

DENTURE RELATED STOMATITIS

Definition

Denture-related stomatitis indicates an inflammatory process of the mucosa that bears a complete or partial removable dental appliance, typically a denture.

Since it was described as “sore mouth under plates”, several terms have been used in the past to define this condition: “chronic denture palatitis”, “stomatitis prothetica”, “denture related candidiasis” “denture-induced stomatitis” and “denture stomatitis”. The classical expression “denture sore mouth” is being abandoned as most patients show asymptomatic lesions.

Nowadays, “denture stomatitis” stands for a mild chronic erythematous candidiasis, usually seen after middle age as erythema limited to the area beneath an upper denture, with the presence of the denture as the only common etiologic factor to these situations. It is not caused by allergy to the denture material.

Epidemiology

Denture stomatitis is a common condition: findings from several studies suggest that it can affect as many as 35-50% of persons who wear complete dentures. The prevalence of denture stomatitis among those wearing partial dentures is markedly lower than among complete denture wearers, whose rank goes from 10% to 70% depending on the population studied.

No racial or sex predilection exists, although some authors have described a higher prevalence among women.

This disorder is more frequent among elderly people, as they are more likely to wear removable dentures. However, there are reports that could not prove significant differences in the prevalence according to the age of the subject. Paradoxically, several authors have described a significant fall in the prevalence of denture stomatitis in older patients. The highest prevalence, though, has been reported in aged people, especially those living in nursing facilities.

Clinical presentation

Denture stomatitis lesions may show different clinical patterns, and are more frequently found in the upper jaw, especially on the palate. The absence of denture stomatitis in the lower jaw is probably due to the washing action of saliva.

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.

Staging 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:

Newton's type I: pin-point hyperaemic lesions (localized simple inflammation) (Fig.1)

Newton's type II: diffuse erythema confined to the mucosa contacting the denture (generalized simple inflammation) (Fig.2)

Newton's type III: granular surface (inflammatory papillary hyperplasia) (Fig.3).

Related disorders:

Denture stomatitis can occasionally be associated with different lesions of fungal origin such as angular cheilitis, median rhomboid glossitis and candidal leukoplakia.

Aetiopathogenesis

The aetiology is best considered multifactorial, but denture wearing, especially when worn during the night, represents the major causative factor.

Among the aetiological factors that should be considered are:

1. Prosthetic factors

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

1. Systemic factors

- a. Physiological. (advanced age)
- b. Endocrine dysfunctions.
- c. Nutritional deficiencies.
- d. Neoplasias.
- e. Immunosuppression.
- f. Ample spectrum antibiotics.

2. 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 such as imprint cultures may also be applied.

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 candidosis, 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 of hygienic measures, ease 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.

Prevention

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 caregivers, 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



Figure 1. Newton's type I stage showing hyperaemic foci



Figure 2. Newton's type II stage showing diffuse erythema confined to the mucosa contacting the denture.



Figure 3. Granular type of stomatitis (Newton's type III).

Further reading

- 1 Barbeau J, Seguin J, Goulet JP, de Koninck L, Avon SL, Lalonde B, Rompre P, Deslauriers N. Reassessing the presence of *Candida albicans* in denture-related stomatitis. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2003; 95:51-9.
- 2 Frenkel H, Harvey I, Newcombe RG. Improving oral health in institutionalised elderly people by educating caregivers: a randomised controlled trial. *Community Dent Oral Epidemiol.* 2001; 29:289-97.
- 3 Chandra J, Mukherjee PK, Leidich SD, Faddoul FF, Hoyer LL, Douglas LJ, Ghannoum MA Antifungal resistance of candidal biofilms formed on denture acrylic in vitro. *J Dent Res* 2001; 80:903-8.
- 4 Fenlon MR, Sherriff M, Walter JD Factors associated with the presence of denture related stomatitis in complete denture wearers: a preliminary investigation. *Eur J Prosthodont Restor Dent.* 1998; 6:145-7.
- 5 Wilson J. The aetiology, diagnosis and management of denture stomatitis. *Br Dent J.* 1998; 185:380-4.

Links

www.emedicine.com/derm/topic642.htm

www.dentalhealth.org.uk/faqs/leafletdetail.php?LeafletID=12

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