

Surgical treatment for the aberrant internal carotid artery in the middle ear with pulsatile tinnitus



Yohei Honkura^a, Hiroshi Hidaka^a, Jun Ohta^b, Shigeki Gorai^b, Yukio Katori^{c,*}, Toshimitsu Kobayashi^a

^a Department of Otolaryngology-Head & Neck Surgery, Tohoku University School of Medicine, Sendai, Japan

^b Division of Otorhinolaryngology, Iwaki Kyoritsu Hospital, Iwaki, Japan

^c Division of Otolaryngology, Sendai Municipal Hospital, Sendai, Japan

ARTICLE INFO

Article history:

Received 15 January 2013

Accepted 4 October 2013

Available online 30 October 2013

Keywords:

Aberrant internal carotid artery

Tympanic membrane

Middle ear surgery

Pulsatile tinnitus

ABSTRACT

Many previous reports have indicated that pulsatile tinnitus caused by an aberrant internal carotid artery (ICA) should not be treated surgically because of the risk of infection or aneurysm formation. We herein describe a case of aberrant ICA treated by middle ear surgery for which we introduced a novel approach. An 84-year-old man was presented with a one-year history of tinnitus in his right ear. Otoscopic examination demonstrated a whitish mass in the antero-inferior quadrant of the tympanic membrane associated with rhythmic pulsation. Images obtained by CT, MRI and MRA revealed protrusion of the ICA into the tympanic cavity, making contact with the tympanic membrane. Surgery to separate the tympanic membrane from the ICA was performed in order to relieve the pulsatile tinnitus. After the operation, the patient's aural activity was preserved and the tinnitus did not recur within a follow-up period of one year. In the present case, delicate middle ear surgery was effective for relief of the tinnitus. When treating patients with aberrant IAC showing features similar to the present case, the surgical approach we have described is worth attempting.

© 2013 Elsevier Ireland Ltd. All rights reserved.

1. Introduction

The presence of an aberrant internal carotid artery (ICA) in the middle ear is a rare vascular anomaly of the temporal bone, and some cases with a lateral course passing through the middle ear cavity have been reported [1–3]. It is generally accepted that an aberrant ICA creates a collateral pathway resulting from agenesis of the first embryonic segment of the ICA [4]. When considering other conditions for differential diagnosis, aberrant ICA can mimic a glomus tumor, or other vascular temporal bone lesions such as a dehiscent jugular bulb, cholesterol granuloma, petrous carotid aneurysm, pseudoaneurysm, or hemangioma [2]. Pulsatile tinnitus is a common symptom of aberrant ICA [5,6] that can be considerably distressing to patients and having a detrimental effect on daily life. Surgical treatment has been carried out to achieve complete resolution of the symptoms [7–9]. After these pioneering procedures, however, later reports suggested that surgery was not recommended because of the risk of bleeding,

infection or aneurysm formation [10,11]. The use of appropriate, less invasive methods based on anatomical considerations would be preferable to middle ear surgery for resolution of this anomaly. Here we describe a case of aberrant ICA that caused persistent pulsatile tinnitus, and which was treated successfully by middle ear surgery.

2. Case report

An 86-year-old man presented with a one-year history of pulsatile tinnitus in his right ear. The tinnitus was continually persistent, causing the patient to suffer from insomnia. Otoscopic examination revealed an antero-inferior white pulsatile mass in the intratympanic space. The intact tympanic membrane was in contact with the mass, and exhibited rhythmic pulsation (Fig. 1). The left tympanic membrane was normal. Audiometric assessment on the right side revealed a 10-dB conductive hearing loss, and tympanometry demonstrated a normal pattern with no pulse-synchronous perturbations.

Computed tomography (CT) of the temporal bone demonstrated an enhanced intratympanic mass in continuity with the ICA through a dehiscent lateral carotid plate (Fig. 2A and B). Magnetic resonance imaging (MRI) and magnetic resonance angiography

* Corresponding author at: Division of Otolaryngology, Sendai Municipal Hospital, 3-1 Shimizukoji, Wakabayashi, Sendai 984-8501, Japan.
Tel.: +81 22 266 7111; fax: +81 22 211 8972.

E-mail address: entsendai@yahoo.co.jp (Y. Katori).

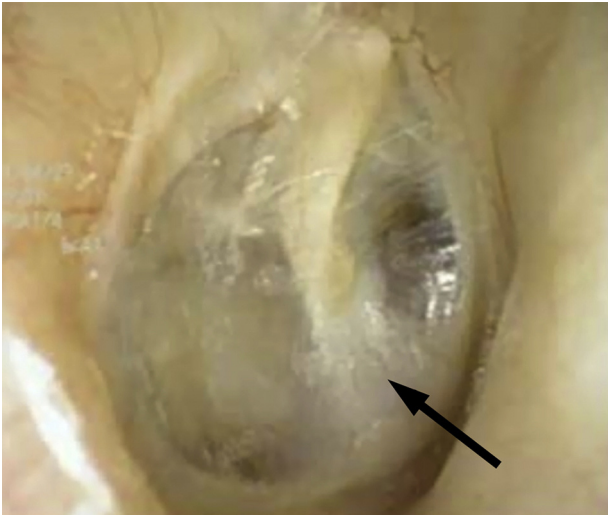


Fig. 1. Otoloscopic view of the tympanic membrane with aberrant ICA. A white pulsatile mass was observed in the intratympanic space of antero-inferior region (arrow).

(MRA) revealed that the middle ear mass was attributable to an aberrant ICA (Fig. 3).

After the patient had been given a thorough explanation about the risks of ICA injury during surgery, he provided informed consent, and middle ear surgery was performed to separate the tympanic membrane from the aberrant ICA for relief of the pulsatile tinnitus.

The operation was carried out via an endoaural approach. To confirm reduction of the pulsatile tinnitus during surgery, we performed the operation under local anesthesia. The middle ear was opened by developing a tympanomeatal flap. The overlying

skin from the 2-o'clock to the 10-o'clock position was divided down to the bone, with the incision running 5 mm from the tympanic groove and parallel to it. The meatal skin was elevated down to the fibrous annulus. The antero-inferior bony meatal wall was taken down to allow the annulus to be thoroughly checked. The tympanic cavity was entered at the 8-o'clock position by dislocating the fibrous annulus from the bony sulcus and perforating the middle-ear mucosa with a small elevator. The chorda tympani was exposed and preserved. Dislocation of the fibrous annulus was continued all the way around to the 2-o'clock position. The pulsating whitish mass of the ICA was found to be exposed to the middle ear, and showed adhesion to the antero-inferior tympanic membrane (Fig. 4A). The tympanomeatal flap, with the annulus and drum, was turned superiorly as far as the lower edge of the umbo. The tympanic membrane was then gently elevated from the ICA, thus relieving the pulsatile tinnitus (Fig. 4B). The lower half of the tympanic cavity (i.e. the ICA wall) was thus exposed and clearly visible. The remains of the epithelial layer of the tympanic membrane adhering to the ICA wall were entirely removed. There was sufficient distance (about 1.5 mm) between the umbo and the ICA wall to preclude any direct conduction of the ICA pulsation to the malleus. To avoid possible re-attachment of the ICA to the tympanic membrane, the epithelium of the tympanic membrane was elevated from the malleus handle (Fig. 4C). The tragal perichondrium was used for myringoplasty. The perichondrium was placed on the malleus handle as an underlay graft, covering the perforation created by separating the adherent tympanic membrane from the aberrant ICA. The tympanomeatal flap was moved anteriorly, and transferred to a superficial position in its inferior and central region.

During one year of postoperative follow-up, the patient was completely relieved of the pulsatile tinnitus and his hearing level demonstrated in the pure tone audiogram was preserved. Postoperative CT images showed that there was sufficient space between the ICA and the tympanic membrane (Fig. 2C and D).

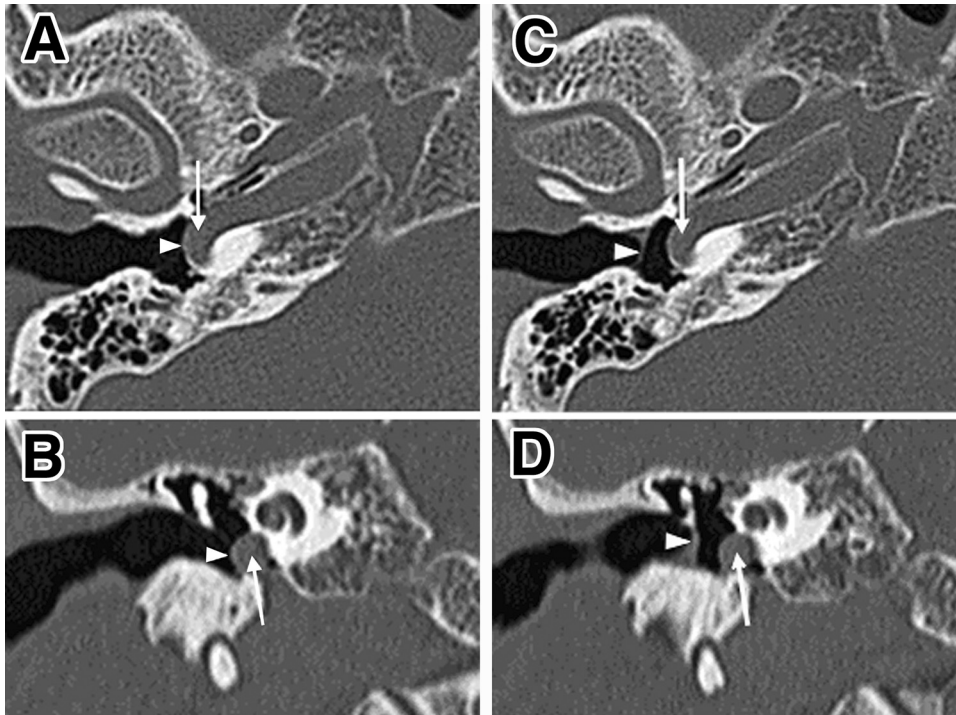


Fig. 2. Preoperative (A: axial, B: coronal) and postoperative (C: axial, D: coronal) CT images of the aberrant ICA. (A and B) An aberrant course of the right ICA was demonstrated through a dehiscent lateral carotid plate (arrows). The tympanic membrane made a contact with the ICA (arrowheads). (C and D) After the operation, there was enough space between ICA (arrows) and tympanic membrane (arrowheads).

Download English Version:

<https://daneshyari.com/en/article/8755394>

Download Persian Version:

<https://daneshyari.com/article/8755394>

[Daneshyari.com](https://daneshyari.com)