Int. Adv. Otol. 2011; 7:(3) 413-417

CASE REPORT

Tuberculous Otitis Media

Mercêdes Fabiana Araújo, Thaís Gonçalves Pinheiro, Igor Teixeira Raymundo, Vítor Yamashiro Rocha Soares, Pedro Ivo Machado Araújo, Ricardo Luiz de Melo Martins, Carlos Augusto Costa P Oliveira

Department of Otolaryngology, Brasília University Medical School, University of Brasília, Brazil (MFA, TGP, ITR, VYRS, PIMA, CACPO)
Department of Pulmonology, Brasília University Medical School, University of Brasília, Brazil (RLMM)

Chronic tuberculous otitis media is a rare disease that is clinically variable and nonspecific.

We present a case of a 38-year-old man who had presented tinnitus, ear fullness, otalgia and otorrhea for 5 months, without improvement through the use of topical antibiotic drops. He had mixed hearing loss of moderate severity. He underwent mastoidectomy because of suspected chronic suppurative otitis media, but continued to present hearing loss, otorrhea and tympanic membrane perforation. In revision operation, material was collected for specific otitis analysis and aural tuberculosis was diagnosed. The patient was treated for 6 months and showed improvement following the first two weeks of treatment.

Tuberculous otitis media may be diagnosed late, mainly because it is often not suspected. This can lead to inappropriate treatment and possible complications. Cases of chronic otitis media that are unresponsive to the usual therapy or show unexpected postoperative evolution should be investigated for tuberculosis.

Submitted : 22 October 2010 *Revised: 25 March 2011* *Accepted : 30 March 2011*

Introduction

Tuberculous otitis media is a rare condition[1]. In the early 20th century, 3 to 5% of the cases of chronic suppurative otitis media were caused by tuberculosis (TB)[2]. Currently, some reports show that the incidence of cases of chronic middle ear infection in developed countries is 0.04 to 0.9% [1,3,4]. This is one of the rarer forms of extrapulmonary tuberculosis and it is probably underdiagnosed [1,5,6]. Diagnosing tuberculous otitis media is not easy. It is usually recognized late because of its low incidence, which does not raise suspicion among otolaryngologists. The signs and symptoms are variable and nonspecific and often differ from classic descriptions. The trio of painless otorrhea, multiple tympanic membrane perforations and facial paralysis is usually absent[5]. Because TB is rarely suspected, TB tests are not routinely requested[7]. False-negative cultures usually occur because of naturally indolent Mycobacterium tuberculosis. Tuberculous otitis media should be suspected after failure of current antibiotics or persistent effusion after tympanoplasty or mastoidectomy[8]. Because of these factors, the diagnosis is often made during surgery or postoperatively.[7] Late diagnosis delays the start of treatment, thereby increasing the risk of complications such as facial paralysis and irreversible hearing loss[1].

Corresponding address:
Mercêdes Fabiana Araújo
Hospital Universitário de Brasília - SGAN 605, Av. L2 Norte, Asa Norte,
Brasília –DF, Brazil – Zip code: 70910-900
Phone: 55-61-34485582
E-mail: mercedesfabiana@gmail.com

In this paper, we report a case of tuberculous otitis media with the aim of expanding the knowledge about the disease, focusing on early diagnosis in order to avoid serious complications.

Case Report

A 38-year-old man presented with pulsatile tinnitus and aural fullness in his left ear, which had begun five months before he came to the Otorhinolaryngology and Head and Neck Surgery Department of the University Hospital of Brasília. He also reported episodes of otalgia and serous otorrhea, which did not improve with antibiotics and ear drops. The patient reported a 12 pack-year smoking history and absence of comorbidities or previous surgical procedures. Any contact with individuals having infectious and contagious diseases was denied. The tympanic membrane was found to be hyperemic and intact during otoscopy.

Audiometric tests showed moderately severe mixed hearing loss in the left ear. Computed tomography scan of the mastoid was suggesting the presence of soft tissues inside the mastoid cells and the tympanic cavity on the left, without any signs of bone resorption or contrast enhancement (Figure 1).

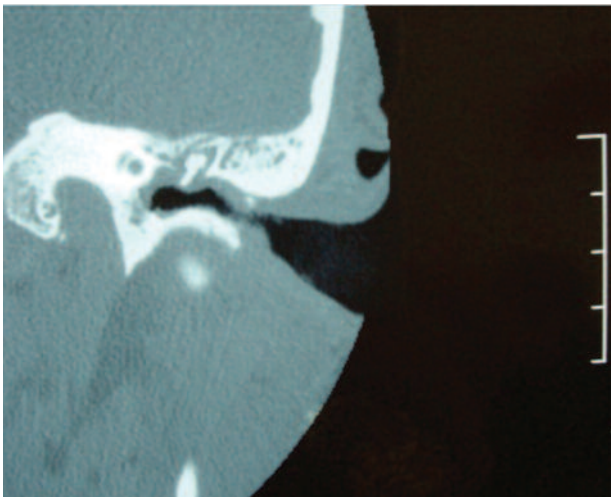

Figure 1. Coronal reconstruction of a CT scan showing soft tissue mass filling the left middle ear and mastoid, without any signs of bone resorption or contrast enhancement.

Exploratory tympantomy was planned. Before the surgery perforation of the tympanic membrane on the posterior-superior portion was observed and an intratympanic mass suggestive of cholesteatoma became apparent. Canal wall up mastoidectomy was performed, and a whitish-yellow bleeding mass was observed in the middle ear. The tumor was already compromising the ossicular chain. No significant changes were seen in the antral region.

Histopathological examination of the specimen showed mononuclear inflammatory infiltrate with occasional multinucleated giant cells.

The patient presented persistent hypoacusis, otorrhea, a sensation of fullness and perforation of the graft following the surgery. But the tinnitus was improved.

Revision surgery was performed and during the surgery the mastoid antrum and middle ear were found to be filled with a large whitish fibrotic mass accompanied with necrotic foci.

Histopathological examination suggested chronic inflammatory infiltration in the connective tissue (Figure 2). The acid-fast bacillus microscopy test was negative. Culturing of the material taken from the middle ear in Lowenstein-Jensen medium was positive for Mycobacterium tuberculosis.

Chest x-ray images showed fibronodular lesions in the upper lobes, on the left side, permeated by small cavitations. A purified protein derivative (PPD) test was considered to be strongly reactive (23 mm).

The diagnosis was then confirmed to be tuberculous otitis media and treatment started with a course of rifampicin, isoniazid and pyrazinamide. The otorrhea improved two weeks after treatment was started and the tympanum is now intact.

Following the revision surgery the patient still presented severe mixed hearing loss on the left side, with a mean of 80 dB, speech recognition threshold of 75 dB, speech recognition index of 72% at 95 dB and bone-air gap of 50 dB. Exploratory tympanotomy and ossicular reconstruction were scheduled to be performed after the drug treatment was completed. Through these procedures, the patient achieved improvement in his hearing ability. Later on the audiometric tests suggested mild mixed hearing loss on the left side, with 30 dB hearing threshold.

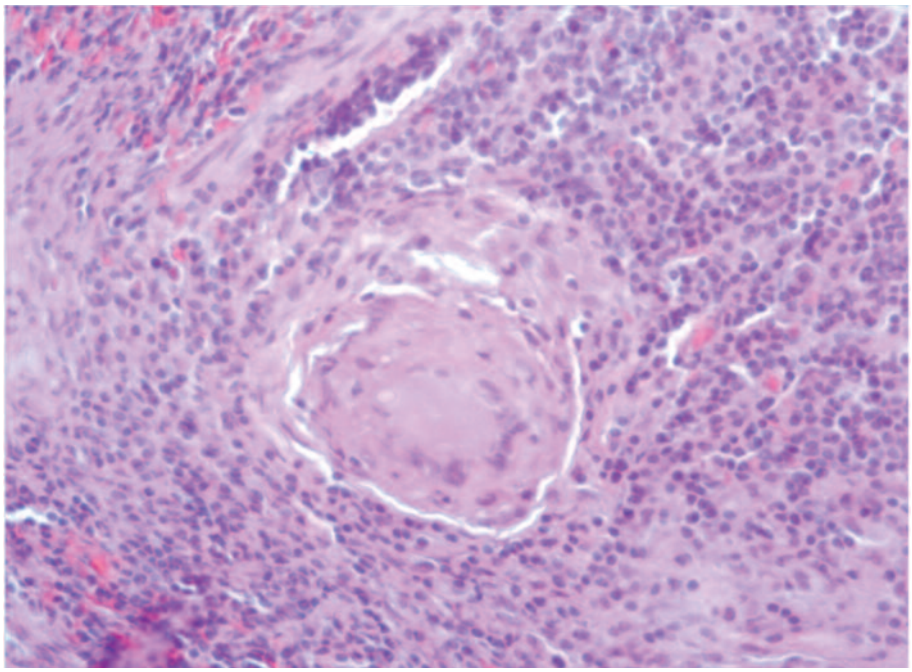

Figure 2. Histological aspect of fragments of tissues with inflammatory infiltrate containing mononuclear cells and multinucleate giant cells. Hematoxylin and eosin staining. (Original magnification X400).

Discussion

Tuberculosis is a chronic bacterial infection caused by Mycobacterium tuberculosis.[2] Estimates from the Brazilian Ministry of Health indicate that 50 million individuals in Brazil are currently infected and that 130,000 new cases are diagnosed every year. The disease is also responsible for 6,000 deaths a year.[9] The incidence of tuberculosis had been decreasing over the years, because of improvements to the public healthcare services and the availability and efficacy of antituberculosis chemotherapy[3], but the numbers of cases have increased again over the last few years[1], mainly because of AIDS, bacillus resistance to antituberculosis therapy, drug dependence, alcohol abuse and diabetes[2].

Tuberculosis of the middle ear is a rare condition and, in cases in which the primary focus is the ear, children are more frequently affected than adults[2]. However, surveying the literature brings up differing reports[7]. The typical presentation of tuberculous otitis media used to be painless otorrhea, multiple perforations of the tympanic membrane and peripheral facial paralysis. However, this condition has become polymorphic and insidious, changing according to patients' immune status[2,3,5]. Normally, patients present with significant otalgia, probably caused by the pressure exerted by the granulomatous tissue lying in the mastoid[5], and with serous otorrhea, which can evolve into purulent otorrhea, because of secondary bacterial infection. Hearing loss is found in 90% of the cases. The losses often occur early on and are severe, sensorineural and mixed or conductive. Sensorineural hearing loss can be attributed to vasculitis of the cochlear veins, immunocomplex deposits in the cochlea or the presence of granulomatous tissues affecting the acoustic nerve[10]. Peripheral facial paralysis may occur and a few cases of bilateral facial paralysis caused by tuberculous otitis media have been reported, but it is extremely rare[11].

Normally, otoscopic investigations reveal a single or multiple perforations of the tympanic membrane and there is usually ossicular resorption and lesioning of the auditory tube and even of the mastoid cortical bone. The bony capsule of the facial nerve can also become affected[4,5]. Investigations may also find pale granulation in the middle ear and mastoid cells. Sometimes this finding can be mistakenly interpreted as cholesteatoma, which could be an indication for

exploratory surgery of the mastoid[5]. This was the case with our patient. Necrotic tissue is another common occurrence. The granulomatous tissue can become hyperemic and it may bleed and be friable to the touch[2]. The granulomatous inflammatory process may involve the regional lymph nodes, especially those of the cervical posterior auricular and pre-auricular chains, and may progress to the underlying skin, thereby forming a persistent retroauricular fistula[2].

Cho et al. compared 53 cases of tuberculous otitis media with 49 control cases of non-tuberculous, non-cholesteatomatous chronic otitis media and found that in the first group, the symptoms were short-lasting. Facial palsy was a rare finding and all the cases were seen in the study group (9.6%). Additionally, the pattern of ossicular resorption did not differ between the groups and otalgia occurred equally in both groups (around 10% of the cases). A computed tomography scan on the mastoid showed that sclerotic changes of the temporal bone were less frequent in patients with tuberculous otitis media, while destruction of the cortical bone was a more frequent finding. This is different from the resorption that begins in Prussak's space, which is characteristic of cholesteatomas[5].

One should suspect tuberculosis or specific chronic otitis media in the following cases: when there is evidence of tuberculosis in any other organ; when the pneumatized mastoid cells and middle ear are filled with a soft mass; when computed tomography scans show cortical bone resorption; when patients present with chronic persistent otorrhea, which improves with the usual treatment; and when patients present with short-lasting symptoms, severe hearing loss and/or peripheral facial paralysis without the presence of cholesteatoma[7].

The differential diagnosis of diseases such as chronic otorrhea, which does not improve with conventional treatment, includes cholesteatoma, tuberculosis, syphilis, Wegener's granulomatosis, fungal infection, eosinophilic granulomatosis and sarcoidosis[2,3,10].

Bacteriological investigation of ear secretions may not be as sensitive, because other microorganisms may interfere with the growth of Koch's bacillus. It is also hindered by chronic use of topical ear drops, especially aminoglycosides, which can interfere with culture sensitivity[5,7,10,12]. Cultures on ear secretions are usually positive in around 20-30% of the cases[2].

Linthicum (2002) analyzed the temporal bone of a deceased elderly patient who had presented with peripheral facial paralysis on his left side when he was two years of age, and in whom tuberculous chronic otitis media subsequently became evident. The histological examination showed that the middle ear was filled with ectopic bone tissue, in which there were small tubercles with the characteristic multinucleated Langerhans-type giant cells, epithelioid cells and round cells. The ossicles were absent, except for the platinum of the stapes. A tubercle occupied the left facial canal, where the nerve should have been, close to the geniculate ganglion[13].

Imaging tests on tuberculosis cases typically show imaging tests showed ossicle resorption, sclerosis of the mastoid cortex, opacification of the middle ear and bone resorption[2]. The patient in our case presented with opacification in a pneumatized mastoid, which thus was in agreement with the literature.

PCR (polymerase chain reaction) on biopsy material can confirm the diagnosis in a few hours and it is both sensitive and specific for Mycobacterium tuberculosis[2].

Even when a preoperative investigation for tuberculosis has been performed (Mantoux screening test, chest x-ray, acid and alcohol-fast bacillus (AAFB) test and ear secretion culture), tuberculous otitis media is detected in only 26% of the patients[8]. The possible reasons why preoperative procedures for diagnosing tuberculous otitis media cases are only infrequently performed relate to low detection rates, low incidence of personal or family history of tuberculosis and low incidence of radiological abnormalities in cases of pulmonary tuberculosis[7].

Aural tuberculosis should be the first consideration in any patient presenting with otorrhea and evidence of active tuberculosis in any other part of the body, until proof to the contrary[2]. Concomitant pulmonary lesions are present in 50% of the cases of otitis media caused by tuberculosis[5]. Tuberculosis of the middle ear should be investigated in cases in which the usual treatment for chronic otitis media is not producing the desired outcomes, and when the patient's history and clinical exams give reason to suspect that the infection has been caused by Koch's bacillus[2].

After the diagnosis has been established, drugs should be used as the first treatment option for this type of

otitis media. Although severe, this condition can be cured in practically 100% of the cases[9]. Early treatment is a decisive factor in preventing possible complications. In most patients, tuberculostatic drugs drastically improve the prognosis[8].

The Brazilian Ministry of Health advocates treatment regimens that are administered in a supervised setting or that motivate compliance, since they need to last for at least six months. If patients do not comply with the full course of treatment, the bacillus may become resistant to the drugs currently available[3,9]. During the follow-up period, signs and symptoms should be investigated and assessed on a regular basis, and remission will indicate a positive therapeutic response[8].

Conclusion

Because of the atypical presentations of aural tuberculosis and its rarity, physicians may not include it in their diagnostic hypotheses. Thus, it may be left untreated, resulting in inadequate management, possible complications and a high morbidity rate. When faced with a case of chronic otorrhea in a pneumatized mastoid, in a patient with or without a history of tuberculosis, in whom the usual clinical therapy is not producing the desired outcomes, physicians should consider the possibility of specific chronic otitis. Additionally, other cases of otitis media that do not present the expected postoperative outcomes should be carefully investigated, since they may have been caused by tuberculosis, especially in endemic regions.

References

1. Vaamonde P, Castro C, Garcia Soto N, Labella T, Lozano A. Tuberculosis Otitis Media: A Significant Diagnostic Challenge. Head Neck Surg. 2004; 130:759-66.

2. Sens PM, Alemida CIR, Valle LO, Costa LHC, Angelis MLS. Tuberculose de Orelha, Doença Profissional? Rev Bras Otorrinolaringol. 2008; 74:621-627.

3. Ma KH, Tang PSO, Chan KW. Aural Tuberculosis. Am J Otol. 1990; 11:174–7.

4. Nicolau Y, Northrop C, Eavey R. Tuberculous Otitis in Infants: Temporal Bone Histopathology and Clinical Extrapolation. Otol Neurotol. 2006; 27:667-671.

5. Farrugia EJ, Ali Raza S, Phillipps JJ. Clinical Records Tuberculous Otitis Media - A Case Report. J Laryngol Otol. 1997; 3:58-59.

6. Pinho MM, Kós AOA. Otite Média Tuberculosa. Ver Bras Otorrinolaringol. 2003; 69:829-837.

7. Cho YS, Lee HS, Kim SW, Chung KH, Lee DK, Koh WJ, et al. Tuberculous Otitis Media: A Clinical and Radiologic Analysis of 52 Patients. Laryngoscope. 2006; 116:921–927.

8. Awan MS, Salahuddin I. Tuberculous Otitis Media: Two Case Reports and Literature Review. ENT: Ear, nose and Throat. 2002; 81:792-794.

9. Ministério da Saúde. Fundação Nacional de Saúde. Tuberculose – Guia de Vigilância Epidemiológica. ASCOM, Brasília: MS, 2002.

10. Bhalla RK, Jones TM, Rothburn MM, Swift AC. Tuberculous Otitis Media - A Diagnostic Dilemma. Auris Nasus Larynx. 2001; 28:241-243.

11. Iseri M, Topdag M, Ulubil SA, Kuru FD. Bilateral Facial Paralysis Caused By Tuberculous Otitis Media: A Case Report. Int. Adv. Otol. 2010; 6:(3) 410-414.

12. Yaniv E. Tuberculous Otitis Media as a Secondary Infection to Chronic Otitis Media with Cholesteatoma. Am J Otol. 1987; 8: 40-42.

13. Linthicum Jr, FH. Temporal Bone Histopathology Tuberculous Otitis Media. Otol Neurotol. 2002; 23:235–236.