

AORTIC ROOT ABSCESS FOUR YEARS POST-BENTALL'S PROCEDURE – A CASE REPORT

Authors: R. Corcoran, A. O'Shea

Affiliations: Royal Perth Hospital

Introduction:

Infections of aortic grafts are a potentially devastating complication of aortic surgery, often necessitating repeat procedures to remove infected material. Contamination of a graft may occur via haematogenous or lymphatic spread, or due to lapses in sterile surgical technique (1). From a microbial perspective, there is a predominance of *Staphylococcus aureus* infections (35%), with other common causes including coagulase-negative *Staphylococcus*, *Streptococcus* and *Enterococcus* species (2). In these cases, prosthesis replacement in conjunction with antibiotics is considered the gold standard of treatment. However, conservative management with antibiotics alone is often favoured in populations such as those with significant co-morbidities (1).

Presentation:

This is the case of a 51 year old gentleman who presented with two-week history of productive cough, as well as a vague one day history of cough, chest pain radiating to shoulders, and fevers. This was on a background of a Bentall's procedure and insertion of a tissue aortic valve replacement in 2020, indicated for severe aortic regurgitation. Investigations revealed an aortic root abscess due to *Staphylococcus aureus*, four years after the initial procedure.

On examination, the patient was alert, with ongoing central chest pain (8/10) radiating to his shoulders. His blood pressure was 105/72 mmHg, with a heart rate of 95, a respiratory rate of 24, saturations of 97% on room air, and he was initially afebrile. A soft systolic murmur was noted at the first intercostal space, and his chest was clear. No clinical signs of heart failure were noted, nor were there peripheral stigmata suggestive of endovascular infection.

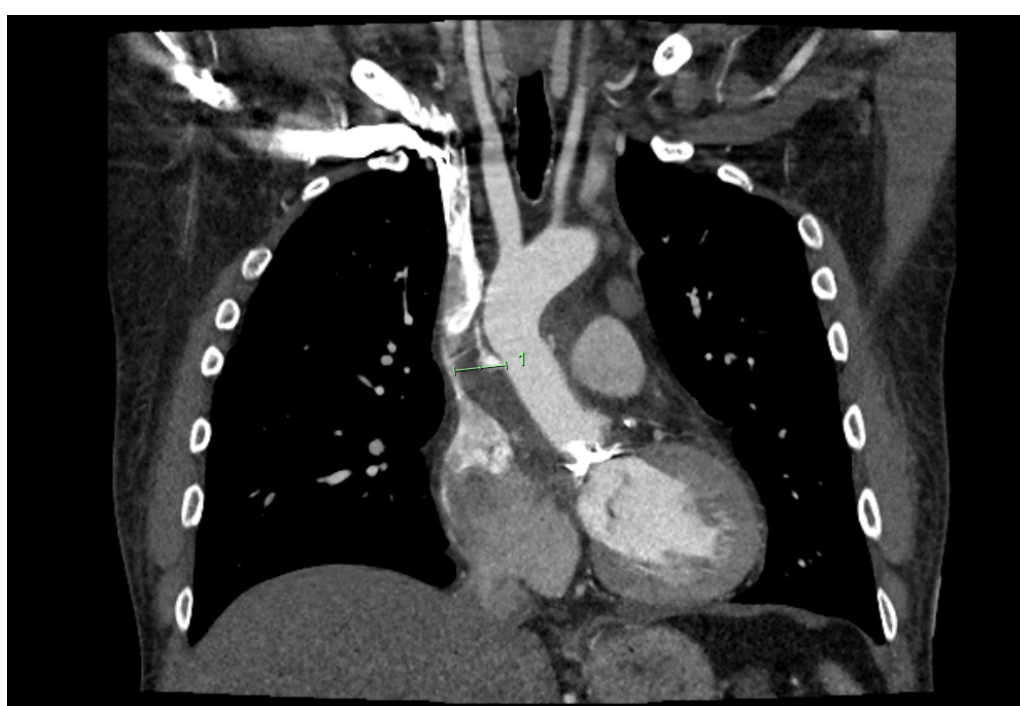


Figure 1: CT thoracic angiogram showing "circumferential fluid collection around the aortic graft extending to the level of the aortic arch".

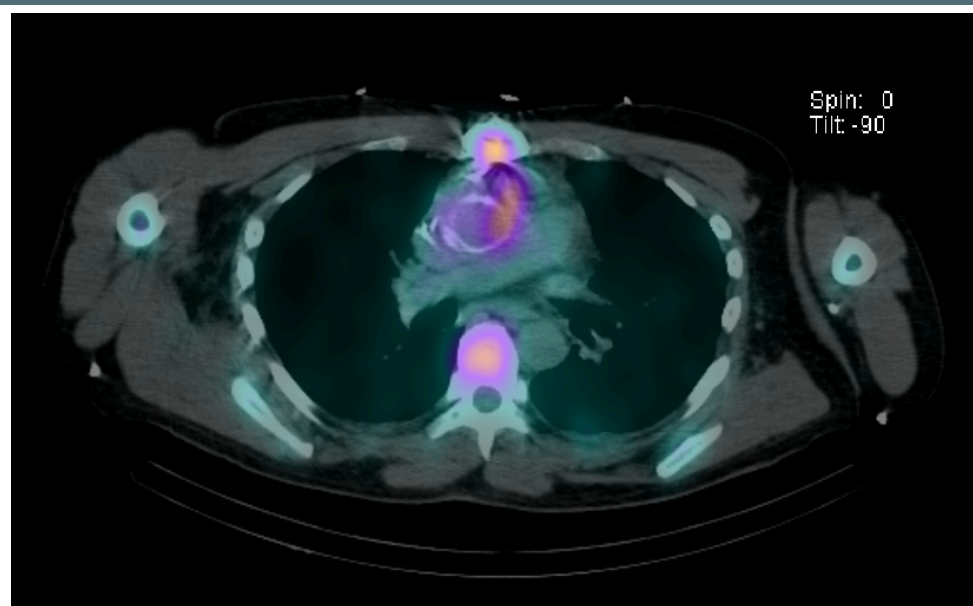


Figure 2: Tc-99m HMPAO labelled WBC scintigraphy showing "low-grade inflammation/infection at the base of the aortic root graft extending into the mediastinum".

Investigations and treatment:

Initial acute coronary syndrome (ACS) work-up was negative. Blood tests revealed a haemoglobin of 121 g/L (reference interval (RI), 135–180 g/L), a white cell count of 18.4×10^9 cells/L (80% neutrophils, RI $4\text{--}11 \times 10^9$ /L), C reactive protein of 133 mg/L (RI <5.0 mg/L) with normal renal function, electrolytes and liver transaminases. A chest x-ray was interpreted as having lower lobe consolidation, leading to the patient being initially treated as a severe community-acquired pneumonia with IV Ceftriaxone and Azithromycin.

Provisional blood culture results thereafter revealed a likely *Staphylococcus aureus* bacteraemia. The patient was switched to IV Vancomycin, and the differential was shifted to likely aortic graft infection. This led to imaging of the graft by CT thoracic angiogram (Figure 1), and subsequent diagnosis of a periaortic abscess occurring on day three of admission. Once the causative organism was deemed to be Methicillin-sensitive *Staphylococcus aureus* (MSSA), the patient was placed on IV Flucloxacillin. Additional imaging including transoesophageal echocardiogram (TOE) and Tc-99m HMPAO labelled WBC scintigraphy (Figure 2) was performed. The patient was managed medically for two weeks following initial presentation, followed by transfer to the local centre for Cardiothoracic surgery, for replacement of the aortic root and valve.

The patient continued IV flucloxacillin and oral rifampicin for an additional six weeks. Since then, he has been reviewed in the outpatient clinic, where he reported no ongoing fevers or chest pain and has returned to his baseline functional.

Conclusion:

The main challenge in the management of this patient was the initially vague presentation resembling that of a community-acquired pneumonia. This led to imaging of the graft only occurring on day three of admission.

This case demonstrates how the complexity of clinical presentation seen with this condition can lead to delays in management. While definitive management often involves a combination of surgery and antimicrobial therapy, early initiation of appropriate empirical antibiotics has been identified as the most important modifiable factor associated with long-term survival (3).

This example also raises the question of whether the threshold for imaging such patients should be lowered to avoid delays in appropriate treatment. It highlights that, although the incidence of this complication is low, it should still be considered in the differential diagnosis for patients with indwelling prostheses who present with febrile illnesses and non-specific symptoms. (4).

References:

1. Machelart I, Greib C, Wirth G, Camou F, Issa N, Viallard JF, Pellegrin JL, Lazaro E. Graft infection after a Bentall procedure: a case series and systematic review of the literature. *Diagnostic microbiology and infectious disease*. 2017 Jun 1;88(2):158–62.
2. Galar A, Weil AA, Dudzinski DM, Muñoz P, Siedner MJ. MSSA prosthetic valve endocarditis: pathophysiology, epidemiology, presentation, diagnosis, and management. *Clinical microbiology reviews*. 2019 Mar 20;32(2):10–128.
3. Sixt T, Aho S, Chavanet P, Moretto F, Denes E, Mahy S, Blot M, Catherine FX, Steinmetz E, Piroth L. Long-term prognosis following vascular graft infection: a 10-year cohort study. *InOpen Forum Infectious Diseases* 2022 Apr 1 (Vol. 9, No. 4, p. ofac054). US: Oxford University Press.
4. Johnson BV, Kumbhakar RG, Corcoran MA, Burke CR, Krieger EV. Diagnosing Prosthetic Valve Endocarditis Despite a Negative Work-Up. *Case Reports*. 2024 Sep 4;29(17):102492.