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A case report on the atypical presentation of cerebellopontine angle (CPA) meningioma as aural polyp in tertiary care hospital in Pakistan

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Abstract

Meningioma, a benign tumor arising from arachnoid cells, rarely affects the middle ear (ME) and can either occur solitarily or as a lateral extension of a CPA meningioma. Though benign, these tumors may lead to symptoms like hearing loss, vertigo, tinnitus, and facial numbness due to cranial nerve involvement. Advanced imaging tools, such as CT and MRI, are essential for identifying CPA meningiomas. This report presents a case of a CPA meningioma that initially appeared as an auditory polyp. A benign middle ear tumor was detected via CT, and subsequent biopsy confirmed meningioma. Further investigation through MRI revealed a CPA meningioma. The case underscores the necessity of MRI in evaluating middle ear meningiomas to rule out intracranial spread.

Keywords: Middle ear meningioma; CPA meningioma; Aural polyp; Hearing loss.

Introduction

Meningiomas are common benign intracranial tumors, but 20% are atypical (WHO grade II), and 1%-3% are malignant (anaplastic). They account for 20%-30% of all intracranial tumors, making them the second most common neoplasm of the central nervous system [1]. These tumors rarely occur in the middle ear and mastoid cavity, constituting about 1% of temporal bone tumors. Typically, they result from the lateral spread of intracranial meningiomas, though isolated cases originating from the middle ear (ME) have been reported. Some theories suggest the involvement of pluripotent cell maturation or arachnoid cells lying along bony fusion lines [2]. Earlier diagnoses of isolated middle ear meningiomas (MEMs) have been criticized for potentially overlooking intracranial malignancies prior to the widespread use of MRI [3]. Various causes of hearing loss and vertigo exist, including Meniere's disease, infections, and neoplasms [4]. Meningiomas are more common in females and have been linked to female-specific cancers, possibly due to the presence of estrogen and progesterone receptors on the tumor [5]. CPA meningiomas, occurring in the posterior cranial fossa, account for 5%-10% of all intracranial tumors [6]. Meningiomas of the ME and mastoid bone are uncommon, with extracranial meningiomas representing only 2% of all meningiomas [7]. These tumors can be isolated or extensions of CPA meningiomas. Around 20% of intracranial meningiomas have extracranial extensions, involving areas like the scalp, orbit, soft tissues, ear, and temporal bone. The middle ear, however, is a rare site for extracranial spread, with an incidence of less than 2% [2]. Critics of isolated extracranial meningiomas emphasize the need for advanced imaging to rule out intracranial tumors [8].

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Case presentation

A 49-year-old woman from rural Punjab, Pakistan, presented to a tertiary care hospital in Rahim Yar Khan with a 3-month history of progressive left-sided hearing loss, recurrent episodes of positional vertigo accompanied by imbalance, and intermittent purulent, blood-tinged otorrhea. Initial management at a local clinic for suspected Otitis

Media With Effusion (OME) with oral antibiotics and decongestants failed to alleviate symptoms. Pure tone audiometry (PTA) revealed normal hearing in the right ear, and moderate-to-severe mixed hearing loss in the left ear (Figure 1). Otoscopic evaluation revealed a pedunculated, erythematous polyp obstructing the left external auditory canal, which was excised endoscopically. Histopathology confirmed the polyp as grade 1 meningothelial meningioma (World Health Organization classification). Persistent sensorineural hearing loss prompted contrast-enhanced brain MRI, which identified a 2.8 × 2.5 cm homogenously enhancing, dural-based mass in the left cerebellopontine angle (CPA), with mild brainstem compression (Figure 2). The mass exhibited a broad dural attachment to the petrous ridge, radiologically consistent with CPA meningioma. The patient underwent left retrosigmoid craniotomy with gross total resection of the CPA tumor (Figure 3). Intraoperative placement of an external ventricular drain (EVD) was performed prophylactically and removed on 5th day. The patient's vertigo and otorrhea resolved completely, though left-sided sensorineural hearing loss remained unchanged. Final histopathology of both the CPA mass and aural polyp confirmed concordant grade 1 meningothelial meningioma, establishing the polyp as an ectopic extension of the intracranial tumor (Figure 4).

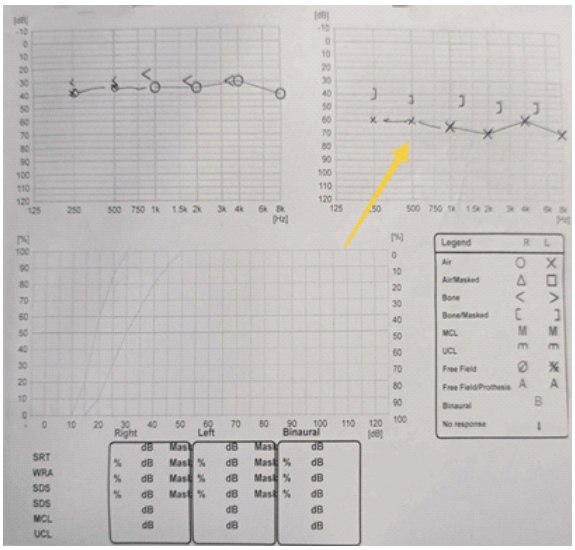

Figure 1: Pure-tone audiometry (PTA). Yellow arrow showing left ear moderately severe mixed hearing loss.

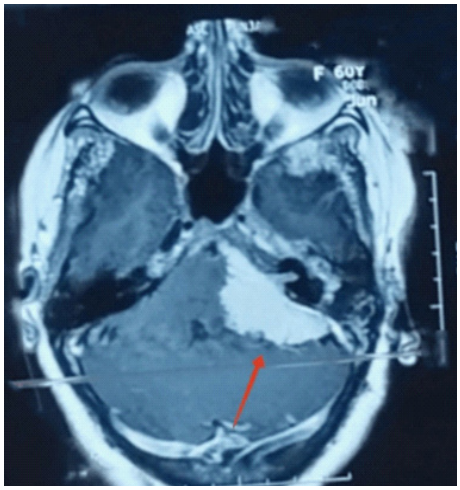

Figure 2: Preoperative Magnetic resonance imaging (MRI) brain with contrast red arrow showing left Cerebellopontine angle (CPA) tumor.

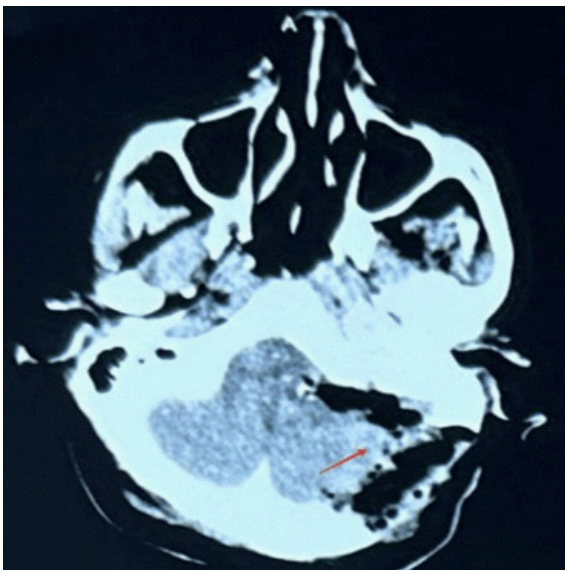

Figure 3: Post opeartive (computed tomography) CT brain scans plain red arrow showing site of removal of tumor.

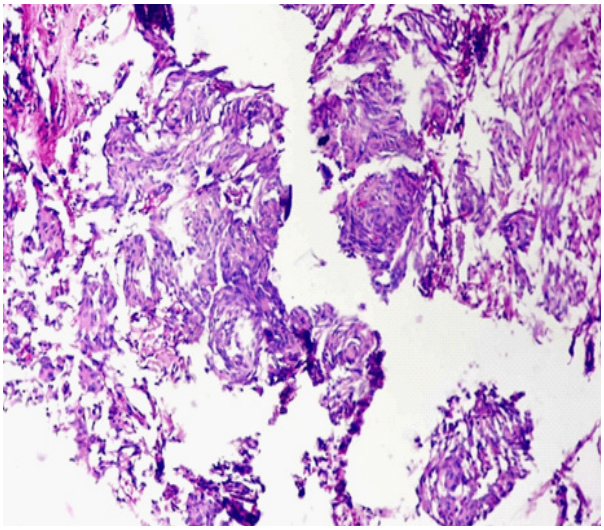

Figure 4: Histopathology report of brain tumor showing grade 1 meningothelial meningioma.

Discussion

In this case, the initial presentation with hearing loss and an ear polyp led to the incidental discovery of a CPA meningioma. The meningioma was identified as meningothelial type, WHO grade I, the most common subtype [9]. Benign middle ear tumors should always be considered when evaluating ear polyps, and MRI is crucial in ruling out intracranial connections, as 20% of meningiomas have extracranial spread [10]. Vestibular schwannomas and meningiomas are the most common CPA tu-

mors, accounting for 79% of cases [7]. Other conditions include arachnoid cysts, facial nerve schwannomas, and epidermoid cysts [5]. Though rare, intracranial meningiomas can extend extracranially, with middle ear involvement being extremely uncommon [2]. The most commonly affected cranial nerve in CPA meningiomas is the 7th nerve, but in this case, only the 8th nerve was involved [7]. Total gross excision is the optimal treatment for MEM, unlike tumors with intracranial extensions, where subtotal resection or radiotherapy may be considered [10]. In our patient, the left polyp and CPA meningioma were completely excised, with no connection between the extracranial and intracranial tumors. The delay in diagnosis resulted from the asymptomatic nature of the CPA component and the initial treatment for otitis media. This case highlights the need to consider retro cochlear disease in cases of unexplained sensorineural hearing loss [11]. This case illustrates an exceptionally rare presentation of CPA meningioma masquerading as an aural polyp, likely facilitated by CSF otorrhea secondary to tegmen tympani erosion. The diagnostic odyssey-from initial misdiagnosis of OME to interdisciplinary collaboration between ENT and neurosurgery-highlights challenges in resource-limited settings and underscores the importance of considering skull base pathology in refractory otologic conditions.

Conclusion

CPA meningiomas can rarely present as a middle ear mass or effusion. When encountering aural polyps or refractory middle ear effusion, biopsy and imaging are necessary. If extracranial meningioma is pathologically confirmed, MRI should be performed to identify any intracranial component. This rare case emphasizes the importance of a thorough evaluation of patients with persistent otologic symptoms to ensure timely diagnosis and treatment.

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