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Imaging in Takayasu Disease

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Abstract **Case Report**

Takayasu disease is a chronic inflammatory arteritis mainly affecting the aorta and its main branches. Imaging plays an important role in assessing vascular damage. Angiography-CT/ Angiography-MRI shows circumferential parietal thickening of the large vessels with contrast enhancement, stenoses, occlusions or segmental dilatations of the arteries involved (aorta, subclavian arteries, carotid arteries, renal arteries, etc.), the possible presence of aneurysms and signs of neovascularisation in the affected areas. Doppler ultrasound of the supra-aortic trunks and peripheral arteries shows thickened and hypoechoic arterial walls, reduced vessel calibre with turbulent flow or reduced blood flow. These tests can be used to assess the extent of lesions, make the diagnosis and monitor progress under treatment. We report one case of Takayasu disease to provide a better understanding of the radiological signs.

Keyword: Takayasu disease, Angiography-CT/ Angiography-MRI, Imaging.

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INTRODUCTION

Takayasu disease (TD) is an inflammatory arteritis of large vessels, predominantly affecting the aorta and its main branches. It combines general non-specific inflammatory signs and polymorphous ischemic manifestations, reflecting the progressive formation of stenosis and aneurysms within the arterial tree [1].

At present, echo-Doppler, computed tomography (CT) and nuclear magnetic resonance imaging (MRI) are reliable, non-invasive and rapid methods. Imaging plays a key role in the positive diagnosis and follow-up of the disease, particularly as it is characterized by clinical polymorphism, non-specificity of the initial presentation, and absence of biological or histological markers. The recent use of cross-sectional imaging techniques (CT, MRI) in TD has made it possible to detect parietal arterial lesions at an early phase, before the appearance of luminal abnormalities that are only visible on angiography.

CASE PRESENTATION

A 32-year-old patient with no previous history and no particular complaint presented with intermittent claudication of the left upper limb with cough and dyspnoea, associated with arthralgias. Biological work-up revealed anaemia of 9, high CRP and SS. Doppler ultrasound the supra-aortic trunks was performed, which revealed circumferential, regular, hypoechoic thickening of the wall of the left supraclavian artery, prompting a thoracic angioscan.

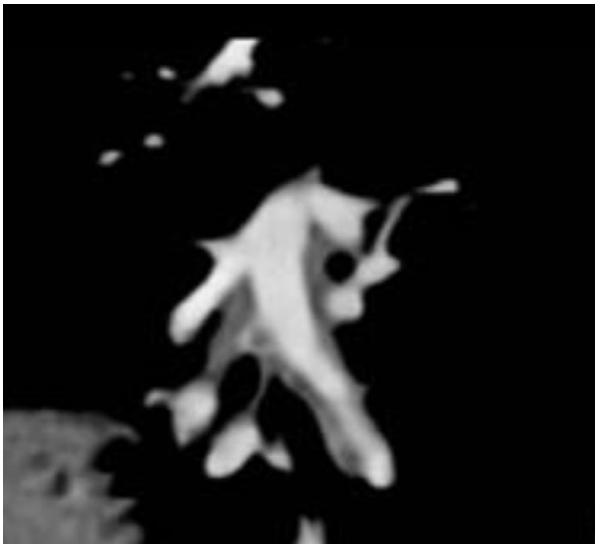

Figure 1: Coronal computed tomography section showing diffuse parietal thickening of the left superior lobar artery

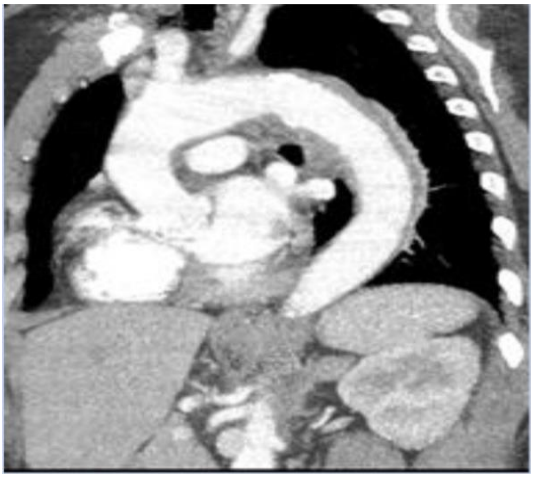

Figure 2: CT sagittal section showing focal parietal thickening of the descending thoracic

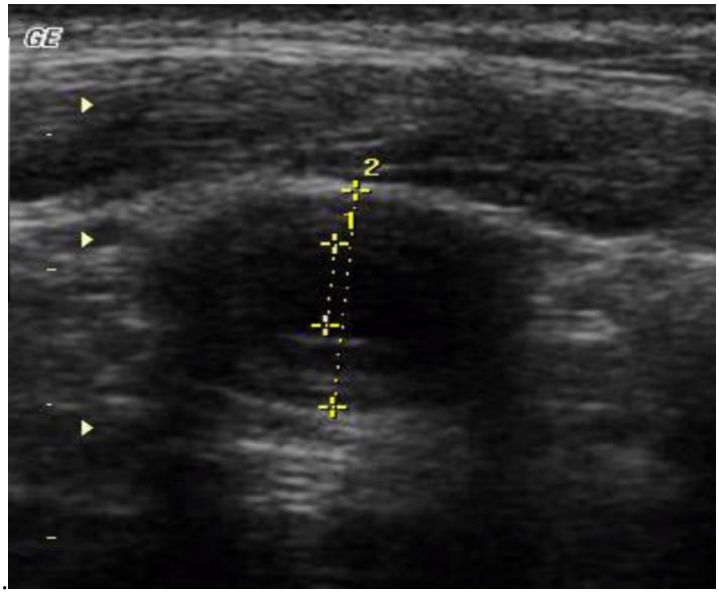

Figure 3: Axial ultrasound section showing circumferential parietal thickening of the left subclavian artery

DISCUSSION

Takayasu disease (TD) is an inflammatory arteritis of large and medium vessels, mainly affecting the aorta, its main dividing branches and the pulmonary arteries. TD affects electively and segmentally the thoracic and abdominal supraceliac aorta, the origin of the large arterial trunks that arise from it, the coronary arteries and the pulmonary arteries [2]. TD usually begins with a systemic or preocclusive phase marked by general manifestations (fever, arthralgias, myalgias, altered general condition, pleuropulmonary signs, etc.), followed or overlapped by a vascular phase in which ischaemic symptoms predominate, created by the arterial lesions of the varied clinical expression of the disease: arterial hypertension (AH), claudication of the lower or upper limbs, cerebral ischaemia, angina [1]. Angiography used to be the reference examination, but now echo-doppler, CT and MRI are reliable, non-invasive and rapid methods of assessing vessel walls and lumina. CT and MRI can detect parietal arterial lesions at an early phase, before the appearance of luminal abnormalities [3].

Doppler ultrasound satisfactorily explores the supraceliac abdominal aorta, the supra-aortic trunks and the arteries of the upper and lower limbs [3]. It provides precise information on the arterial wall, particularly during inflammatory attacks, showing: regular hypoechoic circumferential thickening of the affected areas; the presence of long, regular stenosis.

Arterial occlusions, ecstatic lesions and signs of aortic insufficiency should also be sought. CT scan is performed in the systemic phase and at the beginning of the occlusive phase: Circumferential thickening, often with low density without calcifications, homogeneously enhancing at the end of the injection: characteristic double-ring appearance, the outer limit of the aortic wall is often irregular, abrupt transition from healthy to pathological aorta [3, 5]. In the chronic phase, the radiological appearance is less characteristic: the

parietal thickening is more discreet, more irregular and there may be more calcifications. In principle, there is no late parietal contrast [3, 5].

MRI is interesting in the diagnostic and extension work-up in the early phase of the disease, as well as in post-treatment follow-up. In T1, there is diffuse, concentric thickening of the aortic wall, or even arterial stenosis. In T2, the arterial wall and periaortic tissues may show oedema in the form of a hypersignal. T1 sequences with gadolinium injection and fat saturation: may show contrast enhancement of the arterial wall suggesting disease activity [4]. Angio-MRI: can also be used to map arterial lesions and show stenosis, occlusive and ecstatic lesions at a later phase [4].

CONCLUSION

Takayasu Disease affects young adults and is essentially manifested by multiple arterial stenosis responsible for the symptoms.

Doppler ultrasound, CT, MRI and MRI-angiography have made it possible to diagnose lesions at an early phase, as well as to carry out a precise extension assessment and monitor the effects of treatment.

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