

# Tuberculosis Presenting as Perforated Tympanic Membrane and Uveitis

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## ABSTRACT

**Introduction:** Extra-pulmonary tuberculosis (EPTB) may involve any organ of the body with often confusing symptoms and signs. Because of the relatively low incidence of tuberculosis in the western hemisphere, this diagnosis is sometimes overlooked by the clinicians. This delay in diagnosis may have serious implications for the patient. **Aims:** We present a unique case where the patient presented with ear and eye symptoms and he was diagnosed with tuberculosis. The management of the case is discussed to raise awareness of this condition among clinicians. **Method:** A case report with literature review **Result:** A 56 years old Caucasian male presented with symptomatic left tympanic membrane perforation. He also complained about reduced visual acuity in his eyes. Ear examination was otherwise unremarkable but the fundoscopy raised suspicion of tuberculosis which was later confirmed by Montoux test. This patient was managed in a multidisciplinary team setting and he received anti-Tuberculous chemotherapy along with prednisolone for his bilateral uveitis. The patient responded well to treatment. The patient underwent left cartilage tympanoplasty and remained symptom free during his 1 year follow up. **Conclusion:** Although rare, tuberculosis can present with tympanic membrane perforation and uveitis. The clinicians should have a high index of suspicion and include tuberculosis in the differential diagnosis when involved in such scenarios.

**Key words:** Tuberculosis, tympanic membrane perforation, uveitis, management

## INTRODUCTION

**T**uberculosis is a serious communicable disease. It can present in a multitude of forms including pulmonary symptoms and extra-pulmonary symptoms. Spreading from person to person via air droplets it has been a condition affecting populations worldwide for many decades and has been an immense burden on healthcare systems around the world. Extra-pulmonary tuberculosis (EPTB) can affect any

organ in the body, presenting with unclear or subtle symptoms. EPTB can occur in the bone, intestines, lymph nodes, as well as in the ear, nose and head & neck (Figure 1A &1B). Although, TB presenting with ENT manifestations does occur in terms of TB of the nose, tonsils, ears, tympanic membrane, lymph nodes and pharynx, it is a rare occurrence<sup>1</sup>.

Primary tuberculosis of the ear has rarely been reported; however, it is reported to present as recurrent tympanic

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membrane perforations, painless otorrhoea, bone necrosis and hearing loss. It has been found that multiple tympanic membrane perforations have occurred in TB patients which eventually coalesce into total tympanic membrane perforation<sup>2</sup>. The most reliable diagnostic test for TB otitis media is biopsy from granulation tissue and treatment is recommended for 6 months<sup>3</sup>. Orbital TB is also a rare form of extrapulmonary TB. Spread to ocular tissue may be either directly from the paranasal sinuses or through the haematogenous route<sup>4</sup>.

Furthermore, as TB has a relatively low incidence in the western Hemisphere, given the rare ENT presentations of this condition it is important to raise awareness amongst clinicians of the presentation, investigations and management of patient presenting with these symptoms, in order to avoid overlooking a diagnosis. A delay in diagnosis may lead to serious complications<sup>5</sup>.

In this case report, we share our experience of managing a patient presenting with symptomatic ear and eye who went on to be diagnosed with tuberculosis.



**Figure 1A:** An example of extra-pulmonary tuberculosis presenting as neck abscess



**Figure 1B:** Needle aspiration of extra-pulmonary tuberculosis presenting as neck abscess

## CASE REPORT

A 66 year old Caucasian male presented with symptomatic left tympanic membrane perforation. The patient also reported a reduced visual acuity. His past medical history included chronic breathlessness for the past six years.

On examination the patient had otherwise unremarkable findings, however on fundoscopy he was noted to have bilateral vasculitis and a diagnosis of TB-related vasculitis was raised. This was later confirmed via a strongly positive Mantoux test. He was diagnosed with bilateral TB related uveitis. This case was discussed and managed in a multidisciplinary team setting. He received anti-tuberculous chemotherapy in the form of Rifampicin and Ethambutol as well as prednisolone to treat the bilateral uveitis. His anti-tuberculous course was completed after 1 year. Intraoperatively he was found to have a subtotal perforation with an intact ossicular chain. A tympanoplasty was performed to repair the defect with underlay tragal cartilage and temporalis fascia graft.

Overall, the patient responded well to treatment and remained symptom free in the one year follow up period. The patient was reviewed in the ENT clinic one year post left tympanoplasty, at this review the patient's tympanic membrane was intact and looked healthy, with no evidence of recurrence. The patient was seen again at clinic 5 years

post treatment, where his visual acuity was stable bilaterally and there was no requirement for further treatment.

## DISCUSSION

Rarely, tuberculosis can present in the ear and is a rare cause of chronic otitis media, mastoiditis, multiple tympanic membrane perforations, ear discharge as well as progressive hearing loss. The diagnosis of TB should be considered when these conditions are not responding to the routine management.

The pathogenesis of tuberculosis affecting the middle ear has been controversial. There are few hypotheses to explain the possible aetiology including suggestions of a transmission of military tuberculosis from distant sites, or direct extension from the nasopharynx through the eustachian tube to the middle ear, as well as many other hypothesised aetiologies<sup>6</sup>.

It is increasingly difficult for clinicians to establish a link between symptoms and TB. It has been widely accepted that any patient presenting with otorrhea/multiple tympanic membrane perforations and evidence of active tuberculosis in any other parts of the body has tuberculosis of the ear unless proven otherwise<sup>7</sup>.

Microbiological confirmation of disease may be difficult. Ziehl–Neelsen or fluorescent staining for acid fast bacilli is characterized by low sensitivity (0-20%). Though culturing is more sensitive (0-44%), there is a long incubation time of 6-8 weeks and in cases of extrapulmonary tuberculosis, due to a low count of living pathogens, acid fast bacilli is difficult to culture<sup>8</sup>. GeneXpert is a nucleic acid amplification test with an ability to detect Mycobacteria as well as detect drug susceptibility to rifampicin<sup>9</sup>.

Both tuberculous otitis media and orbital TB are rare and coupled with the difficulty in obtaining microbiological confirmation, this may lead to a delay in diagnosis. It is vital to recognise symptoms early and make a timely diagnosis, as a delayed diagnosis may lead to multiple complications and the requirement for surgery. Complications may include facial paralysis, labyrinthitis, osteomyelitis, acute mastoiditis, cerebral abscesses, amongst many others<sup>3</sup>.

A summary of symptoms, investigations and anti-tuberculous treatments reported in other case reports over the last five years is summarized in table 1<sup>10-14</sup>.

**Table 1:** Literature Review of Relevant Cases over the Past 5 Years, English Language, Adult Patients.

Author	Symptoms and Examination Findings on Presentation	Investigations and Findings	Anti-Tuberculous Treatment Regimen
Apostol et. Al <sup>10</sup>	1 month progressive bilateral hearing loss, otalgia, otorrhea. Bilaterally purulent ear discharge, Right tympanic membrane subtotal perforation and ossicular chain erosion. Left bulging tympanic membrane.	-Audiometry: bilateral mixed moderate hearing loss. -Culture of ear swab and bronchial lavage: negative. - Ziehl- Neelsen staining: revealed numerous intracellular bacilli.. -Histopathology: necrosis and inflammatory infiltrate with neutrophils and histiocytes. -Chest X-ray: multiple low-density fibronodular lesions imprecisely demarcated, located in the superior pulmonary lobes, some of them with merging tendency -CT Temporal Bones: bilateral mastoiditis, with areas of bone lysis, soft tissue densities in both the mastoid and middle ear bilaterally and right ossicular chain erosion	Isoniazid, Rifampicin, Pyrazinamide, Ethambutol. (Duration not documented).

<p>Bhatkar D et. Al<sup>11</sup></p>	<p>75F 4-6 months bilateral ear discharge with associated progressive hearing loss. Past history of abdominal tuberculosis 50 years earlier for which she had been treated with anti tuberculous therapy (ATT).</p>	<p>-Audiometry: moderate– severe mixed hearing loss in left ear and severe mixed hearing loss in right ear.                      -Culture of ear swab: GeneXpert test Positive for Mycobacterium Tuberculosis in both ears.                      - Ziehl- Neelsen staining: positive for AFB.                      -Chest X-ray: Normal.                      -High resolution CT temporal bone; bilateral mastoiditis with abnormal soft tissue in mastoid air cells involving bilateral middle ear surrounding ossicular chains.</p>	<p>Antituberculous treatment (exact medications not defined by authors) as a retreatment case according to Revised National Tuberculosis Control Program for a duration of 8 months, then shifted to continuation phase of ATT in view of clinicoradiological response.</p>
<p>Nanda A et. Al<sup>12</sup></p>	<p>28M, 6 month history of severe Right otalgia</p>	<p>-Bone biopsy: caseating granulomas and multinucleated giant cells.                      -Cultures from mastoid lesion: positive for Mycobacterium Tuberculosis.                      -CT temporal bones; opacification of Right middle ear and mastoid air cells.                      -Quantiferon TB test: Positive.                      -Chest X-ray: Right lower lobe calcified granuloma.</p>	<p>Isoniazid, Rifampicin, Pyrazinamide, Ethambutol, Pyridoxine.</p>
<p>Bruschini et. Al<sup>13</sup></p>	<p>38F chronic otitis media, unilateral hearing loss, vertigo, and right-sided facial nerve paralysis (House–Brackmann grade V). Auricular secretions.</p>	<p>-Audiometry: severe mixed hearing loss.                      -Quantiferon TB test: Positive.                      -Chest X-ray                      -CT; wide area of mastoid cell opacification on the right side in a well-pneumatized mastoid bone, widespread opacity of the tympanic wide area of mastoid cell opacification on the right side in a well-pneumatized mastoid bone, widespread opacity of the tympanic                      -Polymerase Chain Reaction: positive for M. tuberculosis complex DNA</p>	<p>Ethambutol, rifampicin, and isoniazid</p>
<p>Singh A et. Al<sup>14</sup></p>	<p>5 month history of post-aural swelling</p>	<p>-Audiometry; mild unilateral conductive hearing loss on left side.                      -HRCT; soft tissue density filling middle ear and mastoid cell system, with                      -Mantoux test; normal                      -Chest X-ray normal.                      Gram stain, acid-fast bacilli staining, culture sensitivity and GeneXpert along with histopathology</p>	<p>rifampicin, isoniazid, pyrazinamide and ethambutol</p>

## CONCLUSION

Although rare, Tuberculosis can present with extra-pulmonary symptoms such as tympanic membrane perforation and uveitis. It is vital that clinicians have a

have a high index of suspicion and include Tuberculosis in their differential diagnoses. It is important to make an early diagnosis and clinicians need to be aware of such presentations, to ultimately avoid serious complications.

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