Successful treatment using percutaneous drainage for aortic arch prosthetic graft infection

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Introduction

Aortic graft infection in the ascending aorta or arch is a rare but lethal complication. The optimal treatment is aggressive debridement of the infected or necrotic field and graft replacement [1]. However, the radical surgery involved is challenging and confers high risks of operative mortality and morbidity [2].

Case report

A 45-year-old man was aware of chest discomfort 2 months previously. As the symptoms disappeared for a while, he did not undergo an examination. However, 6 weeks later, he was admitted due to progressive congestive heart failure. Further examination showed chronic type A dissection, complicated with aortic root dilatation and moderate aortic regurgitation. He underwent combined aortic valve-sparing root replacement using a 28-mm Gelweave Valsalva graft (Terumo-Vascutek, Inchinnan, Renfrewshire, Scotland) and total arch replacement using a 22-mm Gelweave branched graft (Terumo-Vascutek) for chronic type A aortic dissection with aortic root dilatation. Comorbidities included diabetes mellitus and hypertension. The patient’s postoperative course was uneventful, and he was discharged 3 weeks after the operation. Thirteen months later, he presented with high fever and loss of consciousness complicated with left hemiparesis. On admission, he was in septic shock, with a white blood cell count of 19,700 mm–3 and C-reactive protein level of 12.6 mg/dL. The previous median sternotomy wound was clear without any sign of mediastinitis. Brain and chest computed tomography (CT) scans revealed hemorrhagic brain infarction in the right cerebellum and fluid retention around the ascending aortic and arch prosthetic graft, which suggested graft infection (Fig. 1). The blood culture sample obtained on admission demonstrated methicillin-resistant Staphylococcus aureus (MRSA). An echocardiogram showed no sign of infective endocarditis or aortic regurgitation. A three-dimensional CT scan showed no lesions that could have caused the brain infarction within the prosthetic graft and neck vessels. CT-guided percutaneous drainage was performed initially. Two 12-French pigtail drainage tubes for infusion and drainage were introduced percutaneously through the 2nd intercostal space at the right sternal border. Percutaneous aspiration confirmed the presence of pus that proved to be MRSA.

With the intravenous administration of vancomycin, initially continuous and then intermittent irrigation was initiated with 0.1% gentian violet solution. Continuous irrigation was performed with a solution of 100 mL/h, and intermittent irrigation was applied...
with a solution 100 mL of once for every 3 or 4 h. The patient was afebrile and recovered consciousness. The C-reactive protein level gradually decreased, and the white blood cell count returned to normal. Two months later, the diameter of the abscess cavity around the prosthetic graft was remarkably reduced (Fig. 2), although the culture sample from the drainage tube was still positive for MRSA. The prosthetic graft from the ascending aorta to the aortic arch proximal to the left subclavian artery was replaced with a 22-mm Gelweave branched graft, and then graft coverage with an omental flap was performed for radical treatment. The infection was limited in a small area involving the distal ascending aorta and the proximal aortic arch. Previous suture lines were not exposed owing to strong adhesion with the surrounding tissue. Postoperatively, the same dose of vancomycin was administered for 3 weeks. The postoperative course was uneventful. The patient was discharged and remained asymptomatic at the 12-month clinical follow-up.

Discussion

Conservative treatments without graft removal recently developed as alternatives to surgical approaches have been reported with successful outcomes. With salvaging of original grafts, mediastinal debridement and irrigation, followed by tissue transposition, provide better results than radical treatment [3]. Coselli et al. [3] emphasized the importance of graft coverage and elimination of dead space with viable tissue flaps. Percutaneous drainage prior to an open surgical repair or the treatment of abdominal or thoracoabdominal aortic graft infection has been reported [4–6]. To the best of our knowledge, although percutaneous drainage of an abdominal aortic aneurysm sac has been previously reported, drainage of an abscess located at the aortic arch is rare. In our patient, the infection was fortunately limited around the distal ascending aorta and proximal aortic arch, with an intact sternum. A less invasive percutaneous drainage was initially performed prior to the radical open surgery because the patient was in a septic state. Two drainage tubes for continuous irrigation were inserted for injection and drainage, respectively. Gentian violet for continuous irrigation was also applied because of its potential efficacy against MRSA, instead of antibiotics or povidone–iodine [7–9]. If such a percutaneous drainage is ineffective, an alternative open drainage should be considered. Fortunately, the diameter of the abscess cavity was remarkably reduced and the infection was well controlled. However, with drainage alone, incomplete healing or recurrence of infection was encountered in some patients [7]. In particular, MRSA is associated with poor prognoses [10]. Most other medical practitioners covered the infected graft with tissue flaps such as an omental or a muscle flap, using one- or two-stage procedures [8,11]. A well-vascularized omental flap was used to cover the perigraft space [12]. Although only omentopexy could provide better immunocompetence against MRSA, graft replacement was carried out for radical treatment. Less-invasive percutaneous drainage and irrigation would be a useful alternative second-line treatment before radical open repairs for the treatment of aortic graft infection.

Disclosure statement

We have no financial or other interest in the manufacture or distribution of the device.

References


