

# REVIEW ON NEWER APPROACH FOR THE MANAGEMENT OF DENTURE STOMATITIS

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## Abstract:

*ABSTRACT: Dentures can produce various changes in the oral environment which remains unforeseen in most of the cases. As denture is the main reason behind denture stomatitis, proper oral and denture hygiene should be maintained in order to avoid this condition. In the present review article various etiological factors, physiology, clinical features and treatment modalities of denture stomatitis are discussed.*

*Key words: Denture stomatitis, poor oral hygiene, candidial infection, chronic atrophic candidiasis, inflammatory papillary hyperplasia.*

## Introduction:

Denture stomatitis indicates an inflammatory process of the mucosa that bears a complete or partial removable dental appliance, typically a denture. Incidence of occurrence is 11-67% in complete denture wearers. Denture stomatitis is also known by the names Denture sore mouth, inflammatory papillary hyperplasia, denture induced stomatitis and chronic atrophic candidiasis. Success in the treatment of complete

denture patients requires not only mechanical skills and proficiency but also a knowledge of the physiology of the involved anatomical structures and an understanding of the possible pathologic changes that may occur after the treatment.

## Clinical appearance

Clinically Denture stomatitis appears in various types. Some authors have classified Denture stomatitis into:

### A. Newton<sup>1</sup> Classification (1962)

- ❖ TYPE 1: Pin point hyperaemic foci or localised simple inflammation (Fig.1)
- ❖ TYPE 2 :Diffuse hyperaemia of denture supporting tissue or generalised simple inflammation (Fig.2)
- ❖ TYPE 3: Papillary hyperplasia or inflammatory papillary hyperplasia (Fig.3)

### B. Budtz – Jorgensen & Bertram Classification (1970)

- ❖ TYPE1: Simple localised inflammation
- ❖ TYPE2: Simple diffuse (generalised) inflammation

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❖ TYPE 3: Granular inflammation

## C. Bergendal (1982)

❖ Atropic denture stomatitis

❖ Hyperplastic denture stomatitis

## Etiological factors

The causative factor for Denture stomatitis is multifactorial. Some authors believe that there is no primary etiological factor behind it. Other factors thought to be particularly significant is:

**1. Candidial infection:** Cahn (1936) 1st proposed that infection by candida albicans were responsible for denture stomatitis. Factors responsible for colonisation of candida species in fitting denture surface are adherence of yeast cells, Interaction with oral commensal bacteria, Redox potential of the site, Surface property of acrylic resin. Factors that increase the susceptibility to candida – associated denture stomatitis includes aging, malnutrition, immunosuppression, radiotherapy, diabetes mellitus, and treatment with antibacterial antibiotics.

According to Boucher's 12th edition factors predisposing to denture stomatitis are:

Systemic-old age, diabetes mellitus, nutritional deficiencies (iron, folate, vitamin b12 deficiency), malignancies (acute leukaemia, agranulocytosis), immune defects, corticosteroids, immunosuppressive drugs.

Local-Dentures(changes in the environmental condition, trauma, denture usage, denture cleanliness), xerostomia (sjogren's syndrome, irradiation, drug therapy), High carbohydrate diet, Broad spectrum antibiotics, Smoking tobacco.

**2. Denture trauma (including continuous denture wearing):** According to Nyquist: Dental trauma plays a prominent role in the aetiology of denture stomatitis. It plays vital role in Type 1 & least important in other types of denture stomatitis<sup>2,3</sup>.

Some researchers believe that the lesion occurs less frequently under 'non-traumatic dentures'<sup>4</sup>.

Also it is less frequently seen in patients with satisfactory alveolar ridges compared with those with flat ridges<sup>4,5</sup>. Continuous wearing of denture might cause denture stomatitis<sup>6</sup>.

Incorrect vertical dimension of occlusion has also been suggested as a contributing factor. The result of the studies by Emami E et al., research suggest traumatic occlusion results in an inflammatory reaction which may create an environment favourable for microorganisms found in denture stomatitis.

**3. Denture cleanliness(including reaction to denture plaque):** Poor oral hygiene is the most frequently involved local aetiological factor in denture stomatitis<sup>4,7</sup>. Denture provide opportunities for food lodgement and prevent the natural cleansing action by tongue, lips & cheek<sup>8,9</sup>. Poor oral hygiene is the 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 hard tooth brush<sup>10</sup>: (Walker, British dental journal,1981). Poor oral hygiene, high carbohydrate intake, reduced salivary flow, composition of saliva, design of prosthesis, continuous denture wearing enhance pathogenicity of dental plaque. (fig.4)

**4. Allergic and primary irritant reactions to denture base materials:** Toxicity is usually manifested by the release of several chemical constituents from the material, which can induce an allergic response in terms of localized or generalised stomatitis. This reaction may be related to presence of resin monomer, hydroquinone peroxide, dimethyl-p-toluidine or methacrylate in denture. Contact sensitivities are more common to occur with cold or auto polymerized resins than with heat cured denture base materials.

**5. Systemic factors including predisposing factors.**

## Physiology

### ❖ Changes in the oral physiology of importance

Wearing of dentures imposes a marked change in the environmental conditions of the denture supporting tissues. Inconvenience caused by the initial insertion of denture, by excessive salivation is a transitory condition and compensation occurs within two weeks. Asialorrhoea makes the denture retention difficult and predisposes to oral mucosal irritation. Due to the microbial degradation of carbohydrates contained in saliva film and in the material adherent to denture base material, there is lowering of pH of saliva in between denture base and supporting tissues, which is a predisposing factor for Monilial infections. If the denture bearing tissues are nutritionally deficient, the prosthesis will fail even if how well it is constructed.

### ❖ Denture bearing area

Thin and friable epithelium covering the edentulous saddle area may not be able to tolerate the forces imposed upon it by hard unyielding acrylic. Also the connective tissue pad in between the bone and the epithelium covering may not be thick enough to absorb the forces placed upon the area.

### ❖ Oral environment

Oral environment must be moist and warm and the oral mucosa must be firm elastic and able to resist mild abrasions, to keep the prosthesis comfortable. If the mouth is dry and the tissue burning and friable, it is almost impossible for the patient to tolerate even if the denture is perfectly balanced and carefully constructed.

### ❖ Dehydration

As elderly people are susceptible to negative water balance, especially due to excessive water loss through insufficient or damaged kidneys, the oral mucosa also becomes dry-easily dehydrated.

### ❖ Saliva

Xerostomia results when water is reduced, resulting in reduced water content in saliva, which in turn affects the mastication.

### ❖ Dry mouth

Mucous membrane becomes hot, dry and fragile in dry mouth, which cannot be tolerated by denture wearers. Even most skilfully fabricated denture fails in dry mouth cases.

### ❖ Osteoporosis

Osteoporosis results from the loss of bone especially the spongy spicules of bone that support the weight bearing parts of the skeleton. Osteoporosis is common in ageing person, especially in post-menopausal women when the osteogenic blood level has dropped precipitously.

### ❖ Thinning of mucosa

The epithelium becomes very thin in elderly; hence a prosthesis placed upon the edentulous ridge is now covered by a thin pad of connective tissue rests mostly on bone. It is uncomfortable the hard acrylic or metal base rest almost directly upon the bony ridge with little cushion effect between. Therefore the search for soft acrylic base to cushion the occlusal force continues.

## Clinical features

Female predilection is seen in case of denture stomatitis. The Mean age is approximately 49 years (mean age at which a person start to wear denture). Common Site is under complete or partial denture, mainly in palatal areas. Appears as patchy distribution often associated with speckled curd like white lesion.

28-70% of patients with denture stomatitis have oral complaints<sup>11,12</sup>: (Nater; J Pros Dent, 1978). The symptoms include mucosal bleeding, swelling, burning or painful sensation, halitosis or an

unpleasant taste & dryness in the mouth. Signs that are clinically present include bright red, oedematous and granular palatal tissue, Red patches which appears erythematous or speckled, sharply outlined border of reddened mucosa which are restricted to the tissue in contact with the denture and multiple pinpoint foci of hyperaemia are seen.

## Diagnosis

Clinically an erythematous area under the complete denture aid in diagnosis of denture stomatitis. Confirmed by- mycelia or pseudo hyphae in a direct smear or high number of candida species from lesion (>50 colonies)

Yeast recovered from the fitting surface of the denture confirms, candida is the main cause of denture stomatitis.

## Treatment

- ❖ Patient counselling
- ❖ Cessation of smoking in smokers.
- ❖ Clean dentures regularly after each meal with a soft brush and soap.
- ❖ Efficient plaque control
- ❖ Overnight immersion of denture in alkaline peroxide cleanser or alkaline hypochlorite



Fig 1

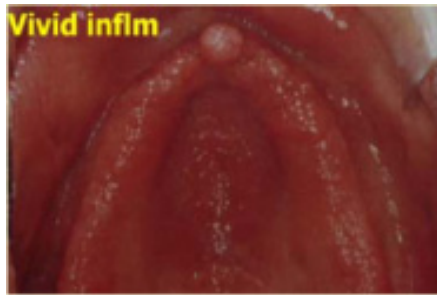


Fig 2



Fig 3

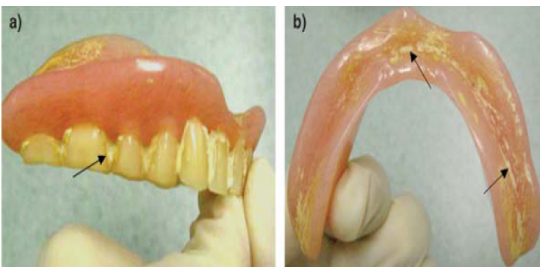


Fig 4



Fig 5

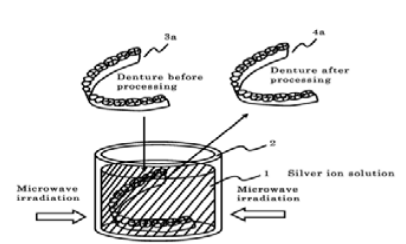


Fig 6



Fig 7



Fig 8



Fig 9

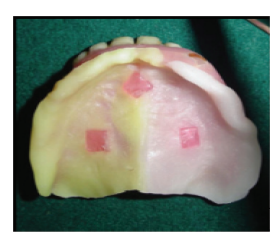


Fig 10

## ❖ Correction of ill-fitting denture

1. Relining (fig.5)
2. Replacement of denture if necessary

## ❖ Disinfection-

- 10% acetic acid( vinegar)
- Antiseptic denture cleanser
  - Chlorhexidine
  - Dilute sodium hypochlorite

(10 drops of household bleach in 500 ml of tap water)

## ❖ Microwave irradiation:

Immerse denture in 200ml of water & irradiate for 3min at 650W (fig.6)

## ❖ Antifungal agents

- TOPICAL

Amphotericin B-(3% lotion, twice daily)

- Nystatin suspension(100,000 unit per ml) (fig.7)

- Imidazole compounds
- Clotrimazole-1% cream (fig.8)
- Miconazole-2-4%cream
- Ketoconazole
- Econazole

## - SYSTEMIC

- Cap.Fluconazole  
(50mg daily for 14 days)

- Cap.Itraconazole

(100 mg daily for 15days)

## ❖ Treatment of underlying systemic diseases.

❖ Lacquer or tissue conditioners containing anti- fungal are effective in some cases(lacquers containing miconazole is widely used) (fig.9)

❖ Surgical treatment(in severe papillary hyperplasia):

- Cryosurgery
- excision

## ❖ Sustained drug delivery system

In this context, incorporation of antifungal agents into the denture base materials to be progressively released into the oral cavity has been suggested to prevent the biofilm accumulation, inhibit *C.albicans* colonization and contribute to the treatment of Denture stomatitis. This protocol requires only the use of denture by the patients, thus reducing the need for patient compliance to antifungal drug regimes.

Furthermore, the incorporation of drugs into denture liners breaks the contact between the denture biofilm & infected tissues, thus avoiding a cycle of re-infection via prosthesis, hence soft lining materials are highly recommended. In order to avoid degradation & microbial colonization anti-microbial agents are added to lining materials, mainly short term ones as tissue conditioners & temporary resilient liners which are more susceptible.

Although anti-fungal/anti-microbial effectively inhibit the growth of *Candida albicans*, it may affect their morphological structure,hardness,roughness,properties such as tensile strength, water absorption, modulus of elasticity and weight, and peel bond strength to denture base resin. Hence, Bueno, et al. determined minimum inhibitory concentrations (MICs) of *C.albicans* biofilm for antifungal/antimicrobial agents added to the lining materials. Five drugs-nystatin, miconazole, ketoconazole, itraconazole and chlorhexidine diacetate are the drugs usually incorporated.

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During their life cycle, polymeric materials release soluble substances like methyl methacrylate & dibutyl phthalate, which may be potentially toxic. So; it is possible to conclude that modification of temporary resilient materials by antifungal/antimicrobial agents, especially in lower concentrations, may represent a viable protocol for treatment of denture stomatitis during a period similar to conventional therapy with topical antifungals (14 days). (fig.10)

## Conclusion

Denture placement in the oral cavity will produce notable variations in the oral microbial flora affecting the integrity of oral tissues. Hence adequate home care instructions should be given at the time of denture delivery. Regular recall appointments to reinforce denture hygiene.

In most cases elimination of traumatic factors, adequate oral hygiene measures, administration of local antimycotic medicaments enables the healing of denture stomatitis.

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