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Denture Stomatitis

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Updated: Feb 18, 2009

Introduction

Background

Denture stomatitis is a common oral mucosal lesion in the United States and Western Europe. Prevalence rates of 2.5-18.3% in adults aged 35-44 years or 65-74 years are reported, with a predominance in the latter age group.^{1,2} Although patient age and denture quality alone do not predispose individuals this mucosal condition, the odds of developing stomatitis, denture-related hyperplasia, and angular cheilitis are increased almost 3-fold in denture wearers.³ Studies indicate that correlations may exist with the amount of tissue coverage by a maxillary denture, vitamin A levels, smoking of cigarettes, and not removing dentures.⁴

Pathophysiology

Mucosal factors have been implicated in the etiology of this condition, as have behavioral and manner-of-use factors in patients who wear complete dentures. In these patients, the nighttime wear of the prosthetic appliance is the most significant factor.⁵

Although the dominant etiologic factor now appears to be fungal infection, other factors must be considered; these include the prosthetic device itself and also local and systemic factors in patients who are aging and edentulous. The extent of inflammation has been correlated with the presence of yeast colonizing the denture surface.⁶ Trauma has been shown to have a role in the production of basement membrane alterations involving expression of type IV collagen and laminin (alpha 1), thus indicating a possible relationship between these elements and denture stomatitis.⁷ Regarding the prosthesis-related factor, an allergy in the form of contact mucositis is suggested. This reaction may be related to the presence of resin monomers, hydroquinone peroxide, dimethyl-*p*-toluidine, or methacrylate in the denture. Furthermore, contact sensitivities such as this one are more common with cold or autocured resins than with heat-cured denture-base materials.

Candida species have been identified in most patients^{8,9} or in all patients,¹⁰ with *Candida albicans* being the predominant species isolated in addition to many other candidal species.¹¹ Whether the organism is merely commensal in this situation remains an issue because of the frequency of such organisms in the general population; the role of this organism as the sole etiologic factor in denture stomatitis is unclear; however, the presence of candidal organisms within the overall biofilm lends credence to its role in the development and maintenance of denture stomatitis.¹² The etiology is best considered multifactorial, with the prosthesis considered the prime etiologic factor. The character of biofilm communities of denture wearers, however, has been shown to be distinctive when

compared with healthy non – denture-wearing individuals.¹³

Related eMedicine articles include Noncandidal Fungal Infections of the Mouth and Candidiasis, Mucosal.

Frequency

United States

The exact prevalence of denture stomatitis is unknown, but it appears to be 2.5-18.3% among adults. The disease is common in elderly persons, especially those living in nursing home facilities. Findings from several studies suggest that denture stomatitis develops in as many as 35-50% of persons who wear complete dentures.^{14,15}

International

Denture stomatitis is a common oral mucosal lesion in Western Europe, Thailand, and Turkey.^{16,17}

Race

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Although the dominant etiologic factor now appears to be fungal infection, other factors must be considered; these include the prosthetic device itself and also local and systemic factors in patients who are aging and edentulous. The extent of inflammation has been correlated with the presence of yeast colonizing the denture surface.⁶ Trauma has been shown to have a role in the production of basement membrane alterations involving expression of type IV collagen and laminin (alpha 1), thus indicating a possible relationship between these elements and denture stomatitis.⁷ Regarding the prosthesis-related factor, an allergy in the form of contact mucositis is suggested. This reaction may be related to the presence of resin monomers, hydroquinone peroxide, dimethyl-*p*-toluidine, or methacrylate in the denture. Furthermore, contact sensitivities such as this one are more common with cold or autocured resins than with heat-cured denture-base materials.

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International

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Race

No racial predilection is recognized.

Sex

Sex-related frequencies differ among studies; therefore, no clear sex predilection is apparent.

Age

The disease is more common in elderly persons than in young persons because elderly persons are more likely to wear dentures and because their level of oral and denture hygiene is reduced. In addition, age-related chronic disease (eg, type 2 diabetes mellitus), iatrogenic drugs, and age-associated immunocompromise contribute to this risk level.

Clinical

History

- Denture stomatitis usually occurs in a patient who wears a complete maxillary denture or a partial denture. The presence of deteriorating temporary soft denture lining material and an improperly matched cleanser (which generally is the case) is associated with an increased presence of candidal organisms within the biofilm.¹⁸
- In almost all patients, the duration of the lesion is usually unknown because of its asymptomatic nature.
- On rare occasions, patients may complain of slight bleeding and swelling in the involved area, as well as a burning sensation, a xerostomialike quality, or cacogeusia.¹⁹

Physical

- Although symptoms are uncommon, the clinical presentation of erythema and edema in the part of the palatal mucosa covered by the denture base is a diagnostic finding. Intense erythema is the most common finding.
- At times, an obvious fungal infection in the form of white surface colonies or plaques may be observed on the mucosal surface.
- Variably intense erythema, which may also be associated with scattered petechiae, is distributed over the mucosa covered by the base of the denture but not beyond.
- Palpation of the involved mucosa reveals no tenderness or tissue friability.
- The severity of denture stomatitis can vary (see Staging).

Causes

See Pathophysiology.

Differential Diagnoses

Cancers of the Oral Mucosa

Contact Stomatitis

Oral Manifestations of Autoimmune Blistering Diseases

Oral Manifestations of Systemic Diseases

Workup

Laboratory Studies

- A smear of the fungal material from the mucosa can be prepared and studied by using a potassium hydroxide (KOH) preparation or periodic acid-Schiff staining in the laboratory.
- Other methods of identifying fungal organisms involve the use of imprint cultures.²⁰

Histologic Findings

- Inflammatory papillary epithelial hyperplasia (IPEH) is not associated with cytologic signs of dysplasia.
- Epithelial dysplasia has not been observed in specimens of denture stomatitis.

Staging

- The level of denture stomatitis can be classified as follows²¹ :

- Type I - Pinpoint hyperemia or localized simple inflammation
- Type II - Diffuse erythema confined to the mucosa in contact with the denture base (see Media file 1)
- Type III - Granular surface or inflammatory papillary hyperplasia of the palate (see Media file 2)
- Type III denture stomatitis involves the epithelial response to chronic inflammatory stimulation secondary to yeast colonization and, possibly, low-grade local trauma resulting from an ill-fitting denture.

Treatment

Medical Care

Mechanical plaque control and appropriate denture-wearing habits are the most important measures in preventing and treating the disease. Also, denture sanitization is an important element in the treatment of denture stomatitis.

Despite the absence of symptoms, patients with advanced, chronic, or previously untreated cases must be treated because of the risk of papillary epithelial hyperplasia. IPEH usually needs to be surgically removed before the denture is emplaced or relined. In mild cases of IPEH, antifungal treatment without surgery might be an alternative before the dentures are relined or replaced.

- In the absence of papillary hyperplasia, verify denture-base adaptation to the alveolar and palatal mucosal surfaces and identify and correct occlusal disharmonies, vertical dimension, and centric position.
 - Scrupulous denture hygiene is mandatory, with daily thorough brushing. The dentures should be soaked overnight in an antiseptic solution such as chlorhexidine or dilute sodium hypochlorite (10 drops of household bleach in a denture cup or container filled with tap water). If the denture base contains metal, the patient should avoid using hypochlorite because it causes metal to tarnish.
 - Another benefit of the regimen of overnight denture soaking is that the patients must remove their dentures for a prolonged period. Removal of the denture minimizes additional irritation and is a cornerstone of treatment.
- Initiate antifungal therapy if fungal organisms are identified or if the condition fails to resolve even with the regimen described above.
 - Topical therapy is the first-line treatment.
 - The use of clotrimazole or nystatin lozenges and/or pastilles, with the denture removed from the mouth, is recommended.
 - The application of antifungal agents (eg, nystatin powder or cream) on the tissue-contacting surface of the denture is also recommended.
 - Combine topical medical treatment with proper care of the denture, as described above.
- In cases that fail to respond to the usual treatments, consider the role of systemic disease and its impact on oral function and homeostasis.
 - Chief among the systemic conditions that may affect denture stomatitis is type 2 diabetes mellitus. In patients with type 2 diabetes mellitus, the number of candidal organisms that adhere to the palatal epithelial cells is significantly increased; this finding supports the notion that this form of diabetes predisposes patients to *Candida*-associated denture stomatitis. However, a recent study group suggested that reduced resistance to candidal organisms present before the development of type 2 diabetes mellitus is related to denture stomatitis.²²
 - Other conditions that may need to be excluded include cellular immunodeficiency and humoral immunologic disorders, HIV infection, hypothyroidism, poor diet, and iatrogenic drug use.²³

Surgical Care

IPEH should usually be surgically removed before the denture is relined.

Medication

The goals of pharmacotherapy are to eradicate the infection, reduce morbidity, and prevent complications.

Antifungal agents

Mechanism of action usually involves inhibiting pathways (enzymes, substrates, transport) necessary for sterol/cell membrane synthesis or altering the permeability of the cell membrane (polyenes) of the fungal cell. It may also involve an alteration of RNA and DNA metabolism or an intracellular accumulation of peroxide that is toxic to the fungal cell.

Clotrimazole (Mycelex Troches)

Broad-spectrum antifungal agent that inhibits yeast growth by altering cell membrane permeability, causing fungal cells to die.

Dosing

Adult

Remove denture from mouth; dissolve 10-mg troche orally 5 times/d

Pediatric

<3 years: Not established

>3 years: Administer as in adults

Interactions

None reported

Contraindications

Documented hypersensitivity

Precautions

Pregnancy

C - Fetal risk revealed in studies in animals but not established or not studied in humans; may use if benefits outweigh risk to fetus

Precautions

Not for treatment of systemic fungal infections; avoid contact with eyes; if irritation or sensitivity develops, discontinue and initiate appropriate therapy

Nystatin (Mycostatin Pastilles, Nystatin)

Fungicidal and fungistatic antibiotic obtained from *Streptomyces noursei*; effective against various yeasts and yeastlike fungi. Changes permeability of fungal cell membrane after binding to cell membrane sterols, causing cellular contents to leak. Treatment should continue until 48 h after symptoms disappear. Reevaluate after 14 days of treatment if no improvement. Drug is not significantly absorbed from GI tract.

Dosing

Adult

Remove denture from mouth

Pastilles: Slowly dissolve 200,000-400,000 U (1-2 pastilles) 4-5 times/d

Oral susp: 400,000-600,000 U PO swish and swallow qid

Pediatric

Administer as in adults

Interactions

None reported

Contraindications

Documented hypersensitivity

Precautions

Pregnancy

C - Fetal risk revealed in studies in animals but not established or not studied in humans; may use if benefits outweigh risk to fetus

Precautions

Patients should not chew or swallow pastilles whole; pastilles should be allowed to dissolve slowly in the mouth; if irritation or sensitivity develops, discontinue and initiate appropriate therapy

Follow-up

Deterrence/Prevention

- Denture sanitization is an important element in the treatment of denture stomatitis and should be emphasized to the patients.
- The 6-month incidence of denture stomatitis can be significantly reduced by educating nursing home caregivers about oral health care.
- The incidence of denture stomatitis and the duration of denture wear are highly correlated. Dentists can help prevent this condition by instructing patients to take their dentures out of their mouth for 6-8 hours each day.
- Mechanical plaque control and appropriate denture-wearing habits are the most important measures in preventing and treating the disease.

Complications

- IPEH has never been reported to undergo malignant transformation.

Prognosis

- In most patients, the elimination of mechanical and traumatic factors, the consistent use of oral hygiene measures, and the administration of local antimycotic therapy usually enables the inflammatory lesions to heal rapidly.
- Recurrences are common when exacerbating factors are reintroduced.

Patient Education

- The need for an educational component in a preventive oral health care program in geriatric institutions is unmet.²⁴
 - Dental professionals who work with geriatric patients should address this need by implementing a preventive oral health care program.
 - Such programs should include not only patient examinations and preventive care but also education for allied health care professionals and members of the patient's family.
- Patients should be taught how to properly wear and sanitize their dentures and about how to perform good oral hygiene (see Deterrence/Prevention).

Miscellaneous

Medicolegal Pitfalls

- Many practitioners encounter patients who continue to have difficulty adapting, even with newly fabricated complete dentures.
- In most instances, patients with complete dentures present with complaints only when a real design fault or a tissue problem exists.

Multimedia



Media file 1: A variably intense erythema distributed over the part of the mucosa covered by the denture base is diagnostic of denture stomatitis.



Media file 2: When untreated and chronic, papillary epithelial hyperplasia may develop. This may need to be surgically removed before the denture is replaced or relined.

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