Closure of refractory gastrocutaneous fistula with endoscopically guided percutaneous suturing with the use of miniature biopsy forceps

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INTRODUCTION

A PEG tube is an ideal option for enteral nutrition in patients with impaired swallowing or for nutrition optimization. After PEG tube removal, the tract usually closes spontaneously. However, persistent gastrocutaneous fistula (GCF) is a rare but well-known adverse event of long-term PEG tube use.[1] Despite the evolution of endoscopic techniques over the last decade, such as over-the-scope clips (OTSCs), endoscopic suturing, and biosynthetic glue plaque, the management of GCF remains challenging.[2-6] Although endoscopic suturing results in full-thickness closure of the gastric wall, persistent leakage from the cutaneous site may still occur, requiring surgical intervention for the management of the fistula. We report a case of successful GCF closure with an endoscopically guided percutaneous suturing technique using miniature biopsy forceps.

CASE DESCRIPTION

Our case is a 28-year-old man with a history of cystic fibrosis (CF) complicated by malnutrition, requiring PEG tube placement since childhood. After starting CF therapy with elexacaftor/tezacaftor/ivacaftor and achieving optimal nutritional status, his PEG tube was removed after 2 decades of his life. Unfortunately, he developed a persistent GCF. Initial attempts at closure with an OTSC (Ovesco Endoscopy, GmbH, Tubingen, Germany) and endoscopic suturing with OverStitch (Apollo Endosurgery, Austin, Tex, USA) failed as he continued to have persistent leakage from the GCF site. OTSC closure failed because of significant underlying fibrosis in the immediate area around the PEG site, and thus the inability of the OTSC to anchor within the gastric tissue. Therefore, the decision was made to proceed with GCF closure by endoscopically guided percutaneous suturing using the SpyBite (Boston Scientific, Marlborough, Mass, USA) miniature forceps (Figs. 1 and 2; Video 1, available online at www.videogie.org).

The patient received prophylactic antibiotics before the procedure. Under endoscopic guidance, two 16-gauge long angiocaths were advanced into the gastric lumen, 1 caudal and 1 cranial to the fistula tract in a sterile fashion (Fig. 1C). A 2-0 silk suture was advanced through one angiocath and externalized using SpyBite forceps through the other angiocath (Fig. 1D). The angiocaths were removed over the suture, and the loop was tied down using a surgical knot (Fig. 1E and F). This process was repeated 2 more times along the fistula tract, 5 mm from each other, to ensure adequate closure of the GCF orifice (Fig. 1B). We then proceeded with reinforcing the closure of the GCF with OverStitch endoscopic suturing. Using 1 interrupted and 2 running patterns, we placed 3 sutures (8 stitches; 3-3-2) along the border and cinched to reinforce the site. There was no immediate adverse event or delayed skin inflammation. The patient had no further leakage from the GCF site at the follow-up 2 months later.

CONCLUSION

With the emergence of novel CF therapies, the dependence on feeding tubes has decreased. Unfortunately, these patients are at high risk of GCF formation after PEG tube removal. Given the difficulty in closing GCF, we advocate a multimodality approach using transcutaneous and endoscopic suturing. In previously described endoscopically guided percutaneous suturing, the suture

Abbreviations: CF, cystic fibrosis; GCF, gastrocutaneous fistula; OTSC, over-the-scope clip.

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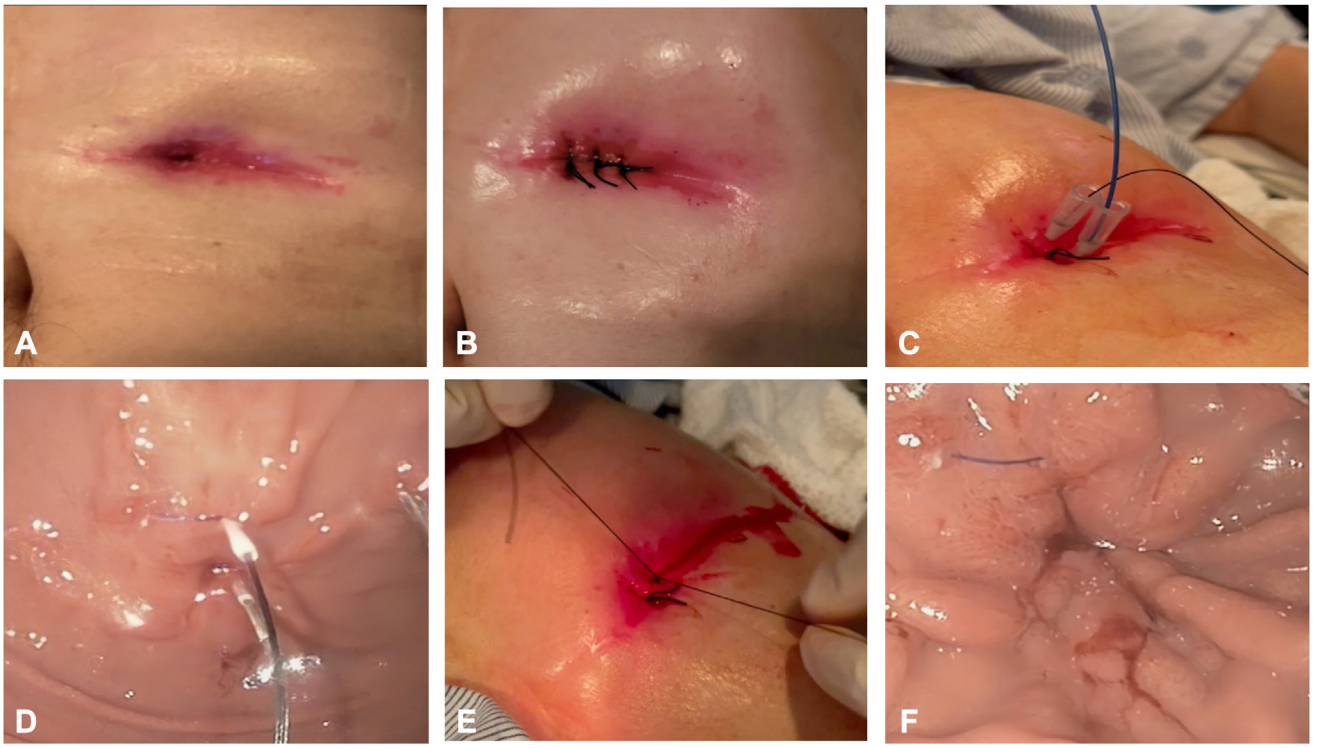

Figure 1. Endoscopically guided percutaneous suturing technique. The gastrocutaneous fistula was visualized preclosure **(A)** and postclosure **(B)**. **C and D,** Two 16-gauge long angiocaths were advanced into the gastric lumen along the fistula tract under endoscopic guidance. A 2-0 silk suture was advanced through one of the angiocaths into the gastric lumen. The suture was then externalized through the adjacent angiocath with SpyBite biopsy forceps. **E and F,** After removal of the 2 angiocaths, the suture was tied down using a surgical knot to close the fistula. This was repeated 2 more times.

loop is externalized through the GCF tract or the mouth, which limits their utility and feasibility in smaller GCF tracts with less room for maneuverability.[7,8] Similar suturing techniques and laparoscopic devices have been described for suture grasping and closure of abdominal wall defects, for example, the dual gastropexy device, which has 2 parallel 20-gauge needles and a suture holding loop, and the suture grasping forceps (Carter Thomason CloseSure Systems, Trumbull, Conn, USA), which have been used routinely for closure of port sites.[9] However, these are not widely available in the gastroenterology suite. Our technique differs in using SpyBite forceps to externalize the suture through a second catheter for transabdominal suturing. This method is simple and provides a safe and effective alternative for the closure of refractory GCFs.

DISCLOSURE

Dr Abidi is a consultant for Apollo Endosurgery, AMBU USA, and ConMed. Dr Ryou is a consultant for Boston Scientific, Fujifilm, Medtronic, Cook Medical, EnteraSense, GI Windows, and Olympus; receives grant/research support from Cook Medical; and is a founder of EnteraSense and GI Windows. All other authors disclosed no financial relationships.

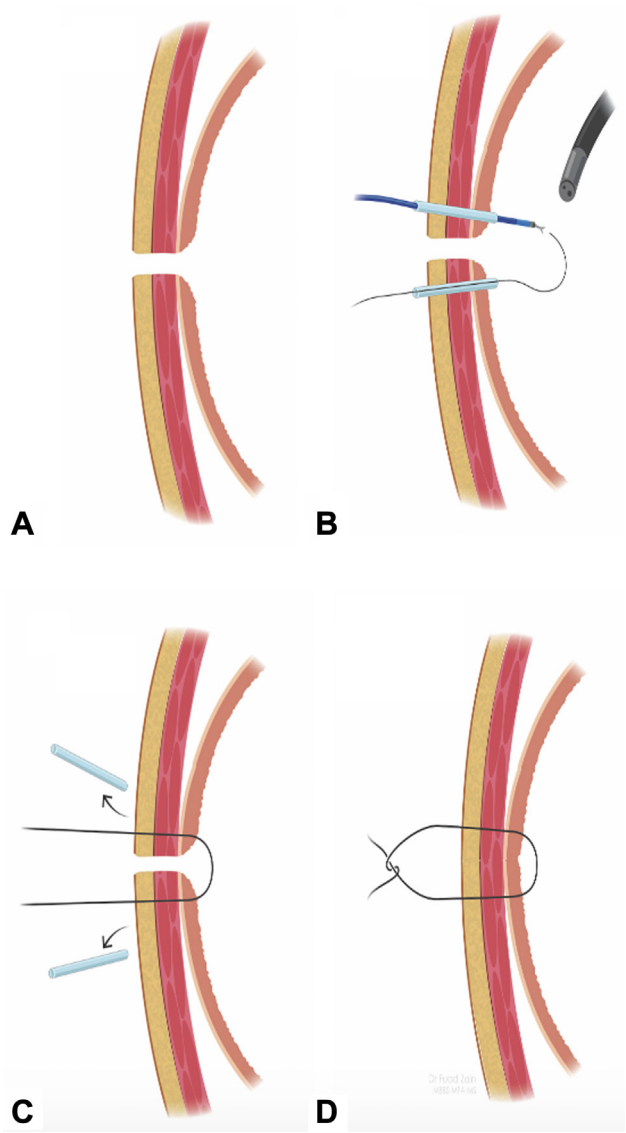

Figure 2. Step-by-step demonstration of endoscopically guided percutaneous suturing with the use of SpyBite biopsy forceps for closure of a persistent gastrocutaneous fistula.

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