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Case Report

Pseudomembranous candidiasis in patient wearing full denture

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ABSTRACT

Background: *Oral candidiasis is a common opportunistic infection of the oral cavity caused by an overgrowth of Candida species, the commonest being Candida albicans. Candida albicans is a harmless commensal organism inhabiting the mouths but it can change into pathogen and invade tissue and cause acute and chronic disease. Dentures predispose to infection with Candida in as many as 65% of elderly people wearing full upper dentures.* ***Purpose:*** *The purpose of this case report is to discuss thrush in patient wearing full denture which rapidly developed.* ***Case:*** *This paper report a case of 57 year-old man who came to the Oral Medicine Clinic Faculty of Dentistry Airlangga University with clinical appearance of pseudomembranous candidiasis (thrush).* ***Case Management:*** *Diagnosis of this case is confirmed with microbiology examination. Patient was wearing full upper dentures, and from anamnesis known that patient wearing denture for 24 hours and he had poor oral hygiene. Patient was treated with topical (nystatin oral suspension and miconazole oral gel) and systemic (ketoconazole) antifungal. Patient also instructed not to wear his denture and cleaned white pseudomembrane on his mouth with soft toothbrush.* ***Conclusion:*** *Denture, habit of wearing denture for 24 hours, and poor oral hygiene are predisposing factors of thrush and it can healed completely after treated with topical and systemic antifungal.*

Key words: *thrush, Candida albicans, denture, poor oral hygiene*

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INTRODUCTION

Candidiasis is a common opportunistic oral *Candida* infection that develops in the presence of one of several predisposing conditions.[1] Candidiasis is caused by an overgrowth of the superficial fungus *Candida albicans (C. albicans).*[2] *C. albicans* is a commensal organism residing in the oral cavity in a majority of healthy persons.[1]

Oral candidiasis (OC) has been arranged into two classification categories. Primary OC is confined to oral or perioral tissues. These are sub classified as: acute: pseudomembranous and erythematous; chronic: pseudomembranous, erythematous and hyperplastic; and *Candida*-associated lesion (denture-induced stomatitis, angular cheilitis, and median rhomboid glossitis.[3–4] Secondary OC is an oral manifestation of a generalized systemic mucocutaneous candidal infection, subdivided based on various immunological disease etiologies includes chronic mucocutaneous and *Candida*-endocrinopathy syndrome.[3–5]

Pseudomembranous candidiasis (thrush) is the most common form of candidiasis.[1] Thrush forms soft, friable, and creamy plaques on the mucosa that can be wiped off, leaving a red, raw or bleeding, and painful surface. The buccal mucosa, palate, and tongue are common location.[2] The lesions may involve the entire oral mucosa or relatively localized areas where normal cleansing mechanisms are poor.[6] The pseudomembrane consists of a network of candidal hyphae containing desquamated cells, microorganisms, fibrin, inflammatory cells, and debris.[3] Diagnosis of thrush is usually based on clinical criteria. Direct smear microscopic examination with potassium hydroxide and culture are helpful.[5]

Thrush predominantly occurs in middle-aged or older persons.[7] *Candida* infection is also found commonly in denture wearer.[8] One study found 63.1% of adults were asymptomatic carriers of *C. albicans*, with the occurrence of thrush at 64.8% in adults and 66.7% in adults with dentures. Non-retentive denture, poor oral hygiene, constant irritation by a prosthesis, higher salivary yeast counts, and adherence of *C. albicans* to denture base may explain the higher occurrence of thrush in patient who wear denture.[4]

Oral candidiasis (OC) that usually occurred in denture wearer is chronic atrophic candidiasis or denture stomatitis which characterized by chronic erythema and edema of the mucosa that contacts the fitting surface of the denture.[7] However, in this case report, a patient whose wearing denture had thrush that rapidly developed on almost all over his oral mucosa. It is thought that thrush is caused by several predisposing factors of OC, such as wearing full denture, wearing denture for 24 hours, and poor oral hygiene.

The purpose of this case report is to discuss thrush in patient wearing full denture which rapidly developed.

CASE

On April 1st 2008, a 57-years-old male patient came to Oral Medicine Department, Faculty of Dentistry, Airlangga University with almost all over his oral mucosa covered by white patches. According to anamnesis known on March 26th 2008, the patient came to Prosthodontics Department to make lower denture. In intra oral examination was found white lesion on lower edentulous ridge with clinical diagnosis was chronic hyperplastic Candidiasis, the patient then referred to Oral Medicine Department. Since 3 days ago this patch developed in almost all over his oral mucosa and painful. Patient then came to Community Health Service and was given several drugs including amoxicillin, methampyrone, and vitamin B, but the patient did not take the drugs. Patient has been wearing full upper denture since 4 months ago. Since the patient wear denture, he used to wear this denture for 24 hours. Patient cleaned his denture with toothbrush. Since 1 month ago, patient had sore throat. Patient visited Tambak Rejo Hospital and was given several drugs, including ambroxol.

Patient's general condition was thin and weak because since he had sore throat about a month ago he only drunk milk and not ate other food. In dental history known that patient wear full upper denture since 4 month ago. Patient had smoking habit. There's no known disorder in patient's medical history and family history. Extra oral examination showed chronic lymphadenitis on the right and left submandibular glands.

In intra oral appeared white, elevated, pseudomembrane that can be wiped off on almost all over oral mucosa (Figure 1).

Figure 1. Visit I: white pseudomembrane on almost all over oral mucosa.

CASE MANAGEMENT

From anamnesis and clinical examination at first visit (April 1st, 2008), clinical diagnosis of this case was thrush. The patient refused to do complete blood examination, because he just had complete blood examination for hemorrhoid operation which is scheduled on April 3rd 2008, and the result of the complete blood examination was normal. The patient was treated with chlorhexidine mouthwash 2 times/day, nystatin oral suspension 2 times/day, miconazole oral gel 2 times/day, ketoconazole tablet 200 mg 2 times/day, vitamin C 100 mg 2 times/day, and vitamin B complex 100 mg 2 times/day, for 14 days. Patient instructed not to wear his denture and cleaned white pseudomembrane on his mouth with soft toothbrush.

According to anamnesis two days later (April 3rd, 2008), the pain is greatly reduced and patient already ate solid food. Right and left submandibular glands are normal. In intra oral appeared thin and discrete white pseudomembrane on several part of oral mucosa (Figure 2A–G). On hard palate appeared erythematous patch (Figure 2H).

Swab was done on lateral surface of the tongue and lower labial fold for microbiology examination. Patient was instructed to continue the treatment. From anamnesis 5 days later (April 8th, 2008) known that there's no more pain. Intra orally, all white pseudomembrane was gone, except on lateral surface of the tongue there was white spots on filiform papilla (Figure 3). Microbiology examination result found *Candida* colony. Patient was instructed to continue the treatment, but ketoconazole dose was reduced into 200 mg 1 time/day.

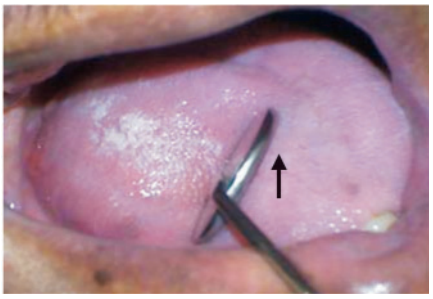

Figure 3. White spots on filliform papilla (arrow). All pseudomembrane had healed (8th day).

One week later (April 15th 2008), there was no pain anymore. Intra oral examination showed white spot on filiform papilla that can not be wiped off. The lesion was clinically diagnosed as hairy tongue (Figure 4). The treatment was stopped. Patient was instructed to maintain the oral and denture hygiene, and take off the denture at night.

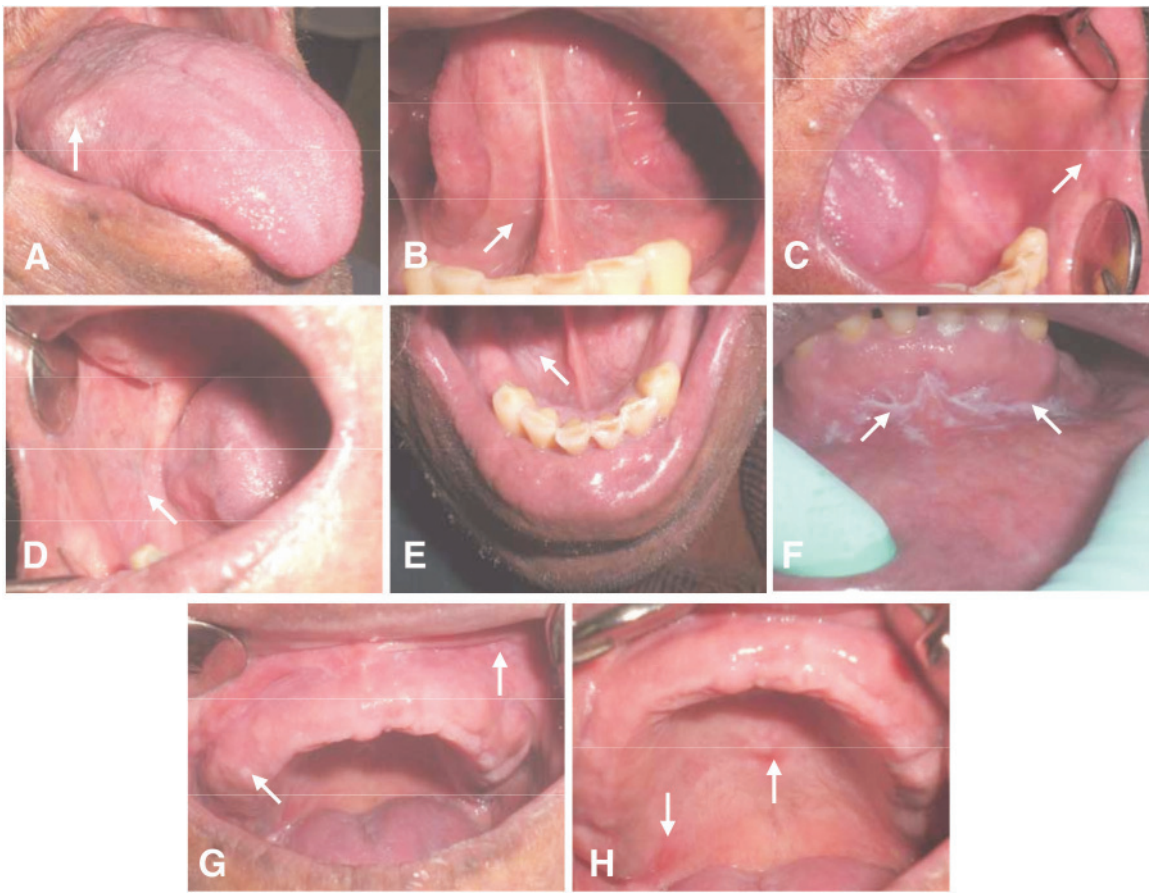

Figure 2. Visit II (3rd day), white pseudomembranous only seen on several part of oral mucosa and erythematous patch on hard palate (arrow).

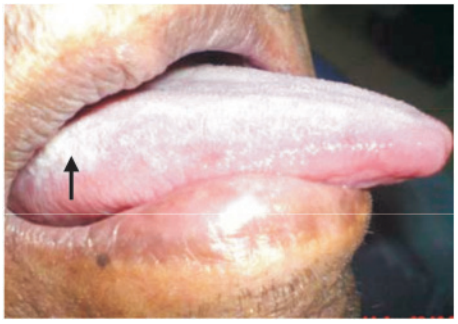

Figure 4. White spot on filiform papilla (arrow) was clinically diagnosed as *hairy tongue*.

DISCUSSION

Prevalence, characteristic appearance, and ease of removal of the lesions makes thrush easily recognized, and a diagnosis of thrush is frequently made based on the appearance of the lesion.[6] Taking a history followed by a thorough examination of the mouth, at the soft and hard palate, and examining the buccal mucosa in those wearing dentures after they have been removed are usually good starting points.[9]

Diagnosis can be confirmed microbiologically either by staining a smear from the affected area with periodic acid-Schiff (PAS) stain, Gridley stain, or Gomori methenamine silver (GMS) stain or by culturing a swab from an oral rinse.[7,9] Culture *Candida* using a Sabouraud's agar slant was done to aid in the definitive identification of the fungal organism.[10]

This case was diagnosed based on clinical features, which characterized of thrush that is white creamy pseudomembrane (patch) that can be wiped off and leaving erythematous base. Diagnosis of this case was confirmed with microbiology examination through *swab* and culture using Sabouraud's agar. *Candida* colony was found in microbiology examination.

Predisposing factors is so important in the etiology of Candidiasis that it is extremely rare to find a case of OC in which one or more of these factors cannot be identified. A diagnosis of thrush should always be followed by a search for a possible undiagnosed medical disorder, a review of patient's medications, and some locally acting predisposing factor such as denture.[6]

According to Neville, *et al. cit*. Firriolo[10] there are three general factors that may lead to clinically evident OC. These factors are: immune status of the host; oral mucosal environment; and particular strain of *C. albicans* (the hyphal form is usually associated with pathogenic infection). Factors that alter immune status of the host are blood dyscrasias or advanced malignancy, old age or infancy, radiation therapy or chemotherapy, and HIV infection or other immunodeficiency disorders, endocrine abnormalities (such as diabetes mellitus, hypothyroidism, hypoparathyroidism, pregnancy, corticosteroid therapy or hypoadrenalism). Factors that alter oral mucosal environment are xerostomia, antibiotic therapy, poor oral or denture hygiene, malnutrition or gastrointestinal malabsorption, iron, folic acid, or vitamin deficiencies, acidic saliva or carbohydrate-rich diets, heavy smoking, and oral epithelial dysplasia. The yeast form of *C. albicans* is believed to be relatively innocuous, this is associated with the fact that *Candida* is poorly equipped to invade and destroy tissue, but the hyphal form is usually associated with invasion of host tissue.[6] Few *Candida* hyphae are associated with the atrophic epithelium in erythematous candidiasis, whereas numerous organisms are found invading the prickle cell layer of oral epithelium in pseudomembranous candidiasis. *C. albicans* is a polymorphic organism which undergoes morphological transition among yeast, pseudohyphal, and hyphal forms. All three morphogenetic forms of *C. albicans* are frequently encountered in the oral mucosa, and, in most oral infections, both yeast and filamentous organisms can be found in the infected tissues. However, clinicopathologic findings have correlated the presence of filamentous forms with localized tissue invasion in oral candidiasis.

The transition from commensalism to infection in the oral mucosa is dictated by changes in the local oral microenvironment (breach of mucosal integrity, qualitative or quantitative shifts in oral microbial flora), or by an inadequate host defense, which results in overgrowth of the organism. In oral mucosal infections, *C. albicans* organisms colonize the outermost layers of epithelium, rarely invading past the spinous cell layer. It is well recognized that the epithelial cells is an infection barrier against *Candida.*[11] A major pathogenicity mechanism of candida is its adherence capacity to the host cell. Adherence capacity depends on several factors, such as the hydrophobic state of the fungal cell wall and the characteristics of the substrate surface. The expression of cellular surface hydrophobicity of *C. albicans* is a dynamic process on which the culture conditions have a fundamental influence.[12]

In this patient found several factors that can contribute for OC, which is denture, poor oral hygiene, and smoking habit. Denture wearing, poor oral hygiene, smoking habit, and habit of wearing denture for 24 hours makes thrush develop rapidly.

Candida-associated denture stomatitis is a recalcitrant disease in some 60% of otherwise healthy denture wearers.[13] Denture wearers are predisposed to the development of candida colonization, candidiasis, and presence of candida. It is observed that denture base composition influences significantly in the adhesion of *Candida* to denture.[14] The surface irregularities of acrylic resin is a factor in the entrapment of microorganisms, especially *C. albicans*.[8] Microbial plaque accumulation on the base surface of removable dentures plays a critical role, promoting a switch from a commensal to a pathogenic oral flora. The denture-palatal interface offers a unique ecological niche for microorganism colonization because of the relatively anaerobic and acidic environment favoring yeast proliferation.[15] The isolated *Candida* associated with dentures are related to the poor hygienic condition of the

dentures, to the long time of the usage, wearing dentures at night and to the modifications of the hard supporting tissues.[8] Some studies have reported that smoking significantly increased carriage from 30–70%.[7]

Oral hygiene and topical antifungals are usually adequate for uncomplicated OC. Oral hygiene involves cleaning the teeth, buccal cavity, tongue, and dentures, if present, daily.[9] Denture related oral candidiasis is a recalcitrant fungal infection not easily resolved by topical antifungals.[13] This case was treated with topical and systemic antifungals.

Topical antifungals that were used in this case were nystatin oral suspension and miconazole oral gel. Majority of candidiasis maybe simply treated with topical applications of nystatin oral suspension.[1] Nystatin oral suspension 100.000 units/ml was used for 14 days after meals and at bedtime.[10] Miconazole, an imidazole, can be used as a local application in the mouth.[9]

Systemic antifungal are usually indicated in cases of disseminated disease and/or in immunocompromised patients.[10] Systemic antifungal that was used in this case was ketoconazole. Oral ketoconazole can be effective for treatment of severe oral and esophageal candidiasis, but patient's compliance often is poor because of taste of drug.[8–9] Ketoconazole tablets, 200 mg twice daily can be used for 14 days.[10]

Chlorhexidine mouthwash was given to improve oral hygiene, and vitamin C and B complex was given to improve patient's general condition. Denture should be cleaned and disinfected daily and left out overnight or for at least six hours daily.[9] Patient was instructed to remove the denture at night and the denture should always be cleaned. Patient was advised to reduce the smoking habits.

The conclusion of this case is thrush developed due to 3 factors are reduced of host's immune status that was affected by patient's age (57 years old); oral mucosa environment that contributed to candidiasis i.e. poor oral hygiene, denture wearing, and smoking habits; and the present of *C. albicans* which is normal oral flora. In this case, thrush was diagnosed through clinical feature which was confirmed with microbiology examination and treated with topical antifungals (nystatin oral suspension and miconazole oral gel) which were combined with systemic antifungal (ketoconazole).

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