



CLINICAL SPECTRUM AND MANAGEMENT OF NATURE'S AUTOMASTOID CAVITY: A CASE SERIES

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Abstract

Background: Automastoid cavity disorders are a recognized complication of chronic otitis media. Patients may present with persistent ear discharge, progressive hearing loss, and recurrent infections. The following case series examines four patients, detailing their clinical course, radiological findings, audiological outcomes, and treatment modalities in light of contemporary literature.

Methods: The aim of the study is to see the various intraoperative presentation and management of automastoidectomy cavity. A retrospective study was conducted in the Department of Otorhinolaryngology, GMERS sola civil hospital Ahmedabad , Gujarat from June 2024 to June 2025. The diagnosis of automastoidectomy was made based on history, clinical examination, and high resolution computed tomography (HRCT) followed by its Surgical management.

Results: All patients exhibited bilateral or unilateral automastoid cavity with varied hearing loss. Surgical intervention was necessary for persistent disease, paralleling literature on improving discharge control and hearing stability. Outcomes indicate profound, mixed, and sensorineural hearing loss as common sequelae. Literature comparison underscores importance of individualized management and the role of imaging and audiometric monitoring.

Conclusions: Timely diagnosis, thorough audiometric evaluation, and tailored intervention are crucial in managing automastoid cavity cases. Postoperative rehabilitation is key for functional recovery. This manuscript offers clinical insights and outlined contemporary management principles based on literature review.

Keywords: Automastoid cavity, mastoidectomy, hearing loss, chronic otitis media, case report.

Introduction

Chronic Otitis Media [COM] is a persistent middle ear condition characterized by chronic inflammation of the middle ear and mastoid cavity. Chronic inflammation in the middle ear can result in permanent changes to the TM, such as atelectasis, tympanosclerosis, perforation, retraction pocket formation or the development of a cholesteatoma leading to intra and extra cranial complications. The automastoid cavity is an anatomical sequelae of COM. Its inadequate management may allow the infection to extend beyond the middle ear and mastoid, resulting in serious intracranial and extracranial complications. These include mastoid abscess, facial nerve paralysis, labyrinthitis, sigmoid sinus thrombosis, and even life-threatening intracranial infections such as meningitis or brain abscess.. Worldwide estimates place chronic otitis and its complications as a leading cause of

acquired hearing disability, affecting both adult and paediatric populations. Surgical measures such as mastoidectomy are often reserved for refractory cases, yet outcomes and quality of life may vary, necessitating further case-based exploration. Recent literature describes advancements in surgical technique, audiological rehabilitation, and postoperative care. This paper describes five varied cases and synthesizes published evidence for clinical best practices.(1,2,3)

Methods

A retrospective analysis of four patients was conducted, utilizing clinical notes, audiology assessments, and HRCT temporal bone imaging. Inclusion criteria comprised chronic ear discharge, hearing loss, and radiological evidence of automastoid cavity. Data extracted included demographics, chief complaints, risk factor exposure, physical and audiological findings, radiology, treatment delivered, and outcomes.

Case Descriptions

Case report 1

A 52-year-old female, presented with complaints of bilateral ear discharge and reduced hearing for the past 3 years. On otoscopic examination, the right tympanic membrane (RTM) showed a large perforation, while the left tympanic membrane (LTM) revealed automastoid cavity formation. Tuning fork tests were negative bilaterally with 256 Hz, 512 Hz, and 1024 Hz frequencies, and the Weber test lateralized to the right side. Pure tone audiometry (PTA) indicated bilateral moderate conductive hearing loss. High-resolution CT scans of both ears revealed otomastoid cavities with sclerosis of mastoid air cells and absence of ossicular continuity. We proceeded with a left canal wall-down procedure and type IV tympanoplasty, and found intraoperatively that the facial nerve was dehiscient.

Case report 2

A 39-year-old man presented with lifelong bilateral ear discharge and hearing loss. Otoscopic examination revealed bilateral otomastoid cavities; the fistula test was negative and there was no nystagmus. Tuning-fork testing showed Rinne's negative at 256, 512, and 1024 Hz and Weber's test lateralized to the right. Pure tone audiometry demonstrated bilateral profound sensorineural hearing loss. High-resolution CT of both ears revealed automastoid cavities with destruction of the mastoid air cells and no preservation of the ossicular chain. During surgery, we performed a left canal wall-down procedure with type IV tympanoplasty. The cholesteatoma sac was entirely removed and a lateral semicircular canal fistula was discovered, which we sealed with bone wax.

Case report 3

A 41-year-old female, presented with right ear discharge since childhood, right earache for the past 4-5 years, reduced hearing in the right ear for the same duration, along with giddiness for 4-5 years and tinnitus for the last 5-6 months. On otoscopic examination, the right tympanic membrane (RTM) showed automastoid cavity formation, while the left tympanic membrane (LTM) was intact and normal. Tuning fork tests were negative on the right side with 256 Hz, 512 Hz, and 1024 Hz frequencies, and the Weber test lateralized to the right side. Pure tone audiometry (PTA) indicated mild to moderate sensorineural hearing loss in the right ear and mild sensorineural hearing loss in the left ear. During surgery, encountered CSF LEAK so we performed Subtotal petrosectomy with culd e sac closure. Post operatively the patient developed grade 4 facial weakness.

Case report 4

A 26-year-old female, presented with bilateral ear discharge since childhood, reduced hearing in both ears for the past 6 months, and left earache for the last 15 days. On otoscopic examination, the right tympanic membrane (RTM) showed a grade 2 pars tensa retraction, and the left tympanic membrane (LTM) showed automastoid cavity formation. Tuning fork tests were negative bilaterally with 256 Hz, 512 Hz, and 1024 Hz frequencies, and the Weber test lateralized to the left side. Pure tone audiometry (PTA) revealed a moderate mixed hearing loss in the right ear and moderately severe

mixed hearing loss in the left ear. During surgery, we performed a left canal wall-down procedure with type IV tympanoplasty

Radiological Findings

All patients underwent HRCT temporal bone, which remains the gold standard for evaluating cavity extent, bony erosion, and disease complications. Findings consistently included evidence of sclerotic mastoid air cells, cavity formation, tympanic membrane abnormalities, and variable ossicular involvement. Contemporary literature strongly supports early imaging for surgical planning and complication detection.(4)

Management and Surgical Intervention

Management was guided by discharge control, degree of hearing loss, and radiological findings. Conservative therapies (antibiotics, ear hygiene, topical steroids) were instituted. Surgical intervention, particularly mastoidectomy or cavity debridement, was reserved for cases with persistent symptoms or anatomic abnormality.(5,6) Modified radical mastoidectomy aims to eradicate disease, allow for epithelialization, and reduce chronic discharge—a strategy supported by outcomes studies. Open cavity techniques, although effective in eliminating infection, may predispose to cavity problems requiring future minor procedures.(10)

Audiological Outcomes

Audiometric assessment revealed the spectrum from moderate conductive to profound sensorineural loss. Sensorineural impairment is considered secondary to longstanding disease, inflammatory insult, and possible labyrinthine involvement. All the post operative patients of sensorineural Hearing loss were managed with Hearing Aid. Therefore, comprehensive pre- and postoperative counseling, serial audiometry, and early intervention, if possible, are recommended.(12)

Discussion

The three cases presented illustrate a spectrum of chronic middle ear conditions, including otitis media, cholesteatoma, and automastoid cavity formation, leading to varying degrees of hearing loss and other symptoms. While ear discharge and hearing loss were common across all cases, the degree of involvement and the presence of additional symptoms such as tinnitus, giddiness, and earache varied. The presence of automastoid cavity formation in all four cases highlights the chronic nature of the conditions and suggests that these patients had been coping with long-standing ear issues, often without significant medical intervention. This is not uncommon in rural or underserved populations, where there is limited access to ENT specialists and healthcare awareness may be low. In such settings, symptoms like ear discharge, hearing loss, and occasional earache may not be perceived as urgent by patients, leading to delays in seeking medical care until more severe symptoms arise. The involvement of both conductive and sensorineural components of hearing loss, as seen in Case 3 and Case 4, suggests that these patients may have had a more complicated course of disease. The progressive nature of the disease in these cases emphasizes the importance of early diagnosis and treatment, particularly to prevent complications such as inner ear involvement, facial nerve palsy, or more severe intracranial complications. Cholesteatoma and its associated complications, including automastoid cavity formation, can cause significant destruction of the middle ear and surrounding structures if left untreated. Therefore, timely surgical intervention is crucial to prevent further damage and to preserve hearing. Surgical techniques such as canal wall down (CWD) remain the mainstay of treatment followed by intraoperative management of other findings. This case series aligns with established patterns in chronic automastoid cavity presentations, confirming the importance of thorough clinical and radiological assessment. Mastoidectomy remains the cornerstone for surgical management, reducing infection and discharge rates. The literature reveals ongoing debate regarding open versus closed cavity techniques, but consensus supports the role of HRCT-guided planning. (11) Rare differential diagnoses, like fungal otomastoiditis or granulomatous disease (e.g., otoscleroma),

require consideration, especially with atypical presentation. Successful treatment hinges on early diagnosis, individualized therapy, and multidisciplinary postoperative rehabilitation. (12)

Conclusion

Chronic automastoid cavity disease poses significant morbidity from persistent otorrhea and progressive hearing loss. Accurate diagnosis using HRCT, targeted intervention—including mastoidectomy where indicated—and close audiological follow-up underpin best clinical practice. Future research should validate individualized management approaches and address hearing restoration strategies.

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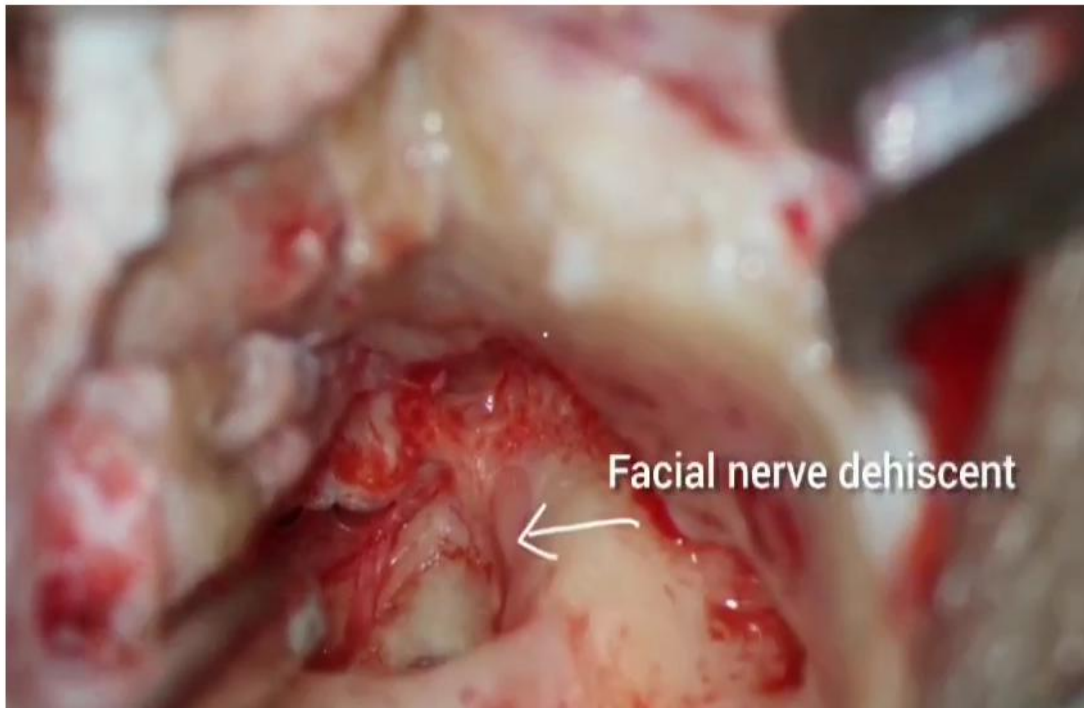
Declarations

Ethics Approval and Consent to Participate: Ethics approval and consent to participate were granted by the Research Committee of GMERS Sola Civil Hospital. No reference number was assigned for this approval. Written informed consent was obtained from the patient for participation in this case reporting, with full respect for confidentiality. Participation was voluntary, and the patient retained the right to withdraw at any time.

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CASE - 1



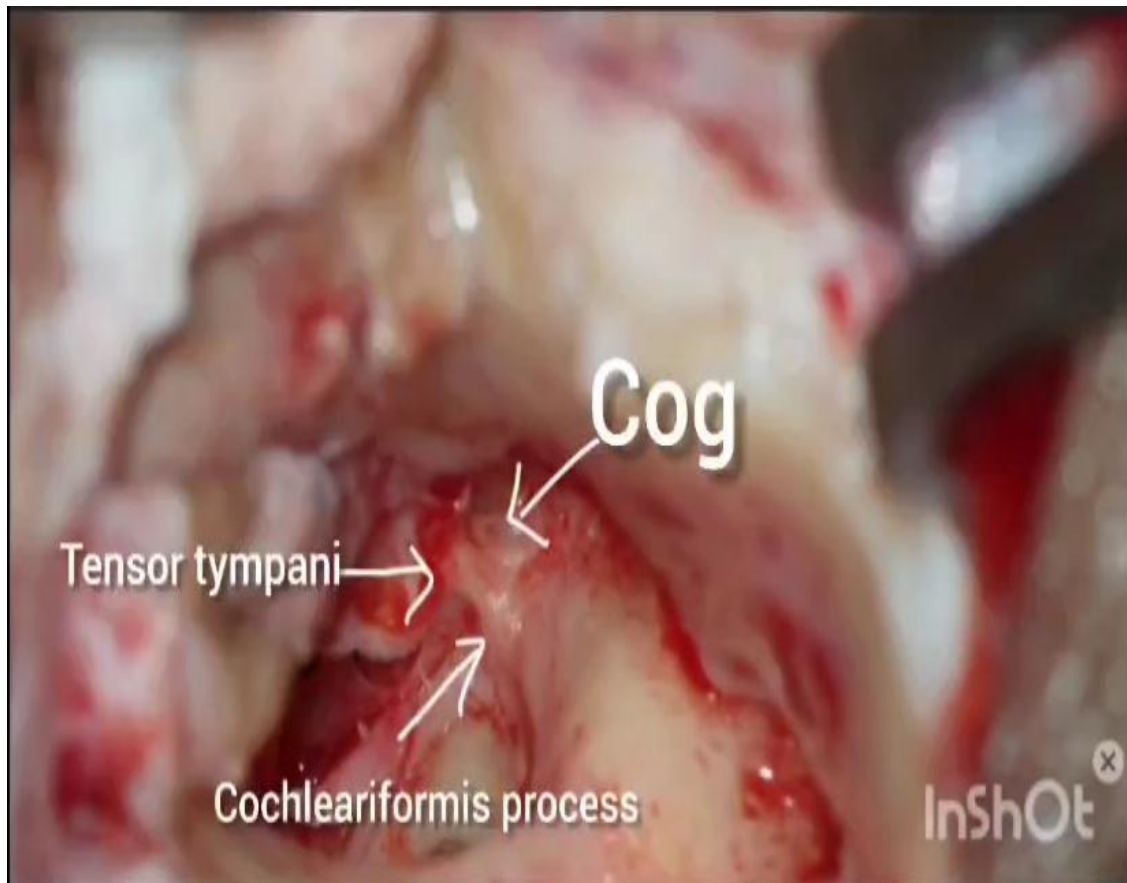
CASE – 2



CASE - 3



CASE – 3 : INTRAOPRATIVE IMAGE



CASE – 4 : INTRAOPRATIVE IMAGE