

Neuroimaging Highlight

Vessel Wall Imaging for Identifying Symptomatic Atherosclerotic Plaque in Perforating Artery Stroke

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Intracranial vessel wall MRI (VW-MRI) has emerged as an important tool for identifying atherosclerotic plaque that may not be apparent on conventional imaging.¹ In fact, VW-MRI can detect intracranial plaques in approximately 50% of stroke patients with non-stenotic findings on angiography.² This is particularly valuable for determining the stroke mechanism in perforator artery territory strokes by identifying a culprit atherosclerotic plaque at the vessel origin.

We present a 72-year-old male with left-sided weakness and left facial droop. MRI revealed an acute right ventral pontine infarct (Figure 1A). CT angiogram showed no hemodynamically significant stenosis (Figure 1B). Possible non-stenotic basilar artery atherosclerosis was seen on coronal reformatted images (Figure 1C), prompting evaluation with VW-MRI, which demonstrated a right-sided eccentric arterial wall thickening with contrast enhancement, adjacent to the pontine infarct (Figure 1D). The stroke etiology was determined to be non-stenosing intracranial atherosclerotic disease (ICAD), given the presence of an enhancing plaque and exclusion of alternative causes (e.g., cardioembolic and small vessel). The patient was previously on rivaroxaban (2.5 mg twice daily) plus aspirin for peripheral artery disease. Following the identification of ICAD on VW-MRI, his treatment was switched to dual antiplatelet therapy for 90 days to address symptomatic ICAD. At three-month follow-up, the patient continued to experience left-sided weakness but had not suffered a recurrent stroke.

This case highlights the utility of vessel wall imaging in detecting atherosclerotic plaques near perforator artery origins, even when the parent artery appears non-stenotic. Furthermore, plaque enhancement on VW-MRI indicates intracranial plaque instability in cases of low-grade stenosis.¹ This improves the detection of ICAD as a stroke etiology, enabling more timely and targeted treatment strategies while avoiding unnecessary cardioembolic workup.

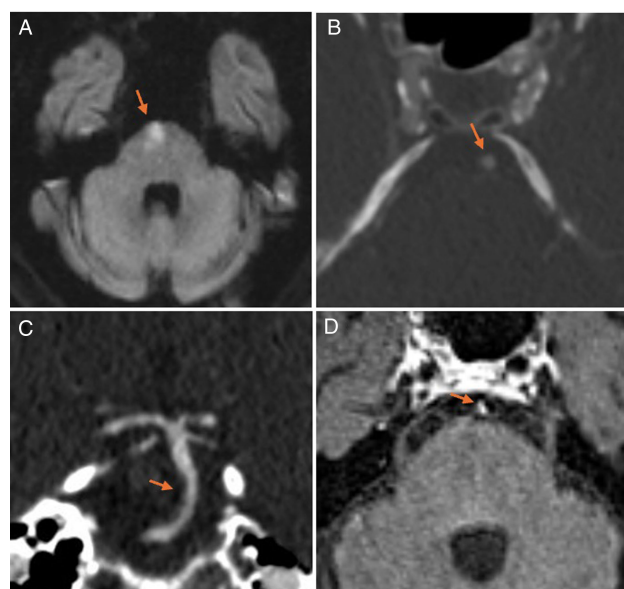


Figure 1. Diffusion-weighted imaging shows a ventral right pontine stroke (A). Axial CT angiogram shows no hemodynamically significant stenosis (B). Multiplanar reformation of the CT angiogram suggests a possible plaque in the basilar artery (C), which is confirmed as an eccentric atherosclerotic plaque with enhancement by vessel wall MRI (D).

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