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Recurrent *Trichosporon asahii* Glossitis: A Case Report

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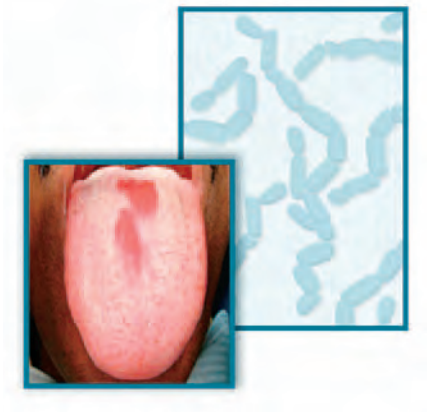

Abstract

Aim: This case report aims at describing an infection of the tongue as a manifestation of a *Trichosporon asahii* infection, its association with bronchial asthma and steroid administration, and to present a review of the literature pertaining to its antifungal susceptibility profile.

Background: *Trichosporon asahii* has been reported to be associated with a wide spectrum of clinical manifestations, ranging from superficial infection to severe disseminated diseases, particularly in immunocompromised patients.

Case Report: A 36-year-old male asthmatic patient with recurrent glossitis presented with a chief complaint of burning sensation and two red areas on the dorsum of the tongue of three months duration. The glossitis was associated with *Trichosporon asahii*, which had a reduced susceptibility to some azole antifungal agents.

Summary: *Trichosporon asahii* is an emerging fungal pathogen which may cause a wide range of clinical manifestations. More reports on its various clinical presentations in the oral environment need to be made available in the literature. To date there is a paucity of data on its prevalence, pathogenesis, and antifungal resistance mechanism.

Keywords: *Trichosporon asahii*, glossitis, asthma, voriconazole

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Introduction

Fungal pathogens are frequently implicated in many clinical conditions involving immunocompromised patients. With regard to oral infections, the most common oral fungal pathogens affecting humans is *Candida albicans* which may be present as atrophic (erythematous) candidosis. It is characterized by erythematous lesions in any part of the oral mucosae; when the tongue is involved, it exhibits a partial or generalized depapillated area on the dorsum of the tongue.[1,2] There are other types of yeast being implicated in oral infections besides *Candida*.[3]

Trichosporon is a basidiomycetous yeast isolated from soil, water samples, vegetables, mammals, and birds. Taxonomic classification, which has undergone a few revisions, identifies six *Trichosporon* species: *T. asahii*, *T. asteroides*, *T. cutaneum*, *T. inkin*, *T. mucoides*, and *T. ovoides* as causative agents for trichosporonosis.[4,5]

Trichosporon asahii is the most common species of *Trichosporon*, which has been reported to be associated with both mild superficial cutaneous infections to life-threatening disseminated infections.[3,6] Isolation of the fungus from the oral cavity has not been reported previously. This case report aims at describing an infection of the tongue as a manifestation of a *Trichosporon asahii* infection as well as its association with bronchial asthma and steroid administration.

Case Report

Diagnosis and Preliminary Treatment

A 36-year-old male patient presented to the Oral Medicine Clinic, Universiti Sains Malaysia with a chief complaint of burning sensation and two red areas on the dorsum of the tongue of three months duration.

On reviewing his medical history, the patient has bronchial asthma and was on regular steroid inhalation, budesonide, a synthetic corticosteroid, twice daily for the last eight years. The oral examination revealed two atrophic depapillated erythematous areas on the dorsum of the tongue; the borders of the lesions did not show any indurations (Figure 1).

A fungal infection was suspected, and the patient was prescribed an oral suspension (500.000 IU) of Nystatin four times a day for 14 days. On follow-up examination the lesion showed partial regression and the patient's symptoms slightly improved. Laboratory investigations were performed to identify the fungus as well as to look for other underlying medical illnesses.

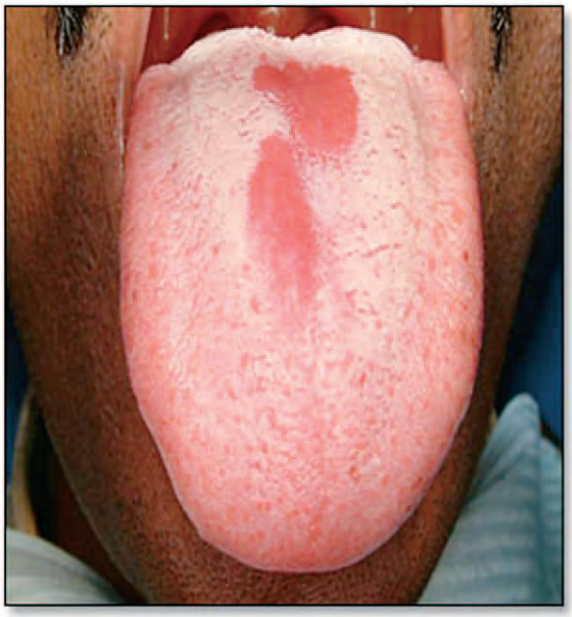

Figure 1. Atrophic depapillated lesions on the mid-dorsum of the tongue.

Scrapings of the tongue lesions were submitted for the microbiological investigation. Hematological and immunological investigations were requested to exclude other underlying systemic diseases such as anemia, diabetes mellitus, and acquired immunedeficiency syndrome. After consultation with the patient's physician regarding his medical condition, the treatment was changed to a combination of budesonide and formoterol (*Symbicort*®), a beta 2 agonist, a once daily dose. Budesonide in combination with formoterol was used to reduce the steroid (budisonide) dose from twice to once daily.

Both hematological and immunological investigations revealed no abnormality. Microscopic examination of the lesions by using the Giemsa-stained smear showed the presence of brick-like septate hyphae and desquamated epithelial cells. Yeast colonies were recovered from the specimen after 48 hours of incubation at 30°C on Sabouraud dextrose agar (SDA) (BBL Microbiology System, Cockeysville, MD, USA) which revealed rapid-growing, smooth, white to cream-colored colonies that became wrinkled with time and showed typical heaping at the centre. Colonies from 48 hour SDA cultures were evaluated for the following:

- Sensitivity to cycloheximide, as determined by their growth on Mycosel agar (BBL Microbiology System)
- Growth at 37°, 42°, and 45 °C on Sabouraud dextrose agar
- Urease activity on Christensen's urea medium
- Carbohydrate and nitrogen assimilation patterns by mean of the API 20C AUX yeast assimilation systems (bioMérieux, France)
- *In vitro* antifungal susceptibility testing by the Etest® (AB Biodisk, Solna, Sweden)

A slide culture on cornmeal-Tween agar (Difco Laboratories, Detroit, MI, USA) showed a typical morphology of arthroconidia and blastoconidia (Figure 2). The fungal isolates were identified as *Trichosporon asahii* based on the typical morphology, urease production, and a compatible profile on the API 20C AUX with 99% confidence.

Definitive Treatment

Treatment for the oral lesion was modified according to the microbiological finding and oral fluconazole 100 mg daily for two weeks was prescribed. Complete resolution of the tongue lesions was achieved. However, the lesions recurred three months later.

Antifungal susceptibility testing showed *Trichosporon asahii* resistance to ketoconazole and a reduced activity of fluconazole but a susceptibility to voriconazole. Therefore, a trial of voriconazole 400 mg loading dose followed by 200 mg twice daily for two weeks was prescribed to the patient which successfully eradicated the fungal infection. The patient has been free of glossitis symptoms for nearly two years at the time of this report.

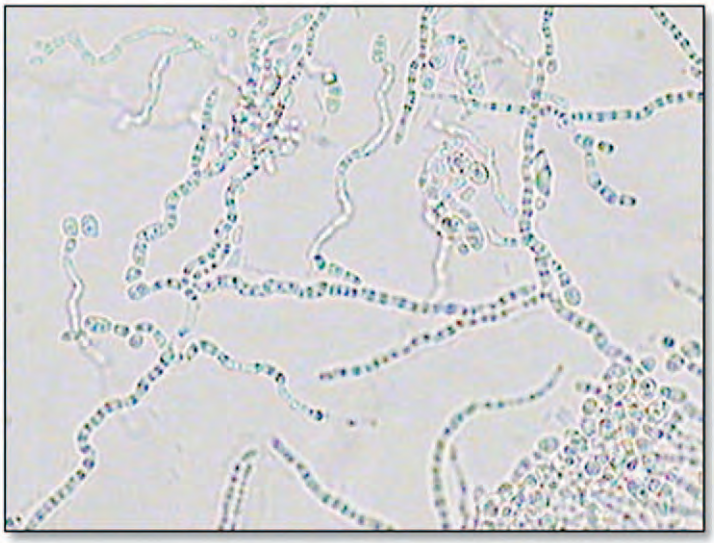

Figure 2. A picture demonstrating arthroconidia and blastoconidia of *Trichosporon asahii* on slide culture using corn meal agar.

Discussion

Trichosporon asahii has emerged as an opportunistic fungal pathogen and had been implicated in a number of clinical conditions, ranging from superficial cutaneous infection to highly fatal systemic involvement.[3,6] A literature review revealed an absence of any report on *Trichosporon asahii* being recovered from a patient with glossitis. The present report appears to be the first to appear in the literature. The diagnosis was based on the identification profiles obtained by API 20C AUX system, isolates' colonies, and microscopic morphology the fungus recovered from the patient specimen was identified as *Trichosporon asahii*.

Because the patient was on an inhaled steroid (budesonide), the risk of fungal colonization and subsequent infection was relatively high. Brightman[1] and Sapp[2] established an increasing frequency of oropharyngeal infection by *Candida* species due to topical and systemic steroid therapy as one of the risk factors that increase the possibility of infection.[1,2] Epstein[7] suggested the mucosa of the tongue may represent a reservoir of organisms which enhances residual colonization, and both systemic and local steroids increase the risk of candidiasis by facilitating the conversion of glycogen to glucose which increases the essential substrates for candidal growth. Therefore, the authors would expect the possibility of a similar association with *Trichosporon asahii*.

A *Trichosporon asahii* association with summer-type hypersensitivity pneumonitis was established, particularly in Japan.[8] However, there are not any current reports on the association between a *Trichosporon asahii* infection and bronchial asthma particularly in patients on steroid therapy. Hirakata[9] reported an occurrence of asthma in a patient with a family history of familial summer-type hypersensitivity pneumonitis. Unfortunately, the mechanism of pathogenesis in bronchial asthma associated with *Trichosporon asahii* remains uncertain. The present patient is an asthmatic on regular steroid inhalation which is a predisposing factor for fungal colonization and infection of the oropharynx. Bronchial asthma is a type of respiratory disease caused by hyperresponsiveness of the airways. *Trichosporon asahii* colonizing the oropharynx could have been one of the allergens associated with its exacerbation. Therefore, a formal study of the prevalence of *Trichosporon asahii* colonization and infection in chronic bronchial asthma patients is warranted. Its association with oral infections and exacerbation of asthma resulting in steroid dependency also needs to be established.

Trichosporon asahii has been reported to be resistant to a few azole antifungal agents. Wolf et al.[10] reported the recovery of *Trichosporon asahii* isolates that have demonstrated a reduced *in vitro* susceptibility to amphotericin B, flucytosine, and azoles from six non-granulocytopenic patients treated in intensive care units. Therefore, demonstration of reduced effectiveness of fluconazole in the present patient should be anticipated. This may explain the reason for the recurrence of *Trichosporon asahii* glossitis while he was on fluconazole. The patient finally responded to voriconazole, which was the expected outcome based on the demonstrated *in vitro* susceptibility. A recent paper by Paphitou et al.[11] reported the new triazoles including voriconazole were highly potent against 24 isolates of *Trichosporon asahii* {minimum inhibitory concentration (MIC) and minimal fungicidal concentration (MFC) of 0.25 and 0.5 mg/liter, respectively}. This observation was similar to the previous study by McGinnis et al.[12] showing voriconazole has a lower MIC for *T. asahii* than do other azoles.

Voriconazole is an expanded-spectrum synthetic triazole derivative of fluconazole which inhibits the enzyme lanosterol 14-demethylase of *Candida albicans* and *Aspergillus fumigatus* with potencies 1.6 and 160 times greater, respectively, than those of fluconazole. Its potent fungicidal activity is likely due to the high affinity of voriconazole for fungal 14-demethylase, a concept supported by ultrastructural and biochemical analysis.[13] However, unlike fluconazole, voriconazole also inhibits 24-methylene dihydrolanosterol demethylation of certain yeasts and filamentous fungi.[14] These two reasons may explain why voriconazole shows effectiveness in the treatment of mycoses like trichosporonosis that do not respond to other azoles.

Summary

Trichosporon asahii is an emerging fungal pathogen which may cause a wide range of clinical

manifestations. More reports on its various clinical presentations in the oral environment need to be made available in the literature. To date there is a paucity of data on its prevalence, pathogenesis, and antifungal resistance mechanism. Further studies would help create a better understanding of this pathogen ultimately improve the management of patients with *Trichosporon asahii* infections, particularly those with immunosuppression.

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