Is endoluminal vacuum therapy “sponge worthy”?

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Central Message

Endoluminal vacuum sponge therapy may be useful for managing esophageal perforations, but patient-selection criteria are needed. In addition, a kit approved by the Food and Drug Administration would simplify implementation.

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Esophageal anastomotic leaks and perforations continue to pose a challenge to surgeons and cause significant morbidity and mortality. Multiple surgical and nonsurgical treatment modalities have been used without a clear advantage of one over the another. Endoluminal endoscopic treatments of esophageal leaks have been increasingly used and include endoluminal stenting,¹ endoluminal suturing,² and, more recently, endoscopic vacuum sponge therapy. Endoscopic vacuum therapy was developed to treat colorectal anastomotic leaks,³ but was adopted quickly for upper gastrointestinal leaks.⁴

Esophageal perforations and leaks often form infected mediastinal cavities that are hard to properly drain. A stent alone will cover the cavity but will not appropriately drain the infected space. On the other hand, endoscopic vacuum therapy facilitates drainage of the cavity, causing progressive collapse and ingrowth of granulation tissue, progressively healing the intraluminal defect. Esophagogastric defects are successfully closed in 90% to 100% of patients,^{5,6} and endoscopic vacuum therapy appears superior to endoluminal stenting.⁵

In the present issue of the *Journal*, Fraga and colleagues⁷ present a case of an infant who had an iatrogenic esophageal injury during a minimally invasive lobectomy to repair a congenital defect. A thoracotomy with primary repair of the perforation failed, and the patient had an uncontrolled leak into the pleural cavity. Endoscopic vacuum therapy was instituted, and in 4 days, the leak was resolved. This is one of the first reports of this treatment modality in the pediatric patient population⁸ with an esophageal leak and may assist others dealing with the similar issues in children.

Although our group and a few others have used endoscopic vacuum sponge therapy, there are scant reports from the United States on the use of the technique for esophageal leaks. This may stem from the fact that a kit that is commercially available in Europe (Endo-SPONGE, B. Braun, Barcelona, Spain) is not available in the United States. Users must improvise and create the device using a nasogastric tube (16F for adults), and a piece of

GranuFoam, which is available from the V.A.C. dressing package (K.C.I., San Antonio, Tex). After the nasogastric tube is inserted in the patient's nostril, it is brought out through the mouth and placed inside the foam, which is sutured around the nasogastric tube. The nasogastric tube is then inserted in the esophagus, and the foam positioned at the tear, such that it covers the complete length of the tear. This insertion is facilitated by the use of laryngoscopy and a Magill forceps. The nasogastric tube is then connected to the V.A.C. therapy unit, which is set to high negative pressure (125 to 175 mm Hg). It is not clear if there is any advantage to positioning the foam inside the mediastinal cavity formed by the perforation versus intraluminally.

Case reports, small case series, and retrospective cohort studies suggest that endoscopic vacuum sponge therapy is a good option to treat esophageal perforations with a high likelihood of successful closure and few complications.⁹ Perhaps the most important aspect of this technique is that it adds another tool to the surgeon's armamentarium to treat esophageal leaks in adults and children. Future studies will allow proper patient selection for each of the endoluminal therapies and hopefully improve patients' outcomes.

References

1. Schweigert M, Dubecz A, Stadlhuber RJ, Muschweck H, Stein HJ. Treatment of intrathoracic esophageal anastomotic leaks by means of endoscopic stent implantation. *Interact Cardiothorac Surg*. 2011;12:147-51.

2. Henderson JB, Sorser SA, Atia AN, Catalano MF. Repair of esophageal perforations using a novel endoscopic suturing system. *Gastroint Endosc*. 2014;80:535-7.
3. Weidenhagen R, Gruetzner KU, Wiecken T, Spelsberg F, Jauch KW. Endoscopic vacuum-assisted closure of anastomotic leakage following anterior resection of the rectum: a new method. *Surg Endosc*. 2008;22:1818-25.
4. Wedemeyer J, Schneider A, Manns MP, Jackobs S. Endoscopic vacuum-assisted closure of upper intestinal anastomotic leaks. *Gastroint Endosc*. 2008;67:708-11.
5. Hwang JJ, Jeong YS, Park YS, Yoon H, Shin CM, Kim N, et al. Comparison of endoscopic vacuum therapy and endoscopic stent implantation with self-expandable metal stent in treating postsurgical gastroesophageal leakage. *Medicine (Baltimore)*. 2016;95:e3416.
6. Moschler O, Nies C, Mueller MK. Endoscopic vacuum therapy for esophageal perforations and leakages. *Endosc Int Open*. 2015;3:E554-8.
7. Fraga JC, Nunes DL, Andreolio C, Ferreira J, Holanda F, Isolan PS, et al. Endoscopic vacuum sponge therapy for an infant with an esophageal leak. *J Thorac Cardiovasc Surg*. 2018;156:e193-5.
8. Manfredi MA, Clark SJ, Staffa SJ, Ngo PD, Smithers CJ, Hamilton TE, et al. Endoscopic esophageal vacuum therapy: a novel therapy for esophageal perforations in pediatric patients. *J Pediatr Gastroenterol Nutr*. June 20, 2018 [Epub ahead of print].
9. Newton NJ, Sharrock A, Rickard R, Mughal M. Systematic review of the use of endo-luminal topical negative pressure in oesophageal leaks and perforations. *Dis Esophagus*. 2017;30:1-5.