Case Report

A case of angiographically occult, distal small anterior inferior cerebellar artery aneurysm

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Abstract

**Background:** A small aneurysm at an unusual location, such as a distal anterior inferior cerebellar artery (AICA) aneurysm, may conceal as a computed tomography angiography (CTA) and digital subtraction angiography (DSA)-occult aneurysm.

**Case Description:** We herein present the case of a patient suffering from a subarachnoid hemorrhage (SAH) with two aneurysms in which the AICA aneurysm was negative by CTA and DSA. CTA demonstrated a right anterior choroidal artery aneurysm, which was revealed to be an unruptured aneurysm after surgical exploration. A small distal AICA aneurysm was detected by 3D rotational angiography (3DRA). The patient fully recovered except for left-side hearing loss four months after the second operation.

**Conclusion:** We recommend a meticulous diagnosis by 3DRA in patients with SAH in which the distribution is not coincident with a typical aneurysmal location.

**Key Words:** Distal anterior inferior cerebellar aneurysm, diagnosis, subarachnoid hemorrhage, 3D rotational angiography, 3D computed tomography angiography

INTRODUCTION

A distal anterior inferior cerebellar artery (AICA) aneurysm is relatively rare, and is estimated to comprise approximately 1–2% of all intracranial aneurysms.[1–3,5,10,11] The standard examination for aneurysmal detection is converting digital subtraction angiography (DSA) into 3D computed tomography angiography (3DCTA), as an aneurysm is easily and less invasively depicted with 3DCTA. However, a small aneurysm in a peripheral location may commonly be missed on 3DCTA.[6] To our knowledge, this is the first report demonstrating that a distal AICA aneurysm that was invisible on 3DCTA and 2D DSA, and that was confirmed by 3D rotational angiography (3DRA).

CASE REPORT

A 71-year-old male was transferred to our hospital with severe headache. A computed tomography (CT) scan showed subarachnoid hemorrhage (SAH), the distribution of which was dominant in the left side and relatively localized in the posterior fossa [Figure 1a]. CTA demonstrated a 4 mm aneurysm with blebs in the direction to the left side in the right anterior choroidal artery (AChA) [Figure 1b]. Based on a magnetic resonance image performed at a previous hospital, the AChA aneurysm was thought to be a ruptured aneurysm [Figure 1c]. The aneurysm was surgically explored, but was found to be an unruptured aneurysm. DSA and subsequent 3DRA were performed. A small
aneurysm measuring 1 mm in maximum diameter was depicted with 3DRA at the meatal segment of the left AICA [Figure 2a]. The AICA aneurysm was not noted by 2DDSA [Figure 2b]. The aneurysm was completely clipped, preserving the AICA main trunk, but the internal auditory artery that divided from the aneurysmal dome was difficult to preserve [Figure 2c and d]. The patient has improved without any complications due to vasospasm, except for postoperative deafness on the left side.

**DISCUSSION**

Although the incidence of distal AICA aneurysms varies,[1‑5,7,10,11] because they are often described as a locational minority, more than 150 cases of distal AICA aneurysms have been reported in the literature since the first report described a distal AICA aneurysm in 1948.[8] Approximately 90 cases of distal AICA aneurysms were described until 2004, including large series and a review, with 56 cases reported in a review by Yamakawa et al.[10] and 34 cases in a review by Gonzalez et al.[2] As the radiological diagnostic technology has improved, particularly after the application of 3DRA or multi-row high resolution CT, the detection rate has increased dramatically, resulting in more than 60 reported aneurysms during past 10 years.[1,4,5] Peripheral aneurysms in the posterior circulation are therefore not as rare as was previously thought. Rodríguez-Hernández et al.[7] have described that distal AICA aneurysms were observed in 9 cases (22.5%) of all patients with peripheral aneurysms in the posterior fossa, but represented only 0.6% of the total of 1669 aneurysms. The opportunity to encounter a distal AICA aneurysm is still a relatively rare clinical experience.

The diagnosis for a small peripheral aneurysm commonly requires careful investigation during radiological examinations. Especially if the aneurysm is small (<3 mm), the aneurysm may be defined as an angiographic occult aneurysm, or as a CTA-occult aneurysm.[6] Two cases of AICA aneurysms, both of which measured 6–7 mm in size, have been described as angiographic-negative aneurysms at the initial DSA procedure, and were subsequently revealed during second angiography study.[11] Even when the size of the aneurysm is not small, a DSA-occult aneurysm may be present at the peripheral AICA territory. In our case, both a 1.0 mm very small aneurysmal size and the rare distal AICA location contributed to misreading the ruptured site. Recent studies reported by van Rooij et al.[9] showed that 3DRA is a powerful modality to reveal small aneurysms. In the present study, 3DRA was retrospectively warranted after CTA, because the bleeding pattern was in concordance with an aneurysmal configuration.

**CONCLUSION**

3DRA is desirable to detect a small peripheral aneurysm when the distribution of SAH is not in agreement with the aneurysmal location. A distal AICA aneurysm is a relatively rare aneurysm, but such a possibility has to be taken into consideration when making a differential diagnosis, especially if the SAH is observed in the posterior fossa.
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