

## Prevention and Management of Denture Stomatitis- A Review

### Abstract:

Denture stomatitis, also called as Chronic Atrophic Candidiasis, is considered to be synonymous with the condition better known as denture sore mouth, a diffuse erythema and edema of the denture bearing area, often occurring with angular cheilitis. It is the most common form of the oral disease. The prevalence of denture related mucosal lesions (DMLS) were observed more frequently in complete denture wearers than in partial denture wearers as the area covered by a complete denture is more and therefore increase the risk of DMLS. It is associated with dental plaque, candida infection, poor denture retention and mechanical trauma<sup>1</sup>. The major risk factor for the development of this condition is wearing an upper complete denture, particularly when it is not removed during sleep and cleaned regularly. Older dentures are more likely to be involved. Other factors include xerostomia (dry mouth), diabetes or a high carbohydrate diet, human immunodeficiency virus (HIV).

**Keywords:** Denture induced stomatitis, DMLS Candida albicans, denture cleansers, cryotherapy, hydrogel patch.

### Introduction:

The term Denture induced stomatitis has evolved from numerous historical descriptions since the 1800s. In 1936, Cahn described "rubber sore mouth", subsequent terminology included "chronic denture palatitis", "stomatitis venenata" and "sore mouth under plates". It can also be termed as "denture sore mouth". The term denture induced stomatitis was then adopted and described as the chronic inflammation of the oral mucosa covered by a removable denture<sup>[2]</sup>. Improving the fit of poorly fitting or unstable dentures is needed in order to eliminate soft tissue trauma from the denture. Treatment may involve smoothing rough areas of the fitting surface of the denture, relining the denture, or remaking the denture. The elimination of tissue inflammation should be achieved before new impressions are made. Tissue conditioners can be used to temporarily improve the fit and stability of existing dentures, as well as reduce inflammation of the mucosa. The use of a sponge to aid cleaning of soft linings can also be done but this can result in less thorough cleaning.

Poor cleaning of the dentures may also lead to problems of denture stomatitis. We can use alcohol based mouthwash and isopropyl alcohol. Bleach can also be used that causes limited damage to PMMA. Different cleaning agents such as specialist denture cleanser tablets, regular toothpaste,

mouthwash, soap and water, denture pastes, foam or liquid denture cleanser and dishwashing detergents can also be used. Denture tablets are the most recommended in developed countries, whereas toothpastes are recommended in developing countries. Passive methods of denture cleaning can also be used that include soaking the dentures in antimicrobial mouth rinses and microwave disinfection. Chlorhexidine mouthwash is widely available and exhibits good antimicrobial and anti-fungal properties. To significantly reduce candida and plaque, sodium hypochlorite solutions can be used to soak dentures. In addition to methods of thorough cleaning of denture itself, the use of a toothbrush to clean the palate after every meal and at night for a period of 3 months can reduce palatal inflammation. Microwave disinfection of dentures to prevent or treat denture stomatitis is recommended. Preliminary studies demonstrated that 6

<sup>1</sup>PANKHURI AKHIL, <sup>2</sup>RAJIV K GUPTA,  
<sup>3</sup>VIKRAM KAPOOR, <sup>4</sup>PALLAVI SIRANA

<sup>1,2,3</sup>Institute of Dental Studies and Technologies,  
Kadrabad, Modinagar

<sup>4</sup>Department of Prosthodontics and Crown and Bridge  
Institute of Dental Studies and Technologies,  
Kadrabad, Modinagar

**Address for Correspondence:** Dr. Pankhuri Akhil  
PG Student

Department of Prosthodontics and Crown and Bridge,  
IDST, Kadrabad, Modinagar -201201

Email : pankhuriakhil@gmail.com

**Received :** 31 Dec., 2021, **Published :** 30 June, 2022

Access this article online	
<b>Website:</b> www.ujds.in	<b>Quick Response Code</b> 
<b>DOI:</b> https://doi.org/10.21276/ujds.2022.8.2.21	

**How to cite this article:** Pankhuri, A. (2022). Prevention and Management of Denture Stomatitis. UNIVERSITY JOURNAL OF DENTAL SCIENCES, 8(2). 108-116

minutes of microwave irradiation at 650W resulted in sterilization against *Candida albicans*[1].

Medical management of denture stomatitis mainly aims at removing the etiologic agent which is the candidal overgrowth. For the same we can suggest systemic antifungal agents such as fluconazole, Itraconazole, ketoconazole, voriconazole and topical antifungal agents such as nystatin, miconazole, amphotericin B, propolis and also certain herbal extracts such as green tea extract, punica granatum fruit extract, garcinia kola extract. Their doses are fixed but, depending on the severity of denture stomatitis their dosage may vary accordingly.

We can also manage denture related traumatic ulcers using ozone therapy that improves tissue healing and reduce pain and patient discomfort.

Lasers and photo dynamic therapy and cryosurgery are the surgical methods for management of denture stomatitis. Low level light therapy excites the biological cell chromophores at appropriate low doses of visible wavelength light, which causes generation of reactive oxygen species. Photodynamic therapy provides results similar to those of antifungal therapist.

### Classification:

Classification of DIS has been generally based on the clinical appearance of the inflamed mucosa<sup>2</sup>.

**Newton (1962) described the clinical stages of Denture induced stomatitis based on inflammation severity and this has been widely adopted[2]:**

- 0 Healthy
- 1 Pin-point hyperemia
- 2 Diffuse hyperemia
- 3 Granular

**Modified Newton's classification includes (Bergendal 1983):**

- 0 Healthy
- 1A Petechiae in normal palatal tissue
- 1B Localised area of inflammation of the denture
- 2 Generalised area of inflammation of the denture bearing area.
- 3 Hyperplastic palatal surface with inflammation of denture bearing area.

**Schwartz in 1988 classified inflammation according to size as follows:**

- 0 Healthy
- 1 Inflammation of the palate extending up to 25% of denture bearing area.
- 2 Inflammation of the palate covering between 25 to 50% of the denture bearing area.
- 3 Inflammation covering more than 50% of the palatal denture bearing area.

### Clinical Relevance:

In addition to the erythematous mucosa, patients may complain of discomfort, mucosal bleeding, swelling, a burning sensation, or a bad taste. However, most patients seem unaware of the problem. Lack of salivary flow, xerostomia, has been reported in 14.7% of denture wearers and complaints include discomfort when eating, speaking and poor denture fit. Narhi and colleagues reported 41% of denture patients demonstrated xerostomia, which resulted in higher yeast counts than non-affected patients, though this ailment is probably causative and not a resultant of denture stomatitis due to lack of salivary flow to clear the *Candida* yeast. Many *Candida* species can be regularly found on the palatal surface of dentures, which supports the theory that the upper denture functions as a reservoir for *Candida*. Infection with *Candida albicans* presents mainly in any of four forms: pseudo membranous candidiasis, hyperplastic candidiasis, erythematous candidiasis, or angular cheilitis<sup>3</sup>. Patients may exhibit one or a combination of any of these presentations. Each type of infection is associated with characteristic clinical signs and symptoms that are influenced by a range of predisposing factors.

### Aetiology:

Mucosal inflammation found adjacent to the fitting surface of the denture is multifactorial in nature. The associated factors can include: denture trauma, continuous denture wearing, poor denture hygiene, microbial plaque, denture base material, denture age, saliva, dietary factors, smoking, and systemic conditions<sup>4</sup>.

### Prevention Of Denture Induced Stomatitis:

Microbial plaque on the tissue surface of dentures is a significant cofactor in the pathogenesis of denture stomatitis. A regular and thorough denture-cleaning regime is considered

to be appropriate to prevent Denture induced stomatitis development. Denture wearing patients can either mechanically and/or chemically clean their dentures. A denture cleanser is seen as an adjunctive chemical form of cleaning ones denture.

### **An ideal denture cleanser should have the following characteristics[5]:**

- 1) Should be able to reduce biofilm accumulation and
- 2) Be bactericidal and fungicidal, without affecting physical and mechanical properties of the denture base or prosthetic teeth (i.e. no whitening or abrading).
- 3) It should be non-toxic, short-acting, easy to use and cost effective.
- 4) It should also remove tough stains and control denture odours.

### **The different modes of disinfection are:**

- Mechanical disinfection
- Physical disinfection
- Chemical disinfection

### **Mechanical disinfection:**

Mechanical methods comprise brushing, sonic vibrators and ultrasonics. Although brushing is the most widely used method, patients with limited motor co-ordination find it difficult to perform. With regard to mechanical denture hygiene methods, ultrasonic devices are mechanical aids, generally used by professionals. The mechanical cleansing activity of the device is complemented with the concomitant use of a chemical solution. The combination of this method with brushing or with a method of immersion in a chemical solution has been suggested as an effective alternative for cleansing complete dentures, particularly in hospitals and older care institutions or for patients with limited motor co-ordination. However the effectiveness of the ultrasonic device has not been clinically tested.

#### **1) Brush**

Mechanical cleaning of dentures with brushes or ultrasonic devices has limited success on complete removal of the biofilm and can damage the denture surface<sup>3</sup>.

#### **2) Pastes and powders**

All powders and pastes increase the amount of wear on dentures. A specially developed denture-cleansing paste containing zirconium (a ZrSiO<sub>4</sub>-ZrO system) has been found

to be superior to a number of commercially available pastes for cleaning and polishing dentures and decreasing acrylic resin abrasion<sup>14</sup>. Toothpastes containing chloroform have been shown to cause severe denture wear due to the chemical solution of acrylic resin and they should not be used<sup>[6]</sup>.

### **3) Ultrasonic agitation:**

Ultrasonic agitation is not an efficient method for the removal of denture plaque, since ultrasonic treatment per se does not cause a significant reduction of the number of microorganisms that can be cultured from dentures. However, ultrasonic treatment of dentures in disinfectant solutions increases the disinfectant's effectiveness and does not deteriorate the polished denture surface<sup>[7]</sup>.

### **Physical methods of disinfection:**

#### **1) Microwave irradiation:**

Microwave irradiation is one of the techniques used to disinfect the dentures of patients with candidiasis. Microwave irradiation at 650 W for 3 minutes is highly capable of destroying *C. albicans* on the surfaces of complete dentures and can thus be used as an effective technique for disinfecting dentures and preventing candidal denture stomatitis in patients wearing complete dentures. Microwave disinfection is effective and quick, which may be a significant advantage for some patients. Thus, we can conclude that microwave energy has been found to be a feasible method of disinfection of PMMA dentures<sup>[8]</sup>.

### **Chemical methods of disinfection:**

Commercially available denture cleansers may be used to supplement good oral and denture hygiene to prevent colonization and Denture induced stomatitis.

### **Denture cleansers can be divided into five groups:**

- (1) Alkaline peroxides,
- (2) Alkaline hypochlorites,
- (3) Dilute organic and inorganic acids,
- (4) Disinfectants, and
- (5) Enzymes

### **Classification Of Denture Cleansers:**

#### **Denture cleansers can be classified as:**

- 1) According To Type
  - a) Creams
  - b) Pastes

- c) Gels and solutions.
- d) Tablets

## 2) According to the mode of action:

A) Alkaline peroxides: Examples include:

- Efferdent, Polident,
- Steradent triple action,
- Corega Tabs,

This category of denture disinfectants includes the following:

- i). Alkaline detergents: They act by reducing surface tension.
  - ii). Oxidizing (bleaching) agents: Alkaline perborate, sodium perborate (Fittydent Mega Cleansing Tablets) or potassiummonopersulfate.
  - iii). Hydrogen peroxide
- B) Reducing Solutions: e.g. Sodium hypochlorite (e.g.0.5% Sodium Hypochlorite solution).

## Other commercial products include:

Mersene, Kleenite, Dentural, Milton, and Mildent

- C) Chlorhexidine: e.g.0.2% chlorhexidinegluconate
- D) Mild Dilute acids: E.g. Solutions of hydrochloric or phosphoric acid (3 to 5% hydrochloric acid or combination of hydrochloric and phosphoric acid).
- E) Effervescent agents: E.g. Perborate, (FittydentMega Cleansing Tablets)or citric acid.

## Other Commercially available products: Efferdent:

- F) Chelating agents:E.g. EDTA. (Ethylenediamine tetra acetic acid or Versene acid)
- G) Detergents: E.g. Sodium polyphosphate.  
Commercially available products: Clinsodent
- H) Enzymes:Eg: Protease (papain), Amylase26 (gluco- amylase).

## Commercially available products:

- DC- 1 (Pika). It contains the lytic enzyme B-1, 3 gluconase
- I) Additional compounds: Dye markers (1% neutral red)
- J) Disinfectants: E.g. Potassium permanganate, Gluteraldehyde (Cidex, Johnson and Johnson)
- K) Ozone
- L) 100% Vinegar
- M) Denture Wipes:Example:
  - a) Dentist On Call Denture Wipes,
  - b) ProClean

## A newer approach to prevent adhesion of Candida albicans to denture:

Plasma-based coatings have been considered a versatile method of modifying the surface of polymeric materials in many fields. A recent study has demonstrated the possibility of applying Trimethylsilane (TMS) plasma coatings to PMMA denture surface to prevent adhesion of Candida albicans to surface of the denture and thus prevent denture stomatitis[9].

## Management Of Denture Stomatitis:

Here we shall discuss various different approaches towards the treatment of denture stomatitis that includes tissue conditioners, pharmacological and non-surgical treatment methods that are effective in management of denture induced stomatitis<sup>10</sup>.

## Tissue conditioners:

Treatment for chronic denture stomatitis is essential for patient comfort, and it minimizes more serious effects on supporting tissues. Treatment methods for chronic denture stomatitis are;

- (1) Improving tissue tone with tissue conditioner and/or
- (2) Tissue recovery periods during which dentures are withheld from the patient.

Tissue conditioning (TC) has usually been used to manage inflamed tissues of the denture-bearing area when relining ill-fitting dentures; the viscoelasticity of this material produces a cushion effect that improves chewing and distribution of the occlusal forces on the supporting tissues[10].

## • Tissue conditioners infused with anti-fungal agents:

Incorporating antifungal agents into tissue conditioners may be a promising method of drug delivery to overcome this obstacle for therapy<sup>10</sup>. The major advantages of using antifungal agents in tissue conditioners as a method of drug delivery are;

- Reduced costs since only a fraction of the antifungal agent is used compared to conventional therapy,
- No need for patient compliance,
- Simultaneous treatment of injured denture bearing tissue and candidal infection and
- Reduced application frequency



• **Reliners :**

A management alternative for denture stomatitis could be the use of hard autopolymerising reline materials (AHRM), the powder of this material may contain polyethylene methacrylate (PEMA), polymethyl methacrylate (PMMA) or a mixture of PEMA/PMMA; the liquid composition varies and could be isobutyl methacrylate (IBMA), butyl methacrylate (BMA), 2-hydroxyethyl methacrylate (HEMA) or 1,6-hexanediol dimethacrylate (1,6-HDMA). They all have a low polymerizing exothermic reaction, which allows them to be used directly in the mouth. These materials have a longer useful life in the mouth than the TC, so using them would diminish expense, surgery work-time and the number of appointments for the patient before until the provision of the new prosthesis[11].

• **Reliners with antifungal properties**

Douglas and Walker had the idea of enhancing the therapeutic effects of a tissue conditioner with an antifungal agent to prolong the action of drug and treat the tissue trauma with lower cost. An antimicrobial soft liner will help to patients who cannot perform routine denture care. Medicinal herbs are nowadays using as an alternative treatment method as a naturopathic remedy[60].

• **Carvacrol, an antibiotic infused in soft liners**

• **Nystatin containing denture liners**

**Drug Therapy For Denture Stomatitis**

Current therapy for advanced denture stomatitis consists of topically administered polyene antifungal agents or by systemic application of azole drugs. Nystatin, a polyene drug, is historically the most common topical treatment for denture stomatitis due to its efficacy and ease of application. Fluconazole, a drug distributed through gastrointestinal absorption, is favored for prophylaxis and low-level fungal infections based on its safety record but incidences of resistance by *C. albicans* and innate immunity from non-*albicans* species limits fluconazole's efficacy. Amphotericin B, a polyene, is also systemically distributed but is associated with problems with high toxicity. Other members of the azole family, such as itraconazole and voriconazole, are also available though each particular compound has varied success against candida infections. Echinocandins are a recently introduced class of antifungal that target a different component of the yeast cell[19].

**Antifungal agents:**

. Antifungal medication group includes testing different antifungal medications (nystatin, miconazole, amphotericin B, fluconazole) with varying delivery mechanisms<sup>12</sup> (rinse, incorporation into denture adhesive or tissue conditioner, lozenges, capsules).

**The anti-fungal agents can be classified as follows:**

**1. Antibiotics**

- A. Polyenes: Amphotericin B (AMB), Nystatin, Hamycin
- B. Echinocandins: Caspofungin, Micafungin, Anidulafungin
- C. Heterocyclic benzofuran: Griseofulvin

**2. Antimetabolite Flucytosine (5-FC)**

**3. Azoles**

**A. Imidazoles**

Topical: Clotrimazole, Econazole, Miconazole, Oxiconazole  
Systemic: Ketoconazole

**B. Triazoles:** Fluconazole, (systemic) Itraconazole, Voriconazole, Posaconazole

**4. Allylamine Terbinafine**

**5. Other topical agents Tolnaftate, Undecylenic acid, Benzoic acid, Quiniodochlor, Ciclopiroxolamine, Butenafine, Sodium Thiosulfate**

**Pimafucin suspension:**

Poor hygienic conditions and poorly fitting dentures are factors known to enhance the growth of *Candida* and lead to inflammation, erythema, and fissures. Occasionally, nystatin 1% suspension has been used for treating denture stomatitis, but Pimafucin 2.5% suspension has also been effective for treatment of denture stomatitis. Pimafucin 2.5 % suspension has shown to produce a significant decrease in *Candida* infections. Suspension treated patients show a significant reduction of *Candida* infection in terms of culture, culture growth, and number of colonies within the first week of therapy. There is no statistical evidence of relapse during the 4-week period after therapy is stopped. The taste of 2.5% suspension is well accepted<sup>13</sup>.

**Topical gel with triester glycerol oxide:**

Recently, a topical gel with trimester glycerol oxide (TGO) has been introduced. TGO has been shown to adhere to the oral mucosa, forming a lipid film that protects against

mechanical trauma and may help to reduce oral tissue moisture loss and inflammation. TGO as an oral lubricant may be effective for dry mouth symptoms and signs in patients with xerostomia. Additionally, it was previously shown that the TGO gel evaluated creates a reduction in the number of erythrocytes and inflammatory cells in the mucosa. However, it should be remembered that laboratory results do not completely replicate the in vivo environment[14].

### **Hydrogel Patch on Denture-Related traumatic ulcers:**

PerioPatch hydrogel is a novel, locally applied oral health product that acts as a barrier and provides relief from the symptoms of oral inflammation and trauma. It contains a Federal Drug Administration (FDA) approved gel that comprises several ingredients from medicinal plants and forms a protective seal over the ulcerated oral tissues from which it also absorbs wound exudates[15].

The PerioPatch hydrogel is an oval hydrogel patch that measures 25 mm × 8 mm at its widest points. Applied directly on the lesion, it adheres to the mucosal surface.

### **Use Of Natural Products In Managing Denture Induced Stomatitis:**

A wide variety of plant extracts have shown antifungal activity against *Candida*, suggesting its potential for denture stomatitis treatment. Some natural products such as Propolis used in gel form, mouthwash or mucoadhesive, *Punicagranatum* gel, *Pelargonium graveolens*, olive oil and *Ricinus communis* in mouthwash form have shown the same efficacy as conventional antifungal in treating patients with denture stomatitis[13]. Thus, it would be pertinent to review the use of main natural products in the prevention and treatment of denture stomatitis.

### **Major natural products:**

For many years a wide variety of natural products have traditionally been used as antifungal agents, especially those of the genus *Candida*. Considering that oral candidiasis is a frequent opportunistic infection mainly caused by *Candida* colonization, the use of these substances may play an important role in the denture stomatitis treatment. The following natural products have shown potential for the prevention and treatment of denture stomatitis[13].

### **Propolis:**

Propolis is a complex mixture of resinous and balsamic material, usually collected by bees from flowers and tree exudate, which, in the hive, are mixed with salivary secretions[13].

### **Geranium Olive oil:**

*Pelargonium* or geranium olive oil belongs to the Geraniaceae family and it is characterized by being non-toxic, non-irritating, and non-sensitizing, with no adverse effects when administered[13].

### **Equisetum Giganteum:**

*E.giganteum* popularly known as 'horsetail' when added to denture fixative powder, *E.giganteum* hydroethanolic extracts influenced the development of *C. albicans* biofilm on the thermopolymerizable acrylic resin surface, significantly minimizing its colonization and reducing its metabolism[13].

### **PunicaGranatum:**

*P. granatum* Linne, also known as pomegranate, is a fruit deciduous shrub or small Asian tree of the Punicaceae family. *P. granatum* has gained attention for the treatment of oral cavity diseases. Due to its antifungal action, it has been shown that *P. granatum* bark extract could be recommended in denture stomatitis treatment[13].

### **Melaleuca Alternifolia:**

*M. alternifolia*, also known as tea tree oil, is a multipurpose medicinal herb whose essential oil can be obtained from its leaves by steam distillation. Such a compound has shown promising effect as a topical antifungal agent in the treatment of dandruff, acne and oral candidosis[13].

### **Ricinus Communis:**

*R. communis* is a plant that presents tissue biocompatibility, as well as bactericidal and antifungal properties. Dental studies have used castor oil as a root canal irrigating solution, toothbrush for complete dentures, mouthwash in denture stomatitis treatment and as a sanitizer[13].

### **Non-pharmacological Management Of Denture Stomatitis**

All these methods are used when the patient fails to maintain denture hygiene as instructed by its clinician or the disinfectants are not used properly or the pharmacological management of denture stomatitis is not able to yield satisfactory results.

### **Ozone therapy :**

Ozone treatment has been used for many medical and dental purposes. Its benefits come from its analgesic characteristics and abilities to encourage blood circulation and activate immune response, and its potent antimicrobial function. Furthermore, it is a potent oxidant and a rich source of free radicals that have the capability to change or degrade materials [16].

### **Technique of using ozone :**

Ozone gas is applied to the traumatic ulcers for 60 seconds. Ozone gas is produced by an ozone-generating machine at 2350 ppm concentration and a flow rate of 615 mL/min.

### **Laser therapy or photodynamic therapy :**

Low-level laser therapy (LLLT) and photodynamic antimicrobial therapy (PDT) with different wavelengths or photosensitive dyes are contemporary methods. As most denture stomatitis lesions are caused by superficial candidiasis, they are typically accessible by laser photons. The paramount benefit of using LLLT or PDT, unlike topical or systemic treatments, is that there is no need to maintain a high level of drug dose [17].

Er,Cr:YSGG laser irradiation is also used in reducing pain and on the healing rate of denture-induced mucosal ulcerations [18].

### **Non-surgical Approach To Treat Aggressive Inflammatory Papillary Hyperplasia:**

Inflammatory papillary hyperplasia has characteristically been described as a lesion of the mucosa. The lesion almost exclusively involves the hard palate, specifically the vault of the palate, and occasionally extends to the mucosa of the residual ridges. The lesions are typically painless, firm, pink or red, and nodular in proliferation, and they may vary from small localized projections of the palate to large multiple papillary lesions [19].

### **Surgical Management of Inflammatory Papillary Hyperplasia:**

Inflammatory papillary hyperplasia of the palatal mucosa almost invariably has been associated with an ill-fitting removable prosthesis which generally failed to exhibit adequate occlusal balance. In the case of partial prostheses, occlusal rest support achieved from the remaining natural teeth was inadequate or nonexistent [6].

### **Electrosurgery:**

Surgery is an important part in the treatment of inflammatory papillary hyperplasia of the palate. However, today there is no simple surgical method and instrument evaluated which permit rational handling and an uncomplicated postsurgical course. Guernsey described two methods for surgical treatment of inflammatory papillary hyperplasia. One of them was complete excision of the palatal mucosa, including the periosteum. This treatment required an extended healing period varying from 6 to 9 weeks. The extensive exposure of palatal bone to saliva and to the micro-organisms in the oral cavity tended to cause pain and infections. The other method described by Guernsey was electrosurgery in combination with the use of different surgical

### **Resective surgery to remove Inflammatory papillary hyperplasia:**

In cases with inflammatory papillary hyperplasia, the inflammatory reaction of the mucosa may disappear after hygienic, nutritional and prosthetic treatment, but the papillary outgrowths persist. However, the papillary hyperplastic palatal mucosa usually becomes reinfected, as debris and microorganisms are retained in the deep folds between the papillae. Complete removal of the papillary hyperplasia is therefore necessary. Guernsey described two methods for surgical treatment of inflammatory papillary hyperplasia. One of them was complete excision of the palatal mucosa, including the periosteum. This treatment required an extended healing period varying from 6 to 9 weeks. The extensive exposure of palatal bone to saliva and to the micro-organisms in the oral cavity tended to cause pain and infections. The other method described by Guernsey was electrosurgery in combination with the use of different surgical dressings. Surgery is an important part in the treatment of inflammatory papillary hyperplasia of the palate. However, today there is no simple surgical method and instrument evaluated which permit rational handling and an uncomplicated postsurgical course [20].

### **Cryosurgery:**

Cryosurgery is an effective, painless method for the removal of inflammatory papillary hyperplasia. It requires no local anesthetic, and there is no offensive odor or postoperative or operative bleeding. The method is attended by little postoperative discomfort. Total healing occurs from 3 to 5 weeks postoperatively. The palatal mucosa has a normal appearance and is soft and non-tender [9].

## Conclusion:

Denture Stomatitis is a common but treatable infection. Prevention involves a thorough exam on every patient that visits to detect the early signs of stomatitis and more serious conditions, starting from minor irritation or inflammation up to initial cancerous lesions. Cleaning the dentures is essential for all denture wearers. However, it is even more crucial for patients using an upper denture with the large area of the maxilla covered by the prosthesis. Foods can accumulate between the denture and palate and not get cleaned. So, oral hygiene, and proper care and cleaning are very important. We can recommend the following patient instructions for treating and preventing stomatitis:

- Maintaining a good foundation of oral hygiene to keep the denture as clean as possible,
- Rinsing mouth and denture after meals,
- Stopping smoking because it encourages the microorganisms to grow,
- Leaving dentures out of their mouth overnight in disinfectants like chlorhexidine,
- Brushing and soaking dentures every day. Cleaning with a non-abrasive denture cleaner rather than a toothpaste to avoid creating grooves in the surface that can collect bacteria within them,
- Following the manufacturers' instructions for the cleaning solutions,
- Avoiding bleach for dentures with metal parts

If it's too late for prevention, once detected, there are multiple ways to address stomatitis and manage it. The first line of treatment, you can use a variety of different medications and solutions that can treat the condition such as nystatin, amphotericin B,azole drugs such as ketoconazole, fluconazole, itraconazole either in capsule form or solution as well as miconazole that can be used as a gel or varnish. Also we can opt for natural products such as propolis, geranium olive oil, tea tree oil and others. If drug therapy fails to manage denture stomatitis, then we can opt for surgical management such as resective surgery, electrosurgery or cryosurgery.

## References:

1. Gade J, Pawar VS, Singh N. Review on Denture Stomatitis: Classification, clinical features and treatment. *J Appl Dent Med Sci* 2015;14(12):114-22.
2. Theilade E and Joegensen EB. Predominant cultivable microflora of plaque on removable dentures in patients with denture induced-stomatitis. *Oral Microbiol Immunol* 1988;3(1):8-13.
3. Duyck J, Vandamme K, Muller P and Teughels W. Overnight storage of removable dentures in alkaline peroxide-based tablets affects biofilm mass and composition. *J Dent* 2013;41(12):1281-9.
4. Axe AS, Varghese R, Bosma M, Kitson N and Bradshaw DJ. Dental health professional recommendation and consumer habits in denture cleansing. *J Prosthet Dent* 2016;115(2):183-8.
5. Samaranyake LP, McCourtie J and MacFarlane TW. Factors affecting the in-vitro adherence of *Candida albicans* to acrylic surfaces. *Arch Oral Biol* 1980;25(8-9): 611-5.
6. Nikawa H, Iwanaga H, Hamada T and Yuhta S. Effects of denture cleansers on direct soft denture lining materials. *J Prosthet Dent* 1994;72(6):657-62.
7. Liu T et al. Effects of trimethylsilane plasma coating on the hydrophobicity of denture base resin and adhesion of *Candida albicans* on resin surfaces. *J Prosthet Dent* 2017;118(6):765-70.
8. Chow CKW, Miiteai W, Lawrence HP. Efficacy of antifungal agents in tissue conditioners in treating candidiasis. *Gerodontology* 1999;16(2):110-8.
9. Zuluaga DJM, Velandia OCG and Clauijo DMR. Denture-related stomatitis managed with tissue conditioner and hard autopolymerising reline material. *Gerodontology* 2010;28(4):258-63.
10. Lamb DJ and Douglas CWI. Treatment of denture stomatitis by a sustained drug-delivery device: a preliminary study. *J Dent* 1988;16(5):219-21.
11. Sugio CYC et al. Use Of Natural Products In The Prevention And Treatment Of Denture Stomatitis. *Open Acc J Bio Sci* 2020;1(5):201-6.
12. 47. Geckili O, Bektas-Kayhan, K, Eren P, Bilgin T and Unur M. The efficacy of a topical gel with triester glycerol oxide in denture-related mucosal injuries. *Gerodontology* 2011;29(2): 715-20.
13. Jivanescu A, Borgnakke WS, Goguta L, Erimescu R, Shapira L and Bratu E. Effects of a Hydrogel Patch on Denture-Related Traumatic Ulcers; an Exploratory Study. *J Prosthet Dent* 2014;24(2):109-14.
14. AlZarea BK. Management of denture-related traumatic ulcers using ozone. *J Prosthet Dent* 2019;121(1):76-82.



15. Davoudi A, Ebadian B and Nosouhian S. Role of laser or photodynamic therapy in treatment of denture stomatitis: A systematic review. *J Prosthet Dent* 2018;120(4):498-505.
16. Marei MK, Abdel-Meguid SH, Mokhtar SA and Rizk SA. Effect of low-energy laser application in the treatment of denture-induced mucosal lesions. *J Prosthet Dent* 1997;77(3):256–64.
17. .Orenstein NP and Taylor T. A 15.Jivanescu A, Borgnakke WS, Goguta L, Erimescu R, Shapira L and Bratu E. Effects of a Hydrogel Patch on Denture-Related Traumatic Ulcers; an Exploratory Study. *J Prosthet Dent* 2014;24(2):109–14aggressive inflammatory papillary hyperplasia: A clinical report. *J Prosthet Dent* 2014;111(4):264–8.
- 18 .Amaral WJ, Frost JR, Howard WR and Cheatham JL. Cryosurgery in treatment of inflammatory papillary hyperplasia. *Oral Surg, Oral Med, Oral Pathol* 1968;25(4):648–54.