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NEUROLOGICAL PICTURE

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Acute strokes in the setting of a persistent primitive trigeminal artery

A persistent primitive trigeminal artery (PPTA) is the most common of the embryonic carotid–basilar anastomoses that remain into adulthood; an incidence of 0.1–1.0% has been reported.¹ Although typically an incidental finding on angiogram or non-invasive vascular imaging, the condition has been found in association with trigeminal neuralgia² and various vascular anomalies. We present imaging from a patient with acute ischaemia in the setting of a PPTA that is presumed to be embolic along the distribution of this anastomosis.

A 54-year-old man with undiagnosed diabetes and hyperlipidaemia presented to our hospital with 20 min of rapidly improving aphasia, dysarthria and right hemiparesis. His initial head CT was unremarkable. Although clinically he had what would be considered a transient ischaemic attack, his MRI demonstrated several areas of restricted diffusion in what appeared to be the left middle cerebral artery and posterior cerebral artery territories (fig 1A, B). The pattern of infarction was suggestive of embolic phenomena. A left persistent primitive trigeminal artery was seen on magnetic resonance angiography (fig 1C–E). He had a diminutive verteobasilar system caudal to the basilar influx. Incidental note was made of an absent right A₁ segment. His carotid arteries were without haemodynamically significant stenosis but mild atherosclerotic changes were appreciated in the intracranial vessels. Transoesophageal echocardiography was unrevealing, with the exception of an atrial septal aneurysm. Holter monitoring failed to show occult atrial fibrillation on 24 h sampling. Although no clear artery-to-artery embolic or cardioembolic source could be demonstrated, the pattern of infarction suggested a source at or proximal to the origin of his PPTA; in situ thrombosis of two different vascular distributions would seem unlikely.

A PPTA has rarely been reported in the setting of stroke. There are reports in the literature of brainstem infarcts in patients with a PPTA.^{3,4} Poor anterograde flow from atretic vertebral arteries may play a role in posterior fossa ischaemia. A patient with a PPTA and bilateral occipital infarcts secondary to carotid artery disease has been published.⁵ Here we present a unique case of supratentorial strokes in atypical vascular distributions occurring in the setting of this rare vascular anomaly. As with a posterior cerebral artery of

Figure 1 Brain MRI/magnetic resonance angiography (MRA). Diffusion weighted imaging demonstrated acute infarcts in the left corona radiata (A) and occipital lobe (B). Time of flight MRA showed a persistent trigeminal artery (arrows) connecting the left internal carotid (C) and basilar arteries (E). An overview of the circle of Willis shows this anomaly as well as an absent right A₁ segment (D).

fetal origin, the normal boundaries between what is generally considered anterior circulation and posterior circulation are blurred. In this case, an anterior circulation thrombus can cause a “posterior” circulation event.

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