Case report

A 62-year-old male was referred for the management of continuous, persistent backache associated with a tender, pulsatile and expansile central abdominal mass. Twelve months prior to this, he was diagnosed with tuberculosis (TB) of the spine and was treated with anti-TB medications with open drainage and internal fixation.

Physical examination was unremarkable apart from the pulsatile and expansile central abdominal mass. The peripheral pulses were noted to be palpable. Computed tomography (CT) scan and magnetic resonance angiography of the abdomen revealed an infrarenal aortic pseudoaneurysm (Figures 1 and 2). Chest radiography showed normal lung fields with no features of pulmonary TB. His C-reactive protein and erythrocyte sedimentation rate were elevated at 8.31 mg/dL and 70 mm/hr respectively. Sputum for acid-fast bacilli (AFB) was negative. A presumptive diagnosis of tuberculous aortic pseudoaneurysm was made. His anti-TB medications were restarted and he was scheduled for surgery.

A right axillounifemoral bypass was performed using an 8-mm Advanta VS externally supported polytetrafluoroethylene graft with slider (Atrium Medical Corporation, Hudson, NH, USA). This was followed by laparotomy

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Figure 1. Sagittal computed tomography shows the aortic pseudoaneurysm (a) with extension of the sac to the adjacent psoas muscles bilaterally (b).
through a midline incision. At surgery, there was a 6-cm pseudoaneurysm arising from the infrarenal aorta extending down to the distal aorta before its bifurcation. The sac was inflamed but there was no pus or any caseation of the sac wall. There was a defect in the posterior wall of the sac with clots in both adjacent psoas muscles. A $16 \times 8$ mm bifurcated silver-impregnated Dacron graft (B. Braun Medical Inc., Bethlehem, PA, USA) was anastomosed to the infrarenal aorta proximally and to the external iliac arteries distally. Upon release of the clamps, the left femoral pulse was noted to be weak. This was thought to be due to vessel damage during clamping of the calcified left common iliac artery. The left groin was then explored, and a jump graft from the left limb of the aortic graft to the left common femoral artery was carried out following failed attempts to establish good inflow with a Fogerty embolectomy catheter. Perfusion to the left lower limb was then re-established.

Postoperative recovery was uneventful. The culture of the sac wall and clots were negative for aerobic and anaerobic organisms but was not cultured for AFB. He was maintained on biweekly isoniazide, rifampicin and pyridoxine for another 6 months. He was seen on follow-up at 2 monthly intervals. On his latest follow-up at 12 months after surgery, he was noted to be well with no signs of re-infection.

Discussion

TB is still a common disease in Malaysia and around the world. There is a worldwide resurgence of the disease due to drug-resistant TB in association with acquired immunodeficiency syndrome. It poses a great concern among clinicians as it can mimic many diseases in its presentation. Extrapulmonary involvement is rather common but involvement of the aorta is rare worldwide, and has not been reported in Malaysia.\(^1\) Tuberculous pseudoaneurysm can present with free intraperitoneal rupture of the aneurysm, or as upper or lower gastrointestinal (GI) bleeding due to fistulation to the GI tract, usually the duodenum.\(^2\) Involvement of the thoracic aorta can fistulate to the bronchus causing massive haemoptysis.\(^3\) It may also present with symptoms of any atherosclerotic aortic aneurysm with persistent back pain or pulsatile abdominal mass. There may not be any history of pulmonary TB or any significant pulmonary findings. Long et al has suggested that tuberculous aortic aneurysm should be suspected in the presence of one of three clinical scenarios, which are persistent pain, major bleeding and palpable or radiologically visible para-aortic mass.\(^1\)

As suggested by Long et al, this department adopts the policy that treatment for TB patients should be started empirically based on a high index of suspicion while awaiting specific investigations. Staining for AFB may not always be positive and culture for mycobacterium is not routinely done here due to the prolonged incubation period. In a retrospective study of extrapulmonary TB in the Malaysian Peninsula, Nissapatorn et al noted that histopathology, being the most used diagnostic tool, was used in only half the patients to diagnose TB.\(^4\)

As an aneurysm is inflammatory in nature, the morphology of tuberculous aneurysm is more likely to be saccular rather than fusiform, and also a pseudo rather than a true aneurysm.\(^1\) Both of these factors increase the risk of rupture of the aneurysm and other possible complications, as compared to an atherosclerotic aortic aneurysm. Early initiation of treatment is therefore important for a better outcome. This again emphasizes the necessity for empirical treatment based on a high index of suspicion of the disease while awaiting specific investigations.

Surgical intervention is unavoidable due to the natural outcome of an aneurysm and early intervention is advocated due to the low threshold for rupture of an inflammatory or pseudoaneurysm. In the review by Long et al, patients with both surgical and medical therapy fared much better than those who had either therapy alone. There were no survivors among the patients who received only one modality of treatment.\(^1\) Pharmacotherapy with
standard anti-TB treatment is initiated once diagnosis is made or suspected and continued for at least 6 months after surgery. Surgical intervention may be in the form of in situ graft implantation or aneurysm exclusion with extra-anatomical revascularization of the lower limbs. Successful surgical treatment with interposition grafts has been reported. Endovascular exclusion of a tuberculous aneurysm is another option and this has also been reported in the literature. This option was, however, not considered in this patient as we had just started our endovascular aneurysm repair services.

Temporary axillofemoral bypass has been described in high risk patients and patients with transplanted kidneys going for aneurysm repair. We opted to perform an axillofemoral bypass in this patient as an initial procedure. This allows reduction of the cardiac afterload and at the same time perfusion of the lower limbs during aortic cross clamping, which we expected to be longer. However, the main concern that prompted us to perform this bypass was the possibility of infection and not being able to do an in situ graft implantation. In such a situation, the sac would be excluded and the aorta ligated proximally below the renal arteries. If the distal aorta needed to be ligated beyond its bifurcation, then a femoral-femoral crossover graft would be necessary to perfuse the contralateral limb.

Silver is currently used as an active substance in many dressing preparations for its wide-spectrum antimicrobial properties, including some resistant strains. Its use has now been extended to vascular prosthesis as prophylaxis in cases with high risk of graft infection. The French InterGard Silver (IGS) Study Group reported a low graft infection rate despite a high nosocomial infection rate with the use of silver vascular prosthesis in 289 patients. An earlier prospective series by Batt et al showed favourable outcomes using IGS in infections of the aortic grafts and aneurysms. There was an actuarial survival rate of 85% at 24 months in 27 patients with aortic infection treated with IGS in seven centres. In vitro studies by Matsui et al showed strong antimycobacterial activity of silver containing “Hikari-Gintech” powder. However, there is no documentation of use of silver grafts in tuberculous aortic aneurysms so far. This is the first use of a vascular silver graft in this country and, to our knowledge, also the first use in tuberculous aortic aneurysm in the world. The other option would be the use of a rifampicin-coated Dacron graft. However, this was not available to us.

Tuberculous pseudoaneurysm remains a rare but fatal complication of TB and should be treated with a combination of surgical and pharmacological therapy. In situ inlay grafting is a viable surgical option and we have initiated the use of a silver impregnated vascular prosthesis in this country.

References