Review Article

Neurological Manifestations of Takayasu Arteritis: A Case Report and Literature Review

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Abstract

Takayasu arteritis (TA) is a rare large-vessel vasculitis that primarily involves the aorta and its major branches and predominantly affects women of reproductive age. We report the case of a woman who experienced an ischemic stroke at age 20 and a transient ischemic attack at age 53, with TA diagnosed only after the second cerebrovascular event. Although ischemic stroke is an uncommon initial manifestation of TA, early recognition and timely management are essential to prevent further complications and improve long-term outcomes.

Introduction

Takayasu arteritis (TA) is a rare, chronic vasculitis affecting large and medium-sized vessels, primarily the aorta and its major branches. TA predominantly affects women of reproductive age.[1] The disease is characterized by progressive arterial inflammation, which may lead to stenosis, occlusion, and aneurysm formation. Although its exact etiology remains unclear, genetic susceptibility and autoimmune mechanisms, particularly involving Th1 and Th17 lymphocyte pathways, have been implicated.[2]

Early manifestations are often nonspecific and may include fever, weight loss, fatigue, and arthralgia.[1] As the disease progresses, vascular findings become more prominent, including diminished or absent upper limb pulses (84%-96%), limb claudication, inter-arm blood pressure discrepancies, systemic hypertension (33%-83%), and arterial bruits (80%-94%).[1] Approximately 10% of patients remain asymptomatic.[3]

Cerebrovascular events, including ischemic stroke and transient ischemic attack (TIA), occur in 10%-20% of patients with TA[1,4,5] and rarely represent the initial manifestation of the disease.[5] In a cohort of 320 patients, 20% experienced cerebrovascular events, of whom 65% had ischemic stroke and 35% had TIA.[4] Identified risk factors included a history of prior ischemic stroke or TIA and delayed diagnosis.

Keywords

Takayasu Arteritis; Stroke; Neurologic Manifestations

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Manuscript received December 15, 2025, revised manuscript January 31, 2025, accepted February 20, 2026
Editor responsible for the review: Simone Nascimento dos Santos

DOI: https://doi.org/10.36660/abcimg.20250110i

TA should be suspected in young women presenting with cardiovascular symptoms and cerebrovascular manifestations. Early diagnosis and prompt initiation of immunosuppressive therapy are essential to prevent disease progression, reduce complications, and improve prognosis.[1] This study reports a case of TA initially presenting with ischemic stroke.

Case report

A 53-year-old woman presented to the emergency department after a fall from standing height caused by sudden weakness of the right lower limb. The episode was accompanied by leftward deviation of the oral commissure and dysarthria. Her medical history was notable for an ischemic stroke at age 20, resulting in persistent right-sided spastic hemiparesis. She had not received medical follow-up since that event. The patient was sedentary and denied smoking, alcohol consumption, or regular use of medicines.

On physical examination, vital signs were stable, and no additional abnormalities were observed. Laboratory investigations were unremarkable, including a C-reactive protein level of 3.18 mg/L. Initial cranial computed tomography demonstrated sequelae of a lacunar infarction in the left basal ganglia, with no evidence of acute ischemic lesions. Transthoracic echocardiography was normal. Carotid Doppler ultrasonography revealed approximately 31% stenosis of the proximal and mid segments of the left common carotid artery, with wall thickness ranging from 1.2 to 1.4 mm. The right common carotid artery showed 20% stenosis and wall thickness of 1.4 mm. The left vertebral artery was described as hypoplastic.

A repeat cranial computed tomography performed 48 hours later showed no interval changes. Because the neurological deficits resolved within 3 hours, the clinical diagnosis of TIA was established.

Given the suspicion of TA, blood pressure was measured in all four limbs, revealing no significant discrepancies. However, a bruit was auscultated over the left carotid artery. The patient denied prior constitutional or ischemic symptoms.

Cerebral magnetic resonance angiography (MRA) confirmed the previous ischemic stroke sequela in the left cerebral hemisphere. Cervical MRA (Figure 1) demonstrated approximately 60% stenosis of the proximal left common carotid artery, marked narrowing of the left internal and external carotid arteries with filiform flow, and diffuse hypoplasia of the left vertebral artery.

Thoracic MRA (Figure 2) demonstrated a focal fusiform dilation of the descending thoracic aorta.

Figure 1 – *Cervical magnetic resonance angiography. Source: Author's personal archive (2025).*

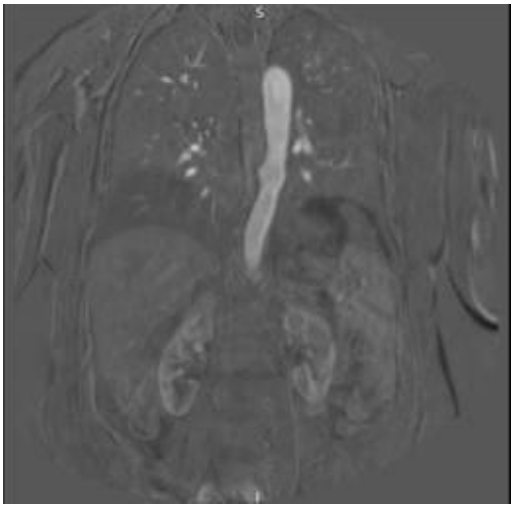

Figure 2 – *Thoracic magnetic resonance angiography. Source: Author's personal archive (2025).*

Abdominal MRA (Figure 3) revealed segmental stenosis of the infrarenal abdominal aorta, beginning at the level of the renal artery origins.

The patient was discharged with referrals to rheumatology, neurology, and cardiology outpatient clinics. However, she did not attend the scheduled appointments and remained without disease-specific treatment despite repeated follow-up attempts.

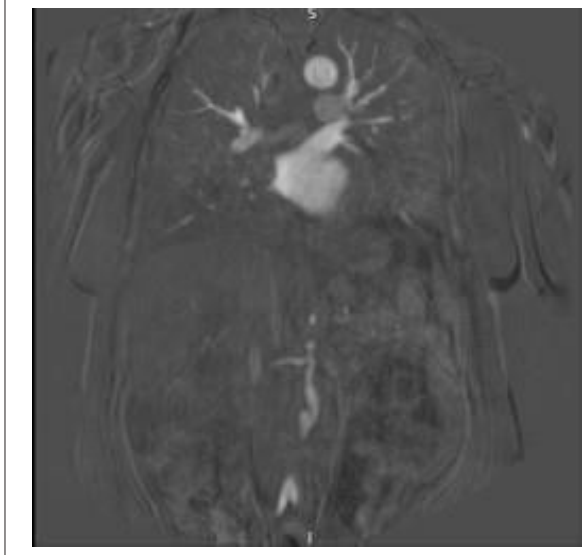

Figure 3 – *Abdominal magnetic resonance angiography. Source: Author's personal archive (2025).*

Discussion

The arteries most commonly affected in TA are large- and medium-caliber supra-aortic vessels, involved in approximately 85% of cases.[6,7] The subclavian (83.73%) and common carotid (73.22%) arteries are the most frequently affected vessels.[7] Renal artery involvement occurs in 24%-68% of cases,[8] and intracranial vessel involvement has been reported in 23.7%, particularly affecting the internal carotid artery.[9] Occlusion of the vertebral and carotid arteries is strongly associated with cerebrovascular ischemic events.

In the present case, the first ischemic event at age 20 likely reflected pre-existing vascular injury. At age 53, the patient presented with a TIA and a left carotid bruit. According to the 2022 American College of Rheumatology/European Alliance of Associations for Rheumatology classification criteria,[10] her clinical and imaging findings were consistent with TA.

Angiographic findings on MRA classified the disease as Type V according to Hata's angiographic classification[11] (Figure 4), which is the most frequent subtype, followed by Type I.[7,11] This classification primarily assists in surgical planning and does not carry established prognostic value.[1]

Risk factors for vascular complications in TA include progressive disease, thoracic aorta involvement, and retinopathy.[12] However, outcomes are influenced by multiple variables, and management must be individualized.

Traditional inflammatory markers, such as C-reactive protein and erythrocyte sedimentation rate, are insufficient to accurately assess disease activity.[13] Additional biomarkers, including matrix metalloproteinases, cytokines, and pentraxins, have been investigated,[13] but they are not routinely available in clinical practice.

Assessment of disease activity remains challenging. Instruments such as the National Institutes of Health criteria,

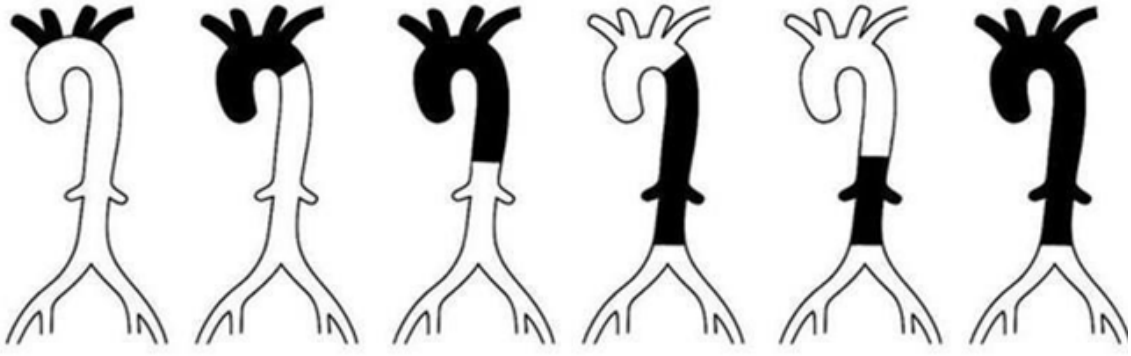

Figure 4 – *Angiographic classification of Takayasu arteritis. The black areas indicate the arteries involved in each type. Source: Adapted from Hata et al.*[11]

the Disease Extent Index for Takayasu Arteritis, and the Indian Takayasu Clinical Activity Score incorporate clinical, laboratory, and imaging parameters, although their accuracy varies.[13] The Takayasu Arteritis Integrated Disease Activity Index has demonstrated high sensitivity and specificity, but further external validation is required.[14] Combining biomarkers with advanced imaging modalities may enhance disease monitoring and therapeutic decision-making.

Treatment strategies depend on disease activity and severity. Active or severe disease requires high-dose glucocorticoids, with intravenous administration reserved for organ-threatening manifestations. In non-severe cases, combination therapy with glucocorticoids and immunosuppressive agents such as methotrexate, tumor necrosis factor inhibitors, or azathioprine has shown improved efficacy. After 6-12 months of sustained remission, gradual glucocorticoid tapering is recommended. In patients with critical cranial or vertebrobasilar involvement, antiplatelet therapy reduces the risk of ischemic events.[15]

Patients without major complications generally have a favorable prognosis.[16] Early initiation of treatment improves long-term outcomes and reduces the risk of accelerated atherosclerosis.[17] Younger patients tend to have lower remission rates, whereas older patients may require less intensive pharmacologic therapy but often exhibit greater functional impairment due to comorbidities.[18]

Conclusions

Although rare, TA may lead to severe neurological events, including stroke. Early recognition, particularly in young women presenting with pulse deficits, blood pressure discrepancies, or limb claudication, is essential. Prompt diagnosis and appropriate treatment improve clinical outcomes and reduce the risk of long-term complications.

Author Contributions

Conception and design of the research and analysis and interpretation of the data: Rolim AAA, Campos F, Carneiro TCAG; acquisition of data and writing of the manuscript: Rolim AAA; critical revision of the manuscript for intellectual content: Campos F, Ferreira DP, Carneiro TCAG.

Potential Conflict of Interest

No potential conflict of interest relevant to this article was reported.

Sources of Funding

There were no external funding sources for this study.

Study Association

This article is part of the Final Course Project by Amanda Antunes Arantes Rolim for Fundação de Ensino e Pesquisa em Ciências da Saúde (FEPECS), conducted at the Hospital Regional de Sobradinho.

Ethics Approval and Consent to Participate

This study was approved by the Ethics Committee of the Fundação de Ensino e Pesquisa em Ciências da Saúde under the protocol number 7.812.420. All the procedures in this study were in accordance with the 1975 Helsinki Declaration, updated in 2013. Informed consent was obtained from all participants included in the study.

Use of Artificial Intelligence

During the preparation of this work, the author(s) used ChatGPT to create Figure 4. After using this tool/service, the author(s) reviewed and edited the content as needed and take full responsibility for the content of the published article.

Availability of Research Data

The data cannot be made publicly available because this is a single case report. The study data correspond to information contained in the patient's medical record and therefore require confidentiality, as established by the Research Ethics Committee for this study.

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