



## Sangeetha Tharmathurai\*, Wan-Hazabbah Wan Hitam and Ahmad Tajudin Liza-Sharmini

Department of Ophthalmology, School of Medical Sciences, Universiti Sains Malaysia Health Campus, 16150 Kubang Kerian, Kelantan, Malaysia

**Dates:** Received: 21 September, 2016; Accepted: 30 January, 2018; Published: 31 January, 2018

**\*Corresponding author:** Sangeetha Tharmathurai, Department of Ophthalmology, School of Medical Sciences, Universiti Sains Malaysia Health Campus, 16150 Kubang Kerian, Kelantan, Malaysia, Tel: +60173309234; Fax: +609-7653370; E-mail: sangt@hotmail.com

**Keywords:** Neuroophthalmology, Artery of Percheron, Double Depressor Palsy, Thalamic Infarct

<https://www.peertechz.com>

## Case Report

# Bilateral Thalamic Infarction and Double Depressor Palsy Secondary to Infarction of Artery of Percheron: A case report

## Abstract

**Introduction:** Bilateral thalamic infarcts are a rare occurrence and accounts for about 22 to 35% of all the thalamic infarcts.

**Purpose:** We report a case of bilateral thalamic infarction and double depressor palsy secondary to infarction of artery of Percheron.

**Results:** A 24-year-old lady with sudden onset of diplopia without other neurological involvement. On examination patient had double depressor palsy. Magnetic resonance imaging (MRI) revealed an occlusion of the Artery of Percheron with infarction of the thalami and part of the midbrain.

**Conclusion:** Bilateral thalamic infarction with double depressor palsy is a rare manifestation and it should raise the suspicion of an Artery of Percheron occlusion.

## Abbreviations

MRI: Magnetic Resonance Imaging; MRA: Magnetic Resonance Angiography; riMLF: Rostral Interstitial Medial Longitudinal Fasciculus

## Introduction

Bilateral thalamic infarct accounts for about one third of all the thalamic infarcts [1]. The first published report on bilateral thalamic infarct was in 1975 by Beuvois and Lhermitte [2]. It has been acknowledged that Artery of Percheron infarction causes bilateral thalamic infarct. The Artery of Percheron is a vessel that arises from the posterior cerebral artery to supply bilateral thalami [3]. Occlusion of this artery causes a variety of symptoms and signs. We report a case of bilateral thalamic infarct and double depressor palsy secondary to Artery of Percheron infarction.

## Case Presentation

A healthy 24-year-old lady presented to ophthalmology clinic with sudden onset of diplopia for 3 weeks. The diplopia was worse on downward gaze. There was no pain or blurring of vision. She did not having any headache, vomiting, slurring of

speech, facial asymmetry or body weakness. There was also no history of fever or trauma.

On examination, visual acuity in both eyes were 6/7.5 in the right eye and 6/6 in the left eye respectively. There was presence of head tilt to the left with right hypertropia with downward gaze palsy. Horizontal and upward movements were normal. There was also presence of horizontal and vertical nystagmus. Fatigability test was negative. Both anterior segments and fundi were normal. Neurological examination and other cranial nerves were normal.

Her connective tissue screening test including rheumatoid factor, anti neutrophil antibody, C3, C4 was normal. Full blood count, coagulation profile, thyroid function test and infective screening (syphilis and toxoplasmosis) were also normal. Echocardiography findings were normal.

Magnetic resonance imaging (MRI) of the brain revealed a hyperintense signal in both thalami, left greater than right, and posterior part of midbrain (tectum and tegmentum) on T2 and FLAIR images (Figure 1). Magnetic resonance angiography (MRA) showed a single common trunk arising from the left P1 segment with double branching vessels distally (Figure 2). The diagnosis of occlusion of the vascular variant known as Artery

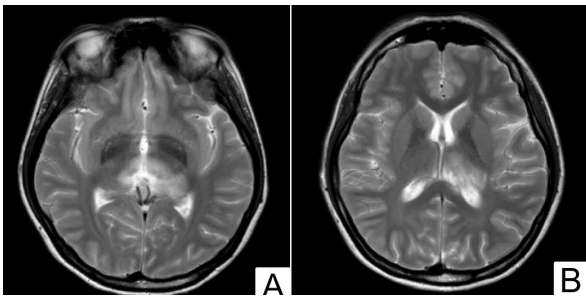


Figure 1: MRI in acute phase of illness. (A,B) - Axial T2 weighted image demonstrating asymmetrical hyperintense signal in bilateral thalamus.

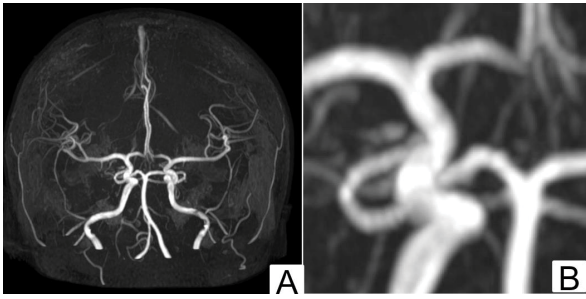


Figure 2: Magnetic resonance angiography of patient. (A,B) - Coronal MRA image of the posterior circulation showing a single branching vessel of the right PCA and zoomed image demonstrating the branching vessel.

of Percheron was made. The patient was treated conservatively. On follow up at 1 month, her condition improved slightly with minimal diplopia. She subsequently defaulted follow up and was not contactable.

## Discussion

Bilateral thalamic infarcts are an uncommon occurrence and constitute 22 to 35% of all the thalamic infarcts [1]. The thalamus contains nuclei that integrate cortical function and is a pathway for communication across the cerebral cortex and midbrain [4]. The medial and lateral geniculate nuclei are involved with visual and auditory function [4].

The multiple small vessels originating from the P1 and P2 segments of the posterior cerebral artery supply the thalamus [5,6]. The vascular territories of the thalamus can be categorized into anterior, inferolateral, posterior and paramedian territories [3,4]. The paramedian artery supplies the paramedian territory [3]. These arteries have variations of size, number and territorial contribution [5]. Occlusion of an anatomic variation of the paramedian arteries is called the Artery of Percheron [3,5].

Occlusion of the Artery of Percheron is the only variant that results in bilateral paramedian thalamic infarcts, with or without midbrain involvement [1]. Percheron has described three variations in the vascular supply to the paramedian thalami. Type I is the commonest variant whereby a perforating artery arises from each P1 segment. Type II also known as the Artery of Percheron arises from one P1 segment and then splits to supply the bilateral thalami and rostral midbrain. Type III is an arcade of perforating arteries arising from an artery bridging both P1 segments [1].

The common etiology for bilateral thalamic infarctions is cardioembolism [3]. However, in this case no etiology was identifiable. Due to its rarity, the mean age and sex predilection of bilateral thalamic infarcts secondary to Artery of Percheron is unknown [3]. There are 4 distinct patterns of Artery of Percheron infarction: bilateral paramedian thalamic with rostral midbrain (43%), bilateral paramedian thalamic without midbrain (38%), bilateral paramedian and anterior thalamic with midbrain (14%) and bilateral paramedian and anterior thalamic without midbrain (5%). Our patient presents with the most common pattern of infarction [3,5].

Thalamus infarction normally presents with a triad of ocular motor abnormalities (third nerve palsy, vertical gaze palsy and internuclear ophthalmoplegia), cognitive abnormalities and alterations in consciousness [1,4,5]. These disorders generally occur with sudden onset and may persist. However, there are cases of complete recovery that have been documented [5]. In this case, our patient demonstrated only ocular symptom which was double depressor palsy suggesting a mesencephalic involvement whereby involving the rostral interstitial nucleus of the medial longitudinal fasciculus (riMLF) [5]. The classic history of altered level of consciousness was also not elicited possibly due to the patient's late presentation for medical evaluation. Double depressor palsy is uncommon. Furthermore, cases without impaired consciousness is an extremely rare manifestation of bilateral thalamic infarction [7,8].

Early imaging with magnetic resonance angiography is important to rule out top of basilar thrombosis and deep cerebral vein thrombosis as causes of bilateral thalamic infarction [9]. Prognosis after a thalamic infarction is good where there is no involvement of the midbrain [10]. This is due to the low incidence of mortality and lack of motor deficits [3,10].

## Conclusion

Bilateral thalamic infarction is a rare occurrence and it should raise the suspicion of an Artery of Percheron occlusion. However, due to the small size of this artery, MRA evaluation is sometimes limited. Other life threatening causes of bilateral thalamic infarct should also be reviewed such as 'top basilar artery' syndrome. Overall, the prognosis of Artery of Percheron infarction is good.

## References

- Rodriguez EG (2013) Bilateral thalamic infarcts due to occlusion of the Artery of Percheron and discussion of the differential diagnosis of bilateral thalamic infarct. *J Radiol Case Rep* 7: 7-14. [Link: https://goo.gl/z6HkpR](https://goo.gl/z6HkpR)
- Beauvois MF, Lhermitte F (1975) Elective memory deficiency and restricted cortical lesions. *Rev Neurol (Paris)* 131: 3-22. [Link: https://goo.gl/5DNTSQ](https://goo.gl/5DNTSQ)
- Peter Adamczyk P, Mack WJ (2014) The Artery of Percheron and Etiologies of Bilateral Thalamic Stroke. *World Neurosurg* 81: 80-82. [Link: https://goo.gl/hvv5N5](https://goo.gl/hvv5N5)
- Schmahmann JD (2003) Vascular syndromes of the thalamus. *Stroke* 34: 2264-227. [Link: https://goo.gl/fzbu5L](https://goo.gl/fzbu5L)
- Lazzaro NA, Wright B, Castillo M, Fischbein NJ, Glastonbury CM, et al. (2010) Artery of Percheron Infarction: Imaging Patterns and Clinical Spectrum. *AJNR Am J Neuroradiol* 31: 1283-1289. [Link: https://goo.gl/9M3cz4](https://goo.gl/9M3cz4)

6. Matheus MG, Castillo M (2003) Imaging of Acute Bilateral Paramedian Thalamic and Mesencephalic infarcts. *AJNR Am J Neuroradiol* 24: 2005-2008. [Link: https://goo.gl/yudEsL](https://goo.gl/yudEsL)
7. Pal S, Ferguson E, Madill SA (2009) Double depressor palsy caused by bilateral paramedian thalamic infarct. *Journal of Neurosurgery Psychiatry* 80: 1328-1329. [Link: https://goo.gl/nWXHqY](https://goo.gl/nWXHqY)
8. Thurtell ML, Halmagyi GM (2008) Complete ophthalmoplegia An unusual sign of Bilateral Paramedian Midbrain Thalamic Infarction. *Stroke* 39: 1355-1357. [Link: https://goo.gl/BJJSmv](https://goo.gl/BJJSmv)
9. Bailey J, Khadjoori K (2016) Artery of Percheron occlusion – an uncommon casue of coma in a middle-aged man. *Clin Med (Lond)* 17: 86-87. [Link: https://goo.gl/5iViyP](https://goo.gl/5iViyP)
10. Arauz A, Patiño-Rodríguez HM, Vargas-González JC, Arguelles-Morales N, Silos H, et al. (2014) Clinical Spectrum of Artery of Percheron Infarct: Clinical – Radiological Correlations. *J Stroke Cerebrovasc Dis* 23: 1083-1088. [Link: https://goo.gl/dHG1AA](https://goo.gl/dHG1AA)