21. Temporal Bone Osteomyelitis Secondary to Necrotizing Otitis Externa: A Case Report

Pia Bella De León [1] Maite De León [2]

[1] Fourth year Medical Student. Pontificia Universidad Católica Madre y Maestra (PUCMM), Santiago, Dominican Republic. [2] MD. Pontificia Universidad Católica Madre y Maestra (PUCMM), Hospital Metropolitano de Santiago (HOMS), Santiago, Dominican Republic.

BACKGROUND: Necrotizing otitis externa (NOE), also referred to as malignant otitis externa, is a severe, invasive infection of the external auditory canal that may extend to the skull base and adjacent structures. It is most commonly caused by Pseudomonas aeruginosa and primarily affects immunocompromised individuals, particularly elderly patients with poorly controlled diabetes mellitus. The condition is associated with significant morbidity and potential mortality if not recognized and treated promptly, as it may progress to skull base osteomyelitis, cranial nerve palsies, and intracranial complications. **THE CASE:** We report the case of a 62-year-old male with a history of poorly controlled type 2 diabetes mellitus and hypertension who presented with altered mental status, profuse diaphoresis, and hypoglycemia, followed by chronic purulent otorrhea and left-sided otalgia. On physical examination, otoscopy revealed marked inflammation of the external auditory canal and perforation of the tympanic membrane. Initial laboratory evaluation showed elevated inflammatory markers. Due to persistent neurological symptoms, the patient was admitted to the intensive care unit and empirically treated for suspected bacterial meningitis with broad-spectrum intravenous antibiotics. Computed tomography imaging demonstrated erosion of the mastoid and temporal bone. Further evaluation with three-phase bone scintigraphy revealed increased uptake consistent with active osteomyelitis of the left temporal bone. Microbiological culture of ear discharge isolated Pseudomonas aeruginosa, while blood cultures and cerebrospinal fluid analysis were negative, effectively excluding central nervous system infection. Based on these findings, antimicrobial therapy was de-escalated and tailored to intravenous cefepime and topical ciprofloxacin. Additional management included strict glycemic control with insulin therapy, analgesia, and supportive measures. The patient demonstrated progressive clinical improvement, with resolution of otalgia, cessation of otorrhea, and stabilization of metabolic parameters. He was discharged in stable condition with a planned six-week course of outpatient intravenous antibiotic therapy and close multidisciplinary follow-up.
CONCLUSION: This case underscores the importance of maintaining a high index of suspicion for necrotizing otitis externa in high-risk populations, particularly in patients with diabetes mellitus presenting with persistent otologic symptoms. Early diagnosis supported by appropriate imaging modalities, including bone scintigraphy, and prompt initiation of targeted antimicrobial therapy are essential to prevent disease progression and serious complications such as cranial nerve involvement and intracranial extension. A multidisciplinary approach, along with careful monitoring and long-term follow-up, plays a critical role in optimizing patient outcomes and reducing morbidity.

Key Words: Necrotizing Otitis Externa; Osteomyelitis; Pseudomonas aeruginosa; Diabetes Mellitus, Type 2; Ear Canal

Figure 1. Multimodal imaging findings in necrotizing otitis externa with left temporal bone osteomyelitis. (A) Three-phase technetium-99m MDP bone scintigraphy showing diffuse increased uptake in the left temporal bone with posterior extension to the mastoid. (B) Contrast-enhanced MRI demonstrating inflammatory involvement of adjacent soft tissues. (C) Non-contrast MRI showing corresponding structural changes.