CASE REPORT

Nagoya J. Med. Sci. **77**. 307 ~ 313, 2015

A CASE OF RUPTURED INTRAMEATAL ANEURYSM SUCCESSFULLY TREATED WITH COIL EMBOLIZATION

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ABSTRACT

Aneurysms within the internal acoustic canal are rare. We report the case of a 71-year-old female with subarachnoid hemorrhage resulting from a ruptured distal anterior inferior cerebellar artery which was not detected on initial radiological examination. A second rupture was detected by contrast-enhanced computed tomography and successfully treated by endovascular coil embolization. The patient recovered without neurological deficits. To the best of our knowledge, this is the first report of an intrameatal aneurysm treated by endovascular coil embolization. We suggest endovascular coil embolization as an alternative to open surgery, even in cases of deep intrameatal aneurysm.

Key Words: coil embolization, endovascular treatment, intrameatal aneurysm, subarachnoid hemorrhage

INTRODUCTION

Aneurysms of the anterior inferior cerebellar artery (AICA) within the internal acoustic canal (intrameatal aneurysms, IMAs) are exceedingly rare. During our literature search, we found only 18 cases.[1-17] Most have presented with subarachnoid hemorrhage (SAH) combined with seventh and/or eighth cranial nerve palsy. All previously reported cases were treated by direct open surgery, which often resulted in postoperative seventh and/or eighth cranial nerve palsy.[1, 3-9, 12-17] We report a case of ruptured IMA successfully treated without complication by endovascular coil embolization.

CASE REPORT

A 71-year-old female presented with severe headache of sudden onset. She had been previously diagnosed with a left internal carotid artery (ICA) aneurysm, 3.1 mm in diameter, in our hospital using three-dimensional (3D) CT angiogram or MR angiogram and was monitored as an outpatient every 6 months. At present, initial CT scan showed diffuse SAH predominantly in the left Sylvian fissure and left ambient cistern. Digital subtraction angiography (DSA) showed that the ICA aneurysm had grown to 3.5 mm in diameter. Rupture of this aneurysm was diagnosed, and she underwent an emergency endovascular coil embolization. Post-embolization DSA of the left vertebral artery showed no vascular lesion (Fig. 1); the patient exhibited no neurological

Received: October 10, 2014; accepted: December 12, 2014

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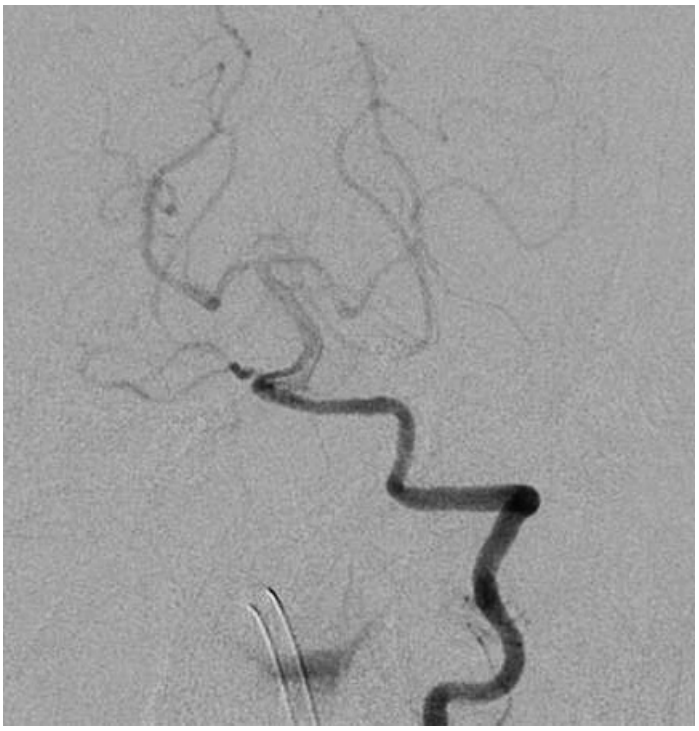

Fig. 1 DSA of the left vertebral artery showing no vascular lesion

deterioration. However, 14 days after admission, the patient again complained of sudden-onset severe headache. A CT showed diffuse bleeding in the subarachnoid space, predominantly in the left posterior cranial fossa, and contrast-enhanced CT revealed aneurysmal dilatation in the left internal acoustic meatus (Fig. 2). Subsequent DSA of the right vertebral artery revealed an aneurysm of the left distal AICA (Fig. 3), and 3D DSA revealed a left AICA dissecting aneurysm with the 'pearl and string' sign (Fig. 4).

This AICA aneurysm was treated with endovascular coil embolization. Under local anesthesia, a 6-French short sheath was inserted into the right brachial artery and a 90-cm 6-French Envoy (Cordis; Johnson & Johnson, Fremont, CA, USA) was advanced into the right vertebral artery as a guide catheter. An Echolon-10 microcatheter (eV3 Covidien; Irvine, CA, USA) was then navigated into the aneurysm with a 0.014-inch microguidewire (CHIKAI; Asahi Intecc, Nagoya, Japan) for coil delivery. Internal trapping was performed with seven platinum coils (EDcoil 10 ExtraSoft; Kaneka Medix, Osaka, Japan) extending from inside the aneurysm to the proximal parent artery (Fig. 5).

The patient's postoperative course was uneventful. Postoperative CT of the bone window showed the coil mass in the left internal auditory canal (Fig. 6). She was discharged without neurological deficits (modified Rankin scale of 0). Magnetic resonance imaging 2 years after the procedure revealed no reperfusion in the aneurysm.

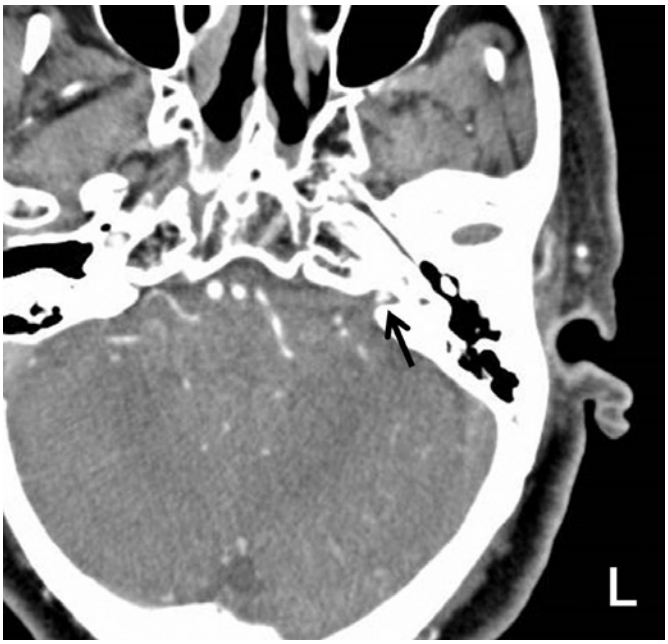

Fig. 2 Contrast-enhanced CT showing an aneurysmal dilatation in the left internal auditory meatus (black arrow)

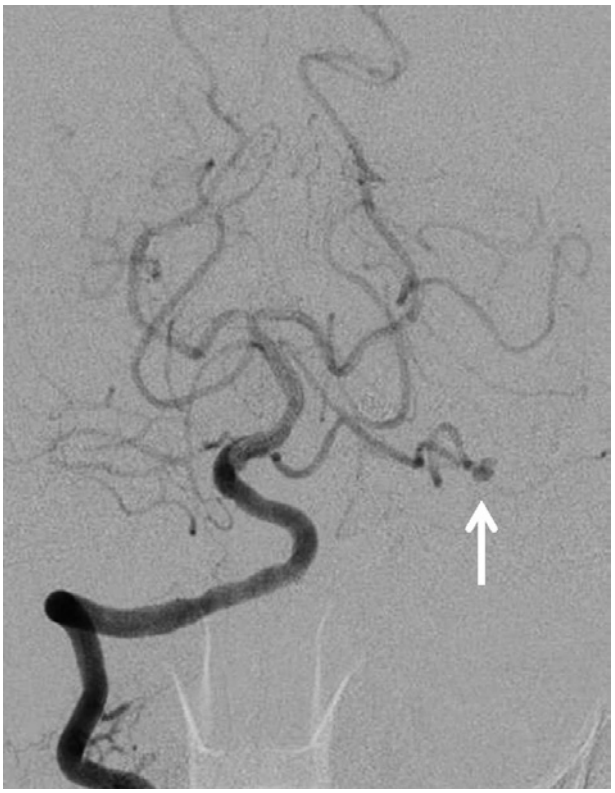

Fig. 3 DSA of the right vertebral artery showing a distal left anterior inferior cerebellar artery aneurysm (arrow)

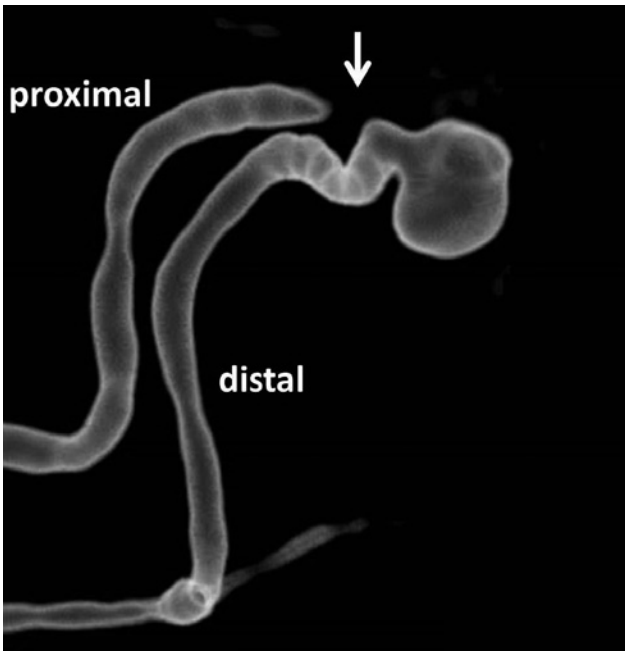

Fig. 4 Three-dimensional DSA showing a severe stenosis of the parent artery just in front of the aneurysm (arrow)

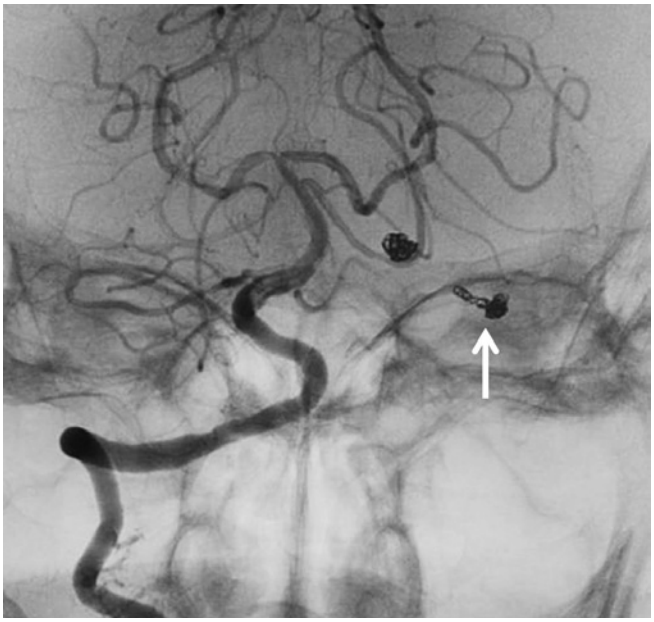

Fig. 5 Postoperative DSA of the right vertebral artery showing complete obliteration of the aneurysm by coils (arrow)

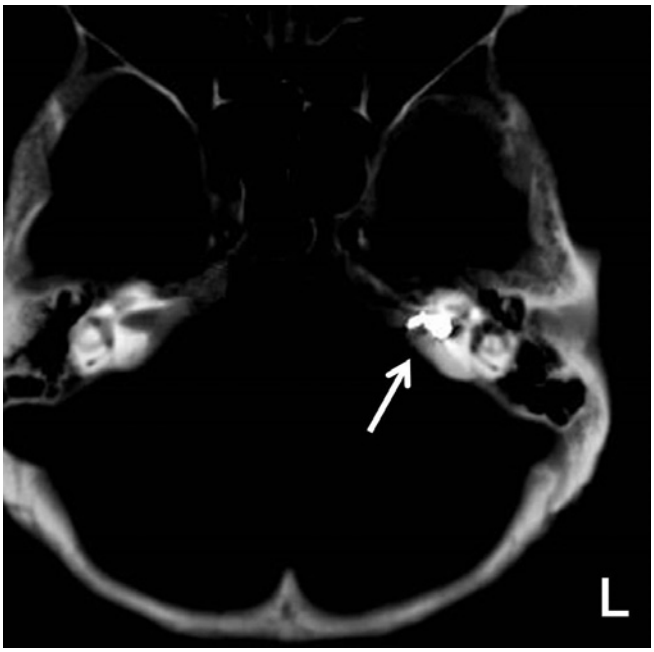

Fig. 6 Postoperative CT revealing the coil mass in the left internal auditory meatus (arrow)

DISCUSSION

This case of IMA resembled most previously reported cases at presentation. Of all the previously reported cases of IMA (including the present case), all but two presented with SAH. Similarly, the majority of previous cases were female (17 of 19) and complicated by seventh and/or eighth cranial nerve palsy.[1-17] In contrast to the present case, however, all previously reported cases were treated by open surgery and postoperative seventh and/or eighth cranial nerve palsy was common, particularly when the aneurysm was deeper in the internal meatus.[13, 15, 17] Direct surgical manipulation of these nerves within the limited working space may be a critical factor leading to postoperative nerve dysfunction.

Recent developments in high-resolution angiography, endovascular techniques and coil embolization technology (such as ultra-soft detachable coils like EDcoil 10 ExtraSoft) have facilitated the treatment of even distal intracranial aneurysms without invasive open surgery.[18] We thought that coil embolization would provide sufficient hemostasis if a microcatheter could be navigated into the aneurysm, as in more proximal AICA aneurysms. Moreover, given the location of the aneurysm, clipping was difficult, so the only alternative would be trapping and sacrifice of the parent artery.[1-2, 5, 7, 10, 12]

A confluence of unusual events prevented the detection of the left ICA aneurysm on initial presentation. First, this patient was previously diagnosed with an unruptured left ICA aneurysm and was currently being monitored at our outpatient clinic. The aneurysm was 0.4 mm larger on admission, so SAH due to rupture of the left ICA was a logical assumption, especially given the rarity of IMA. Moreover, IMA was not detected using 3D CT angiography because of the bony structure. In addition, because initial CT showed diffuse SAH predominantly on the left side, we paid attention to the left side. After coil embolization of the left ICA aneurysm, left vertebral artery angiography (VAG) did not show the left AICA due to laminar flow. The left

AICA was visualized via right VAG in this patient. Thus, we must evaluate the fundamental theory of 4-vessel studies in cases of SAH.

CONCLUSIONS

IMAs are so rare that they are unlikely to be considered as the origin of hemorrhage. We report the first case of ruptured intrameatal aneurysm successfully treated by endovascular coil embolization without any postoperative neurological complications. Thus, coil embolization may be a therapeutic alternative to conventional open surgery.

CONFLICTS OF INTEREST DISCLOSURE

The authors have no personal financial or institutional interest in any of the drugs, materials, or devices in the article.

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