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Case Report

ONYCHOMYCOSIS FINGER NAIL BY *CRYPTOCOCCUS LAURENTII*, *TRYCHOPHYTON SPP*

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ABSTRACT

Onychomycosis is the most common nail disease and contributes to 50% of all cause of onychodystrophy. Onychomycosis cases due to Cryptococcus laurentii and Trichophyton spp. are quite rare. The most common cause of onychomycosis reported in Indonesia is Candida sp. Risk factors for onychomycosis include moisture, occlusion, nail trauma, decreased immunity, slow nail growth, wide nail surface, and genetic factors. Old age, cancer, psoriasis, dermatophyte infection at other sites is also a risk factor. A 54 year-old woman, with brittle nails and cracked palms since 6 months before came to outpatient clinic. She is a farmer and work in the rice fields without gloves daily; she also rarely wash her hands after work. Dermatologic examination of all right and left finger nail is revealed yellow, white, and some blackish discoloration, subungual hyperkeratotic, onycholysis, and onychodystrophy. In the right and left palm, revealed multiple erythematous and yellow-white hyperkeratotic plaques, with fissures and rough scales. From nail clippings, a 20% KOH examination revealed long branching hyphae, periodic Acid-Schiff (PAS) staining revealed spores, and fungal culture revealed growth of Cryptococcus laurentii and Trichophyton spp. colonies. We gave itraconazole pulse dose: 2 x 200 mg tablet orally per day for a week every month. Other treatment was using 20% urea cream. Follow up at 8 weeks after therapy is showed clinical and mycologic improvement. The incidence of onychomycosis due to Cryptococcus laurentii and Trichophyton spp. is still rare. The predisposing factor of infection in these case is suspected due to old age and her habitual contact with the paddy fields without gloves and rarely wash her hand after work.

Keywords: onychomycosis, nail, Cryptococcus laurentii, Trichophyton spp, itraconazole

ABSTRAK

Onikomikosis adalah penyakit kuku yang paling sering terjadi dan berkontribusi pada 50% penyebab onikodistrofik. Kasus onikomikosis akibat Cryptococcus laurentii dan Trichophyton spp. jarang terjadi. Penyebab terbanyak onikomikosis yang dilaporkan di Indonesia adalah Candida sp. Faktor risiko onikomikosis meliputi kelembaban, oklusi, trauma kuku, penurunan imunitas, pertumbuhan kuku yang lambat, permukaan kuku yang lebar, dan faktor genetik. Usia tua, kanker, psoriasis, infeksi dermatofit di tempat lain juga merupakan faktor risiko. Wanita, 54 tahun, mengeluh kuku rapuh dan telapak tangan pecah-pecah sejak 6 bulan sebelum berobat ke klinik rawat jalan. Pasien adalah seorang petani dan bekerja di sawah tanpa sarung tangan setiap hari; dia juga jarang mencuci tangannya sehabis bekerja. Pemeriksaan dermatologik pada seluruh kuku jari tangan kanan dan kiri didapatkan diskolorasi warna kuning, putih, dan beberapa kehitaman, hiperkeratosis subungual, onikolisis, dan onikodistrofik. Pada telapak tangan kanan dan kiri didapatkan plak hiperkeratotik eritematosa dan putih-kekuningan multipel dengan fisura dan skuama kasar. Dari spesimen potongan kuku, pada pemeriksaan KOH 20% didapatkan hifa panjang bercabang, pada pewarnaan Periodic Acid-Schiff (PAS) didapatkan spora, dan pada kultur jamur didapatkan pertumbuhan koloni Cryptococcus laurentii dan Trichophyton spp. Pasien diterapi dengan dosis denyut tablet itraconazole 2 x 200 mg/hari selama seminggu setiap bulan. Pengobatan lainnya adalah krim urea 20%. Evaluasi 8 minggu setelah terapi, tercapai perbaikan klinis dan mikologis. Kejadian onikomikosis akibat Cryptococcus laurentii dan Trichophyton spp. masih jarang. Faktor predisposisi infeksi pada kasus ini diduga karena usia tua dan kontak sehari-hari dengan tanah sawah tanpa sarung tangan dan jarang mencuci tangannya setelah bekerja.

Kata kunci: onikomikosis, kuku, Cryptococcus laurentii, trychophyton spp, itraconazole

INTRODUCTION

Onychomycosis is a nail disorder due to fungal infection.^{1,2} It is more common in cold climates regions and less common in tropical regions. The prevalence study in Indonesia showed a low prevalence, ie 3.5–4.7% among cases of dermatomycosis.¹ It is the most common nail disease and contributes for 50% of all cause of onychodystrophy. In North America in the 2000, onychomycosis affects up to 14% of the population with both an increasing prevalence among older individuals and an overall increasing incidence.²

The most common cause of onychomycosis reported in Indonesia is *Candida* sp., whereas from the dermatophyte group is *Trichophyton rubrum* and *Trichophyton mentagrophytes*.¹ While onychomycosis due to *Trichophyton verrucosum* is quite rare.³ *Cryptococcus laurentii* is a yeast encapsulated basidiomisetessaprophytic species.^{4,5} Onychomycosis due to *Cryptococcus laurentiis* also very rare cases; several existing case reports were found in patients with diabetes mellitus.^{6,7}

CASE REPORT

A 54-year-old woman is came to dermatology outpatient clinic in RSUD dr. Saiful Anwar Malang with brittle nails and cracked palms since 6 months before. She is a farmer and work in the rice fields without gloves daily; she also rarely wash her hands after work. Initially itchy red patches appeared on both palms, followed by dry and rough small bumps then cracked skin. It is accompanied by itching, burning sensation, and pain on the cracked skin. In the next two weeks, brittle at the top of the nail on 5th finger of the right hand is happened. She cut the nail brittle part, but the brittle nail reappeared and spread proximally to whole nail on 5th finger, then it slowly spread into all the fingernails. She already seek medical help to some general practitioners, dermatologist, as well as traditional medication but there is no improvements.

Physical examination and vital signs are in normal range. Dermatologic examination on the left and right fingernail I-V is showed revealed yellow-white and some blackish discoloration, subungual hyperkeratotic, onycholysis, and onychodystrophy (Figure 1). In the right and left palm, it is showed multiple erythematous and yellow-white hyperkeratotic plaques, with fissures and rough scales (Figure 2).

A 20% KOH examination from finger nail clippings are revealed long branching hyphae (Figure 3). While, a 10% KOH examination on scales in the palms revealed no hyphae (Figure 4).



Figure 1. Yellow-white and black discolorization, subungual hyperkeratosis, and onychodystrophy.



Figure 2. Multiple white hyperkeratotic plaque with fissure.

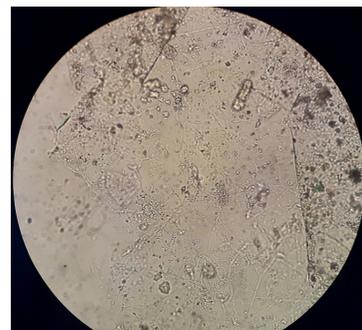


Figure 3. Long and branching hyphae of finger nail clippings (KOH 20%, 400X).

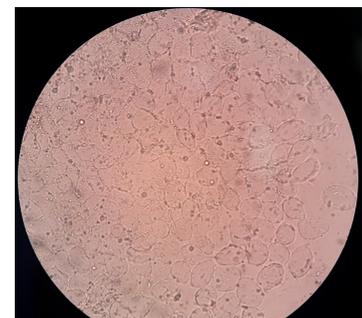


Figure 4. No hyphae from palm scales scrapping (KOH 10%, 400X).

Periodic Acid-Schiff (PAS) staining from finger nail clippings revealed spores (Figure 5). Fungal cultures from finger nails revealed growth of *Cryptococcus laurentii* and *Trichophyton spp* colonies. (Figures 6).

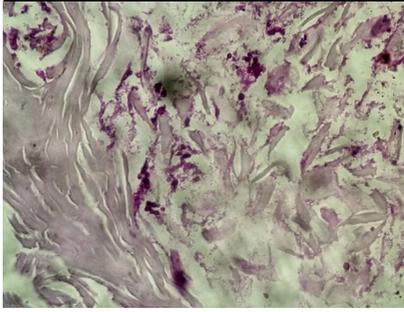


Figure 5. Spores from fingernail clippings (PAS, 400X)

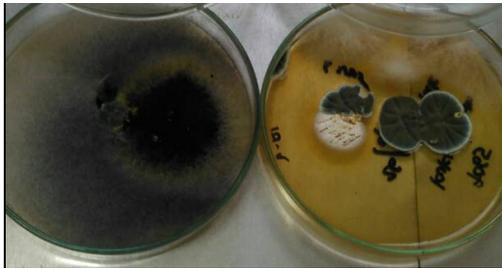


Figure 6. Fungal cultures from the fingernail clippings revealed growth of *Cryptococcus laurentii* and *Trichophyton spp*.

She is diagnosed with onychomycosis. She is treated with itraconazole pulse dose of 2×200 mg tablet / day orally for a week every month and 20% urea cream for her palms. Dermatologist gave her advice to soak the hands for 10 minutes each day to softens hyperkeratotic plaque and cuts off the hyperkeratotic plaque that is peeled off. She is also advised to use gloves in contact with soil or animals, and wash hands afterwards.

Follow up in the eight week after therapy, it is showed clinical improvement such as itching and pain in the palms are reduced, hyperkeratotic subungual is thinner and new healthy nail start to grow from proximal (Figure 7). On the palms, hyperkeratotic plaque and fissure are also reduced fissure (Figure 8). A 20% KOH examination from finger nail clippings is revealed no hyphae (Figure 9).

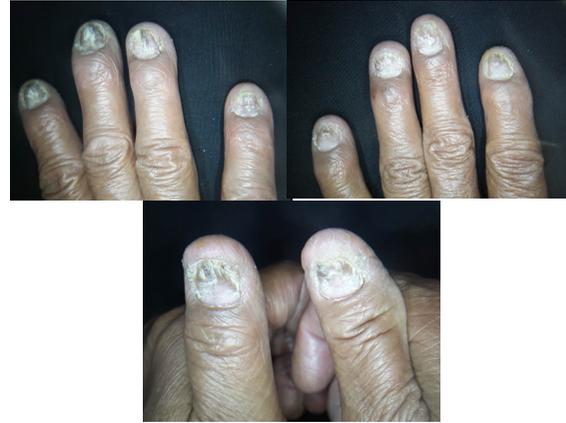


Figure 7. Clinical improvements after 8 weeks therapy. Thinner subungual hyperkeratotic. Healthy nail start to grow.



Figure 8. Clinical improvements after 8 weeks therapy. Reduced hyperkeratotic plaque lesion and fissure.

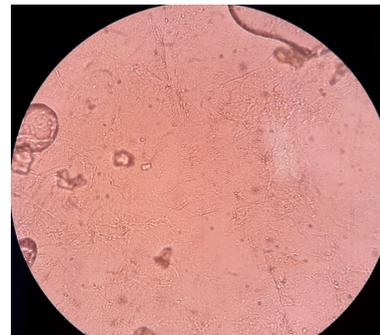


Figure 9. Mycological evaluation after 8 weeks treatment: no hyphae from finger nail clippings (KOH 20%, 400X).

DISCUSSION

Onychomycosis is a nail disorder due to a fungal infection either by dermatophytes, nondermatophytes, or moulds.^{1,2} The prevalence study in Indonesia is showed a low prevalence, ie 3.5–4.7% among cases of dermatomycosis.¹ It is the most common nail disease and contributes for 50% of all cause of onychodystrophy. In North America in the 2000, onychomycosis affects up to 14% of the population with both an increasing prevalence among older individuals and an overall increasing incidence.² In this case, the patient is at old age which is 52 year-old woman.

The most common cause of onychomycosis which is reported in Indonesia is *Candida* sp., whereas from the dermatophyte group is *Trichophyton rubrum* and *Trichophyton mentagrophytes*.¹ Dermatophyte transmission occurs as a result of direct contact. In *Candida* transmission occurs endogenously from the digestive tract and other organs.¹ Some *Trichophyton* species are zoophilic dermatophyte. Dermatophytosis by *Trichophyton* in humans results from direct contact or contact with contaminated products.^{6,8} *Cryptococcus laurentii* is a yeast encapsulated basidiomycetes saprophytic species,^{4,5} can be found on soil contaminated with bird droppings and from trees hollows with decaying wood.^{9–11} This species have occasionally been described as a potential pathogen in immunocompromised hosts.^{12–14}

Risk factors for onychomycosis include moisture, occlusion, nail trauma, decreased immunity, slow nail growth, wide nail surface, and genetic factors. Old age, cancer, psoriasis, dermatophyte infection at the palm, sole, or other sites of the body is also a risk factor.^{1,2} In this case, the risk factor of infection is suspected due to the patient's habitual contact with the paddy fields without gloves and rarely wash her hand after work and old age. Usual direct contact with soil contaminated with bird droppings and other animal might be the source of transmission of *Trichophyton* spp and *C. laurentii*. The condition of her hands often submerged in wetland increases the humidity of hand which are known to be the optimal environment for fungal growth. Her advanced age tend to have impaired circulation which is associated with decrease in nail growth rate. This increases the risk for colonization by dermatophytes and other organisms, as described by Elewski and Charif (1997).¹⁵ Her poor hygiene habit of the nails also increasing susceptibility to infectious organisms colonization.

Clinically, onychomycosis is divided into 5 invasion routes:^{1,2}

1. Distal and lateral subungual onychomycosis (DLSO): originate from hyponium, nail pads or lateral nail folds and moves toward the proximal, characterized by subungual hyperkeratotic and onycholysis.
2. Superficial onychomycosis (SO): a direct invasion of the superficial plates of the nail plate, marked by a sharp-edged cloudy white patch that can be confluent, characterized by a rough, soft, and brittle nail surface.

3. Endotrix onychomycosis (EO): direct invasion on the surface of the nail and inner lining of the nail; characterized by the release of nails in lamellar.
4. Dystrophic total onychomycosis (DTO): secondary onychomycosis conditions, characterized by thickened nails, brownish yellow and distal phalanx swelling.

In this case, the nail abnormality which is originated from the distal end, that is presumed as distal and lateral subungual onychomycosis (DLSO), and within 6 months undergoes a yellow-white and some blackness discoloration, subungual hyperkeratosis, onycholysis, and onychodystrophic proximally and destroy the structure of the whole nail, which is recently present as dystrophic total onychomycosis (DTO).

The management of onychomycosis depends on the causative organism, the involvement of the nail, the presence of tinea pedis, the efficacy and potential side effects of the therapeutic regimen.² The goal of treatment is to eradicate the causative organism.¹⁶ The evaluation is done by microscopic examination and culture.^{1,2} The definition of “complete cure,” as defined by the US Food and Drug Administration (FDA) for the evaluation of clinical trial results, is negative results on potassium hydroxide (KOH) preparation and on fungal culture, as well as a completely normal appearance of the nail. In clinical practice—and for practical purposes—most cures will be defined by the absence of fungus on KOH preparation and possibly, but not always, by a completely normal nail. Realistically, patients who have had long-standing infections or chronic onychomycosis are likely to have sustained damage to the nail matrix or subungual area so that, despite the clearance of infectious organisms, new nail growth may be permanently discolored and/or dystrophic, and some onycholysis (lifting of the nail plate) may persist.¹⁶

Itraconazole is effective therapeutic option for onychomycosis.¹⁷ Itraconazole is fungistatic drug, may be administered according to either of two dosing schedules, with a continuous dose of 200 mg tablet/ day for 3 months, or with pulse dose of 400 mg tablet/ day for a week every month, for 2 months for fingernails and 3 months for toenails.^{1,2} Better results with continuous dose are explained by its pharmacokinetic properties.¹⁸ According to Uberaba study in Minas Gerais, Brazil on *C. laurentii*, the result is showed 71.1% sensitive to dose dependent fluconazole, 94.7% sensitive to voriconazole.¹⁹

Elimination of the fungus generally restores the appearance of the nail in most cases. However, patients should not expect to see normal-appearing nails until the fungi are eliminated and the damaged nail has grown out. Successful treatment has been difficult because of slow growth of the nail.²⁰ For fingernails, the nail growth may take 6 months or more from the time effective treatment is initiated and, for toenails take 12 to 18 months.¹⁶ Toenails grow at the rate of about 1 to 2 mm per month and fingernails grow faster, at the rate of 2 to 3 mm per month; however, nail growth rate peaks during the teenage years and decreases with advancing age.²¹

In this case, the patient is treated with standard therapy which is itraconazole pulse dose of 2 x 200 mg tablet/day for a week each month and emollient for the hand. Follow up in the eight week after therapy, it is found the clinical improvement, itching and pain in the palms are reduced, hyperkeratotic subungual were thinner and new healthy nail start to grow from proximal. On the palms, hyperkeratotic plaque and fissure were also reduced. Mycological improvement is also achieved as there were no hyphae in the KOH preparation from fingernail clippings. Normal appearance of the nail is not yet achieved in this case may be due to long-standing infections or chronic onychomycosis which are likely to have sustained damage to the nail matrix or subungual area and patient's advancing age which decrease the nail growth rate.

CONCLUSION

This is a case of onychomycosis in 54-year-old woman in the fingernails due to by *Cryptococcus laurentii* and *Trychophyton spp*. The predisposing factor of infection in these case is suspected due to old age and her habitual contact with the paddy fields without gloves and rarely wash her hand after work. Patients was succesfully treated with itraconazole pulse dose 2 x 200 mg tablet/day for a week every month. Clinical and mycological improvements was achieved after eight weeks treatment, which include itching, pain, fissures in the palms were reduced, hyperkeratotic subungual were thinner and new healthy nail start to grow from proximal, also there were no hyphae in the KOH preparation from fingernail clippings.

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