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Case Report

Ischemic Stroke due to Percheron Artery Occlusion: A Rare Post COVID-19 Complication

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Abstract

Arterial thromboembolic events are actually described as complications of COVID-19 in both acute and post-COVID phases. The artery occlusion Percheron (AOP) occasioning bithalamic infarction is rarely described in this context. A 44-year-old woman with a history of hypertension and obesity, not vaccinated against Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was admitted for status epilepticus. She was comatose requiring invasive mechanical ventilation. Asymmetric reactivity pupilla was noted with mydriasis of the right on. At the resumption of the interrogation, the family reported a flu-like syndrome two months ago. Serology COVID-19 confirmed previous immunity. Rt-PCR was negative. Thoracic CT showed suitable sequelae of COVID-19 lesions. A post-COVID19 thromboembolic complication was suspected. Cerebral angio MRI showed bithalamic hypersignal lesions without hemorrhagic stigmata and without enhancement related to acute ischemic nature. The patient was given atorvastatin, antiplatelet aspirin and curative anticoagulagulation. Clinical improvement was noted and she was extubated. However, she remained sleepy with an apathetic state, an inappropriate verbal response and memory disorders.

Although this is a rare anatomical variant, the occlusion of the Percheron artery must be suspected in front of a paramedic thalamic infarction. Complexity of clinical manifestations explains difficulty of early diagnosis.

Keywords: *Artery of Percheron; Stroke; Thalamic Stroke; Covid-19; Bilateral Thalamic Stroke; Atypical Stroke; Stroke and Covid-19; Post COVID19-Syndrome*

Abbreviations

AOP: The Artery Occlusion Percheron; CT: Computer Tomography; MRI: Magnetic Resonance Imaging

Introduction

COVID-19 is now recognized as a multi-organ disease with a broad spectrum of manifestations. Similarly, to post-acute viral syndromes described in survivors of other virulent coronavirus epidemics, there are increasing reports of persistent and prolonged effects after acute COVID-19. Bithalamic infarctions in a rare accident representing 0.6% of all ischemic stroke [1]. Here, we present the clinical

case of a young lady with a known history of obesity and hypertension who presented with confusion and drowsiness, due to bilateral thalamic stroke caused by infarction along Percheron artery in the post-acute COVID-19 syndrome.

Case Report

A 44-year-old women with a past medical history of hypertension, not vaccinated against SARS-CoV-2, was admitted to the emergency department of our hospital. She was found to be unconscious with bruised tongue and urinary incontinence after 10 s general clonic movements. The family reported only a flu-like syndrome, two months before her admission. On admission, blood pressure was 230/120 mmHg and heart rate was regular at 84 beats/min. Oxygen saturation was 98% without oxygen. Neurological examination revealed Glasgow coma scale of 7 points (2, 2, and 3 points for ocular, verbal, and motor components) requiring invasive mechanical ventilation. Bilateral pupillary light reflex was poorly reactive with dilatated right pupil. Motor exam demonstrated lower right limb extension. Initial computer tomography cerebral (CT) without contrast performed did not reveal any acute intracranial abnormality. CT angiography cerebral performed after six hours was unremarkable for any dissection, stenosis, occlusion, or aneurysm. Laboratory studies, such as serum sodium, serum potassium, blood urea and nitrogen, serum creatinine were within normal. Serum CRP level was 6 mg/L (normal range 0 - 9 mg/L). Prothrombin time was 12.0s (normal range 9.2 - 12.1s) with an international normalized ratio of 1.0. His lipid panel was within normal limits. Hemoglobin A1C was 5.6 (normal range 0 - 5.9). Chest computer tomography showed interstitial and alveolar opacities in both lungs (Figure 1) which can evoke without neurological deficit. Magnetic Resonance Imaging (MRI) performed two days after the admission showed a larger area of high signal intensity bilaterally in paramedian thalami than before (Figure 2). The appearance consistent with an acute bithalamic ischemic stroke by occlusion of the Percheron artery. At this stage, ischemic stroke following COVID-19 infection was considered. Combined antiaggregant and statin was prescribed. Electroencephalogram did not reveal any clear, focal, lateralizing or epileptiform activity. Transthoracic echocardiography was unremarkable, which ruled out patent foramen ovale as a potential etiology. The following days his focal neurological deficits were much improved. She was alert, awake, oriented and following commands appropriately. She was extubated at the fourth day of admission. On day 8 of his hospitalization, his symptoms were improved significantly. He was safely discharged home with outpatient stroke rehabilitation. During his one-month follow-up visit, his dysarthria had improved but she still suffered from hypersomnia.

Discussion

we present here a rare clinical case of a young lady with a known history of obesity and hypertension who presented with confusion and drowsiness, due to bilateral thalamic stroke caused by infarction along Percheron artery in the post-acute COVID-19 syndrome.

Post COVID-19 syndrome is characterized by persistent symptoms and/or delayed or long-term complications beyond 4 weeks from the onset of symptoms. Stroke syndrome in one of the most frequent incident in the post COVID-19 disease. The artery occlusion Percheron (AOP) was first described by Gerard Percheron in 1973.This artery arises from the proximal posterior cerebral arteries and supplies both the paramedian thalami and the mesencephalon. AOP is a rare anatomical variant that is present in 4% - 12% of the population. The prevalence of bilateral thalamic infarction caused by AOP occlusion is unknown since it is often misdiagnosed. It “seems” that AOP stroke represents 0.1% to 2.0% of ischemic strokes and 4% to 18% of thalamic infarcts [2]. There is no predilection regarding sex, race-ethnicity, and age in the reported cases of AOP stroke in literature. According to Garcia-Grimshaw., *et al*. the aforementioned data depend on the etiology of the AOP stroke. Firstly, it can occur at any age, but it is particularly common in patients between 60 and 70 years [3]. Secondly, there is a slight male predominance with a male to female sex-ratio of 3:2.

The shape of the infarct can deduce the presence of AOP stroke because this anatomical variant typically causes bilateral paramedian thalamic-mesencephalic infarction. The risk factors of AOP stroke are similar to others ischemic ones. The two most frequent recognized risk factors are microangiopathy and cardiac embolism. Clinical presentations are extremely variable. Most common symptom are bilateral vertical gaze palsy (65%), memory impairment (anterograde and retrograde amnesia) (58%), and coma (42%). Remaining clinical

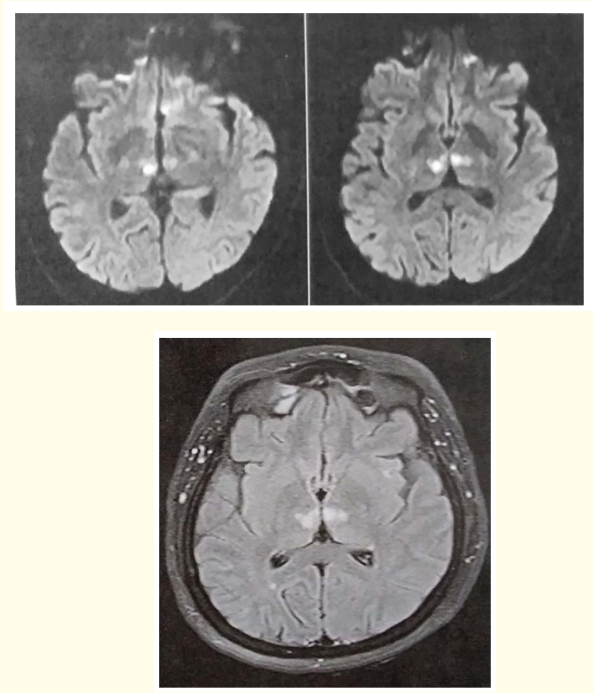

Figure 1: *Axial MRI images showing bilateral high-signal intensity on paramedian thalami in (A) fast spin echo T2 sequence (white arrows) and (B) FLAIR sequence (black arrows).*

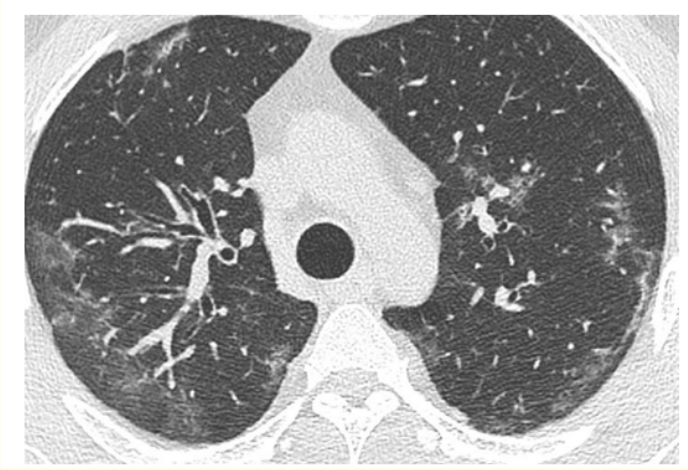

Figure 2: *Chest computer tomography showed interstitial and alveolar opacities in both lungs.*

features reported in the literature include hypersomnolence (29%), akinetic mutism, and behavioral disorders (apathy, agitation, and aggressiveness [4]. In the three published cases, it include hypersomnia, coma, vertical gaze palsy, and neuropsychiatric disorders. However, hypersomnia and hypersomnolence are rarely reported as a first complaint. This symptomatology 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 [5]. Sleep-wake disturbances are more pronounced in bilateral than in left-sided or right-sided thalamic infarcts. Diagnosis and treatment AOP stroke may be delayed because of wide spectrum of its clinical features. The complexity and polymorphism of presentation explain why bithalamic infarction is often misdiagnosed, lately detected, or even not detected. It is a real diagnostic challenge for clinicians. There was rare study or case report about post-COVID syndrome and percheron infraction.

Conclusion

Although it is a rare anatomical variant, AOP must be considered whenever paramedian thalamic infarction is noted in neuroimaging. Good knowledge of the characteristic pattern of ischemia in case of AOP infarction and well under- standing of the variety of its clinical presentation will help in early diagnosis, optimal therapy, and good patient outcome.

Conflict of Interest

This is to certify that I Khaoula Ben Ismail and the author of the article: Ischemic stroke due to Percheron artery occlusion: A rare post COVID-19 complication certify that there is no conflict of interest regarding the publication of this manuscript.

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