Dissecting aneurysms of the intracranial carotid system are uncommon compared with those of the vertebrobasilar system. Since the introduction of angiography, approximately 50 patients with dissecting aneurysms have been documented in the literature. Typical angiographic findings associated with cerebral dissecting aneurysms are irregular stenosis or occlusion of the affected artery. These findings suggest that temporary thrombosis of the pseudolumen may occur in the early stage. We report the extremely rare condition of a middle cerebral artery dissecting aneurysm with a persistent patent pseudolumen and discuss the possible mechanisms.

Case Report

This 60-year-old woman was hospitalized on April 16, 1991, because of abrupt speech disturbance and right hemiplegia. She had had several episodes of transient aphasic attacks during the 3 months prior to admission. Neurological examination on admission revealed total global aphasia and right hemiplegia.

Diagnostic Imaging Studies. Computerized tomography (CT) scanning on the following day showed a low-density area in the distribution of the left lenticulostriate arteries that had not been detected on admission. A left carotid arteriogram obtained on April 24 showed a definite double lumen, a true diagnostic sign of dissecting aneurysm, extending from the C3 segment of the intracranial internal carotid artery to the middle cerebral artery (Fig. 1A). Several left lenticulostriate arteries were absent, probably because they were involved in the dissecting aneurysm. The patient was carefully observed; however, because follow-up arteriograms obtained on May 29 and on June 24 still showed the patent double lumen, an operation was performed on July 3 to reinforce the aneurysm wall.

Operation. The aneurysm was exposed via the transsylvian approach. The assumed pseudolumen had discolored and weakened the arterial wall that corresponded to the angiographic lesion and extended longitudinally from the lateral aspect of the internal carotid artery to the M1 segment. To prevent bleeding, the wall was wrapped using dura mater.

Postoperative Course. The postoperative course was uneventful and there were no additional neurological deficits. The postoperative arteriogram obtained on July 29 still showed the double lumen (Fig. 1B). Interestingly, the pseudolumen became the dominant lumen. The patient recovered but still suffered from mild right hemiparesis. She was discharged on August 8, 1991 and was followed as an outpatient. Her activities of daily living improved to an independent state without episodic ischemic attacks. However, the follow-up arteriograms obtained 6, 13, 27, and 39 months after the onset of symptoms revealed persistent patency of both the true and false lumens (Fig. 1C and D).
Cerebral dissecting aneurysms present as either ischemic attacks or subarachnoid hemorrhages. The major documented angiographic findings associated with cerebral dissecting aneurysms are irregular stenosis with or without focal dilation, known as the “pearl and string sign,” or occlusion of the affected vessel. These findings are indirect signs suggesting a dissecting aneurysm. However, delayed retention of contrast medium in the partially thrombosed pseudolumen is noted as a relatively reliable sign supporting this diagnosis.

Angiographic “double lumen” is a definitive diagnostic sign of dissecting aneurysm. However, this sign is rarely encountered in either the carotid or vertebrobasilar system. This is probably because temporary thrombosis in the pseudolumen may occur immediately following dissection. However, the dissecting plane is assumed to be unstable and fragile in the early days.

This phenomenon is evidenced by the fact that change in aneurysmal configuration or rebleeding occurs with a particularly high frequency within 1 month following onset.

The majority of dissecting aneurysms may have a closed distal end or minimal reentry from the pseudolumen, leading to thrombosis in the early stage. In contrast, the pseudolumen remained patent in the present case, probably due to reentry with sufficient bypass flow.

To our knowledge, there was only one case report that suggested the occurrence of this rare condition prior to our report of the present patient. In that case, in which no angiographic information was obtained, a right middle cerebral artery dissecting aneurysm with patent double lumens was incidentally diagnosed at autopsy. Interestingly, both the true lumen and the pseudolumen were lined by endothelium. In the present case there is also a likelihood of endothelial formation in both lumens as the mechanism of maintaining the stabilized pseudolumen.

References

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