Dissecting Aneurysm in the Proximal Region of the Posterior Inferior Cerebellar Artery Presenting as Wallenberg’s Syndrome

—Case Report—

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Abstract

A 29-year-old female presented with an unusual case of Wallenberg’s syndrome due to a dissecting aneurysm of the posterior inferior cerebellar artery (PICA) manifesting as a sensation of heaviness in the occipital region and vertigo. Magnetic resonance imaging revealed infarction of the lateral aspect of the medulla oblongata. Digital subtraction angiography (DSA) revealed a spindle-shaped dilatation of irregular contour in the proximal portion of the left PICA. Pooling of contrast medium was noted in the venous phase but no double lumen sign. A suboccipital craniectomy confirmed these findings macroscopically. Blood flow meter monitoring before and after proximal clipping of the diseased vessel ensured the safety of the procedure. Follow-up DSA 3 years after surgery revealed no evidence of aneurysm recurrence.

Key words: posterior inferior cerebellar artery, dissecting aneurysm, Wallenberg’s syndrome

Introduction

Wallenberg’s syndrome occurs most often in males in the 5th decade with underlying diseases such as hypertension, arteriosclerosis, and diabetes. Stenosis or obstruction of the vertebral artery and cerebral aneurysms are the most commonly associated vascular lesions. The first case of a dissecting vertebral artery aneurysm causing Wallenberg’s syndrome was reported in 1978, and another more recently. Here we describe a 29-year-old female with Wallenberg’s syndrome caused by a dissecting aneurysm in the proximal portion of the posterior inferior cerebellar artery (PICA).

Case Report

A 29-year-old female, previously in good health, was admitted to our hospital in October, 1989 with fever and a sensation of heaviness or pressure sensation in the occipital region. The occipital symptoms persisted and morning vertigo and vomiting developed after 72 hours. Numbness developed on the left side of the face, and thermo-hyperesthesia-hyperalgesia on the right side of the body.

She was of medium height and build, with a blood pressure of 150/100 mmHg and a body temperature of 37.2°C. Her consciousness was clear. There was no nuchal rigidity. Thermo-hyperesthesia-hyperalgesia of the entire right half of the body, numbness on the left side of the face, and decreased sweating were present. Laboratory examinations revealed a white blood cell count of 11,000/mm³ and C-reactive protein positivity (1+), but serological tests for syphilis and the coagulation profile were normal. Examination of the cerebrospinal fluid revealed no evidence of hemorrhage.

Head computed tomography on admission revealed no focal lesions above or below the tentorium cerebelli. Magnetic resonance (MR) imaging of the...
A tiny infarct lesion, 2 x 1 cm, in the dorsal aspect of the left medulla oblongata which appeared as a low-intensity area on T1-weighted images and a high-intensity area on T2-weighted images. No abnormalities were found in the cerebellum (Fig. 1). The diagnosis of Wallenberg’s syndrome was based on the above findings. The infarct satisfied the criteria for a type II lesion according to Hayakawa’s classification. Digital subtraction angiography (DSA) showed that the left vertebral artery was essentially normal, but a spindle-shaped dilatation with an irregular contour was observed in the region of the proximal portion of the left PICA. The periphery of the left PICA was fed by retrograde pooling from the hemispheric branch of the anterior inferior cerebellar artery (AICA). Pooling of contrast medium was seen in the venous phase but no double lumen sign was seen (Fig. 2). Magnified angiography of the left vertebral artery revealed similar findings, with the double-lumen sign absent. From the above findings, we hypothesized that ischemia had occurred at the periphery of a dissecting aneurysm in the proximal portion of the left PICA, especially near the lateral medullary branches, leading to infarction of the ipsilateral medulla oblongata.

She continued to improve with conservative management. On November 7, a left suboccipital craniectomy was performed. No adhesion of the arachnoid membrane or findings of subarachnoid hemorrhage were observed. The course of the left vertebral artery and the vascular wall contour were normal. The aneurysm involved the entire circumference of the artery at the origin of the PICA and the extremely narrow diameter distal portion adjacent to the aneurysm (arrow).

The postoperative course was unremarkable, without worsening of neurological signs or symptoms. Her chief complaints steadily disappeared day by day. Postoperative angiography demonstrated disappearance of the dissecting aneurysm and blood supply to the periphery of the PICA by retrograde flow in the left dorsal aspect of the medulla oblongata was monitored by a blood flow meter (thermal diffusion blood flow meter BTG-III; Biomedical Science, Ishikawa) during the operation. The regional cerebral blood flow (rCBF) before clipping was 18 ml/100 g/min. The artery was then clipped proximally. No marked changes in blood flow were recognized after clipping for 15 minutes. Since no dilatation of the dissecting aneurysm was seen after clipping, only proximal clipping appeared to be sufficient.

Fig. 1 MR images, revealing a low-intensity area in the dorsal aspect of the left medulla oblongata on the T1-weighted image (left) and a high-intensity area on the T2-weighted image (right).

Fig. 2 DSA, demonstrating a spindle-shaped dilatation in the proximal region of the left PICA (arrowhead) and retrograde flow in the PICA (arrows) (left), and a pooling image in the venous phase (arrowhead) (right).

Fig. 3 Operative photograph, showing the aneurysm involving the entire circumference of the artery at the origin of the PICA (arrowhead) and the extremely narrow diameter distal portion adjacent to the aneurysm (arrow).
flow via the AICA which was visible in the later arterial phase.

Follow-up DSA 3 years after surgery showed that the findings were unchanged from the previous study and no aneurysm was visualized (Fig. 4). She has now returned to her previous work.

Discussion

In our case, the dissecting aneurysm occurred in the proximal portion of the PICA which resulted in infarction in the lateral aspect of the medulla oblongata. Dissecting aneurysms, unlike occlusive disease of the cerebral blood vessels, develop most often in young adults. Stehbens\(^1\) reported the average age at onset is 27 years. This disease occurs more frequently in males than females (ratio 3:2).\(^9\)

Dissecting intracranial aneurysms may be associated with syphilis, trauma, arteriosclerosis, fibromuscular dysplasia, moyamoya disease, and Marfan’s syndrome. Our patient demonstrated none of these underlying risks. The natural history of dissecting aneurysms is apparently related to whether the lesion occurs in the anterior or posterior circulation of the circle of Willis. Lesions in the anterior circulation tend to present with ischemic symptoms while those in the posterior circulation are more likely lead to subarachnoid hemorrhage.\(^1,3,10,12\)

Surgical approaches for definitive treatment of dissecting intracranial aneurysms include proximal ligation (clipping), trapping, wrapping, coating, etc. Proximal ligation is generally considered to be the first choice.\(^9\) Trapping may be a necessary procedure for such aneurysms,\(^7\) but proximal ligation is enough to prevent aneurysm rupture. Moreover, the experience with proximal ligation is extensive and results have been favorable. We placed vascular clips at the origin of the PICA but no sharp bulging of the aneurysm wall due to retrograde blood flow occurred.\(^7\)

Clipping may result in aggravation of ischemia, so we monitored the rCBF by blood flow meter during surgery. This method measures changes in rCBF by the heat clearance method, and is reliable and widely applied clinically. The advantages of this method are easy use, continuous measurement, and non-invasiveness to cerebral tissue.\(^6\) This procedure allowed us to confirm the safety of the proximal clipping.

Tissue in the ischemic zone received retrograde blood flow from the AICA, as demonstrated by the postoperative angiography. Any thrombus formation in the lumen was therefore prevented, which would otherwise increase the risk for subarachnoid hemorrhage. Proximal clipping without obliteration of the aneurysm requires careful follow-up after discharge. Our patient remained under clinical observation for 3 years in the outpatient clinic. Recent follow-up cerebral angiography revealed no recurrence of the aneurysm and adequate blood flow to the periphery of the left PICA by retrograde pooling from the hemispheric branch of AICA.

Addendum

This case was presented at the 111th meeting of the Kanto Chapter of the Japan Society of Neurology held in December, 1989, Tokyo.

References


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