

Twenty nails dystrophy- a rare presentation of dermatophytosis

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Abstract: Twenty-nail dystrophy or trachyonychia is widespread dystrophy involving all twenty nails, can be idiopathic or is caused by many conditions such as lichen planus, eczema, psoriasis and alopecia areata. Onychomycosis though can lead to total dystrophic onychomycosis, but is not considered as a cause of twenty-nail dystrophy. A 50 years old male presented in dermatology outpatient department with thickening and yellowish discoloration of all twenty nails with thickening of palms and soles for 15 years. Examination revealed thickened nail plates with yellowish discoloration in all twenty nails, palmoplantar keratoderma with mild scaling and multiple, scaly, erythematous plaques over chest, abdomen, dorsa of feet, forearms, groins and buttocks. All routine investigations including viral markers were within normal limits. KOH examination of subungual hyperkeratotic material and skin scrapings showed presence of fungal hyphae. Fungal culture yielded *T.mentagrophyte*. PAS staining of histopathology specimen proved palmoplantar keratoderma due to dermatophytes as fungal hyphae were seen. This case is being reported for rare presentation of twenty-nail dystrophy due to dermatophytosis.

Keywords: trachyonychia, dystrophy, Onychomycosis.

INTRODUCTION

Trachyonychia, derived from the Greek word *trakos*, means rough, is a descriptive term referring to rough nail changes [1]. The term "twenty nail dystrophy" (TND) is used to describe trachyonychia involving all 20 nails [2, 3, 4]. The nails show diffuse ridging with lack of luster, and can have sandpaper-like surface [5]. The dystrophic nail findings seen in trachyonychia give the nail plate a rough, opaque appearance. Twenty nail dystrophy may occur as isolated condition, without any other cutaneous condition, but otherwise conditions associated with twenty nail dystrophy includes: Lichen planus, [6] vitiligo [7] alopecia areata [8] Eczemas, Ichthyosis vulgaris [9]. Immunoglobulin A deficiency, [10] ITP, [11] Autoimmune hemolytic anemia, [11] Psoriasis [12]. Onychomycosis though can lead to total dystrophic onychomycosis, but is not considered as a cause of twenty-nail dystrophy. Acquired keratodermas can be defined as a non-hereditary, non-frictional hyperkeratosis of the palms and soles that involves $\geq 50\%$ of the surface of involved acral areas and that may or may not be associated with clinical and histologic inflammation [13].

CASE REPORT

A 50 year old Punjabi, rural, male farmer presented in outpatient department of a tertiary centre with thickening and yellowish discoloration of all the finger & toe nails (Figure 1) along with thickening of

palms and soles for 15 years. He was also having many intermittent episodes of itchy and scaly plaques over various body parts for 12 years, which used to settle temporarily after taking some treatment from local practitioners. Nail plate involvement started distally and laterally and then gradually whole of the nail plate became thickened. Examination revealed thickening & yellowish discoloration of all the twenty nail plates & epidermolytic palmoplantar keratoderma. There were multiple, scaly, annular plaques present over groins, buttocks, chest, and abdomen, dorsa of feet and on forearms. No systemic complaints were present.



Fig-1: Initial nail involvement



Fig-2: After treatment with terbinafine

CBC and biochemical investigations along with viral markers were within normal limits. KOH mount from skin scrapings & subungual hyperkeratotic material showed presence of fungal hyphae. (Figure 3a) Fungal culture from subungual hyperkeratotic material yielded *T. mentagrophyte*. (Figure 3b) Histopathology of palmar biopsy showed markedly thick stratum corneum comprising of compact orthokeratosis with intermittent parakeratosis containing entrapped plasma and inflammatory cells.

Diagnosis of Twenty-nail dystrophy & Palmo Plantar Keratoderma due to dermatophytes was made and Treatment was started with Terbinafine 250 mg OD. After 6 months all the body lesions as well as nail changes improved. (Figure 2)

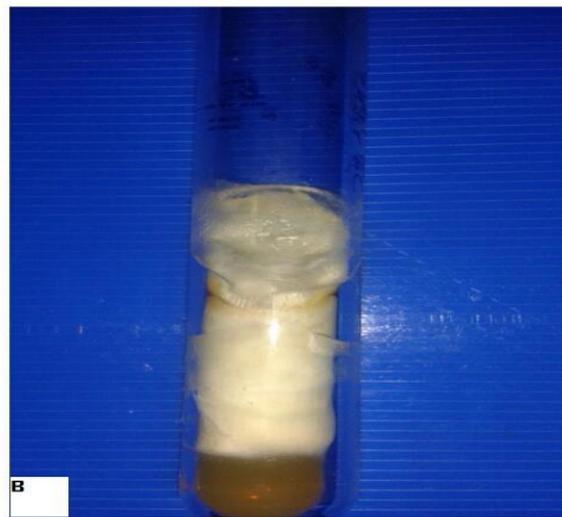
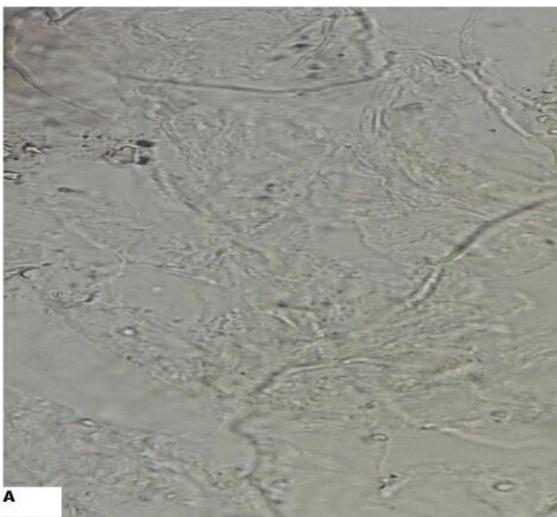


Fig- 3: A. KOH mount showing fungal hyphae & B. Culture showing growth of *T. mentagrophytes*.

DISCUSSION

Twenty-nail dystrophy is known to affect both genders. It is a clinical entity and describes a spectrum of nail plate changes leading to nail plate roughness, thinning or thickening of nail plate, loss of shine, dark discoloration of nail plate, longitudinal ridging, distal notching and splitting characterizes it. Longitudinal ridging is a hallmark of the trachyonychia, which may present as an idiopathic disorder of the nails in about 50% cases with no other cutaneous or systemic involvement, but usually it is associated with variety of

other disorders. Its association has been reported with several diseases such as vitiligo, atopic dermatitis, and alopecia areata. Alopecia areata (AA) is the most common disease in patients with trachyonychia, and affects 1-2% of the population. Trachyonychia is quite common with Lichen planus and is seen in 10% of patients affected by nail lichen planus (LP). In these patients, nail LP is most often isolated. However, oral LP is the most common type of LP associated with nail LP [14].

Table 1: Clue to diagnosis of twenty-nail dystrophy associated with various entities.

Psoriasis	Pitting, subungual hyperkeratosis, oil drop sign, leuconychia, beaus lines, thickening of nail plate, skin lesions
Alopecia areata	Longitudinal striations, Superficial pitting, ragged cuticle, beaus lines, lamellar solittine
Lichen planus	Longitudinal ridging, pitting, lack of lusture, thinning, pterygium& onycholysis, presence of skin lesions elsewhere on body, oral lesions.
Vitiligo	Longitudinal striations, leuconychia, absent lunula, pitting and presence of patches of vitiligo on skin

Fungi may invade the nails in four different ways, leading to four separate types of Onychomycosis with specific clinical features, prognosis and response

to treatment. Dermatophytes are the most common cause of Onychomycosis (83%).

Table 2: Types of Onychomycosis

Type	Organisms	Associations
DLSO (Most common)	Trichophytonrubrum	Palmoplantar keratoderma, tinea cruris.
Proximal subungal Onychomycosis (Least common)	Moulds, but is also caused by dermatophytes like T. rub rum, T. Mentagrophytes, T. tonsurans	HIV, peripheral vascular compromise.
Superficial Onychomycosis	T. Mentagrophytes, Trichophytonrubrum	
Endonyx Onychomycosis	T. soudenence and T. violaceum	
Total dystrophic Onychomycosis	Candida and commonly affects immune-compromised patients	Common in long standing infection
Mixed pattern Onychomycosis	Combination of the above subtypes	No specific
Secondary Onychomycosis	Invasion of fungal agent into a deformed nail.	Trauma or disease

Total dystrophic onychomycosis can occur as end result of other types of onychomycosis, if they remain untreated. Characteristically, some nails are always spared, an important clinical distinguishing feature. Diagnosis can be made by KOH examination and fungal culture using Sabouraud’s medium. The failure rate for nail culture is high (20–30%) since fungi may be scarcely visible and fail to grow. When the clinical picture and direct examination are indicative of onychomycosis it is mandatory to repeat the culture. Differentiating between onychomycosis and psoriasis can be difficult since subungual hyperkeratosis, onycholysis, splinter haemorrhages and diffuse nail ‘crumbling’ are clinical signs of both conditions [15].

Treatment of Onychomycosis has been developed only in last two decades. A comparison of older (griseofulvin and ketoconazole) and newer (itraconazole, fluconazole, terbinafine) antifungal drugs was done which shows that treatment duration, tolerance problem & low affinity for keratin makes griseofulvin less suitable for treatment of Onychomycosis. For ketoconazole greater interactions & side effects didn’t work in its favor for treatment for Onychomycosis. So higher affinity for keratin, low side effects and shorter duration of treatment for cure worked for itraconazole & terbinafine in making them best suitable treatment choice. Comparative trials between itraconazole and terbinafine in patients with dermatophytic infections of the nails have shown almost similar efficacy. There are two general categories of concern that are important in the selection of appropriate therapy: disease related factors and patient-oriented factors. Before selecting agent for treatment accurate identification of the infecting organism is very important, as if Onychomycosis is due to moulds itraconazole is preferred over terbinafine.

However, we cannot ignore patient-related factors also that may influence decision-making. This patient was suffering from dermatophytic infection due to T. mentagrophytes, So cost of the therapy played an important role in selection of therapy with terbinafine, as cost of therapy is considerably low with terbinafine when compared with itraconazole.

We are reporting this case as a first case in the literature as twenty-nail dystrophy due to dermatophytes. This case also emphasize on the importance of prompt diagnosis and treatment to prevent such massive involvement, because in this case patient was suffering for last 15 years and he was not properly diagnosed & treated because he didn’t seek consultation from a dermatologist, leading to complete involvement of all twenty nails. Diagnosis in this case was made on clinical basis & was confirmed by KOH mount, fungal culture of material from subungual hyperkeratosis& skin biopsy. Patient was put on treatment after KOH mount. As various types of dermatophytic infections like Onychomycosis, palmar & plantar keratodermas & tinea cruris en corporis were present in this patient so treatment options were considered keeping in mind all the infections.

CONCLUSION

Although Palmo-plantar keratodermas due to dermatophytes is not a rarity, but Onychomycosis is not known to cause twenty nail dystrophy, and its also not very common to see patients suffering from fungal infections & remained untreated for such a long period of time. In spite of presence of such visible signs and symptoms patient didn’t take proper treatment for so long, showing ignorance on the part of rural patients as well as lack of their accessibility to dermatologists. Further presence of palmoplantar keratoderma along

with twenty-nail dystrophy caused confusion with psoriasis leading to prolonged mismanagement. So this case is being reported for being first case of twenty-nail dystrophy due to dermatophytosis and to highlight the lack of awareness part in rural patients about dermatological diseases

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