High-resolution MRI of radiation-induced intracranial vasculopathy

Figure MRI, CT angiography, and high-resolution MRI findings of the patient

(A) Brain MRI shows an acute lesion within the anterior periventricular white matter (arrow). (B) CT angiography shows right middle cerebral artery stenosis (arrow). (C) On T1-weighted contrast-enhanced high-resolution MRI, a concentric vessel wall enhancement is revealed (arrow, and on the magnified image).

A 46-year-old woman without traditional stroke risk factors presented with acute left limbs numbness. Two years prior, she had a right cranio-orbital junction meningioma resected and received radiation therapy (target dose DT 60 Gy/30 F, 5 F/W, 2 Gy/F). MRI revealed a diffusion-positive focus within the anterior periventricular white matter. CT angiography showed >50% right middle cerebral artery (MCA) stenosis. High-resolution MRI (HRMRI) suggested concentric vessel wall thickening with contrast enhancement (figure).

The precise mechanism of radiation-induced intracranial large vessel arteriopathy is not understood. Although radiation is more commonly associated with arteritis, radiation may contribute to carotid atherosclerosis and stenosis.¹ In our patient, the features of MCA wall lesions on HRMRI are consistent with cerebral vasculitis.²

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