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Denture Stomatitis: Report of a Case with Rarely Used Treatment Modality and Review of Literature

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Candida albicans is the most common *Candida* species isolated from the oral cavity both in healthy and diseased. *Candida albicans* is a dimorphic fungus existing both in blastopore phase (yeast phase) and the hyphal or mycelial phase. Although these organisms typically colonize mucocutaneous surfaces, the latter can be portals of entry into deeper tissues when host defences are compromised. Denture stomatitis is a common form of oral candidiasis that manifests as a diffuse inflammation of the maxillary denture bearing areas & is associated with angular cheilitis. At least 70% of individuals with clinical signs of denture stomatitis exhibit fungal growth & these conditions most likely result from yeast colonization of the oral mucosa combined with Bacterial colonization. *Candida* species act as an endogenous infecting agent on tissue predisposed by chronic trauma to microbial invasion. At one time, oral fungal infections were rare findings in general dentist's office. They were more commonly seen in hospitalized and severely debilitated patients. However with enhanced medical and pharmaceutical technology, increasing numbers of ambulatory immunosuppressed individuals with oral fungal infections are seeking out general dentists for diagnosis and treatment of these lesions.

KEYWORDS: Denture Stomatitis, *Candida Albicans*, Fungal Infection, Yeast, Candidiasis

INTRODUCTION

Denture stomatitis also known as denture sore mouth and prosthetic stomatitis implies inflammation of oral mucosa especially palatal and gingival mucosa which is in direct contact with the denture base. The frequency of its development is 25 to 67%, mostly in women, and prevalence increases with age.¹⁻³

Yeast attached to the denture plays an important etiologic role in chronic atrophic candidiasis. The attachment of yeast to the patient's appliances is increased by mucus & serum & decreased by the presence of salivary pellicle suggesting an explanation for the severity of candidiasis in xerostomic patients. Soft liners in dentures provide a porous surface & an opportunity for additional mechanical locking of plaque & yeast to the appliance. Poor denture hygiene habits are the most prominent contributing factor for denture stomatitis and colonization.

Symptoms of denture stomatitis vary in their severity, from asymptomatic to pain and irritation. Occasionally, the overgrowth of *Candida* can be very severe and lead to discomfort, altered taste, dysphagia and a burning sensation in the mouth.⁴

The condition has been divided by Newton in to 3 clinical categories:⁵ type 1: show pinpoint hyperemia, type 2 (Erythema of general simple type) and this is the most common type of chronic atrophic candidiasis presents with diffuse erythema & edema of the denture bearing areas of the palatal mucosa. The affected mucosa is bright red or dusky & sharply differentiated from the surrounding mucosa at the margins of the denture. The majority of the patients do not complain of soreness & the condition is generally accompanied by angular cheilitis. Type 3 is of the Granular type (inflammatory papillary hyperplasia).

If the type 2 is not treated for a long period a hyperplastic epithelial reaction may occur resulting in a nodular type of lesion with intermittent atrophic areas. A vast majority of patients with chronic atrophic candidiasis are otherwise healthy as local factors such as trauma, poor oral hygiene, carbohydrate diet determine the pathogenesis. We here discuss a case of denture stomatitis with large lesions and its unique responsiveness to tacrolimus and fluconazole combination as treatment modality.



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CASE REPORT

A 70-year-old female was referred to Dr. RPGMC, Tanda with non-healing ulceration of palate for three months. On clinical examination the two erythematous lesions with well-defined hyperemic borders were present 0.5 cm and 1cm away from mid-palatine raphe on left and right side of anterior palate. The lesion on left side was unusually large and measured nearly 3.5 cm x 1.5cm in greatest dimensions whereas lesion on right side was 1.5 cm x 0.5 cm in greatest dimensions. The mucosa over mid-palatal raphe and over alveolus had white patches (Figure 1).



Figure 1. Erythematous Lesions on Palate

History revealed patient had no significant medical history. Patient was a denture wearer since 10 years. The provisional diagnosis of denture stomatitis was made. Patient had already tried topical clotrimazole, benzalkonium and steroid combination for months and Fluconazole tablets from different local dentists. The denture was worn out (Figure 2).



Figure 2. Worn Out Denture

The patient was instructed to discontinue denture use completely. The treatment given was tablet fluconazole 100 mg OD for three days, Tab multivitamin OD and Tacrolimus 0.1% ointment mixed with orabase twice a day for local application and was recalled after three days. On fourth day the lesion had completely disappeared on right side and had considerably reduced in size on left side (Figure 3).



Figure 3. Healing Lesion On 4th Day of Treatment

Patient was advised to take 50 mg of fluconazole once weekly for four weeks and was advised to continue tacrolimus 0.1% twice a day. The patient was recalled after a week and lesion was completely healed (Figure 4). The patient continued fluconazole once weekly and multivitamins as advised for 3 more weeks and tacrolimus was discontinued. Patient was instructed to maintain oral hygiene and advised to get new prosthesis.



Figure 4. Completely Healed Lesion

DISCUSSION

Denture stomatitis is a common form of oral candidiasis that manifests as a diffuse inflammation of the maxillary denture bearing areas & is associated with angular cheilitis. Denture sore mouth is rarely found under a mandibular denture. One possible explanation for this is that the negative pressure that forms under the maxillary denture excludes salivary antibody from this region & yeast may reproduce undisturbed in the space between the denture & the mucosa. The closer adaptation of maxillary denture & palate may also bring in large number of yeasts adhering to the denture surface into contact with the mucosa.⁴

The precise etiology of the condition is unknown but is likely to involve at least one of the following factors: mucosal trauma from poorly fitting dentures, poor oral and deficient denture hygiene, night-time wear of removable dentures and bacterial and yeast infection with *Candida albicans*. Dentures may produce a micro-environment conducive to the growth of *Candida*. This may be due to the enhanced adherence of *Candida* to the acrylic, reduced saliva flow under the surface of the denture fitting and poor oral hygiene. Long-term and continuous use of a denture along with poor denture and oral hygiene promote the development of a biofilm (plaque) on the surface of the prosthesis. The biofilm colonizes the surface and penetrates into the cracks and imperfections of the denture material. The mucosa in contact with the denture then becomes inflamed.^{4,6}

The problem may be compounded by physical disabilities that reduce an individual's ability to maintain good oral hygiene, and also by illnesses such as diabetes mellitus, immunosuppression and medications (e.g. antibiotics and corticosteroids), all of which can disturb the balance of the oral flora, leading to an increase in *Candida* as an opportunistic infection (candidiasis). Other risk factors have been associated with oral candidiasis and denture stomatitis such as vitamin A and folate deficiency and tobacco use.^{6,7}

Histologic examination of the soft tissue beneath dentures has shown proliferative or degenerative response with reduced keratinization and thinner epithelium.⁸ Dentures can also produce other

changes: the oral flora may be altered and plaque collects between the mucosal surface of the denture and the palate. In addition, the saliva that is present between the maxillary denture and the mucosa may have a lower pH than usual [9]. The generalized simple and the granular types of denture-induced stomatitis are most often caused by the accumulation of microbial plaque (bacteria or yeasts) on and in the fitting surface of the denture and the underlying mucosa.¹⁰ Denture-induced stomatitis is not exclusively associated with *Candida*, however, and, occasionally, other factors such as bacterial infection, mechanical irritation, or an allergic reaction to the denture base material may be implicated. Nonetheless, there are no clinical criteria that can reliably distinguish between a *Candida*-associated, a bacterial-induced, a trauma-induced denture stomatitis, or an allergic reaction to the denture base material.¹

The high proportion of women to men sufferers is more likely because of the higher incidence of edentulism among women and because of the tendency for women to seek dental treatment more often than men.¹¹

For management taking history followed by a thorough examination of the mouth, looking at the soft & hard palate & examining the buccal mucosa in those wearing dentures after they have been removed are usually good starting points. Predisposing factors are identified & resolved if possible & the type, severity & chronicity of the infection are assessed. Dentures should be cleaned & disinfected daily & left out overnight or for at least 6 hours daily. The dentures should be soaked in a denture cleaning solution such as 15 to 30 mins in white vinegar (diluted 1:20) or 0.1% sodium hypochlorite or chlorhexidine as this is more effective in eliminating *Candida* than brushing. This is because dentures have irregular & porous surfaces to which *Candida* easily adheres & brushing alone cannot remove them. The patient should ensure that the whole mucosa is coated with the antifungal & held in mouth for a few minutes. Chlorhexidine can discolor dentures. Specific management of candidiasis can be accomplished with topical applications & if not controlled, treatment should include systemic medications. Similarly in patients with persistent infection, advantage can be gained by combining

topical agents, in addition to systemic medications. This may allow a lower dose or reduced duration of use of systemic medications.⁷

Judgment of care completely depends on type, chronicity & severity of disease. It is recommended that the duration of antifungal therapy extend at least twice as long as the termination of clinical signs & symptoms of candidiasis. When selecting an antifungal medication, factors such as taste, comfort of use, texture (includes sucrose or alcohol) potential sensitivity or resistance to drug & cost should be taken into consideration. In patients with dry mouth, tablets given to dissolve in the mouth may be poorly soluble. Oral liquid suspensions may be a better choice, particularly for patients with dry mouth.^{7,12}

Fluconazole is effective against a variety of fungal infections in immunocompetent & immunocompromised hosts. When combined with azoles, tacrolimus and cyclosporine A have synergistic activity in-vitro against the pathogenic fungi *Candida* spp., *C. neoformans*, and *Aspergillus* spp. Against *Candida albicans* biofilms, the synergistic effect of tacrolimus and fluconazole is due to calcineurin inhibition.¹³ We successfully used this combination in this case.

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