



## **Retrospective Analysis of Various Clinical Presentations and Outcome of Patients with Artery of Percheron Infarct**

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**Type of Publication:** Case Report

**Conflicts of Interest:** Nil

### **Abstract**

**Background/Introduction:** The artery of Percheron is a rare anatomical variant where a single arterial trunk arises from the proximal segment of one posterior cerebral artery and supplies the paramedian area of both sides of the thalamus, and sometimes the rostral midbrain. The occlusions of this easily missed artery could lead to bilateral paramedian thalamic infarctions and is mainly responsible for what is known as the Percheron syndrome.

### **Aim**

- To analyse the various clinical manifestation of AOP infarct.
- To analyse the outcome of patient with AOP infarct.

### **Material and Methodology**

**Study Palace:** Department of General Medicine, Government Stanley Medical College & Hospital, Chennai

**Study Design:** Clinical Case Study

**Sampling Method:** Simple Random Sampling and Records of the patients with AOP infarct will be obtained from those who were admitted and treated in

department of General Medicine, Government Stanley Medical College and Hospital.

**Discussion:** In this case series, presented case report of four patients with AOP infarction. As observed in all four cases, acute CT imaging can be unremarkable and targeted CT or MRI should be used. Consequently, AOP infarction is diagnosed only by the follow-up CT or MRI Brain.

**Conclusion:** It is a real diagnostic challenge for clinicians to detect this condition as it has wide spectrum of its clinical features and even the initial CT Brain scan can be normal.

**Keywords:** AOP infarct, CT Brain, MRI Brain, Thalamic Infarction, Hypersomnolence, Doppler

### **Introduction**

The artery of Percheron (AOP) is a rare anatomical variant of the blood vessels which is present in 4%–12% of the population. It is characterized by a solitary common arterial trunk arising from the segment one of posterior cerebral artery [P1]. Occlusion of the AOP is rare and it is one of the few single-artery pathologies that can cause bilateral paramedian thalamic infarction with or without midbrain involvement. AOP supplies both the paramedian thalami and the mesencephalon. AOP stroke represents 0.1% to 2.0% of ischemic strokes and 4% to 18% of thalamic infarcts. In this case series, we elucidate the varied clinical manifestations and the imaging findings of AOP infarct.

### **Aim**

- To analyse the various clinical manifestation of AOP infarct.
- To analyse the outcome of patient with AOP infarct.

### **Methodology**

Records of the patients with AOP infarct will be obtained from those who were admitted and treated in

department of General Medicine, Government Stanley Medical College and Hospital.

### **Case Descriptions**

#### **Case 1**

45-year-old gentleman, with history of hypertension for past 5 years, was brought with complaints of sudden onset giddiness followed by which he became unresponsive. On admission, he was found to be stuporous. His blood pressure was 150/90 mm/Hg. Blood investigation ruled out hypoglycaemia, Initial CT Brain was normal. CBC, RFT, LFT were within normal ranges and urine analysis showed 1+ proteinuria. Two days later, his sensorium gradually improved, but he continued to be in a state of hypersomnolence. On examination, he had right hemiparesis, restriction of vertical gaze-both upgaze and downgaze, and ptosis and dilated pupil in left side. He also had impairment of recent memory. MRI Brain showed well defined minimally enhancing T2/FLAIR hyperintensities with diffusion restriction in bilateral paramedian thalamus (Fig 1A), subthalamic region, left rostral midbrain (Fig 1B) suggestive of artery of percheron infarct. Patient was started on antiplatelets, statin and other supportive measures, antihypertensive were added later. 2D ECHO, CV doppler showed no clinically significant findings. Hypersomnolence improved after a week, whereas memory impairment and vertical gaze palsy persisted for three weeks.

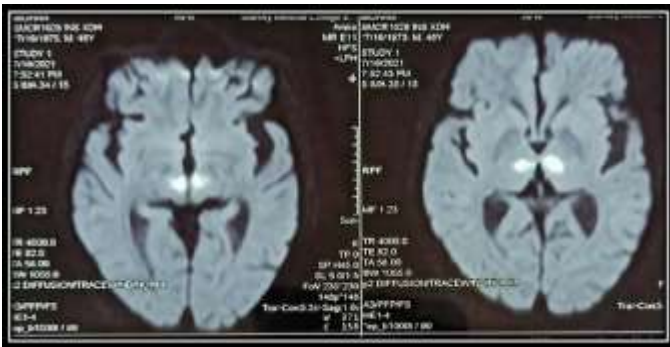


Figure 1 A: Acute infarct in bilateral paramedian thalamus

### Case 2

46 year old gentleman, with history of diabetes for 8 years, presented with acute onset giddiness and diplopia which was binocular. On examination, his vitals were stable with CBG of 290mg/dl. He did not have altered mental state, limb weakness, sensory disturbances or any memory impairment. Ocular examination showed vertical gaze restriction in both eyes and skew deviation. MRI Brain showed an acute infarct in bilateral medial thalamus (Fig-2A) and right side of upper midbrain (Fig-2B)- suggestive of Artery of Percheron infarct. He was treated with antiplatelets, statin and oral hypoglycemic drugs. His 2D ECHO, CV doppler and coagulant profile were within normal limits. His ocular disturbances resolved completely after a period of two weeks without any neurological deficits.

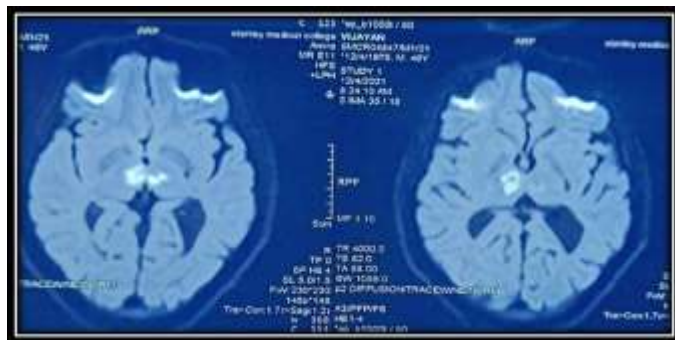


Figure 2A: Showing acute infarct in bilateral medial thalami

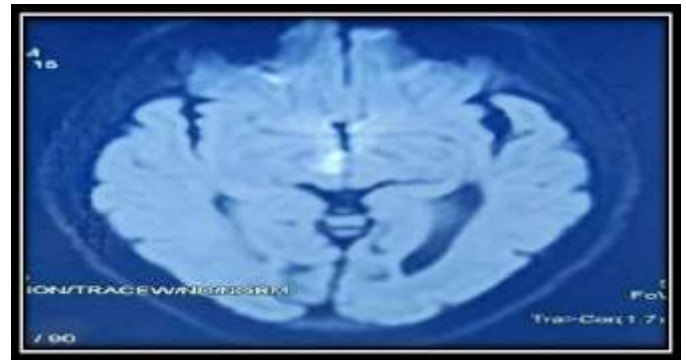


Figure 2 B: Showing acute infarct in right side of upper midbrain

### Case 3

45-year old gentleman, who has hypertension for the past 10 years, came with history of excessive sleepiness for the past 4 days. It was sudden in onset. 1 day later he also noticed binocular vertical diplopia. However there was no sensory disturbances or weakness. On admission, his vitals were stable with BP- 146/80mmHg and he was drowsy and hypersomnolent. He had skew deviation with hypertropia in right eye and hypotropia in left eye. He also had left eye ptosis and anisocoria with left pupil 6mm and right pupil 3mm. There was no motor or sensory deficits. MRI Brain showed T2/FLAIR hyperintensity with diffusion restriction noted in bilateral paramedian posteromedial thalamus and left anterior part of midbrain ( Fig-3A and B) suggestive of artery of percheron infarct for which he was started on antiplatelets and statin. His vertical gaze palsy and skew deviation improved completely in 3 weeks, but he had persistent left eye mild ptosis which was not causing any further visual disturbance.



Figure 3A and 3B: showing acute infarct in bilateral paramedian posteromedial thalamus and left anterior part of midbrain

#### Case 4

A 55 year gentleman, who has hypertension for the past 8 years, came with sudden onset giddiness followed by transient loss of consciousness which lasted for about 4 hours. His blood sugars were normal. Once he regained his consciousness, he complained of weakness of right upper and lower limb. He also had vertical diplopia. His neurological examination revealed hemiparesis and hemiataxia on right side, vertical gaze palsy, skew deviation and impairment of recent memory. Initial CT Brain showed no evidence of hemorrhage. MRI Brain revealed acute infarct in the medial aspect of bilateral thalamus and left hemi-midbrain - artery of Percheron infarct (Fig-4A and B). At discharge, hemiataxia and vertical gaze improved partially and the patient was lost to follow-up after that.

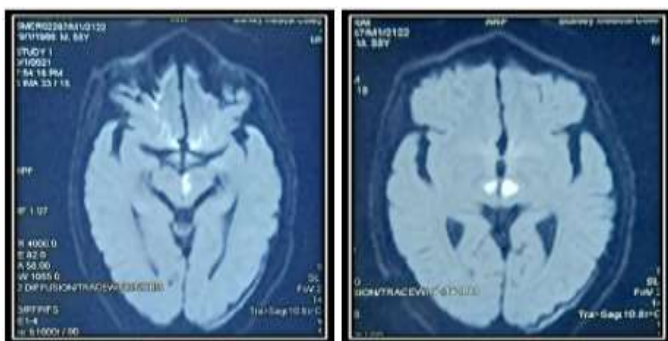


Fig. 4A and 4B: Showing acute infarct in medial aspect of bilateral thalamus and left hemi-midbrain

#### Discussion

There are four major patterns of Artery of Percheron infarction, all of which bilaterally involve the paramedian thalamus:

- bilateral paramedian thalamic and midbrain infarction (most common)
- isolated bilateral paramedian thalamic infarction- 38%
- bilateral paramedian thalamic and anterior thalamic infarction
- bilateral paramedian thalamic, anterior thalamic and midbrain infarction (least common)

AOP stroke has extreme clinical variable presentation. The most common clinical features are bilateral vertical gaze palsy (65%), memory impairment (anterograde and retrograde amnesia) (58%), and coma (42%). The other remaining clinical presentations reported in various literatures include hypersomnolence (29%), akinetic mutism, and behavioural disorders (apathy, agitation, confabulation and aggressiveness), aphasias, slurred speech and cerebellar signs. Altered mental status is a classic manifestation of AOP stroke and can range from hypersomnolence to coma. However, hypersomnolence is rarely reported as a first complaint. Hypersomnolence in bithalamic stroke is explained by the crucial role of the thalamus in sleep regulation and in maintaining arousal. Hypersomnolence has been attributed to the interruption of noradrenergic and dopaminergic impulses from the ascending reticular activating system to the thalamus.

#### Conclusion

The complex polymorphism of AOP stroke semiology explains why the bilateral thalamic infarction is often misdiagnosed, lately detected, or even not detected. It is a real diagnostic challenge for clinicians to detect this

condition as it has wide spectrum of its clinical features and even the initial CT Brain scan can be normal. MRI is the neuroimaging of choice when AOP infarct is highly suspected. Artery of Percheron infarcts should also be kept in the differential diagnoses when elderly patients present with an altered mental status.

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