Aneurysm of the Distal Anterior Inferior Cerebellar Artery

—Case Report—

Shunichi YOKOYAMA, Koki KADOTA, Tetsuhiko ASAKURA,
and Kazumasa KAWAZOE

Department of Neurosurgery, Faculty of Medicine, Kagoshima University, Kagoshima

Abstract

A 38-year-old female presented with vertigo, right hearing disturbance, and slight headache which were treated medically. However, she suddenly developed severe headache with vomiting and vertigo. Computed tomography revealed subarachnoid hemorrhage, and right vertebral angiography disclosed a rare aneurysm at the distal portion of the anterior inferior cerebellar artery. She underwent a right suboccipital craniectomy in the lateral position. The aneurysm could not be clipped because the aneurysm was tightly adhered to the brainstem, so it was trapped. Postoperatively, she showed slight VIIIth to Xth cranial nerve disturbances. Three months postoperatively, the IXth and Xth cranial nerve disturbances had disappeared, but the tinnitus and right hearing disturbance were still present. The initial symptoms were probably caused by minor bleeding from the aneurysm.

Key words: aneurysm, anterior inferior cerebellar artery

Introduction

Aneurysm of the distal portion of the anterior inferior cerebellar artery (AICA) is rare, with only 48 cases in the literature.^{4-24,27-32,34-40,42,44-47} The signs and symptoms in most cases were mainly due to VIIth and VIIIth cranial nerve disturbances. However, some patients with subarachnoid hemorrhage demonstrated associated minor bleeding prior to major aneurysmal rupture, generally manifesting as headache.

We report a case of aneurysm of the distal portion of the AICA associated with minor bleeding in a patient presenting with headache, vertigo, and hearing disturbance.

Case Report

A 38-year-old female noted vertigo, right hearing disturbance, and slight headache when she got up on the morning of October 8, 1989. She visited a local physician and was referred to an otolaryngologist.

She was treated medically and the symptoms improved. On November 19, she suddenly developed severe headache, vertigo, and vomiting. On November 20, 1989, she was admitted to the Department of Neurosurgery of Taraki Public Hospital, Kumamoto.

Computed tomography revealed subarachnoid hemorrhage in the cisterns around the brainstem, predominantly on the right. Right vertebral angiography disclosed an aneurysm at the distal portion of the AICA (Fig. 1). Her symptoms except for the headache improved within 1 day after admission.

She underwent a right suboccipital craniectomy in the lateral position on December 4, 1989. The saccular aneurysm was located near the proximal part of the VIIIth cranial nerve. The AICA bifurcated just distal to the aneurysm (Fig. 2). The aneurysm could not be clipped because the tight adherence of the aneurysmal neck to the brainstem precluded dissection. Her vital signs were unchanged after trapping the parent artery with temporary clips. Therefore, the proximal portion and one of the distal portions of the AICA were trapped with clips, and the other distal portion was coagulated. The aneurysm could not be excised for histological examination, again

Fig. 1 Right vertebral angiograms, anteroposterior (left) and lateral (right) views, showing an aneurysm at the distal portion of the AICA.

Fig. 2 Intraoperative photograph (left) and a sketch (right) showing the saccular aneurysm and the AICA.

because of the adherence to the brainstem.

Postoperatively, she showed hearing disturbance, tinnitus, dysphagia, hoarseness, and dysarthria. Postoperative angiography did not visualize the aneurysm or the distal part of the AICA. Three months postoperatively, the IXth and Xth cranial nerve disturbances had disappeared, but the right hearing disturbance and tinnitus were still present.

Discussion

The characteristics of aneurysm of the distal portion of the AICA are sometimes similar to those seen in other cerebellopontine angle diseases.^{8,13,19,22,30} The aneurysm in our patient was not diagnosed initially

because the headache at onset was very slight and associated with vertigo. Her physician therefore referred her to an otolaryngologist, and not a neurosurgeon. These initial symptoms could have resulted from minor bleeding or disturbance of the internal ear (Ménière's disease, etc.). However, neither tinnitus nor hearing loss were present, and a caloric test suggested that the vertigo was not caused by internal ear disturbance. Therefore, the initial symptoms probably were due to a minor leak from the aneurysm. This implies that an aneurysm can cause vertigo.

It is difficult to judge whether the postoperative cranial nerve disturbances were caused by infarction in the territory of the AICA or nerve manipulation during the operation. In our patient, the VIIth to Xth cranial nerves may have been disturbed at surgery. On the other hand, postoperative angiography did not visualize the distal portion of the AICA. Therefore, we consider that both infarction in the AICA territory and manipulation of the nerves were probably involved in the nerve disturbance.

Trapping of the AICA may cause deficits in the distal AICA territory. Infarction in the territory of the AICA may be associated with symptoms of vertigo, hearing loss, and cerebellar disturbance.¹⁻

Table 1 Summary of reported cases of intraoperative AICA obstruction

Author (Year)	Age/ Sex	Operation	Postoperative signs and symptoms
Schwartz (1948) ³⁹⁾	27/F	trapping	—
Poppen (1959) ³⁴⁾	35/M	AICA ligation	—
	27/M	AICA clipping	unsteady gait
	54/M	AICA clipping	character change
Hori et al. (1971) ¹⁷⁾	35/F	trapping	VIIth and VIIIth cranial nerve palsy
Drake (1975) ⁹⁾	28/F	AICA clipping	VIIth-Xth cranial nerve palsy, ataxia
Johnson and Kline (1978) ¹⁹⁾	54/M	AICA coagulation	VIIIth cranial nerve palsy
Higuchi et al. (1978) ¹⁴⁾	53/M	neck clipping	VIIIth cranial nerve palsy
Cantore et al. (1982) ⁵⁾	35/M	trapping	VIIth cranial nerve palsy
Kamano et al. (1986) ²¹⁾	58/F	trapping	VIIth and VIIIth cranial nerve palsy
Dalley et al. (1986) ⁸⁾	21/F	trapping	VIIIth cranial nerve palsy
Zager (1991) ⁴⁶⁾	25/F	trapping	Vth and VIIth cranial nerve palsy
Present case	38/F	trapping	VIIIth-Xth cranial nerve palsy

3,25,26,33,41,43) The mechanism and the resultant symptoms caused by obstruction of the AICA are more clearly understood than those of infarction in the territory of the AICA. Table 1 summarizes the signs and symptoms caused by surgical occlusion of the AICA.^{5,8,9,14,17,19,21,34,39,46} The most common sign was VIIIth cranial nerve disturbance, as occurred in our case, and all patients survived. Clearly, intraoperative AICA obstruction does not necessarily cause severe neurological deficits. In these patients, anastomoses must have been present between the AICA and posterior inferior cerebellar artery. However, such anastomoses are difficult to detect preoperatively by angiography, and consequently the safety of ligating the AICA cannot be predicted. Special attention should be paid to vital signs during temporary trapping of the AICA, proximal or distal to the aneurysm. When clipping of the aneurysm is not possible, another operative procedure, such as trapping, wrapping, or coating, should be selected.

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Address reprint requests to: S. Yokoyama, M.D., Department of Neurosurgery, Faculty of Medicine, Kagoshima University, 8-35-1 Sakuragaoka, Kagoshima 890, Japan.