A RARE CASE OF TRICHOPHYTON TONSURANS AS A CAUSATIVE AGENT OF ENDONYX ONYCHOMYCOsis

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BACKGROUND

Onychomycosis is a fungal infection of nails caused by dermatophytes most frequently, followed by yeasts and non-dermatophyte molds. It represents 20%-40% of all nail disorders. Endonyx onychomycosis is an unusual variant of onychomycosis which involves the inner surface of nail plate without inflammation, onycholysis or subungual hyperkeratosis. Its common causes are Trichophyton soudanense and T. violaceum. We present a rare case of Trichophyton tonsurans as the causative agent of Endonyx onychomycosis. We used the combination of time honoured techniques of KOH mount and culture for the diagnosis of the affected nail along with special tests like slide culture according to standard techniques. Compared to the other superficial mycoses, this condition is persistent, intractable and poses serious concern to the clinicians as it often becomes chronic, besides causing considerable disfigurement. To the best of our knowledge, there are no previous reports of Endonyx onychomycosis caused by Trichophyton tonsurans from India.

KEYWORDS

Trichophyton Tonsurans, Onychomycosis, Endonyx Onychomycosis.


CASE REPORT

A 32-year-old woman presented with a 1-year history of whitish discolouration of the left toenail. She was previously healthy with no known underlying disease or trauma. None of her family members had a history of dermatophytosis. On examination, the left toenail plate revealed milky white transverse patches without changes of the nail surface. Onycholysis, subungal debris, hyperkeratosis or paronychial inflammation was not detected [Figure 1]. Clinical diagnosis was based on the patient’s history; a physical examination, microscopy with 40% KOH for visualisation of the fungal hyphae and cultures on Sabouraud dextrose agar (SDA) (HiMedia Laboratories, Mumbai, India) containing chloramphenicol (0.05 mg/mL) and Cycloheximide (0.1-0.4 mg/mL) incubated at 25°C and 37°C which yielded a pale buff to yellow growth with suede-like to powdery surface and yellow to deep mahogany reverse appearance within 12 days. The colonies were raised with some folds and sulci and a flat periphery [Figure 2]. The culture isolate was further identified by studying the microscopic examination of the lactophenol cotton blue mounts (LPCM). Microscopic examination of samples from cultures showed broad irregular septate hyphae with a lot of branching. Numerous giant forms of microconidia and chlamydospore-like structures of various sizes and shapes were seen branching at right angles to the hyphae. The microconidia varied from long dorate, broad pyriform, to balloon shaped and stained poorly with LPCM. Smooth-walled macroconidia containing two to four cells in each were sparsely detected and no spiral coils were identified [Figure 3]. These findings are diagnostic of T. tonsurans. Further special tests like In vitro hair perforation (negative); urease production (positive at 5 days) and slide culture were performed according to standard techniques. The patient was successfully treated with oral fluconazole (200 mg) weekly along with topical ketoconazole for 2 months. The lesions were completely cured. Follow-up microscopic examination and fungal culture were negative after the course of antifungal therapy.

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DISCUSSION

Onychomycosis is a chronic mycotic infection of finger nails and toe nails that affect the quality of life to a significant proportion. OM is caused most commonly by dermatophytes (Trichophyton rubrum, T. mentagrophytes, T. tonsurans and E. floccosum). Yeasts (Candida albicans, C. parapsilosis) and molds (Aspergillus spp) represent the second cause of OM followed by non-dermatophyte molds (Fusarium spp, Acremonium spp, Alternaria spp and Neoscytalidium spp.). OM affects approximately 5% of the population worldwide. Relatively little work has been done on this problem in our country. In a five-year survey of OM in New Delhi, the prevalence was confirmed in 45% of patients analysed.[1] The prevalence rate of OM is determined by age, predisposing factor, social class, occupation, climate, living environment and frequency of travel. There has been a recent increase in the incidence as well as the spectrum of causative pathogens associated with OM which may be due to increase in awareness among peoples towards health, cosmetic consciousness or due to increase in various risk factors such as chronic health problems e.g. diabetes, more immunocompromised patients because of human immunodeficiency virus, use of immunosuppressive therapies, cancer chemotherapy or antibiotics and lastly avid sports participation, increase in use of health clubs, swimming pools and occlusive footwear for exercise. [8] Toenails are about 25 times more likely than fingernails to be infected because of their slower growth, reduced blood supply and frequent confinement in dark, moist environments. The longest toe, either the first or the second bearing the brunt of pressure and trauma from footwear, is particularly susceptible. Increasingly OM is being viewed as more than a mere cosmetic problem. [1] Onychomycosis was initially classified based on clinical presentation and patterns of fungal invasion. These classes include distal and lateral subungal onychomycosis (DLSO), proximal subungal, superficial and total dystrophic onychomycosis. Endonyx onychomycosis is an unusual variant of OM. Previously, it was considered a subtype of DLSO, as both originate from the distal part of the nail. However, their clinical manifestations, pathogenesis and aetiologies were found to be different. Recent literature classifies EO as a distinct group of onychomycosis with a characteristic mechanism by which fungal elements reach the nail plate via the pulp and invade its superficial and deeper parts leading to lamellar splitting of the nail plate without causing onycholysis or subungual hyperkeratosis in contrast to DLSO.[2] This unique mechanism of fungal invasion commonly occurs with dermatophytes that cause endothrix type of infections especially, T. soudanense and T. violaceum which also causes the same clinicopathological features. Clinically, this condition is characterised by diffuse milky white discoloration of affected nail. In spite of the milky colour, Endonyx type can be differentiated from superficial white onychomycosis by the presence of normal surface of the nail plate.[4, 6]

Typically, Trichophyton tonsurans causes tinea capitis ranging from tinea capitis carriage status to clinical infection. Besides tinea capitis, T. tonsurans is also known to cause tinea corporis, Majocci’s granuloma and folliculitis decalvans. [9] In another study from Sikkim, T. tonsurans was the most common isolate from onychomycosis patients.[10] Some of these studies reported the presence of T. tonsurans-induced OM, mostly observed in the patients with coexistent tinea capitis or contact history of asymptomatic carriers such as family members.[6] In our
patient, there were no scalp lesions and none of her family members had features of dermatomycosis. The incidence of T. tonsurans infection is dynamically changing in various parts of the world. We were unable to find any previous reports of Endonyx onychomycosis caused by Trichophyton tonsurans in India. Although recently in 2015, a similar case has been reported from Bangkok, Thailand by Bunyaratavej et al.[6] Many of the clinical variants produce very mild symptoms, possibly due to development of host tolerance to T. tonsurans.[3] This case report highlights the need for prompt microbiological conformation which may prevent under diagnosis with subsequent delay or inappropriate treatment. It also emphasises on the importance of awareness of this dermatophyte as a rare and emerging cause of Endonyx onychomycosis. It is imperative to be aware of these changing patterns and causative fungi for making adequate strategies for prevention and treatment of this infection.

REFERENCES