

Gastro-Cutaneous Fistula Closure Using Novel Tack Suture System

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Introduction

Gastro-cutaneous fistulas that develop at prior gastrostomy sites are usually successfully closed using endoscopic suturing or the over-the-scope clips (OTSC). However, the endoscopic suturing device and the OTSC device measure approximately 16 mm and 14 mm, respectively, resulting in them not able to pass through narrow esophageal strictures. The endoscopic tack suture system is a novel technique that includes a through the scope suture-based device that was recently designed for the closure of large and irregular defects in the gastrointestinal tract. Even more advantageous is the ability for the tack suture system to be passed through the working channel of a standard gastroscope.

Case Presentation

A 61-year-old male with past medical history of head and neck cancer presented with persistent gastro-cutaneous fistula and drainage following gastrostomy tube removal. On endoscopic evaluation, a benign appearing esophageal stenosis in the upper esophagus required downgrading the scope from a therapeutic scope to a gastroscope. A gastric fistula was noted in the gastric body, but the exact site of the fistula was unclear as there were 2 defects side by side (Figure 1A). Both defects were treated with APC and the entire area was closed with a single tack suture system with 4 tacks drilled in healthy tissue surrounding the defect in a running pattern (Figure 1B) (Figure 3). Following tack placement, a single suture was used to cinch down and close the defect (Figure 1C). On follow up the patient had no further fistula drainage.

References

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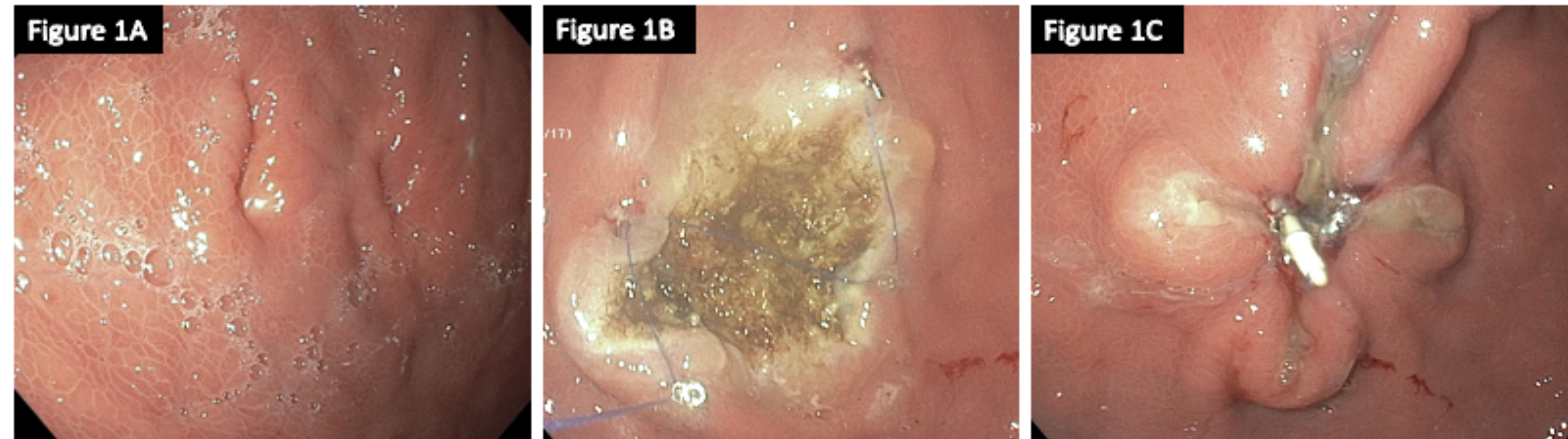
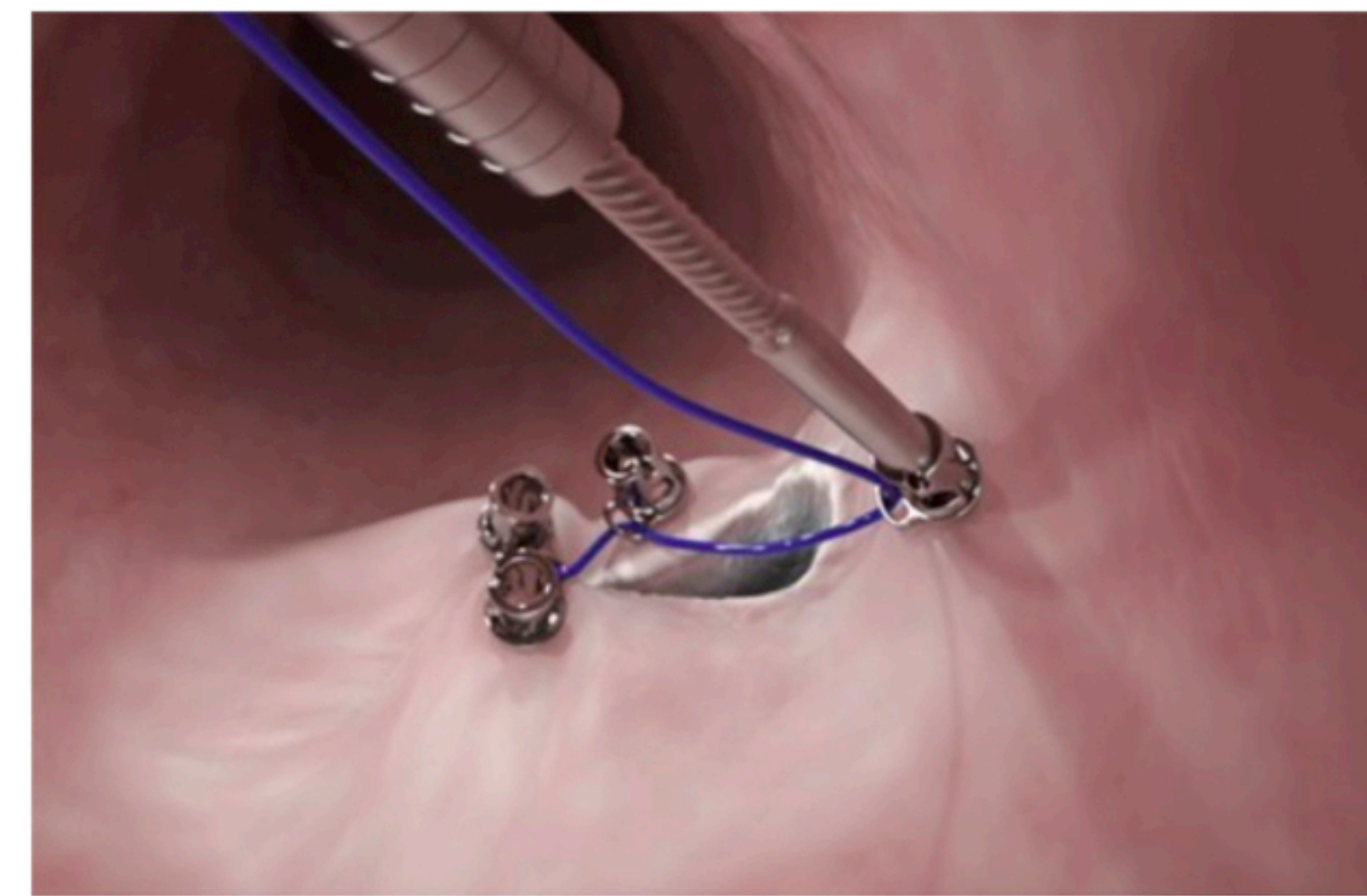


Figure 1A: Gastro-cutaneous fistula with two possible defect sites
 Figure 1B: Both sites treated with APC and 4 tacks drilled into healthy tissues surrounding defect
 Figure 1C: Synched with good closure of defect



Figure 2: Ex vivo footage of the tack suturing system



Device	Advantages	Disadvantages
Tack Suture System	<ul style="list-style-type: none"> Superior for defects >30 mm Closure of irregularly shaped defects No need for endoscope withdrawal 	<ul style="list-style-type: none"> Effectiveness of closure force unknown Risk of wound dehiscence
TTS Clips	<ul style="list-style-type: none"> Well studied Ease of use 	<ul style="list-style-type: none"> Restricted grasp of tissue Low closure force Need for multiple clips, increased cost
OTS Clips	<ul style="list-style-type: none"> Large clip size allow for larger defect closure 	<ul style="list-style-type: none"> Difficult with small defects <20mm Need for endoscope withdrawal and reload Passage through narrowed tortuous lumen
Endoscopic Suture Device	<ul style="list-style-type: none"> No limit on defect size Full thickness closure ability 	<ul style="list-style-type: none"> Need for endoscope withdrawal and reload Need for specialized double channel upper endoscope Expensive

Table 1: Comparison of tack suture system, through the scope clips (TTS), over the scope clips (OTS), and endoscopic suture device.

Discussion

- Our case presents the use of a novel tack suturing system to close a persistent gastro-cutaneous PEG fistula in the setting of an esophageal stricture.
- Commonly used defect closing devices such as the OTSC and endoscopic suturing device can be too large to navigate severe esophageal strictures. The tack suture system can be deployed through the 2.8 mm working channel of a standard gastroscope.
- The endoscopic tack sutures system can aid in the closure of fistulas, perforations, anastomotic leaks and submucosal dissections.
- While preclinical data reported no adverse events, possibilities include wound dehiscence, delayed perforation, and bleeding if the tacking system is improperly placed.
- Mahmoud et al. conducted the first and only multicenter study describing the feasibility and safety of the endoscopic tack suturing device in the clinical setting and found successful closure of defects in approximately 90% of cases. Adverse effects only occurred in 2% of study patients.
- Further, when compared to through the scope clip intervention, tack sutures were superior for acute closure of large mucosal defects with similar rates of healing.
- This novel tack suture system is a useful tool in cases that are limited to the parameters of a standard gastroscope.