



# Top of the Basilar Artery Syndrome (Bilateral Thalamic Infarction) Observed After Cesarean Operation Under Spinal Anesthesia

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<sup>1</sup>University of Health Sciences Turkey, Prof. Dr. Cemil Taşçıoğlu City Hospital, Clinic of Anesthesiology and Reanimation, İstanbul, Turkey

<sup>2</sup>University of Health Sciences Turkey, Prof. Dr. Cemil Taşçıoğlu City Hospital, Clinic of Neurology, İstanbul, Turkey

## Abstract

Top of the basilar artery syndrome; is revealed as a result of the brainstem and lower cerebral, cerebellar area infarction due to the embolism of the basilar artery's most rostral part. It may present with very mild symptoms, leading to severe neurological sequelae or death. In this report, we present a case of bilateral thalamic infarction with no history of chronic disease.

**Keywords:** Basilar artery syndrome, pregnancy, bleeding

## INTRODUCTION

Thalamus is the intersection of frontoparietal connections with memory systems such as the hippocampus and the limbic system (1). The basilar artery originates from the intersection of two vertebral arteries at the ponto-bulbar junction and terminates at the pons-mesencephalon junction. Spinal anesthesia is one of the most common techniques used in anesthesia applications in obstetric patients, children, and ambulatory surgery patients, but it can cause a variety of neurological complications. The incidence of neurological complications associated with spinal anesthesia is 3.78 in 10,000, and some are permanent neurological deficits (2).

Basilar artery occlusion can cause very mild symptoms by embolizing the bilateral posterior cerebral artery and cerebellar arteries, as well as a wealth of neurological symptoms such as impaired consciousness and bilateral pyramidal, sensory, cerebellar findings, cranial neuropathies or conjugated gaze disorders. Mental state changes, vertical gaze limitation and memory impairment constitute the classic triad (3,4). Its prognosis is highly variable and depends on the location, spread

and collateral circulation of the occlusion. The symptoms are sudden and dramatic, so the clinical picture should be immediately recognized and patients should be referred to appropriate treatment. Magnetic resonance imaging (MRI) and diffusion-weighted imaging play a key role in imaging because clinical findings are not leading in many cases. In this paper we present a case of bilateral thalamic infarction in a thirty-seven-year-old woman with no history of chronic disease on her resume.

## CASE PRESENTATION

Thirty-seven years old female patient diagnosed with known chronic disease, miscarriage and no history of previous thrombosis. Four days ago, there is a history of cesarean section under spinal anesthesia for her second pregnancy and it is known that cesarean section in her first pregnancy took place uncomplicated under spinal anesthesia. The patient who was brought to the emergency department of our hospital after the development of confusion and tendency to sleep was interned to the intensive care unit (ICU) after spinal anesthesia



**Address for Correspondence:** Namigar Turgut, University of Health Sciences Turkey, Prof. Dr. Cemil Taşçıoğlu City Hospital, Clinic of Anesthesiology and Reanimation, İstanbul, Turkey

**Phone:** +90 533 360 76 59 **E-mail:** namigarturgut@gmail.com **ORCID ID:** orcid.org/0000-0003-0252-3377

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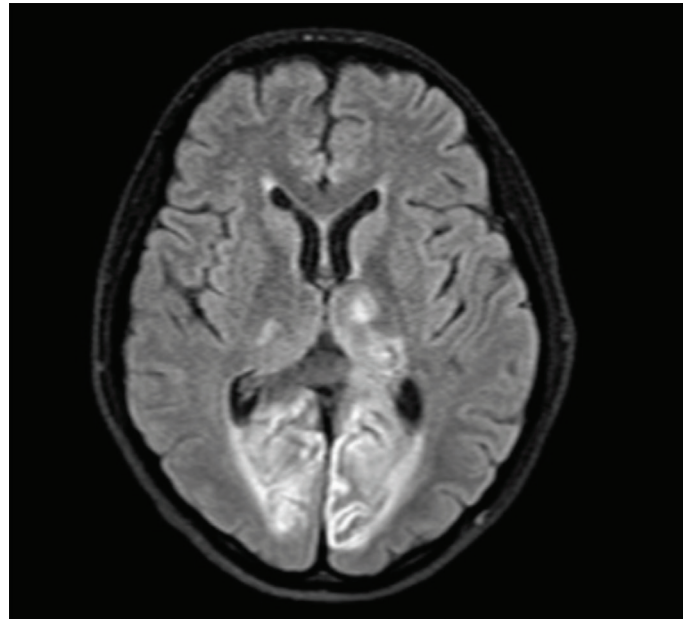
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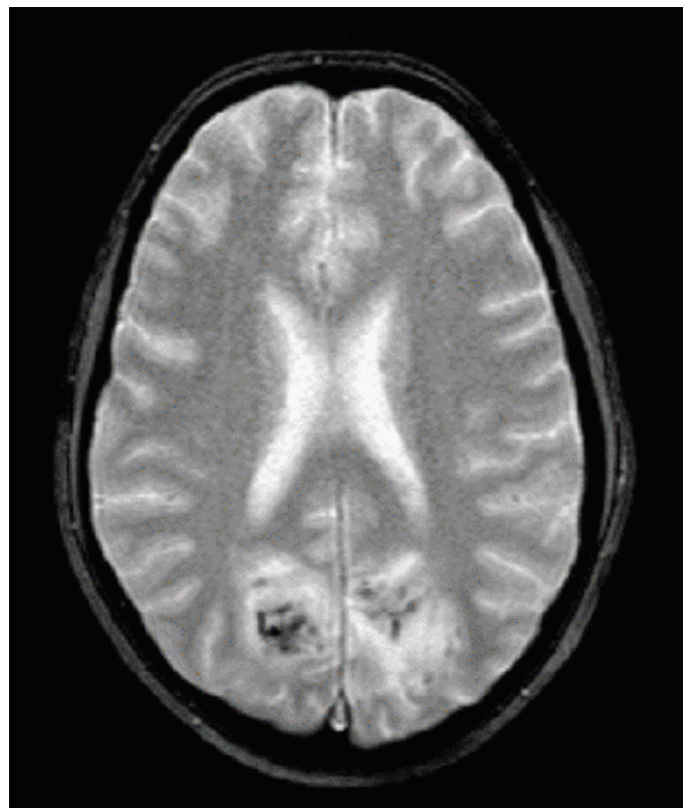
upon the determination of acute lacunar infarction and left thalamic infarction in bilateral posterior communicating artery irrigation area on cranial diffusion MRI. The patient was treated with antiedema, antiagregan and anticoagulant. Physical examination at the time of hospitalization showed no signs of neck stiffness or meninx irritation, except for bilateral roncus in the basal lung. Arterial blood pressure: 110/70 mmHg, pulse: 76 beats/min, fever was 36.2 °C. Neurological examination revealed unconscious, Glasgow-Coma scale: 8, pupillary myotic-isochoric, LR +/+, eyes give on to right, response to painful stimulus in 4 extremities +, no lateralized signs, Babinski sign with flexor on the right and extensor on the left.

The patient who had bilateral infiltrative changes in the chest-X-ray was started to receive antibiotic therapy. Cranial diffusion MRI examination taken on the same day showed areas in favor of acute infarction showing symmetrical diffusion restriction in both parietooccipital, both occipital lobes and both medial temporal lobes. Acute infarction areas showing diffusion restriction were observed in bilateral thalamus and right half of pons. Cranial computed tomography (CT) showed large hypodens in the pons, both cerebral hemispheres, bilateral occipital lobes, both temporal lobes, bilateral thalamus, more prominent on the left. Both cerebral hemispheres appear to be edematous, and as a result, cerebral cortical sulci have been wiped out. It has been observed that the third ventricle is semicompressed (Figures 1, 2). No pathological findings were observed in transesophageal echocardiography, bilateral lower limb venous Doppler and urinary ultrasonography examinations for etiological factors. Vasculitis and thrombosis panel were examined. ANA+, FANA (antinuclear antibody performance) + thin-spotted pattern, HLA B27 resulted in negative. Bilateral carotid-vertebral artery color doppler ultrasonography was observed to be compatible with vasculo biliary injury.

In the neurological examination of the patient, who was diagnosed with ischemic stroke (bilateral thalamic infarction) as a result of 1.5-month ICU follow-up; right-hand dominance (+), unconscious, no orientation and cooperation, no word output, comprehension was partially preserved, no stiff neck, Kernig (-), Brudzinski (-), light reflex direct-indirect were positive bilaterally, pupils were isochoric, conjugated eye movements were totally normal in all directions, no nystagmus, no facial asymmetry, the tongue was in the midline and outside the mouth, four limbs were spontaneously mobile, deep tendon reflexes were alive in the lower limbs, normative in the upper extremities, bilateral Babinski reflex were bilaterally irrelevant and the patient was transferred to the neurology service. The nasogastric probe was



**Figure 1.** Cranial diffusion MR: diffusion restriction in favor of symmetrical acute infarction in parietooccipital, occipital lobe, temporal lobe medial. In both thalamus, areas showing diffusion restriction in favor of acute infarction in the right half of the pons  
MR: Magnetic resonance



**Figure 2.** Cranial CT: Large hypodense areas in pons, both cerebral hemispheres, bilateral occipital lobe, temporal lobe, thalamus. Both cerebral hemispheres are edematous. Third ventricle has a semicompressed appearance  
CT: Computed tomography

inserted because of decreased gag reflex (gag) and inability to swallow during Neurology service follow-up. The patient continued to practice daily physical therapy exercises and was discharged with recommendations.

## DISCUSSION

Thalamic infarction may be unilateral or bilateral. Bilateral paramedian infarction has a classical triad characterized by impaired consciousness, memory dysfunction, vertical gaze paralysis, and neuropsychiatric disorder. Sensory disorders are observed in Bilateral thalamogeniculate artery infarction (5). Occlusion of the Percheron artery, usually caused by bilateral paramedian thalamus entrenched infarction in conjunction with the upper section of the mesencephalon, is extremely rare and has been reported in about 0.1-2% of all ischemic stroke cases (6,7). Percheron artery occlusion is a condition that causes bilateral thalamic lesion. Other conditions that may cause this include top of the basilar artery syndrome and deep cerebral vein thrombosis. Top of the basilar artery syndrome can be presented with bilateral thalamic infarction, but it can also be accompanied by infarction in the irrigation areas of the superior cerebellar artery and posterior cerebral artery. BTIs, which can also be seen as part of the top of the basilar artery syndrome, can rarely develop isolated (8). In the etiology of BTI, it is often (2/3) atherosclerotic small vascular disease, followed by artery-to-artery embolism and cardioembolism (9). Atherosclerosis most commonly affects the first few cm of the basilar artery. The majority of patients have chronic diseases such as hypertension and diabetes mellitus that can cause minor vascular disease (10). Stroke risk increases in pregnancy, is highest in the third trimester and postpartum period (11). Associated mortality is 8% to 15%, and hypercoagulopathy during pregnancy is thought to play a causal role. The direct role of caesarean section operation is unclear, but neurological findings that may occur due to hemodynamic instability, especially observed under spinal anesthesia, should be carefully evaluated. Examples in the literature for reasons such as rare occurrence of this complication, misdiagnosis, proper retention of data or failure to report cases are in the minority. First, Watanabe et al. (12) reported a case of cortical blindness due to transient ischemic neurological deficit after cesarean operation under spinal anesthesia in 1997. Second, Mathur et al. (13) also reported a case of pituitary apoplexy which developed due to transient cerebral vasoconstriction syndrome after cesarean operation under spinal anesthesia in 2014. In patients with acute thalamic infarction, a non-contrast CT should be taken first to rule out bleeding (14).

## CONCLUSION

In order to prevent misdiagnosis and discharge, it is useful to perform MRI on the diagnosis of BTI, especially in young patients with no history of underlying chronic disease. BTI is a diagnosis that should be kept in mind in the differential diagnosis of neuropsychiatric diseases by emergency department physicians, especially in patients with acute onset complaints. In general, the prognoses of thalamic infarctions are positive in terms of mortality and persistent neurological deficit.

### Ethics:

**Informed Consent:** Consent was obtained from patients for this study.

**Peer-review:** Externally peer-reviewed.

### Authorship Contributions

Surgical and Medical Practices: N.A., İ.A., A.C.Ö., K.Y., O.A., N.T., Concept: N.A., İ.A., A.C.Ö., K.Y., N.T., Design: N.A., A.C.Ö., N.T., Data Collection or Processing: N.A., İ.A., A.C.Ö., K.Y., Analysis or Interpretation: N.A., N.T., Literature Search: N.A., İ.A., A.C.Ö., K.Y., O.A., Writing: N.A., N.T.

**Conflict of Interest:** No conflict of interest was declared by the authors.

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