

Soft tissue lesion of the ear canal – now you see it, now you don't

Wong Kim Yew Richard*, Yahia Faik Hussein Al-Hadeethi

Department of Otorhinolaryngology – Head & Neck Surgery, Kulliyah of Medicine, International Islamic University Malaysia, Bandar Indera Mahkota Campus, Jalan Sultan Ahmad Shah, 25200 Kuantan, Pahang Darul Makmur

Abstract

Spontaneous herniation of the temporomandibular joint along a bony defect in the external auditory canal is an uncommon condition that may lead to otologic symptoms. A 43-year-old gentleman presented with otalgia and an external auditory canal soft tissue lesion, which flattens upon opening of the jaw. Computed tomography scan of the temporal region confirmed the presence of a soft tissue lesion that herniated through an external auditory canal wall defect. This condition should be included in the differential diagnoses of an external auditory canal mass, despite infrequently encountered. It is important to inspect the external auditory canal during movement of the jaw when a soft tissue lesion is noted, so as not to miss this diagnosis.

Keywords: temporomandibular joint herniation, otalgia, external auditory canal defect, foramen of Huschke

Received:

17 December 2020

Revised:

26 January 2021

Accepted:

3 February 2021

Published Online:

28 February 2021

How to cite this article:

Wong, K. Y. R., & Al-Hadeethi, Y. F. H. Soft tissue lesion of the ear canal – Now you see it, now you don't. *IIUM Journal of Orofacial and Health Sciences*, 2(1), 62-66. <https://doi.org/10.31436/ijohs.v2i1.64>

Article DOI:

<https://doi.org/10.31436/ijohs.v2i1.64>

Corresponding author:

Address:

Department of Otorhinolaryngology – Head & Neck Surgery, Kulliyah of Medicine, International Islamic University Malaysia, Bandar Indera Mahkota Campus, Jalan Sultan Ahmad Shah, 25200 Kuantan, Pahang Darul Makmur

Telephone: +6012-3971689

Email address:

richardwky@gmail.com

Introduction

Spontaneous herniation of the temporomandibular joint (TMJ) through a dehiscence in the wall of the external auditory canal (EAC) is a rare condition. A congenital bony defect known as the patent foramen of Huschke may be one of its causes. Peculiarly, it may present as a soft tissue lesion at the antero-inferior aspect of the EAC, which flattens when the jaw is opened. A careful examination, combined with high resolution computed tomography (CT) scan of the temporal bone, is warranted to achieve the accurate diagnosis.

Case report

A 43-year-old Malay gentleman, without any underlying medical illness; presented with history of left ear pain and fullness for 2 years. It was associated with left intermittent hearing impairment. He had no history of vertigo, ear discharge, tinnitus, or facial asymmetry. There was no history of ear surgery prior to his presentation.

Examination of the ears noted a lesion at the antero-inferior aspect of the left EAC. On palpation, the lesion was hard, and tender to touch. The left tympanic membrane was intact and normal. Upon examining the jaw, there was left temporomandibular joint clicking, while the mouth opening is 4.5cm

with no limitation of jaw movement. Further examination noted that the lesion flattens when the patient opens his jaw (Figure 1).

The lesion was initially thought to be a granuloma or an exostosis of the EAC, and the patient was sent for a high-resolution CT scan of the temporal bone. The scan unveiled a small soft tissue lesion at the antero-inferior aspect of the medial part of the left EAC, measuring about 0.4 x 0.2 cm (AP x W). The lesion was seen herniating through a dehiscence in the EAC wall (Figure 2). No apparent calcification, central hypodensity

or fat streakiness is seen within or around the lesion. The middle and inner ears were normal bilaterally.

After a detailed explanation to the patient regarding his condition and the options of treatment, the patient was not keen to undergo surgery; and was planned for conservative management with non-steroidal anti-inflammatory drugs for his otalgia. During his subsequent visits, his otalgia had reduced. He was advised for follow-up in our clinic regularly for monitoring of his symptoms.

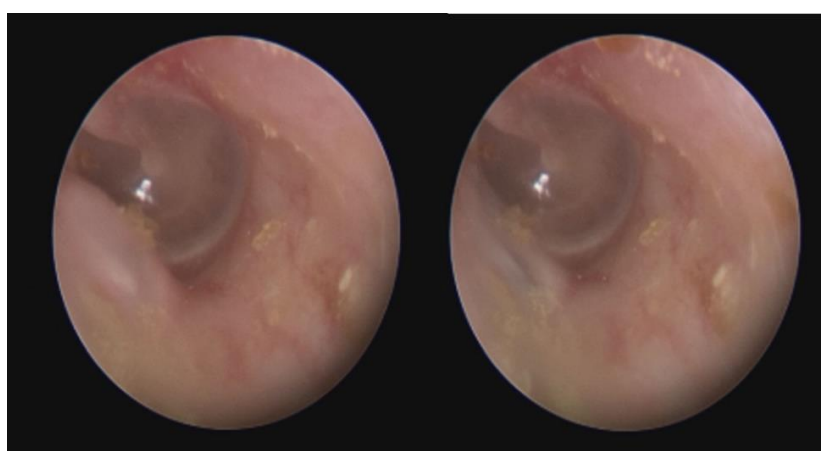


Figure 1. The lesion at the antero-inferior aspect of the left EAC with the jaw closed (left) and flattening of the lesion with the jaw opened (right)

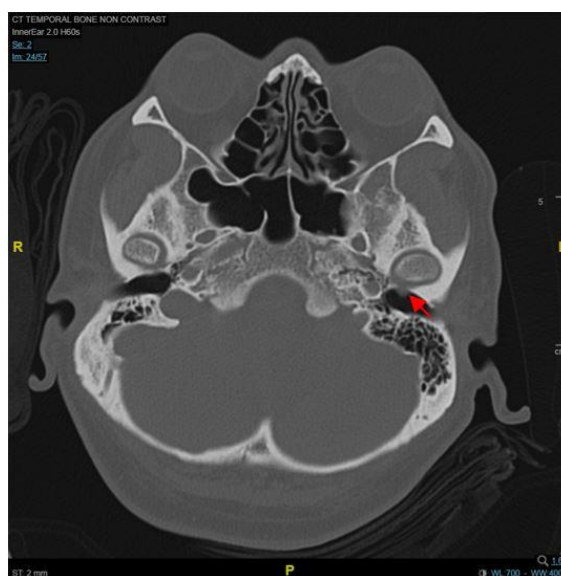


Figure 2. An axial CT temporal bone image at the level of the condylar head of the mandible of the temporomandibular joint. The red arrow depicts the dehiscence in the anterior bony canal wall of the left EAC, with herniation of the soft tissue of the temporomandibular joint (arrow), at the antero-inferior aspect of the medial part of the left EAC measuring 0.4 x 0.2 cm (AP x W).

Discussion

The temporomandibular joint is a type of synovial joint produced by the mandibular condyle and glenoid cavity. The foramen of Huschke (FH), or foramen tympanicum, is a bony defect and anatomical separator between the anterior aspect of the EAC and posterior border of the glenoid cavity (Kayahan *et al.*, 2013). The FH was first described by the German anatomist, Emil Huschke. In 1987, spontaneous herniation of the TMJ into the EAC through the FH was discovered by Hawke (Lacout *et al.*, 2005).

Embryologically, the EAC forms from the first branchial cleft at eight weeks of gestation. In the ninth week, a tympanic ring appears through the fusion of four

ossification centers. From the tympanic ring, the anterior and posterior bony prominences form and continue to grow towards one another. This structure has a U-shaped form and remains incomplete at birth, with the open portion of the structure identified as the notch of Rivinus. During the first year of life, these two prominences will fuse and thus will separate the tympanic ring into the FH inferiorly and external auditory canal superiorly (Figure 3). As the mastoid bone develops, it is displaced downward and forward, resulting in rotation of the ear canal. Therefore, a persistent FH will form a defect at the anterior wall of the EAC. The FH subsequently shortens until its complete closure at five years of age (Figure 4). It is the failure of involution and lack of ossification of the FH that results in an EAC wall defect (Ryu *et al.*, 2017).

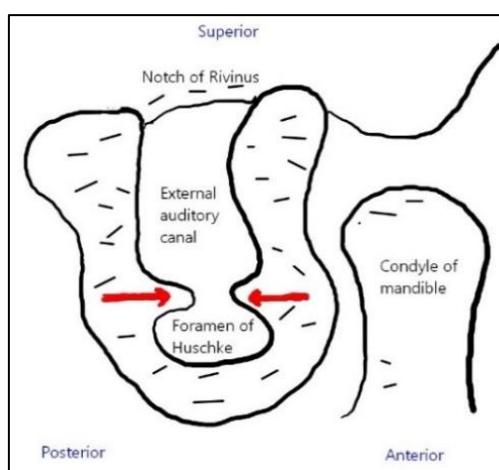


Figure 3. The growth of the tympanic ring, where the red arrows show the anterior and posterior bony prominences growing towards each other

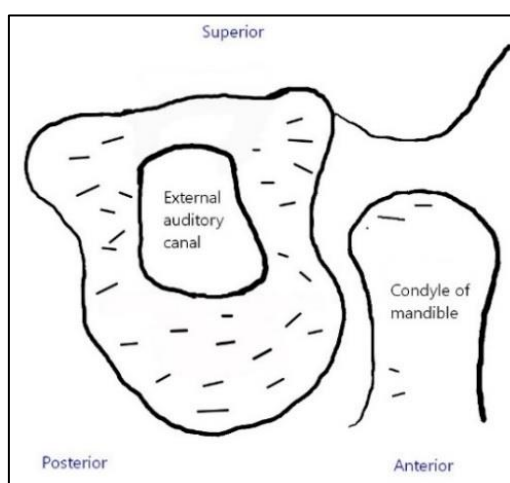


Figure 4. The complete involution & ossification of the Foramen of Huschke

Herniation of the TMJ into the EAC can be due to trauma, malignancy, inflammation, congenital bony defects, or iatrogenic via otologic procedures (O'Brien *et al.*, 2018).

The incidence of FH is about 4.6% in high resolution CT scans of the temporal bone and 7.2% in cadaveric studies. In a study by Park *et al.*, it was reported that TMJ soft tissue herniation was found in only 26% of cases of persistent FH. The sizes of the defect are around 1 mm to 8 mm. There may be a slight female predominance (20%), compared to males (12%); based on one study which looked at 994 Japanese dry skulls (Kim *et al.*, 2013).

Mastication induces mechanical stress, which may cause softening of the tissue between the TMJ and the defect in the temporal bone, subsequently weakening and enlarging the defect, resulting in TMJ herniation into the EAC. This will lead to the occurrence of symptoms over time. Therefore, the mean age of presentation for this condition is about 55 years (Bernstein, 2015).

Spontaneous TMJ herniation into the EAC can cause a myriad of otologic symptoms. Li & Dai reported that, the most common symptoms were otalgia (36%) and clicking tinnitus (36%), followed by otorrhea (32%). The discharge from the ear is specifically watery, odourless and colourless; due to the formation of a fistula leading to the leakage of synovial fluids. The other symptoms include hearing impairment (20%) and aural fullness (10%); while 8% were asymptomatic (Li & Dai, 2015).

Examination reveals a lesion in the antero-inferior segment of the EAC. Special attention must be taken to inspect the EAC during jaw movement, because FH-related TMJ herniation is more pronounced when the jaw is closed and is less prominent when the jaw is opened, due to the negative pressure in the retrodiscal space when the temporomandibular joint is anteriorly translated. In patients who experience a clicking sound as one of the symptoms, this may be heard by placing a stethoscope on the

patient's EAC during jaw movement (Cascone *et al.*, 2015).

This condition can be diagnosed clinically and confirmed radiologically. High-resolution CT scanning is suitable to detect the presence of a bony defect due to their precision and fine millimetric slices. The sagittal and coronal planes are useful in evaluating the size of the defect and its relationship with the mandibular condyle. Using CT scan, TMJ herniation can be differentiated from a true granuloma of the anterior bony canal wall or a salivary fistula. Magnetic resonance imaging (MRI) is helpful to detect the presence and contents of the soft tissue herniation, and the relationship between the existing defect and the parotid gland (Rubio & Vásquez, 2018).

Treatment is based on the severity of the symptoms and patient's choice. Conservative management is usually for patients who are asymptomatic or experience trivial symptoms, the elderly, or patients with multiple co-morbidities. Nevertheless, follow up is essential to control the symptoms and treat any complications that may occur.

Surgical closure of the defect is considered in patients who experience significant symptoms, patients with associated infection, or worsening herniation. There are two usual approaches in managing the defect, which are transcanal and preauricular. For both approaches, a graft is required to close the defect and prevent herniation of the TMJ. It can be in the form of a tragal cartilage, fascia, bone, polyethylene, polypropylene with a titanium miniplate, collagen mesh or titanium mesh. Post operatively, patients are advised to restrict jaw opening for 3 weeks (Singh *et al.*, 2016).

Conclusion

Spontaneous herniation of the TMJ into the EAC is possible due to the presence of a persistent embryological connection between these two structures. We present an interesting finding of such a condition which manifested as a soft tissue lesion that

was prominent when the patient closes his jaw but flattens when the patient opens his jaw. We recommend inspecting the EAC during jaw movement when a soft tissue lesion is noted in the EAC. An anterior wall of EAC soft tissue lesion, which is not cystic, with history of clicking sounds especially during jaw opening; should raise the suspicion of this condition. This is important to ensure that an accurate diagnosis is obtained, and effective treatment is administered to the patient.

References

- Bernstein, J. M. (2015). Spontaneous temporomandibular joint herniation into the external auditory canal through a persistent foramen tympanicum (huschke): Otologic features. *Journal of Otolaryngology-ENT Research*, 2(4), 145 - 147.
- Cascone, P., Ramieri, V., Vellone, V., Angeletti, D., Iannella, G., Magliulo, G. (2015). Temporomandibulare-external auditory canal fistulas treatment: Patient with air into the synovial compartment. *The Journal of Craniofacial Surgery*, 26(6), 530 - 532.
- Kayahan, B., Cabbarzade, C., Bajin, M. D., Gunaydin, R. O., Turan, E. (2013). Spontaneous herniation of temporomandibular joint through the external auditory canal. *Turkish Archives of Otolaryngology*, 52, 145 - 147.
- Kim, T. H., Lee, S. K., Kim, S. J., Byun, J. Y. (2013). A case of spontaneous temporomandibular joint herniation into the external auditory canal with clicking sound. *Korean Journal of Audiology*, 17(2), 90.
- Lacout, A., Marsot-Dupuch, K., Smoker, W. R. K., Lasjaunias, P. (2005). Foramen tympanicum, or foramen of huschke: Pathologic cases and anatomic ct study. *American Journal of Neuroradiology*, 26(6), 1317 - 1323.
- Li, W., Dai, C. (2015). Spontaneous temporomandibular joint herniation into the external auditory canal. *Brazilian Journal of Otorhinolaryngology*, 81(3), 339 - 341.
- O'Brien, D. C., Purpura, K. R., Cassis, A. M. (2018). Bilateral spontaneous temporomandibular joint herniation: A case report and literature review. *Ear, Nose & Throat Journal*, 97(9), E23 - E27.
- Rubio, J. D., Vásquez R. (2018). Dehiscence of the tympanic bone with temporomandibular joint herniation. *SOA Otolaryngology ENT Research*, 1(1), 11 - 13.
- Ryu, K. H., Baek, H. J., Hur, D. G. (2017). Spontaneous temporomandibular joint herniation into the external auditory canal through a patent foramen of huschke: A case report. *Annals of Medicine and Surgery*, 18, 33 - 35.
- Singh, I., Jain, A., Prasad, P., Rajpurohit, P. (2016). Spontaneous temporomandibular joint herniation: A rare case. *Oral and Maxillofacial Surgery*, 21(1), 87 - 90.