

Clinical Records

Tuberculoma of the mastoid

D. S. GREWAL, PUNEET BHARGAVA, BACHI MISTRY, NINAD GAIKWAD

Abstract

Tuberculoma is a rare but known complication of tuberculosis. It rarely occurs in the mastoid bone. When it occurs in the middle ear cleft, it can lead to intracranial complications if there is a delay in the diagnosis and management.

A rare case of tuberculosis of the middle ear cleft which presented as tuberculoma of the mastoid bone with infranuclear facial palsy is described. The tuberculoma was removed and a canal wall down tympanomastoidectomy was performed. Post-operatively the patient was kept on antituberculous therapy. The various problems encountered in the diagnosis and management of this case are discussed.

Key words: Tuberculoma; Mastoid

Introduction

Tuberculoma is described as a rare, slow-growing, circumscribed tuberculous lesion, often multiple and usually seen in children. When it occurs in the brain, it can frequently be mistaken for brain tumour. The lesion is usually firm, spherical and on cut section may show softening in the centre with formation of an abscess (Boyd, 1970).

Tuberculosis of the middle ear cleft, though occasionally diagnosed in the earlier part of the century, showed a gradual decline with the advent of modern antituberculous therapy. However, there has been a gradual rise in the incidence over the last decade. The classical picture, with yellowish areas on the tympanic membrane breaking down to form multiple perforations is rarely seen nowadays. The common mode of presentation now is a persistently discharging ear with, or without, complications due to bone erosion or abscess formation.

The case reported here presented with one of the rarest complications of tuberculosis of the middle ear i.e. a tuberculoma of the mastoid bone with infranuclear facial nerve paralysis.

Case report

A 10-year-old boy from the rural areas of Maharashtra attended our Outpatients' clinic with the main symptom of a discharge from the left ear for six years and a left-sided hearing loss and left facial palsy for the past two years. He had a constant, dull, deep-seated pain in the left ear, intermittent low grade fever (39–40°C) with occasional episodes of giddiness. His hearing was deteriorating gradually (Figure 4). The right ear was normal.

The ear discharge was yellowish in colour, profuse, unremitting, foul-smelling, and occasionally blood-tinged. The patient had undergone left aural polypectomy four times in the past six years. The last aural polypectomy was undertaken two years previously and on histopathological examination tuberculosis was revealed. He was started on antituberculous therapy with rifampicin, isoniazid, and ethambutol, which he took for only three weeks.

On general examination, the patient was anaemic but had no cervical lymphadenitis. On examination of the left ear, the pinna

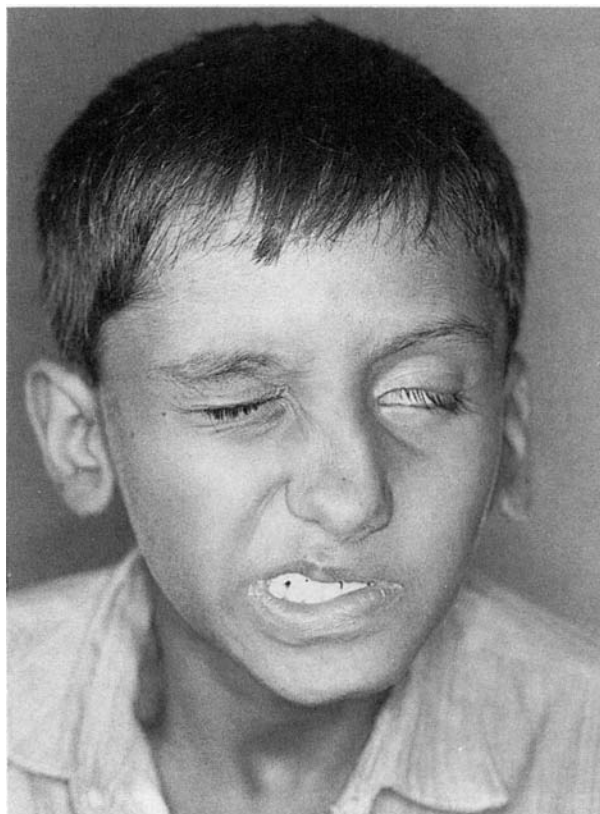


FIG. 1

Ten-year-old patient with tuberculoma of the left mastoid and left facial palsy. Note the prominence of the pinna.

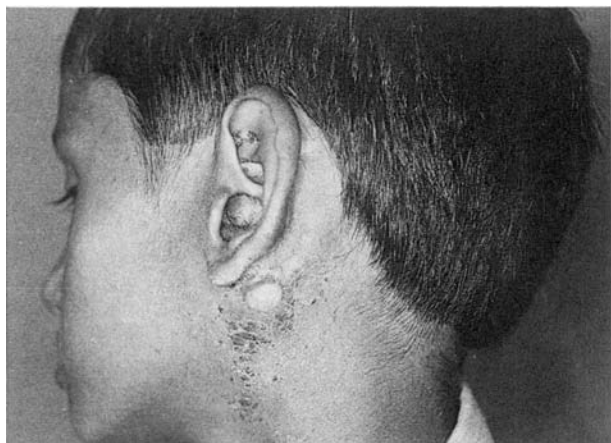


FIG. 2

Polyp in the left ear and characteristic tuberculous sinus below the tip of the left mastoid.

was prominent due to a diffuse swelling in the temporoparietal region (Figures 1 and 3b) which was bony and hard on palpation. There was a classical tuberculous sinus situated 0.5 cm below the tip of the left mastoid bone. The opening of the sinus was 1 cm in diameter with irregular, everted, edges and pale granulation tissue projecting out of it. On probing with a blunt probe, the tract was found to be communicating with the mastoid tip. The sinus was constantly filled with yellowish, foul-smelling pus and because of this, there was excoriation of the skin around the sinus (Figure 2). The external auditory canal was totally occluded by a polypoidal mass. The right ear was normal.

There was a lower motor neuron type of left facial nerve paralysis. There was no nystagmus and the fistula test was negative. On examination, the nose and throat were normal.

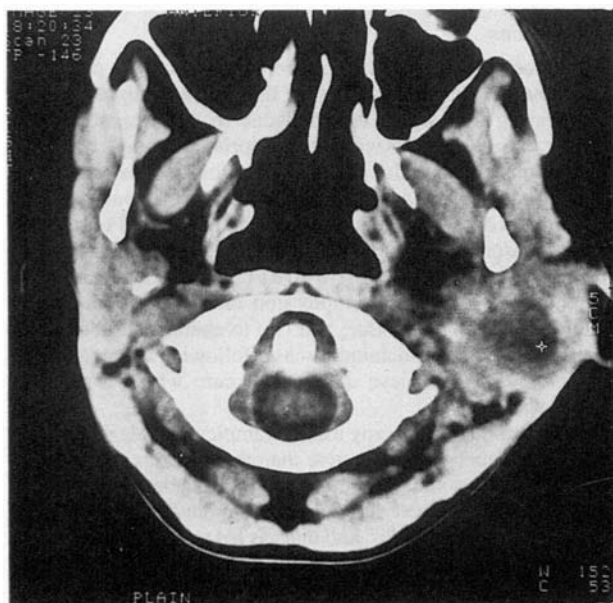
On investigation the haemoglobin was 8 g per cent; total white blood count (WBC) 9900/cm; differential WBC count – neutrophils (32 per cent), lymphocytes (65 per cent), eosinophils (0.2 per cent), monocytes (0.1 per cent); red blood count 4.4 million/cm; erythrocyte sedimentation rate (ESR) 46 mm at the end of 1 h (Westergren). The pure tone audiogram showed the severe

degree of mixed hearing loss (Figure 4). Plain and contrast CT scans of the temporal bone with 2 and 5 mm cuts in the axial plane showed: (1) a hypodense round, soft tissue mass in the left temporal bone with generalized expansion and occlusion of the external auditory canal; (2) the contrast CT scan showed peripheral enhancement of this lesion with multiple septae (Figure 3a and b). The X-ray of the chest was normal.

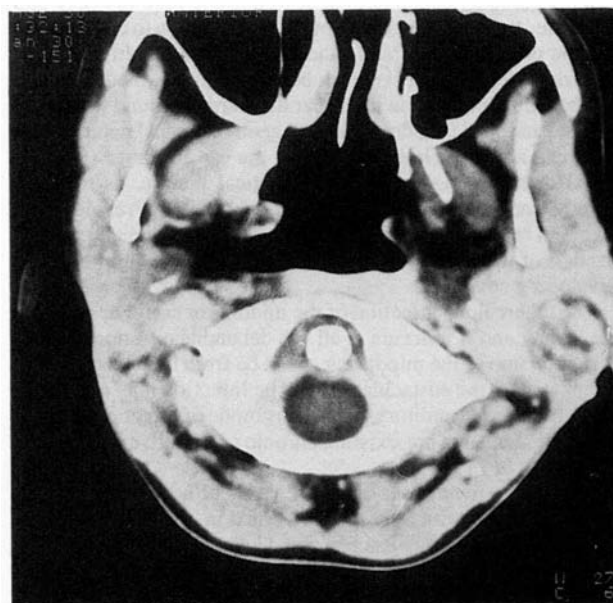
On bacteriological examination, discharge from the ear and mastoid sinus showed *Staphylococcus aureus*, which was sensitive to ampicillin and cloxacillin. No tuberculous bacilli were cultured.

A left tympanomastoideotomy with the canal wall down technique was performed using a post-aural approach. On reflection of the periosteum over the mastoid cortex, multiple bleeding points were seen and the bone appeared very ragged. On drilling, the cortex was found to be thin, with exuberant granulation tissue beneath. The granulations extended for approximately 1 cm in depth beyond which, the antrum was filled with a greyish-white mass about 1 × 1.25 cm in size, occupying the antral and periantral regions, extending to the sino-dural angle and the attic region and partially eroding the posterior wall of the external auditory canal. During the course of surgery, the mass ruptured discharging yellowish pus and caseous material. The wall of the mass was greyish-white and approximately 2 mm in thickness. The entire mass was removed. The sinus and dural plates were intact. The aditus and the middle ear were full of granulation tissue and after their removal the underlying bony facial canal showed erosion for approximately 6 mm in length in the vertical segment. The middle ear revealed absence of the malleus, incus, and stapes suprastructure. There were granulations in the region of the digastic ridge. On their removal, there was erosion of the bone and a fistulous tract approximately 5 mm in diameter was seen which was communicating externally. The bony sequestrum was cleared using a medium-sized diamond burr. The sinus with the tract and the opening in the skin was excised. Grafting with temporalis fascia over the footplate of the stapes, covered the middle ear and the dehiscent vertical portion of the facial nerve. A large meatoplasty was performed and the wound was closed in layers. The ear was packed with gelfoam and an ear pack both soaked in rifampicin solution.

Histopathological examination of the tissue revealed the characteristic features of tuberculosis – tubercles made up of



(a)



(b)

FIG. 3

(a) Pre-contrast CT scan showing hypodense soft tissue mass i.e. tuberculoma.
 (b) Post-contrast CT scan showing peripheral enhancement of mass with multiple septae.

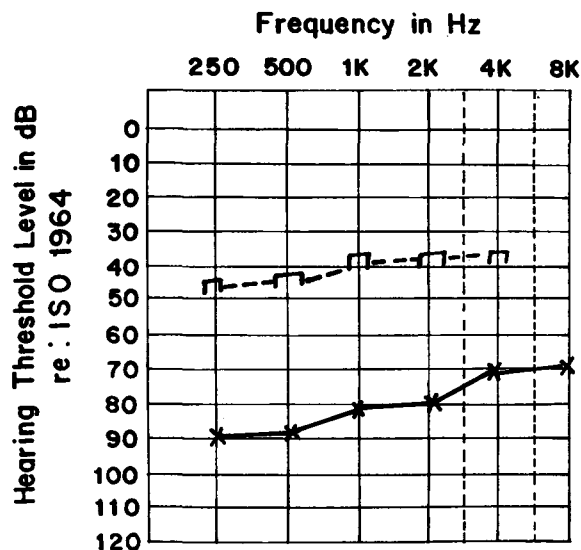


FIG. 4

Pure tone audiogram (left ear) showing severe degree of mixed hearing loss.

caseous necrosis, epitheloid cells, Langhan's giant cells, lymphocytes and fibroblasts (Figure 5). The patient was given a complete course of antituberculous drug therapy with rifampicin, ethambutol and isoniazid for nine months. He had profuse otorrhoea post-operatively to the extent that in spite of repeated suction cleaning, it soaked the bed-sheets. Granulation tissue from the cavity was removed from time to time and cauterization was undertaken using 20 per cent silver nitrate solution.

The patient was reviewed at regular intervals and, after three months, the cavity had epithelialized, and the ear healed completely. However, the facial palsy persisted.

Discussion

Tuberculous otitis media is more common in children (Windle-Taylor and Bailey, 1980; Jeang and Fletcher, 1983). It is more frequent than anticipated. This is because of the various difficulties encountered in a laboratory diagnosis as specific bacteriological and histopathological studies are required (Lee and Drysdale, 1993). Tuberculosis of the ear is known to coexist with chronic otitis media. This further compounds the difficulty for bacteriological diagnosis of tuberculous otitis media as the number of mycobacteria in the ear discharge is found to be very low and antibiotic ear drops such as gentamicin and neomycin, if used, can affect the bacterial flora in the ear discharge (Olijimi, 1988) thus altering the histopathological picture, as they are weakly antituberculous (Grewal *et al.*, 1991). Prevalence is higher in regions where proper supervision of cattle and pasteurization of milk is lax, as commonly seen in the rural areas of developing countries.

The tuberculous infection of the middle ear could be primary, but is rare, and if it occurs at all is a debatable question. Secondary infection to the middle ear could be from the blood stream, lymphatics or the eustachian tube. The infection may also come from the external auditory canal. This mode of infection is likely in the presence of a pre-existing chronic suppurative otitis media (Grewal *et al.*, 1991).

In our experience, out of the 42 cases of tuberculosis of the middle ear cleft which have been treated in our hospital during the past 22 years, none has presented before with this rare complication i.e. tuberculoma of the mastoid bone. Tuberculoma of the brain is one of the rare but known complications of tuberculosis. The other sites where tuberculomas have been reported are the spinal cord, tracheobronchial tree and the lungs (Myerson, 1944).

Tuberculosis of the middle ear cleft should be suspected after mastoid surgery whenever granulomata, slow and incomplete

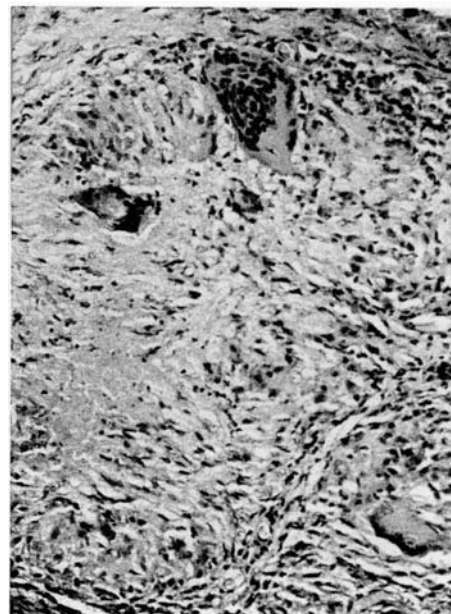


FIG. 5

Microphotograph showing tuberculous inflammation. Tubercles are composed of caseous necrosis, epitheloid cells, Langhan's giant cells, lymphocytes and fibroblasts. (H & E; $\times 100$).

wound healing, persistent otorrhoea and formation of bony sequestra are encountered (Hebert and Riordoan, 1964). Moreover during surgery, bulging of granulation tissue from the mastoid air cells, greyish-white mucosa (Ormerod, 1931) and post-operatively the ear that continues discharging even after adequate surgical clearance of disease should alert the surgeon to the possibility of tuberculosis (Plester *et al.*, 1980). During mastoid surgery, in the absence of cholesteatoma, when the mastoid cavity formed is very large, or larger than expected, then tuberculous infection of the middle ear cleft (Grewal *et al.*, 1991) is a possibility.

In order to ensure early diagnosis of tuberculosis, it is essential to send all granulation tissue and polyps found during ear surgery for histopathological examination (Glover *et al.*, 1981).

Conclusions

Tuberculous otitis media commonly presents with complications. Our case had tuberculoma of the mastoid with facial palsy and hearing loss which occurred due to the presence of the disease for several years without appropriate treatment with antituberculous drugs. In this case, we undertook a canal wall down tympanomastoidectomy followed by a complete course of antituberculous drugs. Surgical intervention is required for the following reasons; (i) to clear pus, granulations and sequestrae; (ii) to clear the tuberculoma; (iii) to give a chance for the facial nerve to recover by relieving compression on the nerve caused by granulations and sequestrae; and (iv) to enable antituberculous drugs to act on the remaining disease (following a tympanomastoidectomy) and achieve a complete cure which is possible nowadays.

The combination therapy using rifampicin, isoniazid and ethambutol is much more effective than the previous combination of drugs such as streptomycin, PAS, and isoniazid. The added advantage is a reduced duration of treatment from the previous 15 months to nine months, and this has led to a much higher cure rate in tuberculous mastoiditis with complications.

Acknowledgements

We are grateful to our Dean Dr (Mrs) K. D. Nihalani, for permitting us to publish this paper. We also are most grateful to Dr N. K. Behl, Associate Professor, Department of Pathology, for helping and guiding us.

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