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Images in Rheumatology

Takayasu arteritis early diagnosis by noninvasive imaging

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The Takayasu arteritis (TAK) is an idiopathic inflammatory disease that primarily affects large and medium caliber vessels, mainly the aorta, supra-aortic trunks, pulmonary, coronary, and renal arteries.[1] The pathogenesis of this granulomatous inflammatory disease remains unclear. Current studies suggest a chronic and destructive immune-mediated inflammatory process, which produces stenosis, occlusion, aneurysms, and ischemia. It appears predominantly in young women, mainly from Asia, North Africa, and Latin America.

Hereby, we present the case of a 31-year-old male, who was admitted to the emergency room in order to study painful and continuous cervical and interscapular pain. The patient reported smoking 40 cigarettes day^{-1}, no other clinical or epidemiological antecedents of interest. His symptoms included night sweating, dizziness, 8 kg weight loss, asthenia, dyspnea, and palpitations. He also presented bilateral Raynaud and third to fifth right-hand finger numbness, without fingertip ulcers or arthritis. Interscapular pain was controlled with nonsteroidal anti-inflammatory drugs and oral analgesia. In the physical examination, a right carotid bruit was found. Peripheric pulses were conserved, with no significative difference in blood pressure between both arms.

Laboratory studies revealed increased fibrinogen (538 mg dL^{-1}), activated partial thromboplastin clotting time (APTT) (39.10 seg), and acute phase reactants (c-reactive protein (RCP) –5.8 g dL^{-1} and erythrocyte sedimentation rate (ESR) –033 mm h^{-1}). Antinuclear antibodies (ANA) and antineutrophil cytoplasmic antibodies (ANCA) were negative, and C3 and C4 and rheumatoid factor values were normal.

Neck ultrasonography showed bilateral thickening of common carotid as well as bifurcation and internal and external carotids. Stenosis of less than 50% of the vessel caliber, but no occlusion, was observed (Figure 1). Subsequent thoracoabdominopelvic computed tomography (CT) (Figure 2) and magnetic resonance imaging (MRI) (Figure 3a) scans confirmed wall thickening of ascending, aortic arch, descending, and abdominal aorta until aortoiliac bifurcation, as well as pulmonary, proximal subclavian, and common carotid arteries, with decreased caliber but without occlusion. Positron emission tomography (PET) scan showed increased radiopharmaceutical uptake in the affected vessel walls, typical of vascular inflammatory processes (Figure 3b and c).

TAK diagnosis is usually obtained through clinical signs plus elevated acute phase reactants. In 1996, Sharma et al.[2] published their modified Ishikawa criteria, with around 95% sensitivity and specificity. Diagnosis confirmation usually requires angiography and/or arterial wall biopsy. Angiography is the gold standard technique to visualize stenosis or occlusion, but it bears multiple iatrogenic risks and it cannot delineate vessel wall pathology. Therefore, noninvasive imaging methods such as MRI or CT have almost replaced catheterized angiography. In 2018, the European League Against Rheumatism published their recommendations for the use of imaging in large vessel vasculitis in clinical practice.[3] While MRI is the preferred

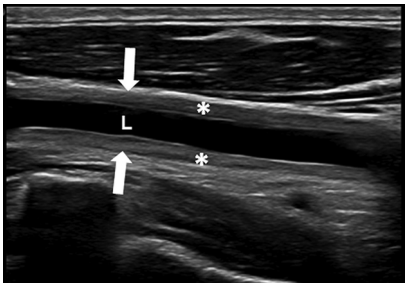

Figure 1. Supra aortic trunk ultrasonography showing right common carotid with marked wall thickening (asterisks) and a stenosis of less than 50% of the vessel caliber (arrows: outer limit of the arterial wall; L: lumen).

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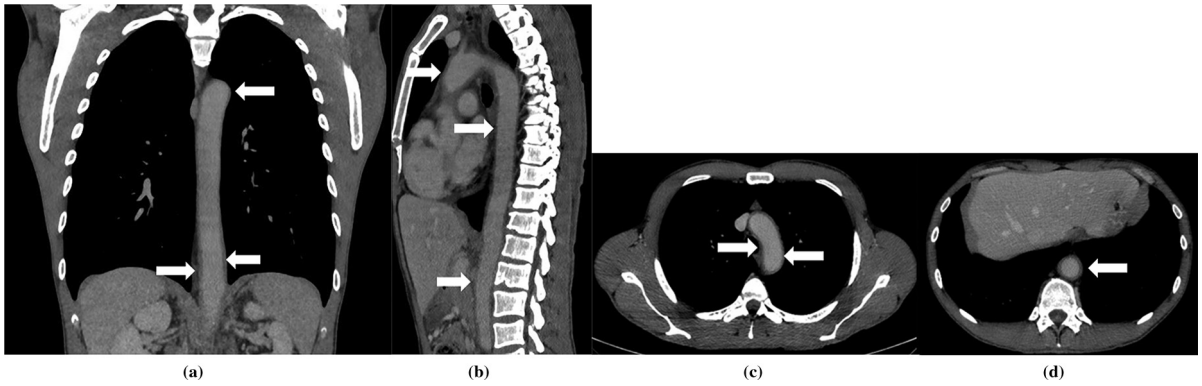

Figure 2. a-d. Thoracic and abdominopelvic CT scan, showing arterial wall thickening with intravenous contrast uptake increase. (a) Coronal image, descending aorta (arrows). (b) Sagittal image, ascending aorta arterial arch, thoracic, and abdominal aorta (arrows). (c) and (d) Arterial arch and abdominal aorta, respectively (arrows in axial images).

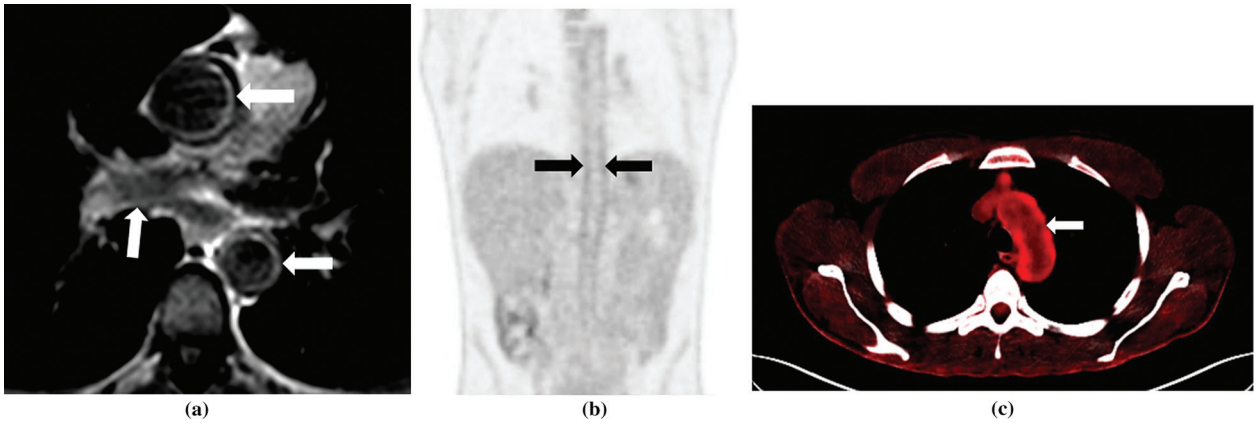

Figure 3. a-c. Thoracic MRI and PET/CT scan images. Arterial wall thickening with intravenous contrast uptake increase was observed on MRI in the ascending aorta, descending aorta, and right pulmonary artery (arrows in a). Increased radiopharmaceutical uptake on PET was observed in descending aorta (arrows in b, coronal image) and in the aortic arch (arrow in c, axial image).

imaging technique,[4] CT is more readily available among diagnostic imaging departments, both widely used for TAK diagnosis and follow-up and PET.[4,5] Early diagnosis in subclinical patients is extremely important to avoid life-threatening complications such as aortic aneurysm or vascular stenosis, as well as those derived from invasive surgical techniques, thereby reducing the morbidity and improving quality of life in these patients.

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