Esophageal Stents: How High Can You Go? A Traumatic Injury Treated with High Esophageal Stent Placement

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Introduction:

Traumatic cervical esophageal injuries, while rare, present particularly challenging dilemmas in surgical decision making and incur high morbidity and mortality.[1] Treatment guidelines have varied depending on location and severity, ranging from wide neck and chest drainage to esophagostomy when primary repair was not feasible.[2] We present a case of a patient's severe high esophageal perforation addressed with endoscopically placed esophageal stent.

Case Report:

20-year-old male presented to the ED after sustaining a gunshot wound to the midline of the neck just above the manubrium. Patient was hemodynamically stable with a neurological exam consistent with T4 distribution paraplegia. Patient was taken to the operating room where a penetrating injury was noted through the trachea, esophagus, and cervical spine. Tracheostomy was placed with partial tracheal repair. EGD demonstrated anterior and posterior wall esophageal injuries approximately 18 cm from the teeth. Left neck dissection was carried out after intraoperative consultation with otolaryngology. However, the esophageal injury was unable to be accessed. Drains were left in the neck, gastrostomy tube was placed and patient was taken to the ICU. He was managed on broad spectrum antibiotics and tube feedings, tracheostomy exchanged for distal XLT, bilateral tube thoracostomies placed for pleural effusion. Otolaryngology attempted right neck exploration; again, unable to define a plane between the esophagus and trachea. Sternocleidomastoid flap was placed in the prevertebral space abutting the posterior esophageal injury. Case was discussed with cardiothoracic surgery, neurosurgery, gastroenterology and after failed NG tube wound vac attempt, general surgery was consulted for stent placement.

Resources:

1. Bryant A.S., Cerfolio R.J. Esophageal trauma. Thorac. Surg. Clin. 2007;17:63–72. doi: 10.1016/j.thorsurg.2007.02.003
2. Raff, L. A., Schinnerer, E. A., Maine, R. G., Jansen, J., Noorbakhsh, M. R., Spigel, Z., Campion, E., Coleman, J., Saquib, S., Carroll, J. T., Jacobson, L. E., Williams, J., Young, A. J., Pascual, J., Burruss, S., Gordon, D., Robinson, B. R. H., Nahmias, J., Kutcher, M. E., … Bosarge, P. (2020). Contemporary management of traumatic cervical and thoracic esophageal perforation: The results of an Eastern Association for the Surgery of Trauma multi-institutional study. *Journal of Trauma and Acute Care Surgery, 89*(4), 691-697. https://doi.org/10.1097/TA.0000000000002841
3. Reed WJ, Doyle SE, Aprahamian C. Tracheoesophageal fistula after blunt chest trauma. Ann Thorac Surg. 1995;59:1251–6. doi: 10.1016/0003-4975(94)00964-9.
4. He J, Chen M, Shao W, Li S, Yin W, Gu Y, Wang D, Tucker S. Surgical Management Of 3 Cases With Huge Tracheoesophageal Fistula With Esophagus Segment in situ As Replacement Of The Posterior Membranous Wall Of The Trachea. J Thorac Dis. 2009 Dec;1(1):39-45.
5. Zimmermann M, Hoffmann M, Jungbluth T, Bruch HP, Keck T, Schloericke E. Predictors of Morbidity and Mortality in Esophageal Perforation: Retrospective Study of 80 Patients. Scand J Surg. 2017 Jun;106(2):126-132. doi: 10.1177/1457496916654097. Epub 2016 Jun 22. PMID: 27334795.

Esophageal stent was placed on hospital day 8, positioned under fluoroscopy and secured in place with 2 interrupted prolene stitches at the cricopharyngeal shelf. Patient was managed for mediastinitis which resolved by week 4 post stent placement. Stent was removed on post op day 40, noting mucosal coverage of the prior perforations. Upper GI series demonstrated no leak and patient was started on a liquid diet without dysphagia

Discussion:

Endoscopically placed covered stents have been used for decades to exclude iatrogenic or spontaneous perforations of the thoracic esophagus. The traumatic etiology and cervical location of esophageal perforation in this particular case presented the unique risk of tracheoesophageal fistula (TEF) formation which has been associated with high rates of mortality.[3] Without proper control of this communication, there is inevitable mediastinitis, pneumonia, sepsis, and eventual maturation of the fistulous tract. Such esophageal injuries with or without TEFs have formerly been managed with primary repair, cervical esophagostomy, or esophagectomy.[4,5]

After failing to achieve a primary repair, we opted for endoscopic placement of a covered stent in order to achieve source control of further contamination. He tolerated the stent placement well, ultimately clearing infection and preserving complete function of swallowing and speech.

This successful intervention we believe decreased morbidity of subsequent neck/thoracic operations and improved quality of life with the absence of esophagostomy.

Conclusion:

Cervical esophageal injuries remain a challenging surgical dilemma, susceptible to significant morbidity and mortality. In appropriate cases, endoscopy can be used therapeutically and, as modalities expand, further research will be needed to determine the placement of esophageal stents in the trauma algorithm.

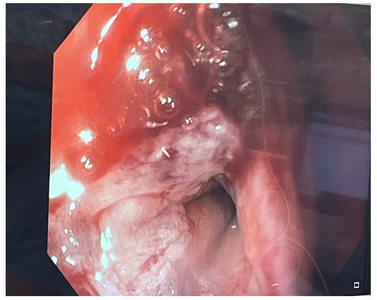
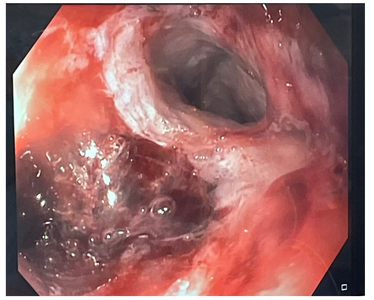


Figure A: Endoscopic photos of the anterior and posterior esophageal perforations on the day of the sustained injury, scope positioned 18cm from the teeth.



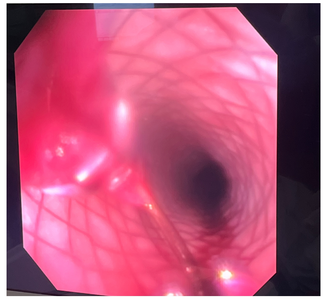


Figure B: Endoscopic placement of the esophageal stent, secured with endostitch.

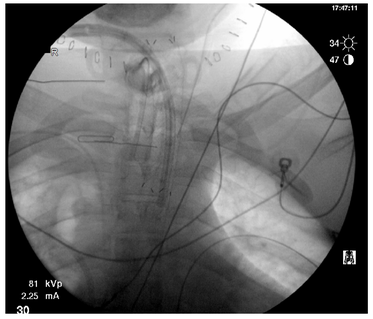
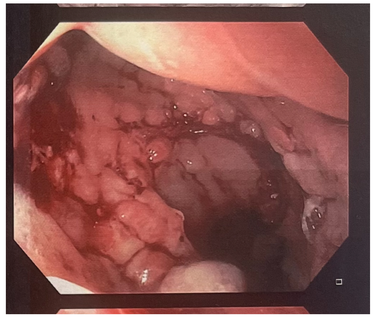


Figure C: Fluoroscopic image of esophageal stent.



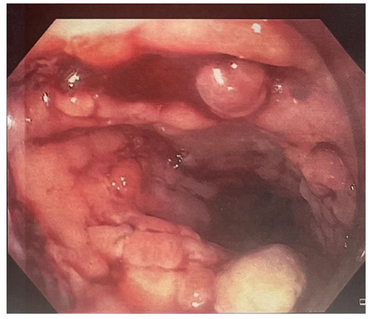


Figure D: Endoscopic photos of the esophagus on the day of stent removal, scope positioned 18cm from the teeth.