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## SHORT REPORT

# Endovascular Treatment of Takayasu's Arteritis of the Thoracic Descending Aorta

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### Introduction

Takayasu's arteritis is a relatively uncommon chronic inflammatory arteritis of the aortic system. Arterial inflammation creates structural changes that lead to stenoses and subsequent end organ ischaemia. More rarely, aneurysm formation can occur with the rupture of thoracic aortic aneurysms being a common cause of death.<sup>1,2</sup> However, treatment strategies for this complication are still controversial.<sup>3</sup> We report a case of a patient presenting with Takayasu's descending thoracic aortitis treated by endovascular stent repair.

### Case Report

A 16 year old male refugee from Sierra Leone presented with a pyrexia of unknown origin and a two year history of muscular aches in the shoulders, chest and upper back. He had a past history of *P. Falciparum* malaria. He took no regular medications, had no allergies or family history and was a non smoker and drinker. He was not sexually active and denied any intravenous drug use.

On examination he looked well but had left sided submandibular and bilateral axillary lymphadenopathy. He had bilateral subclavian arterial bruits, absent left sided radial and brachial pulses and a blood pressure difference of >10 mmHg between his arms.

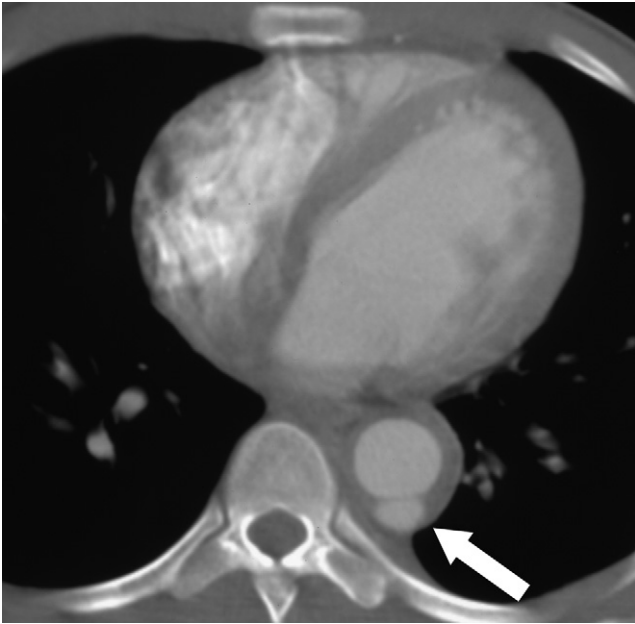
He had evidence of inflammatory disease with a haemoglobin of 9.3 g/dl, MCV 72, ESR 99, Plts 598, CRP 163 and an albumin of 27. There was no serological evidence of Treponemal infection with HIV and Hepatitis C serology was negative. He was Hepatitis B core antigen positive.

A working diagnosis of Takayasu's arteritis was made. The main differential diagnosis was that of Tuberculosis aortitis. Mantoux 1:100 revealed a positive reaction of 24 mm induration and the Heaf test was grade 3. Therefore he was commenced on treatment to eradicate latent Tuberculosis.

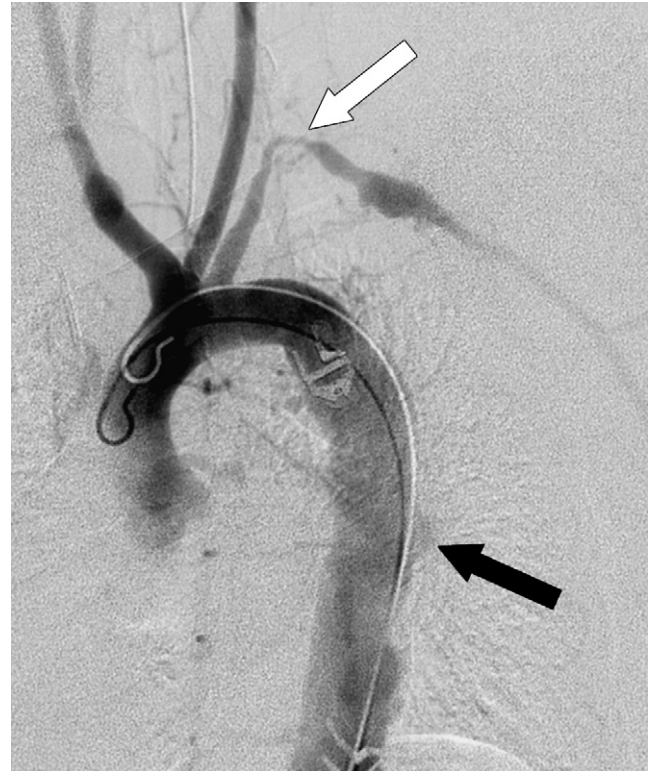
A contrast CT scan of his thorax demonstrated circumferential thickening of the thoracic aortic wall consistent with an aortitis (Figs. 1 and 2). The abnormality extended from the aortic arch to the level of the renal arteries. There were three distinct large penetrating inflammatory ulcers within the descending thoracic aorta. The mesenteric vessels appeared normal but there was a 30% non-osteal stenosis of the left renal artery. This was thought to represent disease at this site. A duplex ultrasound examination of the supra aortic branches demonstrated that the carotid arteries were normal but there were severe bilateral subclavian artery stenoses. He was deemed to be at high risk of aortic rupture and a decision was made to treat.

An endovascular repair of his thoracic descending aorta was performed with an accepted 5% mortality<sup>4</sup> as compared to open surgical interposition graft with a mortality of 20% (Society of Cardiothoracic Surgeons of Great Britain and Ireland) despite longer term durability. Initial diagnostic angiography from a left common femoral artery percutaneous puncture confirmed the CT findings (Fig. 3). The catheter was left within the aortic arch to allow angiography during

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**Fig. 1.** Contrast enhanced CT scan of the thoracic aorta at the level of the left ventricle. There is circumferential thickening of the aortic wall with areas of ulceration (white arrow).



**Fig. 3.** Left anterior oblique projection digital subtraction angiogram of the thoracic aorta. This was performed immediately prior to stent graft deployment and confirms ulceration along the lateral margin of the aorta (black arrow). Note the left subclavian stenosis (white arrow).



**Fig. 2.** Sagittal oblique reconstruction of the CT. This demonstrates to advantage the three areas of aortic ulceration (white arrows). The aortic wall is thickened from the proximal descending thoracic aorta to the visceral vessel origins.

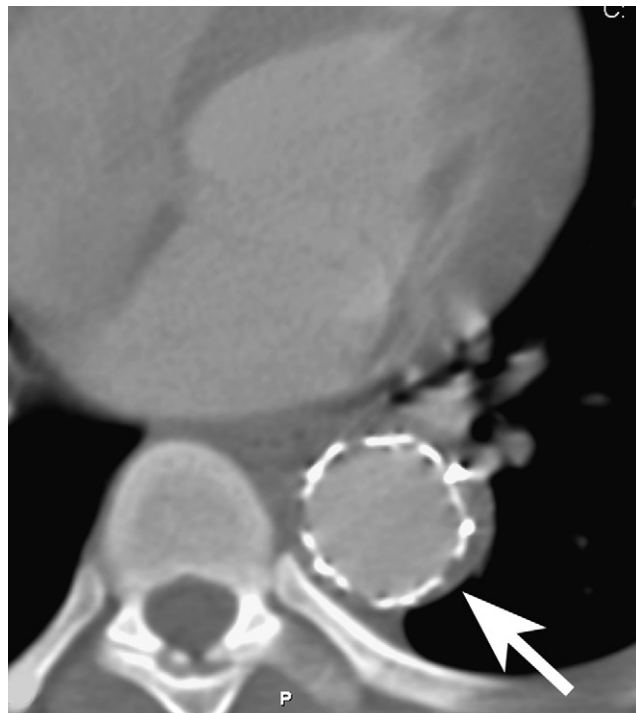
stent graft deployment. The right common femoral artery was then exposed surgically. A standard cobra angiographic catheter was then manipulated into the ascending aorta. An lunderquist ultra-stiff guidewire was inserted through this catheter, over which the stent grafts were deployed. At this time 5000 units of unfractionated heparin was administered intravenously. Two 28 mm diameter 116 mm long Talent thoracic aortic stent grafts (Medtronic, MN USA) were deployed from just distal to the origin of the left subclavian artery down to the abdominal aortic hiatus. An appropriate overlap of 3 stent lengths between the two devices was employed. Completion angiography demonstrated complete exclusion of the ulcers with no endoleak (Fig. 4). A standard surgical repair of the right common femoral artery was then performed. There were no other abnormal findings at operation and there were no post-procedure complications. After the repair he was commenced on steroid therapy. A CT scan performed 18 months following surgery shows entirely satisfactory appearances (Fig. 5) and he continues to be well and radiographically clear at four year follow up.



**Fig. 4.** Completion angiogram. Two 28 mm × 116 mm Talent aortic stent grafts have been deployed from distal to the left subclavian artery to above the celiac axis origin. The aortic ulcers have been excluded and there is no evidence of an endoleak.

### Discussion

Historically, the management of Takayasu's aortitis, in terms of both stenoses and aneurysms, has been that of steroid therapy and open surgical techniques. However, the open surgical approach is a high risk procedure. This is due to the variety and complexity of clinical manifestations attributed to multiple vessel involvement, extent of aneurysm and degree of inflammation.<sup>5</sup> In addition, post operative anastomotic aneurysm formation has been reported.<sup>6</sup> A literature search suggests that the reported case is the first in the use steroid therapy and endovascular stent repair in Takayasu's aortitis. This treatment



**Fig. 5.** Contrast enhanced CT scan 18 months following stent grafting. There is continued patency of the stent graft and no visible ulceration or aneurysm formation outside the graft (white arrow).

option may be used for young patients in whom open surgical techniques are not suitable due to higher mortality rates.

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