

Tuberculous Otitis Media and *Staphylococcus aureus* Coinfection in a Five-Year-Old Boy with Miliary Tuberculosis

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ABSTRACT

A five-year-old boy with acute on chronic ear discharge and fever was diagnosed to have tubercular otitis media (TOM) with *Staphylococcus aureus* co-infection. His chest X-ray was suggestive of miliary tuberculosis. The clinical presentation of the child with a brief review of the literature pertaining to the case is being discussed in this report.

Key words: Child, Miliary tuberculosis, Otitis media, *Staphylococcus aureus*, Tuberculous

INTRODUCTION

Tuberculosis of the middle ear is an uncommon extrapulmonary manifestation of tuberculosis. It can occur as a primary tuberculous infection of the ear or by hematogenous spread. We report a five-year-old boy who had features of tuberculous otitis media (TOM), who also developed a suppurative complication due to *Staphylococcus aureus*. In addition, he also had a miliary pattern in his chest X-ray. TOM is an under-recognized entity in children because signs and symptoms are difficult to differentiate from nontubercular chronic otitis media and due to the lack of constitutional symptoms.^[1] Delay in recognition and treatment of tuberculosis in such children can lead to deleterious effects on the ear. The association of TOM with infection due to *S. aureus* assumes importance because both can cause suppuration and destruction of auditory ossicles leading to permanent hearing loss.

CASE REPORT

A five-year-old developmentally normal boy was hospitalized with fever on and off for more than three months. Fever was found to be high-grade and was associated with

painless and clear discharge from both ears. There had been discharge of frank pus from his right ear with pain and impaired hearing in the week before hospitalization. He had received both oral and topical medications (comprising fluoroquinolones and aminoglycosides) for his ailment from several practitioners without any respite to his symptoms. He had been immunized appropriately.

On examination, he was found to be febrile, toxic, and undernourished with wasting. His submandibular, cervical, and axillary lymph nodes were found to be significantly enlarged bilaterally. His left upper deep cervical lymph nodes were found to be matted. There were multiple healed perforations in both tympanic membranes with granulation tissue, furuncle, and pus discharge from his right ear. The pus was swabbed and sent for microbiological examination. A fine needle aspiration cytology of the left upper deep cervical node revealed caseating granulomas suggestive of tuberculosis. A chest X-ray which was obtained showed miliary mottling [Figure 1]. Tuberculin test elicited no response, and HIV I and II ELISA were also found to be negative. The history had to be reviewed again for possible contact with a known tuberculosis case but was found to be negative.

As the child was toxic with high-grade fever and chills, a complete blood count was ordered which showed neutrophilic leukocytosis. The ear swab culture grew *S. aureus* and smear for acid-fast bacillus (AFB) and culture was reported to be negative (probably because the

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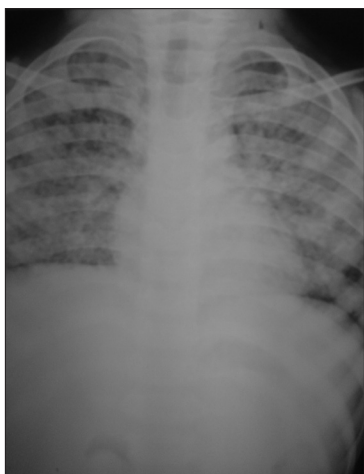


Figure 1: Miliary mottling on chest radiograph

child had been on aminoglycoside ear drops for variable periods before presentation). The child was treated with appropriate antistaphylococcal antibiotic based on culture and sensitivity of the organism. In view of the chronic symptoms, chronic and painless clear aural discharge initially and miliary mottling on chest X-ray, a diagnosis of miliary tuberculosis with otitis media was made and antitubercular therapy (ATT) had to be added to his treatment. With the above treatment, fever and earache subsided, and pus discharge reduced from his right ear. However, he continued to have clear discharge from both ears for which he required frequent toileting. He was discharged after two weeks of hospitalization on ATT. On follow-up at four weeks, he continued to be afebrile, gained weight, his ear discharge reduced considerably, and his lymph nodes regressed in size. Hearing assessment was not done as he reported a subjective improvement in hearing.

DISCUSSION

TOM reportedly occurs more frequently in infants and young children compared to adults.^[1] The presence of painless clear ear discharge, multiple perforations of the ear drum with granulation tissue and a chest radiographic evidence of tuberculosis are regarded to be consistent with a diagnosis of TOM. Bacteriological confirmation of ear discharge specimen for tubercle bacilli is difficult due to low yield, but it improves on repeated examination.^[2] Co-infection with tuberculous bacilli and *Staphylococcus* sp. was described earlier in a ten-year-old boy with miliary tuberculosis who had presented with otorrhoea for four months.^[3] It has also been described in infections of the spine and brain.^[4,5] A report of miliary tuberculosis after staphylococcal pneumonia was also described in a five-year-old boy whose sputum was found to be positive for AFB.^[6]

In our case, TOM was diagnosed in view of chronic painless ear discharge initially (which became painful one week prior to presentation) with multiple perforations of tympanic membrane and granulation tissue on ear examination with a positive cytology from aspiration of the draining lymph node. The child also had miliary mottling on chest X-ray which could explain the cutaneous anergy to tuberculin testing in our case. *S. aureus* co-infection was diagnosed in view of recent-onset purulent infection from the right ear with pain and isolation of organism from pus culture. Although TOM is associated with a bad prognosis for hearing, the boy in our case had improved hearing after treatment, which shows that early diagnosis and treatment might help in improved hearing and other clinical outcomes as had been reported in the literature.^[7]

In patients with tuberculosis who are colonized with *Staphylococcus*, initiation of ATT can result in selection of rifampicin-resistant strains in the nares of such patients. In one study, screening of patients with tuberculosis for nasal carriage of staphylococci was carried out and it was found that nasal colonization with staphylococci had happened in 17% of the subjects of which 50% had a negative carrier state following ATT, and in the remainder, resistance to rifampicin was observed.^[8] In an Indian study on preschool children between 1–5 years of age, prevalence of colonization with *S. aureus* was found to be 6.3%.^[9] The rates of colonization of *S. aureus* varies with the population studied. However, whether these individuals who are colonized with staphylococci would go on to develop disease is not certain. Evidence that was obtained from an earlier study suggested that in patients with tuberculosis, staphylococci would be able to produce disease due to reduced bactericidal activity in their respiratory secretions.^[10]

CONCLUSION

TOM can be complicated with staphylococcal co-infection in young children particularly with disseminated disease. Early diagnosis and treatment of TOM would lead to better outcome; on the other hand, empirical aminoglycoside therapy may mask the symptoms resulting in delayed diagnosis. Nasal staphylococcal carriage in children with tuberculosis needs to be studied in relation to the development of staphylococcal disease and also emergence of resistance which has implications far beyond the treatment of an individual child.

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