

# ACUTE BILATERAL PARAMEDIAN THALAMIC AND ROSTRAL MIDBRAIN INFARCTION DUE TO OCCLUSION OF ARTERY OF PERCHERON

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## ABSTRACT

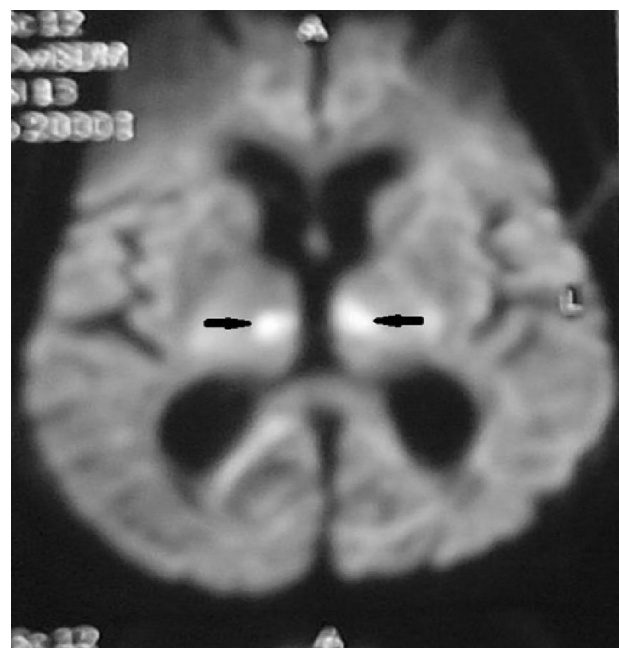
This case highlights a patient presented with unusual symptoms, who was diagnosed on imaging with bilateral thalamic infarcts, probably due to an unusual anatomic variant. These paired lesions have a limited differential diagnosis that includes metabolic and toxic processes, infection, vascular lesions, and neoplasm. These differential diagnoses further narrowed with knowledge of the specific imaging characteristic of the lesions in combination with patient history.

**Key words:** Differential diagnosis, bilateral thalamic infarction, artery of Percheron.

## Case History

A 70-year-old female presented with sudden onset of bilateral lower limb weakness, slurring of speech and diplopia. She was known to have diabetes, systemic hypertension, and dyslipidemia. On admission, blood pressure was 148/88 mmHg. No history of fever or chronic headache. An urgent neuroimaging protocol for stroke demonstrated symmetric restricted diffusion in bilateral paramedian thalamic and upper midbrain regions (Fig. 1, 2) and appearing hypointense on T1 weighted, hyperintense on T2 weighted and FLAIR images (Fig. 3), consistent with acute ischemic events and compatible with occlusion of the artery of Percheron. The large arteries of the posterior circulation including vertebral arteries, basilar artery and posterior cerebral arteries were fully patent on MR angiography except for fetal origin of left posterior cerebral artery (Fig. 4). Electroencephalogram and cerebrospinal fluid study were normal. Patient was treated conservatively with anti-thrombotics, anti-platelets and dose adjustment of anti-

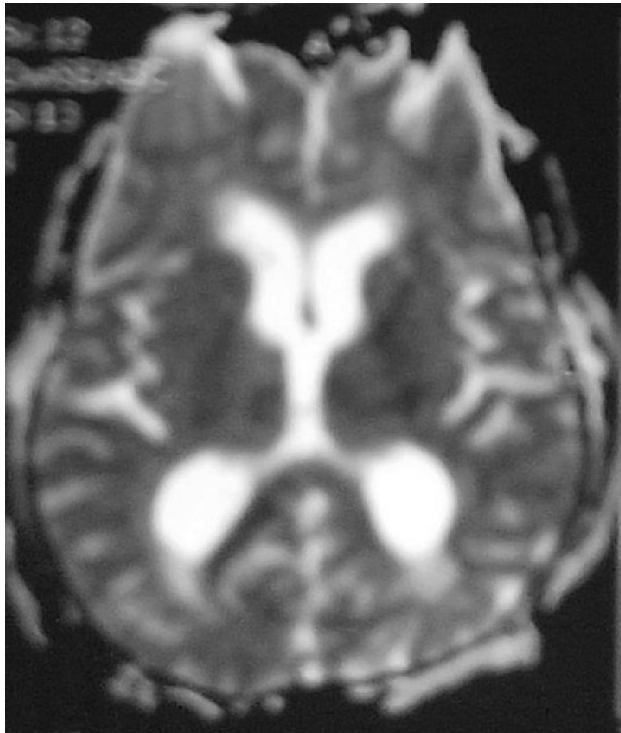
hypertensive and anti-diabetic drugs. There was improvement in patients clinical condition after three days, so discharged with residual weakness.



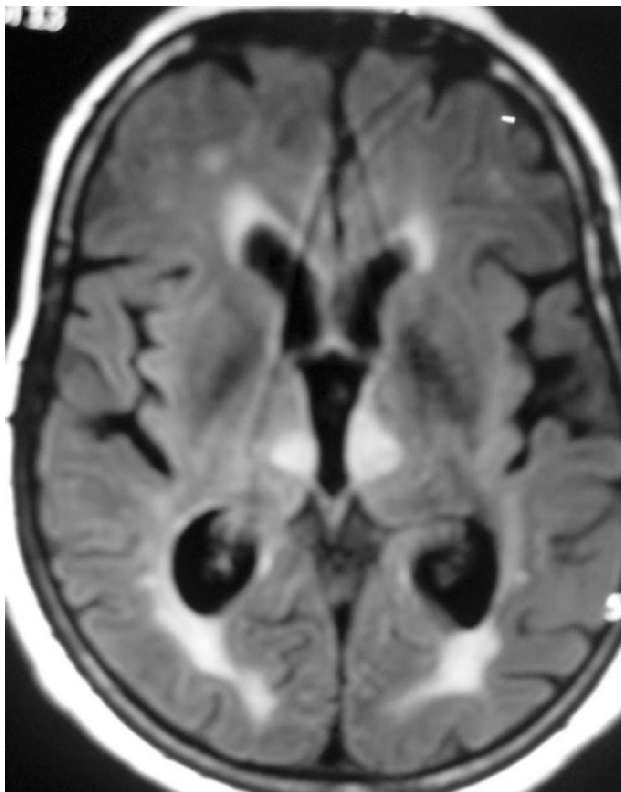
**Figure 1:** MRI DWI image showing hyperintensity in the bilateral paramedian thalami (arrows).

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**Figure 2:** MRI ADC image showing restricted diffusion in the bilateral paramedian thalami corresponding to DWI image.



**Figure 3:** FLAIR T2 Weighted MRI showing bilateral hyperintensities in the thalamic regions with periventricular ischemic changes and mild atrophy of brain parenchyma.



**Figure 4:** MR angiography showing normal appearing vertebral arteries, basilar artery and right posterior cerebral artery. Fetal origin of left posterior cerebral artery noted.

## Discussion

The incidence for bilateral type of stroke is not yet established, so we present this case to illustrate a rare but nonetheless important cause for reduced consciousness with the aim of increased diagnostic awareness and important differentials for bilateral thalamic lesion.<sup>1</sup> Bilateral thalamic lesions have limited differential diagnosis that includes metabolic and toxic processes, infection, vascular lesions, and neoplasm. The differential diagnosis can be further narrowed with the patient history, imaging characteristics, and presence or absence of lesions outside the thalami, however further discussion is beyond the scope of this paper.

In order to understand this clinical syndrome due to artery of Percheron infarction, we must first review the arterial supply of the thalamus and midbrain. The anterior and inferior midbrain and thalami are supplied by the internal carotid artery while the medial, lateral and posterior aspects derive their supply from the vertebrobasilar system. The paramedian arteries normally supply the medial ventral thalami, hypothalamus and subthalamic-mesencephalic junction and derive from the proximal segment of the posterior cerebral artery.<sup>2</sup> In 1973, Gerard Percheron, a French neurologist described three distinct anatomical variations of this.<sup>3</sup> One such variation - the artery of Percheron - arises unilaterally from one proximal segment to provide bilateral paramedian supply. If this artery becomes occluded, bilateral paramedian thalamic infarction occurs.

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Bilateral thalamic infarction due to the occluded artery of Percheron is difficult to diagnose not only clinically but also radiologically. This variant is difficult to visualise with either invasive or non-invasive angiography, but lack of visualisation does not exclude its presence.<sup>4</sup>

In conclusion, bilateral thalamic lesions present with complex clinical syndrome but with limited differential diagnosis which can be further narrowed by knowledge of the specific imaging characteristics of the lesions in combination with the patient history. It is important to exclude other causes of bilateral thalamic lesions before a diagnosis of infarction due to artery of Percheron is given as it is a normal anatomical variant and frequently not visualised with either invasive or non-invasive angiography.

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