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Case Report

Tenosynovial giant cell tumor of the bony external auditory canal: a rare extra-articular case managed by transcanal endoscopic excision

Shruti R. Thorat*, Sanjana V. Nemade, Sandeep Chahande

Department of ENT and Head and Neck Surgery, Smt. Kashibai Navale Medical College and General Hospital, Pune, Maharashtra, India

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***Correspondence:**
Dr. Shruti R. Thorat,
E-mail: ishrutithorat@gmail.com

ABSTRACT

Tenosynovial giant cell tumour (TGCT) is a benign proliferative lesion arising from synovial-type tissue, most commonly involving small joints of the extremities. Occurrence in the external auditory canal (EAC), particularly the bony canal, is exceedingly rare. We report a 20-year-old male presenting with left-sided aural fullness and conductive hearing loss of one month's duration. Otoscopy revealed a smooth, pinkish mass arising from the anterosuperior bony EAC and abutting the tympanic membrane. Complete excision was performed using transcanal endoscopic ear surgery. Histopathology with immunohistochemistry supported localized TGCT. Postoperatively, canal patency was restored, hearing normalized, and no recurrence was observed. This case highlights the diagnostic challenge of EAC giant cell-rich lesions and supports endoscopic excision as an effective treatment.

Keywords: Tenosynovial giant cell tumour, Bony external auditory canal mass, Transcanal endoscopic ear surgery, Conductive hearing loss

INTRODUCTION

The term 'tenosynovial giant cell tumor (TGCT) encompasses a group of lesions arising from synovium of joints, bursae, tendon sheaths and showing synovial differentiation.[1] It was first described by Chassaignac in 1852. It is classified into localized, diffuse and malignant sub-types. The localized type is called giant cell tumour of tendon sheath (GCTTS).[1]

Head and neck involvement is unusual, and the External auditory canal (EAC) is an especially rare site.[2,3] Because the bony EAC has no true synovial lining, its origin in this location is not fully understood.[1] We report a rare localized TGCT of the bony EAC and describe its clinical, radiologic and histopathologic features, together with management by trans-canal endoscopic ear surgery (TEES).

CASE REPORT

A 20-year-old male with no significant medical history presented to the ENT outpatient department in September 2024 with one month of left aural fullness, a foreign body sensation and reduced hearing. He denied otorrhea, otalgia, trismus or prior ear trauma. There was no history of similar lesions elsewhere in the body.

On otoscopic examination, a smooth pinkish globular mass measuring approximately 9×9 mm was seen arising from the anterosuperior bony EAC and closely abutting the tympanic membrane. The lateral canal and pinna were normal. The lesion was firm, non-tender and did not bleed on touch. The tympanic membrane was partially visible and moved normally with Siegelization. Temporomandibular joint and facial nerve examinations were normal, and no other ENT abnormality was found. Pure tone audiometry showed mild conductive hearing

loss on the left side. High-resolution computed tomography of the temporal bone with contrast demonstrated a well-defined soft tissue lesion measuring 6×12.5×10 mm in the left bony EAC, abutting the scutum and showing mild post-contrast enhancement. There was no bony erosion or middle ear extension.

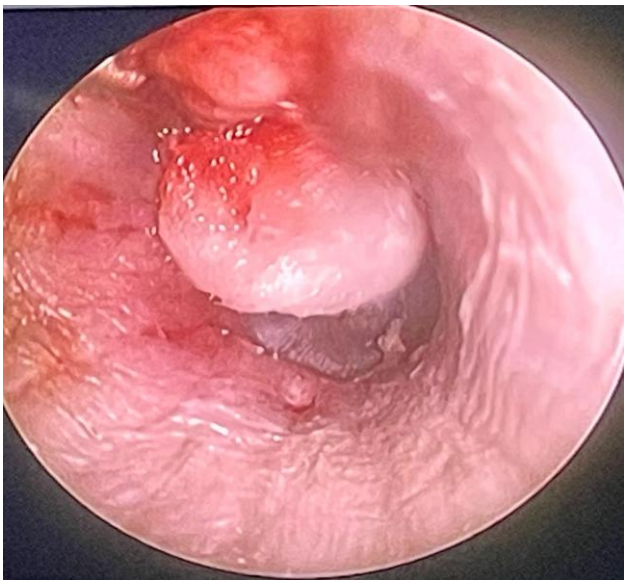

Figure 1: Clinical photograph showing a smooth, pinkish mass arising from the anterosuperior bony external auditory canal.

The patient was advised excision of the aural mass under general anesthesia for both diagnosis and treatment. After informed consent, TEES was planned. Using a rigid oto-endoscope, the mass was completely excised with a 2-3 mm margin of healthy tissue. The underlying bony canal was normal and the tympanic membrane was intact. The specimen was sent for histopathological examination.

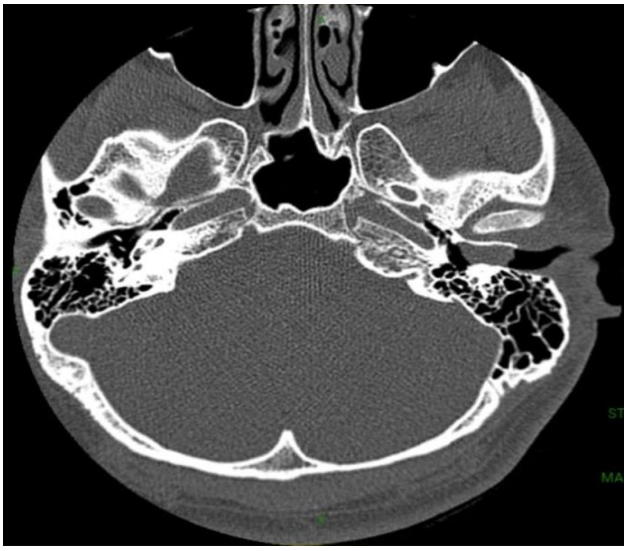

Figure 2: High-resolution computed tomography of the temporal bone showing a well-defined soft tissue lesion in the bony EAC without bony erosion.

Microscopy showed stratified squamous epithelium with hyperkeratosis and acanthosis overlying sheets of spindle cells, evenly spaced osteoclast-like multinucleated giant cells, scattered mitotic figures, hemosiderin-laden macrophages and lymphocytes, along with focal osseous metaplasia. Immunohistochemistry showed diffuse vimentin positivity and focal desmin positivity. These findings were consistent with giant cell tumor of tendon sheath/localized TGCT.

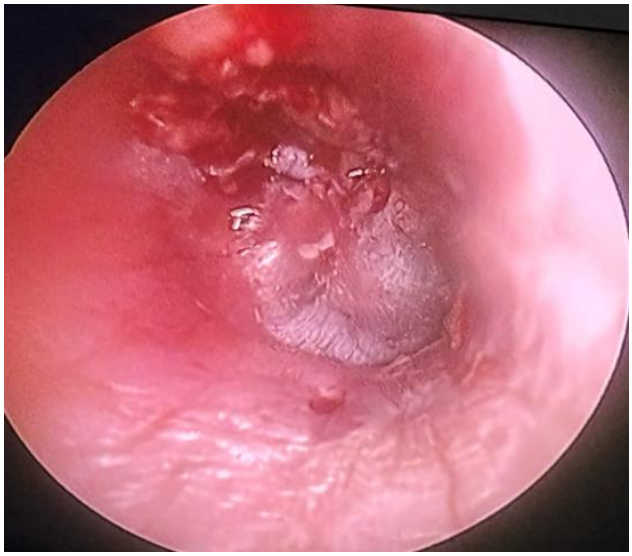

Figure 3: Intraoperative endoscopic view after complete trans canal excision of the lesion.

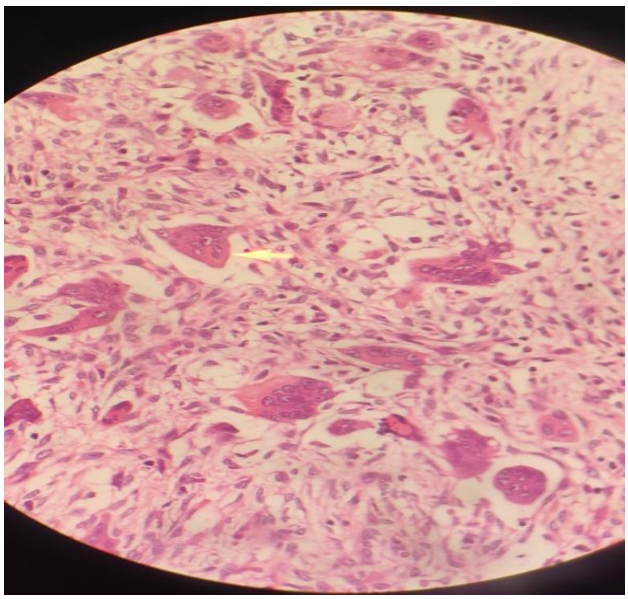

Figure 4: Histopathology showing osteoclast-like multinucleated giant cells with spindle stromal cells and hemosiderin-laden macrophages.

Postoperative recovery was smooth. Canal patency was restored, and serial pure tone audiometry showed return of hearing to normal within six months. At 17 months of follow-up, there was no evidence of local recurrence.

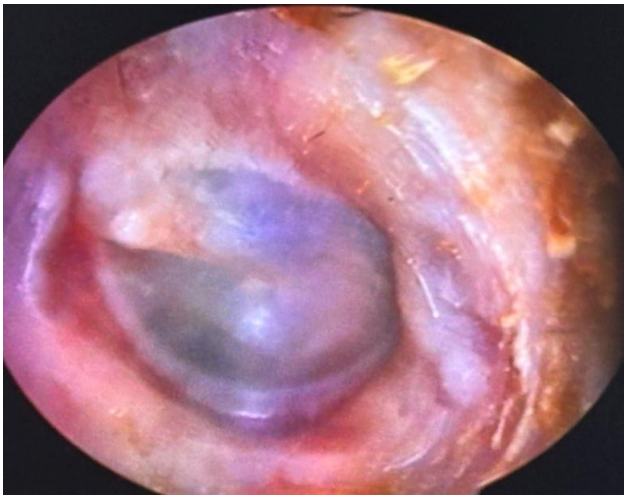

Figure 5: Follow-up image at 17 months showing a healed canal without recurrence.

DISCUSSION

TGCT is now regarded as a clonal neoplastic process of driven by CSF1 overexpression, with the recruitment of macrophages and osteoclast-like giant cells.[1] Localized TGCT is the commonest form and typically affects the hand and wrist. Extra-articular lesions are usually seen near peri-articular soft tissues, although intramuscular and subcutaneous presentations also occur.[1] In the head and neck, the temporomandibular joint region is the best-known site, while primary EAC involvement is distinctly uncommon.[2,3]

The main challenge in this case was preoperative diagnosis. A small, smooth mass in the EAC can suggest osteoma, exostosis, canal cholesteatoma, fibrous dysplasia, vascular lesions or a cutaneous neoplasm.[4,6,8] Our patient had a benign clinical profile and imaging showed a confined lesion without erosion, but these findings were not specific enough to identify TGCT before excision.

Definitive diagnosis therefore depended on clinicopathologic correlation. The combination of spindle stromal cells, osteoclast-like giant cells, hemosiderin deposition and focal osseous metaplasia and immunohistochemistry findings were concurrent with the essential diagnostic criteria of localized TGCT.[1]

Table 1: Comparison with reported EAC cases.

Reference	Site	Key features	Histopathology	Management/ outcome
Trani et al (2014)[2]	Cartilaginous EAC	Firm, well-circumscribed lesion; tympanic membrane intact	Mononuclear cells, multinucleated giant cells in hyalinized collagen fiber matrix CD68 positive, cytokeratins 5,6, P53, S100 negative	Microscopic excision; no recurrence reported
Maghari et al (2016)[3]	Dermis of external auditory meatus	Small recurrent painful oozing mass No cartilage involvement.TM intact.	Ulceration with marked acute and chronic inflammatory changes with granulation tissue Multinucleated giant cells. Factor 13A negative ruling out unusual variant of fibrous histiocytoma	Excision with margins; no recurrence reported
Present case	Bony EAC	9x9 mm smooth mass, no bony erosion	Spindle shaped mononuclear cells, osteoclast like giant cells, hemosiderin laden macrophages and lymphocytes Desmin -focally positive, vimentin positive	TEES with complete excision; no recurrence at 17 months
WHO classification (GCTTS) 2020 (book chapter)	Mostly seen in Fingers, wrist, ankle, rare cases in TMJ. Extra articular type Essentially in peri-	Rarely erodes bone or involves skin, small in size (0.5-4 cm)	Small histiocyte like cells, osteoclast like giant cells, hemosiderin laden mononuclear cells,	Complete surgical excision. Unresectable - molecular therapy targeting CSF1 pathway. (receptor

Continued.

Reference	Site	Key features	Histopathology	Management/ outcome
	peri-articular region but can be solely intramuscular or subcutaneous.		varying degrees of hyalinization foamy histiocytes CD68, CD163, CD45 positive, clusterin positive, desmin focally positive (45-80% cases), CSF1 positivity	inhibitors) 4-30% recurrence. Although nondestructive and controlled by surgical re-excision.

The novelty of this case lies in its location in the bony EAC. Previous reports by Trani et al and Maghari et al have described lesions confined to the cartilaginous canal with normal medial canal.[2,3] In our patient, the absence of trauma, the lack of temporomandibular joint symptoms, the normal surrounding bone at surgery and the absence of radiologic destruction all support a truly isolated extra-articular lesion rather than extension from adjacent structures. Complete surgical excision is the mainstay treatment because incomplete removal increases the risk of recurrence.[1,4,9] Paniselvam et al previously emphasized complete excision of giant cell tumour of soft tissue with adequate margins and demonstrated successful removal through a trans canal endoscopic route.[4] In this case, TEES allowed complete removal while preserving the tympanic membrane and surrounding canal skin. TEES is particularly useful in selected EAC lesions like cavernous hemangioma and osteoma because it offers a close-up, wide-angle view, improves access near the tympanic membrane and avoids a postauricular incision.[5-7] The postoperative course was favorable, with restored canal patency, hearing improvement and no recurrence to date. Continued surveillance remains important because TGCT can recur even after apparently complete excision.

Limitations

This report describes a single case with limited follow-up. Molecular testing for CSF1 rearrangement was not performed and could provide additional support in future similar cases.

CONCLUSION

Localized TGCT of the bony external auditory canal is exceptionally rare and can mimic other benign EAC masses hence should be considered as differential diagnosis. Histopathology with immunohistochemical support is essential for diagnosis. TEES provides a safe, minimally invasive and cosmetically favorable option for complete excision, with good functional outcome as seen in this case. Long-term follow-up is advisable because of the possibility of recurrence.

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