

## Research Article

# THE GREAT MIMICKER IN THE MIDDLE EAR: A CASE SERIES OF TUBERCULAR OTITIS MEDIA IN THREE DISTINCT PRESENTATIONS

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**Abstract:** *Introduction:* Extrapulmonary tuberculosis contributes to 15% the total tuberculosis cases and out of which tubercular otitis media is a rare presentation. We have described three cases related to TOM that were diagnosed and treated for the same in our institute

The aim of this study is to see tuberculosis as a differential diagnosis when usual treatment fails to work and also the difficulty faced in diagnosing it. All the three cases presented with ear discharge and hearing loss as common presentation, one had aural polyp and other one had mastoiditis. All of the cases were confirmed as cases of tubercular otitis media with help of Histopathology and were started on ATT therapy to which all of them responded well and they were free of the disease. Early diagnosis and treatment are important because late diagnosis may lead to complications such as Facial palsy.

**Keywords:** Tubercular otitis media; CSOM; Mastoiditis; Postauricular Fistula; Aural polyp

## INTRODUCTION

Mycobacterium tuberculosis is the implicated pathogen in 0.5 to 0.9 % of chronic middle ear infections [1]. Routine screening for tuberculosis is usually not done in cases; it comes to notice when the patient doesn't respond to conventional therapy. TB otitis media is generally diagnosed post operatively with the help of histopathology. Awareness about the early diagnosis and treatment helps in better management of patients and decreases the risk of complications. Tuberculosis in otorhinolaryngology and head and neck is thought to be rare but inaccuracy and low sensitivity of the diagnosing technique is what creates this misconception [2]

In this study, we evaluated the clinical presentation, associated complications, and the effectiveness of diagnostic approaches in three cases of tuberculous otitis media (TOM). Most patients sought medical attention at an advanced stage of the disease, typically after prolonged and ineffective treatment for chronic middle ear infection. In these cases, diagnosis was established with histopathological analysis of specimens and granulation tissue obtained during mastoid surgery.

### CASE 1

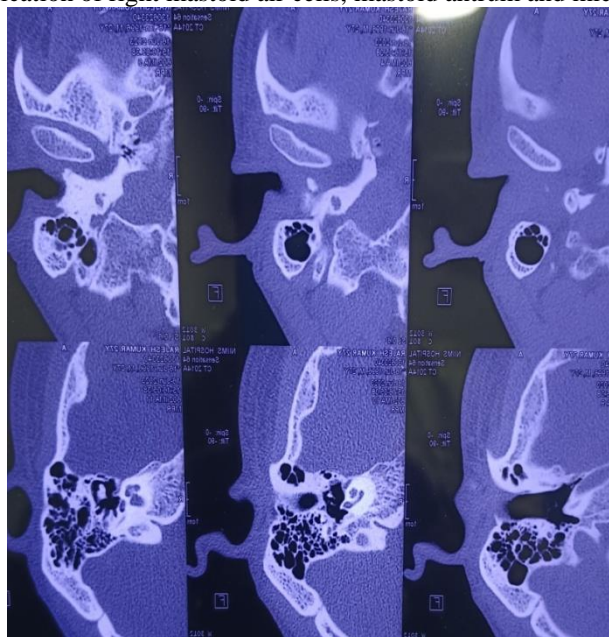
A 27-year-old male presented to ENT OPD with symptoms of ear discharge, decreased hearing and mastoid tenderness in right ear for last 6 months. The ear discharge was sudden in onset, gradually progressive with no foul smell. The discharge was mucopurulent with no blood stain and was not associated with any pain. Discharge was profuse in quantity. Hearing loss in right ear, insidious in onset and gradually progressive. There was no history of fever, chronic

cough, weight loss, night sweats. On examination, external auditory canal was full of discharge despite conventional treatment for 6 months. Examination under microscopy show two central perforations in posterior superior and anterior inferior quadrant[**FIGURE 1**]. Pure tone audiometry revealed moderate conductive hearing loss in right ear, left ear being normal.



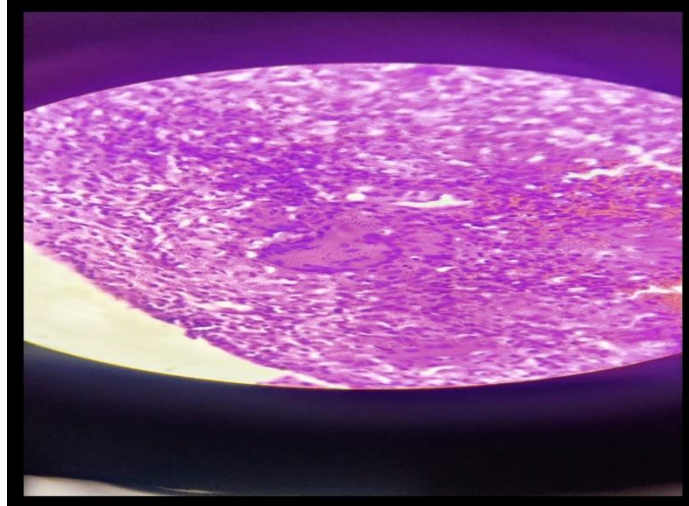
**Figure 1. Tympanic membrane with multiple perforations**

HRCT scan showed opacification of right mastoid air cells, mastoid antrum and middle ear cavity[**FIGURE 2**].



**Figure 2. Right sided otomastoiditis showing opacification of middle ear cleft**

A Mantoux test was advised and showed 18mm induration. The patient was posted for Right Tympanoplasty with Mastoid exploration. Intraoperatively mastoid antrum and middle ear was full of granulation tissues which were sent for histopathological examination. Canal wall up mastoidectomy with type 3 tympanoplasty was done as incus was necrosed. On histopathology, chronic inflammatory cells, epithelioid cells along with Langhans giant cells were observed[**FIGURE 3**]. Areas of Caseous necrosis were also observed in histopathology. These features confirmed the diagnosis of TB otitis media. The patient was started on 6 months course of Anti tubercular drugs including Isoniazid, Pyrazinamide, Rifampin and Ethambutol with regular monitoring and follow-up. Our patient is doing fine till the last follow up of 3 months and is now asymptomatic and in good health. This case has been previously reported as a case report. It has been previously published as individual case reports by the authors and are included here to highlight the broader clinical spectrum of tubercular otitis media[10].

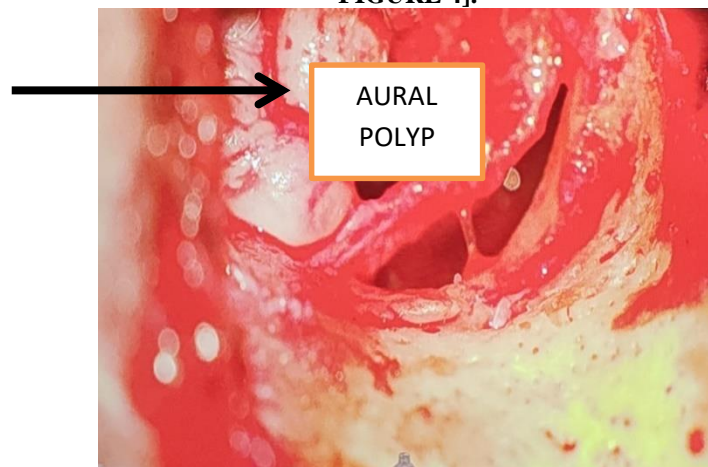


**Figure 3 – Microphotograph showing Epithelioid cell granulomas with multinucleate giant cells and caseous necrosis .**

#### **CASE 2**

A 44 year old female presented to the ENT OPD with the symptoms of ear discharge and hearing loss in left ear for 6 months. The ear discharge was sudden in onset, gradually progressive, non-foul smelling, mucopurulent and profuse. It was not blood tinged and not associated with pain. Hearing loss was only in left ear, insidious in onset and gradually progressive. Patient also complained of aural fullness and occasional otalgia. There was no history of fever, chronic cough, weight loss, night sweats. On examination of left ear, no tragal tenderness was elicited. External auditory canal was full of discharge. Under microscopy and suction clearance aural polyp was seen in the external auditory canal[

**FIGURE 4].**

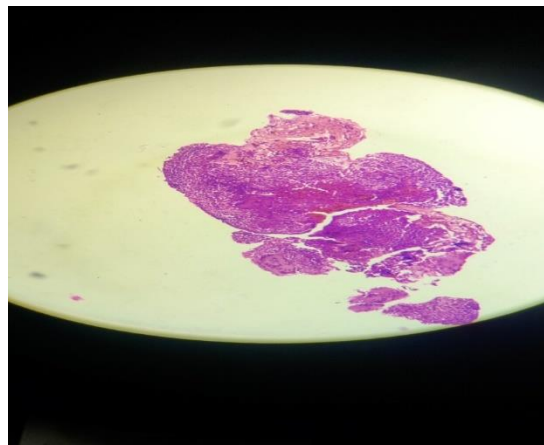


**FIGURE 4- Intraoperative photograph showing Aural Polyp in External Auditory canal.**



**FIGURE 5 – HRCT scan Temporal bone showing opacification of middle ear and mastoid antrum with erosion of ossicles.**

The aural polyp extended till middle ear .Rim of tympanic membrane was seen which was congested . There was subtotal perforation and middle ear was full of granulation tissue. HRCT Scan temporal bone was done which showed opacification in middle ear cleft and erosion of ossicles[ **Figure5**].The patient was planned for tympanomastoid exploration under GA. Aural polyp and granulations were removed and sent for histopathological examination. Canal wall up mastoidectomy with type 3 tympanoplasty was performed. On histopathology Epithelioid cell granulomas with multinucleate giant cells were seen which confirmed it as TB Otitis Media [ **FIGURE 6** ] . The patient was started on 6 months course of Anti tubercular drugs including Isoniazid, Pyrazinamide, Rifampin and Ethambutol with regular monitoring and follow-up. This case has been previously reported as a case report. It has been previously published as individual case report by the authors and are included here to highlight the broader clinical spectrum of tubercular otitis media[11].



**FIGURE 6 – Microphotography showing areas of caseous necrosis and multinucleate giant cells.**

### **CASE 3**

A 15 year old male presented to ENT opd with the symptoms of ear discharge from back of the right ear for 4 months which was intermittent and mucopurulent[ **FIGURE 7**]. The patient complained of ear discharge from inside the ear also which was profuse ,mucopurulent and not blood tinged.



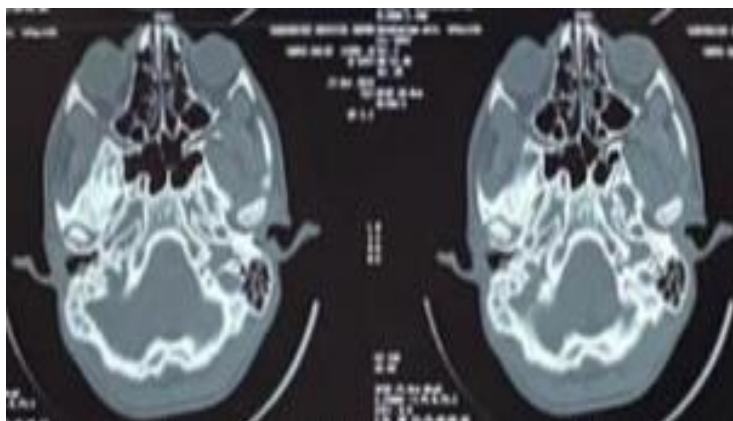
**FIGURE 7 – PREOPERATIVE PICTURE SHOWING RIGHT POST AURICULAR FISTULA**

On examination under microscope and after suction clearance multiple perforations were seen in Tympanic membrane [FIGURE 8]. Middle ear was pale and granulations were present .



**FIGURE 8 – Multiple perforations in Tympanic Membrane**

HRCT scan demonstrated right ear opacification and ossicular erosion. Sclerosis of mastoid air cells was noted [FIGURE 9 ]. Pure tone audiometry showed moderately severe conductive hearing loss on the right side , left ear being normal .



**FIGURE 9 –HRCT SCAN Temporal bone showing opacification and sclerosis of mastoid air cells.**

The patient was planned for Tympanomastoid exploration under GA . Post auricular Wildes incision was given and fistula site was included in the Incision Site.Canal wall down mastoidectomy and Meatoplasty was done. Granulations were removed and sent for Histopathological examination which showed presence of multinucleate giant cells, caseous necrosis and epitheloid cells confirming it to be Tubercular otitis media. The Patient was started on ATT and recovery on follow up after 6 months was good.

## DISCUSSION

Tuberculosis continues to be a major global health concern, with extrapulmonary forms posing significant diagnostic and therapeutic challenges. Tubercular otitis media, though uncommon, is often under recognized due to its diverse and atypical clinical presentation and also due to various other reasons like lack of facility, insufficient clinical suspicious, difficult to demonstrate AFB in smear and culture.

In 1953 Wallner was the 1st to describe the clinical presentation of TOM [3]. There has been rise in cases of extrapulmonary tuberculosis specially in endemic areas this could be due to epidemiological transition in TB, drug resistance TB or better diagnosing facilities, earlier because of which cases of extrapulmonary tuberculosis were missed or labeled differently. Spread of tuberculosis to middle ear is most commonly by hematogenous spread in adults where as in children it is

through eustachian tube, because in children the eustachian tube is shorter, has greater lumen, lies more horizontally as compared to adults[10]. Clinical features of TOM are very much similar to any other condition of ear specially suppurative otitis media such as decreased hearing, ear discharge, otalgia and vertigo which may or may not be present. TOM comes in suspicion when patient does not respond well to conventional treatment. In the above case findings, the signs that helped in diagnosing TOM were multiple perforations, refractory ear discharge, hearing loss which was disproportionate to the extent of the disease. If this classical triad is absent, it can delay the diagnosis and treatment which can lead to irreversible complications.[4,11] The differential diagnosis of chronic otorrhea as a leading symptom in patient with TBOM include variety of diseases including fungal infection, Wegner's granulomatosis, midline granuloma, sarcoidosis, necrotizing otitis externa and cholesteatoma.[5] Examination findings of TOM with mastoiditis showed external auditory canal which was full of discharge, tympanic membrane showed two central perforations in posterosuperior and anteroinferior quadrant

PTA (pure tone audiometry) showed moderate conductive hearing loss.

On HRCT opacification of the right mastoid air cell was visible. Much similar findings were observed in TOM with aural polyp- middle ear showed granulation tissue, congested tympanic membrane with subtotal perforation was also seen. PTA (pure tone audiometry) revealed moderate conductive hearing loss. HRCT findings showed opacification of left mastoid cells and mastoid antrum. The most dependable diagnostic method is histopathological examination of granulation tissue as it has high sensitivity and specificity and thus becomes a reliable investigation [6]. Sputum analysis for acid fast bacilli usually turns out to be negative therefore it becomes a challenge in diagnosing the diseases. CBNAAT provide a robust and promising role in early diagnosis of TB in head and neck as well as other cases of smear negative TB. Its high specificity and less time taking procedure make it an excellent tool [7]. A newer diagnostic and monitoring tool is TR MTB DNA test which is a marker of TB and the assay is based on detection of small cell free MTB specific DNA sequences in urine [8]. In our case series all the patients were tested positive for TB by HPE which showed chronic inflammatory cells, epithelioid cells along with Langhans giant cells in the case of TOM with mastoiditis and were also seen in the case of TOM with aural polyp. Patients were advised Mantoux test which showed 18 mm induration. After diagnosis with TOM was made patient were started on ATT therapy to which they responded well. A complicating factor in the disease is high treatment abandonment rate, making therapy successful in only 65% of cases [9]

## CONCLUSION

This case series highlight the various presentation of tubercular otitis media and various difficulties faced in diagnosing the conditions.

Appropriate clinical suspicion play important role in early diagnosing of TOM and also help in preventing complications. In our case series we also discussed the newer diagnostic tool that helped in managing the patient well. A combined approach involving middle ear surgery along with Anti tubercular therapy led to favorable outcome.

The findings of this study emphasize the need to consider tuberculosis in patients with chronic otitis media that fails to improve with standard antibacterial treatment, especially in regions where tuberculosis is common. These patients frequently exhibit significant conductive hearing loss and a higher risk of complications originating from the ear.

Diagnosis can be challenging due to the frequent presence of mixed infections; however, AFB staining and histopathological examination of tissue from the middle ear remain reliable methods for confirmation. A combination of anti-tubercular therapy (ATT) and surgical intervention has been shown to provide effective disease control, even in more advanced stages

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