

Total Dystrophic Onychomycosis Due to *Syncephalastrum racemosum* – A Rare Cause and its Novel Treatment Option

Abstract

Onychomycosis is a fungal infection of the nail caused by dermatophytic (99%) and/or non-dermatophytic (1%) (including yeasts) infections of the nailplate. Among the non-dermatophytes, the yeast *Candida albicans*, *Candida tropicalis*, and other molds like *Scopulariopsis* spp., *Scytalidium* spp., *Fusarium* spp., and *Aspergillus* spp. may be responsible. Herein, we report a case of total dystrophic onychomycosis in a 41-year-old female, caused by *Syncephalastrum racemosum* and its complete improvement with a combination of oral pulse itraconazole and 1064 nm Q-switched Nd-YAG laser. This case is being reported due to the rarity of causative organism for onychomycosis and a novel approach in its treatment.

Keywords: Nd-YAG laser, onychomycosis, *Syncephalastrum racemosum*

Introduction

Onychomycosis is defined as a fungal infection of the nail that expands slowly and if left untreated leads to complete destruction of the nail plate. Onychomycosis represents about 30% of all dermatophyte infections and accounts for 18–40% of all nail disorders.^[1] The prevalence of onychomycosis ranges between 2% to 28% of the general population and it is estimated to be significantly higher in specific populations such as in diabetes mellitus, the immunosuppressed, and elderly.^[2,3] It is caused by dermatophytic (99%) and/or non-dermatophytic (1%) (including yeasts) infections of the nailplate.^[1] Among the non-dermatophytes, the yeast *Candida albicans*, *Candida tropicalis*, and other molds like *Scopulariopsis* spp., *Scytalidium* spp., *Fusarium* spp., and *Aspergillus* spp. may be responsible.

Syncephalastrum racemosum is a fungus belonging to order mucorales of class Zygomycetes with very low pathogenicity.^[4] It is a saprophytic fungus found ubiquitously in soil and decaying plant debris and is considered to be an uncommon human pathogen. Here, we report a case of total dystrophic onychomycosis caused by *S. racemosum* and its complete improvement with a

combination of oral pulse itraconazole and 1064 nm Q-switched Nd-YAG laser.

Case Report

A 41-year-old female patient presented to our OPD with a history of dystrophy of nail of right great toe since last 1 year. She gave history of working in fisheries with continuous immersion of feet in water for longer periods. She had taken multiple oral and topical medications without any improvement. On examination, the nail appeared to be dystrophic with yellowish–brownish discoloration, nail plate thickening, and subungual hyperkeratosis [Figure 1]. There was no sign of inflammation. The nail clippings were taken and sent to microbiology for potassium hydroxide (KOH) mount and culture.

Direct wet mount of nail clippings with 40% of KOH showed thin, hyaline, branched, and septate hyphae. The nail sample was cultured on two different tubes containing Sabouraud Dextrose Agar with and without cycloheximide and incubated at 37°C for 48 h. The tube without cycloheximide showed colony growth but not the one with cycloheximide. The colonies were cotton to fluffy, white-to-gray in color. The lactophenol cotton blue mount showed aseptate hyphae branching sporangiospores with terminal ovoid

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vesicle, which bear finger-like microsporangia. Based on the above morphological characters, the isolate was identified as *S. racemosum* [Figure 2].

The patient was treated with oral pulse itraconazole therapy for 3 months combined with Q-switched Nd-YAG laser treatment with lasers settings adjusted to yield a fluency of 600 mJ/cm² over a 5-mm spot at a 3 Hz frequency in a single session. Three sessions of laser treatment were performed at Day 0, 30, and 60. The patient was followed-up for 1 year. There was complete improvement of the nail both clinically and mycologically [Figure 3a and b].



Figure 1: Total dystrophic onychomycosis of right great toe



Figure 2: Lactophenol cotton blue preparation of *Syncephalastrum racemosum*



Figure 3: (a) Clearance of onychomycosis after 3 months of treatment. (b) Clearance of onychomycosis after 9 months of treatment

Discussion

Non-dermatophyte molds cause 2% of total cases of onychomycosis.^[1] Only four cases of onychomycosis caused due to *S. racemosum* have been reported previously.^[4-7] Mucorales have been classically described as having broad (10–50 μm), ribbon-like aseptate hyphae with right-angle branching, the hyphae are actually pauciseptate, and the angle of hyphal branching can vary from 45 to 90°.^[8] The other published case of *S. racemosum* are systemic infections. In the previously reported cases, the patients were treated with debridement, topical nystatin, and oral fluconazole.^[4-7] It is different from our case in which we treated our patient with oral pulse itraconazole combined with Q-switched Nd-YAG laser and the nail improved completely in the subsequent 1 year.

Trauma to nail is an important predisposing factor for onychomycosis. In our case the patient used to work in fisheries, from there she could have acquired the infection. Nowadays onychomycosis due to non-dermatophyte molds are increasing and infection due to *S. racemosum* is a rare condition. Appropriate diagnosis through culture and proper treatment is necessary because, though not life threatening, onychomycosis can cause significant discomfort to patient.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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