



The final plug: novel use of vascular plug for management of bronchoesophageal fistula

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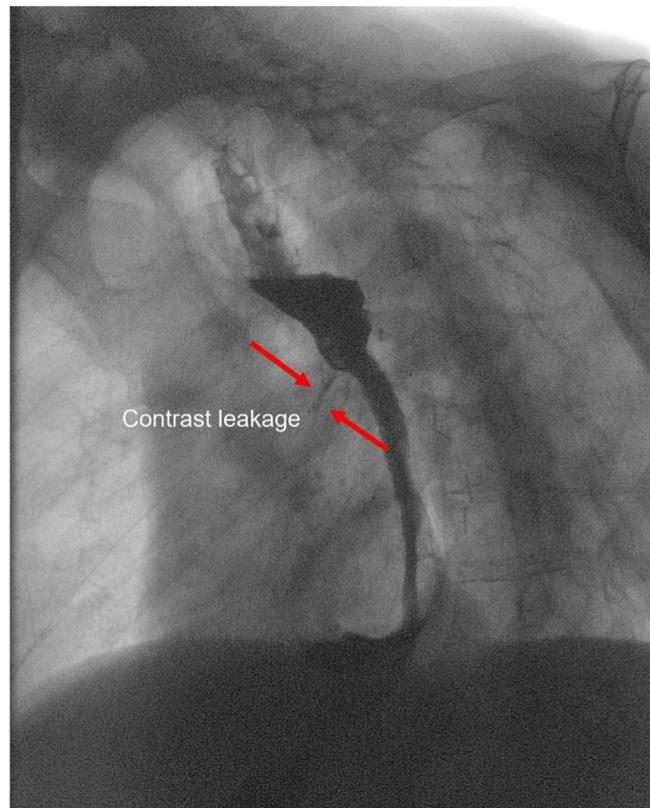


Figure 1. Barium esophagram with *arrows* illustrating contrast leak into the bronchus, confirming presence of a bronchoesophageal fistula.

INTRODUCTION

Bronchoesophageal fistula (BEF) management consists of surgical and endoscopic interventions including use of self-expandable metal stents.^{1,2} However, in cases with altered anatomy, such as in post-esophagectomy with esoph-

agoastric anastomosis, stents may not suffice because of a mismatch in the diameter between the stents and esophago-gastric conduit.³ Thus, novel solutions are required to address BEFs refractory to initial intervention with stents. We describe the successful management of a postsurgical BEF with a combination of a self-expanding vascular plug, glue containing cyanoacrylate, and a fully covered metal stent (FCMS).

Abbreviations: BEF, bronchoesophageal fistula; FCMS, fully covered metal stent.

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CASE PRESENTATION

We present the case of 77-year-old man with a history of esophageal cancer status post-Ivor Lewis esophagectomy who developed a BEF. Initial management included esophageal stent placement. He maintained his nutritional requirements through percutaneous endoscopic jejunostomy tube

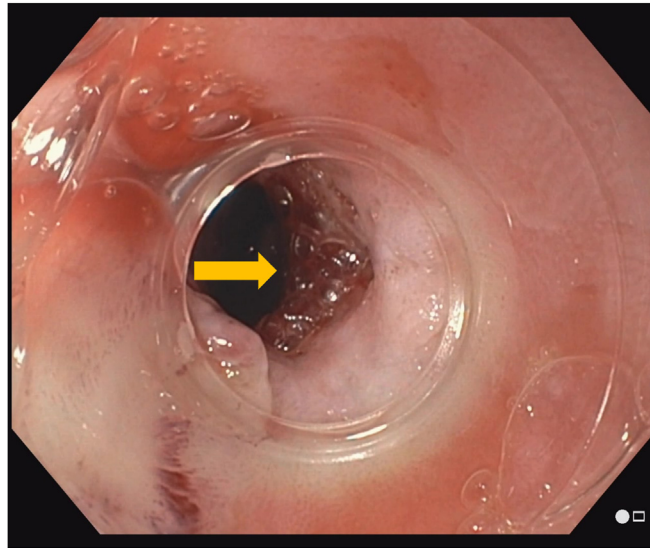


Figure 2. Endoscopic image with *arrow* illustrating bubbling from bronchus into esophagus during positive pressure ventilation, confirming the location of the bronchoesophageal fistula.

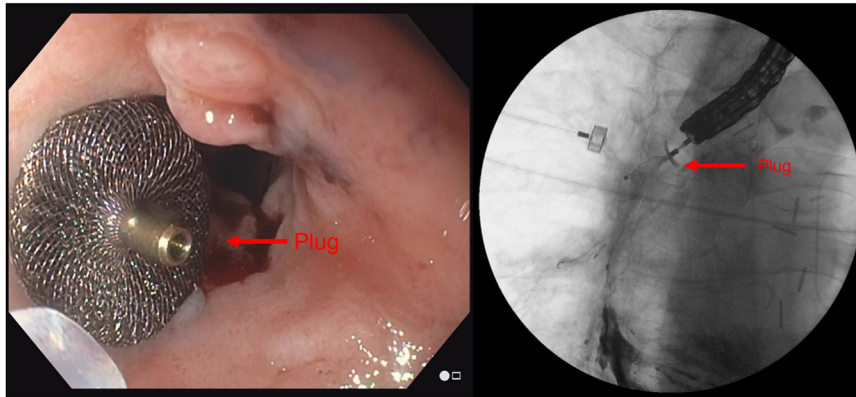


Figure 3. Side-by-side images demonstrating endoscopic view of vascular plug deployment across the fistula tract (*left*) with fluoroscopic guidance (*right*).

feeds. However, the patient experienced a persistent cough after oral intake during the weeks preceding admission. A barium esophagram confirmed leakage from the esophagus into the right bronchus (Fig. 1). The endoscopy team was called for evaluation and management of persistent BEF.

During the endoscopy, a 4-mm fistula was found at the esophageal anastomosis, evidenced by end-tidal carbon dioxide spikes and air bubbles during positive pressure ventilation (Fig. 2). Because of the stenosed esophagogastric anastomosis with the fistula immediately proximal to that, an over-the-scope clip was not feasible. Moreover, there was concern that this could further compromise the lumen. The decision was made to fluoroscopically deploy a 7-mm self-expanding 3-part wheelbarrow-type vascular plug (AVP II; Abbott Cardiovascular, Plymouth, Minn, USA) across the fistula tract (Video 1, available on-

line at www.videogie.org). The plug was inserted such that the thin wheel was deployed into the bronchial side, the middle broader wheel into the fistula tract, and the third thin wheel facing the esophageal side (Fig. 3). The plug components within the fistula and esophageal side were obstructed with contrast-laced cyanoacrylate to create a water-resistant seal, prevent leakage, and avoid bronchial obstruction. Cyanoacrylate was chosen because it solidifies fast and has proinflammatory properties when reacting with nickel (a component of the plug).⁴ The existing stent was removed and replaced with a 10- × 100-mm FCMS (Viabil; Gore Medical, Flagstaff, Ariz, USA) to cover the fistula, under fluoroscopic guidance (Fig. 4) with no contrast leakage observed (Fig. 5).

At the 6-week follow-up the patient was doing well, tolerating oral intake with no cough. The patient has

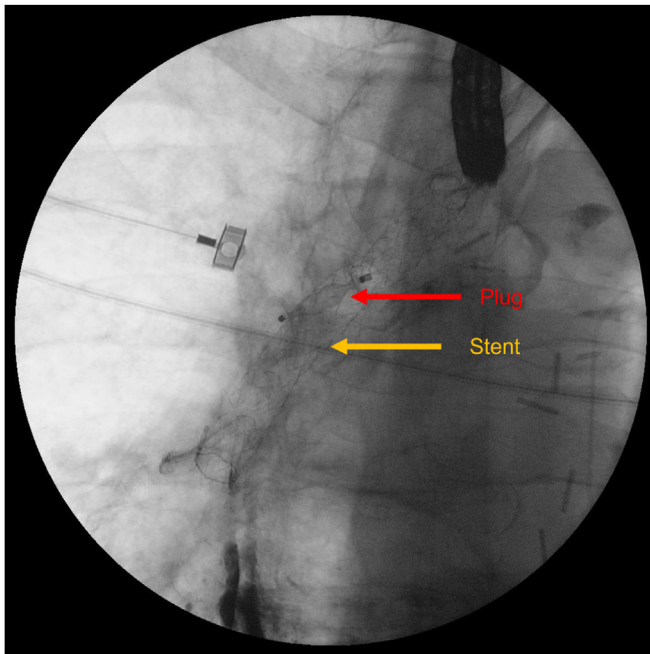


Figure 4. Final location of the vascular plug within the bronchoesophageal fistula tract along with the new fully covered metal stent.

been symptom free for 11 months. The plug, glue, and stent are biocompatible; therefore, subsequent intervention will only be undertaken if the patient is symptomatic.

CONCLUSION

We exploited the use of a vascular plug, glue, and an FCMS to create a water-tight seal for closure of a BEF. The combination of cyanoacrylate and nickel allowed for a proinflammatory reaction and plugging of the fistulous tract. This approach is suitable for patients in whom stents failed because of challenging postsurgical anatomy and mismatch of stent diameter with gastric conduit.

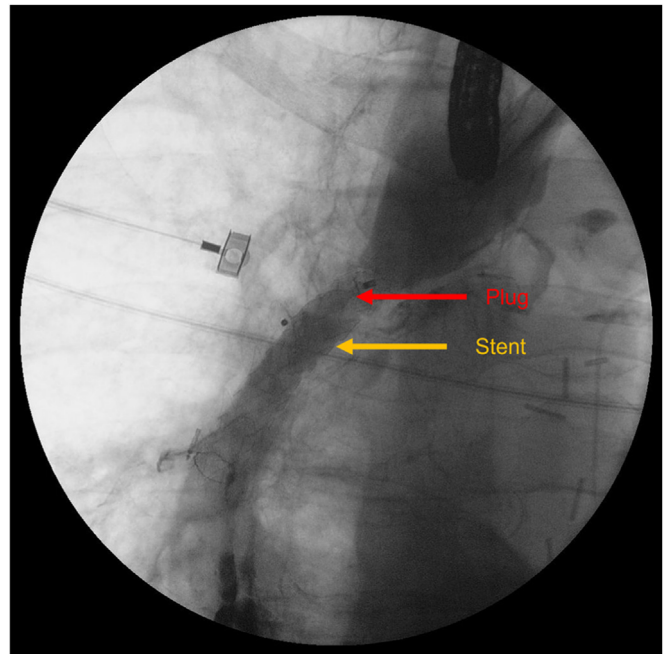


Figure 5. Final location of the vascular plug within the bronchoesophageal fistula tract along with the new fully covered metal stent, demonstrating no contrast leak.

DISCLOSURE

The authors disclosed no financial relationships relevant to this publication.

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