Tuberculous Infection and Exodontia: A Diagnostic & Treatment Dilemma

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Abstract

Tuberculous infection is more common in developing countries which are often overlooked by most of the doctors due to improper medical case history. This causes further complications as they proceed with their procedure. Till date, in dentistry, 90 such cases have been reported in literature. Hence, a dentist should be suspecting preexisting tuberculous osteomyelitis or postextraction complications from such an infection in patients with a positive history of tuberculous infection. Diagnosis as such is often overlooked despite a high prevalence of the disease in high-burden countries such as India. We report this case because of the rarity of its clinical presentation, which was misdiagnosed as odontogenic problem instead of preexisting tuberculous osteomyelitis in the mandibular retromolar region.

Keywords: Contraindication, extraction, osteomyelitis, tuberculosis

Introduction

In developed countries, tuberculosis (TB) is uncommon; however, this is not the case in developing countries where it is a public health problem. According to the World Health Organization, approximately three million people die annually of TB in developing countries.[1] TB is an infectious bacterial disease usually caused by *Mycobacterium tuberculosis* and less commonly by *Mycobacterium bovis*.[2] The primary infection is usually pulmonary although it may also occur in bones, joints, and central nervous system. The increased incidence of extrapulmonary TB in the past few years is thought to be related to the AIDS epidemic. TB of the bone is an uncommon form of chronic osteomyelitis, occurring more often in young individuals and usually in the late stages of the disease. Bone TB forms about 10% of extrapulmonary TB, of which 50% occurs in the spine.[3] The sites most commonly involved are dorsal and lumbar vertebrae and epiphysis and diaphysis of the long bones. Flat bones, including those of skull and mandible, are rarely affected. The occurrence of tuberculous osteomyelitis in the jaw bone is very low.[4,5] Most of the TB cases, which occur, are due to a tubercular focus elsewhere in the body, but primary TB of the mandible is a very rare phenomenon.[6,7] Due to the rarity of TB of the mandible, it seldom arouses clinical suspicion, especially when a positive history of a systemic infection or therapy is denied. Due to the presence of less cancellous bone in the mandible, occurrence of tuberculous infection in the mandible is extremely rare.[7] The mandibular involvement is more frequent than maxilla,[8] and within the mandible, the alveolar and angle regions have a greater predilection.[9] TB of the jaw causes necrosis of the bone slowly and may involve the entire mandible. If identified in the initial stage, Anti Tuberculosis Treatment (ATT) along with curettage of affected bone may promote earlier healing without any damage to involved bony structure. However, in a delayed case, treatment begins with ATT till the systemic condition of the patient is improved followed by curettage of affected bone for a good prognosis.

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Case Report

A 27-year-old female presented with swelling which increased progressively to attain the present size on the left side of the face over the past seven months. Swelling is located in the left submandibular region, which is tender on palpation and painful with movement of jaw, leading to difficulty in mastication. The patient visited a dentist seven months back and was advised for extraction of 38 in the suspicion of pericoronitis and underwent the same. Pain and swelling subsided for a period of time. Later, the problem recurred and the patient was on antibiotics for five months when it was symptomatic. From two months, pain and trismus progressed gradually and the lesion attained its present size.

The patient was diagnosed with TB infection seven years ago and underwent Category (CAT) I ATT. One year back, she was diagnosed to have active TB infection and started with CAT II ATT which was discontinued. During the course of CAT II ATT, the patient suffered from pain in the left lower back region of the jaw, for which patient underwent extraction of 38 by a local dentist.

On physical examination, the patient appeared emaciated and poorly nourished. On extraoral examination, a the patient had a diffuse swelling in the left masseter region. Overlying skin was normal in color, but the area was tender to palpation. A 2 x 2 cm lymph node was noted was palpated in the left submandibular area. There was severe trismus with 6 mm of interincisal distance while opening the mouth. No pus discharge is seen intraorally or extraorally. Chest radiograph revealed the evidence of TB calcifications. Laboratory findings revealed white blood cell count of 18,300 cells/cubic mm, hemoglobin of 8 g/dl, platelet count of 7.8 lac cells/cubic mm, erythrocyte sedimentation rate of 120 mm/h, and packed cell volume of 30%; C-reactive protein test showed raised up value to 24 mg/dl; Mantoux test was 10 mm × 8 mm; and serum HIV test was negative by ELISA. Radiographical findings: Ultrasonography (USG) of the lymph nodes revealed enlarged submandibular lymph node sized 11 mm × 6 mm and upper cervical lymph node sized 17 mm × 9 mm and found to be necrotic with few internal echoes [Figure 1]. USG also revealed the destruction of underlying bone in the ramus of the mandible below the masseter muscle. A linear soft-tissue density was seen extending from the left masseter to the skin surface in USG. Computed tomography (CT) scan revealed that irregularity of left side of the mandible in ramus region up to the coronoid notch even erosion of posterior part of the maxilla on the same side was noticed [Figure 2]. Incisional biopsy was done from the bony defect which gave an impression of chronic nonspecific inflammatory changes. All the above findings of USG and CT scan gave impression of osteomyelitis of the left ramus of mandible.

Based on clinical, medical, and radiological findings, osteomyelitis of the mandible due to TB was suspected. On comparison of the past orthopantomogram (OPG) [Figure 3] with present OPG [Figure 4], it was confirmed as primary osteomyelitis due to TB in the mandible. The past OPG showed diffused radiolucency in the posterior region of the 38 in ramus of the mandible on left side extending till coronoid notch. This was misdiagnosed and overlooked by the dentist previously. In this case, we have planned for both systemic therapy followed by local curettage for the removal of necrotized bone.

Discussion

Despite dramatic improvements in public health measures associated with *M. tuberculosis* infection and disease, such as living conditions, nutrition, Bacille Calmette–Guerin vaccination programs, and antimicrobial chemotherapy, none have resulted in a dramatic decline in the incidence of TB in many countries during the past century.

Tubercular infection of the oral tissues can be primary or secondary. Primary lesions develop when TB bacilli are directly inoculated into the oral tissues of a person who has not acquired immunity to the disease. These frequently involve gingiva, tooth extraction sockets, and buccal folds. Secondary infection of the oral tissues can result from either hematogenous or lymphatic spread or autoinoculation by infected sputum and direct extensions from neighboring structures. Most of the reported cases of mandibular TB are secondary to focus elsewhere in the body, and primary TB of the mandible is a rare occurrence.[6]

Conventionally, the diagnosis of TB has been made on the basis of clinical findings and radiographs and confirmed by sputum or tissue smears that show the bacilli. These methods remain the "gold standard" for diagnosis, but the development of DNA probes, polymerase chain reaction assays, and liquid media now allows more sensitive and rapid diagnosis. Skin testing should be used in conjunction with other clinical findings to establish tubercular infection in children.

A history of TB exposure and/or previous TB infection (active disease) should always be a part of medical history. Bhatt and Jayakrishnan reported a case in a young child who presented with features similar to dentoalveolar abscess, stressing the importance of history-taking during clinical examination.[5] These patients may develop chronic recurrent multifocal osteomyelitis[10] if proper diagnosis is not made promptly.

Predisposing factors for primary oral TB include poor orodental hygiene, dental extractions, periodontitis, and leukoplakia. A soft periosteal abscess then forms presenting as a painless, soft swelling. The infection may extend to the mandible by: [Table 1].

Orofacial presentation of tuberculosis includes swelling, pain, loosening of teeth, and even displacement of tooth buds. Other manifestations may include ulcers, granulomas, involvement of salivary glands and temporomandibular joint (TMJ), and tuberculous lymphadenitis. In the younger age group, tuberculous involvement of the jaw is highly

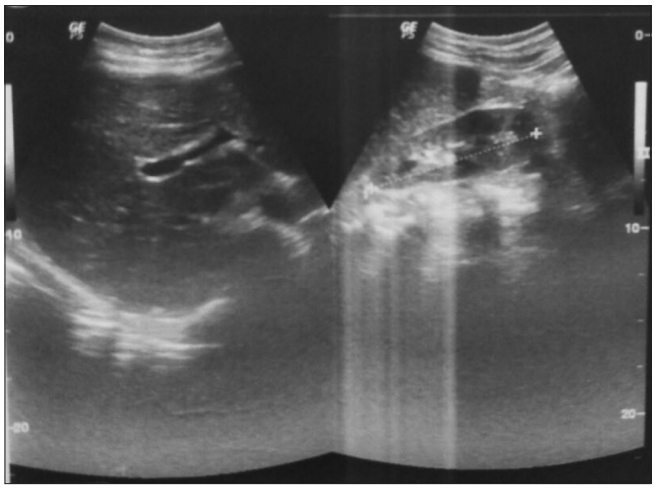

Figure 1: Ultrasonography of the lymph nodes found to be necrotic with few internal echoes

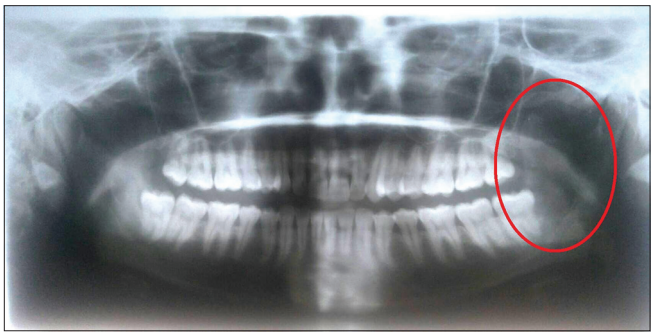

Figure 3: Orthopantomogram revealing bony lesion before the extraction of 38

Table 1: Predisposing factor

Possible ways of dissemination	Diagnostic techniques
Direct transfer from infected sputum or infected raw milk of cow through	Chest X-ray
An open pulp in carious tooth	TB skin test/tuberculin skin test also called
An extraction wound	Mantoux test or PPD test
Gingival margin or perforation of an erupting	Sputum test for tuberculosis
Tooth	Lung fluid tests for tuberculosis
	Biopsy

Regional extension of soft-tissue lesion to involve the underlying bone.[11] Hematogenous route.[1] PPD=Purified protein derivative; TB=Tuberculosis

unlikely, and sporadic instances have been reported in the literature.

The destruction of the bone in radiographs appears as blurring of trabecular details with irregular areas of radiolucency. There is erosion of cortex with little tendency to repair. Gradually, the bone is replaced by soft tuberculous granulation tissue. Caseation appears at places followed by softening and liquefaction. Usually, TB of the mandible presents as multifocal lesion elsewhere in the body, involving other bones and lungs.[11] TB of the TMJ is easily misdiagnosed.[2] Long-term combination antituberculous therapy must be started swiftly

Figure 2: Computed tomography scan of mandible revealing bone erosion

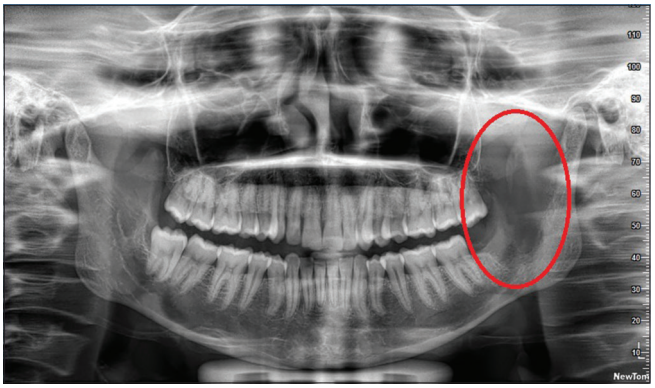

Figure 4: Orthopantomogram with prominent bony erosion in the left ramus and coronoid region after extraction

to reduce bony destruction. Mishra and Bhoyar[12] reported a primary case of TB of the mandible who recovered after 2 years of ATT.

The diagnosis of a case of TB of the mandible is extremely difficult as there are no specific signs pathognomonic of infection.[12] Although of rare occurrence, the differential diagnosis of tuberculous osteomyelitis must always be kept in mind by clinicians, when routine therapy fails to bring about an improvement in the lesions of the mandible. Since the involvement of bone occurs in late stages of the disease, the prognosis is poor and death from involvement of internal organs or from tuberculous meningitis is common. However, if the lesion is primary and detected early, the disease is completely curable and can lead to reversal of all destructive bony changes.

Hereby, this case report highlights the importance of considering TB infection (either active or denied) in medical history should be considered as absolute contraindication for extraction. The incidence of TB osteomyelities through the extraction site or misdiagnosis of primary osteomyelities with odontogenic infection as per the present case report may increase the mortality and morbidity rate. In this case, we have planned for 6 months of ATT CAT II followed by curettage of

affected bone after complete recovery from systemic condition. If the patient does not show any response to the ATT CAT II both locally and in systemic condition, then surgical resection of the infected bone is planned. After 1 year of ATT CAT II treatment, there is no complete recovery in systemic condition, but she is relieved from pain and trismus in the mandibular region. Her mouth opening is increased to 24 mm at present. Hence, we are continuing ATT CAT II for 6 more months and then planned for curettage of affected bone.

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Conflicts of interest

There are no conflicts of interest.

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