Pulmonary artery involvement in Takayasu arteritis. PET/CT versus CT angiography

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ABSTRACT

Objectives. *To report a patient with Takayasu arteritis in whom 18F-Fluorodeoxyglucose (FDG) positron emission tomography (PET)/computerised tomography (CT) failed to demonstrate pulmonary artery involvement.*

Methods. *A patient with Takayasu arteritis underwent PET/CT and CT angiography before and one year after immunosuppressive treatment.*

Results. *Before treatment, PET/CT showed increased FDG uptake in the aortic arch and epiaortic arteries; pulmonary arteries were not visualised. Follow-up PET/CT one year later demonstrated resolution of abnormal vascular FDG uptake. CT angiography of the chest/abdomen prior to treatment revealed circumferential thickening of the ascending aorta, aortic arch, supra-aortic branches, and left inferior intralobar pulmonary artery with normal lumen diameter (27 mm). After therapy, CT angiography revealed decreased aortic wall thickening with complete resolution of intralobar wall thickening. However, the lumen of the central pulmonary artery was increased (32 mm).*

Conclusion. *PET/CT is very sensitive in depicting active vasculitis, but cannot visualise the pulmonary arteries, presumably because their diameter is below the power of detection of PET/CT. CT angiography or magnetic resonance angiography is required to evaluate pulmonary artery abnormalities.*

Takayasu arteritis (TAK) is a primary large-vessel vasculitis affecting the aorta and its major branches. Clinical manifestations include constitutional symptoms such as fever, weight loss and fatigue, as well as vascular manifestations like absent or diminished pulses, bruits, limb claudication, hypertension, cerebrovascular accidents, renal artery stenosis, aortic regurgitation and pulmonary hypertension (1-3). Pulmonary artery involvement is not infrequent although is often asymptomatic. In this regard, a recent study showed abnormal pulmonary perfusion scintigraphy findings in 57% of unselected patients with TAK, whereas only 21% had pulmonary symptoms (2).

^{18}F-Fluorodeoxyglucose (FDG) positron emission tomography (PET) is considered very sensitive in assessing disease activity in TAK (4-5). Herein we report a patient with TAK in whom PET failed to demonstrate pulmonary artery involvement.

A 32-year-old woman developed in 2008 fatigue, shortness of breath, dizziness, numbness, and pins and needles in hands and wrists. She also reported a 13-kg weight loss over 4 months. ESR and C-reactive protein were normal. In 2009 thyroid ultrasonography incidentally disclosed stenosis of the left internal carotid artery. She was diagnosed with TAK and commenced on prednisone 50 mg/day tapered to 15 mg/day over some months with a satisfactory clinical response.

However, six months later, colour Doppler sonography demonstrated a hypoechogenous, concentric halo around the proximal left common carotid, left distal subclavian, and left axillary arteries, while CT angiography of the chest/abdomen revealed circumferential thickening of the ascending aorta, aortic arch, supra-aortic branches, and left inferior intralobar pulmonary artery with normal lumen diameter (27 mm – Fig. 1a). PET showed increased FDG uptake in the aortic arch and epiaortic arteries (grade 3 on a 0–3 scale 4 in the left common carotid artery, and grade 2 in the aortic arch – Fig. 1b). Pulmonary arteries were not visualised presumably

because they were below the detection power of PET/CT (Fig. 1c).

The prednisone dose was increased again to 50 mg/day tapering while methotrexate (15 mg/week) was commenced. Follow-up PET one year later showed no abnormal vascular FDG uptake (Fig. 2b). CT angiography revealed decreased aortic wall thickening with complete resolution of intralobar wall thickening. However, the lumen of the central pulmonary artery was increased (32 mm – Fig. 2a), indicating vessel abnormal dilatation.

PET is usually considered very sensitive in depicting active TAK (5), but cannot adequately visualise the pulmonary arteries. This case highlights the need for alternative/complementary diagnostic imaging techniques such as pulmonary perfusion scintigraphy, CT angiography or magnetic resonance angiography in order to evaluate pulmonary artery abnormalities in TAK.

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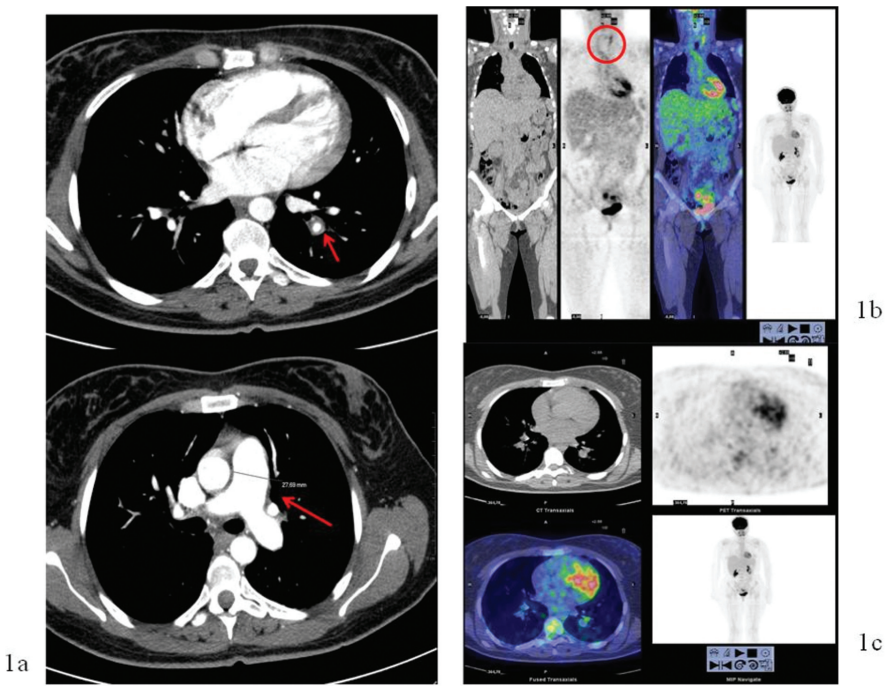

Fig. 1. CT angiography (Fig. 1a) and CT/PET (1b and 1c) before therapy.

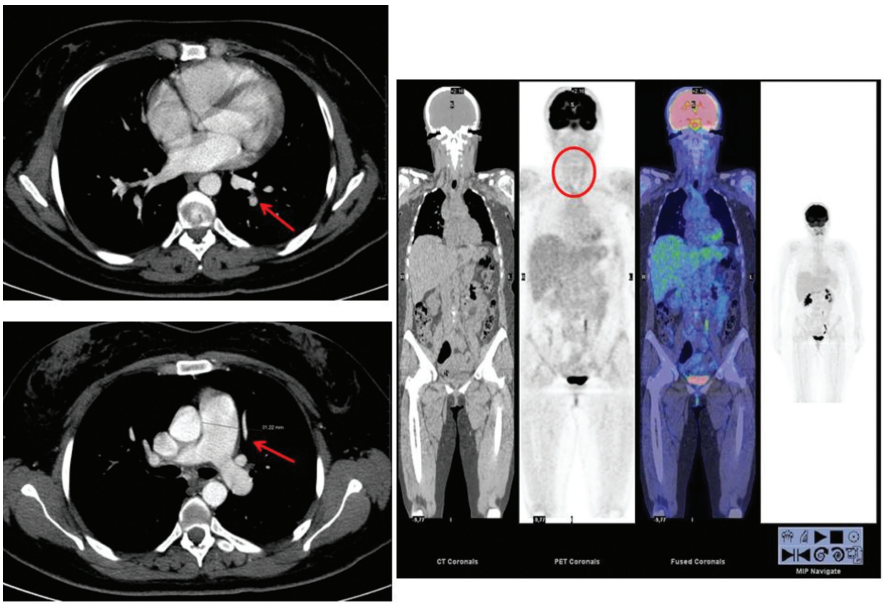

Fig. 2. CT angiography (Fig. 2a) and CT/PET (2b) after therapy.