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Aneurysm Arising from the Distal Anterior Inferior Cerebellar Artery

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Abstract An aneurysm arising from the distal anterior inferior cerebellar artery is reported. The patient, a 66-year-old woman, was admitted to our hospital with vertigo, headache, nausea and vomiting. CT scan showed a high-density area in the right ambient cistern, quadrigeminal cistern and cerebellopontine angle cistern. A right vertebral angiogram revealed a saccular aneurysm at the distal portion of the right anterior inferior cerebellar artery. Surgery was performed 4 days after admission. The neck of the aneurysm was clipped via the suboccipital approach. Normal pressure hydrocephalus occurred during the postoperative course. Ventriculoperitoneal shunt was performed 4 weeks after the occurrence of subarachnoidal hemorrhage. Clinical features of aneurysms arising from the distal anterior inferior cerebellar artery are reviewed from the previous reports and a mechanism of formation and treatment modalities of the aneurysm are discussed in this study.

Key Words : Anterior inferior cerebellar artery, Cerebral aneurysm

Introduction

There have been 35 previous cases of aneurysm arising from the distal anterior inferior cerebellar artery (AICA)¹⁻²⁹. Most of these aneurysms were located on the cerebellopontine angle loop of the AICA. Here we report a case of aneurysm arising from the junction of the inferior hemispheric and superior hemispheric branches of the right AICA. Clinical features of aneurysms arising from the distal anterior inferior cerebellar artery are reviewed from the previous reports and a mechanism of formation and treatment modalities of the aneurysm are discussed in this study.

Case report

A 66-year-old woman experienced acute ver-

tigo, headache, nausea, vomiting and loss of consciousness on July 27th 1991. On admission as an emergency patient, she was drowsy and had nuchal rigidity, but there was no nystagmus, hearing disturbance or facial palsy. Computed tomography (CT) showed a subarachnoidal hemorrhage in the right ambient cistern, quadrigeminal cistern and cerebellopontine angle cistern (Fig. 1). Right vertebral angiography by the Seldinger method revealed a small aneurysm arising from the right distal AICA (Fig. 2). There was an anatomical variation with a common AICA and posterior inferior cerebellar artery (PICA) trunk on the right side. The aneurysm was oriented in a lateral-posterior direction.

Operation: On July 31, 1991, with the patient in the lateral park bench position, right suboccipital craniectomy and neck clipping of the aneurysm with coating of residual aneurysmal area were performed. A dumbbell-shaped aneurysm had arisen from the junction of the superior hemis-

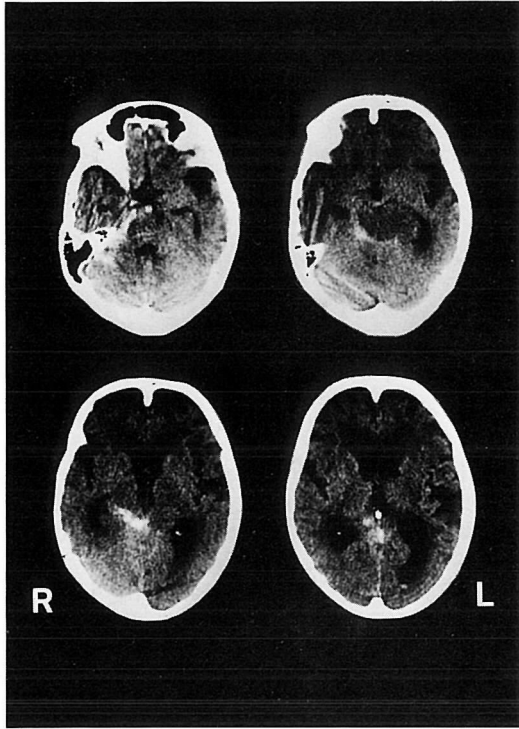


Fig. 1. CT showed a subarachnoid hemorrhage in the right ambient cistern, quadrigeminal cistern and cerebellopontine angle cistern.

pheric branch and inferior hemispheric branch of the right AICA, and existed in the horizontal cerebellar fissure (Fig. 3). The aneurysm had no relation to the 7th or 8th cranial nerve.

Postoperative course.

No additional neurological deficits were observed just after surgery. Disorientation to time and place and urinary incontinence appeared during the postoperative course. CT revealed ventricular dilatation with periventricular lucency. CT cisternography showed ventricular reflux and stasis of contrast medium over 24 h. Ventriculoperitoneal shunt for normal pressure hydrocephalus was performed 4 weeks after the occurrence of subarachnoid hemorrhage. Disturbance of consciousness (Japan coma scale I-3) and urinary incontinence cleared. Gait disturbance gradually improved to a degree sufficient to allow the patient to walk unaided at discharge.

Discussion

The frequency of aneurysm arising from

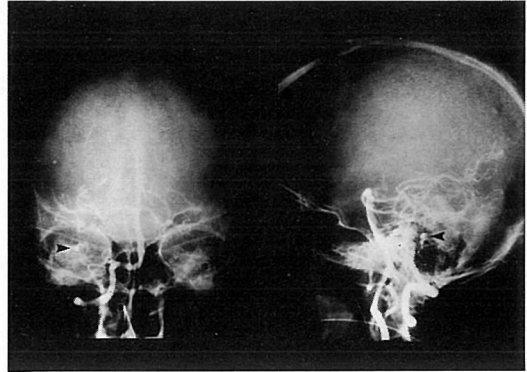


Fig. 2. Right vertebral angiography showed a small aneurysm arising from the distal anterior inferior cerebellar artery.

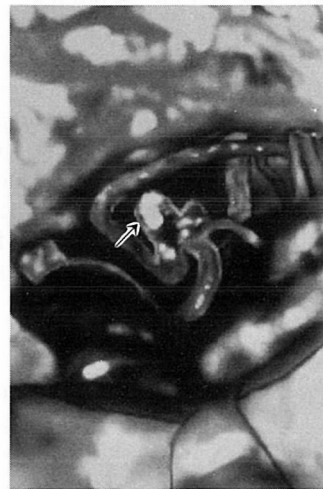


Fig. 3. Operative view. A dumbbell shaped aneurysm (arrow) arose from the junction of superior hemispheric branch and inferior hemispheric branch of the right anterior inferior cerebellar artery.

the distal anterior inferior cerebellar artery is 0.1-0.5% of all intracranial aneurysms¹⁹. Including the present case, there have been 36 cases of distal AICA aneurysm reported in the literature (Table 1). Age distribution of the patients is 20 to 72 yr. (peak age in the fifth decade). Females rather than males are easily affected.

The distal AICA aneurysm arise most frequently from the cerebello-pontine angle loop, occurring in 25 of the 36 cases (70%). Four cases of AICA aneurysm more distal to the cerebellopontine angle loop, including our

Table 1. Location of aneurysms at the anterior inferior cerebellar artery

Location	No. of cases
proximal to the CP angle loop	4
at the CP angle loop	25
distal to the CP angle loop (at the bifurcation of two hemispheric branches after the meatal loop)	5 (4)
unknown	2
total	36

CP: cerebellopontine

case, have been reported^{2,17,18}. The present aneurysm arose from the junction of the superior hemispheric and inferior hemispheric branches.

Generally, the mechanism of formation of a distal aneurysm involves both congenital and acquired factors. The former includes congenital defect of the media or a residual fetal artery, whereas the latter includes degenerative or inflammatory change in the arterial wall or hemodynamic stress on the wall. In the two cases reported previously, one was a mycotic aneurysm and the other was an aneurysm complicated with posterior fossa arteriovenous malformation^{2,17}. The mechanism of formation is inflammatory change in the former and hemodynamic stress the latter. Our patient had hypertension and arteriosclerosis, but no trauma or infection. Presence of a common trunk of the AICA and PICA is a congenital factor. The frequency of such a common trunk is 2%³⁰. The patient's aneurysm arose from the junction of the two branches, and its shape was saccular. Therefore, the main factor involved in formation of the aneurysm was thought to be congenital.

Clinical symptoms of ruptured AICA aneurysm include hearing disturbance, vertigo, tinnitus or facial palsy derive from disturbance of the 7th and 8th cranial nerves^{1,3,7,11}. Our patient had vertigo at the time of onset. An unruptured AICA aneurysm may show sudden onset, or may be manifested as recurrent hearing disturbance. If a patient has SAH with symptoms derived from the 8th cranial nerve, AICA aneurysm must be suspected.

The method of surgery for distal AICA aneurysm includes neck clipping, trapping

and coating. The AICA supplies the lateral part of the middle and lower thirds of the pons and the lateral upper third of the medulla oblongata. It has been reported that trapping of an AICA aneurysm initiated retrograde thrombosis in the proximal AICA and induced medulla or pontine infarction³¹⁻³⁴. There are anastomoses between the branches of the AICA and branches of the PICA and superior cerebellar artery, between the internal auditory artery and carotid artery. However, it is difficult to determine the extent of the anastomoses by angiography. Thus, neck clipping is the best choice. In our patient, the saccular part of the aneurysm was clipped and the remaining aneurysmal part was coated with Biobond-soaked cotton.

As to the prognosis of distal AICA aneurysm, morbidity is about 40%²⁹. Main neurological deficits are hearing disturbance and peripheral facial palsy. Mortality is low, because only 3 patients died among the 35 cases reported previously^{2,4,9}.

Conclusion

A case of aneurysm arising from the distal anterior inferior cerebellar artery is reported. The main factor involved in formation of the aneurysm was thought to be congenital. Clear vertebral angiography is necessary to find AICA aneurysm in patients with subarachnoidal hemorrhage in the cerebellopontine angle cistern and symptoms derived from the 8th cranial nerve.

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