Full-thickness endoscopic suturing of staple-line leaks following laparoscopic sleeve gastrectomy

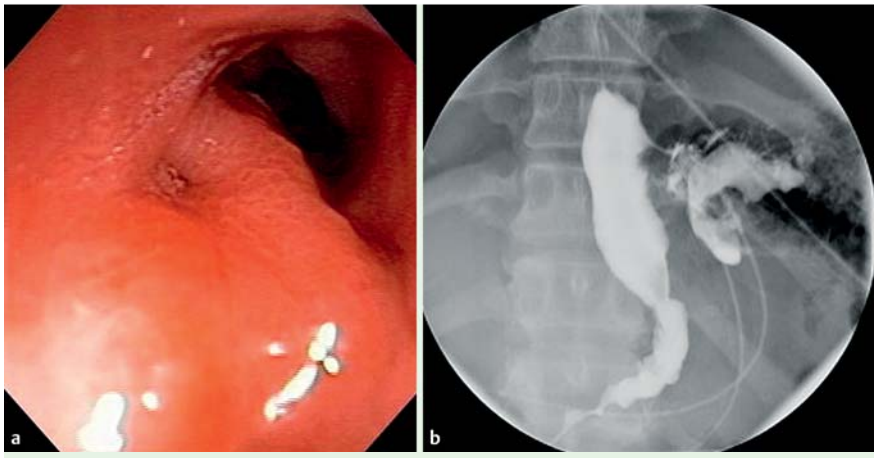

Fig. 1 A 50-year-old woman required management of a 2-mm staple-line leak 3 months after laparoscopic sleeve gastrectomy. **a** Leak site along the staple line immediately below the esophagogastric junction. **b** Fluoroscopic image demonstrating contrast extravasation from the staple line immediately distal to the gastroesophageal junction.

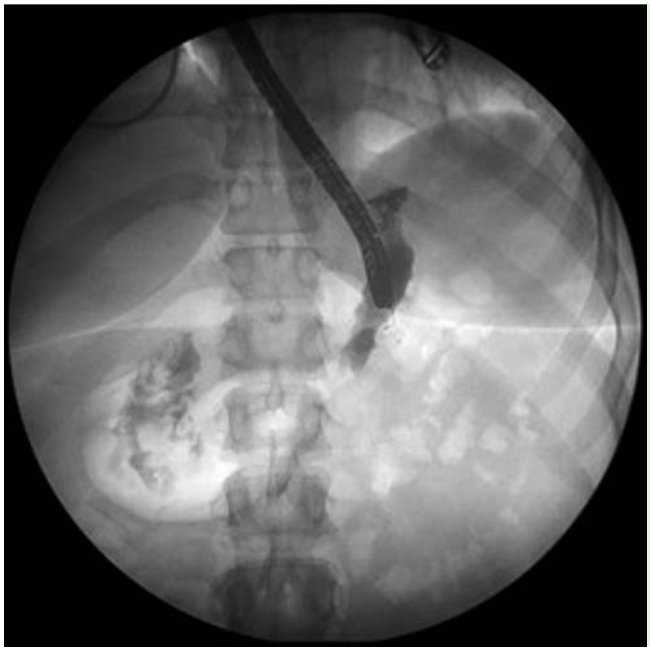

Fig. 2 Fluoroscopic image showing contrast filling the stomach and proximal duodenum without evidence of leakage, following full-thickness suturing in the patient in ▶ **Fig. 1**.

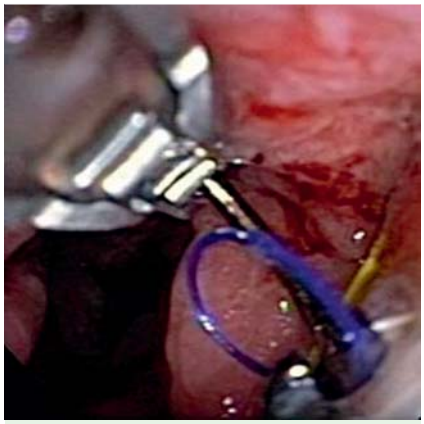

Fig. 3 A 52-year-old woman required management of a large 8-mm staple-line leak below the esophagogastric junction 7 days after laparoscopic sleeve gastrectomy. Endoscopic view of the full-thickness suturing device and a guidewire placed through the defect to facilitate identification of the leak site.

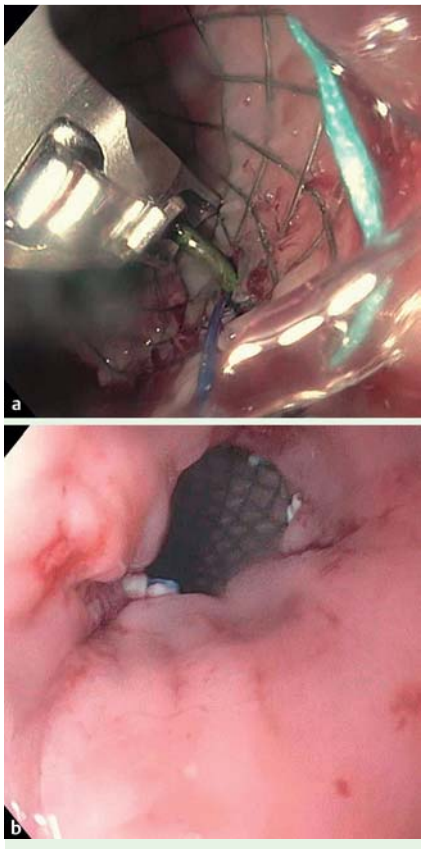

Fig. 4 **a** Endoscopic image of a bite through the stent in the patient in ▶ **Fig. 3**. **b** The proximal end of the stent was secured to the esophageal wall in two locations using the full-thickness suturing device.

Staple-line leaks following laparoscopic sleeve gastrectomy occur in 1%–9% of patients being treated for morbid obesity [1, 2]. Superficial endoluminal suturing has shown limited efficacy, even in conjunction with other closure modalities [2, 3]. We report two cases of successful closure of staple-line leaks after laparoscopic sleeve gastrectomy using full-thickness endoscopic suturing.

A 50-year-old woman presented for management of a chronic 2-mm staple-line leak immediately below the esophagogastric junction 3 months after laparoscopic sleeve gastrectomy (▶ **Fig. 1 a, b**). Primary surgical closure as well as diversion using a fully covered self-expandable esophageal metallic stent (SEMS) had previously failed to achieve closure. Therefore, primary closure of the chronic leak was performed using a full-thickness endoluminal suturing device (OverStitch, Apollo Endosurgery, Austin, Texas, United States). The leak site was treated with argon plasma

coagulation (APC) and subsequently the defect was closed with a single 2-0 nonabsorbable suture. Fluoroscopy after closure demonstrated no leak (**Fig. 2**). The patient commenced a soft diet the following day and remained well at 12-month follow-up.

A 52-year-old woman presented for management of a large 8-mm staple-line leak below the esophagogastric junction 7 days after laparoscopic sleeve gastrectomy. The edges of the leak were treated with APC. A guidewire was temporarily placed through the defect to maintain identification of the leak site. Primary closure was performed with two 2-0 nonabsorbable sutures (**Fig. 3**). Because of the size of the leak, a 23×103 mm fully-covered SEMS (WallFlex, Boston Scientific Corporation, Natick, Massachusetts, United States) was deployed across the leak. The proximal end of the stent was secured to the esophageal wall in two locations using the full-thickness endoscopic suturing device (**Fig. 4a, b**). The patient returned at 4 weeks for stent removal and sutures were cut with the Loop Cutter (Olympus Corporation of the Americas, Center Valley, Pennsylvania, United States). Contrast esophagram confirmed no leak. The patient remained well at 3-month follow-up.

We demonstrate a novel method of endoscopic closure of both a small, chronic and a large, acute staple-line leak following laparoscopic sleeve gastrectomy. Full-thickness suturing alone appears to be sufficient in treating small leaks; however, larger leaks likely require adjunctive techniques including diversion therapy with a fully-covered SEMS. As there is no stricture present, the risk of stent migration is high and we advocate securing the stent in position using endoscopic suturing [4, 5].

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Competing interests: Mouen A. Khashab is a consultant for Boston Scientific and Olympus America and has received research support from Cook Medical. Anthony N. Kalloo is a founding member, equity holder and consultant for Apollo Endosurgery. All other authors have no disclosures.

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Bibliography

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