Our Dermatology Online

Case Letter

Green nail syndrome: Contribution of dermoscopy in two cases

Boularbah Siham, Meryem Soughi, Kawtar El Fid, Zakia Douhi, Sara Elloudi, Hanane Bay Bay, Fatima Zahra Mernissi

Department of Dermatology, CHU Hassan II, Fez, Morocco

Corresponding author: Siham Boularbah, MD, E-mail: sihamboularbah1902@gmail.com

Sir,

Green nail syndrome (GNS) is a nail disorder that may be caused by several etiologies, among which *Pseudomonas aeruginosa* is the main factor that produces pyocyanin and pyoverdine, causing green discoloration. This infection may be confused with etiologies, such as co-infection with onychomycosis [1]. Herein, we report the dermoscopic models of GNS observed in two cases.

A 42-year-old female presented with painless nail discoloration of the right thumb (Fig. 1a). The patient reported that there was only white and yellowish coloring in the same area present for around three years and that the green color had been returning for the last five months. The patient had no similar lesions elsewhere. A dermoscopic examination revealed a polychrome pattern consisting of areas of greenish and yellowish coloring, giving the aspect of aurora borealis (Fig. 1b) with a yellowish-white, jagged edge and subungual hyperkeratosis (Fig. 1c). Microbiological examinations confirmed the presence of *Pseudomonas* infection and *T. rubrum* dermatophytosis.

A thirty-year-old housekeeper female with a history of insulin-treated diabetes presented to our dermatology department with a four-year history of asymptomatic nail discoloration affecting the thumb of the right hand (Fig. 2a), repeatedly treated with oral fluconazole by her general practitioner yet without clinical improvement. An onychoscopic examination revealed a multicolored pattern on the nail plate consisting of areas of homogeneous, blackish-gray and greenish coloration (Fig. 2b). and pachyonychia without subungual hyperkeratosis (Fig. 2c). The direct microscopic preparation of potassium hydroxide was negative, yet a microbiological examination confirmed the presence of *Pseudomonas* infection.

Pseudomonas aeruginosa is the most common pathogen causing bacterial nail infections [3]. However, other saprophytic germs such as *Candida albicans* [2], some species of *Aspergillus*, and *Proteus mirabilis* may also cause chloronychia. Very often, it is a mixed infection.

Pseudomonas aeruginosa is a strictly aerobic, ubiquitous, saprophytic, Gram-negative bacterium that may become an opportunistic pathogen. In humans, moist regions (folds, anogenital regions, external auditory canal) are places of natural colonization. This bacterium may produce green nail syndrome by the accumulation of pyocyanin according to two modes of contamination [3].

On the one hand, *Pseudomonas* may develop immediately in the ungueal tablet. On the other, it may develop by cuticular weakening favored by several risk factors such as [6]:

- repeated immersions, thus being common among housekeepers, hairdressers, and beauticians;
- repetitive strain injuries, such as excessive manicure and onychophagia.

The results of our study confirmed the previously reported risk factors, such as frequent water exposure. The first finger injury in both cases meant that trauma is likely an important risk factor for chloronychia.

How to cite this article: Boularbah S, Soughi M, El Fid K, Douhi Z, Elloudi S, Baybay H, Mernissi FZ. Green nail syndrome: Contribution of dermoscopy in two cases. Our Dermatol Online. 2023;14(1):116-118.

Submission: 25.07.2022; **Acceptance:** 24.09.2022

DOI: 10.7241/ourd.20231.32

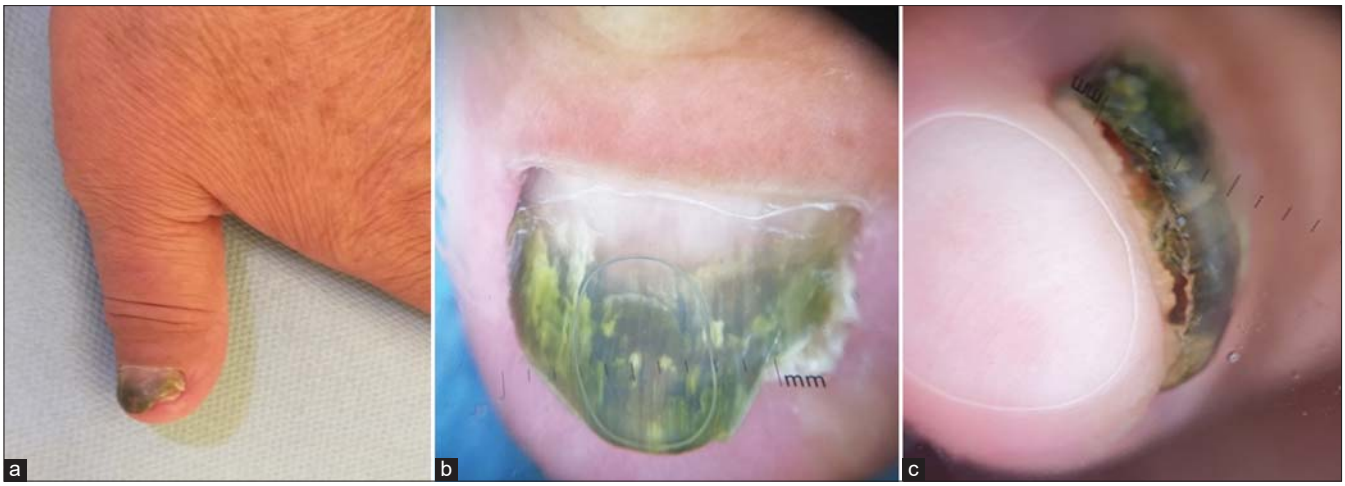

Figure 1: (a) Right thumb green nail: the mycological and bacteriological examinations were in favor of co-infection with *Pseudomonas* and *T. rubrum*. (b) Polychrome pattern consisting of zones of greenish and yellowish coloration. (c) Free edge dermoscopy revealing hyperkeratosis under the nail.

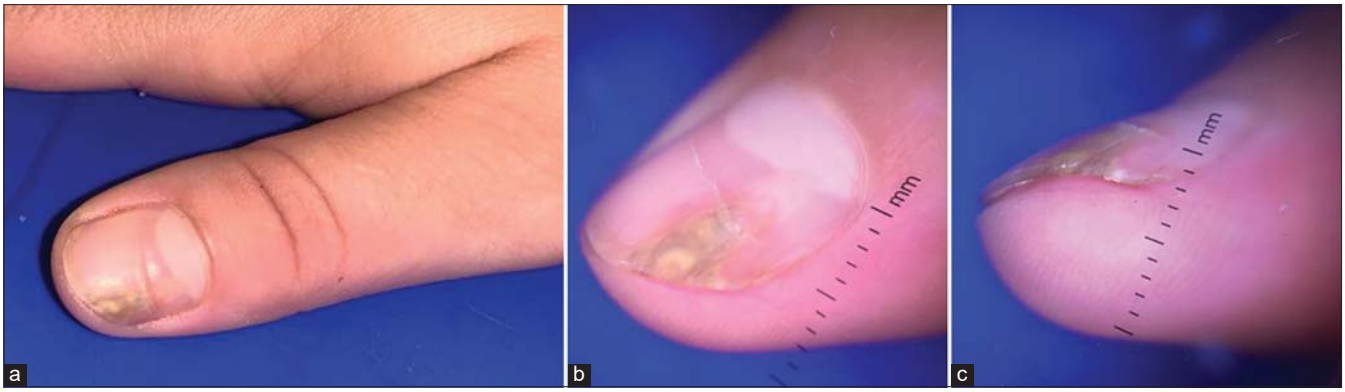

Figure 2: (a) Left thumb green nail: the mycological examination was negative and the bacteriological examination was in favor of *Pseudomonas*. (b) Polychrome pattern consisting of areas of greenish and yellowish coloration. (c) Free edge dermoscopy revealing the absence of subungual hyperkeratosis.

Concomitant nail pathology, essentially onychomycosis [4], is another risk factor for infection with this bacterium. Indeed, concomitant onycholysis constitutes a space for humidity and, therefore, a bed for *P. aeruginosa*. The mixed infection may be confused with isolated *Pseudomonas* infection. It is already known that the isolation of the causative fungus is highly difficult due to the fungicidal properties. In our cases, a greenish pattern without structure or polychrome with the absence of hyperkeratosis under the nail should guide the clinician toward isolated infection with *P. aeruginosa*, while onycholysis and the greenish pattern without structure or polychrome with the presence of subungual hyperkeratosis may direct the diagnosis toward a mixed infection.

Dermoscopy may, therefore, help in the etiological diagnosis of green nails by distinguishing infections with *Pseudomonas aeruginosa* isolated from co-infection with onychomycosis. Our study corroborated a Spanish report published in 2021 [5]. We also suggest reserving the term *aurora borealis* for the dermoscopic appearance of green nails observed in *P. aeruginosa* infection and the term *green aurora sign* for that observed in onychomycosis.

Consent

The examination of the patient was conducted according to the Declaration of Helsinki principles.

REFERENCES

1. Benati E, Ribero S, Longo C, Piana S, Puig S, Carrera C, et al. Clinical and dermoscopic clues to differentiate pigmented nail bands: An International Dermoscopy Society study. J Eur Acad Dermatol Venereol. 2017;31:732-6.
2. Romaszkiewicz A, Slawinska M, Sobjanek M, Nowicki RJ. Nail dermoscopy (onychoscopy) is useful in diagnosis and treatment

follow-up of the nail mixed infection caused by *Pseudomonas aeruginosa* and *Candida albicans*. Postepy Dermatol Alergol. 2018;35:327-9.
3. Kristina DM, Charles PG. Risk assessment of *Pseudomonas aeruginosa* in water. Rev Environ Contam Toxicol. 2009;201:71-115.
4. Chiriac A, Brzezinski P, Foia L, Marincu I. Chloronychia: green nail syndrome caused by *Pseudomonas aeruginosa* in elderly persons. Clin Interv Aging. 2015;10:265-7.
5. Miguel D-S, Borja D-G, Juan J-C, Ana S-V. Dermoscopy of green nail syndrome: The "green aurora sign." Dermatol Pract Concept. 2021;11:e2021093.
6. Solomon G, Shari RL. Retrospective case series on risk factors, diagnosis and treatment of pseudomonas aeruginosa nail infections. Am J Clin Dermatol. 2020;21:297-302.

Source of Support: This article has no funding source,

Conflict of Interest: The authors have no conflict of interest to declare.