Ruptured True Anterior Choroidal Artery Aneurysm in Cisternal Segment

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INTRODUCTION

The anterior choroidal artery (AChA) originates from the posterolateral wall of the internal carotid artery (ICA), then passes through distal segments consisting of the cisternal and choroid segments, which are divided by a choroidal fissure. Among intracranial cerebral aneurysms, ICA–AChA aneurysms arising from the origin of the AChA account for 2%–4%. Distal AChA aneurysms, most of which are located in the choroidal segment and associated with moyamoya disease, also have been reported to cause intracerebral and intraventricular hemorrhaging. Herein, we report an unusual case of a ruptured proximal true AChA aneurysm in the cisternal segment that manifested as a pure subarachnoid hemorrhage (SAH).

CASE DESCRIPTION

A 58-year-old woman with diabetes mellitus and dyslipidemia presented with sudden headache and vomiting. On referral to us, findings of the neurologic examinations were normal. Computed tomography (CT) revealed a diffuse SAH corresponding to Fisher grade 2, with no intracerebral hemorrhage.

BACKGROUND: Rupture of a true anterior choroidal artery (AChA) aneurysm in the cisternal segment is extremely rare, whereas cases of a distal AChA aneurysm associated with moyamoya disease are increasingly reported.

CASE DESCRIPTION: A 58-year-old woman presented with a severe headache and vomiting. Computed tomography demonstrated a subarachnoid hemorrhage without intraventricular or intracerebral hemorrhaging. Cerebral angiogram findings revealed a proximal AChA aneurysm mimicking an internal carotid artery aneurysm at the origin of the AChA. Intraoperative findings demonstrated a ruptured aneurysm located on a bend of the proximal AChA in the carotid cistern. Neck clipping of the aneurysm with preservation of the AChA led to a good outcome.

CONCLUSIONS: A rare case of ruptured true AChA aneurysm in the cisternal segment, unrelated to moyamoya disease, is presented as a cause of subarachnoid hemorrhage.
or intraventricular hemorrhaging noted (Figure 1). On the basis of angiogram findings, we suspected a ruptured ICA aneurysm at the origin of the AChA on the left common carotid artery, although a gap was noted between the aneurysm and ICA (Figure 2).

We performed surgical clipping via a pterional approach. Intraoperative exploration showed that the aneurysm had arisen on the AChA itself, away from its bifurcation from the ICA (Figure 3). It was saccular without dissection and located on a bend of the AChA. The aneurysm was obliterated successfully by surgical clipping with preservation of the AChA, which was confirmed in postoperative angiogram findings (Figure 4). The patient was discharged without neurologic deficits, and postoperative CT demonstrated a transient low-density area in the left globus pallidus.

**DISCUSSION**

Aneurysms arising from the AChA itself have been reported as distal true AChA aneurysms. Inci et al. reviewed 25 reports of distal AChA aneurysm cases, including 2 of their own. A more recent review of 34 cases was presented by Dolati et al., which 5 additional cases have been reported. Most distal AChA aneurysms have been reported to occur beyond the angiographic plexal point and are accompanied by intracerebral and intraventricular hemorrhaging. The differences in hemorrhagic manifestations can be explained by the course of the AChA, which is divided into cisternal and choroid segments. Those in the former location predominantly cause SAH, whereas occurrence in the parenchymal or ventricular portion is associated with intracerebral and intraventricular hemorrhaging.

The surgical approach is dependent on location, with endovascular embolization used increasingly, especially for recent cases associated with moyamoya disease. A ruptured distal AChA aneurysm is associated closely with moyamoya disease, probably as the result of increased hemodynamic stress during development as a collateral vessel, whereas arteriovenous malformation, atherosclerosis, and hemodynamic alteration after arterial occlusion also have been reported as possible etiologies. The present case is unusual because the aneurysm arose from the proximal AChA itself in the cisternal segment, making it difficult to distinguish from an ICA-AChA aneurysm. Yasargil et al. described the same entity in a report of their experience with ICA-AChA aneurysms.

Reported etiologies of hemorrhagic manifestations of true AChA aneurysms in the cisternal segment include 1 case related to infection and 1 with an idiopathic etiology. In that latter report, Hung et al. presented a case of a ruptured aneurysm arising from the cisternal segment of the superior branch of the AChA that had a more distal location compared with ours. They obtained a good outcome by surgical clipping, despite sacrificing the branch of the AChA. In the present case, we preserved the main AChA trunk, although transient low density on CT findings was noted in the globus pallidus.

Although our patient presented with diabetes mellitus and dyslipidemia as atherosclerotic risk factors, the present case may be idiopathic, because increased hemodynamic stress to a bend of the AChA could not be verified because of the absence of main arterial occlusion and the small diameter of the AChA as the parent artery. The location in the present case was easily accessible; thus, we chose surgical clipping, which enabled accurate confirmation of the anatomical relationship between the AChA and aneurysm. Endovascular surgery may be suitable for more distally located aneurysms arising from a dilated AChA.
REFERENCES


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