

A case of rapid fingernail growth associated with nail psoriasis: A case report

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Jade Conway, BA¹ and Shari R Lipner, MD PhD²

Abstract

Overall, 80%–90% of patients with psoriasis will have nail involvement at some point during their lifetime, and nail changes, on average, are more common in patients with longer disease duration. Since there is accelerated keratinocyte proliferation and cell turnover in cutaneous psoriasis plaques compared to normal skin, it has been hypothesized that psoriasis increases nail growth rate. We describe a case of a 44-year-old male with a 10-year history of cutaneous and nail psoriasis, with acceleration in nail growth rate for 2 years prior to presentation. Clinical examination of the fingernails showed very long nails with onychorrhexis, onycholysis, and koilonychia and scattered erythematous plaques involving the chest and arms. We report a case of rapid fingernail growth in a patient with a 10-year history of psoriasis with skin and nail manifestations. Our case supports the hypothesis that increased cell turnover in psoriasis patients affects nail growth rate.

Keywords

Nail growth, psoriasis, cell turnover, onycholysis, onychorrhexis

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Introduction

About 40% of patients diagnosed with cutaneous psoriasis also present with nail involvement, and 80%–90% of patients with psoriasis will have nail involvement at some point during their lifetime. Only 5%–10% of patients have isolated nail involvement.¹ Nail changes with psoriasis are more commonly seen in fingernails compared to toenails and are more frequent in patients with longer disease duration.¹

Clinical manifestations of nail psoriasis are dependent on the location of inflammation within the nail unit. Nail matrix psoriasis may present with pitting, leukonychia, nail plate crumbling, or red spots in the lunula, while nail-bed psoriasis may present with onycholysis, oil-drop discoloration, splinter hemorrhages, and subungual hyperkeratosis.^{1,2} Additional clinical findings include beau's lines, onychomadesis, and onychorrhexis.^{3,4}

Psoriasis is characterized as a disorder of proliferation and differentiation in keratinocytes. In psoriasis plaques there is shorter transit time of keratinocytes from the basal layer to the spinous layer of the epidermis, with substantial acceleration of keratinocyte proliferation and cell turnover compared to normal skin.^{5–7} Psoriasis has thus been hypothesized to increase linear nail growth rate, but there has been little formal research.⁸ We present a case of rapid fingernail

growth in a patient with a 10-year history of psoriasis affecting the skin and nails.

Case report

A 44-year-old male with a history of cutaneous psoriasis presented with a flare involving the skin of his arms and chest for the past month. The patient also had a 10-year history of nail plate ridges and lifting, and fast fingernail growth, with recent acceleration in growth rate for the past 2 years prior to presentation. He noted that, more recently, he had to clip his fingernails twice weekly due to rapid growth. He denied fingernail pain or nail plate breakage.

Medical history was significant for low testosterone and androgenic alopecia. Medications included topical minoxidil, ascorbic acid, cholecalciferol, selenium, and zinc. He started using the topical minoxidil 1 year prior to presentation.

¹School of Medicine, New York Medical College, Valhalla, NY, USA

²Department of Dermatology, Weill Cornell Medicine, New York, NY, USA

Corresponding Author:

Shari R Lipner, Department of Dermatology, Weill Cornell Medicine, 1305 York Avenue, New York, NY 10021, USA.

Email: sh19032@med.cornell.edu



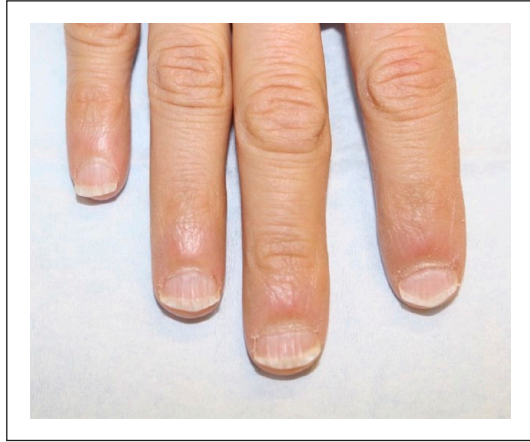


Figure 1. Clinical image of long right fingernails with onychorrhexis, onycholysis, and koilonychia.



Figure 2. Clinical image of long left fingernails alongside erythematous psoriasis plaque of the forearm.

Clinical examination of the fingernails was significant for very long nails with onychorrhexis, onycholysis, and koilonychia (Figure 1). The right thumbnail had a single splinter hemorrhage. There were scattered erythematous plaques with scale involving the chest and arms (Figures 2 and 3). Fingernail clippings showed onychodystrophy and incomplete keratinization associated with confluent subungual parakeratotic scale in the absence of neutrophils and other demonstrable organisms, consistent with a diagnosis of nail psoriasis. Hand X-rays showed no radiographic evidence of psoriatic arthritis. The patient had never been bothered by the appearance of his nails and continued to opt for observation without treatment of the fingernails.

Discussion

Physiological and environmental factors, as well as pathological factors have been posited to affect linear nail growth rate, but there has been limited formal study. For example, warm weather, pregnancy, and right-handed nails are associated with



Figure 3. Clinical image of long left fingernails alongside erythematous psoriasis plaque of the upper arm.

increased nail growth, while cold environments, older age, and left-handed nails are associated with slower nail growth.^{8,9} Normal nail growth is continuous and very slow, with fingernails growing 2–3 times faster than toenails.¹⁰ In an observational study of 22 healthy adults using nail markings to track nail growth rates in 195 fingernails and 188 toenails, the average growth rate of fingernails was faster than toenails (3.47 vs 1.62/mm month, $p < 0.01$).¹¹ It has been suggested that psoriasis increases nail growth rate of both unaffected and affected nails, although few studies have examined nail growth rates in psoriasis patients in detail.⁸

Nail growth rates were compared in 28 patients with idiopathic onycholysis ($n=6$), psoriatic onycholysis ($n=6$), psoriasis with unaffected nails ($n=7$), and normal controls ($n=9$).¹² Idiopathic and psoriatic onycholytic nails grew 25% and 33% faster than normal control nails, respectively ($p < 0.001$), while unaffected nails in the idiopathic onycholysis group grew significantly slower than clinically normal nails of psoriatic patients with and without onycholysis ($p < 0.001$).¹² In sum, patients with psoriasis with onycholysis or unaffected nails had increased nail growth rates compared to normal controls.

In another study comparing linear nail growth rates between psoriasis patients ($n=10$) and healthy controls ($n=6$), nail growth rate was 0.143 mm/day (range 0.114–0.172) in psoriasis patients compared to 0.120 mm/day (range 0.112–0.129) in healthy controls ($p=0.0032$). Therefore, there was a 19% nail growth rate acceleration in psoriasis patients compared with age-matched healthy controls.¹³ Since six of the psoriasis patients were receiving treatment with topical medication, oral cyclosporine, or biologic therapy during the study period, the observed increased linear nail growth rate might have been due to psoriasis itself and/or treatment. As our patient has always opted for intermittent topical treatment for his cutaneous psoriasis, and not systemic therapy or treatment specifically for the nails, his more recent rapid nail growth could not be due to psoriasis treatment.

Treatment with topical minoxidil has been associated with increased linear nail growth, which might be due to its vasodilatory properties. In a randomized study of 32 patients who applied, 5% topical minoxidil solution twice daily to their second and fourth proximal nail folds for 2 months, mean growth of treated nails was 4.27 mm/month compared to 3.91 mm/month in untreated nails ($p=0.003$).¹⁴ In another controlled study of 38 adults of ages 25–45 years, treatment with 5% topical minoxidil was compared to 2.5 mg oral biotin to assess linear nail growth rate of fingernails; pre-intervention nail growth rates were measured over 14 days for comparison. After 28 days of treatment, fingernails of patients treated with topical minoxidil had a 19% increase in nail growth rate versus 15% increase in patients taking oral biotin compared to pretreatment growth rates. Minoxidil treatment thus resulted in greater nail growth rate than biotin treatment ($p<0.01$).¹⁵ However, since our patient only began using topical minoxidil 1 year prior to presentation, but noticed nail growth changes 2 years before presentation, the rapid acceleration of nail growth is unlikely to be solely due to topical minoxidil.

We present a case of rapid fingernail growth associated with psoriasis. Our case supports the hypothesis that increased cell turnover in psoriasis patients not only affects cutaneous lesions, but also the nails. Nail psoriasis is often underrecognized by physicians with delayed diagnosis,¹⁶ which is even more prolonged for the skin of the patients of color.¹⁷ Our finding of rapid nail growth associated with psoriasis may be another clinical clue that may be used to expedite diagnosis of nail psoriasis. In addition, rapid fingernail growth may have implications for treatment of nail psoriasis, with faster clearance in these patients compared to patients with other nail disorders.

Data availability statement

All data generated or analyzed during this study are included in this article. Further inquiries can be directed to the corresponding author.

Author contributions and acknowledgments

J.C. and S.R.L. both contributed to the conception, drafting, and revising of the work, as well as final approval of the version to be published. Both J.C. and S.R.L. agree to be accountable for all parts of the work, ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Declaration of conflicting interests

The author(s) declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: Ms. Conway has no conflicts of interest. Dr. Lipner has served as a consultant for Hoth Therapeutics, Ortho-Dermatologics, and BelleTorus Corporation.

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Patient consent/statement of ethics

Written informed consent was obtained from the patient for publication of details of their medical case and the photographic images. As this is a case report, ethical approval is not required for this study in accordance with the Weill Cornell Institutional Review Board.

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