



Catheter-based deployment of vascular plugs for the management of challenging gastric fistulae

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INTRODUCTION

Gastric fistulae are known adverse events of bariatric surgery.¹ Endoscopic strategies considered for treatment of gastric fistulae include endoscopic suturing, over-the-scope clips, and endoscopic internal drainage. Although these techniques provide durable closure, they are not always feasible because of location. These methods often require repeated treatments and still have inconsistent rates of success. Cardiac septal occluders have emerged as a tool to manage fistulae but have large diameters, which limit their ability in managing smaller fistulae.² The small diameter of vascular plugs allows for effective treatment of smaller fistulae. We present here 2 cases in which vascular plugs successfully managed fistulae.

METHODS

Our series focuses on fistulae measuring 3 to 4 mm in diameter. Manufacturers recommend that the plug diameter measures 150% of the target lumen size.³ For both cases, we deployed 6- × 6-mm plugs (Amplatzer 2; Abbott, St Paul, Minn, USA). This model was chosen for its dumbbell shape and larger surface area, which mitigate plug migration. The device is attached to a delivery wire via a screw attachment. A modified 10-7-5 biliary dilation catheter (Cook Endoscopy, Winston-Salem, NC, USA) is used to position and deploy the plug. Once the plug is in satisfactory position, counterclockwise torque to the delivery wire deploys the plug.

CASE DESCRIPTION

Case 1: Occlusion of endobronchial fistula

A 38-year-old woman underwent sleeve gastrectomy complicated by sleeve leak and a gastrobronchial fistula.

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University of Massachusetts Chan Medical School, Worcester, Massachusetts (1).

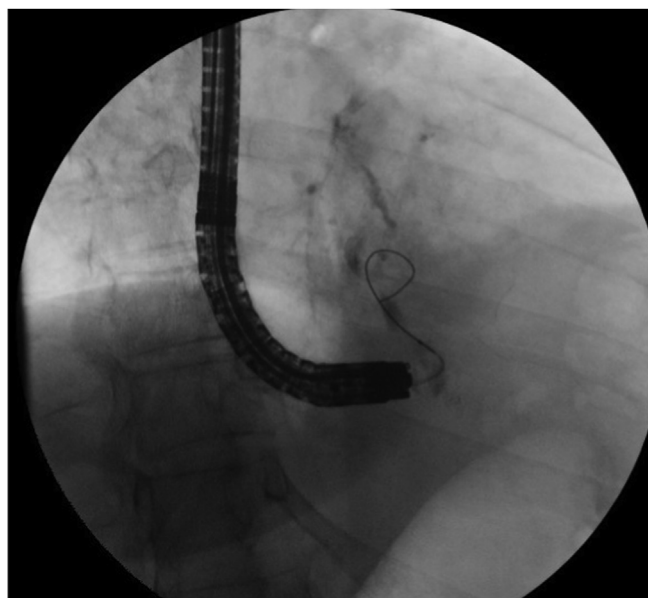


Figure 1. Cannulation of the endobronchial fistula.

The patient's fistula was unsuccessfully managed by endoluminal stent placement, endoscopic internal drainage, and endoscopic suturing. Thus, vascular plug placement was offered.

The modified catheter engaged the fistula along with a 0.018-inch wire (Novagold; Boston Scientific, Marlborough, Mass, USA) (Fig. 1). After removal of the wire, the catheter was left in place and the plug was advanced and deployed (Fig. 2).

The patient experienced significant improvement after the procedure. Six months later, evaluation at an outside institution demonstrated fistula closure on the gastric side and that the plug remained in place. However, the patient did need a thoracotomy to treat her diseased lung.

Case 2: Occlusion of gastrogastric fistula

A 46-year-old woman underwent Roux-en-Y gastric bypass complicated by a gastrogastric fistula (Fig. 3). She had significant reflux and, given the small fistula size, closure with a vascular plug was offered.

The fistula was cannulated with a 0.035-inch guidewire (Boston Scientific), and a modified 10-7-5 biliary catheter was advanced over it. A standard endoscope inserted

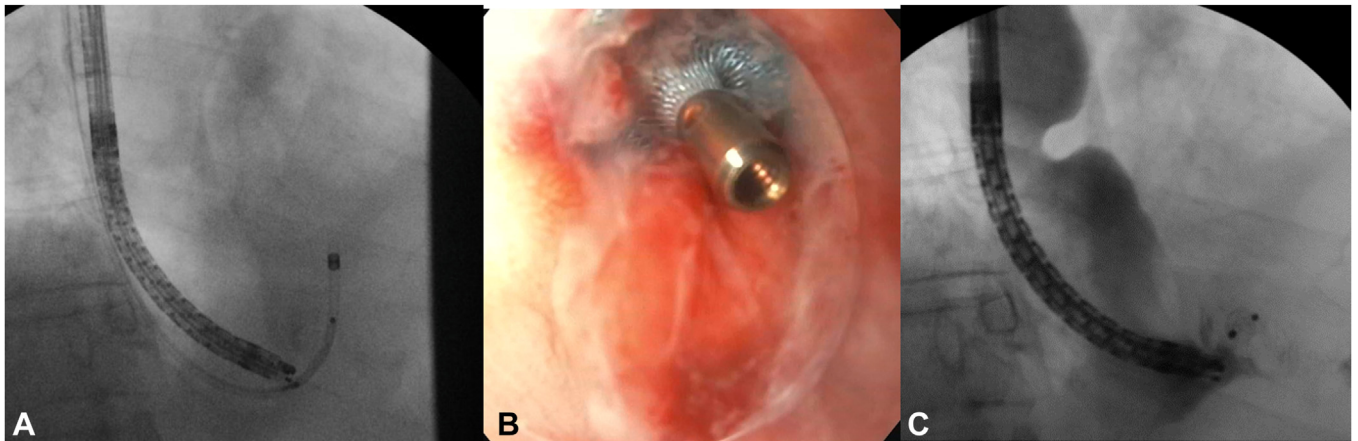


Figure 2. **A**, Fluoroscopic view of delivery catheter in position to deploy vascular plug. **B**, Endoscopic view of deployed vascular plug. **C**, Fluoroscopic view of deployed vascular plug.

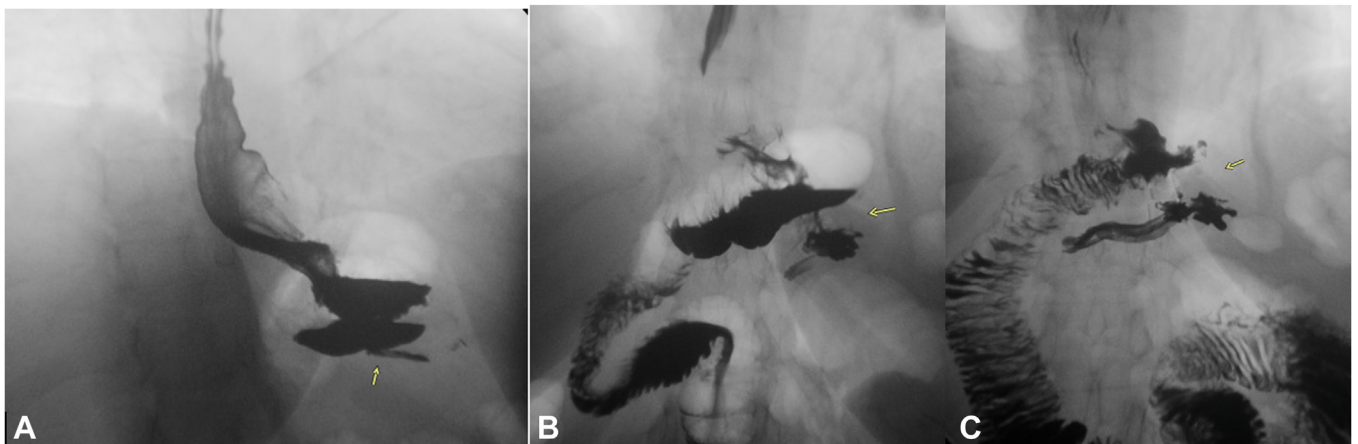


Figure 3. **A-C**, Upper-GI series demonstrating gastrogastric fistula in post-Roux-en-Y anatomy. Each panel is a different phase of the series.

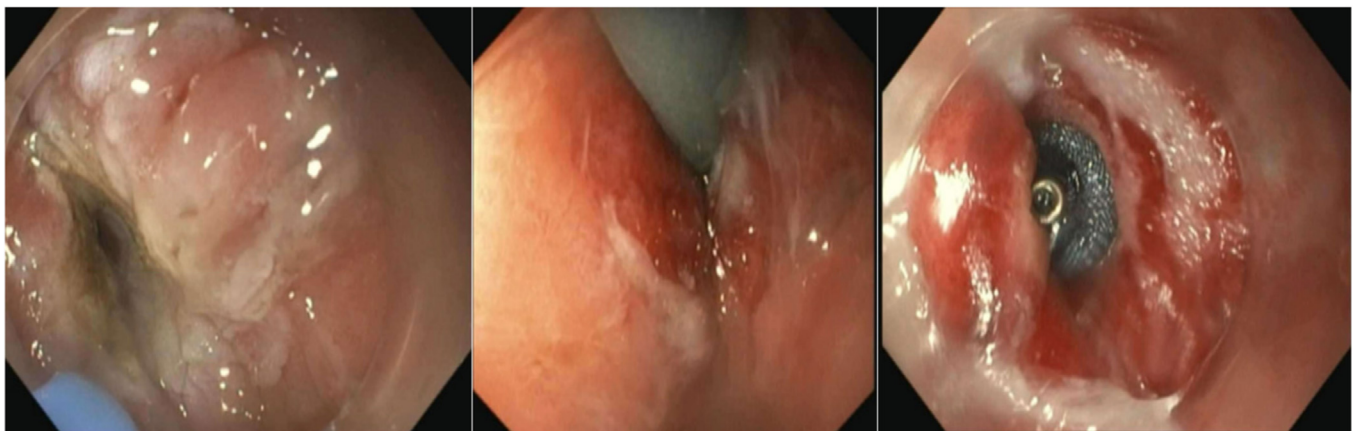


Figure 4. Direct endoscopic visualization of vascular plug deployment.

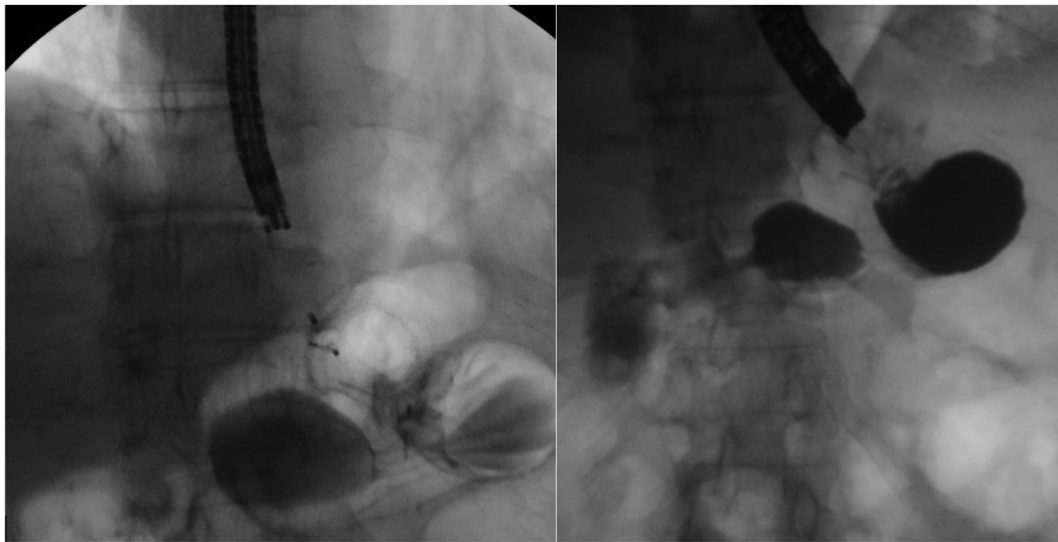


Figure 5. Fluoroscopic images demonstrating no evidence of a leak after vascular plug deployment.

alongside the biliary catheter provided direct visualization (Fig. 4). The vascular plug was deployed into the fistula, with successful fistula closure demonstrated on fluoroscopy.

The patient did well postoperatively and has remained asymptomatic for 9 months. We did not think follow-up endoscopy or imaging were necessary (Fig. 5). We believe the plug epithelized, successfully closing the fistula tract.

CONCLUSION AND CLINICAL IMPLICATIONS

This series demonstrates the novel use of vascular plugs for closure of small and difficult-to-manage GI fistulae. Vascular plugs have an excellent safety profile with low rates of migration or embolization in the vascular literature.³ This makes them an attractive device to incorporate for GI disease. Studies already show promising long-term outcomes in esophageal disease.⁴ Barriers to routine endoscopic use include technical understanding and device exposure. While the plugs have an internal nitinol mesh, it is not clear to us if they can be removed after placement.

Currently, there are no studies reporting long-term outcomes for vascular plugs being used in GI pathology.

Further research is required to determine the clinical use of vascular plug devices and their performance in terms of success rates, adverse event rates, and long-term outcomes (Video 1, available online at www.videogie.org).

DISCLOSURE

Dr Marya is a consultant for Boston Scientific. The other authors did not disclose any financial relationships.

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