Transpyloric lumen-apposing metal stent for management of persistent post-esophagogastrectomy leak

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Anastomotic leaks are an adverse event complication of GI surgery that contribute to increased hospital stays, morbidity, and mortality. Endoscopic therapy via endoscopic closure techniques or covered metal stent placement has increasingly been used for primary therapy of anastomotic leaks.

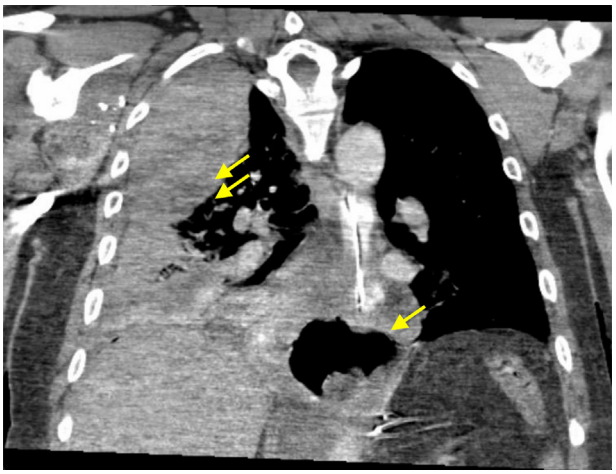

Figure 1. Chest CT scan (anterior posterior view) showing an anastomotic leak with free air and contrast throughout the lesser sac along the lesser curvature (*single arrow*). Also note air around the distal esophagus (*single arrow*) and hyperdense material throughout the right-sided pleural effusion (*double arrows*), which likely represents contrast extravasation.

However, if transpyloric drainage is delayed, a persistent leak may develop. This is due to the preferential flow of gastric contents to the path of least resistance through the leak rather than the stenosed pylorus. Delayed gastric conduit emptying (DGCE) has been described after esophagectomy in 10% to 20% of patients because of denervation and disruption of the natural peristaltic functions of the stomach. Studies have shown an association with DGCE and postoperative anastomotic leaks.[1-3] Improving downstream stenosis to resolve an anastomotic leak has been reported with gastric peroral endoscopic myotomy.[4] We describe a case of persistent anastomotic leak after esophagogastrectomy, which resolved by improving transpyloric drainage via placement of a lumen-apposing metal stent (LAMS). To our knowledge, this novel use of LAMSs has not been previously reported in literature.

CASE DESCRIPTION

A 54-year-old man with a history of prior vertical sleeve gastrectomy underwent esophagogastrectomy for curative intent of invasive adenocarcinoma arising in gastroesophageal junctional mucosa in the background of Barrett's esophagus.

On postoperative day 5, his Jackson-Pratt drain fell out, and he developed right-sided chest pain and respiratory distress. His vital signs revealed oxygen saturation of 85% requiring a non-rebreather mask and tachypnea with a

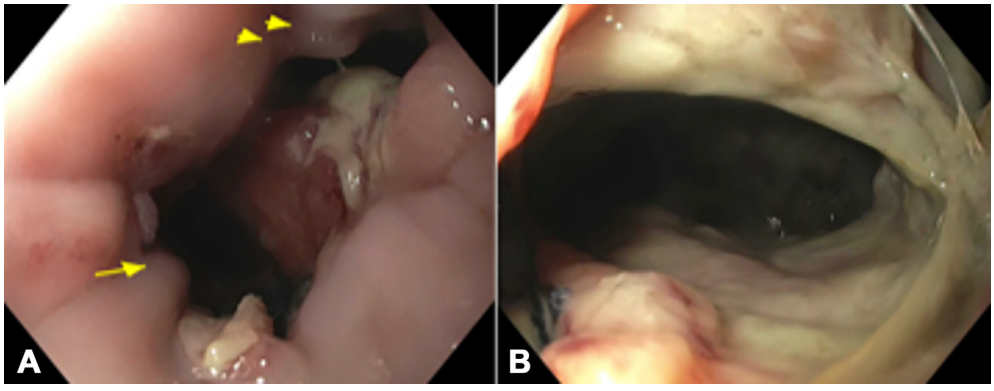

Figure 2. A, *Single arrow* represents the lumen, and *double arrow* represents the area of the defect, which measured 1.5 cm. **B**, Defect opens to a large cavity as seen here, which was extensively irrigated with sterile water.

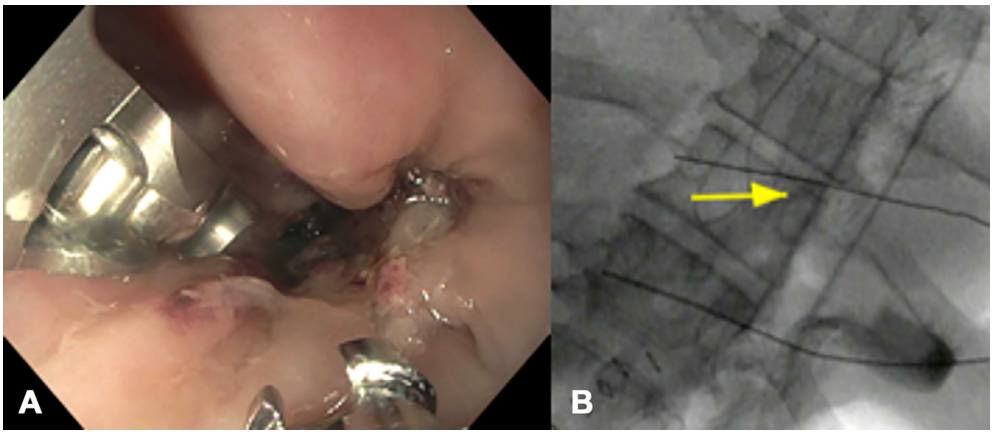

Figure 3. **A**, Placement of 2 running sutures starting from distal edge of leak. To achieve proper (serosa-to-serosa) apposition, the sutures were placed from mucosa to serosa, and then serosa to mucosa. **B**, *Single arrow* showing the 18-mm fully covered metal stent in place. It was anchored with endoscopic sutures.

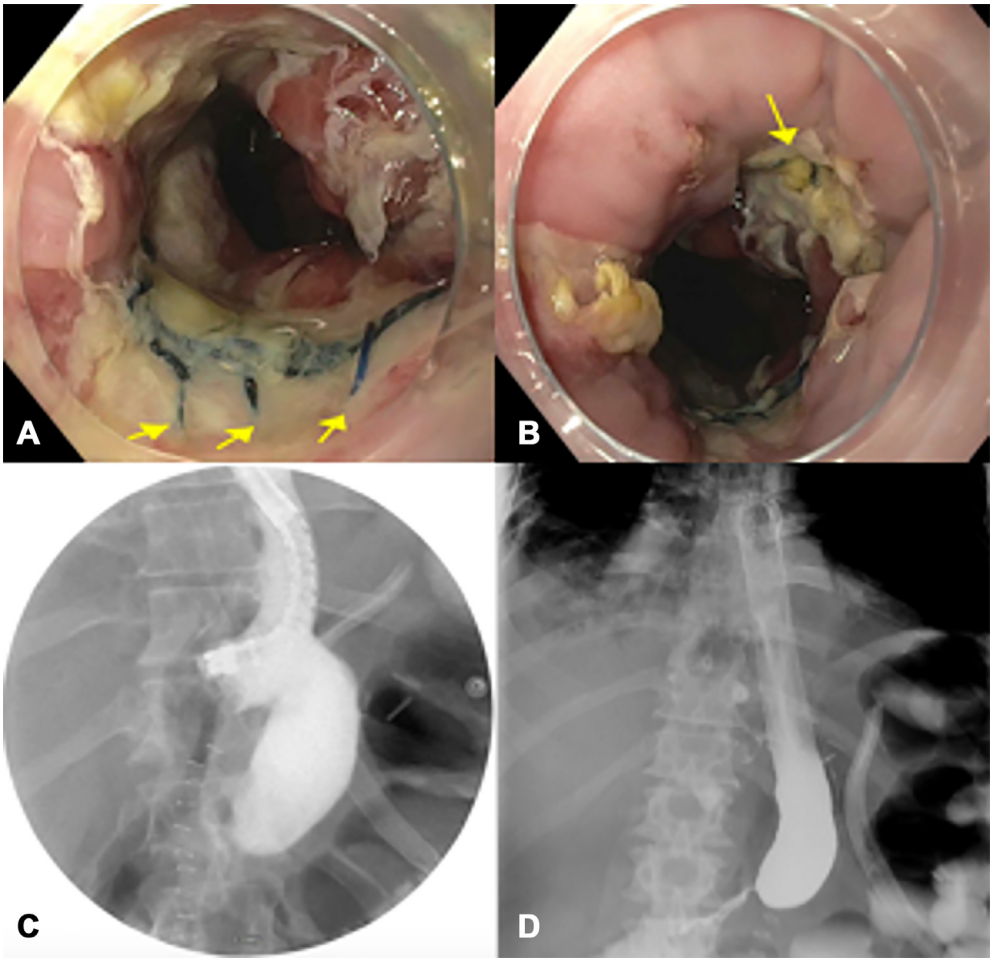

Figure 4. **A**, **B**, After removal of the 18-mm stent, the endoscopic sutures (*yellow arrows*) had satisfactory approximation. Bottom left: Double-contrast (carbon dioxide and contrast) intraoperative esophagram was negative for extravasation even without the stent. **C**, **D**, The stent was upsized to a 23-mm diameter to account for any persistent leakage around the suture sites. Note poor transpyloric emptying of contrast.

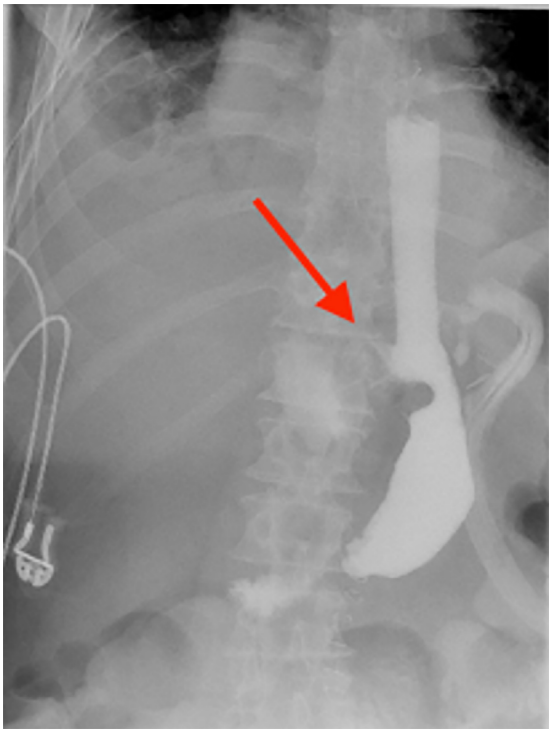

Figure 5. Formal barium esophagram confirming evidence of persistent leak despite placement of larger 23-mm stent (*red arrow*). Also, impaired transpyloric drainage is again appreciated.

respiration rate of 25. His blood pressure and heart rate remained normal. An urgent CT scan revealed evidence of an anastomotic leak with extravasation of contrast and free air adjacent to the lesser curvature of the stomach (Fig. 1). The patient underwent EGD, which showed a 1.5-cm defect at the esophagogastric anastomosis (Fig. 2). An endoscopic suturing device was used to place 2 running sutures to close the defect and achieve apposition of the defect edges. Intraoperative esophagram with contrast and carbon dioxide insufflation suggested adequate closure without evidence of leakage prior to placement of a covered metal stent. Then, an 18- × 155-mm fully covered stent was placed and sutured in place (Fig. 3). A barium esophagram the following day unfortunately revealed a persistent leak along with poor transpyloric drainage of contrast. A repeat endoscopy was performed and showed adequate closure of the leak site. However, there remained a possibility of persistent leakage around the suture insertion sites. Thus, the decision was made to upsize the stent to a 23- × 155-mm fully covered metal stent (Fig. 4). To address the poor transpyloric drainage, the pylorus was dilated to 20 mm with a through-the-scope (TTS) balloon dilator.

An esophagram the following day again revealed a persistent leak and poor transpyloric drainage despite dilation (Fig. 5). Thus, during the following endoscopy, attention was placed on the pylorus, which demonstrated significant spasm and upward angulation related to the gastric pull-up anatomy. A 20-mm LAMS was deployed successfully and followed by a 20-mm TTS balloon dilation. Endoscopic suturing was used to further anchor the stent in the antrum to prevent migration (Fig. 6). A subsequent barium esophagram showed significantly improved transpyloric drainage of contrast and resolution of the anastomotic leak (Fig. 7). Four weeks later, the sutures and stents were removed using endoscopic scissor forceps and rat-tooth forceps, respectively. There was no evidence of residual leak on the follow-up esophagogram.

CONCLUSION

Improvement of transpyloric drainage should be considered one of the options for management of persistent leak despite usual endoscopic strategies such as primary closure and covered metal stenting (Video 1, available online at www.giejournal.org).

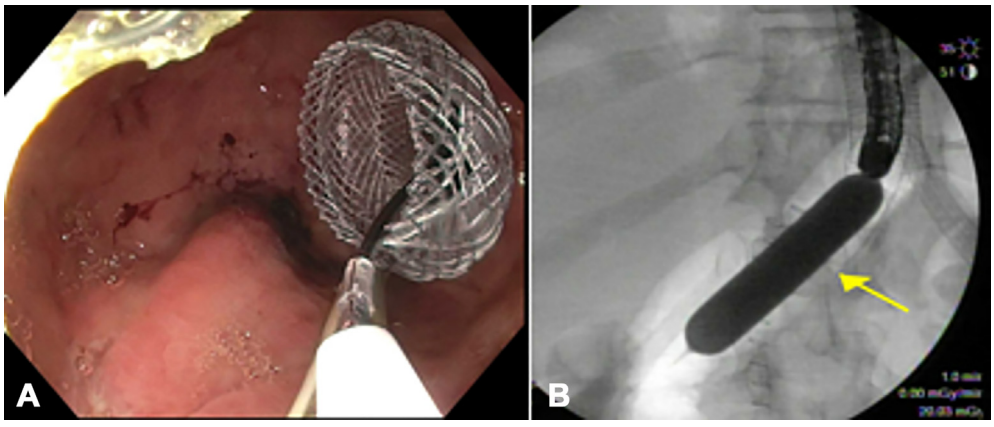

Figure 6. To facilitate transpyloric drainage, a 20-mm lumen-apposing metal stent was deployed (**A**) and followed by a 20-mm through-the-scope balloon dilation through the stent (**B**, *yellow arrow*). The stent was anchored by endoscopic suturing.

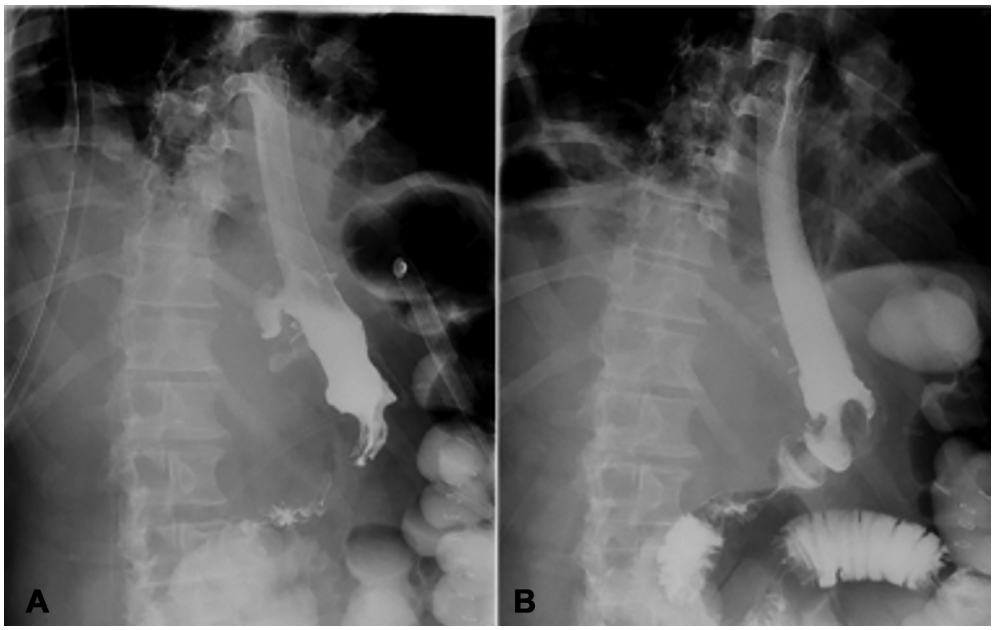

Figure 7. Image comparing the final barium esophagram (**B**) to the first esophagram (**A**) and highlighting resolution of the leak and significantly improved gastric emptying after placement of the lumen-apposing metal stent.

DISCLOSURE

All authors disclosed no financial relationships.

Abbreviations: DGCE, delayed gastric conduit emptying; LAMS, lumen-apposing metal stent; TTS, through-the-scope.

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