Angiographic Documentation of De Novo Aneurysm
—Case Report—

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Abstract

A 49-year-old female presented with a case of de novo aneurysm which was documented angiographically 10 years after the initial aneurysm rupture. The de novo aneurysm arose as a blister-like aneurysm from a previously normal location 7 years after the first ictus. The de novo aneurysm progressed to a saccular aneurysm and ruptured after another 3 years. We recommend late angiography in high-risk patients to prevent repeat ictus.

Key words: cerebral aneurysm, multiple, subarachnoid hemorrhage, de novo

Introduction

Rupture of a de novo aneurysm is rare. Several case reports and clinical studies of de novo aneurysms have been published, but the development of a de novo aneurysm has rarely been observed angiographically. We present an angiographically documented case of de novo aneurysm.

Case Report

A 49-year-old right-handed female developed subarachnoid hemorrhage (SAH) and was admitted to Showa University Hospital. She had a history of smoking and had had SAH 10 years earlier but denied any history of hypertension. She experienced sudden onset of severe headache associated with vomiting and was transferred to our hospital on April 9, 1983. Computed tomography (CT) revealed SAH, and four-vessel cerebral angiography revealed an aneurysm on the anterior communicating artery (AcomA) without multiplicity (Fig. 1). Frontotemporal craniotomy was performed, and the aneurysm was clipped. Following ventriculoperitoneal shunting, the patient recovered completely and was discharged on June 6, 1983.

She fell at home, striking the right temporal region on August 22, 1990. She experienced occipital headache following incident and was again admitted to our hospital. Neurological examination was normal, but CT revealed a right acute subdural hematoma. Cerebral angiography was performed to determine whether the previously placed vascular clip had been dislodged or new aneurysms had ruptured. Angiography confirmed the complete resolution of the AcomA aneurysm. However, an extremely small, blister-like aneurysm was discovered at the bifurcation of the left internal carotid artery (ICA) and

Fig. 1 Cerebral angiograms, anteroposterior (left) and lateral views (right), performed on April 9, 1983 demonstrating an aneurysm (arrow) on the anterior communicating artery, but no aneurysm on the left internal carotid artery.
Fig. 2 Cerebral angiograms performed on August 22, 1990 demonstrating complete resolution of the anterior communicating artery aneurysm, and a blister-like aneurysmal formation at the bifurcation of the left internal carotid artery and the posterior communicating artery (arrow) on the anteroposterior view (left), but the blister-like aneurysm is not prominent on the lateral view (right).

Fig. 3 Initial computed tomography scan on August 29, 1993 revealing subarachnoid hemorrhage.

Fig. 4 Cerebral angiograms, anteroposterior (left) and lateral views (right) demonstrating an aneurysm at the bifurcation of the internal carotid artery and the posterior communicating artery (arrow).

charged without neurological deficit.

She remained well until August 29, 1993, when she collapsed (lost consciousness) after the sudden onset of severe headache. She was transferred to our hospital with a Glasgow Coma Scale score of 14. CT scan revealed SAH (Fig. 3). Four-vessel cerebral angiography demonstrated an aneurysm at the bifurcation of the left ICA and the PcomA (Fig. 4). The aneurysm was surgically clipped. Mild left hemiparesis developed postoperatively because of vasospasm. However, the patient showed significant improvement and could walk by the time of discharge.

Discussion

This case documents the development and rupture of a de novo aneurysm over a 10-year period in a non-hypertensive woman. The aneurysm arose as a blister-like lesion at a previously angiographically normal location 7 years after the first ictus. Subsequently, this blister-like aneurysm progressed to a saccular aneurysm and ruptured after another 3 years. According to previous reports, de novo aneurysms are diagnosed after a mean interval of 11.4 years (range 2 to 34 years). The interval in the present case was similar.

Several cases of de novo aneurysms have been reported, but the causes of such aneurysms remain unclear. The rate of de novo aneurysmal formation is as low as 1.1%. However, de novo aneurysms are only one of several types of aneurysm that increase the risk of SAH by two to six fold, and are thought to have the same etiology as general cerebral aneurysm. All aneurysms are de novo at
some point in time. Although cerebral aneurysm is a risk factor for the formation of additional aneurysms, in most patients with a history of aneurysm and SAH do not develop additional aneurysms. Therefore, the question of which patients should undergo late angiography to confirm the presence of aneurysms must still be resolved. Most previous reports have supported the use of late angiography in high-risk patients,6-9,11,13) in one of four categories: a) patients less than 55 years old; b) patients with congenital conditions associated with aneurysms tend to form; c) patients with multiple risk factors and/or poorly controlled hypertension; and d) patients who have undergone surgery to treat ICA occlusion or who have angiographically proven infundibular dilatation at the bifurcation of the ICA and PcomA.2-11,13-16) The present patient was classified as category a).

The timing and frequency of late angiography should be decided after risk-benefit analysis because of the potential complications and expense associated with angiography. The recent use of noninvasive magnetic resonance (MR) angiography has markedly improved the imaging resolution of small cerebral aneurysms.1,12) MR angiography may be useful for late angiography in such cases. However, conventional angiography or digital subtraction angiography is still essential for diagnosing cerebral aneurysms, so must be performed if MR angiography detects abnormalities. However, a second ictus might be avoided if such blister-like de novo aneurysms are closely monitored. Further studies will determine when and how these aneurysms should be treated.

References


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