DENTURE STOMATITS: A CASE REPORT

ABSTRACT
Despite therapeutic progress, opportunistic oral fungal infectious diseases have increased in prevalence, especially in denture wearers. 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 for the onset of this infectious disease. Hence colonization and growth on prostheses by Candida species are of clinical importance. Here we report a case of a 60 year old male patient with 15-16 years use of complete denture suffering from chronic atrophic candidiasis on the palatal mucosa.

Key words: Candida albicans, Denture, Chronic atrophic candidiasis.

Introduction
Candida infections receive increasing attention, presumably due to the increased prevalence worldwide. Numerous studies have shown that several Candida species possess a multitude of virulence mechanisms leading to successful colonization and infection of the host when suitable conditions occur. The recognition that Candida is an important pathogen has led to many laboratory studies evaluating this virulence attributes in an attempt to clarify the pathogenesis of the disease. The progress made in understanding some of these features, such as the mechanisms that result in adherence to surfaces, cell colonize various habitats in humans, notably skin and mucosa. Commensal existence of oral Candida species varies from 20% to 50% in a healthy dentulous population. As growth on surfaces is a natural part of the Candida lifestyle, one can expect that Candida colonizes denture.[1]

There is a large body of evidence indicating that Candida is able to adhere to acrylic resin dentures. This is the first step that may lead to the development of the infectious process and that may ultimately result in varying degrees of denture stomatitis of the adjacent mucosa. Candida adheres directly or via a layer of denture plaque to denture base (polymethyl methacrylate PMMA). Without this adherence, micro-organisms would be removed from the oral cavity when saliva or food is being swallowed. It is well-known that innumerable factors are involved in the adhesion of Candida to the acrylic resin base, Substrate surface properties, as surface charge, surface free energy, hydrophobicity, and roughness have all been reported to influence the initial adhesion of microorganisms. Microbial adhesion on biomaterial surfaces depends on the surface structure and composition of biomaterials, and on the physicochemical properties of the microbial cell surface, again its surface charge and hydrophobicity. Components of the resilient denture liners and acrylic resin may reduce the adhesion and inhibit the growth of Candida.[1]

Case Report
A 60 year old year male patient reported to the department of oral medicine and radiology with chief complaint of difficulty in eating due to broken denture since 4-5 months. It was associated with mild to moderate burning sensation in the mouth since 15-20 days.(fig:1)

Patient lost most of his teeth due to loosening and he lost his last tooth 20 years back. Patient gave history of wearing complete denture since 15-16 years.

Personal history revealed habit of bidi smoking 10-15 bidis per day since 25-30 years. Patient gave history of breathlessness for last 2 years.

General physical examination revealed abnormal gait with handicapped by right leg. Hearing of the patient was compromised and built was normal.

On intraoral examination, impression of the suction disc of maxillary denture was seen on the palate. On the palatal mucosa, a diffuse white scrapable patch was present on the erythematous base. On scraping the white patch, erythematous base was visible and it was non-tender on palpation. (fig:2)

Considering the history and examination of the patient we arrived at the provisional diagnosis of denture stomatitis. Routine blood investigations were done to exclude the possibility of any hematatic deficiency, random blood sugar was done to detect the possibility of diabetes and cytomsar was advised. On cytomsar examination, numerous Candidal hyphae were seen, confirming the diagnosis as denture stomatitis.

Discontinuation of denture use and refabrication of the denture was advised to the patient and topical application of Candid gumpaint three times a day for two week was given. Patient responded well to the treatment.

Discussion
Denture stomatitis also known as 'Denture Sore
Mouth: a diffuse inflammation of the denture bearing areas often associated with angular cheilitis. There is no apparent age limit and women are affected more frequently than men. There is varying degrees of erythema, sometimes accompanied by petechial hemorrhage, localized to the denture bearing areas of a maxillary dental prosthesis. The absence of denture stomatitis in the lower jaw is probably due to the washing action of saliva. [2]

Despite the fact that denture stomatitis is frequently asymptomatic, patients may complain of halitosis, slight bleeding and swelling in the involved area, or a burning sensation, xerostomia, or taste alterations (dysgeusia). These symptoms occur, with variable intensity, in 20% to 70% of patients with denture stomatitis. In these situations, the patient usually does not relate the use of a denture to the experienced symptoms. Different classifications have been proposed, but the reference classification for denture stomatitis is the one suggested by Newton in 1962, based exclusively on clinical criteria: [2]

Newton’s type I: pin-point hyperemic lesions (localized simple inflammation)

Newton’s type II: diffuse erythema confined to the mucosa contacting the denture (generalized simple inflammation)

Newton’s type III: granular surface (inflammatory papillary hyperplasia)

The etiology is best considered multifactorial, but denture wearing, especially when worn during the night, represents the major causative factor. Among the etiological factors that should be considered are: [3]

1. Prosthetic factors

   No denture stomatitis can exist without prosthesis. Ill-fitting, traumatic, badly-maintained dentures have been considered as the most frequent causes of denture stomatitis.

   Prosthetic traumatism is favored by denture functional deficiencies, like:
   - Occlusal alterations
   - Vertical dimension alterations
   - Retention alterations
   - Unstable prosthesis

   The type of material employed for its construction (Newton’s type III is 5-fold more frequent with acrylic dentures than with metallic ones) also condition the development of denture stomatitis.

2. Infectious factors

   Denture can produce a number of ecological changes that facilitate the accumulation of bacteria and yeasts. Bacteria proliferate. Certain bacterial species, like Staphylococcus species, Streptococcus species, Neisseria species, Fusobacterium species. or Bacteroides species has been identified in patients with denture stomatitis, although no direct relationship between bacteria and the aetiology of denture stomatitis could be proved.

   Candida species, particularly Candida albicans, have been identified in most patients. Patients with denture stomatitis show higher intraoral concentrations of fungi than individuals without this disorder and the lesions objectively improve after antifungal drug administration. However, the role of this organism as the sole aetiologic factor remains unclear.

   Predisposing factors for oral candidosis include:
   - f. Ample spectrum antibiotics.
   - g. Local factors
     - a. Antimicrobials and topical or inhaled corticosteroids
     - b. Carbohydrate rich diet
     - c. Tobacco and alcohol consumption
     - d. Hyposalivation
     - e. Deficient oral hygiene
     - f. Wearing dentures (especially through the night)

**Diagnosis**

The clinical presentation of erythema and oedema on the palatal mucosa covered by the denture base (but not beyond) is a diagnostic finding. A smear of the palate stained with KOH or periodic acid-Schiff can demonstrate the presence of Candida species. Other techniques for identifying fungal isolates are [4]

**Imprint Culture Technique**

It is very sensitive and reliable method for oral sampling. Sterile foam pads (2.5cm by 2.5cm) are dipped in Sabouraud's broth and placed on the surface under study for 60 sec. Pad is then pressed firmly onto sabouraud's plate, transferred to the lab and left in place for the first 8 hours to 48 hours incubation at 37deg.C. Candidal density at each site is determined by a Gallenkamp colony counter & expressed as colony forming units per sqmm.

**Impression Culture Technique**

Alginate impressions of maxillary and mandibular arches are made and sent to the lab. Casting of these impressions is done in 6% fortified foam pads (2.5cm by 2.5cm) are dipped in Sabouraud's broth and placed on the surface under study for 60 sec. Pad is then pressed firmly onto sabouraud's plate, trasferred to the lab and left in place for the first 8 hours to 48 hours incubation at 37deg.C. Candidal density at each site is determined by a Gallenkamp colony counter & expressed as colony forming units per sqmm.
agar with incorporated sabouraud's dextrose broth. Agar models are incubated in wide necked, sterile screw topped jar for 48-72 hours at 37deg. and the CFU yeast is estimated. This method is purely a research tool and useful in quantifying the relative distributions of yeast on oral surfaces such as teeth, gingiva and palate.

Salivary Culture Technique
In this method 2 ml of mixed unstimulated saliva is collected in a sterile, universal container, vibrated for 30 sec on a bech vibrator for optimal disintegration. Number of candida expressed as CFU/ml of saliva, is estimated by counting the resultant growing on Sabouraud's agar using either the spiral plating or Miles and Misra surface viable counting technique (1935). Normal range for smoker's: 0-2927CFU/ml and non smokers: 0-1703CFU/ml.

Oral Rinse Technique
Rinse mouth for 60 sec with 10 ml of phosphate buffered saline (PBH, pH 7.2, 0.1M) supplied in universal container and spit back in the same container. This sample is sent to the lab and after innoculating it to the proper media CFU/ml of the sample is counted using a spiral platter. Imprint & impression cultures are superior in detecting oral yeast in health & disease. A count of 30CFU/sqm of mucosa in dentate & 49CFU/sqm in denture wearers suggest a candidial infection.

Primary Culture Media
Most useful and popular medium for primary isloation of pathogenic candida species is peptone-glucose (dextrose) or peptone malseose agar described in 1986 by Sabouraud. Sabouraud's agar has a pH of less than 6, which suppresses other bacteria and microorganisms and addition of antibiotics also can be done such as chloramphenicol, penicillin, streptomycin and ciprofloxacin but not cycloheximide.

Paganolevin Medium
It was described by Pagano, Levin and Trejo (1958) is useful for retrieval of multiple yeast species from single clinical specimens. Various candida species grow on this medium eliciting degrees of pink, red & mauve coloration & it would therefore appear that paganolevin medium could be used as a valuable adjunct for isolating yeast from clinical samples.

Other Culture Media
Blood agar, Cornoal agar, Litterman's agar, Pal's media and New Zealand agar can be used.

Stains
PAS, Aq. KOH and Gridley's methamine silver can be used.

Detection Of Candida In Biopsy
It is stained poorly by H&E. PAS & Gridley's or Gormori's methamine silver (GMS) stains are ideal stains to be used.

Immunodiagnosis
Flourescein labelled anti candida globulin is examined for antibodies and antibodies such as IgM, IgA, IgE are detected by techniques such as indirect immunoflourescence and ELISA.

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. Dentures should be removed for as long as possible and definitely overnight. Dentures should be brushed in warm, soapy water and soaked overnight in an antiseptic solution such as bleach (10 drops of household bleach in a denture cup), chlorhexidine (not when the denture has metal components), or in any solution suitable for sterilizing baby’s feeding bottles. Benzoic acid containing products should be avoided as they induce changes in the composition of acrylic materials.

Denture fitting and occlusal balance should be checked to avoid trauma. A new prosthesis should be made, if necessary. Tissue conditioning agents are porous materials easier to colonize than acrylic, so they are not recommended for these patients. If there is no other choice, an antifungal agent, like nystatin, miconazole or ketoconazole may be incorporated to the agent. Dentures must be adequately polished and glazed, as pores increase denture contamination by oral microorganisms.

Newton’s type I and II denture stomatitis have been successfully treated with low energy lasers to reduce inflammation of the supporting mucosa. Inflammatory papillary hyperplasia usually needs to be surgically removed (by scalpel, cryosurgery, electrosurgery or with a laser beam) before the denture is placed, although mild cases may respond to antifungal treatment.

Antifungal medications are recommended when yeasts have been isolated, or when lesions do not resolve with hygiene instructions. First choice treatment is the topical application of nystatin or miconazole. Resistance to nystatin is rare; the drug is administered as an oral suspension, with an unpleasant taste and can induce gastrointestinal problems and hypersensitivity. Miconazole is available as gel, varnish, lacquer and chewing gum. It also provokes gastrointestinal alterations and hypersensitivity, but it tastes better. Miconazole enhances warfarin effect.

Systemic antifungal drugs (i.e. fluconazole, itraconazole, ketoconazole), are almost exclusively reserved for patients with systemic factors that condition the development and persistence of candidiasis, such as immunosuppression or diabetes.

Prognosis and Complication
If untreated, denture stomatitis can cause soreness and palatal inflammatory papillary hyperplasia and may lead to poorly fitting dentures in the future. The administration of topical antifungal therapy, removal of mechanical traumatism caused by the denture and reinforcement or hygienic measures, eases the disappearance of the lesions. However, local recurrences are frequent if aetiopathologic factors persist. The prognosis of this disorder is good, as malignant transformation has not been reported, although continuous aspiration and swallowing of Candida species may rarely have potentially fatal consequences in immunocompromised patients. [5]

Conclusion
It is mandatory to include denture stomatitis prevention in oral health care programmes. Dental professionals working with geriatric patients must promote this preventive programmes among all health care workers, home care givers, members of the patient's family and, of course, the patients themselves.

A preventive programme should include:
A routine basis inspection of the oral cavity for screening for this disorder, even when the lesions are asymptomatic.
Properly denture sanitization and perform good oral hygiene
Appropriate denture-wearing habits, instructing the patient to take his/her denture out of the mouth for 6-8 hours each day Patients with partial dentures should undergo periodic professional plaque control

References