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Aneurysm

Distal anterior choroidal artery aneurysms

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Abstract

Background: Distal AChoA aneurysms are quite rare. Only 12 operated cases have been reported in the English medical literature. Treatment of these aneurysms is also difficult because of their deep location, small size, and angioarchitecture.

Methods: The authors report 2 additional patients with aneurysms, arising from the distal AChoA and located within the temporal horn of the lateral ventricle. In the first patient, the aneurysm could also be visualized with CTA, which is the first demonstration in the literature.

Results: The aneurysms were explored and resected via a transtemporal/ventricular approach in both patients. One patient was discharged as neurologically intact and the other died because of severe vasospasm.

Conclusions: The conclusions drawn from our experience and a comprehensive review of the literature include the following: (1) A distal AChoA aneurysm should be considered in patients with isolated medial temporal intracerebral hematoma with intraventricular extension. (2) These aneurysms are frequently very small (<5 mm). Therefore, they cannot be detected on initial angiograms in some cases. (3) These small aneurysms cannot be usually clipped without sacrificing the parent artery. (4) Sacrificing distal AChoA (beyond the plexal point) does not usually cause any neurological deficit, but, whenever possible, this artery should be preserved.

Keywords: Aneurysm; Distal anterior choroidal artery; Surgery; Temporal horn

1. Introduction

Aneurysms of the AChoA mostly arise at the junction of the AChoA and the internal carotid artery and account for less than 5% of all intracranial aneurysms [7,21,41]. In particular, distal AChoA aneurysms are quite rare. In a large surgical series, including 1012 patients, there is no case with distal AChoA aneurysm [40]. To our knowledge, only 12 operated and 11 nonoperated cases have been reported in the English medical literature so far [1,2,4,9,11,15-20, 23,25,28,29,32,35,38,39,42]. Clinical findings and surgical approaches of distal AChoA aneurysms are different from proximal AChoA aneurysms. Their treatment is also difficult because of their deep location, small size, and angioarchitecture. We report 2 cases with a ruptured aneurysm originating from an intraventricular portion of the AChoA. In addition, we comprehensively review the literature related to these rare aneurysms, surgical anatomy of the AChoA, and potential approaches to the aneurysms within the temporal horn.

2. Case reports

2.1. Patient 1

This previously healthy 19-year-old woman was admitted with complaints of sudden severe headache, nausea, and vomiting on August 4, 2004. Her neurologic examination result was normal except for some slight confusion and neck stiffness. Computed tomography scans revealed a medial temporal intracerebral hematoma on the right side with an intraventricular extension.

Fluid-attenuated inversion recovery magnetic resonance imaging showed a small low-intensity area within the

Abbreviations: AChoA, anterior choroidal artery; FLAIR, fluid-attenuated inversion recovery; CTA, computed tomographic angiography; CT, computed tomography; MEP, motor evoked potential.

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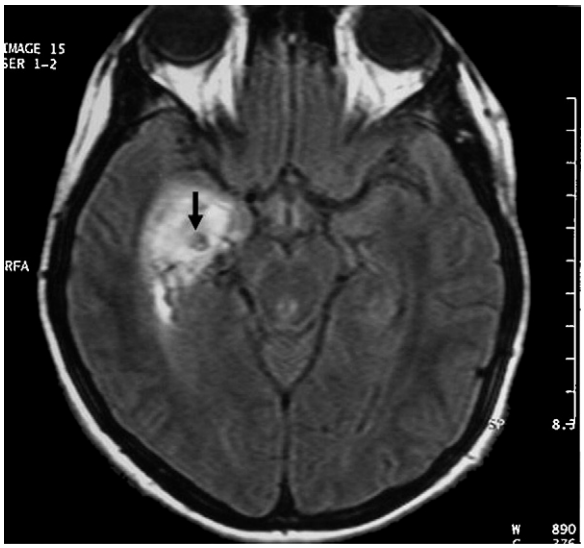

Fig. 1. Patient 1: FLAIR magnetic resonance image shows a small low-intensity area within the right medial temporal hematoma suggesting an aneurysm (arrow).

hematoma suggesting an aneurysm (Fig. 1). This small aneurysm could be demonstrated with CTA, but distal AChoA was not visualized (Fig. 2). Cerebral angiography clearly revealed a small aneurysm measuring 4 × 4 mm at a tiny branch of the right distal AChoA (Fig. 3). The aneurysm was located distal to the angiographic plexal point of the AChoA, indicating that it was located within the temporal horn. Early surgery was considered for prevention of rebleeding.

A right frontotemporal craniotomy including the temporal base was performed. The sylvian fissure and the carotid cistern were opened. The AChoA was explored and followed within the carotid and crural cisterns from the origin to the choroidal fissure. This was our first case of a

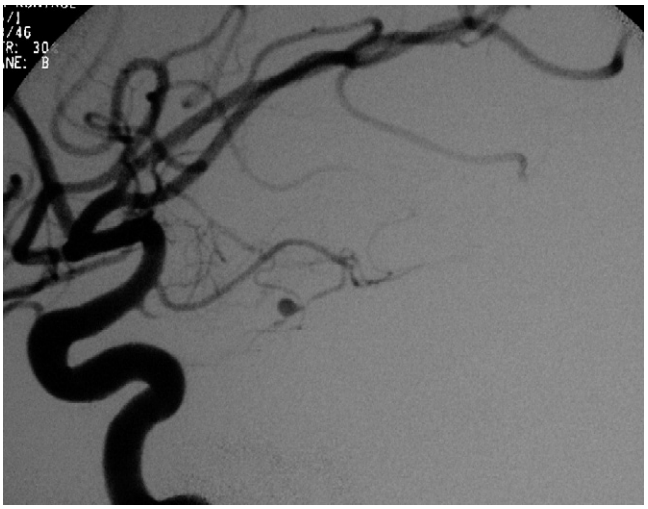

Fig. 3. Patient 1: Lateral view of the right internal carotid angiogram showing a small aneurysm at a tiny branch of the distal AChoA.

distal AChoA aneurysm. Therefore, this exploration was performed for proximal control at the most distal point of the cisternal segment, beyond the perforators of the AChoA. Thereafter, the temporal horn was entered via the inferior temporal gyrus (Fig. 4). After evacuation of the hematoma and partial resection of the choroid plexus, the aneurysm was found at the floor of the temporal horn in the subepandymal layer. It was located at a tiny intraventricular branch of the distal AChoA. The total circumference of the aneurysm was carefully exposed, but attempted applications of a mini clip to the neck resulted in occlusion of the tiny parent artery. Therefore, the aneurysm was resected after the tiny parent artery was trapped with preservation of distal AChoA. The incision was closed in the usual fashion. Control angiography performed 1 day after surgery confirmed the complete

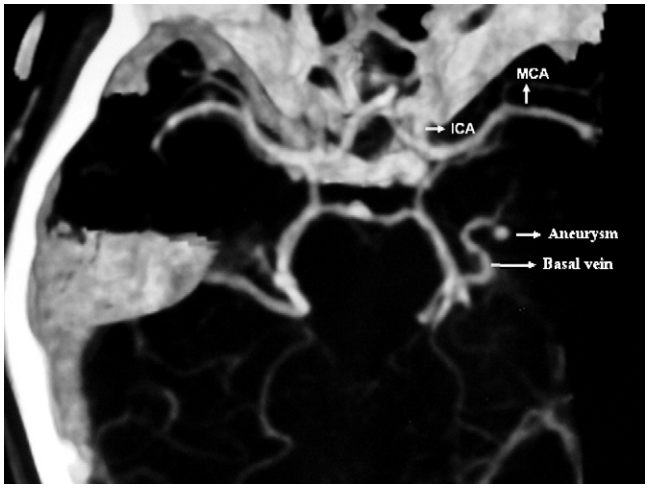

Fig. 2. Patient 1: Computed tomographic angiography demonstrates distal AChoA aneurysm. This is the first demonstration in the literature. In this study, AChoA itself could not be visualized because of the small size.

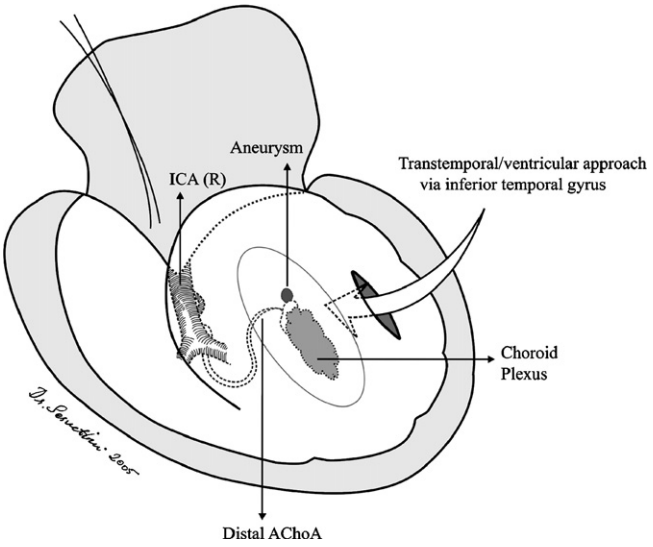

Fig. 4. Patient 1: Schematic drawing showing transtemporal-ventricular approach to a distal AChoA aneurysm.