Middle Ear Tuberculosis as the Initial Manifestation of Miliary Tuberculosis in a Non-Endemic Region

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Abstract

Objective: To characterize the presentation, differential diagnosis, and work-up of a patient with refractory middle ear disease who was subsequently diagnosed with middle ear tuberculosis

Study design: Case report and literature review

Methods: A case report of a 27 year-old male, originally from Mexico, who presented with unilateral otorrhea and granulation tissue involving the external auditory canal and middle ear space. Tympanomastoidectomy was performed, with final pathology showing AFB-positive organisms.

Results: A case of middle ear tuberculosis (TB) in a patient with a suspected cholesteatoma who underwent tympanomastoidectomy. Frozen section analysis was negative for granulomatous disease; however, final histopathologic assessment was positive for acid-fast bacilli. Further work-up revealed extensive pulmonary infiltrates consistent with miliary tuberculosis. RIFE therapy was initiated and is currently ongoing. On last examination, he reported resolution of his otorrhea.

Conclusion: Middle ear tuberculosis is a rare entity accounting for approximately 0.9% of chronic suppurative otitis media worldwide. It is often overlooked in the differential diagnosis of middle ear disease, especially in developed countries. Patient cohorts with higher immigrant populations pose a risk of sporadic cases of tuberculosis. Here we present one of the few cases of middle ear TB as the initial presentation of systemic disease in a non-endemic region. Early consideration and prompt recognition of middle ear tuberculosis is imperative in the implementation of appropriate infection control measures. Timely treatment initiation may help prevent worsening hearing loss and progressive facial paralysis, as well as attendant systemic complications.

Case Report

A 27 year-old Mexican male presented with a two year history of unilateral left-sided otorrhea and associated subjective hearing loss. CT Temporal bone showed opacification of the left mastoid and middle ear cavity with erosion of the malleus and incus (Figs. a1, a2). Audiogram showed a left-sided moderate to severe conductive hearing loss at 250-8000 Hz with excellent bilateral word recognition scores (Fig. b). Initial exam was significant for a large subtotal tympanic membrane (TM) perforation with extensive granulation tissue occupying the middle ear space.

The patient underwent a canal wall-up tympanomastoidectomy with ipsilateral tragal cartilage graft. Intraoperative findings included hard dense mastoid bone, extensive granulation and necrotic tissue in the middle ear space with extension into the Eustachian tube, erosion of the incus and malleus, but an intact stapes. Ossicular chain reconstruction was not performed due to extensive middle ear inflammatory and granulation tissue. Frozen section showed inflammation without evidence of granuloma formation or malignancy. Final histopathologic assessment demonstrated numerous acid-fast bacilli (Fig. c) and necrotizing granulomas (Figs. d, e) confirming diagnosis of tuberculosis (TB).

The patient was referred to the infectious disease department for urgent evaluation. He reported productive cough and a chest X-ray (Fig. f) showed patchy opacities in the right lung suggestive of pulmonary infiltrates consistent with active TB infection. Initial evaluation was positive for AFB organisms. After nine weeks of therapy, he was discharged home with continued outpatient treatment. On follow-up visit, he reported resolution of otorrhea. Post-operative CT scan showed partial opacification of the middle ear space and mastoid air cells, improved from before surgery (Figs. g1, g2). Post-operative audiogram showed a persistent severe hearing loss with poor word recognition score (Fig. h). He remains on antituberculosis therapy at this time.

Discussion

Middle ear tuberculosis is a rare entity accounting for approximately 0.9% of chronic suppurative otitis media worldwide. It is often overlooked in the differential diagnosis of middle ear disease, especially in developed countries where there is lower disease burden. Despite this, consideration and appropriate evaluation for TB is imperative in the prevention of its complications, which can include irreversible hearing loss, progressive facial paralysis, and systemic respiratory and neurologic complications.

In non-endemic regions, a lower index of suspicion may lead to delayed consideration of this diagnosis and potential complications. In non-endemic regions, patient cohorts with higher immigrant populations pose a risk of sporadic cases of tuberculosis. Early recognition of this disease is complicated by its diagnosis, which requires both a high index of suspicion and microbiologic detection. Preliminary clinical findings are nonspecific, and may include otorrhea, exuberant granulation tissue, and disproportionate hearing loss. CT findings are typically unilateral, consist of soft tissue densities occupying the entire mastoid and middle ear without coalescence or sclerosis with an intact scutum. Cases of suspected active TB infection require enactment of airborne isolation precautions and early medical treatment.

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References


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