

Denture Stomatitis: A Brief Review

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Abstract : Dentures can produce a number of ecological changes in the oral cavity by accumulating microbial plaque on and in the fitting surface of the denture. Denture stomatitis consists of mild inflammation and erythema of the mucosa beneath a dental appliance, usually an upper complete denture. The condition is generally symptomless, but when symptoms are present they may appear as burning sensation, mucosal bleeding and dryness in the oral cavity. In the present review article, the various etiological factors, pathogenesis and treatment options of denture stomatitis are discussed.

Keywords: Denture stomatitis, inflammatory papillary hyperplasia, chronic atrophic candidiasis, candida, oral mucosal lesions.

I. Introduction

Denture stomatitis is a condition commonly seen in complete denture wearers. Denture stomatitis is also known as denture sore mouth, inflammatory papillary hyperplasia, denture-induced stomatitis, and chronic atrophic candidiasis. The incidence of denture stomatitis is more in women with palatal mucosa being the most common site of occurrence.¹ Newton has classified denture stomatitis into type I- localized simple inflammation, type II-generalized simple inflammation and type III- inflammatory papillary hyperplasia.² Although the etiology of denture stomatitis is considered multifactorial, denture plaque, trauma, candida albicans, allergy, adverse systemic conditions, surface texture and permeability of the denture base and lining materials are regarded as some of the major factors associated with the condition. In majority of the cases, elimination of denture faults, control of denture plaque and discontinuing the wearing of denture are sufficient.¹ In this article, the various etiological factors and treatment modalities of denture stomatitis are reviewed.

II. Classification

The Newton² classification (1962) is based on the clinical appearance of the inflamed mucosa seen under maxillary complete dentures. It is the most commonly used classification for denture stomatitis and he proposed three types: Type I- Pin point hyperaemic foci, Type II- Diffuse hyperaemia of the denture-supporting tissues, and Type III- Papillary hyperplasia. In 1970, another classification by Budtz-Jorgensen & Bertram³ chose slightly different terminology for the same changes: Type I- Simple localized inflammation, Type II- Simple diffuse (generalized) inflammation, and Type III- Granular inflammation. Bergendal (1982)⁴ included only the diffuse and papillary varieties and referred to atrophic or hyperplastic denture stomatitis.

III. Etiopathogenesis

The Denture stomatitis has been reported in 11-67% of complete denture wearers. The most common site of occurrence is on the palatal region and is predominantly seen in female patients.^{5,6,7} However, in some reports, equal distribution in both sexes were seen.⁶ The condition was described as 'denture sore mouth' by Cahn⁸, but this term was replaced by 'denture stomatitis' (Cawson)⁹ as discomfort was so often absent. Other terms used to describe the condition were 'chronic denture palatitis' (Pryor)¹⁰, 'stomatitis venenata' (Fisher, 1956)¹¹, 'chronic atrophic candidiasis' (Lehner, 1966)¹², 'denture related candidiasis' (Nairn, 1975)¹³, 'stomatitis prothetica' and 'stomato pathiaprothetica' (Nateretal, 1978)⁶. The term 'denture stomatitis' seems preferable since no predominant cause other than the presence of a denture has been universally accepted. Usually the condition is asymptomatic. However, if symptoms are present, the condition is most frequently associated with mucosal bleeding, swelling, burning or painful sensation, halitosis or an unpleasant taste and dryness in the mouth. It has been estimated that between 28-70% of patients with denture stomatitis have oral complaints.^{6,14,15} The mean age for denture stomatitis coincided with the mean age at which the patients started wearing their first dentures, approximately around 49 years of age.⁶ Denture stomatitis has a frequent association with angular cheilitis which is present in 33-82% of the cases. Other associated lesions are atrophic glossitis, median rhomboid glossitis¹⁶, acute pseudomembranous candidiasis and candidal leukoplakia¹⁷.

The causative factor for denture stomatitis is multifactorial. However, some authors believe that no primary etiological factor exists.⁴ Other factors that are thought to be particularly significant are (1) denture

trauma (including continuous denture wearing), (2) denture cleanliness (including reaction to denture plaque), (3) allergic and primary irritant reactions to denture base materials, (4) dietary factors including haematological deficiencies, (5) candidal infection, (6) systemic factors including predisposing factors.^{18,19} Denture trauma plays a prominent role in the aetiology of denture stomatitis.²⁰ Trauma plays vital role in type I denture stomatitis and least importance in other types of denture stomatitis.^{21,22} Some researchers believe that the lesion occurs less frequently under 'non-traumatic' dentures.³ Also it is less frequently seen in patients with satisfactory alveolar ridges compared with those with flat ridges where a greater degree and frequency of denture trauma would be expected.^{3,23} Continuous wearing of denture might cause denture stomatitis²⁰ and 24 hours of denture wearing is associated with an increase in frequency and density of *C. albicans* on the fitting surface of maxillary dentures compared to that in an intermittent denture wearer.⁴ Poor denture hygiene is the most frequently involved local aetiological factor in denture stomatitis.^{3,24} Denture provide opportunities for food lodgement and prevent the natural cleaning action by the tongue, lips, and cheeks.^{25,26,27} Poor oral hygiene is a major factor in Candida-related lesions. Denture cleaning methods may affect the condition of dentures, and pigmentation and abrasions in dentures occur with the use of toothpaste or tooth brush.^{28,29}

In 1936, Cahn first proposed that infection by *Candida albicans* was responsible for denture stomatitis. Many authors reported that there was significantly increased prevalence and density of candida species in denture stomatitis patients compared with that of denture wearing controls.³⁰ The occurrence in smears of candidal hyphae, indicates fungal infection³¹, has also been shown to be more frequent in populations with denture stomatitis than those without.³² Many authors believe that chronic atrophic candidiasis is the most common oral mucosal lesion of clinical importance in denture wearers.^{25,26,28,33} In a study of oral mucosal lesions among institutionalized elderly, chronic atrophic and hyperplastic candidiasis were seen twice as high among women than in men.³³ Moskona and Kaplan investigated 298 patients who were residents of two geriatric hospitals and an elderly home and found chronic atrophic candidiasis in more than 22% of the patients.³⁴ Other authors examined the prevalence of denture-related injuries in 195 patients who were residents at two geriatric hospitals and found chronic atrophic candidiasis in 60% and chronic hyperplastic candidiasis in 16-92% of the patients.³⁵ Peltola reported that the prevalence of chronic atrophic candidiasis was observed in 22% of the upper jaws and 7% of the lower jaws and chronic hyperplastic candidiasis in 64% of the upper jaws and 36% of the lower jaws.²⁸

Most of the authors believe that several systemic diseases have been frequently associated with denture stomatitis, which includes anaemia, hypoparathyroidism, nephritis, bullous pemphigoid kidney, immunodeficiency states, diabetes mellitus, mercury intoxication and urinary tract disease.⁴ Predisposing factors are xerostomia, radiation therapy, smoking, broad-spectrum antibiotic therapy, corticosteroids and psycho-pharmacological drugs.

IV. Treatment

1. Patient counselling
2. Cessation of smoking in smokers.
3. Patients are advised to clean their dentures regularly after each meal with a soft brush and soap.
4. Patients are instructed to remove their dentures before sleeping and immerse them overnight in an alkaline peroxide cleanser or alkaline hypochlorites. Microwave irradiation for 3 min at 650 W with the appliance immersed in 200 mL of water is also helpful. Disinfection can also be achieved using an inexpensive option of 10% acetic acid (vinegar) or an antiseptic denture cleanser. Suitable antiseptic solutions include chlorhexidine or dilute sodium hypochlorite (10 drops of household bleach in a 500 mL container filled with tap water).^{37,38,39,40,41}
5. Topical antifungals include nystatin suspension, mucoadhesive tablets, miconazole gel, or fluconazole suspension, or topical ketoconazole if available, which can be administered concurrently with an oral antiseptic with antifungal activity such as chlorhexidine. Lacquer or tissue conditioners containing antifungals are also effective in some cases.
6. Systemic administration of Fluconazole capsules (50 mg daily for 14 days) or Itraconazole capsules (100 mg daily for 15 days) are also employed in the treatment of denture stomatitis.³⁶
7. Treatment of any underlying systemic diseases.

V. Conclusion

Denture placement in the oral cavity will produce notable variations in the oral microbial flora affecting the integrity of oral tissues. Dentists should give adequate home care instructions while delivering the denture to the patient along with regular recall appointments to reinforce denture hygiene. In most of the cases, the elimination of traumatic factors, adequate oral hygiene measures, and the administration of local antimycotic medicaments enables the healing of the inflammatory lesions.

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