

Oral Candidiasis: Case Series and Recent Updates In its Management

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ABSTRACT

Background: Candidiasis is an opportunistic infection commonly caused by *Candida albicans*. It occurs in young children, elderly and immune compromised patients. Denture stomatitis is a type of candidiasis which is the inflammation of the mucosa underlying prosthesis, most commonly due to removable dentures of the maxilla. The present article deals with series of denture stomatitis cases their hematological and laboratory investigations followed by appropriate management with either topical or systemic antifungal therapy.

Keywords: *Candida albicans*, denture stomatitis, antifungal therapy, Low level laser therapy (LLLT), photodynamic antimicrobial chemotherapy.

INTRODUCTION

Denture stomatitis is a very common disease affecting denture wearers. It is commonly caused by *Candida albicans* but could also be caused by other *Candida* sp. like *C.glaberata*, *C.tropicalis* and *C.gulliermondi* [1]. Clinically, it appears as redness and edema of oral mucosa that contact with the intaglio surface of the denture. The risk factor of denture stomatitis include impaired salivary gland function, drugs, dentures, high carbohydrate diet, smoking, diabetes mellitus, malignancies and immunosuppressive conditions [2]. The maxillary arch is more prone to development of stomatitis of the underlying mucosa [3]. Poor denture hygiene and nocturnal wearing of denture are said to be the probable etiologies [4]. Diagnosis involves performing the appropriate lab investigations to identify the causative agent and treat them effectively with either local or systemic anti-fungal agents depending on the severity of the condition.

CASE REPORTS

Case 1:

A female patient aged 61 years reported to our department with a chief complaint of burning sensation and pain in the front part of upper jaw for past 1 week. Past medical history revealed the patient to be diabetic and under oral hypoglycemic drugs for past 3 years. She is also hypertensive and under anti-hypertensive's for past 1 year. Past dental history revealed that the patient lost her teeth due to loosening of teeth and underwent prosthetic replacement before a year.

On intraoral examination, there was presence of localized erythema in the right side of the anterior hard palate region which is non tender on palpation. On examination of the tongue, characteristic morphological features of geographic tongue was seen as multiple flat, smooth, erythematous patches

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of depapillated mucosa with white, slightly elevated circinate borders on the dorsum and lateral border of the tongue. On palpation, of the erythematous region of hard palate it was not tender. On the tongue, the plaque was scrapable and non-tender. Based on history and clinical examination, a provisional diagnosis of Type I denture stomatitis in the maxillary anterior right alveolar ridge and pseudo membranous candidiasis over geographic tongue was given.

Routine blood investigations were done along with random blood sugar level estimation. Random blood sugar level was 71 mg/dl swabs were taken from one of the erythematous area of the palate from anterior 1/3rd of the dorsum of the tongue and was subjected to KOH staining which revealed the presence of candidal hyphae. Hence, it was finally diagnosed as denture stomatitis of maxillary right anterior alveolar ridge and pseudo membranous candidiasis over geographic tongue (Fig.1 and Fig 2).

Patient was asked to discontinue the old denture and get a new one fabricated. Topical antifungal therapy with Candid gum paint (clotrimazole 0.1%) – TID was given for 2 weeks. Since geographic tongue was asymptomatic no treatment was provided for it .Oral hygiene and denture hygiene instructions were giving and she was recalled after 2 week. Complete regression of candidal infection of tongue and palate was observed.



Fig 1: Type I denture stomatitis.



Fig 2: Pseudomembranous candidiasis over geographic tongue.

Case 2:

A 62 year male patient reported with a chief complaint of ill fitting denture for past 3 months and wanted to replace it. On elaborating the history he did not have any systemic illness and was not under any kind of medications. He did not have any deleterious habits. He underwent uneventful extraction before 3 years and was wearing removable partial denture since 2 years.

On intraoral examination, a diffuse erythematous area was seen in the maxillary hard palate region extending from the incisive papilla anteriorly to 3 cm anterior to the anterior vibrating line, mediolaterally it extends along the poster lateral slopes of hard palate. It was non-tender on palpation and was provisionally diagnosed as “Type II denture stomatitis of the maxillary palate”(Fig 3).In order to confirm the above said diagnosis two swabs were taken from the involved site and subjected to microbiological analysis. Upon KOH staining candidal hyphae was evident confirming our diagnosis .Topical antifungal therapy with Candid gum paint (clotrimazole 0.1%) – TID was given for 2 weeks. He was advised to discontinue wearing the existing prosthesis. Upon review, complete regression of candidal infection was observed and was advised replacement of denture. Oral hygiene and denture hygiene instructions were given.



Fig 3: Type II denture stomatitis.

Case 3:

A 63 year old male patient reported to our department for fitting denture for the past 6 months. On elaborating the history he was devoid of any type of illness and was not under any kind of medication. He did not have proper denture and oral hygiene and had the habit of nocturnal wearing of denture. On clinical examination, there were diffuse erythematous areas involving the anterior part of the maxillary alveolar ridge. On close observation, we were able to appreciate a nodular lesion of size less than 2 cm in diameter in the anterior part of the midpalatine region. On palpation it was non-tender. It was therefore provisionally diagnosed as "Denture stomatitis with papillary hyperplasia or Type III denture stomatitis" of the maxillary arch. (Fig 3). Two swabs were taken from the erythematous area of the hard palate from the anterior part and subjected for cytosmear examination. On direct staining with KOH candidal hyphae were appreciated. It was finally diagnosed as, "Denture stomatitis with papillary hyperplasia or Type III denture stomatitis".

Patient was asked to discontinue the ill fitting denture and get a new one fabricated. Since the papillary hyperplasia was not aggressive surgical treatment was ignored. On inspecting the denture proper relief was not provided in the anterior part of mid palatine raphe. Topical antifungal therapy with Candid gum paint (clotrimazole 0.1%) – TID was given for 2 weeks. Oral hygiene and denture hygiene instructions were given and he was recalled after 2 weeks. Complete regression of candidal infection of the palate with considerable regression of the papillary hyperplasia was observed.



Fig 4: Type III denture stomatitis.

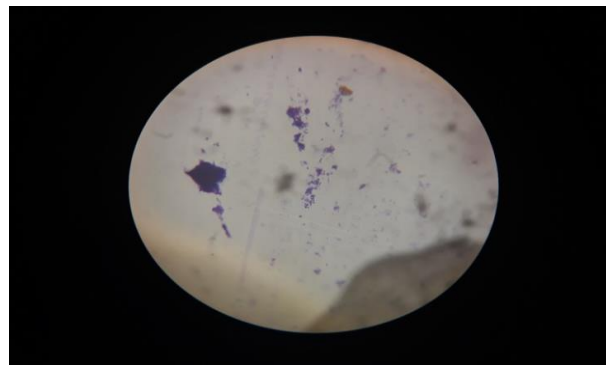


Fig 5: Candida sp. in KOH stain.

DISCUSSION

Denture stomatitis is also known as "chronic atrophic candidiasis". It is most commonly caused by *Candida albicans* (58.3%). It is commonly among denture wearers with maxillary complete denture being the commonly involved site. The proposed pathogenesis is that poorly fitting dentures causes occlusion of the oral mucosa which leads to hampering of salivary flow. As a result there is less clearance of desquamated epithelial cells and food debris from the intaglio surface of denture bases. This increases the adhesion of candidal hyphae to the acrylic thereby leading to candidal outgrowth.[5]. Clinically the lesion presents as erythematous, edematous areas restricted to the oral mucosa in contact with the denture. The patients can be symptomatic or asymptomatic. The symptoms may be burning sensation of mouth, alteration of taste to sour/bitter. In both of our cases the patients complained of burning sensation in the maxillary denture bearing areas. According to Newton's classification (1962),

Type I – Localized inflammation/pinpoint hyperemia.

Type II – Diffuse inflammation of the mucosa

Type III- Papillary hyperplasia on the central part of hard palate.

According to this, the first and second cases belong Type I denture stomatitis and Type II denture stomatitis respectively [1]. The predisposing factors for the cause of denture stomatitis are mainly poor oral hygiene, old age, diabetes mellitus, trauma, and high carbohydrate, usage of broad spectrum antibiotics, immunosuppression and smoking tobacco [6]. In our cases both the patients were elderly and are under medication for diabetes and hypertension for a considerable period. On inspecting, their oral hygiene and denture hygiene were also poor. The treatment for candidiasis mainly include advising the patients oral hygiene and denture hygiene instructions, storage of dentures in Chlorhexidine gluconate (0.12%) as it prevents adherence of candidal hyphae to acrylic and prescription of local antifungal agents [Table 1] or systemic antifungal agents [Table 2] depending on the severity of infection.[7]

Table 1: Topical antifungal agents.

Topical Antifungal agent	Dosage
Miconazole gel 2%	2 or 3 times/day – 1 -2 weeks
Topical nystatin	4 times /day – 15 days
Clotrimazole troches	5 torches of 50 mg/ day – 14 days
Clotrimazole varnish	50 mg / day – 14 days
Ketoconazole 2% orabase	2 times /day
Amphotericin B lozenge	10 mg slowly dissolved in mouth 3-4 times a day

Table 2: Systemic Antifungal agent.

Systemic Antifungal agent	Dosage
C.Fluconazole	100 mg OD-1 week or 50 mg OD 2- 3 weeks
C.Itraconazole	100 mg OD for 18 days
T.Ketoconazole	200 – 400 mg OD 2-3 weeks

In case 1, taking into consideration of the localized erythematous area we prescribed Candid mouth paint (Clotrimazole 0.1%) for 14 days and was asked to use Chlorhexidine Digluconate (0.12%) mouth rinse for 2 weeks. On follow up the lesion was completely regressed and the patient was asked to get a new denture fabricated. In case 2, as the lesion was extensive we prescribed C.Fluconazole 100mg OD-1 week. On follow up, she also showed complete regression of the entire lesion and was asked to practice strict oral and denture hygienes and get a new denture fabricated.

Based on the literature many others have put forward various interventional procedures in the treatment of denture stomatitis. The clear objective is to eliminate *Candida sp.*, it is done primarily by antifungal therapy as discussed earlier. Some of the alternative line of therapy includes disinfection of dentures, low level laser therapy and antimicrobial photodynamic therapy. The most preferred disinfect procedure is overnight immersion of denture in 2% Gluteraldehyde solution. It prevents adherence of candida to the impression surface of the denture thereby minimizing candidal count[2].

Low level laser therapy (LLLT) and photodynamic antimicrobial chemotherapy are considered an emerging alternative mode of fungicidal therapies. Since, the infection is most commonly caused by superficial candidiasis like *C.albicans* they are easily accessible to laser photons. Low Level Laser Therapy (LLLT) functions by exciting the biological cell's chromophores at appropriately low doses of visible wavelength light, which generates reactive oxygen species. The coherent light at a wavelength is 660 nm of light had increased fungicidal activity [8]

Photodynamic antimicrobial chemotherapy is a process in which visible light and a photosensitizer, which in the presence of molecular oxygen species produce reactive oxygen species. These reactive oxygen species cause damage to vital components of the microorganism such as DNA, proteins and lipids resulting in cell death. *liana et al*, have demonstrated the use of Chlorin e6 in inhibiting the growth of *Candida albicans*. [9] It is being suggested that the use of these therapies reduces the side effects caused by antifungal drugs

and forms a safe, efficient and user friendly treatment modalities.^[10]

CONCLUSION

Thus, denture stomatitis is a condition which can be prevented and treated at an earlier stage by patient education regarding oral and denture hygienes and also by prescribing topical / systemic antifungal agents based on the extent and severity of the infection.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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