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Bilateral medial medullary infarction (MMI): Typical " Heart-Shaped" on MRI

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ABSTRACT

Bilateral medial medullary infarction has been considered a rare and severe type of stroke.Its clinical expression is sometimes misleading, particularly in the case of isolated symptoms or fluctuating initial progression. It may be limited to a contralateral hemibody motor deficit when the involvement is limited to the bulbar pyramids. We present a case of a 44-year-old patient with a history of type II diabetes on insulin, who had a left hemibody deficit. The MRI revealed a bilateral MMI, taking the ***"Heart-Shaped****" on hyper T2 signal, FLAIR and Diffusion with a low ADC.*

INTRODUCTION

Bilateral MMI has been considered a rare and severe type of stroke [1], and often severe type of stroke, its clinical expression is sometimes misleading, especially in isolated symptoms or fluctuating initial course, which may be limited to a contralateral hemibody motor deficit when the involvement is limited to the bulbar pyramids [2], The advent of MRI in the 1990 revealed that the clinical features of DWI are more heterogeneous, and that DWI is a routine modality for diagnosing it in the acute phase [1].

MATERIAL AND METHODS

Observation

We report the case of a 44-year-old patient with a history of type 2 diabetes on insulin, who had a left hemi body deficit on May 24, 2020. The CT scan showed a left lenticular lacunar hypo density without an obvious anomaly of density in the medulla. The MRI revealed a bilateral MMI, taking the heart-shaped hypersignal in T2, FLAIR and Diffusion with a low ADC, (figure 1) without any abnormality on the arterial angiographic sequences (figure 2). We also found a lacunar infarction in left capsulo-lenticular region , associated with an signal anomaly in the left frontal subcortical region, the internal capsule,as well as in homolateral cerebral peduncle (pyramidal beam path) evoking a Walerian degeneration (figure 3).

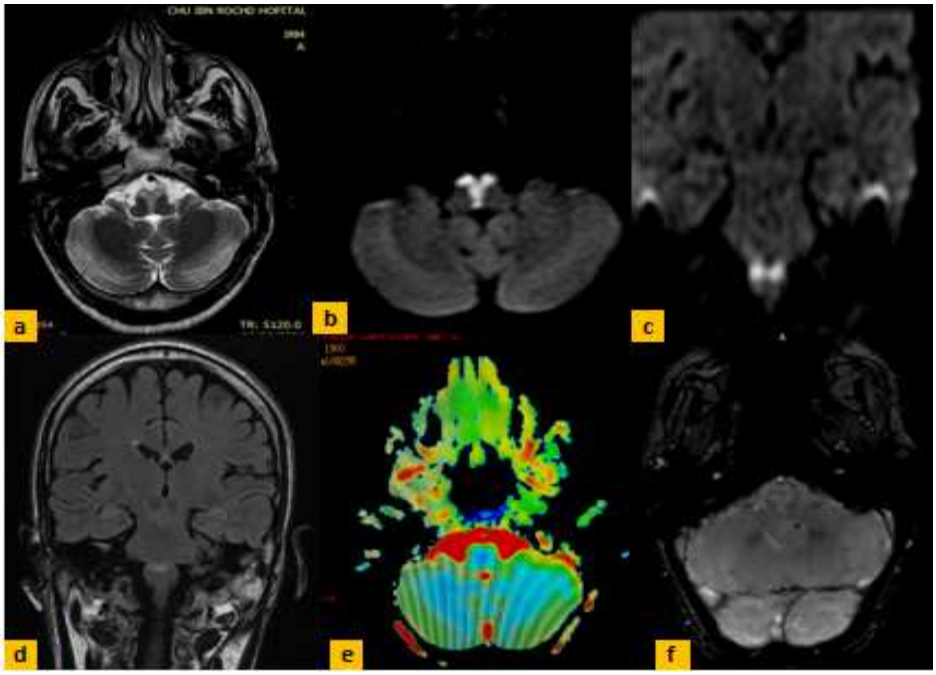

Figure 1: bilateral paramedian bulbar signal anomaly in T2 hypersignal (a), diffusion (b, c), and FLAIR (d), with low ADC (e), taking the 'Heart-Shaped ' sign, without hemorrhagic stigmas on the SW sequence (f).

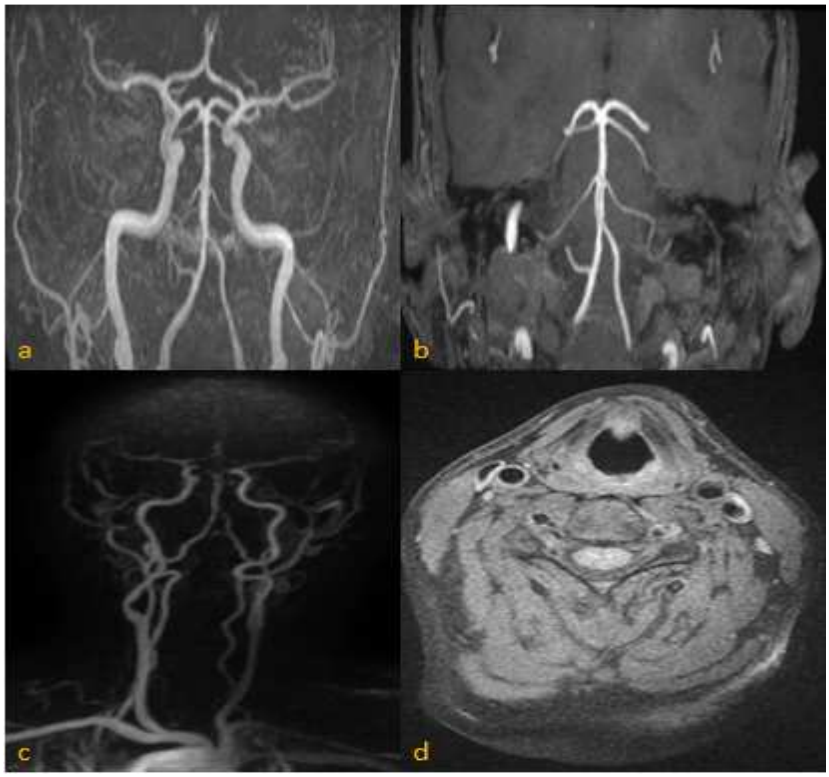

Figure 2: No anomaly in the 3DTOF and 2DTOFangiographic sequences (a, b), TRICS (c)and axial T1SATS (d) sequences on supra aortic trunks

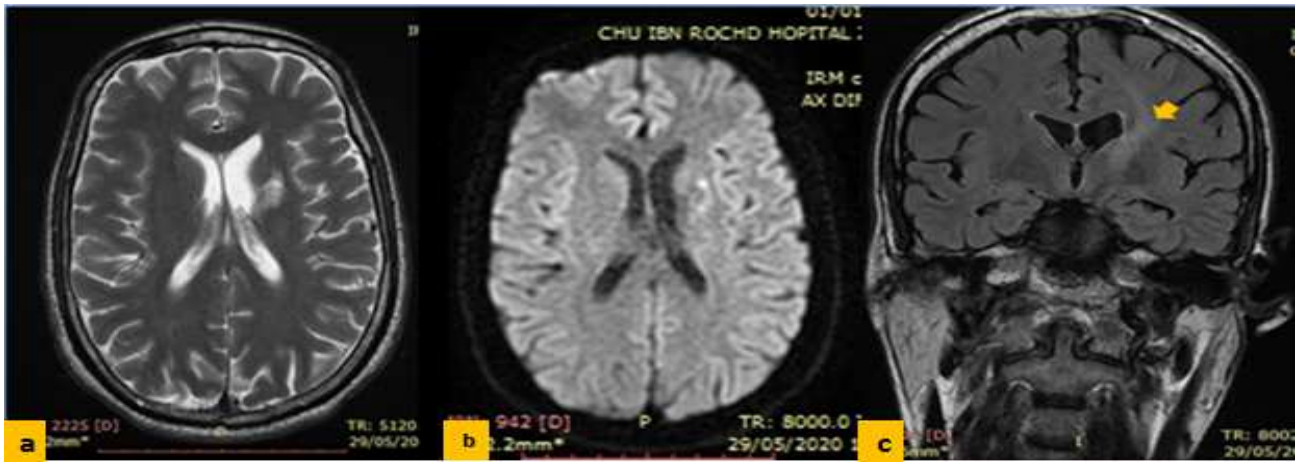

Figure 3: Axial sequences T2 (a) and DWI (b), and coronal Flair (c). Lacunar infarction in left capsulo-lenticular region , associated with an signal anomaly in the left frontal subcortical region, the internal capsule, as well as in homolateral cerebral peduncle (pyramidal beam path) evoking a Walerian degeneration (arrows).

RESULTS AND DISCUSSION

BMP infarction is a rare and devastating form of stroke.The natural history of this disease is difficult to predictbecause of a limited number of available reported cases inthe literature to describe clinical presentation, etiologicfactors, and prognosis[3].

Blood supply of the paramedian portion of the bulb is provided by the anteromedial group of the vertebro-basilar system and has three zones of vascularization, unlike the midbrain and the pons (Figure 4) [4].

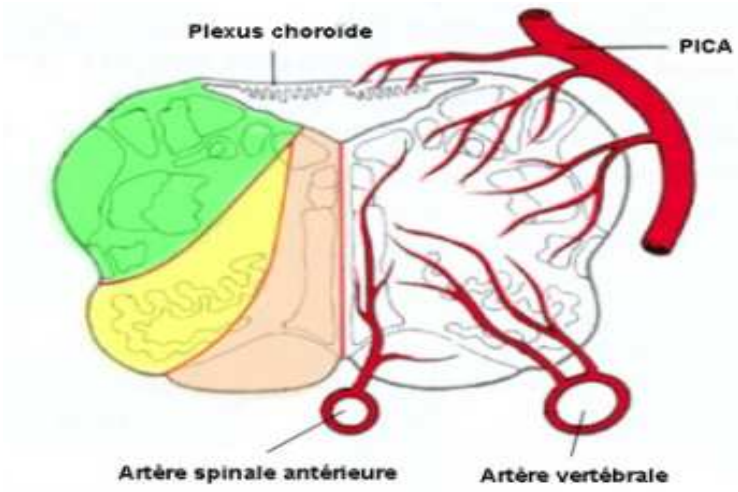

Figure 4: Vascularization of the paramedian portion of the bulb:

The ventral area (in orange on this graph) is irrigated by vessels coming mainly from the anterior spinal artery.

The lateral area (in yellow on this graph) is irrigated by vessels coming mainly from the vertebral artery.

The dorsal area (in green on this graph) is supplied by vessels coming mainly from the posterior inferior cerebellar artery.

The primary etiology of bulbar stroke is atherosclerosis. The microangiopathic mechanism and diabetes appear to be more frequently associated with paramedian than lateral stroke [11]. Bilateral forms of stroke are associated with particularly severe microangiopathy [12].

Bilateral MMI is a rare severe syndrome and the clinical picturescan vary. The rapid confirmation of the diagnosis in patients with incomplete or atypical manifestations can be challenging. [6].

They state that this stroke subtype most commonly presents with an acute onset of quadriparesis (78.4%), bulbar weakness with dysarthria (48.6%), and hypoglossal palsy (40.5%). Sensory deficits were also found in 43.2% of their patients, of whom 25% went on to have respiratory failure and to require intubation.

Before the advent of MRI, the definitive diagnosis of medullary infarction, particularly of medial location, could only be reached by autopsy. For this reason, only a limited number of cases could be examined [7][8].Since the advent of MRI, the diagnosis of bulbar infarction has been made possible, and several clinical studies on bulbar vascular accidents are available [9].

Brain MRI frequently was pathognomic for the heart-shaped sign on the T2 sequence and diffusion indicating BMP infarction [10].

In the patients reported here, regular MRI scanning did not reveal theischemic focal zone in the medulla region even at 10 h after theonset. Misdiagnosis or delay in diagnosis of this syndrome may becommon. An extensive number of other disorders could cause similarfeatures including brainstem encephalitis, GBS, myastheniagravis, inflammatory myopathy, periodic paralysis and para neoplasticsyndrome [6].

CONCLUSION

Early diagnosis of bilateral MMI is crucial in the acute phase. Intravenous thrombolysis may be considered to reduce the morbidity of this rare subtype of stroke.

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