

# Oral Mucosal Lesions in Complete Denture Wearers

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**Abstract:** *In recent decades, the prevalence of edentulism and the incidence of tooth loss has decreased in developed countries; furthermore, oral implants are becoming more popular. However, in developing country like India, in the coming decades, most patients with complete edentulism will still continue to receive conventional prosthodontic treatment. Nevertheless, regular follow up and maintenance is needed, and as most of the patients are of older age complications like oral mucosal lesions are relatively high. Long-term denture use, especially of a poorly maintained or ill-fitting denture, can lead to complications like tissue trauma, chronic soreness, residual ridge resorption, and denture-related oral mucosal lesions. According to previous studies, nearly a half of denture wearers present at least one denture-related mucosal lesion, and three most commonly found denture-related mucosal lesions among elderly wearers of removable denture are denture stomatitis, angular cheilitis and traumatic ulcer.*

**Keywords:** Oral mucosal lesions, Residual ridge resorption, Denture sore mouth, Angular cheilitis, Traumatic ulcers

## 1. Introduction

In recent decades, the prevalence of edentulism and the incidence of tooth loss have decreased in developed countries; furthermore, oral implants are becoming more popular. However, in developing countries, in the coming few decades, most patients with complete edentulism will still continue to receive conventional prosthodontic treatment. The conventional treatment modalities which deal with the replacement of missing teeth and surrounding oral structures with suitable prostheses can be broadly classified as removable and fixed. Treatment with removable dentures has a positive effect on subjective oral health when a large proportion of the natural teeth are missing.<sup>[1]</sup> Nevertheless, regular follow up and maintenance is needed, and as most of the patients are of older age complications like oral mucosal lesions are relatively high. Long-term denture use, especially of a poorly maintained or ill-fitting denture, can lead to complications like tissue trauma, chronic soreness, residual ridge resorption, and denture-related oral mucosal lesions.<sup>[2]</sup> The prevalence of Oral Mucosal Lesions (OMLs) is usually reported to be higher in denture wearers than in non-wearers. The area of the oral mucosa covered by a complete denture is greater than that covered by a partial denture and may therefore increase the risk of Denture Related Mucosal Lesions (DMLs).<sup>[3]</sup> According to previous studies, nearly a half of denture wearers present at least one denture-related mucosal lesion, and three most commonly found denture-related mucosal lesions among elderly wearers of removable denture are denture stomatitis, angular cheilitis and traumatic ulcer.<sup>[4-6]</sup> OMLs in complete denture wearers may be broadly categorised in to two groups: denture related and non denture related (TABLE 1). The main area of focus in present article is on complete denture related oral mucosal lesions.

## 2. Complete denture related Oral Mucosal Lesions

### 2.1 Denture stomatitis (Denture sore mouth)

It is an inflammatory process of the oral mucosal areas that underlie a removable denture and may affect from 15% to more than 70% of denture wearers.<sup>[5,6]</sup> Newton has classified these type of lesions into 3 categories: class I- localised inflammation or hyperaemic points, class II- diffuse erythema, and class III- papillary hyperplasia of palate.<sup>[7]</sup> The erythema sharply limited to the area of mucosa beneath the denture. It is most commonly seen beneath a well-fitting upper denture and rarely seen in lower arch due to protective mechanism of relatively free flow of saliva beneath the lower denture. In many cases this lesions are asymptomatic or sometimes patient may feel burning sensation and altered taste in the mouth.<sup>[8]</sup> This type of lesions are directly associated with mucosal trauma due to ill fitting dentures, poor denture hygiene, continuous wearing of dentures, candida infection. Factors showing conflicting results are low salivary pH, smoking and regular sugar consumption. Predisposing condition for these types of lesions are aging, malnutrition, immune suppression, radiation therapy, diabetes mellitus and surface porosities of dentures.<sup>[9,10]</sup> Treatment plan of denture stomatitis may be divided into two broad categories: conservative and surgical. Conservative measurements include discontinuing wearing dentures, oral and denture hygiene improvement, smoothening of rough areas in the fitting surface of dentures, or tissue conditioners. Antifungal treatment in the form of nystatin mouthwash or oral administration of Fluconazole, Miconazole and Ketoconazole may also improve the condition. Vary rarely in severe cases cryosurgery to remove papillary hypoplastic tissue may require.

## 2.2 Traumatic ulcers (Sore spot)

Denture induced traumatic ulcers may appear in different shapes and sizes, usually round or oval with a diameter of 1 to 8 mm. These are small, painful, irregularly shaped lesions covered by a delicate grey necrotic membrane and surrounded by an inflammatory halo with firm elevated borders. Sore spot develops within a day or two after the insertion of a new denture. A typical location of denture irritation is either the non-mobile oral mucosa or the regions where the mucosa is mobile during functional movements.<sup>[11]</sup> The incidence of this condition is relatively high, and the prevalence of traumatic ulcers may vary from 3.5% in the general elderly population to 16% in wearers of partial removable dental prostheses and 25% in wearers of complete dentures. Percentages increased to 92% when individuals wearing complete dentures and seeking a new one were considered.<sup>[3,4,11]</sup> Etiological factors may include over extended denture borders, rough areas on the inner surface of dentures, bony spicule under the denture or it may be due to suppression of mucosal resistance to mechanical irritation e.g., diabetes mellitus and vitamin deficiency, xerostomia, radiation therapy.<sup>[12-14]</sup> Management includes correction of underlying cause including relief of the flanges, relief of high spots, and developing balanced occlusion. To relieve pain symptomatic treatment in the form of local analgesic/antiseptic gel can be prescribed. Denture induced traumatic ulcers generally heals within few days after elimination of causes. If persists for more than 7-10 days, biopsy should be carried out to rule out possibility of malignancy.

## 2.3 Angular cheilitis (Perleche)

Angular cheilitis is a nonspecific term used to refer to all inflammations, erosions, ulcerations and encrustations at the corners or angles of the mouth. Angular cheilitis affects up to 28% of hospitalized denture wearers and can be recognized as bright erythematous fissures at one or both corners of the mouth.<sup>[3,4]</sup> Patient may complain feeling of dryness and burning sensation at the corners of the mouth and difficult mouth opening. Examination may reveal skin at the commissure appears wrinkled and macerated, even ulcerated, never bleeds, crust formation. Lesions stop at the mucocutaneous junction and mostly on both the corners of mouth.<sup>[15]</sup> Causative factors are reduced vertical dimension in worn out complete dentures, nutritional deficiency-riboflavin, folate, iron and protein deficiency, candida infection, occlusal plane of the lower teeth is too high and sagging of facial tissues with age.<sup>[3,4,15,16]</sup> Majority of these lesions are *Candida* associated. A clinical diagnosis should only be arrived at after other lesions having similar features e.g. herpes are ruled out. The lesions rarely completely disappear, usually reoccur in minor form. Treatment is targeted mostly at removal of etiology and may include fabrication of new denture with correct vertical dimension, nutritional supplementation and treatment of oral candidiasis by oral antifungal drugs (Ketoconazol 200mg OD for 1-2 weeks, Fluconazole 100mg OD for 1-2 week).

## 2.4 EpulisFissuratum (Granuloma fissuratum, Denture epulis, Denture injury tumor)

It is benign hyperplasia of fibrous connective tissue which develops as a reactive lesion to chronic mechanical irritation caused by the flanges of poorly fitting denture.<sup>[3]</sup> Clinical features include tumour like hyperplasia of fibrous connective tissue around denture flanges. It appears as single or multiple folds of hyperplastic tissue in the alveolar vestibule, flanges of denture fits into the fissure between these folds, tissue is firm and fibrous, some lesions appear erythematous and ulcerated if secondary infected. Size of lesion may vary from localized hyperplasia less than 1 cm in size to massive lesions involving the entire length of vestibule.<sup>[17,18]</sup> Females are more commonly affected than male and having anterior portion of jaw predilection.<sup>[19]</sup> Management includes correction of overextended denture flanges and sometimes surgical removal of hyperplastic tissues.

## 2.5 Flabby ridge

It is a condition in which alveolar ridge becomes excessively movable and displaceable under dentures due to fibrous tissue deposition, most commonly seen in upper anterior region. Usually occurs when natural teeth oppose an edentulous ridge - Combination syndrome.<sup>[20]</sup> The lesion may be localized or generalized involving the entire ridge crest, can be caused by hyperplasia or hypertrophy. Flabby ridge provide poor support to the dentures and causes denture instability. Etiologies include old loose dentures, rapid ridge resorption, continuous denture wearing and denture instability due to under extended flanges. Management includes conservative approach in the form of tissue rest by denture discontinuation, soft tissue massage, occlusal adjustment and application of tissue conditioners or in severe cases surgical removal of affected portion. To record flabby tissue during impression making for denture fabrication mucostatic impression technique or window technique should be used.<sup>[21]</sup>

## 2.6 Palatal perforation

Even though it is well known about the harmful effects of suction disk used in complete dentures, they are still popular in rural and semi urban areas as a cheap means to achieve retention in maxillary dentures. This negative pressure induced by them has a destructive effect on the palatal tissues. This negative pressure reduces the blood circulation in the underlying tissues, which causes hypoxia in the affected area and necrosis of tissue. The underlying bony part may also be affected by this leading to tissue perforation.<sup>[18,19]</sup> These pathological changes are more severe if the patient is in the habit of continuously wearing the dentures 24 hours a day. Treatment includes surgically close the opening and allows complete healing using a healing plate and followed by fabrication of new well fitting complete denture.<sup>[22]</sup>

## 2.7 Oral cancers in denture wearers

An association between the chronic irritation of the oral mucosa by ill-fitting dentures and oral cancer has been

claimed, however, no definite proof exists.<sup>[23]</sup> Reports have detailed the development of oral carcinomas in patients who wear ill-fitting dentures or quack dentures. The opinion is still valid that if a sore spot does not heal for long, malignancy may be suspected. Patients with such lesions should be immediately referred to a pathologist. Prognosis is poor for oral cancers, especially the ones in the floor of the mouth.<sup>[18,19,22]</sup>

### 3. Discussion

Dental prostheses are designed to conserve the remaining oral structures and to maintain them. Placement of removable prosthesis in the oral cavity produces profound changes of the oral environment that may have an adverse effect on the integrity of oral tissues.<sup>[24]</sup> Prostheses can act as an etiological factor for OMLs either due to errors from operator, inadequate maintenance by patient or the properties of material used to fabricate prostheses itself. The oral mucosa is subjected to varieties of injuries as a result of wearing complete dentures which may be manifested as denture stomatitis, traumatic ulcers, angular cheilitis, cheek bite, inflammatory papillary hyperplasia of palate, epulis fissuratum, flabby ridges, contact allergy and extreme cases palatal perforation and oral malignancy.<sup>[3,16]</sup> Mucosal reactions could result from a mechanical irritation by the dentures, an accumulation of microbial plaque on dentures or occasionally a toxic or allergic reaction to denture base material. The continuous wearing of denture has a negative effect on residual ridges form because of bone resorption. Furthermore wearing dentures that function poorly and that impair masticatory function could be a negative factor with regard to maintenance of adequate muscle function and nutritional status.<sup>[25]</sup>

#### Precautions to be taken by the dentist to avoid these problems:

- There should be proper retention and stability in dentures.
- There should be adequate relief to prevent excessive pressure beneath the dentures.
- The vertical dimension must be accurate.
- The denture flanges should be neither overextended nor under extended.
- The borders of the denture should be well rounded and well polished to prevent irritation.
- The fitting surface of denture should be well adapted and devoid of any nodules and irregularities to prevent plaque accumulation.
- The polished surfaces of dentures should be well contoured and free of folds and irregularities.
- There should not be any deflective occlusal contact.
- There should be sufficient horizontal overlap of posterior teeth to prevent cheek biting.

### 4. Conclusion

The essential consequences of wearing complete dentures are reduction of residual ridges and pathological changes of oral mucosa. This results in poor patient comfort, destabilization of occlusion, insufficient masticatory function and esthetic problems. Efforts should be made to

retain some teeth in strategically good positions to serve as overdenture abutments. The patient should follow a regular follow - up schedule at yearly interval so that an acceptable fit and stable occlusion can be maintained. Patients should be aware of implant supported prosthesis. In young patients, advantage would be reduced residual ridge reduction. In elderly patients, the main advantages are improved comfort and maintenance of masticatory function. Proper denture care is important for health of both denture and patient mouth. Patient should be motivated to practice proper denture wearing habits and maintenance of oral hygiene and follow a program of recall and maintenance for continuous monitoring of dentures and oral tissues.

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**Table1:** Oral mucosal lesions (OMLs) in complete denture wearers.

Denture related oral mucosal lesions	Non denture related oral mucosal lesions
Denture stomatitis	Lichen planus
Traumatic ulcers	Leukoplakia
Angular cheilitis	Leukoedema
Epulisfissuratum	Apthous ulcer
Flabby ridge	Atrophic tongue
	Fissured tongue
	Smoker's melanosis