



A Brief Summary of Orofacial Lesions Associated with Leprosy

Robert W Frare^{1*} and Mary M Frare²

¹Clinical Educator, New York University College of Dentistry, New York, USA

²The University of Maryland, College of Dental Surgery in Baltimore, New York, USA

*Corresponding Author: Robert W Frare, Clinical Educator, New York University College of Dentistry, New York, USA.

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Introduction

Leprosy, Hansen's Disease, or Hanseniasis is sometimes referred to as one of the oldest diseases known to affect humans. Although it has existed for many centuries, it is not known where or when it first developed. Some experts believe that a description of Hansen's disease was mentioned in the Vedas circa 1400 B.C., in the Sushruta Samhita circa 600 B.C., and in the Nei Ching, circa 500 B.C.

The word Leprosy is derived from the Latin word "leprosus", which means "defilement". Those afflicted with Leprosy, or thought to be afflicted, have been inhumanely treated throughout history. Some individuals were forced to wear bells, clappers, or distinctive garments. Others were excluded from society, officially declared "dead", or worst of all, executed [1-3].

Although viewed by many as a disease of antiquity, the World Health Organization reports that there were 216,108 new leprosy cases registered globally in 2016 from 145 countries, with India and Brazil each reporting greater than 10,000 new cases [4,5]. Males seem to be affected more than females, with a ratio as high as 2:1 [5,9-11].

Leprosy is a chronic infectious disease caused by the acid-fast, rod-shaped bacterium *Mycobacterium leprae* which was first identified by Norwegian physician Gerhard Armauer Hansen in 1873, making Leprosy the first disease identified as having a bacterial etiology [6,7]. *M. leprae* is an intracellular pathogen with a long period of incubation, and produces diverse clinical manifestations depending on the host immune response. The most common organs involved are the skin and peripheral nervous system. However, a moderate degree of infiltration may include other organ systems such as the eyes, oral mucosa, liver, kidneys, lymph nodes, bones,

joints and gonads. Ultimately, the extremities become deformed and paralyzed, and may fall off after repeated but unperceived injuries [2,7,8,12].

Although transmission of *M. leprae* is not entirely understood, it is thought that long-term exposure of the respiratory system to airborne droplets is the main route of infection. Humans are the major reservoir of *M. leprae* infection [7]. However, there are two animals, armadillos in the Americas and red squirrels in the United Kingdom which are natural reservoirs of *M. leprae*, although their role in disease epidemiology is unclear [14]. The risk of transmission of Leprosy in the dental setting is unknown [8].

The standard treatment for Leprosy is based on the multidrug therapy (MDT) established by the World Health Organization in 1982, consisting of two bacteriostatic drugs (dapson and clofazimine) and a bactericidal drug (rifampicin). This therapeutic regimen has contributed to a drastic reduction of disabilities and deformities caused by the disease [8,18].

The different types of Leprosy are categorized according to the Ridley-Jopling Classification. This includes Tuberculoid (TT), Lepromatous (LL), and Borderline (BB), which can assume Tuberculoid (BT) or Lepromatous (BL) characteristics. Leprosy requires the correlation between clinical and histopathological findings for its definitive classification [8,13].

Orofacial Lesions

Oral lesions are more common in the Lepromatous (LL) form. Involvement of the oral cavity in leprosy is variable and may be seen in 19%–60% of patients. These lesions are slow to progress and are usually asymptomatic. The presence of oral lesions is directly proportional to the duration of the disease. That is, they are typically considered a late clinical manifestation [2].

The oral lesions in leprosy are secondary to nasal changes. The mechanism for oral involvement seems to be related to *M. leprae*'s affinity for temperatures that are slightly below body temperature, which promotes its multiplication. A correlation has been noted by researchers that the lower the mean surface temperature, the higher the frequency of oral involvement.

The conditions which explain the preferential oral sites involved in leprosy begins with a nasal lesion which may cause stuffiness, congestion, and eventually obstruction of air flow, which leads to mouth breathing, a condition commonly seen in patients with Lepromatous Leprosy. This lowers the intra-oral mean surface temperature at various sites, especially over the hard and soft palate and the anterior two-thirds of the dorsum of the tongue. This is consistent with the observation that the hard palate is the most frequent site of oral involvement in Leprosy and may be seen in up to 75% of cases when oral lesions are present [8,10,12].



Figure 1: Typical presentation of lesion on hard palate.

The spectrum of oral lesions observed in individuals with Leprosy may vary from relatively non-specific ones like exanthema or hyperpigmentation, to more specific lesions like papules, sessile or pedunculated nodules, fibrosis, and ulcers. The areas of involvement may include the oral mucosa, palate, uvula, tonsils, gingiva, and tongue. The gingiva usually affected most frequently is the region behind the maxillary central incisors, due to the proximity to lesions of the hard palate.

The tongue may present with glossitis, a loss of papillae, fissures, or a "paving stone appearance". Chronic gingivitis/periodontitis may be observed.

In the advanced stages of the disease process, there may be deformities and functional alterations, such as fibrosis of the soft palate or perforation of the hard palate, with serious disturbances in the production or utterance of speech sounds.

Speech and mastication may also be impaired due to the involvement of the buccal and mandibular branches of the facial nerve, the incidence of involvement ranges from 3% to 8%.

There is no pathognomonic oral lesion associated with Leprosy, and there is no specific treatment. Their remission occurs with the initiation of multidrug therapy (MDT), and they usually are the first lesions to resolve [3,8,10,12].

Skeletal changes in the maxillofacial bone may also be present in Leprosy, characterized by atrophy of the anterior nasal spine and recession of the alveolar process of the maxilla. These changes may be associated with loss or loosening of the maxillary incisors.

Facial manifestations in leprosy are similar to lesions on other parts of the skin, varying from localized, well-defined, hypopigmented macules or plaques to multiple nodules coalescing in plaques on the forehead, ears, nose, and lips.

In advanced stages, patients usually present with loss of eyebrow hair and eyelashes, diffuse thickening of the facial skin, and deepening of natural facial lines which has been characterized as "leonine facies" [8,10,12].



Figure 2: Leonine Facies.

Discussion

A cross-sectional, multi-center study in China, indicated that patients with Leprosy have a high prevalence of severe dental caries which was attributed to aging, illiteracy, and poor oral hygiene. Difficulty performing routine oral hygiene activities is a main cause of oral health problems in patients with Leprosy.

Oral hygiene is a self-care task crucial for the maintenance of overall health. However, a recent study concluded that approximately one-third of older people who present with hand deformities as a result of Leprosy have a dependence on others for brushing and rinsing.

Assistive technology for individuals with Leprosy can increase independence regarding activities of daily living, reduce incidence of gingivitis and periodontitis, increase social inclusion, and improve their quality of life [15-17].



Figure 3: Example of assistive technology.

Conclusion

Leprosy has affected humanity on every continent leaving behind a horrific experience of suffering, mutilation, and isolation. Orofacial manifestations of Leprosy are varied, and a careful examination of the head and neck should be an integral part of treatment of a patient with Leprosy. Empowering individuals affected by Leprosy with assistive technology can reduce the incidence of dental disease and improve an individual's quality of life.

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