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A vertebral artery halo sign indicates giant cell arteritis affecting the posterior circulation of the brain

Roald A Lambrechts, Maarten Uyttenboogaart, Gea Drost

A 77-year-old man presented to our neurology clinic reporting short episodes of unsteadiness followed by loss of consciousness brought on by standing from a sitting position. The problem had been present for 2 weeks and had led to frequent falls. He had a history of hypertension—treated with amlodipine, atenolol, and perindopril—and hypercholesterolaemia—treated with ezetimibe. He was a non-smoker.

A neurological examination was unremarkable. A working diagnosis of orthostatic hypotension was made, and the perindopril was stopped.

3 days later, the patient returned, reporting difficulties speaking and more severe gait problems. On examination, he was mildly dysarthric, with a broad-based gait, and impaired tandem walking.

A CT scan showed subacute ischaemia in the left cerebellar hemisphere. We diagnosed a cerebellar infarction and started the patient on aspirin.

Diffusion-weighted MRI showed ischaemic foci in both cerebellar hemispheres (figure) and the right occipital lobe; there was contrast enhancement of the vessels walls of both vertebral arteries, where MR angiography also demonstrated luminal narrowing (figure; appendix). The erythrocyte sedimentation rate was 23 mm/h and the serum C-reactive protein concentration was 8 mg/L; all specific autoantibody tests were negative.

A duplex ultrasound of the vertebral arteries showed luminal narrowing with elevated flow velocities of >300 cm/s (normal <75) and longitudinal, hypoechogenic vessel wall thickening. Axial imaging showed a concentric, hypoechogenic signal—the so-called halo sign—in the vertebral artery (figure). Ultrasonography of the right temporal artery also showed a bilateral halo sign (appendix).

Upon discussion of the results with the patient, he reported that he had previously experienced jaw claudication and tenderness over the temporal artery 2 years earlier; at the time he had been treated with prednisone.

A biopsy of the right temporal artery established a diagnosis of giant-cell arteritis (GCA; appendix). Corticosteroid therapy was started, and 1 week later the patient reported improvement of his symptoms.

GCA can present in a wide variety of ways; the typical symptoms are headache, claudication of the jaw and tongue, loss of vision in one eye, fever, myalgia, weight loss, anorexia, and fatigue. Rarely, GCA presents with symptoms of a posterior circulation stroke because of vertebral artery involvement. Distinguishing GCA from other vessel wall abnormalities on duplex ultrasound is key: atherosclerosis or dissection—which can be similarly hypoechogenic—are usually eccentric rather than concentric. As vertebral artery imaging is routine in the evaluation of large vessel disease after a stroke, recognition of the halo sign—even in the absence of systemic inflammatory markers—should raise the suspicion of GCA (video).

Contributors
We all cared for the patient and managed the case. We all contributed equally to writing and editing, and preparing the images. Written consent for publication was obtained from the patient.

Declaration of interests
We declare no competing interests.

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