Concomitant ischemic stroke and myocarditis as the initial clinical presentation of Takayasu arteritis

Beirão T[1], Coelho C[2], Ferreira N[3], Rodrigues M[4], Videira T[5], Pimenta J[2]

[1] Serviço de Reumatologia, Centro Hospitalar De Vila Nova de Gaia/Espinho

[2] Serviço de Medicina Interna, Centro Hospitalar De Vila Nova de Gaia/Espinho

[3] Serviço de Cardiologia, Centro Hospitalar De Vila Nova de Gaia/Espinho

[4] Serviço de Neurorradiologia, Centro Hospitalar De Vila Nova de Gaia/Espinho

[5] Serviço de Reumatologia, Centro Hospitalar De Vila Nova de Gaia/Espinho

Correspondence to

Tiago Beirão

E-mail: tiagobeirao11@gmail.com

ORCID: 0000-0003-1142-4469

Submitted: 05/06/2022

Accepted: 12/08/2022

Abstract

Tayakasu arteritis (TA) is a chronic large-vessel systemic vasculitis more frequent in women. The pathogenesis of TA is not fully understood. Due to its silent and heterogeneous nature, it is a challenging diagnosis, with no specific diagnostic tests. We report the case of a 45-year-old woman presenting with a concomitant ischemic stroke and myocarditis as an atypical presentation of Takayasu arteritis, revealing its heterogeneous nature. The pre-existent myocardial scar and dilated cardiomyopathy are a reminder of how silent yet aggressive this vasculitis can be and the need of for high level of suspicion to detect and treat Takayasu arteritis early, avoiding late consequences. Corticosteroids (0.5-1.0mg/kg/day) are as the mainstay treatment associated with steroid-sparing drugs, such as methotrexate or azathioprine.

Keywords: Brain; Diagnostic imaging; MRI; Takayasu's disease.

Introduction

Takayasu arteritis (TA) is a large-vessel vasculitis that affects mainly the aorta and its primary branches. Patients may initially present with constitutional complaints and later develop symptoms associated with vascular damage[1,2]. Women are the most affected (80-90% of all cases), with an age of onset usually between 10 and 40 years. The pathogenesis of TA is incompletely understood, with cell-mediated mechanisms being considered the main drivers of the vascular inflammatory process, which leads to narrowing, occlusion, or dilation of the arteries[3].

We report the case of a patient referred to the emergency department with concomitant ischemic stroke and myocarditis as the initial clinical presentation of Takayasu arteritis.

Case Report

A 45-year-old Portuguese Caucasian woman presented to the emergency department with right central facial palsy, right hemihyposthesia, and dysarthria for the past 18 hours. She denied thoracic pain. A brain computed tomography (CT) scan was performed and revealed no

acute ischemic lesions. Angio-CT scan documented a suboclusive stenosis of the left internal carotid artery with presence of an endoluminal thrombus (Figure 1 A). The electrocardiogram showed *de novo* left-bundle branch block; there was no increase in troponin levels. A diagnosis of acute middle cerebral artery ischemic stroke, probably due to a large vessel disease was confirmed by brain magnetic resonance (MR) angiography (Figure 1 B and C), and antiplatelet was started, with afterwards initiation of anticoagulation.

On the third day of hospitalization, the patient developed acute thoracic pain radiating to the interscapular area, with increased troponin (1104ng/mL) and Nt-proBNP (4485 pg/mL) levels. Acute phase reactants were within the normal range (erythrocyte sedimentation rate - 27 mm/hr and C-reactive protein - 0.23 mg/dL). Coronary artery disease was excluded by angiography. Thoracic angio-CT scan ruled out an acute aortic dissection and showed right brachiocephalic trunk occlusion. Cardiac MR showed an enlarged left ventricular chamber with severe systolic dysfunction (ejection fraction of 29%), transmural late gadolinium enhancement in the medial segment of the inferolateral wall and diffuse oedema (more prominent in the anterior anteroseptal and anterolateral walls) on T2 weighted sequences suggesting active myocardial inflammation (Figure 2 - A, C, F). Viral serologies were negative.

The patient was treated with prednisolone 1mg/kg/day with a satisfactory clinical and laboratorial evolution. She was discharged after 13 days without known definitive etiology of myocarditis. Treatment for heart failure with reduced ejection fraction with an BB and an aldosterone receptor antagonist was started. Hypotensive profile prevented ACE inhibitor/sacubitril/valsartan initiation. Control cardiac MRI performed after 3 months showed resolution of oedema and partial recovery of left ventricular ejection fraction (44%) (Figure 2 - B, D, E). At 3 months' follow-up, the patient presented no neurological symptoms.

At 10 months of follow-up, the patient was asymptomatic, with no limb claudication. A thorough physical exam revealed an asymmetry in radial pulses, with decreased right radial pulse, a difference of 19 mmHg in systolic blood pressure between the right and left arm, and a subclavian murmur. These findings raised the clinical suspicion of TA, which was later confirmed by angiography of supra-aortic branches (Figure 1 D to F). The absence of vascular commitment at abdominal angiography allowed it to be classified as Numano Type I. Prednisolone was increased in with addition to methotrexate, which stabilized the condition.

Discussion

TA usually presents with subacute and nonspecific symptoms, which may delay the diagnosis, only established when vascular disease progresses and becomes overtly symptomatic. This was the case of our patient when a magnetic resonance imaging (MRI) revealed a cardiac scar and dilated cardiomyopathy despite no previous symptoms.

Neurological symptoms are common and associated with arterial involvement, but stroke is a rare initial presentation[4,5]. Currently, the therapeutic approach combines thrombolytic therapy and interventional revascularization with a long-term treatment aiming to reduce vessel inflammation. In this patient, stroke due to classic atherosclerosis was excluded due to young age and lack of cardiovascular risk factors. No family history of thrombosis was recorded, so a thrombophilia disorder was unlikely.

According to post-mortem studies, cardiovascular involvement is the leading cause of death, including severe uncontrolled hypertension, systolic and diastolic dysfunction of the left ventricle, valvulopathy and, more rarely, myocarditis. Asymptomatic myocarditis has been previously described and can evolve to dilated cardiomyopathy[6,7]. These abnormalities were detected in on our patient's cardiac MRI, suggesting that vasculitis had been silently active for sufficient time to cause important cardiac injury and severe ventricular function impairment.

The treatment goal is to control active inflammation and prevent arterial injury, with corticosteroids (0.5-1.0mg/kg/day) as the mainstay treatment. Due to the high risk of relapse following steroid withdrawal, steroid-sparing drugs are recommended, such as methotrexate or azathioprine[8]. However, evidence for treatment efficacy is sparse, due to the lack of randomised comparative studies[9]. In our patient prednisolone proved effective, with symptoms and myocarditis recovery, leading to an increase in LVEF of 15%, as reported previously[10].

In summary, this case reported an atypical presentation of TA, with ischemic stroke and myocarditis. The presence of myocardial scar and dilated cardiomyopathy is a reminder of how silent yet aggressive this vasculitis can be. To the best of our knowledge, this is the first case report in which ischemic stroke and myocarditis are simultaneous initial presentations, suggesting its heterogeneous nature. As a result, a high level of suspicion is required to detect and treat TA early, avoiding late consequences.

Figures

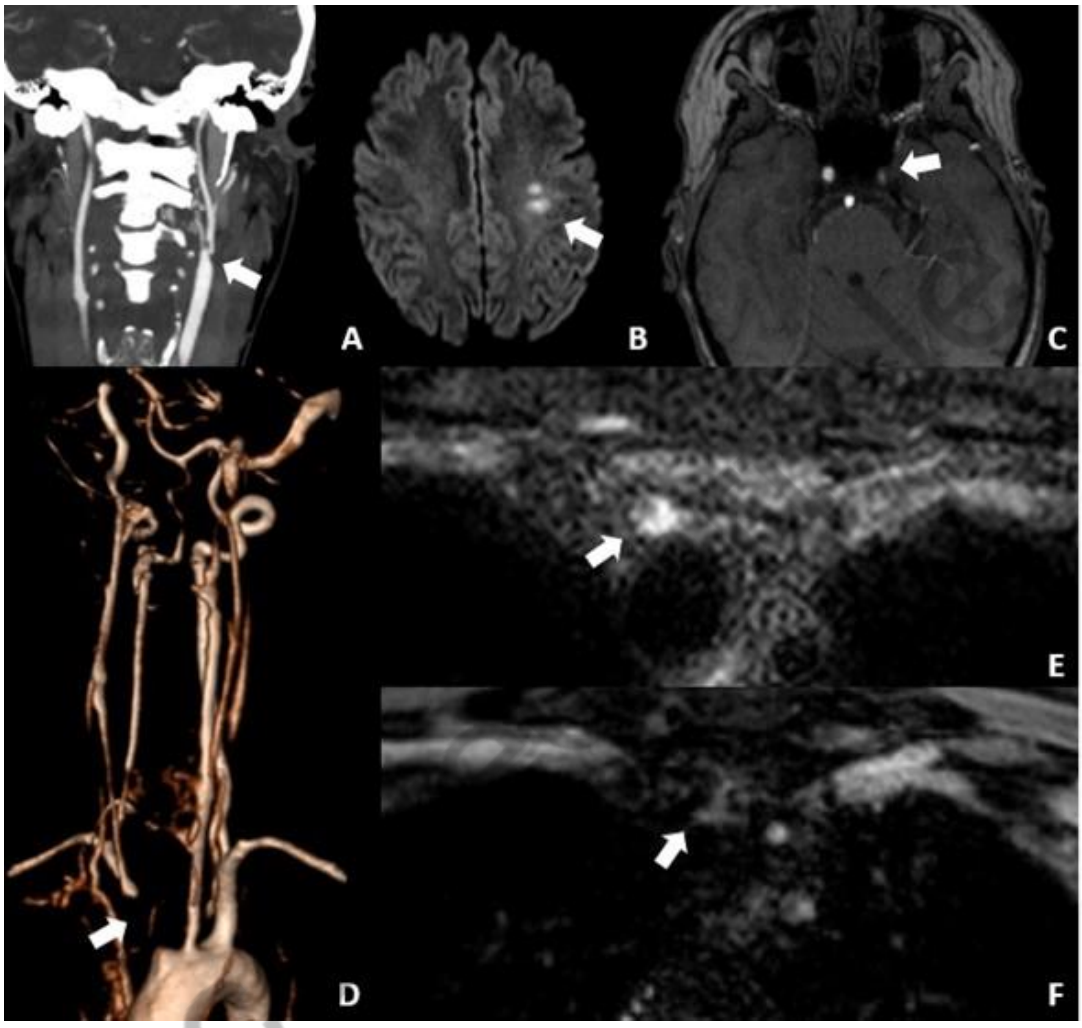

Figure 1 - A. Coronal angio-CT showing suboclusive stenosis of the origin if the left internal carotid artery with associated endoluminal thrombus. B. Brain MR, diffusion-weighted image with acute ischemic stroke involving the left centrum semiovale, reflecting a probable haemodynamic mechanism. C. MR angiography TOF showing slow flow on the left internal carotid artery, consistent with the proximal stenosis. D. 3D MR angiography with gadolinium depicting the occlusion of the proximal brachiocephalic trunk. E. Vessel wall imaging axial T2/STIR showing medial wall thickening of the brachiocephalic trunk with enhancement on the post-contrast images – F – consistent with an inflammatory process.

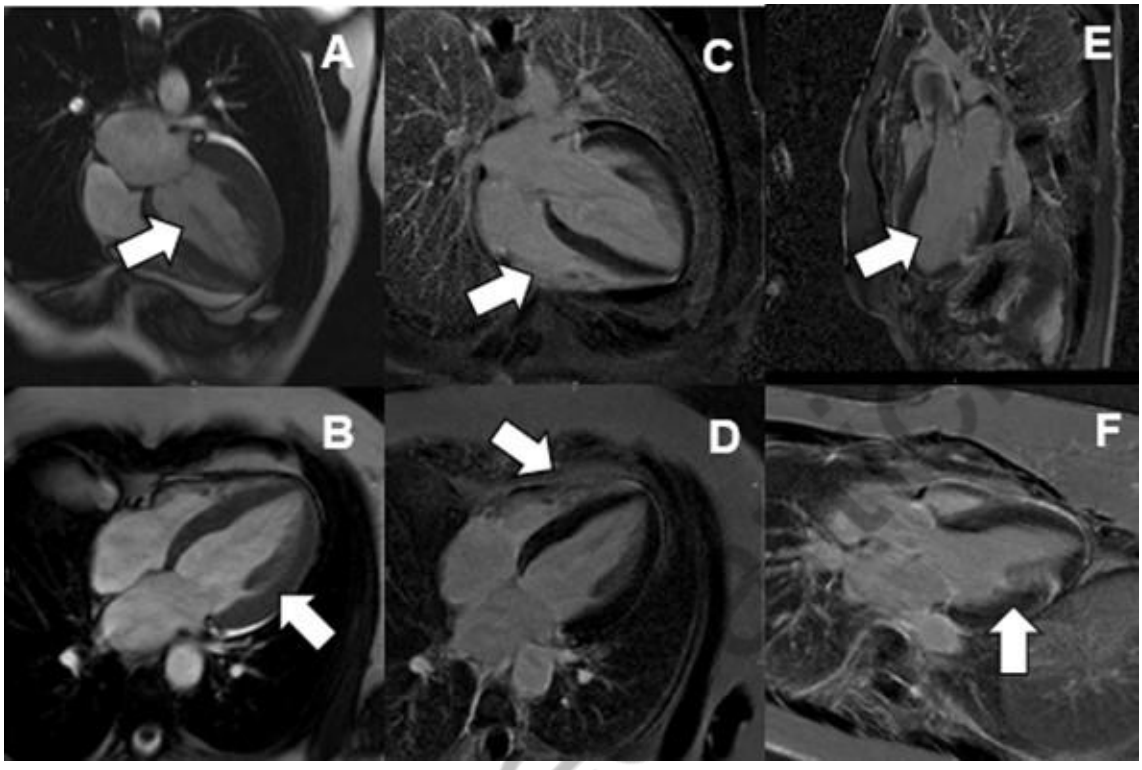

Figure 2 - A and B – Diffuse edema before treatment (A) and after treatment (B); C and D – pericardiac effusion and subepicardial myocarditis on the lateral wall before treatment (C) and after treatment (D); E and F – Myocadiac scar on middle inferolateral area

References

1. Lupi-Herrera E, Sanchez-Torres G, Marcushamer J, Mispireta J, Horwitz S, Vela JE. Takayasu's arteritis. Clinical study of 107 cases. Am Heart J 1977; 93: 94-103.

2. Dabague J, Reyes PA. Takayasu arteritis in Mexico: a 38-year clinical perspective through literature review. Int J Cardiol 1996; 54 Suppl: S103-109.

3. Weyand CM, Goronzy JJ. Medium- and large-vessel vasculitis. N Engl J Med 2003; 349: 160-169.

4. Cheo SW, Mohd Zamin H, Low QJ, Tan YA, Chia YK. A case of Takayasu Arteritis presenting with young stroke. Med J Malaysia 2020; 75: 745-747.

5. Pereira VC, de Freitas CC, Luvizutto GJ, et al. Stroke as the First Clinical Manifestation of Takayasu's Arteritis. Case Rep Neurol 2014; 6: 271-274.

6. Chattopadhyay A, Singhal M, Debi U, Sharma A, Jain S. Silent Myocarditis in Takayasu Arteritis. J Clin Rheumatol 2020; 26: e99.

7. Assomull RG, Prasad SK, Lyne J, et al. Cardiovascular magnetic resonance, fibrosis, and prognosis in dilated cardiomyopathy. J Am Coll Cardiol 2006; 48: 1977-1985.

8. Hellmich B, Agueda A, Monti S, et al. 2018 Update of the EULAR recommendations for the management of large vessel vasculitis. Ann Rheum Dis 2020; 79: 19-30.

9. Liang P, Hoffman GS. Advances in the medical and surgical treatment of Takayasu arteritis. Curr Opin Rheumatol 2005; 17: 16-24.

10. Bechman K, Gopalan D, Nihoyannopoulos P, Mason JC. A cohort study reveals myocarditis to be a rare and life-threatening presentation of large vessel vasculitis. Semin Arthritis Rheum 2017; 47: 241-246.