Artery of Percheron infarction

Introduction

Multiple variants of the arterial supply to the paramedian thalami have been documented. The artery of Percheron is a rare anatomical variant in which bilateral paramedian thalami are supplied by a single vascular branch arising from the P1 segment of the posterior cerebral artery. Clinical findings of vertical gaze palsy, altered mental status and memory impairment have been described, but presentation can be variable.

Its infrequent nature and variable presentation makes diagnosis of artery of Percheron infarction a clinical challenge, particularly as early brain computed tomography may be normal. The radiological modality of choice for diagnosis is diffusion-weighted imaging and fluid-attenuated inversion recovery sequences.

Discussion

The arterial supply to the thalamus commonly originates from perforating branches arising from the posterior cerebral arteries. First described in 1973, the artery of Percheron is a rare variant of arterial supply to the paramedian thalami in which a single dominant vessel arising from the P1 segment of either posterior cerebral artery supplies the thalami bilaterally (Percheron, 1973). Artery of Percheron infarcts can vary in presentation, but a classical triad of vertical gaze palsy, memory impairment and alteration of mental status has been described. There may also be variable involvement of the rostral midbrain manifesting as hemiplegia, ataxia and movement disorders (Lazzaro et al, 2010).

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Studies estimate that 0.1–2% of all ischaemic strokes involve the artery of Percheron (Kumral et al, 2001; Carrera et al, 2004).

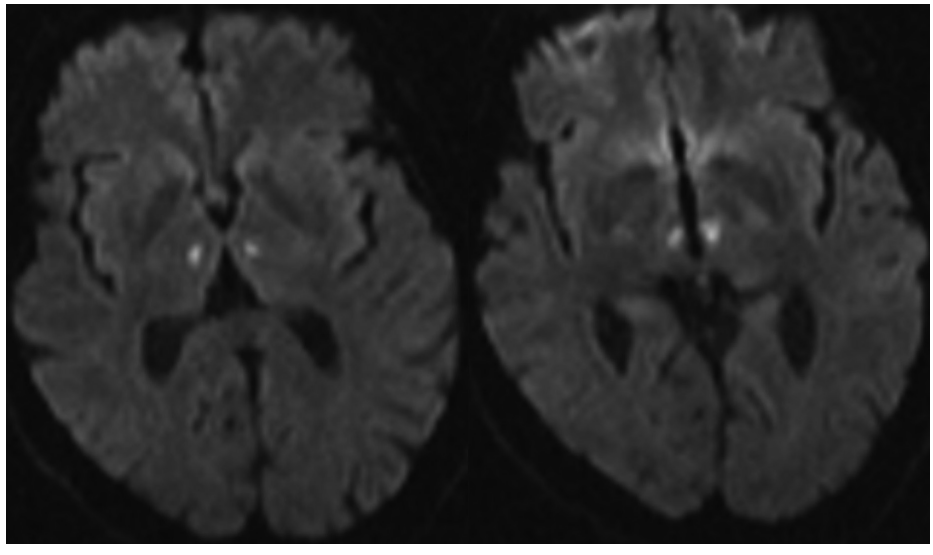
In the setting of acute stroke early brain computed tomography may be normal. Therefore, the gold standard imaging modality for acute stroke diagnosis is magnetic resonance imaging diffusion-weighted and fluid-attenuated inversion recovery sequences (Matheus and Castillo, 2003). Classical findings are high signal on fluid-attenuated inversion recovery and diffusion-weighted imaging with corresponding restriction on apparent diffusion coefficient.

Emergency treatment aims to reperfuse the ischaemic brain parenchyma. Intravenous heparin and thrombolysis with tissue plasminogen activator form the mainstay of initial treatment, provided the patient presents within the thrombolytic window (Li et al, 2015).

The role of mechanical thrombectomy in cases of acute artery of Percheron infarcts has yet to be explored and no consensus currently exists (Meyers et al, 2011). Similar to other strokes, long-term oral anticoagulants are used to prevent further ischaemic episodes.

Patients may recover completely following timely reperfusion (Kostanian and Cramer, 2007), but a spectrum of residual symptoms

Figure 1. High signal in the paramedian thalami bilaterally on diffusion-weighted imaging.

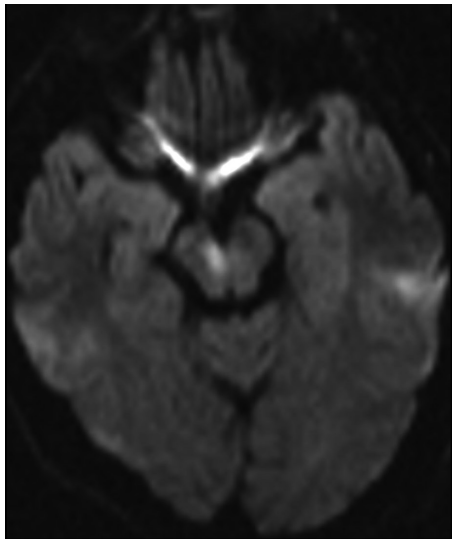


CASE REPORT

A 59-year-old man with no significant past medical history presented to the emergency department having woken up with slurred speech, diplopia, unsteady gait and vertigo. He sought medical attention after symptoms had persisted for several hours. Clinical examination revealed an ataxic gait, dysdiadochokinesia and upward gaze palsy. The working clinical diagnosis was a posterior circulation stroke. The patient was not a candidate for thrombolysis.

Emergency computed tomography of the brain reported no significant findings. As clinical suspicion persisted, diffusion-weighted magnetic resonance imaging was performed, which revealed symmetrical bilateral paramedian thalamic high signal (*Figure 1*). There was additional involvement of the right rostral midbrain demonstrating further restricted diffusion in this territory (*Figure 2*). Findings were consistent with an acute artery of Percheron ischaemic infarct.

Figure 2. Right rostral midbrain high signal on diffusion-weighted imaging consistent with acute infarct.



may persist such as memory deficit (Cassourret et al, 2010) and severe cognitive impairment (Cao et al, 2012). Therefore follow up and rehabilitation need to be tailored to the severity of residual symptoms and the impact on the patient's lifestyle.

Infrequency and variable neurological presentation make artery of Percheron infarcts a diagnostic challenge. Accurate clinical history and examination findings are invaluable in facilitating imaging diagnosis. Clinician and radiologist awareness of the aforementioned spectra of findings is key to improving patient morbidity and mortality. **BJHM**

LEARNING POINTS

- Artery of Percheron is a rare variant of arterial supply to the paramedian thalami with variable mesencephalon involvement.
- Clinical presentation of artery of Percheron infarct varies but vertical gaze palsy, memory impairment and altered mental status can be important clues to the diagnosis.
- Diffusion-weighted and fluid-attenuated inversion recovery sequence imaging are the modality of choice for diagnosis of acute stroke.

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