



Enhancing closure efficacy in antireflux mucoplasty through endoscopic hand-suturing technique

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BACKGROUND

We have previously reported the usefulness of antireflux mucosectomy and antireflux mucosal ablation as interventions for addressing proton pump inhibitor refractory/dependent GERD.¹⁻³ Although the effectiveness of antireflux mucosectomy and antireflux mucosal ablation has been confirmed through meta-analyses,⁴⁻⁶ these methods have been reported to result in approximately 5% delayed bleeding, attributed to the necessity for scar contraction following mucous membrane excision and resection. In endoscopic submucosal dissection, it is widely known that closing the defect reduces delayed bleeding.⁷ To address these concerns, we have introduced antireflux mucoplasty (ARM-P), a procedure that promptly closes the defect after mucosectomy.^{8,9} Having demonstrated the effectiveness of closure techniques like Loop-9,¹⁰ Loop-10,¹¹ and Loop-11,⁸ it is worth noting that these methods involve manual crafting and may be confusing for those less familiar. Moreover, we advocate for an optimal closure method that enables suturing of the mucosal defect without creating dead space. Endoscopic hand suturing (EHS) is a closure technique that involves continuous, linear, and precise suturing of the mucosal layer (Fig. 1), eliminating the formation of any dead space. Its feasibility and efficacy have been documented in addressing mucosal defects following endoscopic submucosal dissection.^{12,13} In this context, we present the initial successful application of EHS for wound suturing in anorectal malformations with perineal fistula (ARM-P).

This study received approval from the institutional review board of Showa University (Approval No. 1205-6).

Abbreviations: ARM-P, antireflux mucoplasty; EHS, endoscopic hand suturing.

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CASE

The patient is a 64-year-old woman who has had constant heartburn and burping symptoms regardless of diet for more than 6 years and has been taking potassium competitive acid blocker (PCAB) 20 mg/d with no improvement in symptoms. She underwent upper endoscopy, high-resolution esophageal manometry to rule out esophageal dysmotility, and 24-hour pH monitoring. Following the upper endoscopy, a Hill's flap grade II hiatal hernia was identified, notably without any signs of erosive esophagitis (Fig. 2). However, the 24-hour pH monitoring exhibited a notable correlation between acid reflux and the patient's presenting symptoms. Despite an acid exposure time of 0.3% and a DeMeester composite score of 1.7, the symptom index revealed a consistent 100% occurrence in belching. Furthermore, the symptom association probability for belching was remarkably high, measuring at 99.7%. As a result, a conclusive diagnosis of reflux hypersensitivity has been established. The pretreatment GERD-Health-Related Quality of Life score¹⁴ was 32/50, and the frequency scale for the symptoms of GERD¹⁵ was 34/48.

PROCEDURE

Mucosectomy

Mucosectomy was performed using the cap-EMR technique using a therapeutic endoscope (H290T; Olympus, Tokyo, Japan) with distal attachment (MH-463; Olympus) and an electrosurgical snare (SD-210L-25; Olympus). The cap-EMR



Figure 1. Endoscopic hand suturing.

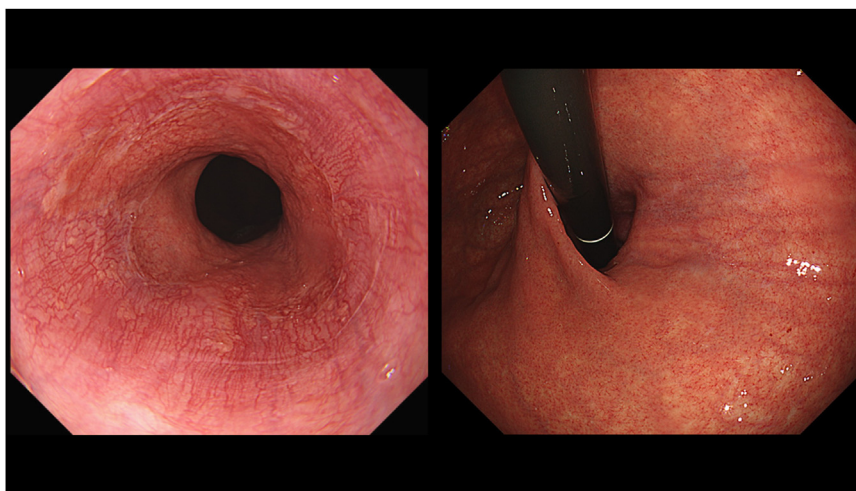


Figure 2. Endoscopic image before antireflux mucoplasty.

was performed 3 times, resulting in the removal of approximately one-third of the mucosal circumference along the lesser curvature (Fig. 3).

Defect closure

Mucosal defect closure was performed using EHS. For the EHS sutures, a barbed thread named V-Loc (Medtronic, New Haven, Conn, USA) was used. Its barbed design ensures that suturing the defect with this thread automatically prevents loosening of the defect. Stitches were initiated from the anorectal side, and tension was applied to bring the defect closer with each stitch. The barb effect caused the defect to gradually shrink, and a total of 9 stitches were applied. One suture was placed at the oral side of the defect as an anchor, and the suture was removed with a loop cutter (FS-410U; Olympus) to complete the procedure (Fig. 4; Video 1, available online at www.videogie.org).

OUTCOME

The duration of the procedure was 153 minutes, and no adverse events such as bleeding or perforation were

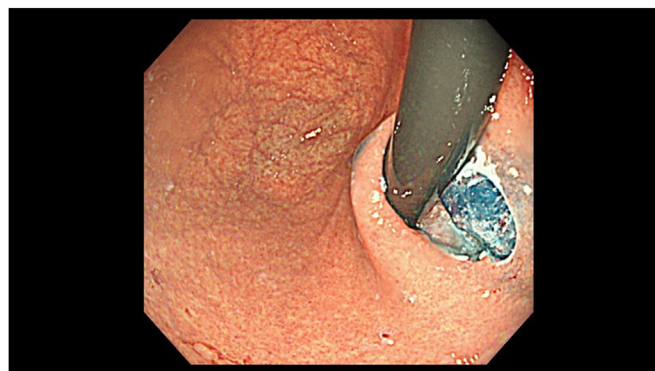


Figure 3. Endoscopic image after cap-EMR.

observed. A follow-up endoscopy 2 months later showed that the hiatal esophageal hernia had narrowed due to scarring of the wound (Fig. 5). Following the procedure, there were notable improvements in all scores: The GERD–Health-Related Quality of Life score improved to 25/50, and the frequency scale for the symptoms of GERD showed improvement to 13/48. Future follow-up assessments are scheduled for 6 and 12 months.

CONCLUSION

For the first time, in this instance, we demonstrated the use of EHS for suturing in ARM-P. EHS is a commercially available suturing device, which makes it a potential option for suturing in ARM-P due to its immediate availability.

DISCLOSURE

Dr Inoue is an advisor of Olympus Corporation and TOP Corporation. He has also received education grants from

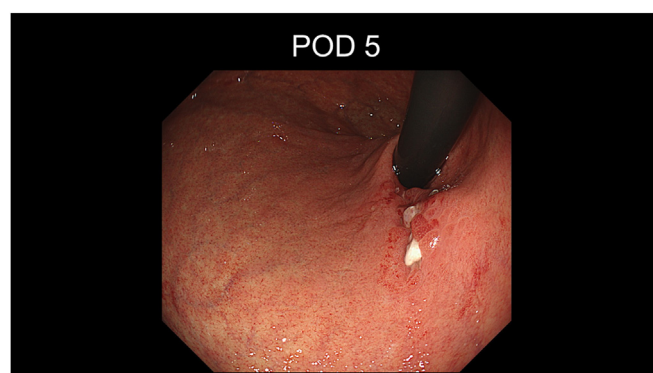


Figure 4. Endoscopic image postoperative day 5 of antireflux mucoplasty.

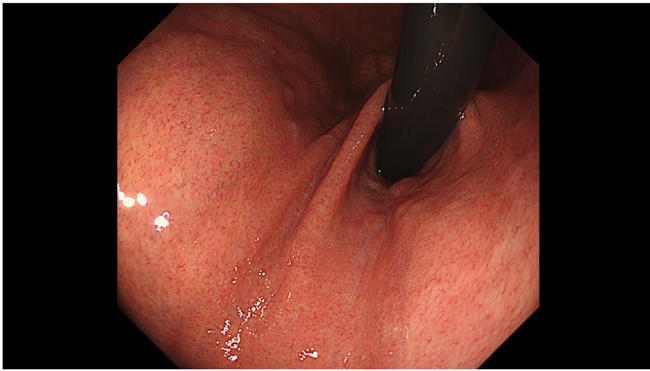


Figure 5. Endoscopic image after 2 months of antireflux mucoplasty.

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