Aortoesophageal fistula treated with emergent thoracic stent grafting

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ABSTRACT

Aortoesophageal fistula (AEF) is a rare pathology with a poor prognosis. Historically, open repair approaches were undertaken. With the advent of endovascular techniques, alternative methods such as thoracic endovascular aortic repair (TEVAR) have emerged. This case describes a patient who presented with severe hematemesis and, upon imaging, an AEF was discovered. Urgent TEVAR was indicated with a graft oversized to the native aorta by 10% to 15%, along with coil embolization of the intercostal artery. We report here on the successful management of AEF via TEVAR. (J Vasc Surg Cases and Innovative Techniques 2021;7:396-8.)

Keywords: TEVAR; Hematemesis; Aortoesophageal fistula; Embolization

Aortoesophageal fistula (AEF) is pathologic communication between the esophagus and aorta that may lead to catastrophic upper gastrointestinal bleeding.[1] Causes include foreign body ingestion and thoracic aortic aneurysm.[1,2] Diagnosis is made based on clinical history, upper endoscopy, and computed tomography scans.[2] Prompt diagnosis and repair are paramount.[3] Endovascular and open surgical repairs are both potential options for treatment with the former being favored in unstable patients.[2-5]

We present a case of a patient who underwent thoracic endovascular aortic repair (TEVAR) to manage an AEF. Patient consent was received for this publication via next of kin before submission.

CASE REPORT

A patient with stage IV non-small cell lung cancer who underwent esophageal stent placement 4 weeks prior for dysphagia secondary to extrinsic compression of the esophagus. On the day of procedure, the patient presented with massive hematemesis. esophagogastroduodenoscopy and computed tomography angiography were done with concern for possible AEF. The patient was then transferred to interventional radiology for angiogram and embolization vs stent graft placement.

After obtaining consent, the patient was placed supine on the procedure table. Both groins were prepped and draped in a sterile fashion. Embolization of the proximal intercostal artery was done for anatomic considerations from computed tomography angiography. Imaging indicated the location of the artery to be coursing towards the site of hemorrhage, so it was determined to be a candidate for embolization.

Aortography (Fig 1) demonstrated focal outpouching and gentle probing of the site for irregularity (Fig 2) in the proximal esophagus precipitated massive hematemesis and profound hypotension.

After a Coda balloon was placed to avert further blood loss and hemorrhage into the esophagus, the massive transfusion protocol was initiated and a 20Fr sheath was placed. Through this sheath, over a Lunderquist wire, a 28 mm × 10 cm Gore TAG endograft was placed across the site of bleeding, necessarily covering the origin of the left subclavian artery, but maintaining perfusion to the hand and arm via collateral flow. The patient underwent TEVAR deployment in zone 2. A post-TEVAR aortogram showed no extravasation or endoleak presence indicating secure graft placement (Fig 3). Surgical cutdown was performed to close the 20Fr groin puncture.

The patient was extubated on postprocedure day 1, and discharged from the hospital on postprocedure day 3, because the patient was hemodynamically stable after TEVAR. The patient was placed on long-term antibiotics to prevent endograft infection and died 8 months later owing to advanced cancer.

DISCUSSION

AEF mainly stems from thoracic aortic aneurysms, foreign body ingestion, and advanced esophageal malignancy.[6] A literature review of 72 patient reports shows that patients typically present with hematemesis (86.1%), hypovolemia (60.9%), and systemic infection (21.7%).[7] A comprehensive review of literature found 500 cases and fewer than 20% were due to foreign body presence, thus highlighting the rare nature of this specific pathology.[6] The etiology of AEF in this patient was likely multifactorial including tumor and esophageal stent erosion into the aorta.

Despite advances made in surgical technique, open repair approaches a 55.5% operative mortality owing to a variety of factors ranging from emergent nature of

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Author conflict of interest: none.

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The editors and reviewers of this article have no relevant financial relationships to disclose per the Journal policy that requires reviewers to decline review of any manuscript for which they may have a conflict of interest.

2468-4287

https://doi.org/10.1016/j.jvscit.2021.04.001

Fig 1. Thoracic aortogram demonstrating subtle outpouching (*arrow*) at the site seen on a recent computed tomography scan.

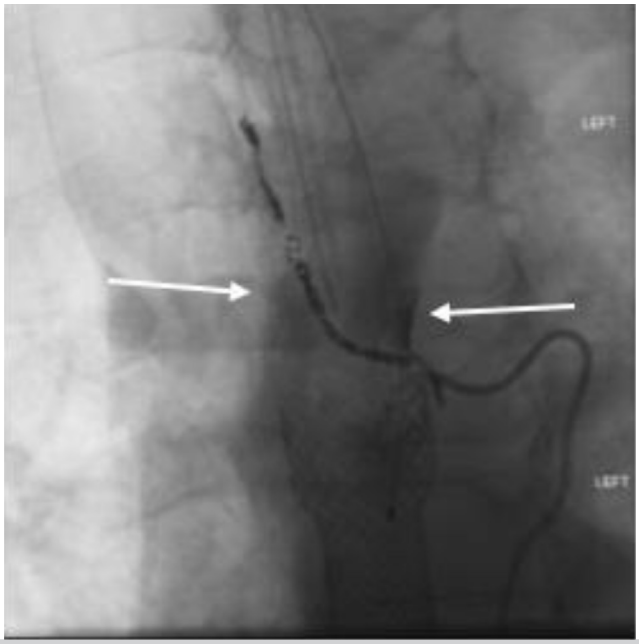

Fig 2. Coil embolization was performed of an adjacent intercostal artery and gentle probing of the irregularity was then done with a 5Fr Mickelson catheter. Hand injection of contrast showed opacification of the esophagus and stent (*arrows*) followed by 1 L of hematemesis and profound hypotension.

repair, access difficulty, and thoracic aorta cross clamping.[7] TEVAR gained approval from the US Food and Drug Administration after the pivotal Gore TAG trial in 2005 and has become the preferred approach for treatment of thoracic aortic pathology.[7] Data from numerous studies highlight the decreased morbidity seen in TEVAR compared with open repair in patient population. Less invasive approaches allow for control of bleeding along with improved postoperative survival.[7,8]

TEVAR has a documented technical success rate of 87.3% (72 patients) in AEF cases based on a review of literature. The most common landing zone used was zone 2 in the patient population. In this case, TEVAR combined with antibiotics offered the patient the best outcome and had the most benefit. Conservative policy for drug regimen is 4 weeks of periprocedural intravenous antibiotics followed with case-specific administration.[7] Drug therapy occurs because the presence of a foreign body (a stent in our patient) or a primary disease of the esophagus can introduce systemic infection once in the blood. Common micro-organisms associated with AEF cases are *Enterococcus*, *Mycobacterium tuberculosis*, and *Streptococcus* spp.[7] Given our patient's preexisting stage IV cancer, antibiotic treatment helped improve the postprocedural status.

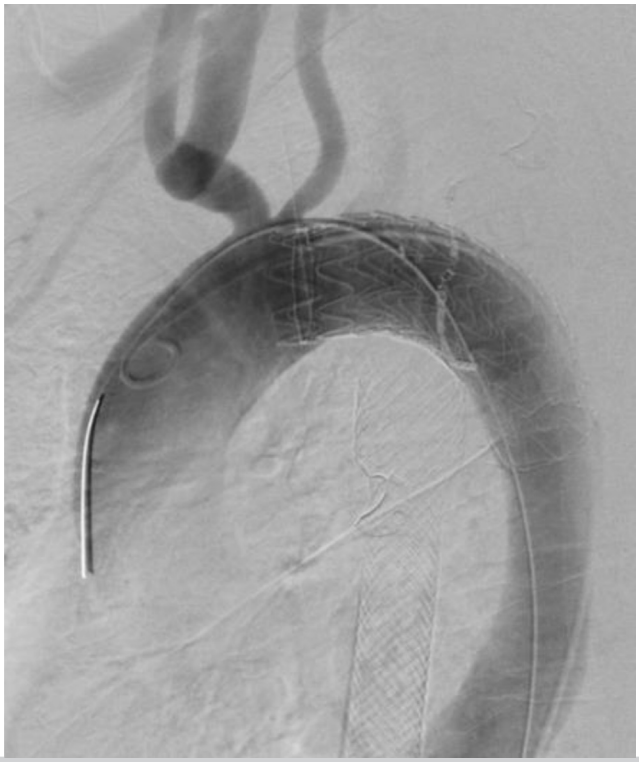

Fig 3. Post-thoracic endovascular aortic repair (TEVAR) aortogram showing no endoleaks and highlights the origin of the left common carotid artery being uncovered. A 28 mm × 10 cm Gore TAG endograft was used.

Endoscopy coupled with computed tomography imaging helped to confirm the diagnosis, along with the patient presentation of severe hematemesis. Owing to hemodynamic complications, a Coda balloon was introduced to prevent further presence of blood into the esophagus. The Gore TAG endograft helped seal the AEF and stability was achieved hemodynamically. Post-TEVAR imaging showed no migration or extravasation of contrast media. TEVAR offers an alternative and less invasive method of management of life-threatening AEF.

CONCLUSIONS

AEF should be considered in the differential diagnosis of massive upper GI bleed, especially in patients with thoracic aneurysms, prior radiation treatment or, as in our patient, esophageal foreign bodies such as stents. Sentinel bleeds may proceed acutely life-threatening bleeds. A combination of clinical, endoscopy, and imaging is often necessary to make the diagnosis. Endovascular repair is a minimally invasive, quick, and safe intervention to treat AEF.

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Submitted Dec 20, 2020; accepted Apr 12, 2021.