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Case Report

Foramen tympanicum with symptomatic temporomandibular joint herniation^{☆☆☆}

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ARTICLE INFO

Article history:

Received 15 April 2018

Revised 9 May 2018

Accepted 13 May 2018

Keywords:

External acoustic canal

Temporomandibular joint

Anatomic variation

Magnetic resonance imaging

X-ray computed tomography

ABSTRACT

Foramen tympanicum (FT), or foramen of Huschke, describes an uncommon anatomic variant of a persistent bony defect connecting the external acoustic meatus to the temporomandibular joint (TMJ). Although rare, it can be associated with significant complications, such as TMJ herniation, salivary gland fistula, infectious or tumoral spread between the external acoustic meatus and the TMJ, or result in inadvertent ear injury during TMJ arthroscopy. To the best of our knowledge, this is the first case report of a symptomatic FT with a full description of computed tomography and magnetic resonance imaging findings. Surgical exploration confirmed the presence of FT with TMJ herniation with subsequent successful closure of the defect obtained.

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Introduction

Foramen tympanicum (FT) arises from an incomplete ossification of the tympanic part of the temporal bone that persists after 5 years of age, and is classically located at the ventrocaudal aspect of external acoustic meatus (EAM), posteromedial to the temporomandibular joint (TMJ) [1]. We discuss a case of TMJ herniation through a FT presenting with chronic otorrhea.

Case report

A 52-year-old male presented for otorhinolaryngologic evaluation following a 4-year history of clear discharge from his left ear provoked with chewing. He denied otalgia, previous head trauma, or ear surgery; and his past medical history was unremarkable. Examination of the left ear revealed a mildly inflamed ear meatus with a normally appearing tympanic

* Acknowledgments: The authors thank their Alfred Hospital Ear, Nose and Throat colleagues, who performed surgery on this patient and contributed clinical information to assist with the publication of this interesting case.

☆☆ Competing Interests: The authors have declared that no competing interests exist.

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<https://doi.org/10.1016/j.radcr.2018.05.009>

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membrane. Examination of the right ear was unremarkable. Audiometry testing demonstrated mild bilateral sensorineural hearing loss.

Noncontrast computed tomography (CT) of the petrous temporal bones with axial, coronal, and sagittal images obtained with a slice thickness of 1 mm demonstrated the presence of a unilateral left FT measuring approximately 3.5 mm in the sagittal plane and forming a communication between the left TMJ and the anterior EAM (Fig. 1). No pathology was visualized on the right.

Magnetic resonance imaging of the TMJs with a slice thickness of 3 mm demonstrated partial herniation of the retrodiscal component of the TMJ through the left FT (Fig. 2). There was no difference in the degree of herniation between closed and open mouth positioning.

Initial conservative management with drying acetic acid and isopropyl alcohol eardrops failed and the patient subsequently underwent surgical exploration which confirmed the presence of FT with TMJ herniation. Tragal perichondrium and cartilage was harvested to successfully close the defect using the postauricular approach.

Discussion

The incidence of FT in the literature has been estimated between 4.6% and 17.9% in high-resolution CT and cone-beam CT studies [2,3], with a slight predominance in women [2]. FT varies in size with age and gender, with a mean size of 4.2 mm in the axial plane and 3.6 mm in the sagittal plane reported by Lacout et al. [2]. The persistence of FT after 5 years of age is usually asymptomatic and an incidental finding on CT. The presence of otorrhea, otalgia, aural fullness, or hearing loss is highly correlated with the presence of related complications [4].

Spontaneous TMJ herniation, as demonstrated in our case, is a rare complication associated with FT with only 26 cases reported worldwide [4]. The resulting otorrhea is typically clear and odorless, originating from synovial fluid within the TMJ. Mastication classically exacerbates otorrhea by facilitation of movement of synovial fluid through the TMJ into the EAM, which was also described by our patient. Otorrhea has also been reported to occur in salivary fistulas, another recognized potential complication of FT [5].

FT is well demonstrated on CT, which should be requested to assess any case of chronic otorrhea without clear otologic cause. It classically appears as a bony defect in the ventrocaudal aspect of the EAM, which is not associated with a history of trauma or tumor resection in the area. Magnetic resonance imaging is invaluable in diagnosing the complications of spontaneous TMJ herniation or salivary fistula, and it is important to obtain both open and closed mouth images to appreciate if there is herniation of soft tissue. Spontaneous TMJ herniation characteristically appears as a soft-tissue protrusion within the EAM with the mouth closed; the soft tissue can retract out of the EAM with the mouth open [2].

Asymptomatic FT does not necessitate treatment; however, surgical closure of a symptomatic defect can be performed using fascia, cartilage, polypropylene plate,



Fig. 1 – Noncontrast computed tomography: (a) axial, (b) sagittal, and (c) coronal images, demonstrating a left foramen tympanicum forming a communication between the left temporomandibular joint and the anterior external acoustic meatus.

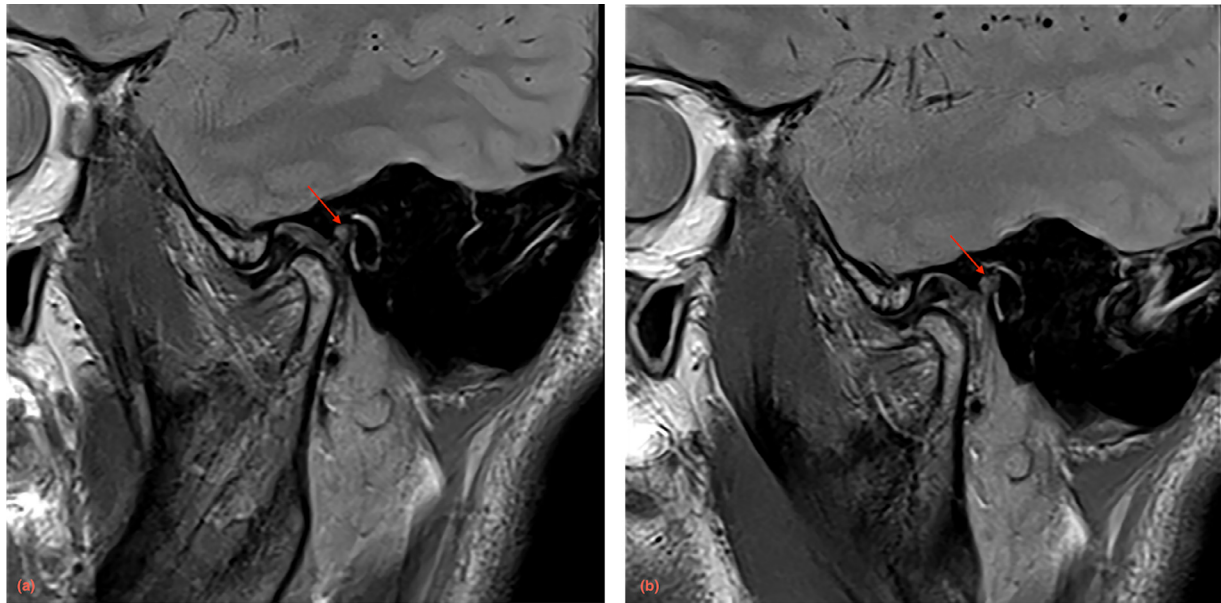


Fig. 2 – Proton density weighted magnetic resonance images demonstrating temporomandibular joint herniation through the left foramen tympanicum. (a) Sagittal closed mouth and (b) sagittal open mouth images demonstrate a similar degree of temporomandibular joint herniation.

autologous bone, or collagen mesh [4]. In addition to the postauricular approach used in our patient, other surgical approaches have also been reported, such as the preauricular and the endaural approach [4], both with good surgical outcomes [6,7].

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