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Case Report

Painless solitary mastoid osteoma: a rare presentation

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ABSTRACT

The benign tumors of the temporal bone, such as osteomas, are rare. Osteomas are typically slow-growing benign tumors composed of mature bone tissue. They occasionally occur in the external auditory canal; however, they are reported to be even rarer in the mastoid bone. A 30-year-old female presented to our department in a tertiary care hospital with a hard swelling behind the left ear, diagnosed as osteoma on HRCT temporal bone scan. A complete excision was done using a postauricular approach. Histopathology confirmed the diagnosis of osteoma. Osteomas, although rare, should be considered when dealing with any hard mastoid swelling. Drilling can ensure complete removal until the normal cortical bone is reached to avoid recurrence. A cortical mastoidectomy should be done if the mastoid air cell system is involved.

Keywords: Osteoma, Mastoid bone, Temporal bone, Mastoidectomy

INTRODUCTION

Osteomas are benign tumors composed of well-differentiated osseous tissue with a laminar structure, classified as mesenchymal osteoplastic in nature.[1] Osteoma66, benign tumors commonly found in the frontal and ethmoidal sinuses, rarely occur in the mastoid.

They have been documented throughout the temporal bone, spanning the squamous region, mastoid, internal and external auditory meatus, glenoid cavity, middle ear, Eustachian tube, petrous apex, and styloid process. Within the temporal bone, osteomas are relatively rare, accounting for only 0.1 to 1% of all benign tumors affecting the skull.[1]

They are most commonly found in the external auditory canal but are infrequently observed in other areas of the temporal bone, including the mastoid, squamous portion, inner ear canal, and middle ear.[1] The report focuses on a specific case of mastoid osteoma, highlighting the clinical and diagnostic challenges associated with this uncommon presentation within the temporal bone.

CASE REPORT

This case report describes a 30-year-old female who presented to the ENT Out Patient Department with a firm swelling in the left postauricular region that had been present for 3 years (Figure 1). On initial examination, the swelling was measured to be approximately 40×30 mm and was noted to be fixed to the underlying mastoid bone.

The overlying skin appeared normal, and there was no increase in local temperature. The patient first noticed the swelling 3 years ago while combing her hair. The patient did not report any associated symptoms such as pain, dizziness, or hearing loss. Her overall health was reported as good, and she denied any history of local trauma, chronic inflammation, changes in cranial nerves, or alterations in hearing. Importantly, examination revealed intact facial nerve function. No bony growths were noted in the external auditory canal.

Further diagnostic evaluation and assessment are required to determine the nature of the swelling, potential causes, and appropriate treatment options. The absence of

symptoms and the long-standing swelling suggest a benign or potentially slow-growing nature, highlighting the need for careful clinical consideration and investigation. On HRCT of the temporal bone, a distinct exophytic sclerotic osseous lesion measuring 4.6×2.2×5.2 cm was observed arising from the left mastoid process. There was no evidence of adjacent bone destruction or involvement of soft tissue. Furthermore, no extension was noted into the external auditory canal or middle ear cavity. These radiological findings indicate a well-defined bone growth originating from the mastoid process, characterized by its sclerotic nature and absence of infiltration into nearby structures (Figure 2).

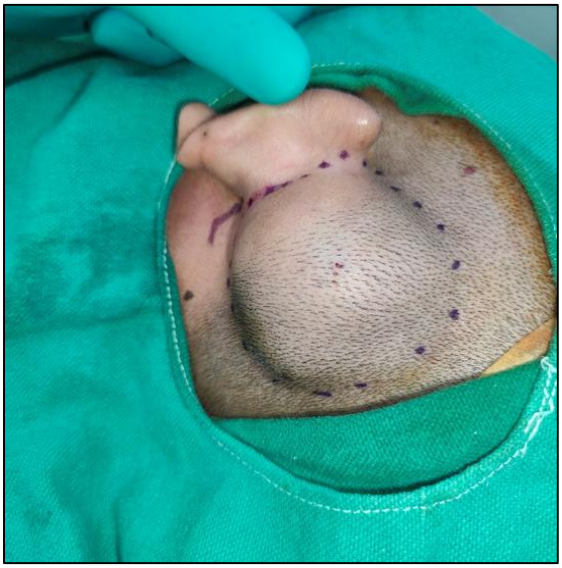

Figure 1: Clinical picture of left post aural swelling.

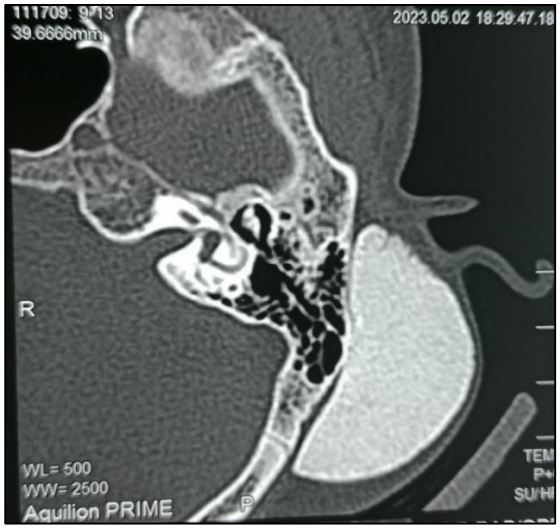

Figure 2: HRCT temporal bone with mastoid osteoma.

The pure tone audiogram of the patient indicates that hearing thresholds were within normal limits bilaterally. (Figure 3).

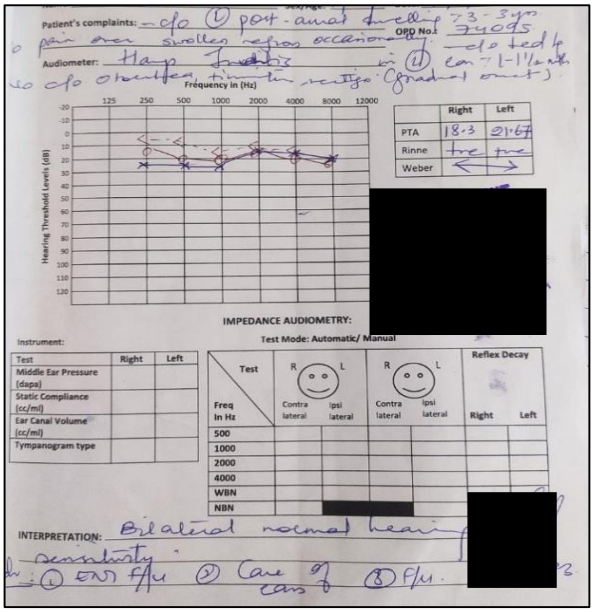

Figure 3: Pure tone audiogram.

Surgical procedure

The patient underwent surgery under general anaesthesia. A post-aural incision was made over the osteoma swelling. The entire osteoma was carefully delineated and removed completely using a chisel and hammer (Figure 4a and Figure 5). During the procedure, the contour of the mastoid cortex was found to be intact, with no evidence of bony invasion noted (Figure 4b).

The excised mass was sent for histopathological examination, which revealed mature lamellar bone and woven bone pattern. Haversian-like canals of varying sizes and shapes were observed, along with osteoblasts contributing to bone formation. Osteoclasts within the matrix appeared normal. Additionally, diffuse sheet-like osteoid deposition with focal areas of mineralization was seen. Based on these histopathological findings, the diagnosis of osteoma of the mastoid bone was confirmed.

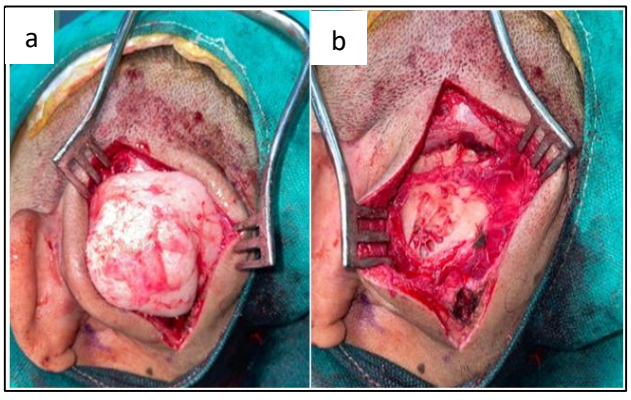

Figure 4: (a) Intraoperative pictures of osteoma; (b) intact mastoid cortex post-removal.

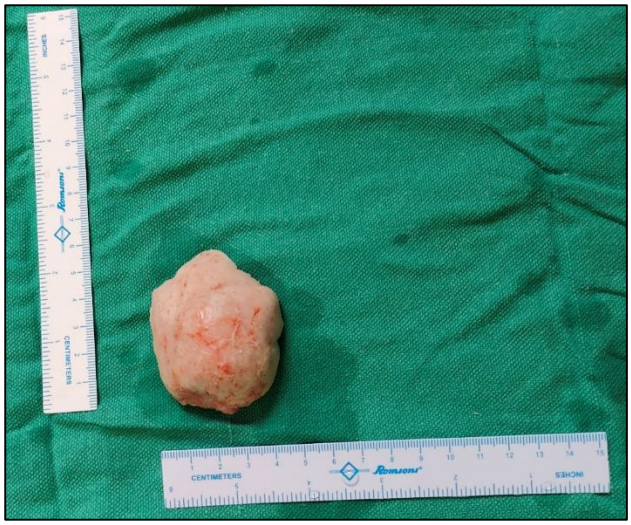

Figure 5: In toto excised Osteoma.

DISCUSSION

Osteomas are benign tumors commonly found in the head and neck region, with a higher prevalence in the frontal and ethmoidal sinuses. However, they are exceptionally rare in the mastoid bone.[2] These tumors can occur in various parts of the temporal bone, including the squamous portion, mastoid, internal and external auditory meatus, glenoid cavity, middle ear, Eustachian tube, petrous apex, and styloid process. D'Ottavi et al reviewed 100 cases of mastoid osteoma and reported two cases from their own experience.[3] According to Dominguez Pérez et al, approximately 150 cases of mastoid osteoma had been documented in the literature up to 2010.[4]

Osteomas exhibit a higher incidence in female patients, particularly in the 2nd and 3rd decades of life, and are rare during puberty.[5] The exact cause of osteomas is unknown, although some suggest a congenital origin. They can occur in isolation or be associated with syndromes such as Gardner's syndrome, which includes multiple intestinal polyps, epidermoid inclusion cysts, fibromas of the skin and mesentery, and osteomas. Non-syndromic cases may have predisposing factors like trauma, surgery, irradiation, metaplasia, chronic infection, or pituitary dysfunction.[6]

Histologically, osteomas can present in various forms including compact, cartilaginous, spongy, or mixed types. They typically manifest as asymptomatic, solitary, slowly enlarging swellings rarely exceeding 3 cm, a presentation consistent with reports by Hazem et al and El Fakiri et al.[2,7] Although usually benign and asymptomatic, osteomas can occasionally lead to complications such as facial palsy, sensorineural hearing loss (SNHL), conductive hearing loss (CHL), sigmoid sinus damage, recurrent ear infections, or pain if they invade neighboring structures or cause periosteal expansion. Rarely, mastoid osteomas can compress posterior fossa structures and lead to intracranial complications, as reported by Dellen et al.[8] The differential diagnosis of mastoid osteoma includes osteoblastic metastasis, osteosarcoma, giant cell tumor, osteoid osteoma (which is painful and has characteristic histological features), isolated eosinophilic granuloma (with specific radiological findings), ossifying fibroma, Paget's disease, haemangioma, calcified meningioma, and monostotic fibrous dysplasia (with distinctive histological characteristics).

It is crucial to distinguish osteomas from exostoses, which lack a fibrovascular stroma, are typically multiple, have a broad-based attachment medial to the suture line, whereas osteomas are usually solitary, pedunculated, and located lateral to the suture line. A CT scan is the preferred diagnostic tool for evaluating osteomas due to its ability to clearly visualize these lesions within the cranium. Osteomas typically appear as a radiolucent area with central calcification that expands outward, preserving the original bone structure. They present as well-defined, low-density osseous tissue surrounded by a sclerotic rim of higher density. In rare cases, osteomas may extend towards the medial aspects of the petrous temporal bone, adjacent to structures like the facial nerve, lateral semicircular canal, or ossicles. Imaging plays a crucial role in defining the anatomical relationships with these structures before considering surgical resection.[1]

MRI (magnetic resonance imaging) may be utilized to assess any inflammation surrounding the lesion, providing additional information about soft tissue involvement and aiding in surgical planning. The primary treatment for osteomas is surgical excision, typically recommended for cases that are symptomatic or aesthetically displeasing. The surgical approach depends on factors such as the location and size of the osteoma, as well as the surgeon's preference and experience. A postauricular incision is commonly used in mastoid osteomas. If the osteoma extends into delicate structures like the fallopian canal or bony labyrinth, complete excision may not be feasible due to the risk of damaging these structures. Osteomas involving the middle and inner ear are typically observed unless they become symptomatic.

For osteomas in the internal auditory meatus, surgical management is approached either through the middle cranial fossa or a sub-occipital approach.[9] Patients undergoing partial excision or expectant management require regular follow-up to monitor for any recurrence or development of symptoms. The literature does not report malignant transformation of osteomas, and recurrence following complete excision is very rare.[10]

CONCLUSION

Mastoid osteomas are benign tumors that originate from the temporal bone and typically grow slowly. They are rare and often asymptomatic but can present with cosmetic deformity, pain, or hearing loss. Diagnosis is

usually straightforward through clinical examination and radiological imaging. Treatment involves surgical excision, which effectively resolves symptoms and addresses cosmetic concerns. When the osteoma is completely removed, the prognosis is generally favorable in terms of both cosmetic improvement and curative outcome. Recurrence of mastoid osteomas is uncommon, and malignant transformation is extremely rare.

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