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CASE REPORT

Aorto-esophageal fistula: the multi-disciplinary team approach to management

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Key Clinical Message

Aorto-esophageal fistula is often a terminal event in many patients. The commonest causes are thoracic aortic aneurysm and esophageal malignancy. To achieve a good outcome in this condition, a MDT approach is required that combines the expertize of vascular surgeons, radiologists, and emergency physicians.

Keywords

Aortic disease, aorto-esophageal fistula, endovascular, MDT, vascular surgery.

Case Report

A 50-year-old man presented to the Emergency Department (ED) with hematemesis and epigastric pain. This was on a background of a 1-week history of progressive chest and upper abdominal pain and he had been taking regular ibuprofen for analgesia. Seven months previously, he had been diagnosed with a lower esophageal adenocarcinoma, for which he underwent esophageal stenting and neoadjuvant chemoradiotherapy. One week prior to his presentation, he had undergone a restaging CT and was awaiting multi-disciplinary team (MDT) discussion later that week.

On arrival, he was in hypovolemic shock, with a heart rate of 110 bpm and blood pressure of 90/41 mmHg. The emergency department team resuscitated him successfully, but further large volume hematemesis resulted in profound refractory hypotension. The anesthetic team, medical registrar, and emergency endoscopy registrar were called at this point. Initial blood gas results showed a hemoglobin of 8.8 g/dL. Once stabilized, the patient was prepared for an urgent esophagogastroduodenoscopy (OGD) under general anesthetic in the operating theater.

The OGD identified frank bleeding originating from the lower esophagus. A bleeding point could not be identified but appeared to originate from the same region as the tumor. The hemorrhage was unresponsive to endoscopic coagulation attempts and the interventional radiologists and vascular surgeons were therefore contacted, with a view to performing embolization of the culprit vessel. However, the patient's past medical history of esophageal adenocarcinoma and briskness of the bleeding encountered on OGD also raised a possibility of an aorto-esophageal fistula. Hence, as the patient was being prepped for angiography, a contingency plan to place an aortic endograft was also made, if a fistula was identified.

The patient was too unstable to undergo CT imaging to determine the aortic dimensions for potential stent graft placement. However, liaison with the radiologists at the tertiary center managing his esophageal cancer allowed for axial measurements of the aorta to be made from his recent staging CT scan and this information was relayed verbally

by telephone to the team to reduce delay. Thus, it was possible to estimate the size of the thoracic aorta to facilitate emergent thoracic stenting, should it be required.

A percutaneous puncture was performed, with sequential dilatation of the common femoral artery and insertion of a large (20Fr) vascular access sheath. An aortic occlusion balloon was placed as a matter of urgency through this sheath. The team performed a diagnostic angiogram, which delineated bleeding from an aorto-esophageal fistula (Fig. 1). A GORE medical thoracic stent graft with oversizing by 10–15% based on the attained aortic dimensions was then successfully deployed and halted the hemorrhage (Fig. 2). The vascular surgeons closed the percutaneous puncture with a post procedure cut down around the access sheath.

While the interventions described above were being performed, the patient became increasingly difficult to ventilate with persisting hypotension and worsening abdominal distension. The vascular surgeons identified this as an acute abdominal compartment syndrome and immediately following his endovascular repair, performed an on-table laparotomy to relieve the intra-compartmental pressure. A Bogota bag was subsequently applied to the open abdomen (laparostomy) and the patient was transferred to ITU.

Five days after his emergency interventions, visceral edema and retraction of the abdominal wall muscle layers made closing of the abdomen difficult. Therefore, a component separation technique was performed to close the abdomen, involving both the vascular and plastic surgeons. Several weeks later, while recuperating on the ward, the patient began to experience worsening dysphagia. A CT scan with oral contrast demonstrated a leak around the esophageal stent, requiring a second esophageal stent placement with cranial extension – this was performed by the upper gastrointestinal surgeons. Continued feeding difficulties necessitated input from the dieticians and total parenteral nutrition for a time. A radiologically inserted gastrostomy (RIG) was performed by interventional radiology to rest the esophagus and facilitate long-term feeding.

Figure 1. Preintervention diagnostic angiogram delineating bleeding from aorto-esophageal fistula.

Figure 2. Completion angiogram postintervention showing endovascular aortic stent sited within thoracic aorta and obliteration of bleeding point.

After six weeks of hospital care, he was discharged home to his wife and family, with follow-up from the palliative care team, where he spent the last few months of his life before succumbing to his primary malignancy. Unbeknownst to the team, his restaging CT scan the week before the events above indicated metastatic spread of his esophageal adenocarcinoma, indicating stage 4 disease and a very poor prognosis. There was no radiological evidence of impending aorto-esophageal fistulation on this scan, although emergent intervention on a patient with terminal disease may be considered controversial. The patient was young, and treatment of this otherwise near terminal event of a bleeding aorto-esophageal fistula, allowed him to say goodbye to his family and friends and he was able to enjoy 6 months of good quality of life until he died.

Discussion

Formation of an aorto-esophageal fistula has considerable mortality and bridging endovascular thoracic aortic repair, often in combination with esophageal intervention (endoscopic or surgical) is potentially lifesaving (Fig. 3)

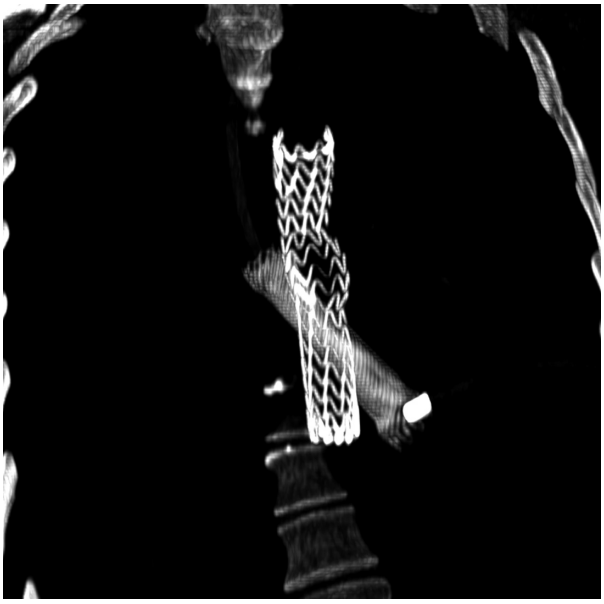

Figure 3. Postintervention coronal CT showing both endovascular and esophageal stents in situ.

[1, 2]. Although there is no specific guidance on the use of endovascular intervention for aorto-esophageal fistula, the European Society of Cardiology (ESC) recommends TEVAR for complex type B dissection and comparable conditions [3]. A minimally invasive procedure theoretically results in an expedited postoperative course and this was an important consideration for a palliative patient. A definitive repair with a minimally invasive technique enabled a timely discharge and peaceful death at home. An open repair would have caused greater physiological stress, and would likely have led to significant morbidity, a prolonged hospital stay, and a higher risk of death as an inpatient. The management of this patient required input from 10 different medical and surgical specialties, working together in both the hyperacute setting of resus to addressing the longer term needs of the patient. Following successful repair, endovascular graft infection is the most severe and common cause of subsequent postoperative mortality, however, individual cases have been reported with up to 1-year survival post repair [4, 5]. Our case report illustrates the fundamental need for a combined multi-disciplinary approach for the successful management of patients with an acute aorto-esophageal fistula.

Conflict of Interest

None declared.

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