INTRODUCTION

The aberrant internal carotid artery (ICA) in the middle ear is a rare, but important vascular anomaly of the temporal bone. The clinical diagnosis of an aberrant ICA is often difficult, because signs and symptoms such as conductive hearing loss, pulsatile tinnitus and vertigo are nonspecific. The aberrant ICA is frequently confused with otosclerosis, glomus tumor and other vascular malformations such as dehiscent jugular bulb, hemangioma and aneurysm (1, 2). A misdiagnosis of this anomaly could have serious consequences. An excessive aural bleeding during a myringotomy or tympanotomy is a life-threatening complication (3). Although the identification became easy with the temporal bone computed tomography (CT), it is not unusual for this anomaly to be discovered during middle ear surgery. Our literature review yielded 78 cases of aberrant ICA in the middle ear, with 11 of them presenting with a persistent stapedial artery. Herein, we report a case of aberrant ICA in the middle ear and describe the clinical and radiological features of this vascular anomaly.

CASE REPORT

A 38-year-old woman visited our hospital due to tinnitus and hearing difficulties of the left ear that had started 5 years ago. During otoscopy, an anteroinferior bluish mass was seen in the tympanic space. Computed tomography and magnetic resonance imaging demonstrated a left-side aberrant ICA with bony dehiscence of the carotid canal in the middle ear and a reduced diameter of the tympanic ICA. Herein we report a case of an aberrant ICA in the middle ear. We also review the literature regarding this important vascular anomaly of the temporal bone which may lead to disastrous surgical complications.

Index terms
Aberrant Internal Carotid Artery
Computed Tomography
Magnetic Resonance Angiography
ICA then turns anteriorly to lie inferior and posteromedial to the eustachian tube, traverses the foramen lacerum and enters the medial cranial fossa.

Rarely, the ICA takes an aberrant course. Several hypotheses have been considered concerning the genesis of aberrant ICA. Lasjaunias and Santoyo-Vazquez (4) hypothesized the alternate blood flow theory that the C1 portion of the ICA involutes owing to the persistence of the pharyngeal artery system and as a consequence, an anomalous course develops with blood flowing via the ascending pharyngeal artery to the enlarged inferior tympanic artery with retrograde flow through the caroticotym-

DISCUSSION

Normally, the ICA enters the petrous bone medial to the styloid process via the carotid canal. The initial vertical segment is separated from the tympanic cavity by a thin plate of bone. The
panic vessels into the horizontal segment of the ICA. This theory may explain the radiological features with an enlargement of the inferior tympanic canaliculus, the presence of a mass like lesion found in the anterior hypotympanum and the absence of the vertical portion of the ICA.

The clinical diagnosis of an aberrant ICA appears as difficult because signs and symptoms such as pulsatile tinnitus, conductive hearing loss and a pulsatile tympanic mass in the anteroinferior area are often nonspecific or absent (5, 6). The results of a conductive hearing loss component from an audiometric evaluation may be attributed to a malleus or incus blockage. Those findings could be regarded as otosclerosis, glomus tumor or other vascular malformation. However, a tympanic mass due to an aberrant ICA looks different from a glomus tumor and dehiscent jugular bulb: anterior, pulsatile and white or rosy (1, 2). Thus, a mostly asymptomatic aberrant ICA will be diagnosed during middle ear surgery (7). A temporal bone CT should be performed before any middle ear surgery in order to avoid a surgical injury due to misdiagnosis. On CT scan, an aberrant ICA is identified by an ICA that runs adjacent to the jugular bulb, in a posterior position and with a reduced diameter, an enhancing mass in the hypotympanum, a deficient bony plate along the tympanic portion of the ICA, an enlargement of the inferior tympanic canaliculus and the absence of the vertical segment of the carotid canal (2). The MRA can be used as an additional tool if a definitive diagnosis is not possible with a CT scan only (6). It provides an excellent visualization of the intracranial and extracranial circulation. In this case, the MRA showed a reduced diameter of the tympanic ICA, the absence of the vertical segment of the carotid canal and an aplasia of the A1 segment of the ACA on the same side. All of these anomalies were located on the same side and probably may have a common cause. This common cause is most likely a maldevelopment of the vascular network (1).

The knowledge about this rare entity is essential for a clinician, because an accidental injury after myringotomy or in case of misdiagnosis with another vascular tumor may lead to disastrous consequences. Most authors recommend a conservative approach in case of an asymptomatic and proven aberrant ICA (7, 8), but Ruggles and Reed (9) advocated a surgery to relieve the patient of troublesome symptoms and to prevent a possible destruction of the middle ear structures and formation of an aneurysm.

The knowledge about the aberrant ICA in the middle ear is essential for clinicians, because a misdiagnosis of this anomaly could lead to serious consequences such as excessive aural bleeding or vascular occlusion. All masses in the middle ear, especially pulsating masses, should be studied by imaging methods such as CT and MRA.

REFERENCES

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중이내 미입 내경동맥의 인지는 임상의에게 중요하다. 중이내 미입 내경동맥의 오진단은 중이 수술 중 심각한 출혈을 야기 할 수 있기 때문이다. 5년 전부터 시작된 좌이의 이명과 청력감소를 주소로 내원한 38세 여성 환자의 정이내 미경 동맥 좌이 고막 전하부위에 청색의 종물이 관찰되었다. 컴퓨터단층촬영과 자기공명영상에서 좌이의 중이내 미입 내경동맥과 좌측 내 경동맥의 고실부분의 형성지하증이 관찰되었다.

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