# The use of fluorodeoxyglucose positron emission tomography for the diagnosis of pediatric Takayasu arteritis

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A 7-year-old boy with history of aortic artery stenosis presented with peripheral arthritis and elevated blood pressure. His parents reported that he never complained of constitutional, pulmonary, cardiac, gastrointestinal or neurological symptoms.

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Laboratory results revealed elevated ESR of 85 mm/hr and CRP of 107 mg/L. The electrocardiograph (ECG) was normal. An echocardiography detected dilation of the ascending aorta and aortic valve regurgitation. This finding was further investigated with computed tomography (CT), which revealed circumferential thickening of the thoracic aorta of about 3 millimeters with irregularities in its caliber. To evaluate the thickening further, a magnetic resonance angiography

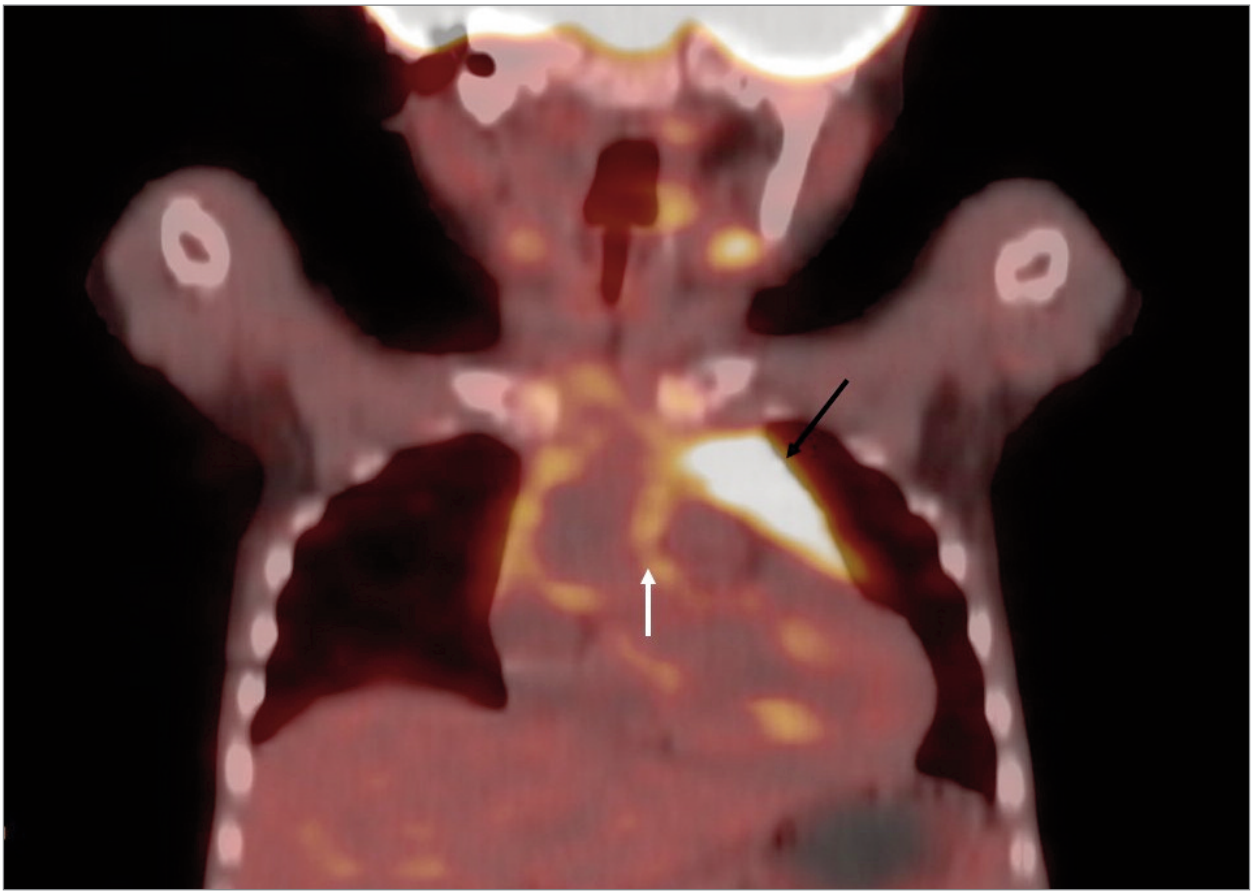

**FIGURE 1.** FDG-avid circumferential wall thickening of the ascending aorta, aortic arch and proximal descending thoracic aorta (white arrow), greater than hepatic activity (SUVmax 1.7 vs. 1.1). Note the intense uptake in the thymus (black arrow), physiologic in the pediatric age group.

(MRA) was performed which have shown thickening of the abdominal aorta, left subclavian and right brachiocephalic arteries, and the aortic isthmus without abnormal Short-TI Inversion Recovery signal. Stenosis of both subclavian arteries, celiac trunk, superior mesenteric artery and descending aorta was also detected. The nature of these findings were further assessed by $^{18}$F-fluorodeoxyglucose positron emission tomography ($^{18}$F-FDG-PET) (Figure 1) which showed circumferential thickening with increased FDG uptake involving the wall of the ascending aorta, aortic arch and proximal descending thoracic aorta. The diagnosis of active Takayasu Arteritis (TA) was suspected and the patient was treated with prednisone then tocilizumab. Acute-phase reactants improved significantly after one dose of tocilizumab.

## DISCUSSION

Takayasu arteritis (TA) is an idiopathic large-vessel vasculitis defined as a granulomatous inflammation of the aorta and its branches which usually occurs in patients younger than 50 years[1]. Less than one-third of all TA cases develop during childhood[2]. The diagnosis of pediatric TA requires a typical angiographic abnormality of the aorta or its main branches found on angiography (conventional, CTA or MRA)[3]. Although $^{18}$F-FDG-PET has been widely used to diagnose and assess disease activity of adult TA, its beneficial role has been less likely described for the diagnosis of childhood-onset disease[3]. Anti-IL-6 receptor antibody tocilizumab has been successfully used for the treatment of pediatric and adult pediatric TA[4,5].

This case highlights that $^{18}$F-FDG-PET may be particularly valuable in pediatric TA patients who present with unspecific symptoms to rule out alternative causes of systemic vasculopathy.

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