

Incidental Detection of Takayasu Arteritis During Thyroid Ultrasonography in a Young Woman: A Case Report

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ABSTRACT

Background: Takayasu arteritis (TA) is a rare chronic large-vessel vasculitis predominantly involving the aorta and its major branches. Early diagnosis can be challenging because of its nonspecific clinical presentation. High-resolution ultrasonography (HRUS), particularly of the carotid arteries, can detect characteristic vascular wall abnormalities and may facilitate early diagnosis.

Case Report: A 22-year-old woman presented with vertigo, generalized weakness, and several episodes of syncope. Brain computed tomography and routine laboratory investigations were unremarkable, except for a mildly elevated erythrocyte sedimentation rate (ESR) of 20 mm in the first hour. One month later, she underwent thyroid evaluation for mild neck swelling. Thyroid function tests were normal, although the thyrotropin receptor antibody (TRAb) level was mildly elevated (2.77 IU/mL). HRUS of the neck demonstrated mild thyromegaly with slightly heterogeneous parenchymal echotexture and marked circumferential wall thickening of both common carotid arteries, with a maximum anteroposterior thickness of 13.8 mm. The intima-media thickness of the internal and external carotid arteries, radial arteries, and abdominal aorta was normal. Clinical assessment revealed non-recordable blood pressure in the left brachial artery and a markedly diminished left radial pulse. An elevated C-reactive protein level and CT angiography demonstrating narrowing of the distal ulnar arteries and the mid-to-distal segments of both radial arteries supported the diagnosis of TA. The patient was treated with corticosteroids, methotrexate, and folic acid, with subsequent clinical improvement and normalization of CRP.

Conclusion: This case highlights the diagnostic value of HRUS in the incidental detection of TA during routine thyroid ultrasonography. Careful assessment of extrathyroidal vascular structures and recognition of characteristic arterial wall thickening may provide an important early clue to TA. Maintaining vigilance during routine ultrasonographic examinations can facilitate timely diagnosis, appropriate referral, and treatment before the development of major vascular complications.

Keywords: Takayasu arteritis; high-resolution ultrasonography; Doppler ultrasonography; common carotid artery; carotid artery wall thickening; macaroni sign

Takayasu arteritis (TA) is a rare, idiopathic, chronic inflammatory vasculitis that predominantly affects the aorta and its major branches, including the subclavian and common carotid arteries (CCAs) (1). It primarily affects young women, particularly during the second and third decades of life, with a higher prevalence

reported in Asian and Middle Eastern populations (1). The disease was first described in 1908 by the Japanese ophthalmologist Mikito Takayasu (2).

The clinical presentation of TA is often nonspecific in its early stages, with symptoms such as low-grade fever, generalized weakness, fatigue, and myalgia. As the disease progresses, arterial wall inflammation and stenosis or occlusion may result in significant ischemic complications (3). Histopathologically, TA is characterized by granulomatous panarteritis, with inflammatory infiltration of the arterial wall leading to wall thickening, luminal stenosis or occlusion, and, in some cases, aneurysmal dilatation (1).

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Conventional angiography has historically been considered an important imaging modality for the diagnosis and assessment of TA. However, computed tomography (CT), CT angiography (CTA), magnetic resonance imaging (MRI), and magnetic resonance angiography (MRA) are now widely used for evaluating vascular involvement. Ultrasonography, particularly high-resolution B-mode and Doppler ultrasonography, is a valuable non-invasive and readily accessible technique for assessing superficial arteries, including the carotid and subclavian arteries. It can demonstrate characteristic arterial wall thickening and provide hemodynamic information through measurement of blood-flow velocities (4). These features make ultrasonography particularly useful for early detection, disease assessment, and follow-up, potentially facilitating timely treatment and reducing the risk of vascular complications.

We present a case of Takayasu arteritis in which ultrasonography played a pivotal role in the initial detection and diagnosis of the disease.

CASE REPORT

A 22-year-old woman presented with vertigo, generalized weakness, and several episodes of syncope over the preceding months. There was no history of fever, cough, respiratory distress, headache, seizures, or visual disturbances. On physical examination, her vital signs were within normal limits, and neurological examination revealed no abnormalities.

To further evaluate her symptoms, a series of investigations was performed, including complete blood count (CBC), erythrocyte sedimentation rate (ESR), serum electrolytes, lipid profile, serum creatinine, blood glucose level, routine urine analysis, and computed tomography (CT) of the brain. All investigations were within normal limits except for a mildly

elevated ESR of 20 mm in the first hour. She was initially managed with symptomatic treatment.

Approximately one month later, she consulted an endocrinologist because of mild swelling in the neck. Thyroid function tests were within normal limits; however, the thyroid-stimulating hormone receptor antibody (TRAb) level was mildly elevated at 2.77 IU/mL. She was subsequently referred to ultrasound division of National Institute of Nuclear Medicine & Allied Sciences (NINMAS) for thyroid ultrasonography (US).

High resolution ultrasound (HRUS) of neck demonstrated a mildly enlarged thyroid gland with slightly heterogeneous parenchymal echotexture. In addition to the thyroid findings, an important extrathyroidal vascular abnormality was identified. Circumferential thickening of the arterial wall, predominantly involving the tunica media, was observed in both common carotid arteries, with a maximum posterior wall thickness of 13.8 mm in the left common carotid artery. The intima-media thickness of the bilateral internal and external carotid arteries, radial arteries, and abdominal aorta was within normal limits (Figure 1).

In view of these sonographic findings, further clinical assessment was performed. Blood pressure and peripheral pulses were measured in both upper limbs. The blood pressure in the right brachial artery was 100/80 mmHg, whereas blood pressure was not recordable in the left brachial artery. The right radial pulse was palpable and normal, while the left radial pulse was markedly feeble. The combination of characteristic sonographic vascular wall thickening, asymmetric upper-limb blood pressure, and diminished peripheral pulse raised suspicion of large-vessel arteritis, particularly Takayasu arteritis (Figure 1).

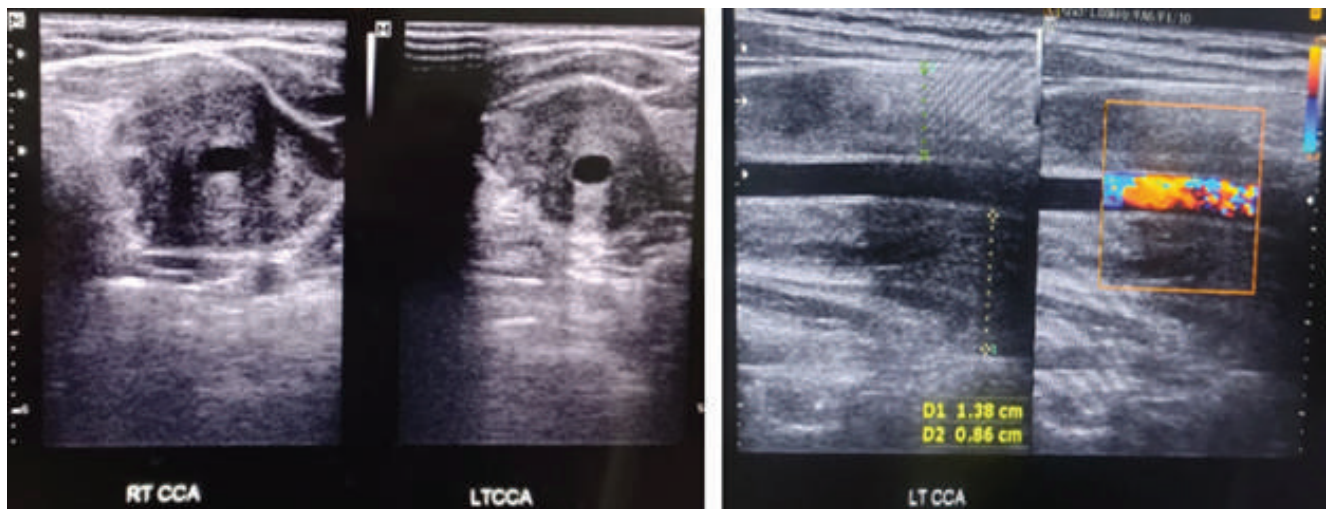


Figure 1. High-resolution ultrasonographic images of the bilateral common carotid arteries demonstrating marked, circumferential arterial wall thickening, predominantly involving the tunica media, consistent with large-vessel vasculitis. The maximum posterior wall thickness measured 13.8 mm in the left common carotid artery

The patient was referred to the Rheumatology outpatient department for further evaluation and management. Additional investigations revealed an elevated C-reactive protein (CRP) level of

39.45 mg/L. CT angiography of both upper limbs demonstrated narrowing of the distal segments of both ulnar arteries and the mid-to-distal segments of both radial arteries (Figure 2).

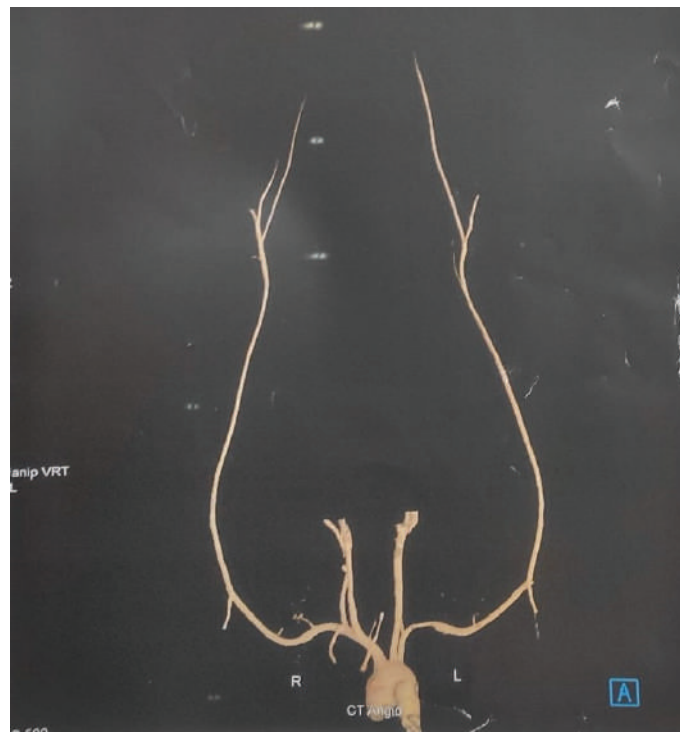


Figure 2. CT angiographic images of both upper limbs demonstrating luminal narrowing involving the distal segments of both ulnar arteries and the mid-to-distal segments of both radial arteries

Considering the patient's clinical history, physical examination findings, and imaging results, a diagnosis of Takayasu arteritis was established. She was treated with prednisolone, methotrexate, and folic acid. On follow-up, her CRP level had returned to within the normal range, and she demonstrated significant clinical improvement.

DISCUSSION

Takayasu arteritis (TA) is a chronic, idiopathic inflammatory disease characterized by granulomatous inflammation of the aorta and its major branches (5). It predominantly affects women, with a reported female-to-male ratio of approximately 8:1 to 9:1. High-resolution ultrasonography of an affected common carotid artery typically demonstrates uniform, circumferential arterial wall thickening, producing the characteristic “macaroni sign” (1).

TA is thought to occur in genetically susceptible individuals and is characterized by T-cell-mediated granulomatous panarteritis involving large vessels. The inflammatory process may initially involve the vasa vasorum and subsequently extend through the full thickness of the arterial wall. With progression or resolution of inflammation, fibrosis and persistent wall thickening may develop, resulting in luminal stenosis or occlusion and, less commonly, aneurysmal dilatation. These changes predominantly affect the aorta and its major branches (6).

The clinical course of TA is often described in three phases. The early systemic phase is characterized by nonspecific symptoms such as fever, headache, fatigue, malaise, and myalgia. This may be followed by an active vascular inflammatory phase, during which arterial wall inflammation and vascular stenosis become clinically apparent. In advanced disease, progressive arterial stenosis or occlusion may

result in diminished or absent peripheral pulses, giving rise to the historical term “pulseless disease” (2,3). In a study of 1,372 newly diagnosed patients with TA, Watanabe et al. reported that 41% presented with systemic manifestations, including fever, fatigue, weight loss, and arthralgia, while 22.6% presented with neurological or vascular symptoms such as vertigo, headache, syncope, cerebral infarction, hemiplegia, or neck pain (7).

The angiographic distribution of TA can be classified according to the Hata/Numano classification into six types (I, IIa, IIb, III, IV, and V), based on the arterial territories involved. Type V represents extensive disease involving a combination of the territories described in the other types (8).

The differential diagnosis includes other large- and medium-vessel vasculitides and vascular disorders, such as giant cell arteritis, fibromuscular dysplasia, microscopic polyangiitis, and granulomatosis with polyangiitis. Differentiation relies on the clinical presentation, laboratory investigations, and characteristic vascular imaging findings.

Early diagnosis and appropriate treatment are essential to prevent irreversible vascular complications. CTA and MRA are important cross-sectional imaging modalities for assessing the extent and severity of arterial involvement. However, CTA involves ionizing radiation and iodinated contrast administration, whereas MRA may be relatively expensive and less readily available in some settings. High-resolution B-mode and Doppler ultrasonography provide a non-invasive, readily accessible, and cost-effective means of evaluating superficial arteries. Ultrasonography can demonstrate characteristic arterial wall thickening and assess associated hemodynamic abnormalities,

particularly in the common carotid and subclavian arteries. The sonographic findings can subsequently be correlated with CTA or MRA for confirmation and assessment of the extent of vascular involvement (2).

In the present case, the characteristic circumferential thickening of both common carotid arteries identified during thyroid ultrasonography, together with the marked asymmetry of upper-limb blood pressure and peripheral pulses, prompted further vascular evaluation and ultimately led to the diagnosis of TA. This case emphasizes the importance of carefully evaluating extrathyroidal structures during routine thyroid and neck ultrasonography, as significant vascular abnormalities may be detected incidentally. Doppler ultrasonography may also have an important role in longitudinal assessment of arterial wall changes and hemodynamic abnormalities during treatment.

Treatment of TA generally involves high-dose corticosteroids for active disease, followed by steroid-sparing immunosuppressive agents or biologic therapies in selected patients. Revascularization procedures, including angioplasty, stenting, or surgical bypass, may be considered for significant symptomatic stenotic lesions, preferably after adequate control of active vascular inflammation (6).

CONCLUSION

Takayasu arteritis is a rare large-vessel vasculitis that may initially present with nonspecific symptoms and remain clinically unsuspected. This case highlights the important role of high-resolution B-mode and Doppler ultrasonography in the incidental detection of

characteristic arterial wall thickening during a routine thyroid examination. Recognition of the circumferential “macaroni sign,” particularly when associated with asymmetric blood pressure and diminished peripheral pulses, should prompt further vascular evaluation with CTA or MRA. Careful assessment of extrathyroidal vascular structures during neck ultrasonography can therefore facilitate early recognition of Takayasu arteritis, enabling timely referral and treatment and potentially preventing serious vascular complications.

REFERENCES

1. Nam SJ, Kim EK. Incidentally diagnosed Takayasu arteritis on thyroid ultrasonography showing prominent collateral vessels of thyroidal arteries and common carotid artery occlusion. *Ultrasonography*. 2014;33(3):222-225. doi:10.14366/usg.14007.
2. Takayasu arteritis diagnosed by carotid artery Doppler: a rare case report. *Bangladesh J Radiol Imaging*. 2026;33(1). doi:10.3329/bjri.v33i1.90680.
3. Niranjan KC, Pramod Kumar S, Lalita B, Ishwari P, Kumar YM. A rare case presentation of Takayasu arteritis affecting the bilateral common carotid arteries: a case report. *Ann Med Surg (Lond)*. 2025;87(4):2494-2499. doi:10.1097/MS9.00000000000003179.
4. Suwanwela NC, Suwanwela N. Takayasu arteritis: ultrasonographic evaluation of the cervico-cerebral arteries. *Int J Cardiol*. 1998;66 Suppl 1. doi:10.1016/S0167-5273(98)00164-8.
5. Suzuki M, Watari T. Macaroni sign: a clue to Takayasu arteritis diagnosis. *BMJ Case Rep*. 2022;15. doi:10.1136/bcr-2022-250920.
6. Gaillard F, Sharma R, Silverstone L, et al. Takayasu arteritis. *Radiopaedia.org*. Available from: <https://doi.org/10.53347/rID-2143>
7. Watanabe Y, Miyata T, Tanemoto K. Current clinical features of new patients with Takayasu arteritis observed from cross-country research in Japan: age and sex specificity. *Circulation*. 2015;132:1701-1709. doi:10.1161/CIRCULATIONAHA.114.012547.
8. Hata A, Noda M, Moriwaki R, Numano F. Angiographic findings of Takayasu arteritis: new classification. *Int J Cardiol*. 1996;54 Suppl. doi:10.1016/S0167-5273(96)02813-6.