

A Case of Aneurysm of the Posterior Temporal Artery Branched from the Fetal Posterior Cerebral Artery

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ABSTRACT

The authors report a case of a ruptured saccular aneurysm located on the posterior temporal artery branched from the fetal posterior cerebral artery. This site of aneurysmal origin is extremely rare. The aneurysmal neck clipping successfully performed via a middle subtemporal route.

Key words: Cerebral aneurysm, Subarachnoidal hemorrhage, Posterior cerebral artery

Posterior cerebral artery (PCA) aneurysms are not commonly seen. They constitute 0.3 to 2.9% of all cerebral aneurysms^{15,16,18)} and 4.9 to 15.4 % of those of the vertebro-basilar system^{6,18)}. PCA aneurysms arise principally in two places, mainly at the origin of the first major branch around the midbrain, and at the junction with the posterior communicating artery⁶⁾. Twenty four cases of PCA aneurysms, which were located on the posterior branch from the pulvinar in the quadrigeminal cistern and located on the posterior choroidal artery, have been reported^{1,3-5,9-12,14,17,18,21-23,25-27)}. We are presenting a case of the posterior temporal artery aneurysm of an extremely rare site.

CASE REPORT

This 67-year-old woman with a medical history of hypertension suddenly experienced severe headache associated with restless confusion on November 4, 1985. She was transferred to Futami Central Hospital 3 hrs after the onset of symptoms.

At admission, she rapidly became semi-comatose and left hemiparesis was remarkable. Her blood pressure was 190/110 mmHg. There were no other abnormal signs on physical examination or laboratory data available. Computerized tomography (CT) on admission showed a high density area in the right suprasellar cistern and ambient cistern, through the right hippocampal gyrus, and into the right lateral ventricle and the 3rd ventricle with moderate ventricular dilatation. Bilateral common carotid angiograms and vertebral angiograms revealed no abnormal findings except for unrolling of the anterior cerebral arteries (Fig. 1).

After ventricular drainage was immediately undertaken, her consciousness improved to be som-



Fig. 1. Right common carotid angiography, lateral view, showing no aneurysm and unrolling of the anterior cerebral arteries.

nolent. A ventriculoperitoneal shunt was performed because of the remaining obstructive hydrocephalus 2 weeks after admission. On November 27, she again showed stuporous consciousness with left hemiplegia and became bedridden. CT at that time revealed a high density area in the right hippocampal gyrus and the right trigone of the lateral ventricle. On January 8, a repeated right carotid angiography demonstrated a saccular aneurysm of the right posterior temporal artery branched from the fetal PCA arising from the right internal carotid artery. The aneurysmal dome was persistently visible at the venous phase (Fig. 2). Her neurological symptoms gradually improved and she could ride in a wheel chair with the signs of left hemiparesis and disorientation remaining.

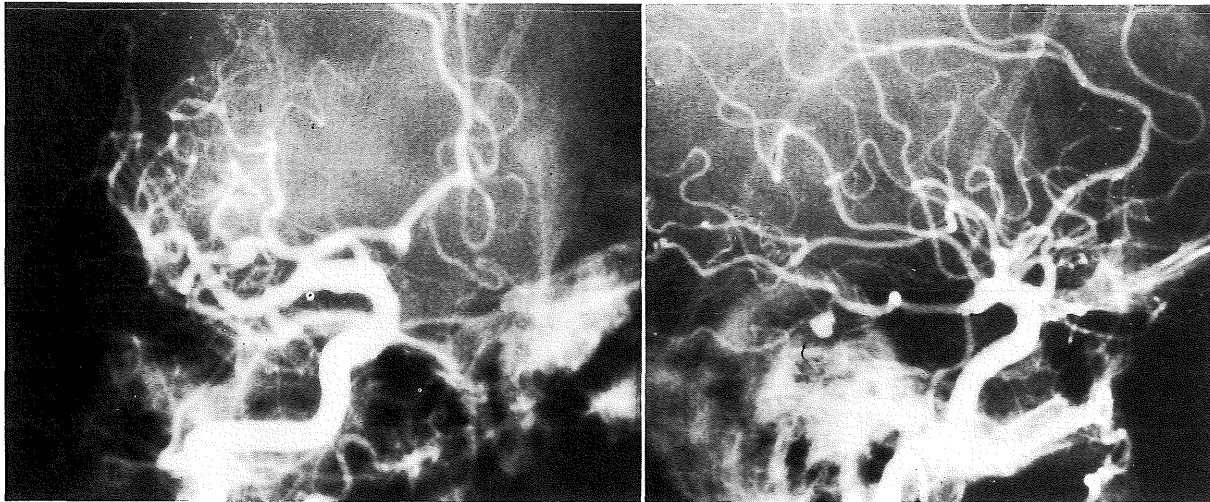


Fig. 2. Repeated right common carotid angiography, left oblique view (left) and lateral view (right), showing a posterior temporal artery aneurysm branched from the posterior cerebral artery.

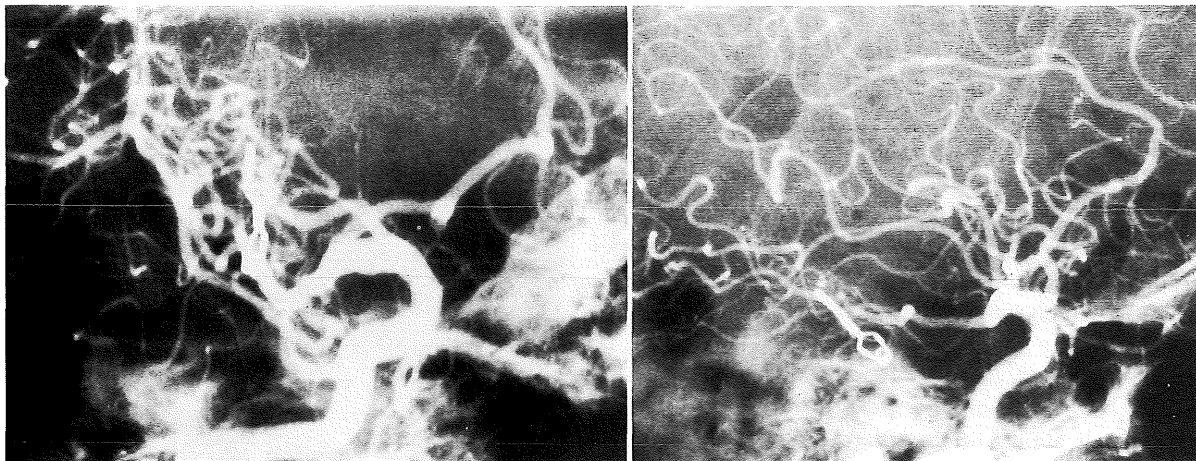


Fig. 3. Postoperative common carotid angiography, left oblique view (left) and lateral view (right), showing the aneurysmal neck clipping.

On April 15, she was placed in the left lateral position with head rotated downward. A right middle subtemporal approach was taken. After 20 ml of cerebrospinal fluid was aspirated from the reservoir of the shunt system, a right temporal craniotomy was performed. The medial subtemporal surface was lifted up and the tentorial edge was visible without adhesion. Then, the arachnoid membrane of the ambient cistern was torn off, and the trochlear nerve and the atheromatous PCA with several branching arteries were seen along the tentorial edge. After a temporary clip was placed on the proximal PCA, a part of aneurysmal neck was revealed distal to the PCA. As most of the dome was hidden into the parahippocampus, a small portion of the cortex around the aneurysm had to be sucked to expose the neck. A bayonet clip was placed on the neck perfectly. The surface of the aneurysmal dome was greyish white and seemed to

be hard.

Left hemiplegia and right mild oculomotor palsy appeared for several hours after the operation, but she recovered to the preoperative state on the next day without new neurological deficits. Right carotid angiography after surgery confirmed complete clipping of the aneurysmal neck and good patency of the posterior temporal artery (Fig. 3).

DISCUSSION

Aneurysms of the PCA are infrequent. When the location of the distal PCA aneurysms is limited to the distal branches over the PCA-posterior temporal artery junction to the occipital lobe, there are 17 reported cases^{3,5,9-11,13,17,18,21,25-27}. Of the aneurysms of the other cortical or terminal branches of the PCA, 7 had the aneurysm of the posterior choroidal artery^{1,4,7,12,14,22,23}. Nevertheless, no case with a posterior temporal artery aneurysm

like this case has been reported and seems to be extremely rare. Among these 24 cases, the distal PCA aneurysms were associated with moyamoya disease in 3 cases^{5,12,25}, and with arteriovenous malformation in 1 case⁴. There were 5 cases with bacterial aneurysm^{9,11,13,17,26} and 1 case with traumatic aneurysm³. In this case, there was no previous history of trauma, infection or heart disease. During the operation, atheromatous change was seen on the surface of the PCA. This presenting aneurysm was suspected to be of congenital origin.

The aneurysm was not shown at the time of the first cerebral angiogram, though the repeated angiography demonstrated it 2 months later. A very small protrusion of the posterior temporal artery on the first cerebral angiogram was found retrospectively to be correspondent with the site of the aneurysmal neck. The neck of this aneurysm was surmised to be small, as the aneurysm was still visible in the venous phase of cerebral angiogram. We considered that the lumen of the aneurysm was replaced with thrombosis at the time of the first rupture because of a narrow aneurysmal neck.

In the present case, the aneurysm was located on the right posterior temporal artery branched from the fetal-type PCA which was described to occur in 31.7 % of adult normal populations². There were a few reported cases of a PCA aneurysm arising from a fetal-type PCA^{10,20,21}. It seems that PCA aneurysms are not so frequently associated with vascular anomaly of the fetal PCA.

The PCA aneurysm is surgically approached via a pterional^{19,27}, subtemporal^{6,21,24} and occipital^{3,9,27} routes. The authors decided to use a right middle subtemporal approach, for the aneurysm existing at the posterior temporal artery branched from the PCA in the ambient cistern. Several attentions regarding head position, control of intracranial pressure, preservation of Labbe's vein, recognition of the feeding artery and sucking of the parahippocampus were necessary to carry the operative procedure. Trapping or proximal ligation of the PCA aneurysm has been described to be harmless because of abundant collateral circulation^{8,21,28}. On the other hand, Chang et al⁵ took a prudent attitude for this treatment. The authors found transient right mild oculomotor palsy and left hemiplegia of this case postoperatively, suggesting the ischemia of the thalamoperforating artery territory resulted from the temporary clipping. Left homonymous hemianopsia was not recognized just after the operation.

(Received March 18, 1988)

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