Persistent hypoglossal artery associated with aneurysms

Report of two cases

NAMIO KODAMA, M.D., HIROO OHARA, M.D., AND JIRO SUZUKI, M.D.

Division of Neurosurgery, Institute of Brain Diseases, Tohoku University School of Medicine, Sendai, Japan

Two cases of persistent hypoglossal artery associated with aneurysm are presented. In one case the aneurysm arose from the anterior communicating artery and in the other from the persistent hypoglossal artery itself. Both aneurysms were treated successfully with direct surgery.

CASES of persistent hypoglossal artery associated with aneurysm are quite rare; only eight such cases have been reported. Recently we have seen two cases, both of which were successfully treated by surgery.

Case Reports

Case 1

This 48-year-old woman experienced sudden onset of severe headache on June 24, 1969. Lumbar puncture produced bloody cerebrospinal fluid (CSF). On admission on August 14, she was alert, but complained of a slight headache. A left carotid angiogram showed on the lateral view the internal carotid artery which divided into two vessels at the level of C-1. The anterior vessel was the internal carotid artery itself and a persistent hypoglossal artery lay posteriorly. At the same time an aneurysm was revealed on the anterior communicating artery (Fig. 1). A vertebral angiogram demonstrated hypoplasia of both vertebral arteries. On September 26, the neck of the anterior communicating aneurysm was ligated under hypothermic anesthesia of 26.5°C. About 1 month after the operation, the patient was discharged in good health.

Case 2

This 34-year-old woman had the acute onset of severe headache, and loss of consciousness on April 4, 1971. Lumbar puncture produced bloody CSF. On admission to our clinic 4 days later, she was drowsy, and had right hypoglossal nerve palsy. A right carotid angiogram showed almost the same picture as seen in Case 1, that is, the internal carotid artery lay anteriorly, and a persistent hypoglossal artery lay posteriorly. Just beyond the hypoglossal canal could be seen...
an aneurysmal shadow, 5 mm in diameter. Submentovertical views of the right carotid angiogram clearly revealed the shadow of the aneurysm (Fig. 2). On the right vertebral angiogram, hypoplasia of the right vertebral artery was seen. Right suboccipital craniectomy was performed on April 20, under hypothermic anesthesia of 26.5°C, and the persistent hypoglossal artery running out from the right hypoglossal canal was found with the aneurysm arising from it. The aneurysm was adherent to the right accessory nerve. After careful dissection, the aneurysmal neck was ligated successfully. Postoperatively, a carotid angiogram showed that there was no aneurysm shadow, and that the blood flow of the persistent hypoglossal artery was preserved (Fig. 3).

Fig. 1. Case 1. Lateral view of the left carotid angiogram (left), and diagram (right) showing an aneurysm of the anterior communicating artery, and a persistent hypoglossal artery (arrows).

Fig. 2. Case 2. Axial projection of the right carotid angiogram (left), and diagram (right). An aneurysm of the persistent hypoglossal artery can be seen.
Persistent hypoglossal artery and aneurysms

FIG. 3. Case 2. Axial projection of the right carotid angiogram (left), and diagram (right). Postoperatively, the aneurysm shadow is no longer visible.

Discussion

Including our two cases, there have been only 10 reported cases of persistent hypoglossal artery associated with aneurysm. In five of these cases the aneurysm arose from the persistent hypoglossal artery itself, in three from the internal carotid artery, in one from the anterior communicating artery, and in one from the superior cerebellar artery. Only two of the five aneurysms originating from the persistent hypoglossal artery itself were treated surgically.1,8 Udvarhelyi and Lai9 tried to ligate this artery but gave up the operation, as the circulation of the brain stem was almost entirely dependent upon its blood supply. Drake1 succeeded in exposing the aneurysm completely, but could not clip or ligate the neck of the aneurysm because of the large fundus and interference of cranial nerves around the aneurysm.

A persistent hypoglossal artery is a very important pathway for the brain-stem circulation because of the associated high incidence of hypoplasia of the vertebral artery. Therefore, every effort should be made to treat the neck of the aneurysm directly without disturbing the circulation of the persistent hypoglossal artery.

References


Address reprint requests to: Namio Kodama, M.D., Division of Neurosurgery, Institute of Brain Diseases, Tohoku University School of Medicine, 5-13-1, Nagamachi, Sendai 982, Japan.