Case Report

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An Endoscopic Approach to External Auditory Canal Osteoma Excision: A Rare Case Report

Ear, Nose and Throat Section

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ABSTRACT

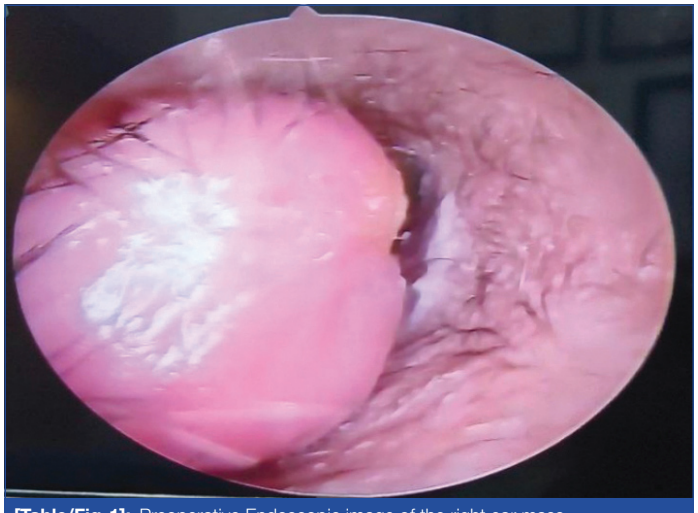
External Auditory Canal (EAC) osteoma is an infrequent, unilateral, benign, solitary neoplasm with relatively slow growth. It appears as a single, pedunculated hyperdense lesion. These lesions remain asymptomatic and are often found incidentally, being treated conservatively. However, in larger lesions that obstruct the EAC, they may infrequently exhibit otalgia, conductive hearing loss, tinnitus, a sense of mass, or aural fullness. Histopathological findings, radiographic imaging, and clinical examination may all be utilised to provide a diagnosis. Although asymptomatic cases are managed conservatively, symptomatic and large EAC osteomas are treated with surgical excision, which can be approached endoscopically or microscopically via endaural, transcanal, or postaural approaches. This case involves a 28-year-old male patient who visited the ENT department complaining of a mass in his right EAC, decreased hearing, and a sensation of blockage in the right ear that had been present for 1.5 years. Imaging and histopathological analysis determined it to be a right EAC osteoma. An endoscopic approach was employed for the surgical excision of the bony mass. This approach has been found to facilitate faster postoperative recovery, with better analgesia and cosmesis.

Keywords: Benign lesion, Endoscopic excision, Endaural, Hyperdense lesion

CASE REPORT

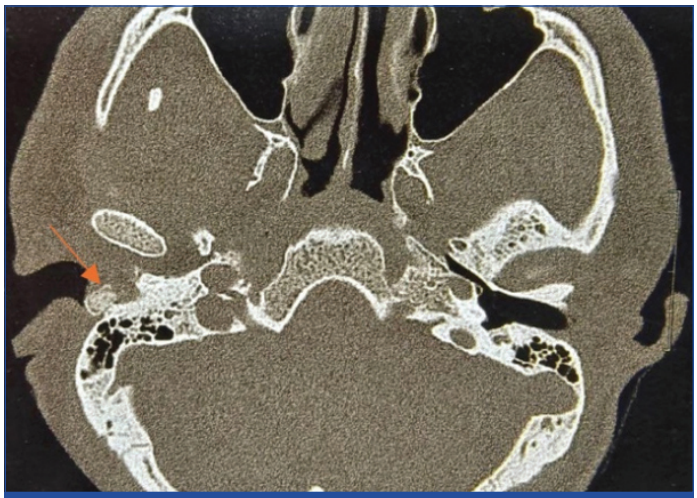
A 28-year-old man reported to the ENT outpatient department with primary concerns of right aural fullness, decreased hearing, and right ear discharge over the past 1.5 years. The hearing loss had a progressive nature. The ear discharge was intermittent and decreased with the use of topical antibiotic drops and oral medication. The patient had a history of swimming frequently and did not report any similar complaints in the left ear. He is non-diabetic, non-hypertensive, and a non-smoker.

During the physical examination, the right EAC was entirely obstructed by a firm, skin-lined mass that was immobile and coated with wax. The mass was found to originate from the posterior wall of the EAC. A conductive hearing loss of 35 dB was determined in the right ear by pure tone audiometry. An otoendoscopy was performed, during which debris and wax around the mass were cleaned by suctioning. A pinkish mass, appearing to arise from the posterior wall of the EAC, was confirmed [Table/Fig-1].



[Table/Fig-1]: Preoperative Endoscopic image of the right ear mass.

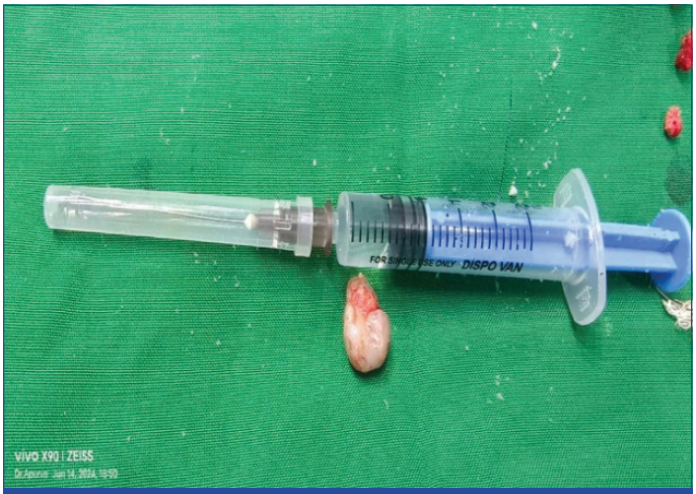
High-Resolution Computed Tomography (HRCT) of the temporal bone [Table/Fig-2,3] revealed a pedunculated mass located along the posterior wall of the right EAC at the bony-cartilaginous junction, measuring approximately 9×7 mm. The middle ear cavity appeared normal. A physical, otoendoscopic, and radiological examination



[Table/Fig-2]: HRCT temporal bone axial view showing right EAC osteoma (arrow).

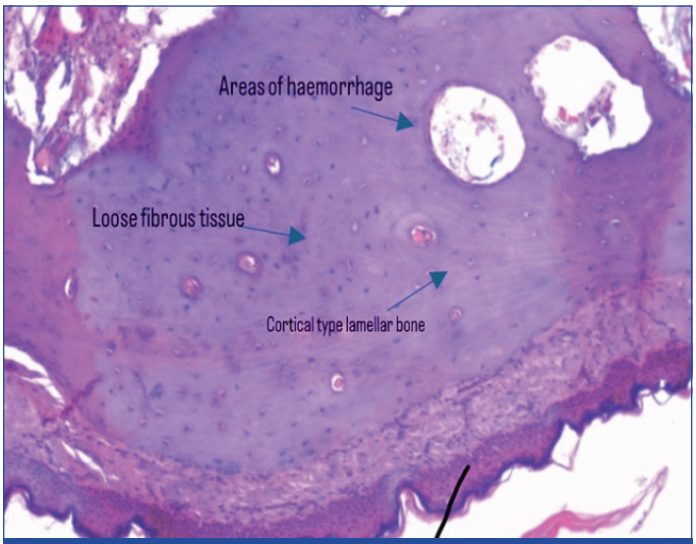
[Table/Fig-3]: HRCT temporal bone coronal view showing right EAC Osteoma (arrow).

of the left ear was found to be normal. The patient underwent excision of the right ear canal mass using an endaural endoscopic approach. Intraoperatively, the mass was found to originate from the posterior wall of the EAC along the tympanomastoid suture line. Complete excision of the bony mass was performed [Table/Fig-4]. This was followed by canaloplasty, and the tympanomeatal flap was repositioned. After excising the mass, the tympanic membrane was visualised and appeared to be normal. The exposed area of the bony EAC was then covered with a temporalis fascia graft and supported by gel foam. The patient was advised to refrain from swimming for three weeks to avoid any further infection.



[Table/Fig-4]: Excised mass from right EAC.

The histopathological examination revealed that the excised lesion was composed of cortical-type lamellar compact bone. The inter-trabecular areas showed loose fibrous tissue with focal areas of haemorrhage and a few congested blood vessels [Table/Fig-5].

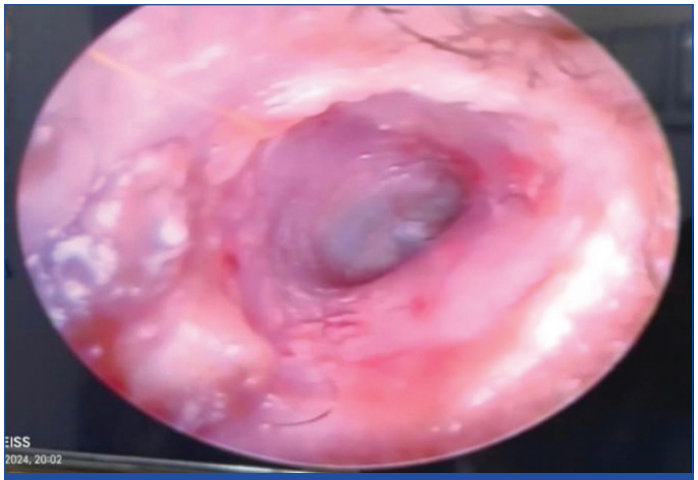


[Table/Fig-5]: (low power 40x) Histology image (Eosin and Haematoxylin stain) showing osteoma in right EAC tissue.

Postoperatively, a follow-up otoendoscopy was conducted after one month, which was normal [Table/Fig-6]. The patient was monitored for the subsequent six months, and no evidence of recurrence had been observed.

DISCUSSION

The EAC osteoma is a rare, unilateral, benign neoplasm of the temporal bone that may arise in any region of the temporal bone. The lateral region of the bony EAC is a typical occurrence site, with its base situated at the tympanosquamous or tympanomastoid suture lines [1]. It has been found to occur most commonly in the second decade of life [2]. The pathogenesis of osteoma encompasses factors such as trauma, glandular influences (for



[Table/Fig-6]: Postoperative otoendoscopy picture after. After one month of follow-up.

example, surgical intervention, pituitary dysfunction, and radiation), as well as persistent infection. Graham proposed that the vascular preosseous connective tissue located at the tympanosquamous or tympanomastoid suture lines is the predominant source of EAC osteomas [3].

The exact aetiology is still not known [4]. EAC osteomas are often confused with EAC exostoses, which are benign growths of periosteal bone that form smooth, sessile, hemispherical swellings in the deep part of the meatus, adjacent to the tympanic membrane, and must be differentiated from EAC osteomas.

Exostoses are typically multiple, bilateral, sessile, and hemispherical swellings located in the deep portion of the meatus, next to the tympanic membrane, and are generally regarded as a reactive condition resulting from frequent exposure to cold water or recurrent otitis externa [5,6]. Exostoses are composed of dense, concentric layers of subperiosteal bone covered by squamous epithelium and periosteum. These structures are rich in osteocytes and do not contain fibrovascular channels. Schuknecht defines lesions confined to the EAC as exostoses, while osteomas are those that extend beyond the canal [7].

While chronic irritation such as cold water exposure and repeated otitis externa is directly correlated with the development of exostosis, a clear aetiology of osteoma of the EAC has yet to be discerned. Although there are a few reported cases of EAC osteoma developing in surfers and cold water swimmers, the majority of medical literature provides only anecdotal evidence suggesting that injury, inflammation, hormones, infection, developmental disorders, and genetic defects may play roles in the development of EAC osteoma [3].

EAC osteomas are often asymptomatic and can be managed conservatively through regular aural toileting. However, if they are large in size and symptomatic, surgical excision may be necessary. The position of the osteoma relative to the EAC isthmus is a key determinant for the choice of surgical approach. For a medially placed neoplasm, a postauricular technique is employed; however, for laterally positioned tumours, a transcanal method may be utilised [8]. The postauricular method is the most favoured approach, as it provides superior exposure and facilitates complete excision [9].

In our case, the osteoma was excised using endoscopic visualisation to ensure total removal, as the tumour was large and fully occupied the EAC. The osteoma is typically removed via its pedicle, with the base drilled to reduce the possibility of recurrence [9]. Grinblat G et al., conducted drill canaloplasty in 245 instances of EAC osteoma and documented no recurrences [10].

Potential surgical complications may include injury to the posterior wall of the EAC, discontinuity of the ossicular chain, trauma to the temporomandibular joint, damage to the tympanic membrane,

sensorineural hearing loss, facial nerve palsy, chorda tympani injury, and ear canal stenosis [4].

Currently, with the advancements in endoscopic technology and improved equipment, the minimally invasive transmeatal approach is recommended for the removal of EAC osteomas as well as exostoses. Nonetheless, the postauricular route remains the most preferred method due to its superior exposure and capability for complete removal [2].

A newer advancement in the field of osteoma surgery is the piezoelectric device. This bone scalpel employs micro-vibration at ultrasonic frequencies to protect soft tissues from harm, even if the cutting tip inadvertently comes into contact with them [11].

The endoscopic transcanal approach to EAC osteomas demonstrates good results for lesion removal without recurrence or intraoperative complications [12].

CONCLUSION(S)

The EAC osteomas are uncommon, slowly developing, benign tumours that are usually asymptomatic and discovered incidentally. The surgeon's experience and the size of the incision dictate the surgical strategy. Although asymptomatic patients are managed conservatively, if no intervention is undertaken for an extended period, it may lead to complications such as cholesteatoma, which can become life-threatening. Therefore, surgical excision of the osteoma, along with canaloplasty, is essential.

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