

Case Report

Giant cell arteritis imitating dural arteriovenous fistula: Diagnostic pitfalls and the importance of timely corticosteroid treatment – A case report

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ABSTRACT

Visual disturbances and chronic headaches in the elderly often prompt investigation for intracranial vascular anomalies such as dural arteriovenous fistulas (DAVFs). However, giant cell arteritis (GCA)-a systemic vasculitis-can present with similar symptoms and even mimic DAVF radiologically. Misdiagnosis may delay appropriate treatment and result in irreversible complications such as vision loss. We report a case of a 65-year-old male presenting with progressive bilateral visual impairment and a longstanding headache. Initial magnetic resonance angiography (MRA) suggested DAVF involving the ophthalmic and internal maxillary arteries, with associated vascular dilatation. However, digital subtraction angiography (DSA) revealed bilateral dilatation and sluggish contrast flow in the superficial temporal arteries-findings more indicative of GCA. High-dose oral prednisone (40–60 mg/day) was initiated, followed by a gradual taper. Within one month, the patient experienced marked improvement in both visual acuity and headache symptoms. While DAVF and GCA are distinct vascular disorders, overlapping clinical features and imaging findings can lead to diagnostic confusion. DAVFs typically show arteriovenous shunting and venous congestion, while GCA demonstrates arterial wall inflammation and altered flow patterns. In this case, DSA played a pivotal role in clarifying the diagnosis. Early corticosteroid therapy, as recommended by major rheumatologic societies, was effective in reversing symptoms and preventing visual deterioration. This case highlights the importance of thorough vascular imaging interpretation and clinical judgment in differentiating DAVF from GCA. Prompt and accurate diagnosis, coupled with early corticosteroid treatment, can significantly reduce morbidity and preserve vision in elderly patients presenting with overlapping vascular symptoms.

Keywords: Corticosteroid, Dural arteriovenous fistula, Giant cell arteritis

INTRODUCTION

Visual disturbances and chronic headaches in elderly patients often prompt evaluation for various intracranial pathologies, including vascular anomalies. Dural arteriovenous fistulas (DAVFs) are rare but potentially serious conditions that can present with progressive visual loss and headache, particularly when involving the ophthalmic or cavernous venous drainage systems.^[1] Digital subtraction angiography (DSA) is considered the gold standard for diagnosing DAVF due to its high spatial resolution and ability to delineate vascular architecture.^[2]

However, other vascular disorders such as giant cell arteritis (GCA) – a systemic vasculitis affecting medium to large arteries – can mimic the clinical and imaging features of DAVF. GCA frequently involves the superficial temporal arteries and can lead to irreversible vision loss if not diagnosed and treated promptly. Early administration of corticosteroids is essential to prevent ischemic complications, particularly in cases presenting with visual symptoms.^[3,4]

This case highlights a diagnostic challenge in which an elderly male with visual impairment and chronic headache was initially suspected to have DAVF based on magnetic resonance angiography (MRA) findings, but subsequent DSA and clinical correlation revealed GCA. Prompt initiation of corticosteroid therapy led to clinical improvement, emphasizing the importance of accurate diagnosis and early intervention to reduce patient morbidity.

CASE REPORT

Patients information

A 65-year-old man presented with progressive visual impairment due to optic atrophy. The patient had progressive visual impairment characterized by blurred vision and visual field narrowing over the past year. Symptoms initially affected the left eye, beginning with peripheral vision loss that gradually progressed to involve the nasal field. Over the past

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3 months, the patient also noted blurred vision in the right eye. In addition, the patient reported a persistent throbbing, non-progressive headache over the past 5 years, localized primarily in the temple area of the head, which improved with over-the-counter medication. There were no other symptoms.

The patient denied any prior history of hypertension, diabetes mellitus, or stroke. Current medications included Aptor 100 mg once daily, Neurosanbe 100 mg once daily, and a compounded capsule taken 3 times daily containing Paracetamol 300 mg, Diazepam 2 mg, Trifluoperazine 2 mg, and Caffeine 30 mg.

Clinical findings

The neurologic abnormalities we found were impaired vision and visual field. Visual acuity was markedly reduced, with 1/60 in the right eye and 1/300 in the left eye, with decreased left pupillary reflex. Scalp tenderness was also observed in this patient [Figure 1a]. Fundoscopic examination of the left eye showed optic atrophy with no signs of retinal hemorrhage, whereas the right eye appeared normal [Figure 1b]. Temporal hemianopia was noted in the left eye on the confrontation test. Extraocular muscle movements were intact, and there were no abnormalities in other nerves.

Diagnostic assessment

Head magnetic resonance imaging (MRI)-MRA revealed the presence of DAVF resulting from an abnormal connection between the internal maxillary artery and the ophthalmic artery [Figure 2a and b]. This vascular anomaly was associated with dilatation of the middle meningeal artery and the superficial temporal artery – branches of the external carotid artery—as well as dilation of superficial orbital veins surrounding the ocular muscles.

DSA was performed to further investigate the suspected DAVF. However, the examination revealed bilateral dilatation and caliber enlargement of the superficial temporal arteries, accompanied by slow contrast flow—findings suggestive of temporal arteritis [Figure 2c-f]. Carotid ultrasound revealed a halo sign on the right superficial temporal artery, indicating arterial wall inflammation suggestive of GCA [Figure 3]. Laboratory testing revealed an elevated erythrocyte sedimentation rate (ESR), measured at 77 mm/h, supporting the suspicion of an inflammatory process such as GCA.

Therapeutic intervention

The patient was treated with oral prednisone at a dose of 40–60 mg/day for 2–4 weeks, followed by a gradual tapering of 10 mg every 2 weeks [Figure 4].

Follow-up and outcomes

Within 1 month of initiating therapy, there was a marked improvement in both visual disturbances and headache symptoms.

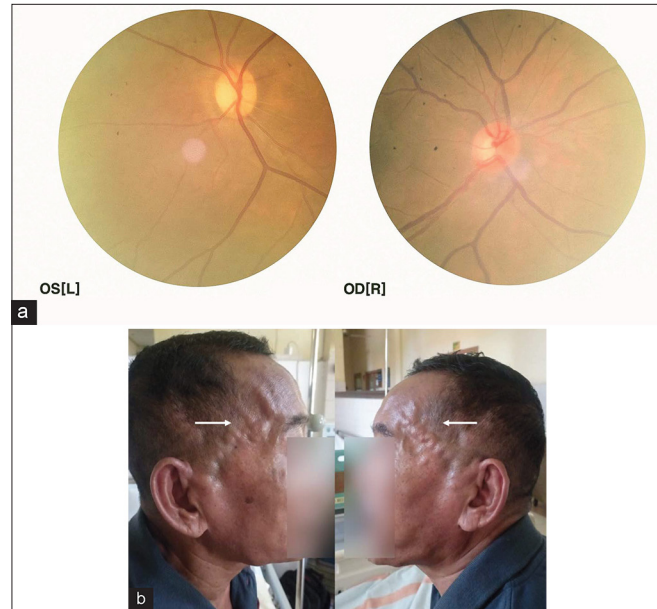


Figure 1: (a) Fundoscopic examination reveals optic atrophy in the left eye (left panel; OS[L]), characterized by a pale optic disc (white arrow) without evidence of retinal hemorrhage. The right eye (right panel; OD[R]) shows a normal optic disc (white arrow) and retinal appearance. (b) The clinical picture showed scalp tenderness and prominent temporal arteries on both sides (white arrows).

DISCUSSION

DAVFs are acquired vascular malformations characterized by anomalous connections between dural arteries and venous sinuses or cortical veins. They commonly present with symptoms such as pulsatile tinnitus, proptosis, cranial neuropathies, and visual disturbances depending on the fistula's location and venous drainage pattern.^[5] In this case, initial MRA findings suggested DAVF, showing abnormal arterial dilatation and venous congestion near the orbit. While MRA and computed tomography angiography can be useful screening tools, DSA remains the gold standard for DAVF diagnosis due to its superior resolution and dynamic flow analysis.^[1,5]

GCA, on the other hand, is a granulomatous vasculitis primarily affecting medium to large-sized arteries, including the superficial temporal, ophthalmic, and posterior ciliary arteries. It is one of the most common vasculitides in individuals over 50 and can cause irreversible visual loss if not treated promptly. Headache, scalp tenderness, jaw claudication, and visual symptoms are classical manifestations, just like our patient [Figure 1]. Imaging modalities such as high-resolution MRI and color-coded duplex sonography have become valuable tools in detecting vessel wall inflammation characteristic of GCA.^[5,6] In some cases, GCA can mimic intracranial vascular anomalies, especially when imaging reveals arterial wall changes or abnormal vessel caliber,^[7] as seen in this patient.

We decided to perform a follow-up DSA to confirm the MRA findings suggestive of DAVF.^[8] Our patient showed bilateral

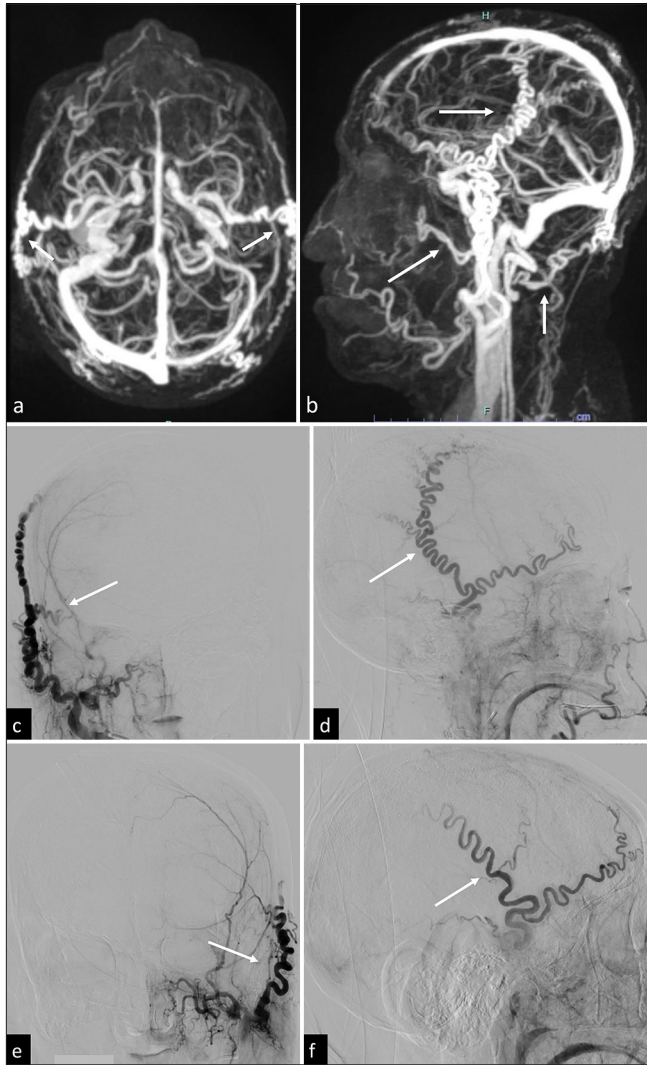


Figure 2: Magnetic resonance angiography (a) axial and (b) coronal views revealed the presence of dural arteriovenous fistula (white arrows) resulting from an abnormal connection between the internal maxillary artery and the ophthalmic artery associated with dilatation of the middle meningeal artery and the superficial temporal artery. Digital subtraction angiography following right external carotid artery injection in (c) sagittal and (d) coronal views shows dilatation and prominence (white arrows). The left external carotid artery injection in (e) sagittal and (f) coronal views also shows dilatation and prominence of the occipital artery and superficial temporal artery bilaterally (white arrows).

superficial temporal artery dilatation with sluggish contrast flow on DSA—findings more consistent with inflammatory vasculopathy than arteriovenous shunting—redirecting the diagnosis toward GCA. In addition to imaging findings, the patient's elevated ESR further supported the diagnosis of an active inflammatory process consistent with GCA. Color Doppler ultrasonography can be helpful in evaluating suspected GCA. The “halo sign” on ultrasound is considered indicative of active vasculitis.^[9] In our case, carotid ultrasound demonstrated

a halo sign on the right superficial temporal artery, supporting the diagnosis of GCA. However, in cases with diagnostic uncertainty, temporal artery biopsy remains the definitive test.^[8]

Currently, there are no formal diagnostic criteria for GCA. The updated 2022 American College of Rheumatology/European League Against Rheumatism (EULAR) classification criteria now reflect key advances in the field, including the integration of ultrasound and positron emission tomography imaging in the evaluation of GCA.^[9] From the score, we got >6, where this patient can be diagnosed with GCA.

High-dose glucocorticoids (GC) are the primary initial treatment for GCA, leading to rapid symptom relief and reducing the risk of permanent vision loss. The 2018 EULAR and Pan American League of Associations for Rheumatology guidelines recommend starting with 40–60 mg/day of prednisone, while the 2021 ACR/Vasculitis Foundation suggests 1 mg/kg/day (up to 80 mg). Intravenous methylprednisolone is advised for patients with vision loss.^[4] In this case, the patient was treated with 40–60 mg/day of oral prednisone, followed by a gradual taper. Remarkably, both the headache and blurred vision improved within the 1st month, highlighting the effectiveness of timely corticosteroid therapy.

This case emphasizes the necessity of distinguishing between DAVF and GCA, two conditions with overlapping yet distinct vascular profiles. Misdiagnosis can lead to inappropriate interventions and missed opportunities for sight-saving treatment. A high index of suspicion for GCA should be maintained in elderly patients presenting with visual symptoms and headache, especially when vascular imaging shows changes involving the superficial temporal arteries.

CONCLUSION

This case highlights the importance of accurate vascular imaging and clinical judgment in elderly patients with visual symptoms and headache. Although initial imaging suggested a DAVF, definitive angiography revealed GCA. Prompt corticosteroid therapy led to rapid improvement, emphasizing the need for early recognition and treatment to prevent vision loss. Clinicians should consider GCA even when imaging suggests other vascular anomalies, as timely diagnosis can significantly reduce morbidity.

Ethical approval: Institutional Review Board approval is not required.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patients have given their consent for their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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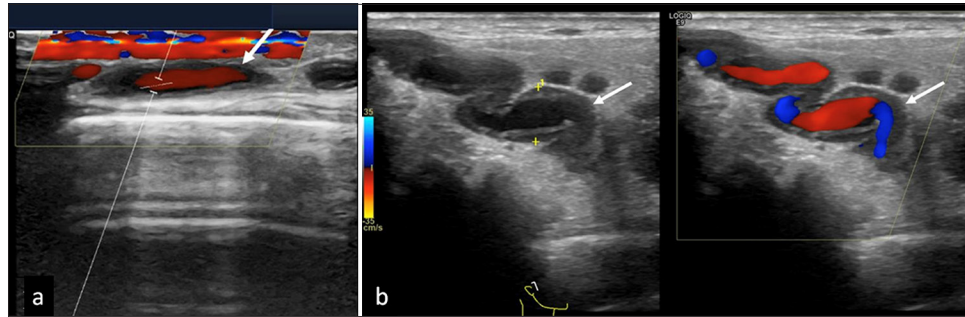


Figure 3: Carotid ultrasound demonstrating (a) “halo sign” (white arrow) on the left and (b) right superficial temporal artery, indicative of arterial wall inflammation (white arrows) consistent with giant cell arteritis.

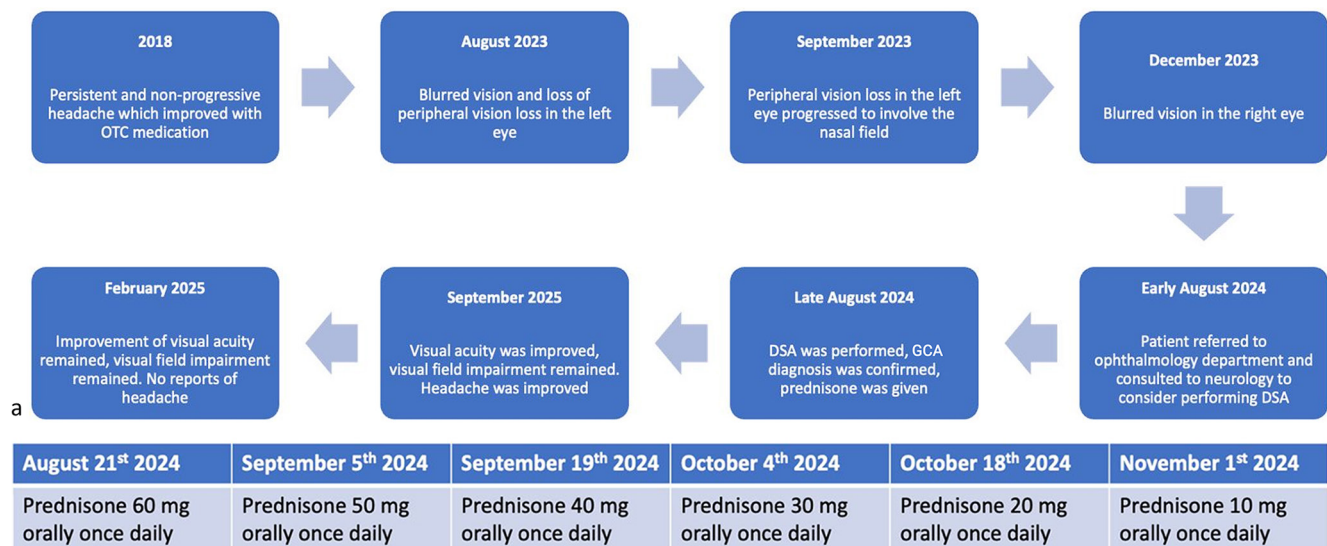


Figure 4: (a) The timeline of the patient. (b) Corticosteroid treatment in the patient. DSA: Digital subtraction angiography

Use of artificial intelligence (AI)-assisted technology for manuscript preparation: The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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