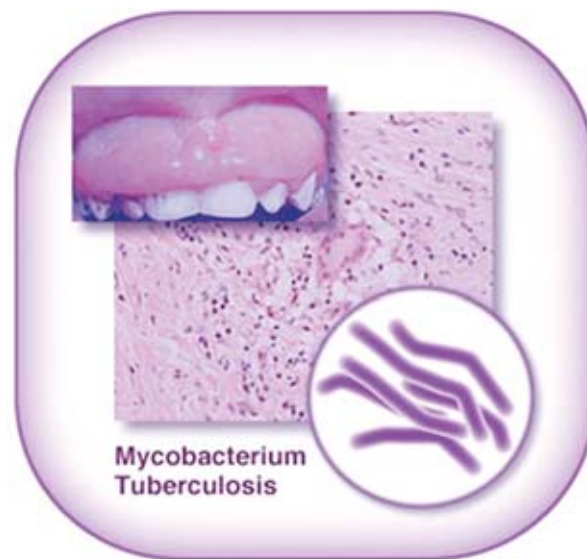


Primary Tuberculosis Clinically Presenting as Gingival Enlargement: A Case Report

C. G. Dileep Sharma, MDS; A. R. Pradeep, MDS;
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Abstract

Tuberculosis is a chronic systemic granulomatous disease which rarely affects the oral cavity. Oral lesions can be either primary or secondary to systemic tuberculosis, the former being rare. This is a never-before reported case of primary tuberculosis presenting as a localized diffuse gingival enlargement in an 11-year-old Indian female patient. The diagnosis was reached through identification of positive histopathological features, Tuberculin test results, presence of anti-tubercular antibodies confirmed by a polymerase chain reaction. In view of the recent increase in the incidence of tuberculosis and the prevalence of the same, it is reasonable to include tuberculosis in the differential diagnosis of gingival enlargements. This is essential to avoid any serious complications for both the clinician and patient due to a delay in the diagnosis of such a rare but plausible oral condition.

Keywords: Gingival enlargement, primary tuberculosis, polymerase chain reaction, orofacial granulomatosis

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Introduction

Tuberculosis is a chronic granulomatous, infectious disease caused by acid fast, gram positive bacilli *Mycobacterium tuberculosis* which most often affects lungs i.e., pulmonary tuberculosis, but can also affect any part of the body including oral cavity.

Oral tuberculosis most commonly affects the tongue (tip, dorsum, lateral borders, and base), and other sites reported to be involved include the floor of the mouth, lip, cheek, soft palate, anterior tonsillar pillar, uvula, gingiva, and alveolar mucosa.^{1,2} The presenting forms of lesions range from superficial ulcers,^{3,4} patches,⁵ indurated soft tissue lesions,⁶ or as central jaw lesions termed tuberculous osteomyelitis.⁷

Tuberculous lesions in the oral cavity are usually secondary to lung involvement⁸ and are frequently seen affecting 0.05-0.5% of elderly tuberculosis patients. However, primary oral tuberculous lesions are quite rare and, if present, are usually seen in younger patients.⁹ The aim of this paper is to report the first-ever case of primary oral tuberculosis presenting as a localized diffuse gingival enlargement in an 11-year-old female patient.

Case Report

An 11-year-old Indian female reported to the Oral Diagnosis Clinic in the Government Dental College and Hospital in Bangalore, India with a complaint of progressive, non-painful swelling of the upper anterior gingiva for the past year.

Oral examination revealed a diffuse gingival enlargement of maxillary anterior gingiva, covering up to middle third of the anterior teeth-crowns extending from right to left maxillary canines and associated with minimal local deposits which did not commensurate with the lesion. The color of the gingiva was reddish; surface was pebbled with no ulcerations with a minimal tendency for bleeding (Figure 1).

On palpation the enlargement was fibrous and was associated with pseudopockets of 6-8 mm in depth. Strikingly, the mandibular gingiva showed minimal enlargement consistent with local factors.



Figure 1. Diffuse enlargement and lobulated appearance of gingiva involving right to left maxillary canines.

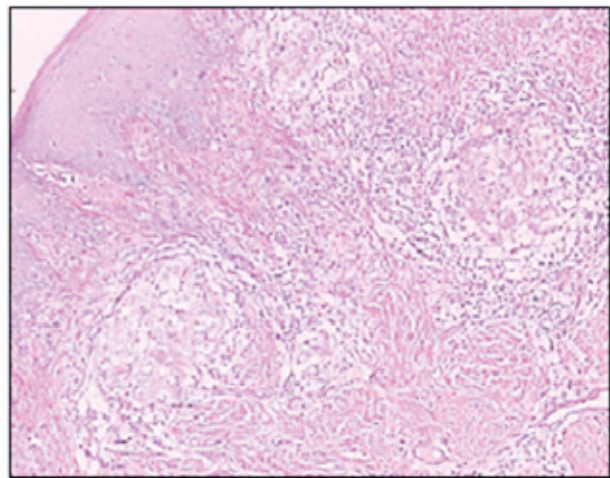


Figure 2. Microscopic picture at low magnification (5x) showing non-caseating granulomas.

Common etiologies for gingival enlargement such as inflammatory and other rare causes like bacterial, fungal, and viral infections were included in the differential diagnosis. An incisional biopsy from the maxillary labial gingiva adjacent to the central incisors was performed. Histopathological examination showed granulomatous inflammation (Figure 2) containing

Langhans' type giant cells (Figures 3a and 3b). The possibility of granulomatous infection including tuberculous ("hard tubercle"), sarcoid, and a fungal infection were explored.

Since tuberculosis is the most common cause of chronic granulomatous inflammation in the Indian population, a Tuberculin (Montoux) skin test (purified protein derivative, PPD) and Ziehl-Neelsen (ZN) stain of tissue sample were performed. The tuberculin test turned out to be positive with a red, indurated area measuring 1.8 cm suggestive of tubercular infection, but tissue sections failed to reveal acid fast bacilli following ZN staining.

Further, a fresh tissue sample was submitted to the laboratory for tissue culture on selective media (Lowenstein-Jensen) of tubercle bacilli, which after 4-6 weeks was reported to be negative. Simultaneously, Periodic acid-Schiff and Grocott-Gomori staining of a tissue specimen for fungi yielded negative results ruling out fungal etiology. The serum calcium and angiotensin converting enzyme level was not elevated, thus, excluding sarcoidosis.

Blood analysis was within normal limits except for a raised white cell count (12.9×10^9) and a raised erythrocyte sedimentation rate (52 mm/hour). In view of these findings, referral for a complete medical examination was made and a chest x-ray was obtained which revealed no abnormal findings excluding a primary focus of tuberculosis in the lungs. Further, immunological investigation (ELISA) on the patient's serum to detect IgM, IgG, and IgA anti-*Mycobacterium tuberculosis* antibodies was performed, and the serum sample was found to be positive for antibodies suggesting but not confirming a tuberculous infection.

A polymerase chain reaction (PCR) test known to be highly specific and sensitive to the DNA tested was then performed on the tissue sample which yielded a positive result confirming diagnosis of primary tuberculosis presenting as a localized gingival enlargement.

Further investigation of the patient's family history revealed that her brother was treated for tuberculosis two years previously suggesting he was the source of the infection.

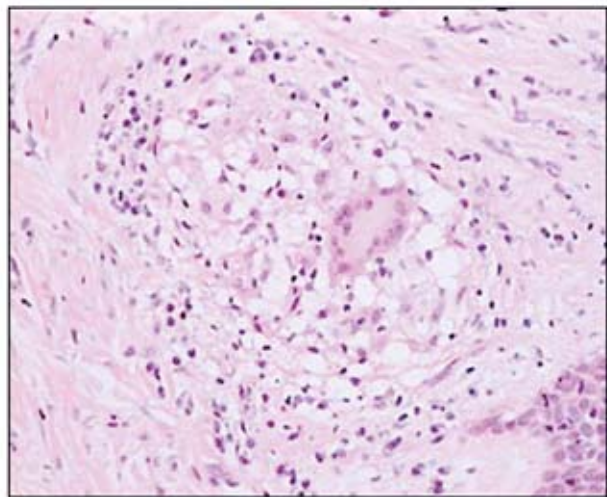
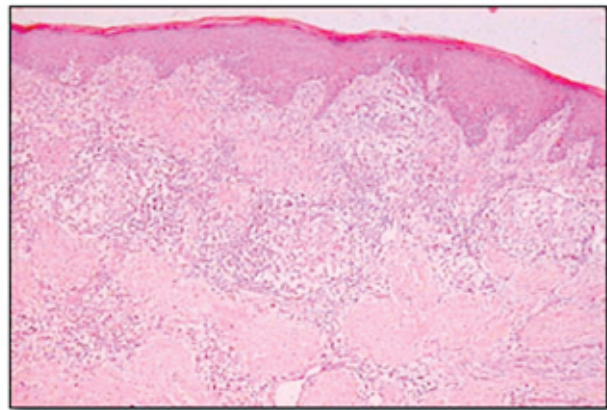


Figure 3. Microscopic picture at **A.** Low (10x) and **B.** High magnification (40x) showing granulomatous lesion with Langhan's giant cells and epithelioid cells.

Management consisted of anti-tuberculosis therapeutic regimen of isoniazid (10 mg/kg body wt), pyrazinamide (20-35 mg/kg body wt), rifampicin (10-20 mg/kg body wt), and ethambutol (25 mg/kg body wt) for two months followed by isoniazid (10 mg/kg body wt) and rifampicin (10-20 mg/kg body wt) for the next four months.

After completion of the treatment regimen, the enlargement showed minimal regression; thus, surgical treatment (gingivoplasty) was performed under total asepsis using universal precautions. Healing was uneventful, and no recurrence of the enlargement during the six months follow-up period was observed (Figure 4).

Discussion

Chronic granulomatous lesions of the oral cavity are quite challenging as they present as clinical

manifestations of specific diseases/conditions like tuberculosis, deep fungal infections, or foreign body reaction. Such lesions can also be one of the *Orofacial granulomatoses* (nonspecific) that includes Melkersson-Rosenthal syndrome, Miescher's chelitis, Crohn's disease, or Sarcoidosis.¹⁰ But in clinical situations the latter group of conditions is rare; hence, the determination of a specific cause for the granulomatous inflammation is a key sorting factor for the diagnosis.

The PCR method is essential for detecting *M. tuberculosis* in oral samples as shown by Eguchi et al.¹¹ In that study the PCR positivity in samples from mixed saliva, dental plaque, caries lesions, and denture plaque obtained from tuberculosis patients was 98.0%, 92.0%, 89.0%, and 100%, respectively, while the detection rates by the culture method were 17.3%, 2.0%, 0%, and 0%, respectively. Further, culture techniques are known to be less sensitive for detection of *M. tuberculosis* in tissue samples, unlike in body secretions, where DNA amplification by PCR for *M. tuberculosis* in formalin-fixed, paraffin-embedded tissue samples would be essential, to detect singular number of genomes of organism.¹² Thus, the final diagnosis of this case was reached only after the PCR results were available.

Diagnosis of oral tuberculosis is imperative in a dental setting as oral health workers are known to be at risk for nosocomial infection by tubercle bacilli. Recent studies have shown the presence of *M. tuberculosis* in oral samples is almost universal in patients with tuberculosis.¹¹ Reports are also available showing live *M. tuberculosis* on alginate impressions.¹³ Further, aerosol transmission of bacteria can occur during dental treatment involving aerosol production such as during ultrasonic scaling and the use of air-turbine



Figure 4. Photograph showing no recurrence after six months follow up.

handpieces. It has been documented in these conditions chair side care providers can inhale infectious particles and over an extended period of exposure organisms can penetrate deeply to the terminal portions of the lungs.^{14,15}

Tuberculosis of the gingiva is relatively rare and oral lesions in cases of tuberculosis would invariably be secondary to pulmonary tuberculosis. The possibility of primary lesions elsewhere should be ruled out before arriving at the diagnosis of primary oral tuberculosis. This is the first case in the literature reporting primary tuberculosis presenting as gingival enlargement.

Conclusion

The reported incidence of smear-positive cases of tuberculosis in the Indian subcontinent is at 84 per 100,000 population annually¹⁶ and 460,000 deaths per year with one person dying every minute.¹⁷ These data warrant the need for exploring the tubercle bacilli, which is the most common cause of granulomatous inflammation, as an etiological factor in granulomatous enlargement of the gingiva. Thus, the dental clinician can contribute in early diagnosis and prompt treatment of such a highly prevalent disease as tuberculosis.

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