 1**

The technique for endoluminal esophagopleural fistula closure using a novel endoscopic suturing system.

**Endoscopy_UCTN_Code_TTT_1AO_2AI**

**Competing interests:** Dr. Gostout is a member of the Apollo group which conceptualized the suturing system. Dr. Gostout is an advisor to Apollo Endosurgery. Both he and the Mayo Clinic hold equity in this company. Drs. Louis Wong Kee Song, Juliane Bingener and Eduardo A. Bonin have nothing to disclose. Zachary Gostout was a former employee of Apollo Endosurgery, Inc., developer of the Over-Stitch device.

**E. A. Bonin¹, L. M. Wong Kee Song², Z. S. Gostout¹, J. Bingener⁴,⁵, C. J. Gostout¹**

1 Developmental Endoscopy Unit, Mayo Clinic, Rochester, Minnesota, USA
2 Department of Gastroenterology and Hepatology, Mayo Clinic, Rochester, Minnesota, USA
3 Apollo Endosurgery, Inc
4 Department of Surgery, Mayo Clinic, Rochester, Minnesota, USA
5 Mayo Clinic and Foundation, Mayo Clinic, Rochester, Minnesota, USA

**References**

3 Hampe J, Schniewind B, Both M et al. Use of a NOTES closure device for full-thickness suturing of a postoperative anastomotic esophageal leakage. Endoscopy 2010; 42: 595 – 598
5 Kantsevoy SV, Thuluvath PJ. Successful closure of a chronic refractory gastrocutaneous fistula with a new endoscopic suturing device (with video). Gastrointest Endosc 2011: Epub

**Bibliography**

DOI http://dx.doi.org/10.1055/s-0031-1291494
Endoscopy 2012; 44: E8 – E9
© Georg Thieme Verlag KG Stuttgart · New York
ISSN 0013-726X

**Corresponding author**

C. J. Gostout, MD
Developmental Endoscopy Unit
Mayo Clinic
200 First Street SW
Rochester
MN 55905
USA
Fax: +1-507-266-3939
gostout.christopher@mayo.edu

Bonin EA et al. Closure of a persistent esophagopleural fistula, assisted by a novel endoscopic suturing system... Endoscopy 2012; 44: E8–E9