Oral cavity and leprosy

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ABSTRACT

Although leprosy involves the oral cavity in up to 60% of the patients, examination of the oral cavity in leprosy clinics or oral health science clinics is often neglected. Oral involvement in leprosy can broadly be divided into non-specific and specific lesions. In this review, we discuss various oral manifestations in leprosy patients so as to increase the awareness about this aspect among dermatologists and dental surgeons.

Key words: Leprosy, non-specific, oral involvement, specific

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INTRODUCTION

Leprosy is a chronic multisystemic disease caused by *Mycobacterium leprae*, wherein the clinicopathological presentation is determined by the complex interaction between the invading organism and the immune status of the individual. The most common organs involved are the skin, monocyte–macrophage system and peripheral nervous system. However, a mild to moderate degree of infiltration is seen in many other organs and organ systems like the liver, kidneys, eyes, oral mucosa, lymph nodes, bones and joints and gonads. Historically, destructive changes in facial bones formed the basis for diagnosing leprosy among skeletons excavated from the site of a leprosy hospital in Denmark that existed between 1250 and 1550.[1] Inflammatory changes of the hard palate, varying from small pits near the transverse palatal sutures to palatal perforation along with atrophy of the anterior nasal spine and alveolar process of maxilla were seen in a majority of these specimens.[2] Together, these formed the triad *facies leprosa* that was highly suggestive of leprosy. Involvement of the hard palate suggests that lesions of the oral mucosa occur in patients with advanced disease. Involvement of oral mucosa in leprosy is considered to be of greater epidemiological significance as this, along with nasal mucosal involvement, may constitute an important source of transmission of bacilli.[3,4]

EPIDEMIOLOGY AND PATHOGENESIS

Involvement of the oral cavity in leprosy is variable, seen in 19–60% of the patients,[5,6] with involvement being more common in multibacillary disease compared with paucibacillary leprosy.[7] Recently, Martins *et al.* observed that leprosy-related lesions are not present in patients undergoing treatment, probably due to response to multidrug therapy.[8]

M. leprae has an affinity for the cooler regions of the body. This to an extent explains the preferential sites involved in leprosy, i.e. the peripheral nerves and the nasal mucosa. Hastings *et al.*[9] confirmed this hypothesis by observing that the bacterial index was much higher in skin with a mean surface temperature of 32.5°C compared with skin with a mean surface temperature of 33.46°C. Scheepers *et al.* found the hard palate to be the most frequent site of oral involvement in leprosy, followed by the soft palate, labial maxillary gingival, tongue, lips, buccal maxillary gingival, labial mandibular gingival and the buccal mucosa. This was found to correlate with their mean surface temperatures.[10] Lower the mean surface temperature, higher was the frequency of involvement. The anterior palate, which may be involved in up to 75% in cases with oral lesions, shows a mean surface temperature of 27.4°C. Mouthbreathing is commonly seen in patients with lepromatous leprosy due to nasal obstruction and stuffiness. This lowers the mean surface temperatures, especially over the dorsum of the tongue and the hard and the soft palate.[11,12]

Pinkerton in 1932 described the various pathological alterations seen in the nasal and oral mucous membranes following mycobacterial invasion.[13] Initially, there is congestion of the mucosa followed by infiltration and formation of nodules, which may ulcerate. In advanced disease, complications arise due to fibrosis, leading to deformities, gross disfiguration and functional abnormalities.

MORPHOLOGY

The oral lesions in leprosy are slow to progress and are usually asymptomatic. The spectrum of lesions may vary from relatively non-specific ones like enanthem of palate or uvula, which, on histopathology, may show no changes or non-specific infiltrate to more specific lesions like papules, nodules and ulcers, which may show bacillary positivity.[14] Table 1 enumerates the various non-specific and specific lesions seen in the oral cavity in leprosy. However, no lesion can be referred to as pathognomonic for leprosy. The number of oral lesions increases with age. Scheepers *et al.* report the prevalence of oral lesions to be higher among males compared with females.[15] Females tend to present at a younger age, probably because of the greater cosmetic concern. The same authors observe the presence of family history of leprosy to be a significant factor in determining the severity of the oral lesions.

Leprous involvement of the lips may present as macrocheilia, presence of flat-topped nodules and microstomia.[16] The swollen and rigid appearance of the lips may be marked and hence cosmetically quite troublesome. In a study by Handa *et al.*, leprous macrochelia was seen in 10.7% of the 28 patients presenting with chronic macrocheilia.[17] The tongue may be involved in 17–25% of the cases.[18,19] Commonly observed lesions include multiple superficial ulcers, mild glossitis, loss of papillae, chronic atrophic candidiasis and fissured tongue.[20] Nodular lesions may be present over the anterior part of the tongue, giving a pavement-stone appearance and ultimately lead to scarring. The muscles of the tongue are usually spared unlike the extensive involvement seen in other subcutaneous muscles. The buccal mucosa may appear paler than normal. In advanced cases, there may be diffuse infiltration, swellings, papulonodules and ulceration.

Hard palate, as already mentioned, is the most common site of involvement and shows the most varied type of lesions. The disease may present as erythematous or reddish papules that gradually increase in size and number and coalesce to form a generalized nodular sub-mucosal infiltrate [Figures 1-4]. As the disease progresses, the mucosa loses its shininess and gives a matt-like appearance.[21] Ultimately, there may be palatal ulceration and perforation leading to communication between the oral and nasal cavity. At this time, patients may develop functional abnormalities like difficulty in swallowing, eating and drinking. Bucci *et al.* reported erythema nodosum leprosum to be an important but rare cause of destruction of the hard and soft palate.[22] Noduloulcerative lesions over the palate may at times mimic squamous cell carcinoma.[23] Further in the course of disease, the mucosa of the soft palate, uvula and fauces of tonsils become infiltrated with the appearance of miliary papules or nodules. These may break down forming superficial ulcers, especially during leprosy reactions. The uvula may initially appear swollen and later completely effaced or may become adherent to the soft palate. Scarring in the region of fauces may lead to a triangular deformity instead of the normal faucial arch.

Involvement of gums may be in the form of gingivitis, periodontitis and periodontoclasia. Gums appear swollen with shiny and purplish mucosa and bleed easily with decreased sensitivity to pain. Dental involvement has been less extensively studied. Miranda *et al.* described three different types of leprotic

Table 1: Non-specific and specific oral lesions seen in leprosy

Leprosy–non-specific lesions
Enanthem of palate or uvula
Leprosy-specific lesions
Lips
Flat-topped nodules
Macrocheilia
Microstomia
Tongue
Multiple superficial ulcers
Mild glossitis
Loss of papillae
Fissured tongue
Nodules on anterior tongue
Atrophy
Pavement-like appearance
Buccal mucosa
Diffuse infiltration
Papulonodules and ulceration
Pale mucosa
Hard and soft palate
Loss of shininess of mucosa
Erythematous papules
Nodular sub-mucosal infiltrate
Palatal ulceration
Palatal perforation
Uvula and fauces
Miliary papules and nodules
Triangular deformity of fauces
Dental
Gingivitis
Periodontitis
Periodontoclasia
Specific pulpitis
Periapical granulomas

involvement of teeth: specific pulpitis, dental anomalies and periapical granulomas. Marti *et al.* further concluded that leprosy patients tend to have poor dental and periodontal health, unrelated to the presence of facial destruction or the type of leprosy.[24] In addition, it has been postulated that oral chronic infections may be associated with the recurrence of leprosy reaction episodes. Motta *et al.* compared 38 patients with leprosy – 19 with and 19 without oral infections – and found the latter group to show clinical improvement in leprosy reactions after dental treatment.[25]

Figure 1: Erythematous infiltrated plaque on upper lip in a case of borderline tubercular leprosy with type 1 reaction

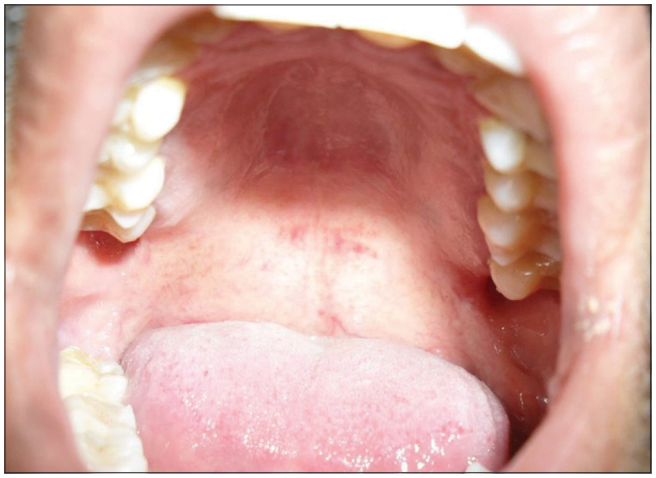

Figure 3: Superficial erosion on the hard palate

Histopathological examination of the mucosal lesions may show variable features. Scheepers *et al.* described epithelial atrophy to be a feature seen only in patients with lepromatous leprosy.[15] Grenz zone, which is a consistent feature in skin lesions, is rarely seen in oral lesions. Intense infiltration of macrophages, lymphocytes and plasma cells is prominently seen in oral lesions of lepromatous leprosy, with abundance of acid fast bacilli. Hyperkeratosis is observed in some cases and is believed to be analogous to desquamation of skin, as seen in reversal or downgrading reactions. Abreu *et al.* studied 19 patients with multibacillary leprosy between 2000 and 2002, and concluded that clinical alterations in the oral mucosa do not imply disease involvement and should be confirmed by

Figure 2: Induration on the tip and lateral border of the tongue

Figure 4: Nodule on the right fauci (encircled) in case of lepromatous leprosy

histopathological examination.[26] Conversely, the normal oral mucosa can show specific histopathological changes.

CONCLUSION

While concluding, it may be emphasized that examination of the oral mucosa should form an integral part of the examination of a patient with leprosy. Although the patient with leprosy will at first report to the dermatologist and rarely to the dental professional, the dental professional should be well aware of the precautions (wearing gloves and mask, proper sterilization, etc.) to be taken while giving any kind of treatment to this patient in a leprosy center. Appropriate treatment of dental infections will help to reduce the recurrence in leprosy reactions in addition to improving the general oral hygiene of the patient. Further, it is believed that oral lesions along with nasal lesions form an important source of bacillary dissemination in the community, and the reduced number or absence of patients exhibiting oral manifestations of leprosy can be attributed to the early diagnosis of the disease and the effectiveness of multidrug therapy.

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