

**How to Cite:**

Queen, A., Singla, L., & Goyal, R. R. (2021). Denture stomatitis. *International Journal of Health Sciences*, 5(S2), 1–5. <https://doi.org/10.53730/ijhs.v5nS2.5130>

## Denture Stomatitis

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**Abstract**--Removable dentures provide edentulous patients with the rehabilitation of masticatory and esthetic functions. Denture stomatitis is the most prevailing situation that has existed for long time in denture wearers. The etiopathogenesis of denture stomatitis is multifactorial and complex to understand. Candida species are normal oral commensals present in 30% to 70% of apparently healthy persons. The combination of entrapment of yeast cells in irregularities in denture-base and denture relining materials, poor oral hygiene and several systemic factors is the most probable cause . Candida albicans that adhere to the surfaces of prostheses results in pathogenesis of denture stomatitis. Therefore to control denture stomatitis, it is important to control the adhesion of Candida albicans on the surface of the prosthesis. Hence colonization and growth on prostheses by Candida species are of clinical importance. Certain trends are followed in the management of denture stomatitis to maintain oral cavity in healthy state.

**Keywords**--candida albicans, denture stomatitis, denture wearers, etiopathogenesis, healthy state.

**Introduction**

Denture stomatitis is an inflammatory reaction of the palatal and alveolar mucosa underlying the prosthesis. This stomatitis is more commonly seen in the maxillary mucosa. This disease has a multifactorial etiology of which poor hygiene and continuous denture wearing has been the most frequent factor. Denture induced stomatitis is the pathogenic reaction and one of the most common state of chronic

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International Journal of Health Sciences ISSN 2550-6978 E-ISSN 2550-696X © 2021.

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Manuscript submitted: 18 Sept 2021, Manuscript revised: 9 Nov 2021, Accepted for publication: 12 Dec 2021

candidiasis. Denture stomatitis was described as 'denture sore mouth' by Cahn (1936) but this term was replaced by 'denture stomatitis'. Other names used have been 'chronic denture palatitis' (Pryor, 1936), 'stomatitis venenata', used by Fisher (1956) to describe a proposed tissue reaction to allergens in the denture base, 'chronic atrophic candidiasis', which included angular cheilitis as well as denture stomatitis (Lehner, 1966). The term 'denture stomatitis' seems preferable since no predominant cause other than the presence of a denture has been universally accepted.

### **Causes**

Denture-related stomatitis is very common, with over 50% of denture wearers affected in some populations. It is the most common clinically important condition developing in the mouth of denture wearers. Factors that predispose to the development of denture stomatitis include:

- Complete upper (maxillary) denture – probably due to the large contact area between denture and oral mucosa
- Acrylic dentures – Candida species seem to have a particular binding affinity for acrylic resin
- Poor dental hygiene – Candida species and Lactobacillus bacteria stick to denture surfaces and should be removed chemically and/or mechanically at least daily
- Poorly fitting dentures – mechanical trauma damages the mucosa, making it more prone to infection
- Denture age – old dentures are commonly associated with denture stomatitis probably due to poor fitting and rough surface in which Candida can hide
- Continuous wearing of denture – failure to remove at night increases the risk
- Men – are twice as likely to develop denture stomatitis than women
- Diabetes mellitus – diabetics are more prone to developing yeast infections
- Dry mouth (xerostomia) – saliva normally helps flush the mouth and clean the denture surface
- Diet rich in sugars and carbohydrates.
- Smoking
- Alcohol use
- Endocrine dysfunction.

### **Classification**

Denture-related stomatitis is of three types based on severity. Type one may represent an early stage of the condition, whilst type two is the most common and type three is uncommon.

- Type 1 - Localized inflammation or pinpoint hyperemia
- Type 2 - More diffuse erythema (redness) involving part or all of the mucosa which is covered by the denture

- Type 3 - Inflammatory nodular/papillary hyperplasia usually on the central hard palate and the alveolar ridge

### **Etiopathogenesis**

*Candida albicans* that adhere to the surfaces of prostheses are essential for the pathogenesis of denture stomatitis.<sup>9</sup> Therefore to control denture stomatitis, it is important to control the adhesion of *Candida* on the surface of the prosthesis. Tissue surfaces of dentures usually show microporosities which harbour microorganisms difficult to remove by mechanical or chemical cleaning. Such yeasts adhere to the denture surfaces and act as reservoirs of microorganisms. Several investigators have analyzed the adherence of *Candida albicans* to acrylic resin surfaces. *Candida albicans* has the capability to stick and proliferate through the hard and soft tissues of the oral cavity and produce a complex and heterogeneous bacterial biofilm and are therefore essential for the pathogenesis of Denture Stomatitis. Mechanism for microbial adhesion to either hard or epithelial surfaces has four phases:

- phase 1—transport to the surface
- phase 2-initial adhesion
- phase 3-attachment
- phase 4-colonization

The four stages are based on the surface free energy and surface roughness. The substratum surface energy is important in initial adhesion, although surface roughness provides a larger surface area for attachment and a protected environment until firm attachment is completed in phase. Larger amounts of *Candida albicans* have been reported to adhere surfaces with increased surface wettability (i.e. surface energy), due to its hydrophilic nature. Surface roughness directly influences the initial surface adherence of microorganisms, biofilm development, and colonization of *Candida albicans*. Materials with the roughest surfaces usually exhibit higher yeast counts.

### **Signs and Symptoms**

- Redness swelling and tenderness in the mouth .
- Soreness in the mouth or throat.
- White or red patches on the tongue, gums, lips, inner cheeks or roof of mouth.
- Sores or cracks in the corners of the mouth.
- Pain or discomfort while swallowing .
- Papillary hyperplasia .
- Angular stomatitis.

### **Diagnosis**

Generally, oral stomatitis is diagnosed during a dental examination. Clinical diagnosis is based on pattern of redness, swelling in the mouth, especially on the palate (roof of the mouth) following the shape of denture contact . Thrush — which

looks like light-colored patches — may appear on the gums, lips, inner cheeks, tongue and palate. Cracking at the corners of the mouth can also be noticed. Microbiological swabs can be taken of the surface of the denture or from palate region . Direct Culture Test for counting of candida cells. Investigations to rule out possibility of diabetes may be indicated. Tissue biopsy is not usually indicated, but if taken shows histologic evidence of proliferative or degenerative responses and reduced keratinization and epithelial atrophy.

### **Prevention**

The best way to prevent oral stomatitis is to practice excellent oral hygiene. Brush your teeth and gums at least twice a day and swish with an antimicrobial mouthwash. Avoid smoking, as it can increase risk for oral infections. . Proper denture sanitization Appropriate denture wearing habits. Be sure to take dentures out for at least eight hours every day (such as while sleeping). This will give tissues a rest and prevent denture sores from developing. Dental professionals working with geriatric patients must promote preventive programmes among all health care workers, home caregivers, members of the patient's family and, of course, the patients themselves. Patients with partial dentures should undergo periodic professional plaque control procedures.

### **Treatment**

Good oral hygiene is mandatory. The mouth must be kept as clean as possible and a thorough rinse after meals should be performed. Local factors which promote growth of yeasts, such as smoking or wearing the dentures throughout the night, must be discouraged and storing it overnight in an antiseptic solution. Chemical cleaning is also preferred sometimes.

- Soaking in sodium perborate, sodium hypochlorite (6 percent bleach diluted by mixing 10 parts water to one part bleach for 10 minutes), chlorhexidine digluconate, weak acids. Sodium hypochlorite may not be used for an indeterminate period of time according to its ability to damage the prosthetic handiwork.
- Soaking in enzymes such as proteases and mutanases
- 10% vinegar overnight soak is an inexpensive option but not ideal.
- Anti-fungal treatment: The first line of defense is usually anti-fungal medication, such as nystatin or miconazole , amphotericin B, miconazole and fluconazole. On the other hand, Clotrimazole is usually presented in a cream or solution form; the cream form also has an antistaphylococcal activity. Among systemic antifungal drugs, fluconazole and itraconazole have been the most extensively studied and proven as efficient antifungal drugs These medications are often given as lozenges. In some cases, anti-fungal ointments can be given to reduce your symptoms. Oral antifungal tablets should be avoided if possible as side effects are more common than with topical applications
- Laser therapy: low-energy laser therapy to treat oral stomatitis, especially when anti-fungal medications don't work.

- Surgical removal: Some patients develop small nodules on the roof of their mouth. This can interfere with denture and prevent it from fitting properly. In these cases, minor surgery is performed to remove those nodules.
- In addition, clean, polish and glaze denture to prevent micro-organisms from contaminating appliance. Check bite and make any necessary adjustments. In some instances, a new denture may be necessary.

### **Conclusion**

Though candida albicans was thought to be the main cause in the etiology of denture stomatitis, it may not be present in all cases. Avoid giving antifungal drugs without mycological investigations. As denture stomatitis is generally asymptomatic; patients wearing dentures should be examined properly and periodically.

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