Endarterectomy for atheromatous hypoglossal artery

Case report

CARROLL P. OSGOOD, M.D., JAIME A. MONTANEZ, M.D.,
ESIRI R. KARUNARATNE, M.D., AND DENNIS J. VANDEVANDER, P.A.

Departments of Surgery and Radiology, Altoona General Hospital, Altoona, Pennsylvania

A 57-year-old white man developed transient ischemic symptoms of the posterior circulation in August, 1981. Serial arteriography revealed stenosis of a large right hypoglossal artery which narrowed from 50% to 90% after only 2 months. The hypoglossal artery occurs in the 4-mm human embryo, normally from Days 21 to 26 of gestation. This is the first reported case of hypoglossal endarterectomy.

KEY WORDS □9 hypoglossal artery □9 rapid atheromatous stenosis □9 endarterectomy □9 vertebrobasilar circulation

The persistent hypoglossal artery is a rare form of carotid-basilar anastomosis. Gilmartin found two such cases in 2207 consecutive arteriograms, and Wiedenmann and Hipp found two cases in 7382 arteriograms. The hypoglossal artery develops normally in the 4-mm embryo as a temporary anastomosis between the two longitudinal neural arteries (primitive basilar artery) and the internal carotid artery. The artery regresses spontaneously in the 5.5-mm embryo as the first cervical segmental arteries fuse to become the caudal source of flow to the basilar artery. When the vessel persists it enters the posterior fossa via the anterior condyloid foramen; it is usually associated with hypoplasia of the vertebral arteries and, in some cases, with an aplastic vertebral artery on the ipsilateral side. In our case, the contralateral vertebral artery was hypoplastic as well. This is the first reported case of endarterectomy for symptomatic atheromatous hypoglossal artery stenosis.

Case Report

This 57-year-old Caucasian man was first seen in September, 1981, for complaints of episodic visual blurring, facial numbness, and dysequilibrium. Examination. The patient was revealed to be neurologically intact and normotensive. There was a loud right cervical bruit, and oculoplethysmography demonstrated a borderline right pulse lag of 11.7 m/sec. Arteriography at that time revealed a large right hypoglossal artery; this persistent artery was 50% occluded at its origin, as was the right internal carotid artery (ICA). The hypoglossal artery arose from the posterior wall of the ICA, 4 cm above the bifurcation, and supplied most of the posterior circulation (Fig. 1 left). The patient was followed medically for the next 2 months and took only aspirin, 300 mg every other day. In early November, 1981, his visual symptoms became worse and he became so unsteady and light-headed that emergency admission was required on November 8. He was placed on full-dose heparin. Repeat oculoplethysmographic testing showed an ominous 21.0 m/sec pulse lag on the right. A repeat angiogram was performed and, after only a 2-month interval, showed only marginal patency of the right hypoglossal artery (Fig. 1 center). Left vertebral arteriography showed that the contralateral vertebral artery was hypoplastic (Fig. 1 right).

Operation. A right hypoglossal endarterectomy was performed uneventfully on November 13, 1981. An unusually long, friable, ulcerated plaque was removed through separate arteriotomies above and below the 12th cranial nerve. This atheroma proved to be extremely thick and organized in many layers, with evidence of recent hemorrhage within its layers. A straight Silastic shunt was inserted into the hypoglossal artery, but not into the ICA. The patient’s visual symptoms, facial numbness, and ataxia have not recurred over a 10-month follow-up period, and repeat oculoplethysmography was within normal limits.
Comment

In 1969, Fukui and Kitamura reviewed 34 cases of hypoglossal artery in the literature. The anomaly was one-sided in all cases, and the incidence showed a male to female ratio of 11:18. Udvarhelyi and Lai presented the only known case of aneurysm on a persistent hypoglossal artery in 1963. In 1980, Pinkerton, et al., described the case of a 61-year-old man who developed symptoms of transient ischemia in both the carotid and vertebral basilar systems as a result of significant occlusion in the left ICA just proximal to the origin of a hypoglossal artery. In the case presented by Gilmartin, the clinical picture and angiographic findings were similar to those described by Pinkerton, et al., however, postmortem examination demonstrated areas of hemorrhagic infarction in the ipsilateral occipital lobe and cerebellar cortex. Interestingly, Begg had postulated several years earlier that a persistent hypoglossal artery would be of no clinical significance unless occlusive phenomena were to occur in the carotid system or within the hypoglossal artery itself.

Acknowledgments

The authors would like to thank medical photographers, Mr. Raymond Lund, Johns Hopkins University, and Mr. James Lusardi, Altoona Hospital, for their excellent technical assistance.

References

7. Wiedenmann O, Hipp E: [Abnormal communications between region of internal carotid artery and the basilar artery (carotido-basilar anastomoses).] Fortschr Geb Roentgenstr Nuklearmed 91:350-365, 1959 (Ger)

Manuscript received July 12, 1982. Accepted in final form January 10, 1983. Address reprint requests to: Carroll P. Osgood, M.D., Blair Medical Center, 501 Howard Avenue, Altoona, Pennsylvania 16601.