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CASE REPORT

Vertebrobasilar artery dissection manifesting as Millard-Gubler syndrome in a young ischemic stroke patient: A case report

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Abstract

BACKGROUND

Millard-Gubler syndrome (MGS) is caused by a lesion in the brainstem at the level of the facial nerve nucleus, and it is also a rare ventral pontine syndrome. Vertebrobasilar artery dissection (VAD) is an uncommon cause of ischemic stroke. To the best of our knowledge, this is the first case report on the coexistence of MGS and VAD in a young acute ischemic stroke patient.

CASE SUMMARY

We herein describe an unusual case of young acute ischemic stroke patient, presenting with acute right peripheral facial palsy, right abducens palsy, and contralateral hemihypesthesia, manifesting as MGS. After receiving dual antiplatelet therapy with aspirin and clopidogrel, as well as rosuvastatin, the patient recovered significantly. The high-resolution magnetic resonance imaging (MRI) indicated a diagnosis of VAD.

CONCLUSION

Our finding further demonstrated that high-resolution MRI is a useful technique to early detect underlying dissection in posterior circulation ischemic stroke.

Key words: Millard-Gubler syndrome; Vertebrobasilar artery dissection; Ischemic stroke; Case report

Core tip: Millard-Gubler syndrome (MGS) is caused by a lesion in the brainstem at the level of facial nerve nucleus, and it is also a rare ventral pontine syndrome. We herein describe an unusual case of young acute ischemic stroke patient presenting with MGS. The high-resolution magnetic resonance imaging (MRI) indicated a diagnosis of vertebrobasilar artery dissection (VAD). This is the first case report on the coexistence of

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MGS and VAD in a young acute ischemic troke patient. Our finding further demonstrated that high-resolution MRI is a useful technique to early detect underlying dissection in posterior circulation ischemic stroke.

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INTRODUCTION

Millard-Gubler syndrome (MGS) is one of uncommon pontine-crossed syndromes, and it involves the facial nerve nucleus, abducent nerve, and the corticospinal tract. It is characterized by paralysis affecting the face and the abducent nerve on the side of the lesion and central hemiplegia on the opposite side[1]. It has been reported that MGS could be found in patients with brainstem tumor such as cavernous angioma[2-4], rimary meningeal hemangiopericytoma[5], neurocysticercosis[6]. As far as we know, only five cases of MGS caused by cerebral infarction have been reported[1,7-10]. Vertebrobasilar artery dissection (VAD) is an uncommon cause of ischemic stroke, especially in posterior circulation ischemic stroke[11]. To the best of our knowledge, this is the first report on the coexistence of MGS and VAD in a young acute ischemic stroke patient, using the technique of high-resolution magnetic resonance imaging (MRI). Herein, we describe an unusual case of posterior circulation ischemic stroke manifesting as MGS caused by VAD.

CASE PRESENTATION

Chief complaints

A 49-year-old male presented with dizziness and slurred speech for two days.

History of present illness

Two days before admission, the patient experienced sudden dizziness and nausea, followed by slurred speech, dysphagia, and choking. Before the onset of the illness, he did not suffer from fever or cervical pain.

History of past illness

He suffered from hypertension for seven years. There was no other vascular risk factor or family history.

Physical examination

On admission, his neurological examination revealed right peripheral facial palsy, right abducens palsy, and left hemihypesthesia, suggesting the presence of MGS. Besides, dysarthria, absent gag reflex, and positive bilateral Babinski's signs were also detected. The other cranial nerves and motor exam were normal. On admission, his blood pressure was 141/85 mmHg.

Laboratory testing

The laboratory tests showed elevated plasm cholesterol (7.83 mmol/L), glycosylated hemoglobin (9.0%), and homocysteine (15 μmol/L), and normal low density lipoprotein (1.4 mmol/L). For the routine blood test, his white blood cell was mildly elevated (10.63 × 10^9/L) and other items were normal.

Imaging examination

The chest X-ray film showed mild pneumonia. The parameters of MRI examination using a 3-Tesla system (Discovery MR750, GE Medical Systems, Milwaukee, Wis., United States) were as follows: MR angiography (MRA) (repetition time 21 ms; echo time 3.4 ms; slice thickness 0.9 mm), axial T2-weighted (repetition time 5838.7 ms; echo time 107.3 ms), axial T1-weighted imaging (repetition time 1800 ms; echo time 27.7 ms), axial diffusion weighted imaging (DWI) (repetition time 3000 ms; echo time 65.3 ms, b value 1000), and coronal fluid-attenuated inversion recovery sequences

(repetition time 7500 ms; echo time 121.1 ms). Brain MRI revealed acute multifocal infarctions in the pons, ventral medulla oblongata, right middle cerebellar peduncle, and left occipital lobe (Figure 1A-C). Brain MRA without contrast agent indicated the occlusion of the left vertebral artery and severe stenosis of the proximal right vertebral artery (Figure 1D). The high-resolution MRI with contrast enhancement showed luminal irregularities with eccentric periluminal hematoma, indicating the dissection of the basilar artery and left vertebral artery (Figure 2).

FINAL DIAGNOSIS

According to the typical symptoms, physical examination, and imaging findings, this patient was diagnosed with acute ischemic stroke presenting as MGS caused by VAD.

TREATMENT

The patient was given dual antiplatelet therapy with aspirin and clopidogrel, as well as rosuvastatin.

OUTCOME AND FOLLOW-UP

Nine days after his admission, he recovered significantly and was discharged from our department with mild residual right facial palsy and left hemihypesthesia.

DISCUSSION

MGS is caused by a lesion in the pons at the level of the facial nerve nucleus. This lesion involves the facial nerve nucleus, the abducent nerve, and the corticospinal tract. Clinical features include ipsilateral peripheral facial palsy, ipsilateral abducens paralysis, contralateral hemidysesthesia, and central hemiplegia caused by the lesion of the ventrolateral pons. To date, there are only five case reports of MGS due to cerebral infarction[1,7-10] (Table 1). One case was a 56-year-old male who presented with left lower facial paralysis and hemiparesthesia on the right side, and brain MRI revealed an acute infarct in the left ventral pons[1]. Another case was a 63-year-old man who presented with left hemiparesis and right facial paralysis involving the lower facial muscles and the orbicularis oculi but sparing the frontalis muscle. DWI indicated acute infarction in ventro-medial aspect of the medulla[7].

VAD has been found more frequently in patients with posterior circulation ischemic stroke[12]. MRA, a non-invasive technique for dynamic assessment of the cranial circulation, is routinely used in stroke work-up to detect arterial occlusion. In addition, high-resolution MRI has been used to explore vascular diseases, with good advantages in the diagnosis of the dissection, and it can help to give more information about the etiology of cerebral infarction[13,14]. By using the combined high-resolution MRI, we speculated that the acute multifocal infarctions were caused by the dissection of the basilar artery and left vertebral artery.

To the best of our knowledge, this is the first report on the coexistence of MGS and VAD in a young acute ischemic stroke patient. Our case raises the importance that the utility of high-resolution MRI with fat saturation might be a useful tool to early detect the dissection in posterior circulation ischemic stroke, especially in young patients.

CONCLUSION

For acute ischemic stroke in a young patient, artery dissection should be considered in clinical work. High-resolution MRI with fat saturation is an important and useful tool to early detect the dissection, especially in posterior circulation ischemic stroke. Further studies are needed to warrant the potential findings and applications of high-resolution MRI, black blood T2-weighted MRI (angiitis, branch disease, *etc*.), and fat-saturation MRI (dissections) in stroke differential diagnosis and follow-up.

Table 1 Characteristics of Millard-Gubler syndrome cases caused by cerebral ischemic stroke in the prior literature

Author	Time	Age, yr	Sex	Medical history	Physical examination	MRI	MRA	Others
Yasuda Y *et al*[9]	1993	60	Male	NA	Right peripheral facial nerve palsy, left hemiparesis, tongue deviated to the left, exaggerated deep tendon reflex, and equivocal left Babinski's reflex	Cerebral infarction in the right ventral pons	Occlusion of both vertebral arteries	
Matlis A *et al*[8]	1994	76	Male	Hypertension, ischemic heart disease, and type II diabetes mellitus	Slight dysarthria, peripheral right facial palsy, flaccid left hemiparesis, brisk left deep tendon reflexes, and positive left Babinski's reflex	Cerebral infarction in the right anteromedial pons	NA	
Onbas O *et al*[1]	2005	56	Male	NA	Left facial paralysis, right hemiparesthesia, and exaggerated deep tendon reflexes	Acute cerebral infarction in the left ventral part of the pons	Stenosis of the basilar artery	
Rose DZ *et al*[10]	2010	45	Male	HIV	Horizontal diplopia, left facial paralysis, and right hemiparesis	Acute cerebral infarction in the left pons	Unremarkable	MRSA meningo-vasculitis caused by the restricted diffusion of pus in the subarachnoid space
Ahdab R *et al*[7]	2013	63	Male	Diabetic and hypertensive	Right facial palsy involving the lower facial muscles and the orbicularis oculi but sparing the frontalis muscle and left hemiparesis	Acute cerebral infarction in the ventro-medial aspect of the medulla and limited to the right pyramid	Diffuse atherosclerotic changes of the basilar trunk with mild to moderate multisegmental narrowing, especially in the distal third	

MRI: Magnetic resonance imaging; MRA: Magnetic resonance angiography; NA: Not available; HIV: Human immunodeficiency virus; MRSA: Methicillin-resistant Staphylococcus aureus.

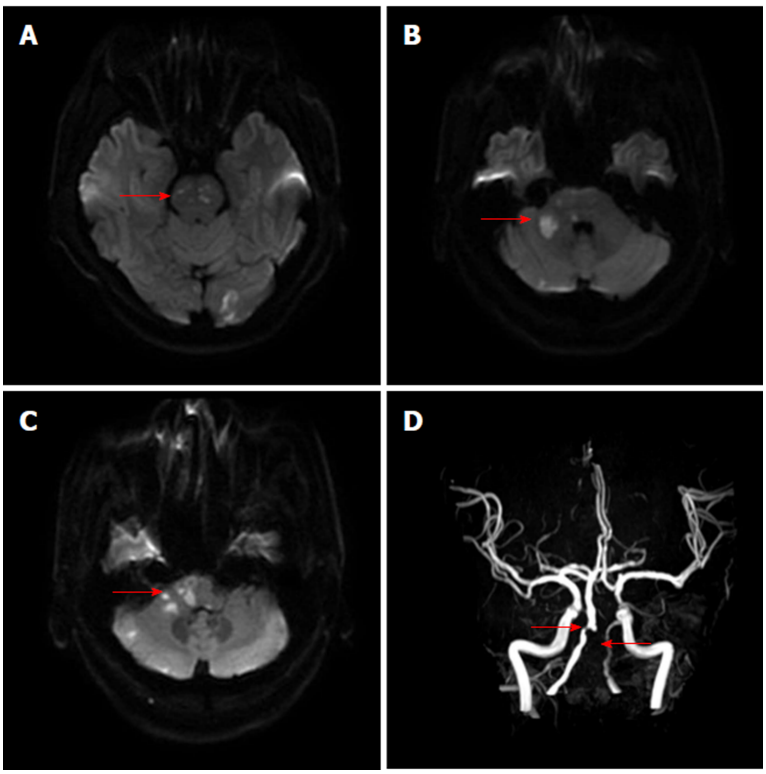

Figure 1 Brain magnetic resonance imaging and magnetic resonance angiography show multiple infarctions and occlusion and stenosis of the vertebral artery. A-C: Diffusion weighted imaging shows acute multifocal infarctions in the pons, ventral medulla oblongata, cerebellopontine angle, and left occipital lobe; D: Brain magnetic resonance angiography indicates the occlusion of the left vertebral artery and severe stenosis of the proximal right vertebral artery.

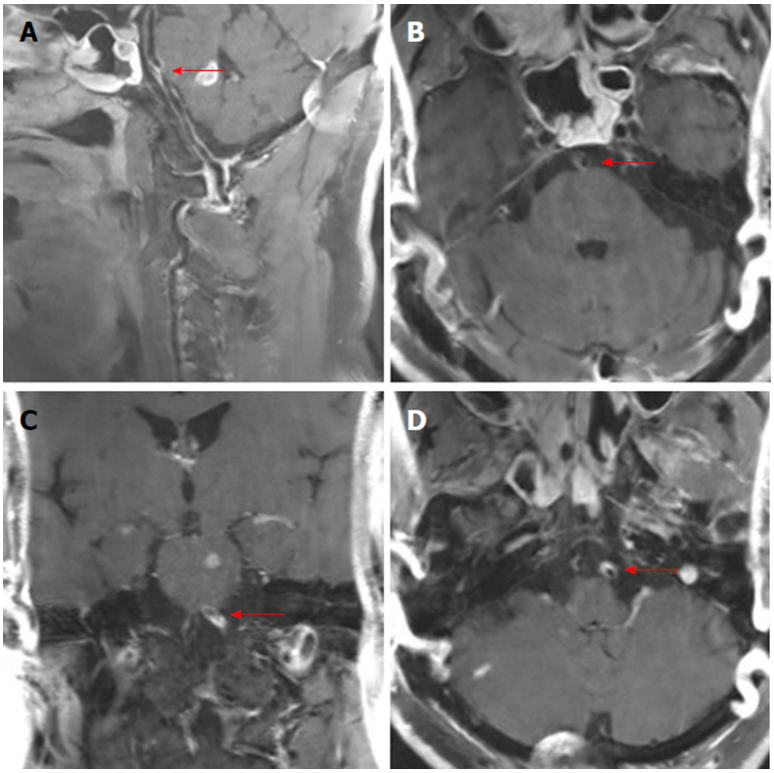

Figure 2 High-resolution magnetic resonance imaging shows the dissection of the basilar artery and left vertebral artery. A, B: The eccentric periluminal hematoma of the basilar artery; C, D: The eccentric periluminal hematoma of the left vertebral artery.

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