

## A Case Study of Onychomycosis – Short Report

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**Abstract & Back Ground-** An 48 year old man presented with 4 months history of nail involvement, prominent discoloration, thickening and hardening of toenails. He has no history of Foot Trauma, Psoriasis, or Eczema of the foot. His family has unsuccessfully used over the counter topical antifungal cream on nails. Multiple toenails are affected and showed onycholysis (separation of the nail plate from the nail bed), thickening of the distal-lateral aspects of the nail.

**Keywords:** Onychomycosis, *T. rubrum*

### Introduction Methods

The patients affected nails were clipped and saved. Subungual debris was obtained by using a small curette. A potassium hydroxide (KOH) preparation showed some septate hyphal elements (Figure 1). The morphology of the microconidia and macroconidia was the primary means of preliminary identification of isolates in our laboratory.

Two days later, initially Sabouraud's dextrose medium culture and a fungal slide culture (for typical sporulation, usually microspores) was performed and maintained at room temperature (24 to 26°C) and one at 37°C, which turned red and at week 3, *Trichophyton rubrum* was identified in the laboratory culture specimen (Figure 2 & 3).

### Conclusion and Diagnosis

This patient has mild distal-lateral subungual onychomycosis. The etiologic organism was *T. rubrum*, the most common pathogen in onychomycosis. *T. rubrum* shows a wide variability in its phenotypic features, including the presence or absence of reflexively branching hyphae, micro- and macroconidia, red colony pigmentation and urease activity [1].

### Treatment

The risks and benefits of various treatment options were discussed. They chose ciclopirox nail lacquer, which was prescribed for daily application for 3 months.

### Follow up at 3 Months

The patient's nail showed significant improvement in clinical appearance. No new involvement was noted.

### Discussion

Onychomycosis is considered an uncommon disease, but its prevalence is increasing.

The prevalence is more common in adolescence than in early childhood, but it can occur at any age. The youngest reported case was in a 10 week old infant.

The organism most often responsible for paediatric fungal disease are *T. rubrum*, *Trichophyton mentagrophytes*, *Candida albicans*. A fungal etiology is unlikely if all fingernails or toenails are dystrophic [2]. However, our case had multiple toenail involvement which is very rare. Other causes of nail dystrophy include Trauma, Alopecia areata, Psoriasis, Foot Eczema and Genetic disorders.

Onychomycosis is diagnosed by collecting nail clippings and subungual debris and then using any of the following 4 methods: a KOH preparation, Fluorescent staining with Calcofluor, Culturing for Fungus or PAS. Lawry et al., showed that PAS appears to be the most sensitive method for diagnosis, especially when combined with a culture [3]. However not all centres may have this option.

Based on cost and ease, physicians initially may use KOH or culture methods. A culture is extremely important because sometimes nails appear as though a fungus is present but, in fact, the nail changes have been caused by something else, possibly psoriasis or trauma or even a less common disorder (eg. Lichen planus). In our case both culture as well as KOH examination was positive. The culture of nail clippings from different infected nails showed *Trichophyton rubrum*. KOH positivity is seen in 80% of DLSO cases and culture is positive in 70% of the cases of onychomycosis [4]. Most practitioners would begin with a culture; however, if they are highly suspicious that dermatophytes are present but the culture is negative and the culture results are negative, then they also could send the PAS to the laboratory. Culture is most sensitive and specific and in case of KOH preparation it has low sensitivity and specificity, but up to 100% sensitive if >2 preparations examined.

Several treatment options for onychomycosis are available. Generally, systemic therapy is almost always more successful than topical treatment. Topical therapies may be useful adjunct to systemic therapies, but are less effective when used alone [5]. The pediatric nail grows faster than an adult nail, and the nail plate is thinner in children than in adults, which may be because of blood circulation in the younger population. Because of these characteristics, children may respond to topical treatment. Terbinafine has been used for treatment of childhood onychomycosis [6]. Sardana [7] reported ciclopirox nail lacquer to be safe and effective. Our case showed complete morphological and mycological cure in 3 months without any side effects.

### Legends for Figures

**Figure 1:** Potassium Hydroxide Preparation of a Nail Sample Showing Branched Septate Fungal Hyphae (Potassium hydroxide,  $\times 40$ )



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**Figure 2:** Culture Showing White,downy Colony.



**Figure 3:** Narrow, Cylindrical, Long, Pencil Shaped Macroconidia Seen in Fungal Isolate Micrograph ( $\times 40$ )

