

A Case of Green Nail Syndrome caused by *Enterococcus durans* and *Enterococcus hirae*

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Green nail syndrome is characterized by the green discoloration of the nail plate (ranging from greenish-yellow and greenish-brown to greenish-black), proximal chronic non-tender paronychia, and distolateral onycholysis. This condition is predominantly caused by a *Pseudomonas aeruginosa* infection in individuals whose nails are frequently exposed to water, soaps, detergents, or mechanical trauma¹. The green discoloration observed in *P. aeruginosa* infections stems from the production of pyocyanin or fluorescein. However, various case reports have implicated numerous microorganisms, such as *Klebsiella*, Gram-positive bacteria, *Aspergillus*, and *Candida* spp., as causative organisms of green nail syndrome. We

present a case of green nail syndrome caused by Gram-positive bacteria.

A 58-year-old male presented with navy green to greenish-brown nails on both thumbs that persisted for several months (Fig. 1A). Dermoscopy revealed a brown discoloration at the edge of the lesion (Fig. 2). The lesion initially appeared as a small coin-sized mark, which gradually enlarged and seemed to merge. He frequently exposed his hands to water and had a medical history of dyslipidemia and asthma. Other than those observed in both thumbnails, no specific dermatologic lesions were observed. Complete blood count and biochemistry findings were unremarkable, except for an elevated eosinophil count (6.9%). Biopsy samples were

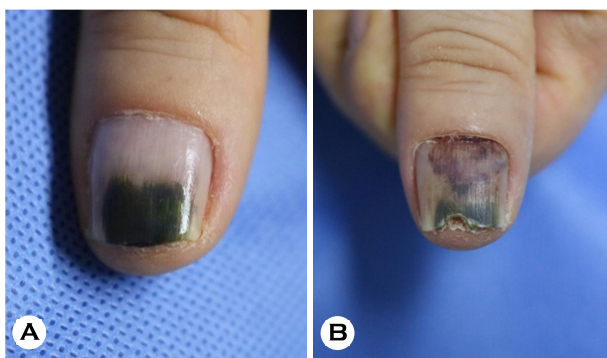


Fig. 1. (A) Navy green to greenish-brown discoloration on the left thumbnail that persisted for several months. (B) After 7 weeks of treatment, the lesion had decreased.

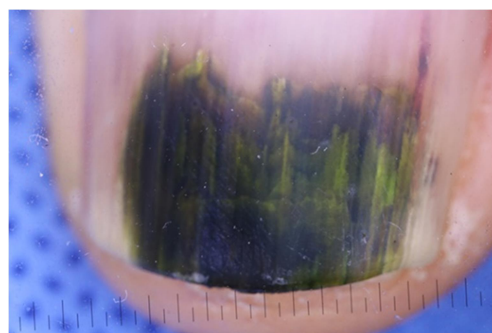


Fig. 2. Dermoscopy image of the lesion showing a brown discoloration on its edge

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obtained from the left thumbnail, and gram staining and bacterial cultures were conducted on both thumbnails. Histopathology revealed focal hemorrhage, whereas D-PAS and gram staining showed no significant findings. However, nail scraping cultures from both thumbnails tested positive for *Enterococcus durans* and *Enterococcus hirae*. Considering the brownish discoloration on the edge of the nails, a diagnosis of green nail syndrome induced by *E. durans* and *E. hirae* was established. Based on an antibiotic sensitivity test, treatment with oral minocycline (100 mg/daily) and mupirocin ointment was started. After 7 weeks, follow-up cultures confirmed bacterial absence, indicating improvement in the green nail syndrome (Fig. 1B).

Enterococci are Gram-positive, facultatively anaerobic organisms commonly found in the human intestinal flora. They typically cause urinary tract infections, bacteremia, endocarditis, wound infections, and intra-abdominal infections. Enterococcal nail infections are rare, though some reports do exist². These infections manifest as yellowish-brown discolorations likely due to flavonoids and carotenoids produced by the *Enterococci*^{3,4}. In this particular case, we observed a navy green to greenish-brown central discoloration with brownish edges. This could have been attributed to the high density of pigment produced by the *Enterococci*. The confined space within the nail bed compared to other body parts might have caused the higher density of *Enterococci*. Hence, enterococcal nail infections may manifest as greenish discolorations, otherwise known as green nail syndrome.

In conclusion, *P. aeruginosa* should not be considered the sole causative agent for green nail syndrome. Performing not only bacterial culture but also KOH and fungal culture is necessary⁵. Patients should be treated appropriately according to culture results and antibiotic sensitivity tests.

Key Words: *Enterococcus durans*, *Enterococcus hirae*, Green nail syndrome

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CONFLICT OF INTEREST

In relation to this article, we declare that there is no conflict

of interest.

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PATIENT CONSENT STATEMENT

The patient provided written informed consent for the publication and the use of his images.

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