Onycholysis and Chromonychia: A Case Caused by *Trichosporon inkin*

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Established Facts

- Onycholysis has many causes.
- *Trichosporon* spp. is a rare cause of fungal nail infections.

Novel Insights

- We report a case of a fungal nail infection caused by *Trichosporon inkin* characterized by onycholysis and chromonychia.

Key Words

Onycholysis · Onychomycosis · Chromonychia ·
Trichosporon · *Trichosporon inkin*

Abstract

Yeasts cause only 5–10% of onychomycosis; the most common yeast is *Candida albicans*, and rarely *Trichosporon* spp. is found. Recently, it has become an important cause of fungemia with a high mortality rate in immunocompromised patients. Superficial infections caused by *Trichosporon* spp., including piedra and onychomycosis, occur in immunocompetent patients. Herein, we report a case of a fungal nail infection characterized by onycholysis and chromonychia caused by *Trichosporon inkin*.

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Introduction

Onychomycosis is a fungal infection of the nail. It affects 10% of the population and represents 50% of all onychopathies [1]. It can be caused by dermatophytes, yeasts and non-dermatophyte molds. Dermatophytes are isolated in 90% of cases, and the most common etiological agent is *Trichophyton rubrum*. 5–10% of these infections are caused by yeasts, especially *Candida albicans* [2, 3].

In the last two decades, *Trichosporon* spp. has emerged as an important opportunistic pathogen in immunocompromised individuals, especially *Trichosporon asahii*. This is the most important yeast, after *Candida* spp., causing systemic infection [4]. It is frequently associated with a high mortality (80%) [5]. Fungemia can occur in 74.7% of cases and disseminated infection in 50.6% [6]. The

Fig. 1. Onycholysis of the distal and lateral aspect of the nail.

Fig. 2. Presence of blastospores (↓) and hyphae (↓↓) (KOH, ×40).

Fig. 3. Blastospores and arthroconidia, characteristic of *Trichosporon* spp.

most common underlying conditions related to invasive trichosporonosis are peritoneal dialysis, solid tumors and hematological malignancies [6].

Case Report

A 62-year-old female resident of Mexico City presented at the Dermatology Clinic with thickening and discoloration of the right first toenail. Examination showed onycholysis of the distal and lateral aspect of the nail and black-greenish discoloration (fig. 1). A partial overriding of the second toe over the first toenail could be

seen. A previous-year onychomycosis had been diagnosed and treated with terbinafine for 3 months with complete remission, but xanthonychia and pachyonychia persisted and were treated only with urea cream for nail avulsion.

Two months before, the patient had presented with a traumatic ulcer on the dorsal aspect of the first toenail of the right foot. It healed completely after some days of just protecting the area from further trauma.

The patient also has a 5-year history of a venous and arterial ulcer on her right lower leg. She has received several treatments but has not achieved good compliance, and the ulcer has not healed. She is otherwise healthy.

In the mycological examination of a scraping from the nail plate, the KOH test and Chlorazol Black E stain (Delasco, Council Bluffs, Iowa, USA) revealed blastospores and hyphae (fig. 2), and a yeast was isolated on Sabouraud dextrose agar (Bioxon, Mexico). After microscopic examination, it was identified as *Trichosporon* spp. (fig. 3) and later, with mass spectrophotometry (Vitek MS, bioMérieux), as *Trichosporon inkin*.

The patient was started on itraconazole with a favorable response and only a persisting yellowish discoloration.

Discussion

Clinical manifestations caused by *Trichosporon* spp. include superficial skin infections (white piedra) and onychomycosis in immunocompetent patients as well as severe disseminated mycosis in immunocompromised patients.

Trichosporon ovoides is the most common agent isolated in white piedra of hairs and *T. inkin* in the inguinal area. *Trichosporon cutaneum* has been reported to be the most common yeast in onychomycosis [5, 7, 8].

After the first description of onychomycosis related to *Trichosporon beigelii* in 1984 [9], the pathogenic role of this yeast is still controversial. In our case, although we had a positive KOH and culture and a good response to itraconazole, it is impossible to be sure whether *T. inkin* was a true pathogenic yeast or a secondary colonizer.

Onycholysis can be caused by trauma originating from a friction, especially in toenails (asymmetric gait toenail unit sign). Also, changes similar to onychomycosis can be observed [10, 11]. Onycholysis caused by constant friction could be the predisposing factor that allowed fungal infection. The greenish color of the nail is commonly caused by *Pseudomonas*, which in this case was not excluded because no bacterial cultures were performed.

In two Mexican papers on 467 and 98 cases of onychomycosis, *Trichosporon* spp. was found in 35.5 and 18.3% of patients, respectively [2, 12]. In Korea, in 1,009 cultures positive for onychomycosis, *T. beigelii* was isolated in 212 cases (21%) [13]. In 1997, Kai-Man et al. [14] in Hong Kong reported *T. beigelii* in 11% of onychomycosis cases. In a multicenter study in Argentina, including 2,731 patients with positive culture for onychomycosis, only 8 cases were caused by *Trichosporon* spp. [15].

Trichosporon is characterized by arthroconidia, blastoconidia, hyphae and pseudohyphae [5, 7, 16]. Cultures

on Sabouraud dextrose agar grow as white-to-beige yeast colonies showing a cerebriform aspect and radial surfaces [5].

Currently, *T. beigelii* has been replaced by seven species, now recognized as causal agents in human infections: *T. asahii*, *T. inkin*, *T. mucoides*, *T. cutaneum*, *T. ovoides*, *T. asteroides* and *T. loubieri* [4, 5].

Trichosporon spp. has been found to have an in vitro high-resistance profile to amphotericin B and itraconazole, high susceptibility to fluconazole and moderate resistance to 5-flucytosine [17]. It has been suggested that onychomycosis caused by *T. beigelii* must be treated with systemic antifungals, mainly itraconazole [8].

Statement of Ethics

The authors state that, in this clinical case report, they have followed the guidelines for human studies and animal welfare regulations. The publication of this case report received the approval of the ethical committee, and the patient provided informed consent.

Disclosure Statement

The authors declare that they have no conflicts of interest.

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