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Case Report: Tympanic Paraganglioma – A Multimodal Radiological Analysis

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Abstract | **Case Report**

Tympanic paraganglioma, or glomus tympanicum, is a rare neuroendocrine tumor arising from paraganglionic cells within the middle ear. Although benign, its hypervascular nature necessitates a rigorous imaging strategy for accurate diagnosis and surgical planning. We report the case of a 62-year-old female presenting with unilateral hearing loss and pulsatile tinnitus. This report highlights the essential complementarity between high-resolution Computed Tomography (CT) of the temporal bone and Magnetic Resonance Imaging (MRI), which are critical for characterizing the lesion and ensuring safe surgical management.

Keywords: Tympanic paraganglioma, Glomus tympanicum, Pulsatile tinnitus, Computed tomography (CT), Magnetic resonance imaging (MRI), Temporal bone.

1. INTRODUCTION

Tympanic paraganglioma is the most common middle ear tumor after inflammatory processes. It originates from paraganglionic cells located along Jacobson's nerve or the auricular branch of the vagus nerve in the tympanic cavity wall. The primary radiological challenge is distinguishing this tumor from chronic otitis media or cholesteatoma, as misdiagnosis can lead to significant intraoperative hemorrhaging. This report emphasizes the decisive role of multimodal imaging in the characterization and assessment of lesion extent.

2. Clinical Presentation

The patient, a 62-year-old female, presented to the radiology department with a one-year history of left-sided unilateral hearing loss, pulsatile tinnitus, and non-positional rotatory vertigo.

Otoscopic examination revealed a retrotympanic mass. Given the clinical suspicion of a tumor, a rigorous radiological evaluation was required to exclude other inflammatory or neoplastic differential diagnoses.

3. Radiological Findings

3.1 Temporal Bone Computed Tomography (CT)

CT imaging without contrast, utilizing 0.5 mm thin-section slices, allowed for precise analysis of bony structures:

- **Localization:** The mass occupied the epitympanum and mesotympanum, causing a localized mass effect.
- **Bone Integrity:** Unlike acquired cholesteatoma, there was no evidence of scutum erosion or significant destruction of the ossicular chain.
- **Diagnostic Significance:** The integrity of the jugular bulb wall confirmed the pure tympanic origin of the lesion, an essential finding to distinguish it from inflammatory processes.

3.2 Magnetic Resonance Imaging (MRI)

MRI is the gold standard for tissue characterization and vascular assessment:

- **T1-weighted sequences:** The lesion displayed intermediate signal intensity (iso-intense relative to extra-ocular muscles).
- **T2-weighted sequences:** A heterogeneous hypersignal was observed, occasionally showing a characteristic "salt and pepper" appearance in larger lesions.
- **Contrast-enhanced sequences:** Gadolinium

administration revealed intense, homogeneous, and early enhancement, confirming marked hypervascularity.

- **Angio-MRI (TRICKS or TOF):** These sequences confirmed vascular synchronism with adjacent major vessels, a pathognomonic feature of paraganglioma.

Table 1

Diagnostic Tool	**Key Radiological Feature**	**Clinical Utility**
CT Scan	Absence of scutum erosion	Distinguishing from Cholesteatoma
MRI	Intense post-contrast enhancement	Confirming hypervascularity
Diagnostic Tool	Key Radiological Feature	Clinical Utility
Angio-MRI	Vascular synchronism	Pathognomonic confirmation

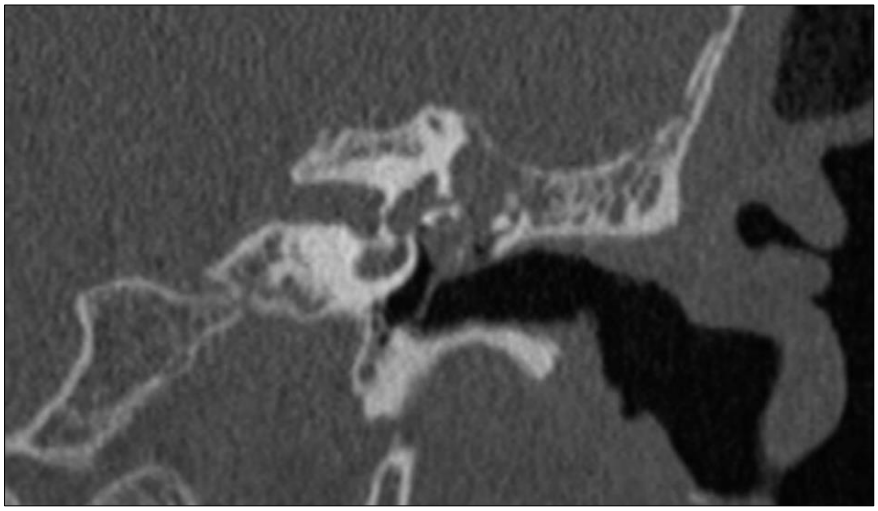

Fig. 1

4. DISCUSSION

The diagnosis of tympanic paraganglioma relies on rigorous radio-clinical correlation. The differentiation from cholesteatoma is primarily based on the absence of characteristic bone erosion on CT. MRI plays a pivotal role in confirming the hypervascular nature of the mass. Therapeutic management, which is often surgical, is highly dependent on imaging findings; preoperative embolization is recommended for larger lesions to reduce the risk of hemorrhage.

5. CONCLUSION

Tympanic paraganglioma is a pathology where radiological imaging dictates clinical decision-making. The combination of CT and MRI is inseparable. The radiologist's role is essential for differentiating this lesion from inflammatory processes and for planning surgical intervention safely.

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