

Under Pressure: An Uncommon Case of Extraluminal Esophageal Air

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Case Background

A 70-year-old woman with a past medical history of hypertension and atrial fibrillation on anticoagulation under intensive care was noted to have tachycardia and worsening hypotension. She underwent a recent thoracoabdominal endovascular aortic aneurysm repair (TEVAR) after aortic rupture that was complicated by lower extremity acute limb ischemia requiring surgical intervention. The patient did not note any GI symptoms and there was no overt GI bleeding.

Objective Data

Physical examination:

Vitals: Temperature: 96.1°F, HR: 123 beats per minute, BP: 85/51 mm Hg, RR: 13 respirations per minute, 100% oxygen saturation on 40% FiO₂

General: Critically-ill appearing, no acute distress

HEENT: Clear oropharynx

CV: Tachycardic, irregularly irregular heart rate

Abdomen: Soft, non-tender abdomen, and a rectal exam without evidence of blood

Skin: Midline wound vacuum dressings on the midline abdomen and lower extremity were functioning appropriately without increased output

Relevant labs:

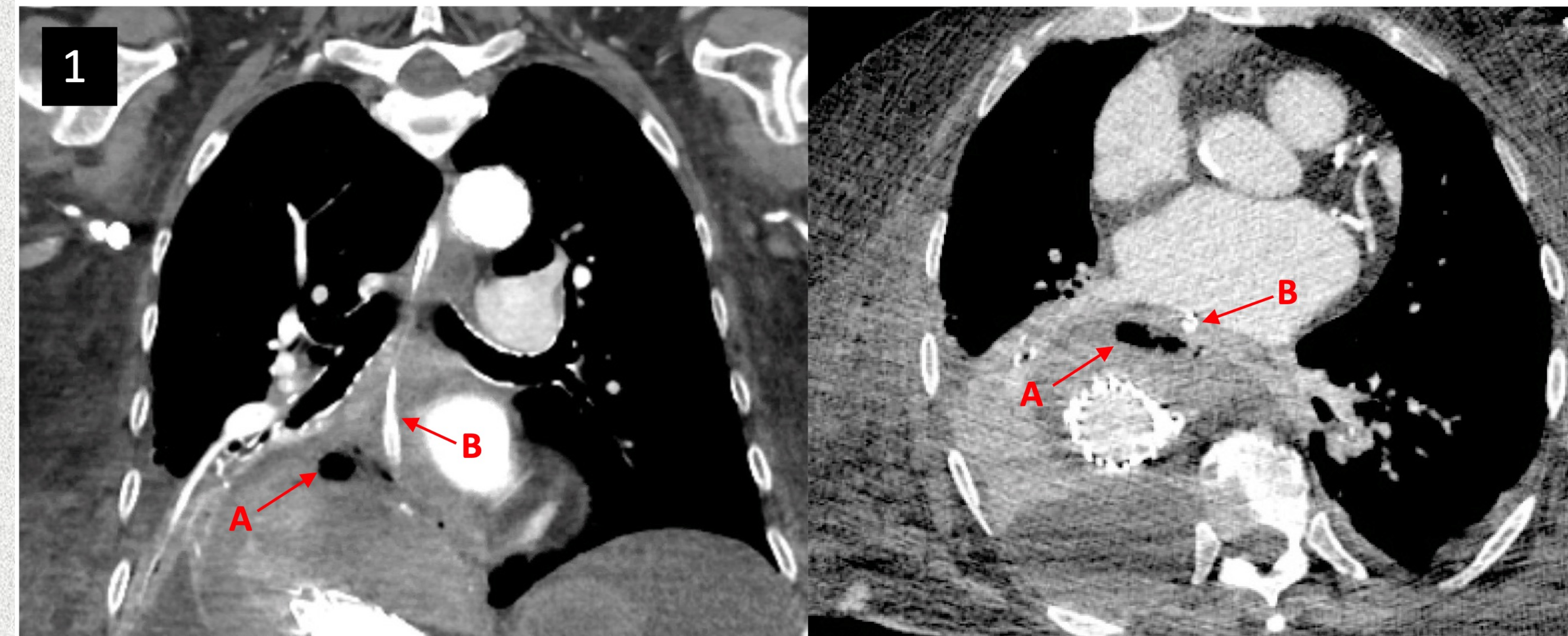
WBC: 19.0 x10⁹/L

Hgb: 6.8 g/dL (8.2 g/dL 12 hours prior)

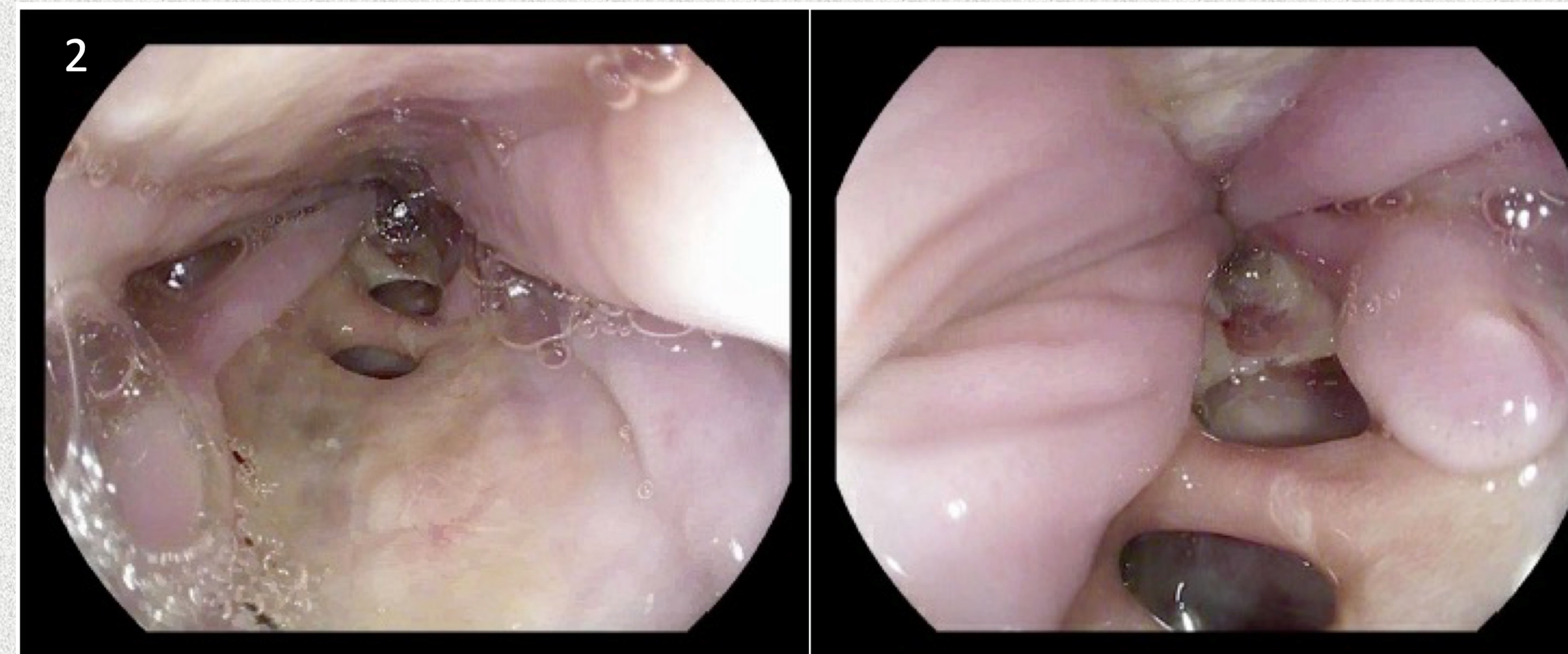
Lactate of 2.1 mmol/L (0.9 mmol/L 12 hours prior)

1 unit of packed red blood cells was ordered and imaging was performed.

Computed tomography imaging showed interval air in the excluded thoracic aneurysmal sac adjacent to the esophagus (figure 1, arrow A), which was intubated by an enteric tube at the time (figure 1, arrow B).



Esophagogastroduodenoscopy revealed two large non-bleeding perforations in the middle esophagus with possible fistulation to the mediastinum.



These findings were concerning for Aorto-esophageal Fistulas, likely due to compressive ischemia and esophageal necrosis from the thoracic aneurysmal sac and compounded by prolonged shock related to antecedent thoracoabdominal aortic aneurysm rupture and critical illness. Given high operative risk, an esophageal stent and gastrostomy tube were placed by cardiothoracic surgery.

Background and Evaluation

- **Aorto-esophageal fistula (AEF)** formation is a rare but serious complication of TEVAR.
 - Incidence of post-TEVAR AEF: 1.7–1.9%, and is increasing with increasing utilization of TEVAR.
- **AEF formation** post-TEVAR may be due to:
 - Graft infection or pressure necrosis of the aorta
 - Esophageal erosion secondary to aortic expansion
- **Chiari's triad** for AEF: mid-thoracic pain and sentinel hematemesis followed by massive hematemesis
 - Massive hemorrhage may occur soon after a sentinel episode of hematemesis, or can be delayed by years.
- **Imaging findings** for AEF include air within the aortic thrombus or esophageal wall, persistent or expanding fluid collection around the graft, or contrast extravasation outside of the aortic lumen.
- **Endoscopic findings** include submucosal protrusions of the esophageal wall due to extrinsic compression, ulcerative lesions, or fistula formation.

AEF Management

- Once diagnosed, **urgent intervention** is required to prevent lethal complications.
- **Initial management:** control of hemorrhagic shock, antibiotic therapy if concern for infection, and urgent TEVAR if necessary for hemodynamic stabilization.
- **Long-term surgical options** include primary esophageal defect repair, subtotal esophagectomy and aortic reconstruction.
- In poor surgical candidates, **palliative options** such as esophageal stenting are a potential therapeutic option.

References

- Hagspiel, K. D., et. al (2007). "Diagnosis of aortoenteric fistulas with CT angiography." *J Vasc Interv Radiol* 18(4): 497-504.
- Uno, K., et. al (2017). "Management of aorto-esophageal fistula secondary after thoracic endovascular aortic repair: a review of literature." *Clin J Gastroenterol* 10(5): 393-402.