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CASE REPORT

A Rare Case of Cutaneous Zygomycosis in a Diabetic Patient due to *Syncephalastrum racemosum*

Sikander Chirag, Noha Hashmi*, Mehreen Syed Gurcoo

Abstract

Zygomycosis represents a group of uncommon but, potentially fatal fungal infections. The incidence of Zygomycosis has increased manifold in recent years. *Syncephalastrumracemosum* is a fungus belonging to Zygomycetes. Very few cases of human disease caused by this fungus have been documented. We report a case of a diabetic male with cutaneous Zygomycosis caused by *Syncephalastrum racemosum*. The patient was successfully treated with surgical debridement and Liposomal Amphoterecin B.

Key Words

Mucormycosis, Zygomycosis, Syncephalastrum

Introduction

Zygomycosisrepresents a spectrum of infections caused by ubiquitous fungi belonging to order Mucorales that were considered as non-pathogenic to humans and were treated as laboratory contaminants in the past. However, these fungi are emerging as highly opportunistic pathogens in the present times[1]. Mucormycosis is the second most frequent mold infection in immunocompromised patients and can progress rapidly in both immunocompromised and immunocompetent individuals[2]. It presents in six clinical forms, depending on the site involved: rhinocerebral, pulmonary, cutaneous, gastrointestinal, isolated renal and disseminated forms[3].

The mucormycetes (previously Zygomycetes) belong to the order Mucorales and involve 6 main families: Syncephalastraceae, Saksenaeaceae, Cunninghamellaceae, Mucoraceae, Thamnidiaceaeand Lichtheimiaceae [3]. The most common species of this order are Rhizopus and Mucor but there are certain rare species such as *Syncephalastrum racemosum* that have been responsible for opportunistic fungal infections[4,5]. Here, we report a case of cutaneous Zygomycosis caused by *Syncephalastrumracemosum*, a rarely encountered pathogen in humans with a rarity of 2% in mucormycetes[4].

Case Report

A 48-year-old male, diabetic laboratory worker presented with cutaneous lesions on the dorsum of right hand and left leg. The lesion had developed first on the hand and then on the leg fifteen days back. It was non-pruritic but, was associated with intermittent discharge. The patient gave a history of transient ischemic attack one month back. There was no past history of trauma or previous similar lesions. The patient sought treatment in a local nursing home where he was diagnosed as having eczema and treated with topical steroid cream. The lesion seemed to disappear in a few days after application of the topical medication but, reappeared once he stopped its use. The patient was diagnosed with type 2 diabetes mellitus two years back and is on oral hypoglycemics since then with a good glycemic control. History and examination revealed no other significant findings.

On presenting to the hospital, the skin lesions were

Deptt of Microbiology, *M.B.B.S. Student, GMC, Jammu, J&K, India.

Correspondence to: Dr. Mehreen Syed Gurcoo, Department of Microbiology, GMC, Jammu, India.

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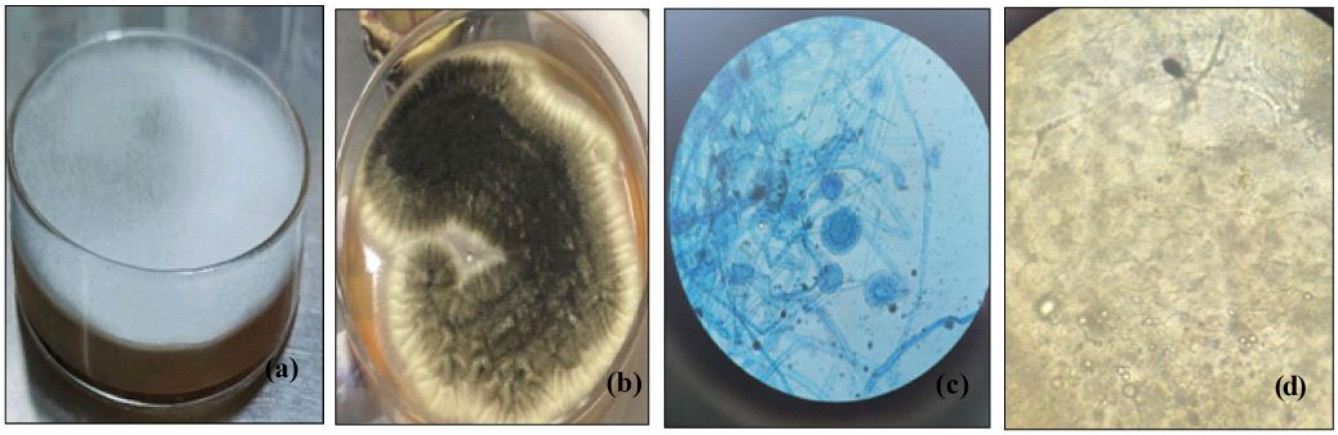

Figure I: (a) Fungal growth on SDA after 48 hours (b) 72 hours (c) Lactophenol cotton blue mount of the fungal growth showing chains of merosporangia of *Syncephalastrum racemosum* (d) KOH mount showing hyaline broad aseptate branching hyphae

debrided and tissue biopsies along with swab specimen of the discharge were sent to the Microbiology Laboratory for microscopy and culture. The KOH mount revealedhyaline, aseptate, broad and branching hyphae [Figure I d]. Culture on Sabouraud's dextrose agar with chloramphenicol and gentamicin grew fluffy mould with greyish sporangium within 48 hours at 26°C [Figure I a and b].The reverse side was pale yellow. Lactophenol cotton blue mount showed broad, aseptate, hyaline hyphae bearing erect sporangiophores terminating into globose columellae bearing the characteristic cylindrical merosporangia with rows of merosporangiospores [Figure I c]. The isolate was identified as *Syncephalastrum racemosum* based on these morphological characteristics. No other organisms were grown by bacterial and fungal cultures. Immediately after the suggesting fungal infection by direct microscopy, antifungal treatment was initiated. The patient was put on intravenous Liposomal Amphotericin B (5 mg/kg) for a period of 10 days, after which a repeat culture was done which showed no growth of the fungus. The antifungal treatment was continued until a week after all signs and symptoms of the infection had disappeared (the total duration of antifungal treatment was 18 days). He made an uneventful recovery with healthy wound healing.

Discussion

Zygomycosis can be divided into six types - rhino cerebral, pulmonary, cutaneous, gastrointestinal, disseminated and miscellaneous. Cutaneous zygomycosis is the third most commonform of zygomycosis after rhino-orbito-cerebraland pulmonary formsworldwide[6]. A study conducted in India foundcutaneous zygomycosis as the second most common form after rhino-orbito-cerebral form[7].

Cutaneous zygomycosis is classified as localised when it affects only the skin or subcutaneous tissue; deep extension when it invades muscle, tendons or bone; and disseminated when it involves other non-contiguous organs[1]. It may be due to direct inoculation in skin or dissemination from a distant focus seeding the bloodstream. The risk factors include sustained immunosuppressive therapy, chronic prednisone use, diabetes mellitus, neutropenia, broad-spectrum antibiotic use, severe malnutrition, trauma, surgical wounds, needle sticks or burns[1]. *Syncephalastrum*, belonging to the order *Mucorales*, is a ubiquitous saprophytic fungus, commonly found in soil. Its colonies grow very rapidly and fill a 90 mm plate completely in 48 h. The color of colonies, from the front, is initially white and turns to dark grey then black. The reverse is pale or yellowish-brown. Microscopically, *Syncephalastrum* has ribbon-like aseptate, branched fungal hyphae and sporangiophores, which terminate in swollen vesicles with radial merosporangiae filled with linear chains of sporangiospores. *Syncephalastrum* differs from *Aspergillus* by the presence of merosporangia and absence of phialides[1, 8].

Literature search reveals very few documented reports on cutaneous *Syncephalastrum* infections with a rarity of 2% in mucormycetes[4]. The first detailed report was published in 1980 in a 50-year-old diabetic patient presenting with multiple draining sinuses [9]. In 2022 Mamali V *et al.*published a case report of necrotizing cutaneous infection due to *Syncephalastrum* species in

a 36-year-oldimmunocompetent male following open tibia fracture[5]. Mangaraj *et al.* in 2014 reported a case of subcutaneous mucormycosis due to *Syncephalastrum racemosu*m where the patient was suffering from diabetic ketoacidosis[1]. These cases were treated with surgical debridement and amphotericin B[1,5]. A case of Onychomycosis caused by *Syncephalastrum racemosum* was reported in a 50-year-old diabetic patient in 2015[4]. The patient's nail was surgically excised and thorough debridement was done. The patient was successfully treated with topical nystatin.

Conclusion

We reported a case of a diabetic male with cutaneous Zygomycosis caused by *Syncephalastrum racemosum*. The patient was a laboratory worker and had lesions on hand and leg. Typical microscopic features combined with culture findings in the absence of any other fungal growth support the pathogenicity of *Syncephalastrum* in our case. He was successfully treated with debridement and Liposomal Amphoterecin B. *Syncephalastrum racemosum* is a rare causative agent of cutaneous zygomycosis. Early diagnosis and prompt management hold the key for successful outcome. All efforts should be made to correct the underlying and predisposing factors. Surgical debridement should be done at the earliest to remove maximum amount of devitalised tissue that is possible. Intravenous amphotericin B (liposomal) is the main stay of therapy. The possibility of these atypical infections should always be borne in mind while dealing with immunocompromised patients.

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