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SPONTANEOUS SUBCLAVIAN ARTERY DISSECTION CAUSING ISCHEMIA OF THE MEDULLA OBLONGATA AND CEREBELLUM

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□ **Abstract—Background: Spontaneous subclavian artery dissection is a rare etiology. Spontaneous artery dissection causing brain ischemia is rare in all ischemic strokes. However, in young to middle-aged patients with brain ischemia, spontaneous carotid or vertebral artery dissection causing ischemic stroke accounts for 10–25%. Case Report: A 58-year-old man with a history of hypertension presented to the Emergency Department with a sudden onset of left-arm paresthesia and numbness followed by symptoms of vertigo and vomiting. A neurological examination showed left-arm paresthesia, horizontal-rotational nystagmus, and left-side dysmetria according to a finger-to-nose test. Contrast-enhanced computed tomography showed left subclavian artery dissection. Diffusion-weighted imaging demonstrated hyperintensity in the left medulla oblongata and inferior part of the cerebellum. Why Should an Emergency Physician Be Aware of This?: Spontaneous artery dissection is an important etiology of ischemic stroke among young patients. Cervical magnetic resonance angiography is the gold standard for the diagnosis of arterial dissection. Cervical disc disease is a common etiology in a patient with neck and shoulder pain without cause or neurologic symptoms, when cervical MRI is negative, however, spontaneous subclavian artery dissection should be considered in the differential diagnosis when a patient, especially in a case of younger patient, presents with acute new-onset neck and shoulder pain followed by the onset of neurological symptoms.**

□ **Keywords—brain infarction; subclavian artery dissection; vertebral artery dissection**

INTRODUCTION

Subclavian artery dissection (SAD) is a rare condition usually associated with an anomalous aortic arch, trauma, or cardiac catheterization (1–3). Spontaneous arterial dissection accounts for 2% of all ischemic strokes (4). However, it is a major cause of brain ischemia in young to middle-aged patients without any risk factors associated with atherosclerosis (4,5).

CASE REPORT

A 58-year-old man presented to our Emergency Department via ambulance complaining of sudden left-arm paresthesia and numbness after the onset of left shoulder and neck pain. Shortly after the onset of paresthesia, he started to have vertigo and vomiting. He denied chest pain. On examination, he was alert and oriented. His blood pressure was 150/66 mm Hg in the right arm and 134/79 mm Hg in the left arm. His pulse was 72 beats/min. The left radial pulse was slightly weaker than the right. Left-arm paresthesia,

Informed consent was obtained from the patient for publication of this case report and accompanying images.

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horizontal-rotational nystagmus, and left-side dysmetria, according to a finger-to-nose test, were observed. The remainder of the examination was unremarkable. He was a smoker with a 68-pack-year smoking history. There was no history of trauma or neck manipulation. Electrocardiography displayed a normal sinus rhythm without any significant ST-T changes. Magnetic resonance imaging (MRI) of the brain 3 h after the onset of his symptoms demonstrated normal findings (Figure 1). Magnetic resonance angiography (MRA) of the head and cervical region (not including aortic arch) revealed the left vertebral artery to not be visible (Figure 2). Subsequently, we ordered a contrast-enhanced computed tomography scan of the chest and neck to rule out the aortic dissection, which was a possible cause of the pain and paresthesia at the left upper extremity. Computed tomography showed a dissection flap in the first part of the left subclavian artery at the intersection with the left vertebral artery, which was occluded (Figure 3A and B). A neurologist was consulted thereafter. We did not administer tissue plasminogen activator, and admitted him to the general ward for follow-up. On the second hospital day, his initial symptoms improved slightly; however, he reported a decreased left-side facial sensation, which had not been observed at the time of admission. His new symptoms were not observed on physical examination. We decided to follow up his symptoms. A second MRI study was planned on the next day. On the third hospital day, the left neck and shoulder pain suddenly recurred in the early morning.

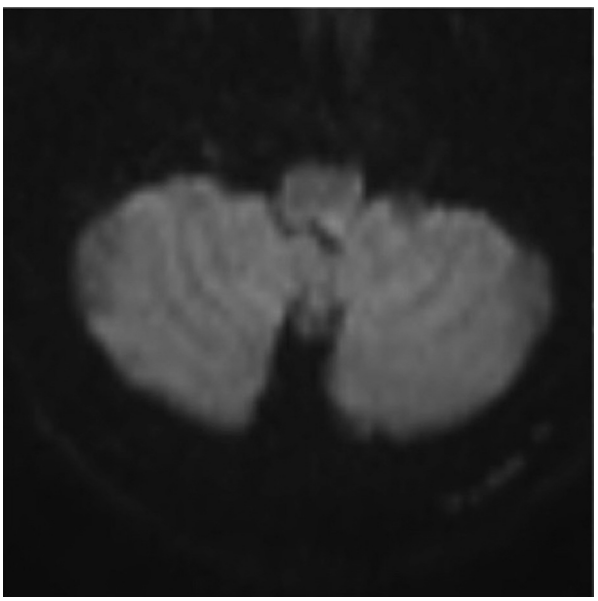

Figure 1. A diffusion-weighted image 3 h after the onset of the patient's symptoms is normal.

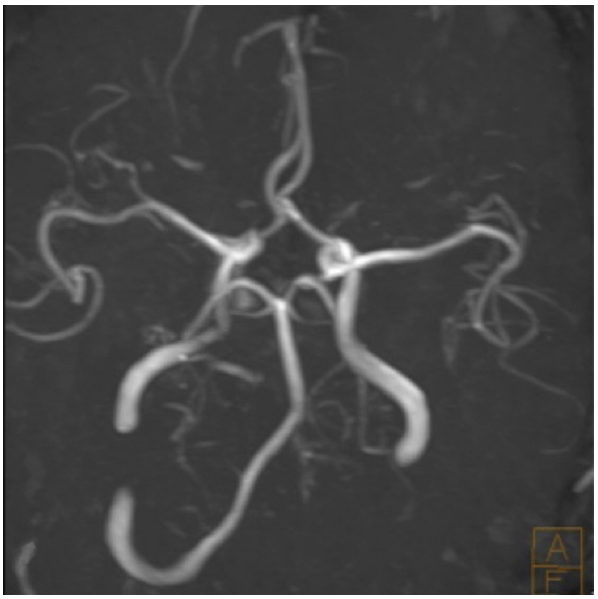

Figure 2. Magnetic resonance angiogram of the head and neck 3 h after the onset of the patient's symptoms shows an occluded left vertebral artery.

On examination, there were decreased pain and temperature sensations in the right-side trunk and limbs and the left side of the face, and the pulse in the left arm was weaker than in the right. Repeated MRI, obtained about 42 h after the onset, revealed a restricted diffusion area in the left medulla oblongata and the inferior part of the cerebellum (Figures 4 and 5). We considered that those symptoms were likely to be the result of an expanded dissection lumen. The cardiologist decided that no intravascular intervention or thrombolysis was needed. Blood pressure control without antithrombotic therapy was recommended. Continuous careful evaluation and monitoring of the patient's blood pressure are essential in the case of arterial dissection. At 1 month after admission, he was discharged with slightly decreased pain and temperature sensations in the right-side trunk and limbs, which completely disappeared when examined at both 1 and 3 months after discharge.

DISCUSSION

This cerebrovascular accident was caused by left spontaneous SAD into the left vertebral artery, which reduced the vertebral artery flow, resulting in ischemia of the medulla oblongata and cerebellum. The risks of atherosclerosis, which included current smoking and hypertension in this case, could have contributed to the narrow arteries of the brain. Flow-limiting stenosis or hypoplasia could have been present in the left vertebral artery, which was the risk of posterior circulation