EDITORIAL

Endoluminal management of anastomotic dehiscence after esophagectomy: an increasing quiver of options reflects the difficulty in realizing a definitive therapy

Intrathoracic leakage after esophagogastrectomy is a dreaded and morbid complication that can be associated with a prolonged hospitalization and high mortality rate.[1] The presentation and subsequent management of an intrathoracic leak depends on the defect size and location within the gastric conduit or the esophagogastric anastomosis. Therefore, in the initial management, it is important to define whether intrathoracic leakage is secondary to (1) gastric conduit necrosis, (2) conduit staple line dehiscence, or (3) esophagogastric anastomosis dehiscence.[2] Gastric conduit necrosis presents early in the perioperative interval and manifests with profound systemic sepsis requiring immediate surgical intervention. Staple line and esophagogastric anastomosis dehiscence, which occur early in the perioperative period, are also associated with a high degree of intrathoracic contamination and systemic sepsis and may require surgical intervention. However, late intrathoracic leakage arising from an isolated and limited defect within the staple line or anastomosis may be associated with little or no intrathoracic contamination and can be managed nonoperatively if adequate drainage can be achieved, infection treated, and enteral nutrition established. However, because no consensus for optimal treatment has been formulated, the appropriate treatment is usually individualized to the scenario encountered, and there is a high degree of variability among providers.

In an effort to decrease intrathoracic contamination through ongoing anastomotic leakage and improve patient outcomes by using more minimally invasive approaches, endoscopic therapies such as fibrin-glue injections, clip application, and covered self-expanding stents have been developed and used. Endoscopic clips or hemoclips are more commonly used to treat acute perforations of the esophagus or stomach but have been used to treat chronic esophageal anastomotic leaks with minimal success.[3] Similarly, endoscopic application of fibrin glue and vicryl plugging has been used successfully to manage postoperative esophagogastric and esophagojejunal fistulae.[4] Despite these reports, the endoscopic modalities of fibrin glue and clip application have not been widely adopted in the management of intrathoracic leaks, and there is little controlled evidence to support their use.

Stenting of anastomotic fistulae with self-expanding metallic stents (SEMS) or self-expanding plastic stents (SEPS) has been shown to be feasible and have few procedure-related complications.[5-12] Stenting can be used to occlude anastomotic leakage in approximately 90% of cases, as demonstrated by water-soluble contrast material studies. Successful stenting allows for the establishment of oral feeding but is complicated by stent migration in over a quarter of cases (Table 1). Long-term complications of SEMS include an inability to retrieve the device, perforation, fistula formation, hemorrhage, and stenosis.[7,9] Therefore, SEMS should ideally be avoided, and early retrieval of SEMS is strongly recommended if used. Silicone-covered SEPS prevent the ingrowth of granulation tissue at the ends of the stent and so facilitate easier retrieval. However, the smooth characteristics of SEPS also lead to poor seating and unwanted distal migration of the stent. Furthermore, the disparity between the diameter of the intraluminal esophagus and the gastric conduit further increases the likelihood of distal migration of the SEPS. Advocates of SEPS suggest improved patient outcomes, but there is a lack of controlled data to support this claim. However, Hünerbein et al[12] reported reduced in-hospital mortality, morbidity, and hospitalization in stent-treated patients compared with historical controls who were managed operatively or conservatively.

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In this issue of *Gastrointestinal Endoscopy*, Wedemeyer et al[13] publish their initial experience with an endoscopic vacuum-assisted closure (EVAC) system in the management of 8 patients with postsurgical gastroesophageal intrathoracic leakage. The EVAC system consists of polyurethane foam fixed to the distal end of a duodenal tube, which is endoscopically placed within the fistulous

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TABLE 1. Selected case-series reports with primary outcome and stent migration rates

First author	Reference	Stent type	Sample size	Successful fistula occlusion	Stent migration
Freeman	3	Plastic	25	95%	24%
Dai	4	Plastic	22	95%	23%
Doniec	5	Metallic	21	90%	Not reported
Langer	6	Plastic	18	89%	50%
Roy-Choudhury	7	Metallic	14	100%	Not reported
Kauer	8	Metallic	10	90%	40%
Schubert	9	Plastic	12	100%	17%
Hünerbein	10	Plastic	9	89%	22%

cavity, with the proximal end of the duodenal tube connected to continuous negative pressure of 125 mm Hg. The system was endoscopically replaced two times per week until fistula closure was achieved. Enteral nutrition was established through a nasojejunal feeding tube via the contralateral nostril. The primary endpoint of successful leak closure was achieved in 7 of 8 patients after a mean of 23 days and median of 7 endoscopic interventions. The authors report no serious adverse events. All patients reported nasal and nasopharyngeal irritation from the feeding nasojejunal and duodenal tubes occupying both nostrils. The authors do not report on the concurrent use of percutaneous pleural or mediastinal drainage in their series, and this is an important detail that would lend insight into the degree of acuity managed in this series. More importantly, the selection criteria for this procedure require further delineation. For example, was it confirmed a priori that there was no communication between the fistula cavity and pleural space by using imaging techniques prior to the procedure?

Although the EVAC approach attempts to tap into a very successful method of contaminated wound closure popularized in the field of plastic surgery, this method is a local therapy to be used in patients who do not manifest mediastinal sepsis. As such, it is very difficult to determine whether the technical success achieved in this series is related to the intervention itself or simply patient selection. In addition, because of the multiple procedures required to facilitate successful wound closure and the discomfort likely experienced by the patient, superiority over existing endoluminal therapies would need to be established in order to justify its use. Compared with patients who undergo stenting, EVAC patients must endure bilateral, large-caliber nasal tubes and repeated endoscopic procedures, and oral feeding is restricted for a mean of 3 weeks. Elimination of one nasal tube could be accomplished easily by the placement of a needle jejunostomy feeding tube at the time of esophagectomy.

The preliminary technical outcomes of this approach appear comparable with those of endoscopic stenting. Although the current SEPS procedure achieves a high rate of fistula occlusion and allows for early oral feeding, it is far from being a panacea. The next generation of endoscopic stents must specifically address the migration issue, be easily retrieved, or even be biodegradable. More fundamentally, the pathophysiology of esophagogastric anastomotic dehiscence is poorly understood and underinvestigated. Basic research into the host response to injury and healing of the anastomosis is required to enhance our level of understanding and direct further efforts. In addition, clinical research strategies such as vascular augmentation (ie, supercharging), gene therapy, or ischemic conditioning of the gastric conduit, which aim to improve GI anastomotic perfusion and healing, are also required. Wedemeyer et al should be lauded for their efforts to bring a creative solution to a long-standing and poorly remedied life-threatening problem. However, the fact that we continue to search for yet another approach to the management of ischemia-related dehiscence reflects the fact that there is little dependability with existing endoluminal approaches and that we have made limited progress in preventing the complication altogether.

DISCLOSURE

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Abbreviations: EVAC, Endoscopic-vacuum–assisted closure; SEMS, self-expanding metallic stents; SEPS, self-expanding plastic stents.

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