Case Reports

Spontaneous Dissection of Both Vertebral Arteries Diagnosed with Three-Dimensional T1-Weighted Image

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A 48-year-old woman spontaneously developed occipital pain, without any other neurological deficit. A brain magnetic resonance angiography showed narrowing, irregular dilatation, and aneurysmal formation in both the vertebral arteries (VA). According to these findings and the clinical course, we diagnosed the patient with spontaneous VA dissection. There was no finding suggesting cerebral infarction or subarachnoid hemorrhage. Three-dimensional T1-weighted magnetic resonance imaging performed 27 days after first onset of headache revealed a crescent-shaped high-intensity lesion in both the VA walls. These findings indicated that the lesions in both VAs were equally in the subacute phase. Follow-up three-dimensional T1-weighted imaging indicated that the high-intensity signals in both VAs disappeared at almost the same time. This case report presents imaging evidence showing that spontaneous dissection occurred simultaneously in both the VAs.

Key Words: Spontaneous vertebral artery dissection—Three-dimensional T1-weighted image—MRI—Cerebrovascular disease

Introduction

In some cases of vertebral artery (VA) dissection (VAD), bilateral lesions occur.[1] In contrast, simultaneous onset of bilateral spontaneous VAD has rarely been described; there are few reports showing imaging evidence of lesions in both the VAs. Here, we demonstrate a case of simultaneous bilateral spontaneous VAD diagnosed based on temporal changes in three-dimensional T1-weighted (3DT1) magnetic resonance imaging (MRI) findings.

Case Report

A 48-year-old woman spontaneously developed occipital pulsatile pain without any other symptoms. She had no history of cervical trauma. Her headache was continuous, with severe occipital pain recurring a few days after the first episode of headache. She visited our hospital 23 days after symptom onset. She had no obvious neurological symptoms apart from the headache. A brain magnetic resonance angiography showed narrowing, irregular dilatation and aneurysmal formation in both VAs (Fig 1,A) indicating spontaneous VAD. There was no evidence of brain parenchymal lesion. Spinal fluid analysis showed no abnormalities. 3DT1 MRI performed 27 days after onset revealed a crescent-shaped high-intensity lesion in both VA walls (Fig 1, B-D). T1 high-intensity lesions were observed in the intradural segment of both VAs, and there was no continuity of each lesion.

Follow-up 3DT1 performed 59 days after first onset revealed diminished high-intensity signals in both lesions (Fig 1, E); they were not observed in either VA 82 days after first onset (Fig 1, F).

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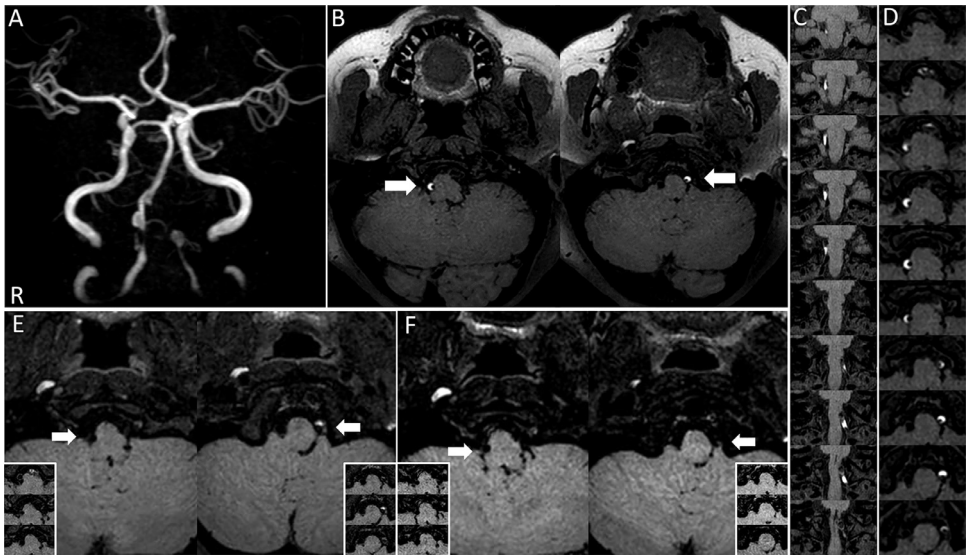

Figure 1. *Temporal changes in the brain magnetic resonance imaging (MRI) findings.*

The findings of brain magnetic resonance angiography (1.5T, SIGNA, GE Healthcare) performed 23 days after first onset indicated bilateral vertebral artery (VA) dissection (VAD) (A). A three-dimensional T1-weighted (3DT1) MRI (3T, Ingenia, Philips; TR400, TE29.26) 27 days after onset clearly showed crescent-shaped high-intensity lesion (arrow) in the bilateral VA wall (B). 3DT1 consecutive coronal views at 1-mm intervals (C) and axial views at 2-mm intervals (D) are shown. High intensity signals in both the VA diminished (arrow) 59 days (3T, Ingenia; TR584.95, TE32.53) (E) and disappeared (arrow) 82 days after onset (3T, Ingenia; TR584.95, TE32.72) (F). The insets are slices showing findings indicated by arrows and slices 4 mm apart from them rostrally and caudally.

R, right.

Discussion

T1-weighted imaging is useful to detect hematoma in the arterial wall in cases of dissection. T1 high-intensity signal can be observed from a couple of days to months after the onset of dissection.[2,3] In the present case, equal T1 high-intensity lesions in both VAs were observed and disappeared at almost the same time. These findings indicated that the dissections in both VAs occurred within a short period of time. This information is important to determine the ideal management of this condition.

Approximately, 15.6% of VA dissections present as bilateral lesions.[1] Simultaneous occurrence can be diagnosed in traumatic cases, because the onset period is clear.[4] Although bilateral spontaneous VAD associated with various pathological conditions is known,[5,6] few reports show the imaging evidence of simultaneous onset. In the present case, imaging evidence could be presented clearly through the use of 3DT1.

Conclusion

We demonstrated a case of simultaneous spontaneous dissection of both VA diagnosed by performing serial 3DT1. Altogether, this method is useful to diagnose the onset period of multiple arterial dissections.

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