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Case report

Temporomandibular joint herniation through the foramen of Huschke with clicking tinnitus



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ABSTRACT

Introduction: The foramen of Huschke (FH) is an uncommon anatomical variation of the tympanic portion of the temporal bone. It is located on the anteroinferior aspect of the external auditory canal; extremely rarely, the soft tissues around the temporomandibular joint (TMJ) can herniate through it.

Case summary: We report two cases of TMJ herniation through the FH presenting with clicking tinnitus that were treated differently.

Discussion: The treatment of TMJ herniation depends on the presenting symptoms and the patient's willingness to undergo surgical correction. If surgical management is chosen, the bone can be obliterated using tragal cartilage and temporalis fascia.

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1. Introduction

The foramen of Huschke (FH), also known as the foramen tympanicum, is an anatomic defect found on the anteroinferior aspect of the external auditory canal (EAC) bone. Persistence of the FH is an uncommon condition, and symptomatic temporomandibular joint (TMJ) herniation into the EAC is extremely rare [1,2]. The potential causes of such herniation are neoplasms, trauma, inflammation, and congenital diseases [3]. In patients with TMJ herniation, symptoms such as hearing loss and tinnitus are common; salivary discharge occurs rarely. In the treatment of TMJ herniation, the severity of symptoms and the practicability of surgery are significant considerations. Here, we report two cases of TMJ herniation presenting with clicking tinnitus; each case was managed differently. An institutional review board approval was obtained from our hospital (IRB No: 2018AS0035).

2. Case reports

2.1. Case 1

A 63-year-old woman presented to the out-patient clinic with complaints of clicking tinnitus and fullness in both ears for the

previous one month. There was no history of otitis media, surgery, or trauma that could have led to these symptoms. The patient did not benefit from any medical treatment. Otoscopic examination revealed bulging soft masses on the anterosuperior wall of each EAC (Fig. 1A–D). The masses protruded when she opened her mouth (Info sup 1). Results of impedance and pure-tone audiometry, which were performed due to the ear fullness, were normal. Temporal bone computed tomography (TBCT) showed bony defects on the anterior aspect of the EAC and soft tissue masses protruding from the TMJ through these defects on both sides (Fig. 1E). We presumed that this was a congenital defect. Following a discussion with the patient regarding the treatment plans (including surgery), we decided to observe her closely as an out-patient.

2.2. Case 2

A 55-year-old man presented to the out-patient clinic with complaints of intermittent bloody otorrhea and clicking tinnitus during mastication for a month. He did not have a history of otitis media, surgery, or trauma that could have led to these symptoms. The otoscopic examination revealed a bleeding reddish soft mass located on the anteroinferior wall of the left EAC (Fig. 2A). The bleeding from the mass increased during mastication. A slightly enhancing soft tissue lesion in the left EAC was observed in the TBCT images (Fig. 2B, C). Histological examination of the mass following an excisional biopsy revealed a hemangioma. The anterior wall on which the stalk had been placed continued to bulge during mastication, with intermittent bleeding over the following three weeks (Fig. 2D, Appendix BMedia 2). Because the patient wanted

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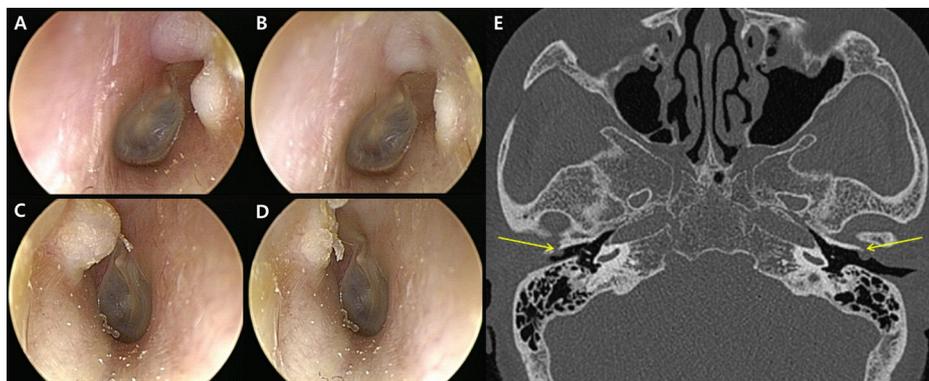


Fig. 1. Otoloscopic findings on both sides of the external auditory canal (EAC). A, C The protruding skin overlaid the EAC when the patient closed her mouth (A: right, C: left). B, D The protrusion descended when the patient opened her mouth (B: right, D: left). E Temporal bone computed tomography showing bony defects, measuring 4×3 mm, on the anterior aspects of both EACs and the protruding soft tissue masses from temporomandibular joint (TMJ) through these defects (arrow).

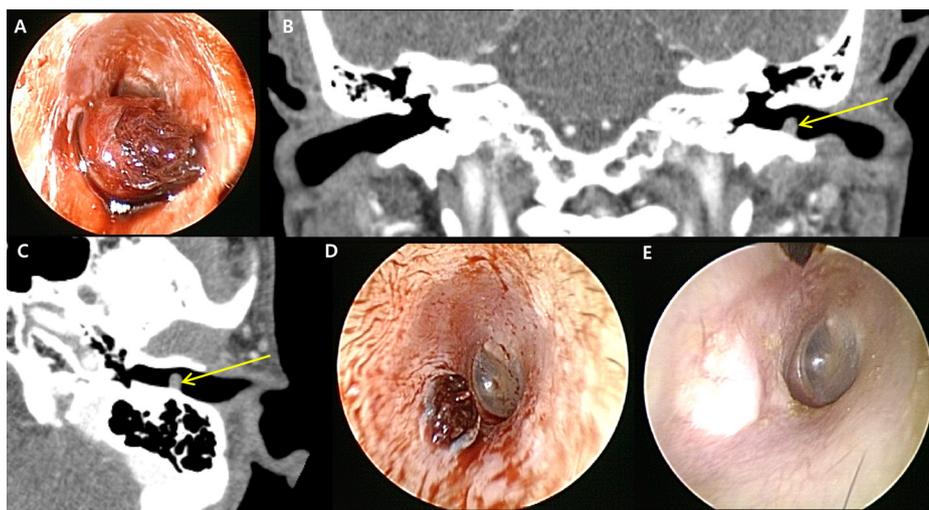


Fig. 2. A Otoloscopic examination revealed a bleeding mass protruding from the anteroinferior wall of the left external auditory canal (EAC). B, C Temporal bone computed tomography revealed a slightly enhancing soft tissue lesion in the left EAC (B: coronal view, C: axial view). D Otoloscopic examination after excisional biopsy. E Postoperative otoscopic examination 6 months later.

to undergo a surgical repair, an EAC reconstruction operation was performed in which polypropylene (Medpore), titanium mesh, and tragal cartilage were used (Fig. 3). One year later, the patient did not complain of bloody otorrhea and clicking tinnitus, and bleeding from the anterior EAC was not observed during the otoscopic examination (Fig. 2E, Info sup 2).

3. Discussion

Persistent foramen tympanicum, also called the foramen of Huschke, is an embryological bone defect in the anteroinferior wall of the EAC. At birth, the tympanic bone assumes an incomplete U shape. Consequentially, the anterior and posterior prominences of the U-shaped bone grow and fuse, and the EAC finally closes by the age of 5 years. However, infrequently, the tympanic bone defect persists beyond this age [4]. The incidence of FH has been reported to be approximately 7.2% in previous cadaveric studies [5] and 1.5%–4.6% in studies using high-resolution TBCT [1,6].

In a previous study on patients with temporomandibular herniation through a patent FH, the mean age of presentation was 55 years, and 80% of patients were aged over 50 years. Female patients were dominant [7]. It has been assumed that herniation of the TMJ through a patent FH is due to the mechanical stress of mastication.

The weakening and widening of the FH can increase with age. Patients have a complaint of hearing loss [8], tinnitus [7], otalgia [9], and otorrhea [1]. For the diagnosis, evaluation of the EAC during mastication can be helpful. A dome-shaped polyp observed during the closing the mouth is characteristic. This is because the negative pressure of the retrodiscal space retracts the herniated mass during anterior translation of the TMJ [10]. Additionally, high-resolution TBCT is also useful in the evaluation [9].

The treatment of TMJ herniation depends on the presenting symptoms and the patient's willingness to undergo surgical correction. If surgical management is chosen, the bone can be obliterated using the tragal cartilage and temporalis fascia.

In our cases, one patient presented with clicking tinnitus only and the other with clicking tinnitus and bleeding. In the first case, the symptom was not severe, and the patient decided on conservative management. If the patient's symptoms are aggravated during out-patient clinic follow-up, closure of the defect can be considered. The second patient wanted to undergo surgical management because of the severe symptoms, and the defect was covered using polypropylene (Medpore) implant that was fixed with a titanium miniplate. Long-term complications and results of surgery have not been documented sufficiently. Therefore, further studies are needed [11,12].

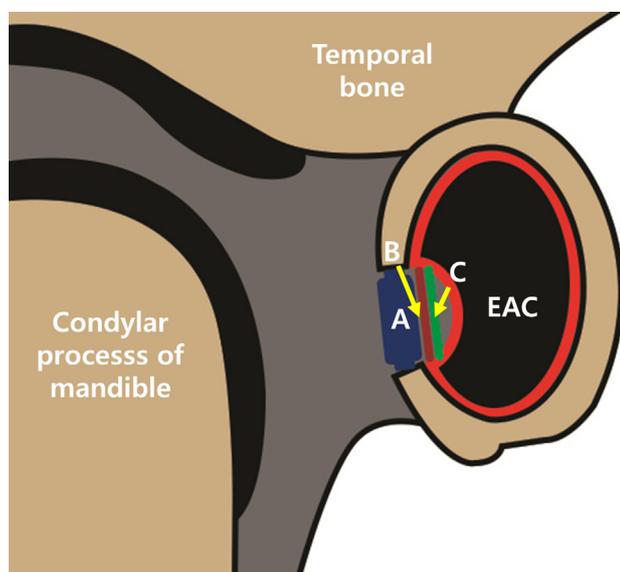


Fig. 3. After the preauricular approach with the dissection anterior to the external auditory canal, a bony defect measuring 3×4 mm and temporomandibular joint capsular herniation into the external auditory canal was observed. (A) Titanium mesh with (B) tragal cartilage and (C) perichondrium were used to reconstruct the defect. (EAC: External auditory canal).

4. Conclusion

We have reported two rare cases of TMJ herniation through the FH presenting with clicking tinnitus with and without bloody otorrhea. Clinicians should keep FH in mind in the evaluation of an EAC mass or tinnitus, which are commonly encountered in medical practice. In addition, while deciding on the treatment, the patient's preference and severity of symptoms should be considered.

Disclosure of interest

The authors declare that they have no competing interest.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <https://doi.org/10.1016/j.anorl.2018.05.014>.

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