Intrameatal thrombosed anterior inferior cerebellar artery aneurysm mimicking a vestibular schwannoma

Case report

DENNIS PÄSLER, M.D.,1 JÖRG BALDAUF, M.D.,1 UWE RUNGE, M.D., PH.D.,2 AND HENRY W. S. SCHROEDER, M.D., PH.D.1

Departments of 1Neurosurgery and 2Neurology, Ernst Moritz Arndt University, Greifswald, Germany

Aneurysms of the anterior inferior cerebellar artery (AICA) are a rare entity. Purely intrameatal aneurysms are even rarer. The authors report an intrameatal thrombosed AICA aneurysm mimicking a vestibular schwannoma that was treated by resection and end-to-end anastomosis.

This 22-year-old man presented with acute hearing loss, vertigo, and moderate facial palsy. Magnetic resonance imaging showed an atypical intrameatal lesion with dilation of the internal auditory canal.

Microsurgical inspection via a retrosigmoid approach and drilling of the posterior wall of the internal auditory canal revealed a thrombosed AICA aneurysm. The aneurysm was excised, and an end-to-end suture was performed to restore AICA continuity. Intraoperative indocyanine green videoangiography as well as postoperative digital subtraction angiography showed a good revascularization.

Intrameatal AICA aneurysms may present with symptoms similar to vestibular schwannomas. End-to-end reanastomosis after aneurysm resection is a treatment option when clipping is impossible.

(Key Words: • anterior inferior cerebellar artery aneurysm • end-to-end reanastomosis • end-to-end suture • intrameatal aneurysm • revascularization)

DOI: 10.3171/2010.9.JNS10491

Presentation and Examination. This 22-year-old man with right-sided hearing loss and headache was treated with prednisolone and rheological infusions 2 weeks after onset at another institution, resulting in a slight improvement in hearing. Magnetic resonance imaging performed at this time revealed a right-sided intrameatal lesion with inhomogeneous Gd enhancement. A vestibular schwannoma was suspected. One month later, the patient suffered from another severe headache and was admitted to the neurology department at our institution. Examination revealed a right-sided facial palsy (House-Brackmann Grade III), total loss of right-sided vestibular function, and total loss of speech discrimination. Audiography proved total hearing loss on the right side. Acoustically evoked potentials showed lower amplitudes in the first and second waves and extinction of the third to fifth waves, indicating peripheral loss of right-sided hearing and possibly additional impairment of the lower auditory tract/lower brainstem. Computed tomography scanning revealed normal findings except for a dilated internal auditory canal on the right side (Fig. 1a). Computed tomography angiography findings were normal. Magnetic resonance imaging showed no signs of sinus thrombosis, encephalitis, or stroke. Magnetic resonance imaging of the CPA was repeated and showed an unusual lesion inside the internal auditory canal (Fig. 1b and c). Interdisciplinary discussion among the neurology, neuroradiology, and neurosurgery teams was held, and the patient was referred to the neurosurgery department for surgical treatment of an atypical lesion with progressive neurological symptoms.

Operation. The CPA was exposed via a right retrosigmoid craniotomy (Fig. 2a). Underneath the vestibular nerves, a blue-red–colored lesion was found (Fig. 2b). After complete dissection, the lesion turned out to be a thrombosed AICA aneurysm (Fig. 2c). Microvascular

Abbreviations used in this paper: AICA = anterior inferior cerebellar artery; CPA = cerebellopontine angle; ICG = indocyanine green; SAH = subarachnoid hemorrhage.
Fig. 1. Preoperative images.  

**a and b:** A CT image (a) showing a dilated internal auditory canal, and an MR image (b) showing atypical lesion inside the canal.  

**c:** Magnetic resonance image with central Gd enhancement.

Fig. 2. Intraoperative photographs. View of the posterior wall of the internal auditory canal after resection of the dura (a). The intrameatal vestibular nerves were thinned and flattened by a blue-red–colored lesion (b) that proved to be a thrombosed AICA aneurysm after complete dissection (c). After resection of the thrombus and excision of the aneurysm, an end-to-end suture was made with 8 stitches (d and e). Final ICG videoangiography showed good filling of the reanastomosed vessel (f).
Intrameatal thrombosed AICA aneurysm

Doppler ultrasonography did not indicate any flow in the distal or proximal AICA branches. Intraoperative ICG videoangiography showed a delayed filling of the feeding branch with minimal flow in the distal branch. The aneurysm was incised and a thrombectomy was performed. Because of a very weak retrograde bleeding from the distal branch, the decision was made for AICA reconstruction. The aneurysm was excised, and an end-to-end suture of the AICA with 8 stitches (10-0) was made (Fig. 2d and e). The final ICG videoangiography showed good filling of the reanastomosed vessel (Fig. 2f).

Postoperative Course. Postoperative digital subtraction angiography (Fig. 3a and b) and MR imaging (Fig. 3c) showed good filling of the AICA without relevant stenosis or stroke. The patient was discharged from the hospital on the 8th postoperative day with complete recovery from facial palsy, persistent hearing loss, and headache. One year after surgery, hearing loss and headache persisted in this very sensitive patient. Facial nerve function was normal (House-Brackmann Grade I). Magnetic resonance imaging showed patency of the reanastomosis.

Discussion

Distal AICA aneurysms are exceedingly rare lesions with a prevalence of about 0.1% of all intracranial aneurysms. To the best of our knowledge to date, only 16 cases of intrameatal aneurysms have been reported. Almost all patients (15 of 16) had onset of symptoms with sudden headache due to SAH and hearing impairment (12 of 16). There is a high predominance of females (15 of 16 cases).

Our patient, however, initially presented with hearing loss and headache without clinical or radiological signs of SAH. Later on, additional cranial nerve impairment (facial palsy) was seen. Although a vestibular schwannoma was initially suspected, close inspection of the MR images before surgery revealed an atypical appearance for a vestibular schwannoma. Furthermore, intrameatal schwannomas of this size usually do not present with facial palsy. Therefore, we suspected another type of tumor. The differential diagnosis of intrameatal lesions includes above all meningiomas, epidermoids, and arachnoid cysts (for review, see the article by Zamani). Because of the space-occupying effect inside the internal auditory canal, aneurysms in this location can mimic clinical signs of CPA tumors and can be easily mistaken for vestibular schwannomas. Therefore, high-resolution imaging of the CPA is necessary before advocating the various therapy options such as micro- or radiosurgery. In retrospect, contrast-enhanced T1-weighted axial imaging (Fig. 1c) showed a circular enhancement that follows the course of the AICA before entering the internal auditory canal. This was the only imaging study that suspected a vascular lesion arising from the AICA. The CT scan simply revealed a dilated internal auditory canal indicating a slow-growing lesion. Computed tomography angiography might be helpful in differentiating between tumor and vascular lesion.

All published cases of intrameatal AICA aneurysms were treated surgically (10 clippings, 5 trappings, and 1 packing with muscle), although endovascular treatment of distal AICA aneurysms has also become a therapeutic option. A recent publication gives a detailed overview on the treatment of AICA aneurysms. Aneurysm resection and AICA reconstruction with end-to-end anastomosis has not been reported so far. In our patient, clipping of the aneurysm after clot removal was not possible because of the circumferential involvement of the vessel wall. Aneurysm resection and reanastomosis was performed instead of trapping, since minor blood flow was seen in the distal branch with the ICG videoangiography before aneurysm resection. However, trapping of the aneurysm might have been an alternative procedure with the same clinical outcome. According to the literature, AICA trapping may result in hearing loss but not in facial palsy. We found 5 reported patients with trapped intrameatal aneurysms, of whom 1 patient at admission presented with facial palsy. However, no new facial palsy developed after trapping. Occlusion of the AICA before entering the internal auditory canal has obviously no risk.

Fig. 3. Postoperative imaging with digital subtraction angiography (a and b) and MR imaging (c) showing a patent anastomosis with good filling of the reanastomosed vessel (arrows) without relevant stenosis (a and b) or stroke (c).
to compromise the blood supply to the facial nerve. In another 10 reported trapped or obliterated distal AICA aneurysms, proximal trapping/occlusion was performed in 6 patients, resulting in persistent hearing loss but not in facial palsy.\textsuperscript{6,12,14,18,25} Trapping of the middle or distal segment of the AICA after passing the internal auditory canal in 4 patients did not result in permanent neurologic deficits.\textsuperscript{1,17,22,25}

**Conclusions**

Patients with intrameatal AICA aneurysms may present with symptoms similar to vestibular schwannomas. End-to-end reanastomosis after aneurysm resection is a treatment option when clipping is impossible.

**Disclosure**

The authors report no conflict of interest concerning the materials or methods used in this study or the findings specified in this paper.

Author contributions to the study and manuscript preparation include the following. Conception and design: Päsler, Schroeder. Acquisition of data: Päsler, Runge, Schroeder. Analysis and interpretation of data: Päsler, Schroeder. Drafting the article: Päsler, Baldauf, Schroeder. Critically revising the article: all authors. Reviewed final version of the manuscript and approved it for submission: all authors. Study supervision: Schroeder.

**References**


Manuscript submitted May 13, 2010. Accepted September 8, 2010. Please include this information when citing this paper: published online October 22, 2010; DOI: 10.3171/2010.9.JNS10491. Address correspondence to: Dennis Päsler, M.D., Klinik und Poliklinik für Neurochirurgie, Universitätsklinikum Greifswald, Sauerbruchstrasse, 17475 Greifswald, Germany. email: paeslerd@uni-greifswald.de.