Green Nail Syndrome

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She denied systemic symptoms. Her medical and surgical histories were unremarkable. She took no prescription medications and did not smoke cigarettes or drink alcohol. The patient was afebrile. Green discoloration of the nail plate was noted on the fingers of the right hand; the nail folds were normal. Fungal cultures of nail scrapings were negative for growth in Sabouraud dextrose agar and Mycosel agar; Pseudomonas aeruginosa infection was diagnosed. Fifteen-minute alcohol soaks 2 or 3 times a day and frequent nail clipping were prescribed. The condition resolved completely in 3 weeks.

THE GREEN NAIL SYNDROME

Pseudomonas species and, less commonly, Candida species are the primary causes of "green nail syndrome." The differential diagnosis also includes1,2:

- The use of green dyes, chemicals, lacquers, or paints.
- Aspergillus infections.
- Subungal hematomas.
- Malignant melanoma.

Paeruginosa (formerly Bacillus pyocyaneus) is a motile, aerobic, gram-negative organism that grows optimally at 37°C (98.6°F).1 "Aeruginosa," derived from the Latin word for copper rust, refers to the distinctive blue-green pigment produced by the organism. This pigment adheres to the undersurface of the nail plate, causing the green color; portions of or the entire nail plate may be involved. Green-striped nails arise from the deposition of pigment during repeated paronychial infections.3

PATHOGENESIS

Paeruginosa is an opportunistic pathogen that causes disease primarily in persons with impaired immunologic mechanisms.2 The stratum corneum is the first line of defense against Pseudomonas skin infections; in a normal host, the organism is unable to withstand the dryness of the skin. Frequent hydration of the skin increases susceptibility to the infection. Thus, green nail syndrome from Paeruginosa commonly is seen in bakers, dishwashers, barbers, medical personnel, and others whose hands are frequently submerged in water. Nail trauma of any kind-including onychophagia, onychotillomania, hangnails, manicures, heat, occlusion, sweating, dermatitis, ulcerations, or excoriations-predisposes one to paronychia. Secondary Pseudomonas infections occur in diseased nails.4 Broad-spectrum antimicrobials may facilitate colonization. Pseudomonas infections are more common in neutropenic and immunosuppressed patients.2 Persons with artificial nails also appear to be predisposed to Paeruginosa nail infections (Box). This
susceptibility may be related in part to nail trauma sustained during the application of the false nails and/or to the increased hydration permitted by the highly permeable acrylic monomers that form sculptured fingernails.\(^5\)

**DIAGNOSIS**

Perform a Gram stain and culture to confirm suspected *Pseudomonas* nail infections. A pigment solubility test also may be elucidating. To perform this test, immerse a sample of the affected nail in 1 mL of chloroform or distilled water. If *Paeruginosa* is present, the organism's water-soluble pigment will turn the liquid bluish green in 24 hours. *Candida* and *Aspergillus* pigment solubility tests are negative because no soluble pigment is produced by these organisms.\(^2\) Standard practice is to obtain scrapings of green nails for culture on Sabouraud dextrose agar and Mycosel agar. If these fungal cultures are negative, empirically treat the patient for *Pseudomonas* infection.

**TREATMENT**

Topical treatments include bacitracin; polymyxin B; acetic acid in 50% alcohol; 15% sulfacetamide in 70% ethyl alcohol; or 2 or 3 daily soaks in alcohol or household bleach, diluted 1:4.\(^2\) Alternatively, a 4-week course of oral ciprofloxacin, 500 to 750 mg bid, is effective.\(^6\) Treatment of *Pseudomonas*-infected nails is more successful when predisposing factors, such as hydration and trauma, are avoided.

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