Intracranial Vertebrobasilar Artery Dissection with Silent Rapid Progression

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Abstract

Purpose: Intracranial vertebrobasilar artery dissection (iVBD) is a potentially lethal disease, and progression of the dissected vessels is not uncommon. Our report is aimed at providing further clinical experience of the timing of follow-up vascular imaging or endovascular intervention in iVBD patients.

Case report: We report a case of iVBD with silent rapid progression. The 48-year-old woman presented as transient right limbs weakness. Brain MRI showed a small acute infarct over the left cerebellum, and MRA revealed a short segment of dissection over the left distal vertebral artery extending to proximal basilar artery. With no new clinical symptoms and signs, follow-up of vascular imaging within 1 week showed progressive critical narrowing of the dissected vertebrobasilar arteries. The blood flow of the vertebrobasilar system was restored by endovascular stenting.

Conclusion: iVBD might progress without clinical manifestations. Early follow-up of vascular imaging should be considered in the patients with high risk for progression.

Keywords: Vertebral artery, Basilar artery, Intracranial artery dissection, progression.

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INTRODUCTION

Intracranial artery dissection (IAD) is an important etiology of ischemic stroke and subarachnoid hemorrhage (SAH) in young and middle-aged people [(1)]. Despite optimal medical treatments, 2–14% of patients with unruptured IAD experience recurrent ischemic events [(2)]. Notably, patients with intracranial vertebrobasilar artery dissection (iVBD), especially those with basilar artery (BA) involvement, demonstrate unfavorable outcomes [(3)].

Despite the potential risk of progression of vascular dissection, there is no consensus about the optimal timing of follow-up imaging or endovascular intervention. In the pursuit of further clinical experience, we report the case presented with rapidly progressed iVBD without clinical deterioration. Informed consent was obtained.

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CASE REPORTS

A 48-year-old woman presented with sudden onset of right limbs weakness, which lasted 40 minutes and then completely subsided. Brain MRI and magnetic resonance angiography (MRA) on the same day showed a small, acute infarct in the left cerebellar hemisphere, a short-segmental high-grade stenosis of the bilateral distal vertebral arteries (VA), and mild stenosis of the proximal BA (Fig 1A, B). Aspirin, loading with 300 mg followed by a daily dose of 100 mg was given to the patient. Systolic blood pressure was well-controlled below 140 mmHg. Follow-up computed tomography angiography on day 5 showed progressive narrowing of the BA; however, the patient denied experiencing any symptoms. MRA on day 8 showed further progressive narrowing of the dissecting stenosis of the BA, associated with an aneurysmal formation at the left distal VA to the vertebrobasilar junction (Fig 1C). On day 12, digital subtraction angiography showed total occlusion of the left VA and nearly occlusion with trickle flow of the right distal VA and BA (Fig 1D). The patient remained symptom-free. A 4.532-mm LVIS® stent (MicroVention, Tustin, CA, USA) was deployed from the right distal VA to the mid-BA to restore BA blood flow (Fig 1E). Follow-up MRA after 5 months showed patency of the bilateral VA and BA (Fig 1F) and resorption of the intramural hematoma over the bilateral distal VA.

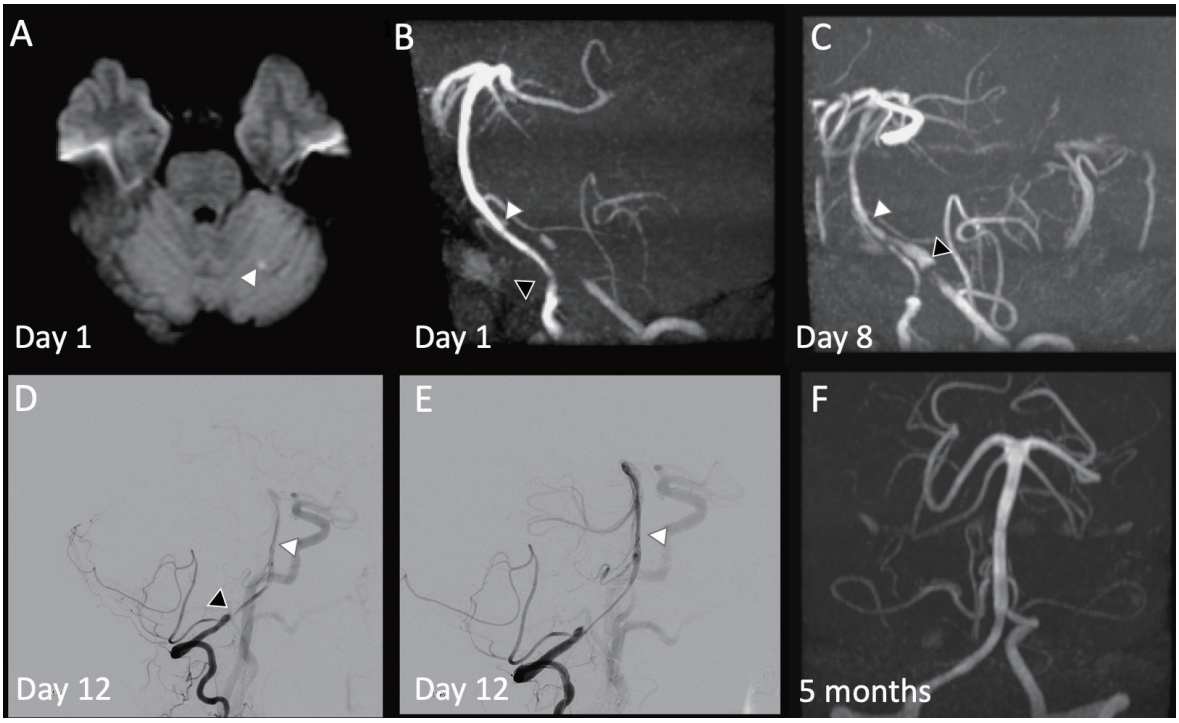

Figure 1. A: Diffusion-weighted imaging of the brain MRI showed a tiny acute infarct (arrowhead) at the left cerebellum. B: MRA of the brain showed short-segmental stenosis of the bilateral distal VA with proximal BA involvement (white arrowhead: VB junction; black arrowhead: dissecting stenosis of right VA). C: MRA of the brain showed progressive narrowing of the dissecting stenosis of the BA and aneurysmal formation of the left distal VA (white arrowhead: VB junction; black arrowhead: aneurysmal formation of the left distal VA). D: Digital subtraction angiography in oblique sagittal view showed trickle blood flow over the right distal VA and BA. (white arrowhead: BA; black arrowhead: right distal VA;)E: Post-stenting digital subtraction angiography in oblique sagittal view showed recanalization of the right distal VA to mid-BA with 60–70% residual stenosis. (arrowhead: restoration of BA flow after stent placement). F: Follow-up MRA of the brain 5 months after the endovascular intervention showed fair patency of vertebrobasilar system.
Abbreviations: MRI: magnetic resonance imaging, MRA: magnetic resonance angiography, VA: vertebral arteries, BA: basilar artery

DISCUSSION

We report a case of iVBD with clinically silent, but rapid progression of dissecting vessels within 1 week, which was successfully treated with endovascular stenting. Dissection involving posterior inferior cerebellar artery and BA have been identified as risk factors for progression in iVBD [4]. Our patient carried both risk factors for iVBD progression, despite trivial clinical symptoms. Close follow-up of the vascular image helped identify the silent progression of dissection, which led to the decision of further endovascular intervention. Stenting has been reported to be a technically feasible therapeutic option in treating cerebral artery dissection and can be considered in patients refractory to medical treatments [5].

In conclusion, iVBD might progress without clinical manifestations. Early follow-up of vascular imaging, even including high-resolution vessel wall imaging(HR-VWI), should be considered in the patients with risk factors for progression.

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