Rapid diagnosis and successful drug therapy of primary parotid tuberculosis in the pediatric age group: a case report and brief review of the literature

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Introduction

Among a plethora of perioral swellings described in children, the diagnosis of primary tuberculosis (TB) of the parotid gland is very difficult. Most of the reported cases have been diagnosed after surgical intervention.1,2 The objectives of this study were (1) to describe a case who, with the help of specialized microbiology, was diagnosed early and treated successfully without surgery, and (2) to review the literature.

The case

A 13-year-old female presented to the Neuro-otorhinolaryngology Department of Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow with a history of slowly growing swelling of the right parotid gland, low grade fever, mild pain, and gradually increasing difficulty in opening the mouth over a 3-month period. She had received multiple courses of antibiotics, which did not effect any improvement. She had no present or past history suggestive of tuberculosis. Ten years previously her father had received drug therapy for cervical lymph node tuberculosis.

She had a non-tender, circumscribed, solitary, 6 × 4 cm size swelling of the right parotid region. The swelling was firm and non-tender with ill-defined borders. The skin over the swelling

Summary

Isolated parotid tuberculosis is difficult to diagnose in the pediatric age group. Often the problem leads to surgery. We describe the case of a 13-year-old female who presented with right parotid swelling with facial palsy. Computerized tomography, aspiration cytology, PCR differentiation, culture sensitivity, and drug therapy led to complete resolution. A literature review revealed case reports suggesting a trend towards a conservative approach.

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was intact and the temperature was not raised. Clinical signs of facial nerve palsy were present. There was no cervical lymphadenopathy. The rest of the head and neck examination was normal. A BCG vaccine scar was present. The hematological and biochemical profile was normal. Chest X-ray did not show any abnormality. A contrast-enhanced computerized tomography (CT) scan of head and neck region showed a 5 × 4 × 3.6 cm mass lesion with areas of fluid density, completely replacing the right parotid. Fine needle aspiration cytology (FNAC) from the most prominent part of the swelling yielded purulent material. A smear stained with hematoxylin and eosin showed caseous necrosis and degenerated mixed inflammatory cells. A Gram stain did not show any organism. A smear stained by Ziehl–Neelsen technique showed no acid-fast bacilli (AFB).

**Microbiology**

Thick pus (2 ml) was aspirated. Two smears were made: one direct smear was prepared from the unprocessed specimen and the other was from a processed specimen (0.5 ml of aspirated pus was mixed with 1 ml of phosphate-buffered saline and centrifuged for 5 min at 3000 rpm). Both the smears were stained by Ziehl–Neelsen technique and were examined for AFB. The unprocessed specimen showed two AFB in the entire smear. The processed specimen showed 1–2 bacilli/10 oil immersion fields.

**Molecular methods**

DNA extraction was done from the aspirated pus. Differentiation of *Mycobacterium tuberculosis* was done by PCR amplification using the IS6110 gene (Figure 1, inset).

**Culture**

Aspirated pus was cultured on conventional Lowenstein–Jensen (LJ) slants and in the radiometric BACTEC 460 TB system (Becton Dickinson Diagnostic Systems, USA). The slant was incubated at 37 °C and inspected weekly for any growth.

BACTEC culture showed growth of AFB after 10 days of incubation, whereas conventional culture was positive after 3 weeks of incubation. The culture isolate from LJ and BACTEC media was identified as *M. tuberculosis* complex by *p*-nitro-α-acetylamino-β-hydroxypropiophenone (NAP) 5 μg disc (radiometric BACTEC 460 TB system identification method). Susceptibility testing to four first-line anti-tuberculosis drugs (rifampin, isoniazid, ethambutol, and streptomycin) was done. The isolate was sensitive to all four drugs.

**Treatment**

The patient was treated with World Health Organization (WHO) approved directly observed treatment short course (DOTS) category III regimen under the Revised National Tuberculosis Programme.

**Follow-up**

The swelling and fever had subsided by 6 months. She was able to open her mouth to near normal status. Her appetite was normal and she had gained 7 kg in weight. There was no evidence of disease at the end of one year.

**Discussion**

Reports of primary parotid TB with facial nerve palsy are limited to 100 odd cases in adults and a few cases in the pediatric age group. The diagnosis is difficult on clinical grounds because the swelling resembles a range of benign or malignant tumors and non-tuberculous bacterial or mycobacterial infections. Hence in most of the reports the diagnosis was made either by a process of elimination or following histopathology of the surgically extirpated specimen. More recent case reports show a trend towards early diagnosis and successful conservative management. CT has been found to be the imaging modality of choice for most pediatric parotid disease. Associated facial nerve symptoms could be evaluated by magnetic resonance imaging. FNAC has 80% sensitivity and 93% specificity for diagnosing parotid tuberculosis. A negative Mantoux test may be helpful.

Parotid involvement with non-tuberculous mycobacteria (NTM) is not uncommon in this age group. Prior to the start of drug therapy, it is important to differentiate the *M. tuberculosis* infection from NTM, since the management differs significantly. Routine laboratory tests generally do not identify the specific organism. Hence the use of PCR has the added advantage of confirmation. Culture sensitivity gives the additional benefit of specific therapy. In our case, rapid diagnosis using the advanced multidisciplinary tools and timely institution of the WHO recommended anti-tubercular regime led to complete resolution of the disease. Authors of other case reports claim to have avoided surgery using a similar approach.
Conclusions

Primary tubercular involvement of the parotid gland in the pediatric age group is rare. A high index of suspicion, rapid diagnosis, treatment with anti-tubercular drugs, and minimal intervention can successfully manage the disease without the risk of major parotid surgery and thereby maintain the cosmesis. Advanced microbiological tools can give the additional benefit of rapid diagnosis and culture specific drugs for targeted therapy.

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