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OTOLOGY

KEEP IN MIND A MIDDLE EAR MENINGIOMA

MENINGIOMA OF THE MIDDLE EAR: CASE REPORT

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INTRODUCTION

Middle ear meningioma (MEM) is a rare condition with nonspecific symptoms that can lead to misdiagnosis and delayed management. This report aims to raise awareness of MEM and emphasize the importance of considering meningiomas in the differential diagnosis of middle ear disorders. We report the cases of a patient followed in our ENT department since 2019.

Case

Age :38 **Gender :** female **Medical history :** no past medical history

History of illness :

- Two episodes of left peripheral facial palsy, nine months apart, successfully treated with corticosteroids
- Months later she presented with left-sided hearing loss, aural fullness, dizziness, and intermittent left otalgia with tinnitus.

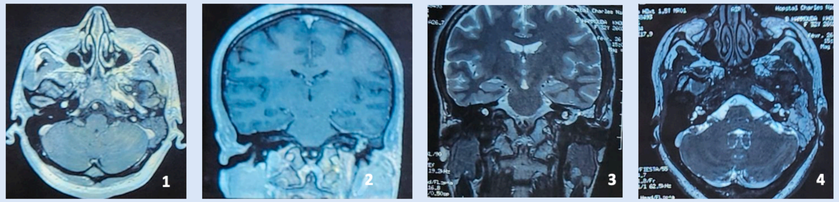
Clinical examination findings : Otoscopy revealed a dull, retracted left tympanic membrane, tissular mass behind the tympan
Audiometry showed a 50 dB left conductive hearing loss. **Videonystagmography (VNG)** suggested a left peripheral finding.
Fiberscopy did not reveal any space-occupying lesion obstructing the Eustachian tube in the nasopharynx,
initial **Temporal bone CT** concluded to chronic otitis media with effusion of the left ear
=> an inflammatory etiology was considered => conservative treatment with decongestants was initiated,
but no improvement was observed after several weeks. further exploration was needed :

MRI with gadolinium revealed an ***en-Plaque meningioma of the middle ear***:

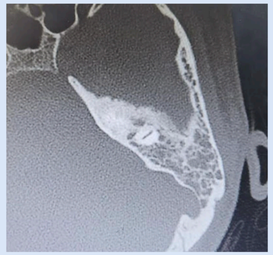
* left *regular thickening of the meninges* in the temporal fossa, measuring approximately 8mm in thickness, extending to the lateral wall of the homorateral cavernous sinus, which remains permeable
* The thickening extends *via the tegmen tympani* to the middle ear at the epi and meso tympanic levels, reaching the geniculate ganglion *in contact with the second portion of the facial nerve.*
* *hyperostosis of the tegmen tympani+petrous apex+greater wing of the sphenoid bone around the base foramina.*
* Enhancement of the ME + *Fluid retention in the middle ear and mastoid cells,* which appears hypointense on T1-weighted imaging and hyperintense on T2-weighted imaging. no enhancement after gadolinium chelate injection.

the **Temporal bone CT** complement visualised:

*total filling of the mastoid and middle ear cells.
*osteosclerosis of the tegmen tympani and the greater wing of the sphenoid bone.
*no abnormality of the external auditory canal. The ossicular chain is intact.
*the 2nd tympanic portion of the facial nerve is a seat of osteosclerosis of its canal on the slope.
*The round and oval windows are filled externally, in contact with the above-described filling.
*no dehiscence of the superior semicircular canal. no morphological anomaly/density of the bony labyrinth.
*The internal auditory canal is intact.



Regular meningeal thickening of the temporal fossa extending to ME + an aspect of serous otitis media(**Fig.1+2+3+4**)
Fig.1 Axial gadolinium-enhanced T1W MR image at the level of the temporal bone pyramid shows an intensely enhancing anterior wall of the ME cavity
Fig.2 Coronal gadolinium-enhanced T1W image enhancement of the roof of the tegmen.
Fig.3+4 T2-weighted images show hyperintense fluid accumulation in the middle ear/mastoid cells and thickening/hypointense sclerosis of the ME walls



-Fig.5 Axial CBCT image of the right temporal bone : hyperostosis of the tegmen tympani, petrous apex, and greater wing of the sphenoid around the base foramina

Therapeutic management :The decision was to "wait and monitor" with regular follow-ups and serial imaging.
short-term and long-term follow-up : no recurrence of PFP, stability of the hearing loss, but the patient still have vertigo, intermittent otalgia, vitamin-therapy was non efficient , actually we started vestibular rehabilitation sessions

Discussion

*Meningiomas are slow-growing benign tumors and represent the most common extra-axial intracranial neoplasm. Disease incidence rises with age, especially in females aged 30-60 years (1), rarely it occurs extracranially (<2%), often affecting the orbit, nose, or paranasal sinuses.
Meningiomas in the middle ear and mastoid are more rare and can cause nonspecific symptoms, leading to misdiagnosis and delayed treatment.(2)

*in most cases Patients presented clinically with otitis , pain, dizziness/vertigo, sensorineural hearing loss, tinnitus, and/or facial palsy (2,3)
*En plaque meningiomas in the temporal bone may cause a **distinctive hairy, irregular appearance of the affected bone's free edge.**
These tumors often show **soft-tissue opacification in the middle ear cavity**, surrounding but not destroying the ossicles.

***MRI** is the preferred imaging modality for diagnosing temporal bone meningiomas.
T2-weighted images show hyperintense fluid accumulation in the middle ear and thickening/hypointense sclerosis of the middle ear walls
Gadolinium-enhanced T1-weighted images reveal enhancing dural-based masses or thickened, enhancing middle ear walls due to meningioma invasion.(4)

*Temporal bone meningioma can be differentiated from *fibrous dysplasia* by the intact bony structure. *Cholesteatomas* and *paragangliomas* typically destroys ossicles and involve the temporal bone. Cholesteatomas do not enhance after gadolinium and exhibit hyperintensity on diffusion-weighted sequences, distinguishing them from meningiomas. (4)

*In deciding the treatment, the relative benefits of each treatment option or their combinations are weighed against the associated risks.

Surgical intervention is the preferred treatment
=> a **combined middle fossa craniotomy and mastoidectomy approach** is recommended,
it provides superior and lateral views of the temporal bone, allowing for the removal of hyperostotic bone and involved dura.
Wound reconstruction with a vascularized temporalis muscle graft helps prevent cerebrospinal fluid (CSF) leaks.
it offers the best chance for complete tumor removal and reduces the risk of recurrence. (4,7)

Stereotactic radiosurgery is a highly effective alternative to surgery /adjuvant treatment for residual or recurrent tumors.

Observation is a reasonable approach for small tumors that do not show evidence of growth or related symptoms ,
follow-up imaging at 6-12 month intervals is recommended to monitor for any signs of aggressive growth.(4,6)

Conclusion

This case underscores the importance of a thorough imaging evaluation in patients with unexplained otology symptoms to enable early diagnosis.

References

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