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Case Report OMICS International

Patent Extra-Anatomic Graft 12 Years after Ascending-Descending Aortic Bypass for Interpositional Graft Infection

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Case

A male car driver who sustained polytrauma in a road traffic accident when he was 25 years old, had emergency partial hepatectomy performed for liver laceration, followed by interpositional graft (18 mm woven Dacron) repair for transection of the proximal descending aorta via a left thoracotomy. He also had multiple fractures which were treated conservatively. His postoperative recovery was complicated by bilateral MRSA empyema necessitating cope loop drainage and a large MRSA-infected sacral sore requiring a rotational flap and a total of 6 months of intravenous Vancomycin. He was presented with hemoptysis 3 years later. Aortography revealed a leak at the distal end of the aortic interpositional graft, which had resulted in a pseudoaneurysm and an aortobronchial fistula. The leak was successfully occluded with a 22 mm × 131 mm Talent stent graft (Medtronic AVE, Santa Rosa, Calif) via an endovascular approach. He subsequently developed MRSA septicemia which was treated with several months of antibiotics. His hemoptysis recurred 2 years later due to a recurrent leak from the distal end of the previous graft. Emergency extra-anatomic ascending aorta to descending aorta bypass by using a 16 mm woven Dacron graft was performed via a posterior pericardial approach through median sternotomy (Figure 1).

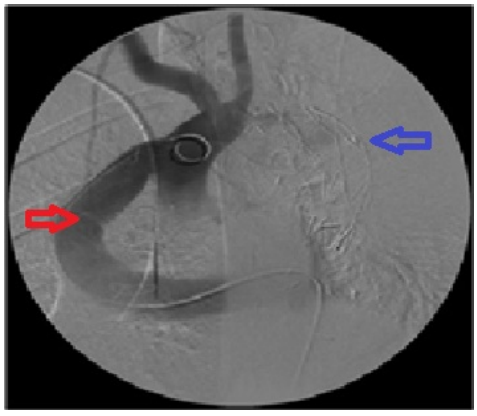

Figure 1: Postoperative angiogram showing a patent and well-positioned extra-anatomic ascending-descending aortic graft (red arrow), with the old interpositional graft (with endovascular stent in situ) occluded (blue arrow).

The proximal descending thoracic aortic-graft was excluded. He was discharged from this hospital stay on lifelong anti-MRSA treatment. He remained well for the following 6 years before requiring multiple hospital admissions for recurrent hemoptysis. Each episode of hemoptysis was successfully addressed by embolization of hypertrophic intercostal arteries. No evidence of aorto-bronchial fistula was shown during bronchoscopy. At the age of 42, he presented with high grade fever and cough of 1 day duration after traveling overseas. On examination he was tachycardiac and tachypneic with bilateral basal coarse rales. His chest x-ray showed consolidation of bilateral lower zones and his blood investigations revealed elevated markers of infection. He was diagnosed with type I respiratory failure secondary to community acquired pneumonia and was intubated due to rapid deterioration and treated with intravenous antibiotics. Computed tomographic (CT) aortogram showed chronic consolidation at the left upper lobe encasing the excluded old aortic stent, a paravertebral abscess and possible chronic osteomyelitis of the adjacent vertebrae and rib. The extra-anatomic ascending-descending aorta bypass graft was widely patent 12 years after placement (Figure 2).

Figure 2: Computed tomographic angiogram performed 12 years after surgery showing a patent extra-anatomic ascending-descending aortic bypass graft (arrow) with recanalization of the previous descending aortic endograft.

Discussion

Traumatic aortic transection is associated with extremely high on-scene mortality [1]. Emergency aortic repair with an interpositional graft or endograft may be life-saving for individuals who survive the transfer to hospital. Graft infection is uncommon but is associated with high mortality [2].

Except for treatment with prolonged (often lifelong) culture-directed intravenous antibiotics, removal of infected graft material is essential for source control. Reconstitution of vascular continuity may be achieved using another in-situ graft or extra-anatomic bypass. An

endovascular approach may be utilized as a temporizing treatment since re-infection remains a major concern when stenting within an infected area, while alternative open surgical graft replacement carries a high mortality rate [3,4] . An extra-anatomic bypass graft from the ascending aorta to the distal descending or abdominal aorta may be a valuable bailout technique in these scenarios. This procedure was initially described for the treatment of recurrent or complex aortic coarctation and its durability has been shown to be promising [5,6]. More recently, the technique of extra-anatomic aortic bypass has been used to address complex aortic arch or descending thoracic aortic aneurysms, Takayasu's aortitis and other complex aortic obstructions [7]. Cases describing aortic graft infection have rarely been reported. These sequelae are usually associated with episodes of complicated postoperative recovery involving recurrent local or systemic infection, pneumonia leading to empyema or formation of chronic graft-esophageal/bronchial fistulas [8,9]. Although infected grafts can be removed and their stumps covered with omental or pleural flaps, the feasibility may be limited by the patient's general condition and hemodynamic stability, in the setting of sepsis and malnutrition [10]. Our posterior pericardial approach via a median sternotomy successfully bypasses the infected graft and avoided the extensive dissection and bleeding commonly encountered during reoperation through a thoracotomy. This approach also shortened the operative time and lowered the surgical risk.

Our case was the first of its kind describing the use of an extra-anatomic ascending-to-descending aortic bypass to treat an infected, leaking interpositional graft. Recent imaging 12 years after surgery has demonstrated excellent patency and freedom from infection of this extra-anatomic bypass. This is reassuring considering our patient's ongoing struggle with recurrent bouts of pulmonary infections. Ultimately a left pneumonectomy may be required to control the source of recurrent pulmonary infections and bleeding.

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