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CASE REPORT

Pontine Infarct Presenting in Millard-Gubler Syndrome: A Rare Case Report

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Abstract: Millard-Gubler condition (MGS) is a rare neurological syndrome caused by a single lesion in the basis pontis (ventral pons). This neurological syndrome is characterized by an ipsilateral palsy of the facial nerve (CN VII) and a contralateral hemiparesis, which are caused by corticospinal tract involvement in the pons above the pyramids' medullary decussation. Here, we present the case of a 60-year-old female patient who was admitted to the emergency room with the complaint of left facial palsy and weakness on the right side of her body due to pontine infarct. She had a history of hypertension with irregular medication use. An acute infarct on the ventral aspect of the pons was discovered following a brain MR diffusion, and it was consistent with Millard-Gubler syndrome. She was treated with dual antiplatelet therapy and strict blood pressure control. Eventually, her condition significantly improved, and she was able to return to her prior functional state after consistent physical therapy. MGS is a rare brainstem condition characterized by a unilateral lesion to the basal area of the ventral pons, which affects the facial (VII) cranial nerve and corticospinal tract. This case emphasizes the importance of considering pontine infarction in the differential diagnosis of patients presenting with MGS. Timely diagnosis and treatment are crucial for optimal patient outcomes.

Keywords: Millard-Gubler Syndrome, pontine infarct, facial palsy.

1. INTRODUCTION

Millard-Gubler syndrome (MGS), also known as ventral pontine syndrome, was named after two French physicians, Auguste Louis Jules Millard and Adolphe-Marie Gubler, who discovered the illness's symptoms in 1858. MGS is one of the rare crossing brainstem syndromes, defined by a unilateral lesion of the basal region of the ventral pons, including fascicles of the facial (VII) cranial nerve and corticospinal tract [1, 2]. The MGS lesion is located above the decussation of the pyramidal and spinothalamic circuits. As a result, cranial nerve signs are ipsilateral while limb symptoms are contralateral, leading to the classic crossed brain stem scenario [3]. The MGS is typically caused by a unilateral lesion at the base of the caudal pons by a tumor, hemorrhage, or infarction [4,5]. Older patients are more prone to hemorrhage and infarction, while younger patients are more likely to develop malignancies and infections. Brain MRI is more accurate

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and precise than CT scans in detecting almost all brainstem abnormalities. In cases of acute strokes, brain MRI will reveal diffusion restriction on diffusion-weighted imaging [6]. Millard-Gubler syndrome is an uncommon disease that affects the ventral pontine area and can be recognized by Ipsilateral peripheral facial nerve involvement and contralateral hemiparesis (pyramidal tract fibers) [2]. The most common cause of Millard-Gubler syndrome is a stroke in the pons, which can be due to ischemic stroke or hemorrhagic stroke. Other potential causes include tumors, infections, and autoimmune diseases.

This case report clarifies the characteristic or presentation, diagnosis and management of a patient with Millard-Gubler syndrome from pontine infarction. Our objective is to improve the comprehensive literature of MGS and underline the importance of timely diagnosis and intervention for optimal patient outcomes.

2. CASE PRESENTATION

A 60-year-old female patient was brought to our emergency department with right side weakness and left facial palsy for one day. She had a past medical history of uncontrolled hypertension. On arrival, she had blood pressure of 166/85 mmHg and a pulse rate of 89 beats per minute, serum blood glucose of 120 mg/dl, and oxygen saturation of 96% on room air.

On neurological examination, the patient was fully conscious, alert, and oriented to time, person, and place. Her Glasgow coma scale was 10/15 (eye – 4, verbal – 5, and motor – 1). She had right side weakness of 1/5 muscle power (based on MRC scale), left facial weakness. Her pupils were equal, round, and reactive to light. Extraocular movements were intact bilaterally. Facial sensation was intact, but there was a left facial palsy with decreased prominence of the left nasolabial fold. Plantar reflex resulted in plantar extension of right toes (positive Babinski sign). Cranial nerve examinations were normal except for lower facial palsy. The other systemic examination was unremarkable.

The patient had undergone brain MRI, which revealed diffusion restriction on the ventral part of the pons, which is consistent with acute infarction (see Figure **1 A-B**). Echocardiogram, electrocardiogram, and chest X-ray were normal. Laboratory investigations, including lipid profile, vitamin B12, liver function test, renal function test, and blood sugar levels, were within the normal range. Unfortunately, the patient did not arrive at the emergency department at gold hours for IV thrombolytic treatment, and therefore she missed that opportunity. Due to a delay in hospital arrival, the patient missed the golden hours of thrombolytic treatment with a tissue plasminogen activator. She was admitted to the neurology ward and was treated with low molecular weight heparin, 60 mg subcutaneously, aspirin 300 mg, Clopidogrel 75 mg OD, and other neuroprotective agents.

After 5 days of admission, the patient was discharged to home with oral dual antiplatelet, atorvastatin 20 mg OD and amlodipine 10 mg OD, and she was referred to physical rehabilitation. After 2 months of follow-up at the neurology OPD, her condition improved; the facial weakness resolved.

3. DISCUSSION

Millard-Gubler syndrome, often referred to as ventral pontine syndrome, was initially identified in 1858 and is usually related to a tumor and an infract in the pons [9]. Pontine infarctions typically manifest as a part of a more extensive ischemic stroke affecting the brainstem; however, they can also occur only in the pons. Infarctions occurring in this particular region present distinct clinical patterns that are associated with dysfunctions of cranial nerves, abnormalities in eye movements, and impairments in motor function [10].

In contrast, pontine hemorrhage caused by hypertension typically affects the medial region and causes damage to the nucleus of cranial nerve VI and the fibers of cranial nerve VII, leading to the development of Foville syndrome [18]. Our case was a 60-year-old female patient with right side weakness and left facial palsy for one day. Imaging revealed an acute infract on the ventral part of the pons consistent with Millard-Gubler syndrome, and she was started on secondary stroke prevention therapies as she presented late. The lesion lies above the decussation of the pyramidal and spinothalamic tracts. This means that typical crossed

brain stem syndrome is the result of contralateral limb weakness and ipsilateral cranial nerve palsy. Pyramidal tract involvement typically results in hemiplegia or hemiparesis of the upper or lower extremities, as well as facial palsy [11-14].

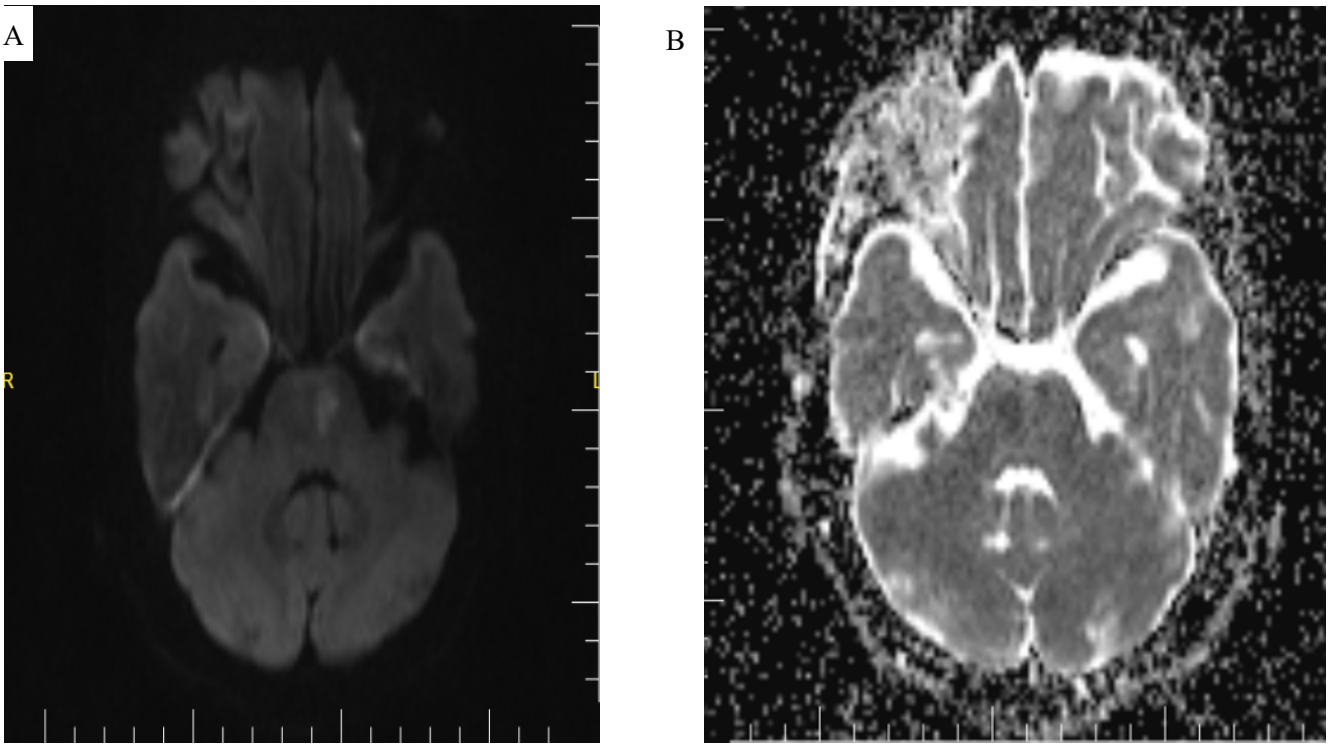

Figure 1. (A-B) Brain MRI showing hyperintensity in the DWI and hypointensity in the ADC on the ventral part of the pons consistent with acute infarction.

Hypertension, diabetes, and dyslipidemia were the most common risk factors in earlier studies on small vessel pontine infarctions [15, 16]. In our case, the patient had right hemiparesis and left-sided facial palsy owing to her left-sided pontine infarct. In this case, a long-standing history of hypertension without regular medication use and her age suggest a more probable diagnosis of an ischemic stroke, for which an MRI was done. Additionally, the MRI showed small vessel disease affecting the pontine branches of the basilar artery. Magnetic Resonance Imaging (MRI) plays a crucial role in differentiating the vascular causes of a ventral pontine infarction from other disorders like tumors, demyelinating diseases, and tuberculosis [17].

Prompt recognition of MGS is essential for initiating appropriate management. In this case, the patient had a ventral pontine infract, and she came to the hospital late and could not be given IV thrombolytic treatment. Early diagnosis and management with immediate implementation of thrombolytic treatment is essential in patients presenting with acute cerebral infarction [17, 19, 20]. The prognosis of MGS can vary based on the severity of the infarction and any other previous medical history. However, a considerable number of patients observe substantial recovery with immediate intervention.

CONCLUSION

This case report describes a patient with Millard-Gubler syndrome (MGS) due to a pontine infarct. The distinct clinical picture of ipsilateral facial palsy, contralateral hemiparesis, and brain neuroimaging determined the diagnosis of MGS. Early diagnosis and timely treatment are essential for optimizing patient outcomes and improving their quality of life. The present case report contributes to the limited literature on MGS from pontine infarction, thereby enhancing comprehension of this condition and its possible clinical manifestations.

AUTHOR CONTRIBUTIONS

All authors performed substantial contributions to the case sections. Took part in drafting the case or revising it critically for important

DECLARATION OF COMPETING INTEREST

The authors declare that there is no competing interest related to the study, authors, other individuals, or organizations.

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CONSENT FOR PUBLICATION

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

GUARANTOR

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PROVENANCE AND PEER REVIEW

Not commissioned, externally peer-reviewed. Highlights (For Review).

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