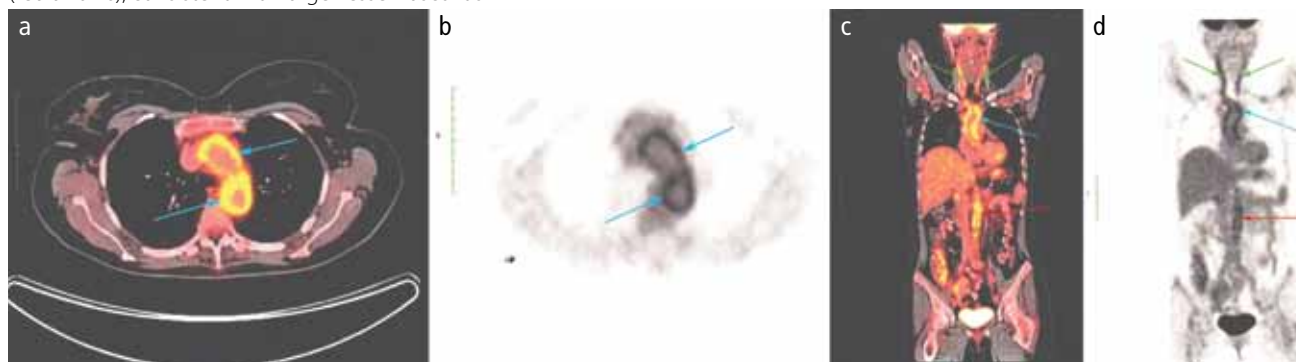


# Role of PET/CT in the diagnosis of large vessel vasculitis in a patient with systemic inflammatory response syndrome

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**Figure 1. a-d.** Axial (a, b) and coronal (c, d) images from PET/CT scan. Intense 18F-FDG linear uptake is seen as a bright yellow color on fused PET/CT images (a, c), corresponding to the gray scale on whole-body PET images (b, d). Note the markedly abnormal 18F-FDG uptake in the walls of the aortic arch (blue arrows), expanding to the carotid arteries (green arrows) and the abdominal aorta (red arrows), consistent with large vessel vasculitis



A 57-year-old woman presented with systemic inflammatory response syndrome manifesting as high-grade fever over the past 2 months, unexplained fatigue, malaise, weight loss, night sweats, diffuse non-specific arthralgias and myalgias. The patient had a history of hypertension for 2 years. The physical examination, with a focus on pulse assessment, bruit auscultation, and inter-arm systolic blood pressure difference, was not suggestive of arterial disease. Laboratory results showed leukocytosis (12,100/ $\mu$ L), elevated erythrocyte sedimentation rate (72 mm/h), and C-reactive protein level (131 mg/L). No clear focus of infection was found. A transthoracic echocardiogram was negative for infective endocarditis. Contrast-enhanced computed tomography of the chest, abdomen, and pelvis did not reveal clinically important abnormalities. With a suspicion of an occult malignancy, the patient underwent whole-body fluorine-18 fluorodeoxyglucose positron emission tomography/computed tomography (18F-FDG PET/CT) that showed increased 18F-FDG uptake in the thoracic and abdominal aorta expanding to the subclavian, common carotid, and femoral arteries (Figure 1). In the setting of systemic inflammatory response syndrome, we judged these images to be compatible with large vessel vasculitis (LVV). The patient initiated treatment with methylprednisolone and methotrexate, resulting in significant improvement of symptoms and reduction of inflammatory markers.

LVV is characterized by predominant but not exclusive involvement of the aorta and its major branches, with Takayasu arteritis (TAK) and giant-cell arteritis (GCA) being the two major variants (1). The margin between GCA and TAK is blurred, and the histopathological findings are indistinguishable (2). This case illustrates the central role of 18F-FDG PET/CT findings in early diagnosis of LVV in a patient with unexplained systemic disease. PET/CT imaging reveals increased metabolic activity when morphological changes (like wall thickening, arterial stenosis, or dilatation) and overt vascular symptoms (such as pulselessness, bruits, blood pressure difference) are absent (3). Therefore, when diagnosed in an early stage, most patients would not meet the existing 1990 American College of Rheumatology classification criteria for either GCA or TAK, as these criteria are appropriate for advanced cases. Moreover, these criteria do not consider the possibility of using novel imaging modalities (4). Cases of early diagnosis of both GCA and pre-pulseless TAK with improved imaging techniques are increasingly reported (5). Therefore, we suggest that the time has come to update the classification criteria for LVV, which are currently not working at an early stage of the disease (3).



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