

Dissecting Aneurysm of the Posterior Cerebral Artery Masquerading as Saccular Giant Aneurysm

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ABSTRACT

The aneurysm nature and configuration in a giant aneurysm of the PCA is important and careful angiographic examination is needed. We present a case of dissecting aneurysm of the posterior cerebral artery masquerading as saccular giant aneurysm. A 17-year-old man presented with subarachnoid haemorrhage. Cerebral angiograms on admission showed a giant saccular aneurysm with wide neck at P1-P2 junction. The patient underwent endovascular coils embolization and extraventricular drainage of cerebrospinal fluid successfully. However, the patient was aggravated neurologically and got the rebleeding on postembolization 8 days. Repeat cerebral angiograms revealed dilated P1 segment with aneurysmal change of P2 segment. We report the angiographic feature and unusual clinical course and discuss the endovascular treatment of dissecting aneurysms. (*Kor J Cerebrovascular Surgery* 8:210-3, 2006)

KEY WORDS : Cerebral aneurysm · Endovascular treatment · Posterior cerebral artery

Introduction

Aneurysms of the posterior cerebral artery (PCA) represent approximately 1% of all intracranial aneurysms.⁵⁾⁹⁾¹¹⁾ These aneurysms have some peculiar morphologic features and present with specific clinical findings that distinguish them from aneurysms occurring at other anatomic locations of the intracranial circulation. These are younger than the average age of 50 to 60 years for aneurysms occurring at other anatomic sites.²⁾ Also, there is a higher incidence of large and giant aneurysms.³⁾ The most common presentation of PCA aneurysms is the subarachnoid haemorrhage (SAH).⁴⁾⁵⁾⁹⁾ The majority of these patients with SAH had a saccular aneurysm, but rarely a dissecting aneurysm. However, it is occasionally difficult to differentiate the dissecting aneurysm

from the saccular one in case of giant aneurysm.

This report illustrates the angiographical finding of a dissecting aneurysm of the PCA and summarizes the previous reports to discuss their peculiar clinical characteristics and treatments.

Case Report

A 17-year-old man presented to us with a sudden onset of severe headache, vomiting, and a decreased level of consciousness. His medical history was not significant for hypertension, infectious disease, heart disease, head injury, or intravenous drug use. A neurological examination showed the patient to be stuporous. His pupils were equal and reactive, and his motor power was weak in his right extremities. The results of routine laboratory testing showed no abnormalities; specifically, there was no evidence of a haematological disorder or infectious processes. Computed tomography (CT) of the head at admission revealed diffuse SAH with focal clot in the proximal left ambient cistern (Fig. 1). Cerebral angiography disclosed a giant aneurysm with wide neck at P1-P2 junction (Fig. 2). There was no evidence of arterial dissection including focal stenosis or dilatation.

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Endovascular placement of Guglielmi detachable coils (GDCs) was performed under general anesthesia and systemic heparinization. The adequacy of systemic anticoagulation was monitored by frequent measurements of

the activated clotting time (ACT). A baseline ACT was obtained prior to the bolus infusion of 3000 IU heparin, and hourly thereafter. The bolus infusion of heparin was followed by a continuous drip (1000 IU/hr), with the purpose of doubling the baseline ACT. The aneurysm was catheterized with a microcatheter (Tracker 18) and occluded with 14 GDCs. The final angiogram demonstrated some remnant of aneurysmal neck portion, but the procedure was terminated due to the high risk of parent lumen obstruction (Fig. 3). Subsequently, the patient underwent extraventricular drainage (EVD) of cerebrospinal fluid (CSF) via Kocher's point. The patient was slightly confused but was able to obey commands after the procedure. However, the patient was



Fig. 1. Initial computed tomographic scan showing diffuse subarachnoid haemorrhage with focal clot in the proximal left ambient cistern.

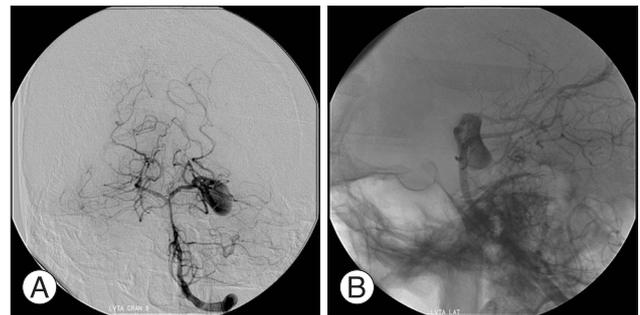


Fig. 2. Left vertebral angiograms, anteroposterior (A) and lateral (B) views, disclosing a giant aneurysm with wide neck at P1-P2 junction.



Fig. 3. Left vertebral angiogram obtained at immediate postembolization, anteroposterior view, showing some remnant of aneurysmal neck portion (arrow).

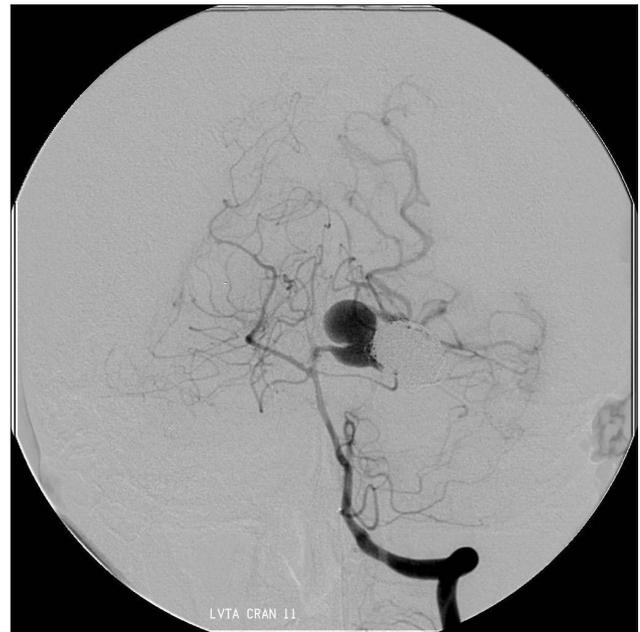


Fig. 4. Repeat vertebral angiogram, anteroposterior view, demonstrating dilated P1 segment with aneurysmal change of P2 segment.

suddenly semicomatous on postembolization 8 days. His left-sided pupil was fully dilated and non-reactive. Emergent CT scan showed massive SAH with intraventricular haemorrhage on the whole ventricle. Repeat cerebral angiograms revealed dilated P1 segment with aneurysmal change of P2 segment (Fig. 4). Parent artery occlusion was planned, but the patient was died on the day due to brain herniation.

Discussion

Aneurysms arising from the PCA have a predilection for the P1 and P2 segments. They have a higher incidence of large and giant aneurysms affecting the PCA. Drake³⁾ reported a 42% incidence of giant aneurysms and Yasargil¹²⁾ a 50% incidence of giant aneurysms. In a giant aneurysm, it is difficult to know the nature of the aneurysm (ie, saccular, fusiform, or dissecting) perfectly. In the giant aneurysm of our case, we initially mistook the dissecting aneurysm in nature for a saccular one and planned the inappropriate endovascular treatment option.

Dissecting aneurysms are diagnosed angiographically by a number of well-described patterns. Angiographic features were divided into the following four groups: “pearl and string sign” (corresponding to a fusiform dilation associated with proximal or distal narrowing), “string sign” (corresponding to an isolated irregular narrowing), “double lumen” (corresponding to the visualization of two channels), and fusiform dilation. The appearance in the subsequent angiographic studies of a change in the luminal configuration of the lesion is a complementary sign in support of the diagnosis of dissecting aneurysm as our case.¹⁾ CT angiography and MR angiography may have a role in follow-up of dissections, avoiding repeat angiography.⁶⁾ The natural history of dissecting aneurysms involving the PCA is not well-documented. However, in light of the evolution of the existing cases, it could be surmised that the dissecting aneurysms of the PCA is a relatively benign course compared with dissecting aneurysms occurring elsewhere in the posterior circulation. In the reviews by Pozzati et al.,¹⁰⁾ the outcome in three cases of isolated PCA involvement was good, compared to a good outcome in only 4 of 13 cases of dissection involving the vertebrobasilar system. However, our case had an aggressive clinical process and devastating

outcome.

Recently, endovascular treatment with GDCs is viable alternative of surgical treatment, especially in vertebrobasilar system.⁸⁾ Endovascular treatment with the GDC varies depending on the nature of the aneurysm, and its location along the different anatomic segments of the PCA. Saccular aneurysms can be treated effectively, by use of GDC, to obliterate the aneurysm yet preserve the parent artery. Fusiform and giant serpentine aneurysms of the PCA can be effectively be treated by permanent occlusion of the parent artery.²⁾ In a large series,²⁾ two of six aneurysms involving the P1-P2 junction were dissecting in nature and were the result of a major head trauma. These aneurysms were successfully underwent endovascular treatment with parent artery preservation. In a dissecting aneurysm with SAH, parent vessel sacrifice by GDC proximal to the aneurysm was also effective.⁷⁾ In these cases, thorough knowledge of the PCA segmental anatomy is crucial in order to select the site of occlusion and to avoid major neurologic deficits.

The aneurysm nature and configuration in a giant aneurysm of the PCA is important and careful angiographic examination is needed. Although neurologic deficits would be expected, parent artery occlusion would be considered as initial endovascular treatment method in case of dissecting aneurysm of P1-P2 junction. However, when underwent aneurysmal embolization with GDCs, repeat angiographic evaluation within a short period could be needed.

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