Spontaneous regression of an aneurysm at a nonbranching site of the supraclinoid internal carotid artery

Case report

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Aneurysms at a nonbranching site of the supraclinoid ICA are rare and can occur spontaneously or after trauma. The modality of treatment is an issue of controversy, and the natural history of these aneurysms has never been clarified, although prompt invasive surgery in the acute phase has been favored.

Case Report

History and Examination. This 22-year-old man with no history of cerebrovascular disease presented with loss of consciousness and blunt head trauma that had been incurred after drinking alcohol. Computerized tomography scanning revealed diffuse thick SAH (Fig. 1 left), but DS angiography failed to demonstrate a bleeding source (Fig. 1 right). Four days after presentation the patient became disoriented and aphasic, and results of three-dimensional CT angiography (Fig. 2 left) obtained on Day 6 postadmission and DS angiography (Fig. 2 right) obtained on Day 12 postadmission demonstrated an aneurysm protruding from the medial aspect of the left ICA, just proximal but unrelated to the branching site of the left anterior choroidal artery. Although the left anterior circulation was compensated by the right ICA via the anterior communicating artery and by the left posterior cerebral artery via the posterior communicating artery, single-photon emission computerized tomography studies exhibited poor cross flow, which made proximal occlusion with or without distal anastomosis unsuitable as a treatment.

Fig. 1. Left: Initial CT scan revealing SAH. Right: Digital subtraction angiogram obtained on the day of presentation, demonstrating no apparent abnormality.

Treatment. Endovascular treatment by performing stent placement or aneurysm trapping with a bypass was thought to be a potential therapeutic option, but the former method has not been officially approved for use in Japan and the latter was not accepted by the patient’s next-of-kin because of the considerable risks involved, especially given that the significantly invasive and risky surgery would have been performed during the vasospastic phase after SAH. Thus, treatment in this patient consisted of careful observation with meticulous control of blood pressure.

Posttreatment. Follow-up DS angiograms demonstrated a recanalized left anterior cerebral artery and a gradual decrease in the size of the aneurysm (Fig. 3) until its complete obliteration (Fig. 4). The patient was ultimately discharged with no neurological deficit, and a DS angiogram obtained...
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5 months later confirmed the disappearance of the aneurysm and the integrity of the cerebral arteries.

**Discussion**

We could not clarify whether the SAH in this patient originated due to spontaneous rupture of an existing aneurysm or trauma. The SAH might have occurred following spontaneous rupture of an existing aneurysm that had been too small to be visible on initial angiography—known as a blisterlike aneurysm—but had enlarged afterward. The configurational change of this type of aneurysm from blisterlike to saccular has been documented. In the present case the loss of consciousness and blunt head trauma were results of the SAH. On the other hand, the SAH might have occurred as a result of blunt head trauma. A DS angiogram obtained on Day 12 postadmission, which demonstrates stenosis extending distally and proximally to the aneurysm, may indicate a dissection with pseudoaneurysm formation or a vasospasm. No conclusion about the aneurysm’s origin can be deduced.

The spontaneous disappearance of traumatic pseudoaneurysms on the extracranial carotid arteries and arteries of the posterior circulation has been well documented, but the phenomenon rarely occurs on arteries of the intracranial anterior circulation and has never been reported on the supraclinoid ICA. Traumatic intracranial ICA aneurysms usually appear up to 3 weeks after an injury and are demonstrated not on initial but on subsequent angiography studies.

Various kinds of therapeutic approaches could have been considered in the present case, including direct surgical approach to the aneurysm, proximal occlusion of the parent artery with or without distal anastomosis, aneurysm trapping with a bypass, endovascular treatment with stent placement, and supportive observation. Although a direct surgical approach may have preserved the blood flow of the parent artery, the procedure carries a high risk of intra- and postoperative rupture. Spontaneous saccular aneurysms at this site that have been blisterlike initially and change their configuration afterward exhibit extremely fragile walls, and the aneurysm necks should be dealt with like blisterlike aneurysms, which have an extremely high risk of intra- and postoperative rupture.

Proximal occlusion with or without distal anastomosis is a cardinal treatment option for the traumatic type of aneurysm and an alternative for the spontaneous type, but poor cross flow precluded this choice in the patient in the present case. To perform the procedure safely, enough cross flow must be confirmed beforehand or subsequent severe ischemic sequelae will ensue. Although these common modalities of treatment were unsuitable in the patient featured in this report, we thought positive measures like endovascular stent placement or lesion trapping with a bypass were still feasible and could have been performed. Although we carefully observed the patient and he attained a remarkably good outcome, careful observation is not the single appropriate choice of treatment.

In previously published literature prompt surgical or endovascular treatment has been favored because of the sup-
posed poor natural history of the disorder.\(^3,5,10\) This view is based on data from small clinical studies, however, and there is a tendency for patients who undergo surgery to be less severely injured than those treated by nonsurgical means.\(^3\) A clinical study on the natural history of these aneurysms has not been performed. Associated with the difficulty in conducting such a study is the fact that 50% of traumatic lesions and almost all of the spontaneous type occur with rupture of the aneurysms,\(^1,4,6\) which makes it difficult to evaluate the risk of rupture.

To our knowledge the present case is the first report of an aneurysm at a nonbranching site of the supraclinoid ICA, which resolved completely with supportive treatment.

References


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