

HEART

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FDG-PET/CT in the diagnosis of aortitis in pyrexia of unknown origin with severe aortic incompetence

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Title Page

Title: FDG-PET/CT in the diagnosis of aortitis in pyrexia of unknown origin with severe aortic incompetence

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Case

A 53-year-old woman with a previous history of ventricular ectopic ablation was admitted with weight loss, sweats and low grade fever and found to have severe aortic incompetence and a dilated left ventricular cavity (6.1cm) on transthoracic echocardiography (TTE, Fig 1). No vegetations were seen on transoesophageal echocardiography (TOE) and sequential blood cultures were negative. Despite extensive investigation she continued to deteriorate clinically and had a persistently elevated CRP and ESR at 300mg/l and 108mm/hr respectively. A positron emission tomography (PET)-CT scan with ¹⁸F-Fluorodeoxyglucose (FDG) showed a striking increase in FDG uptake throughout the whole aorta as well as the subclavian and iliac arteries (Fig 2), confirming a large vessel arteritis. She was treated with 3-days of high-dose dexamethasone with both a dramatic response, followed by an oral tapering regime. The patient remains well under routine outpatient follow-up with both the Cardiology and Rheumatology specialist teams.

Aortitis is an inflammatory process of one or more layers of the aortic wall with large vessel arteritis the commonest cause of non-infective aortitis. The presence of aortic incompetence is associated with a poorer prognosis¹. Multi-modality imaging is recommended whilst FDG-PET/CT has a role in the diagnosis of large vessel vasculitis affecting the aorta though caution must be exercised, as FDG-PET/CT will detect just over half of affected patients². Management consists of immunosuppression with high-dose corticosteroid therapy. Surgery and percutaneous intervention are best avoided due to the early complications associated with aortic wall fragility, prosthetic valve dehiscence and refractory inflammation despite optimal anti-inflammatory therapy¹.

Figure Legend

Figure 1 (A-B). Transthoracic echocardiogram (TTE) demonstrating severe aortic regurgitation in (A) the apical 3-chamber view showing thickening of both mitral and aortic leaflet tips with retraction of aortic leaflet tips, also seen with (B) colour flow mapping.

Figure 1 (C-D). Transoesophageal echocardiogram (TOE) demonstrating (C) the structure of the aortic valve and the origin of the aortic regurgitation (D) by colour-flow mapping.

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5 *Figure 2. FDG-PET/CT scan demonstrating the distribution of inflammation through active*
6 *uptake of FDG in the (A) ascending and descending aorta and (B) the aortic arch in the*
7 *transverse plane.*
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10 11 12 **References**

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15 regurgitation associated with takayasu arteritis and other forms of aortitis. *The Annals of*
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26 27 **Data Sharing Statement**

28 No additional data
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32 33 **Contributorship**

34 MSR - patient care, prepared manuscript and images
35
36 NS - patient care, literature search
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38 LJA - in charge of patient care, final editing of manuscript
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55 56 **Competing Interests**

57 No competing interests from any author
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Ethics

Informed written consent was obtained from the patient and submitted with the manuscript

Confidential: For Review Only

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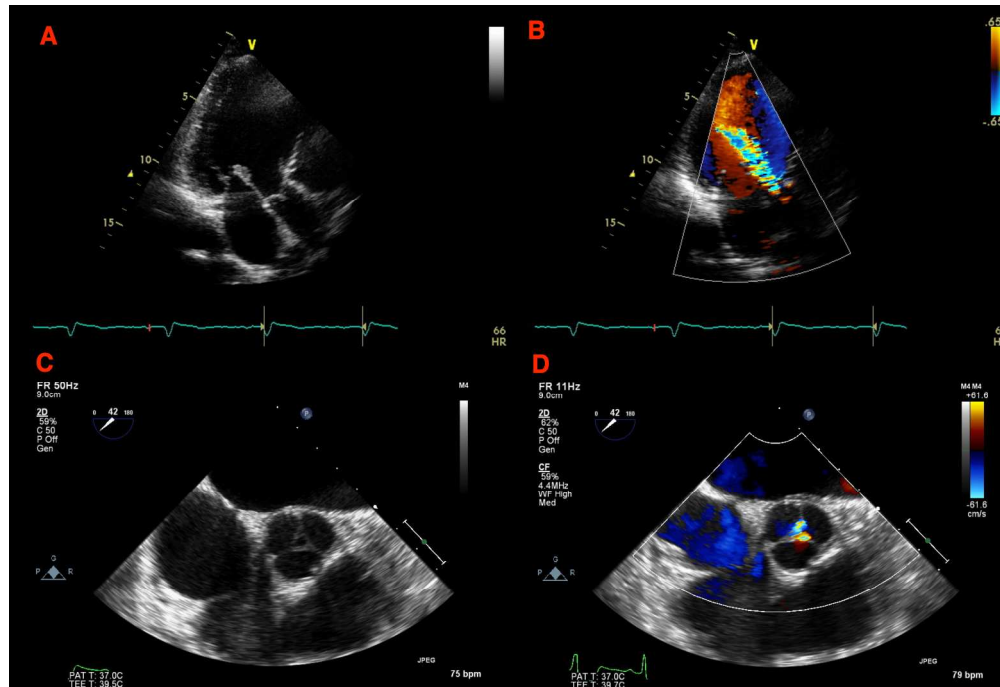


Figure 1 (A-B). Transthoracic echocardiogram (TTE) demonstrating severe aortic regurgitation in (A) the apical 3-chamber view showing thickening of both mitral and aortic leaflet tips with retraction of aortic leaflet tips, also seen with (B) colour flow mapping.
Figure 1 (C-D). Transoesophageal echocardiogram (TOE) demonstrating (C) the structure of the aortic valve and the origin of the aortic regurgitation (D) by colour-flow mapping.

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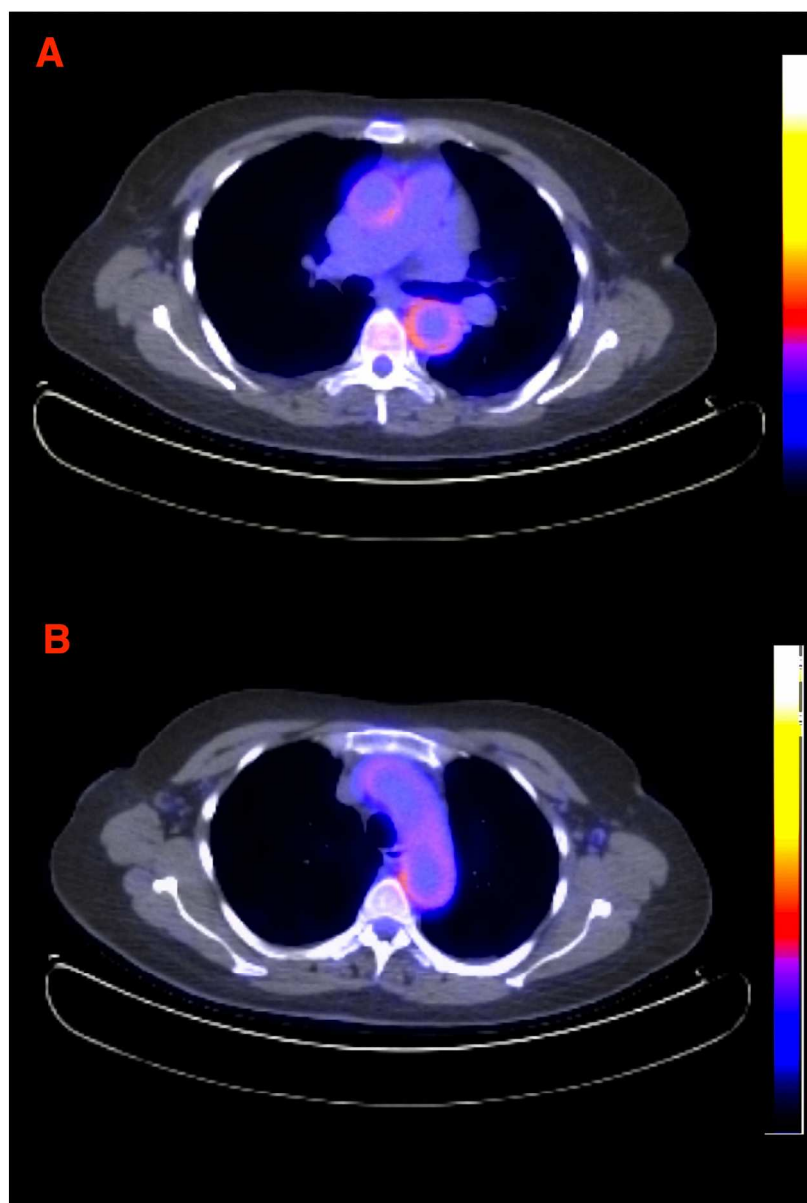


Figure 2. FDG-PET/CT scan demonstrating the distribution of inflammation through active uptake of FDG in the (A) ascending and descending aorta and (B) the aortic arch in the transverse plane.
171x254mm (300 x 300 DPI)