



CASE STUDY

A Strange Looking Toenail



ABSTRACT

Green nail syndrome is a paronychia caused by *Pseudomonas aeruginosa*. The affected toenail may show discoloration that ranges from greenish-yellow, greenish-brown, and greenish-black. Differential diagnosis includes other conditions causing nail plate discoloration such as subungual hematoma, malignant melanoma or infections by other pathogens including *Aspergillus*, *Candida*, and *Proteus*. Gram stain and culture of the subungual scrapings confirm the diagnosis of suspected *Pseudomonas aeruginosa* infection. Topical antibiotics, such as bacitracin, silver sulfadiazine, or gentamicin, applied 2 to 4 times daily will treat most patients within 1 to 4 months. Oral ciprofloxacin for 2 to 3 weeks has been successful in treating patients who fail topical therapies.

KEYWORDS: green nail syndrome, paronychia, *Pseudomonas aeruginosa*

A 78-year-old female presents with a right hallux toenail with greenish-black discoloration and distolateral onycholysis. She has been treated with a 3 months course of systemic terbinafine with no improvement.

What is your diagnosis?

Green nail syndrome is a paronychia caused by *Pseudomonas aeruginosa* (Figure 1). Involvement is usually limited to one or two toenails, with signs of proximal chronic paronychia and distolateral onycholysis. The affected toenail may show discoloration that ranges from greenish-yellow, greenish-brown, and greenish-black (Figures 2 and 3).^{1,2}

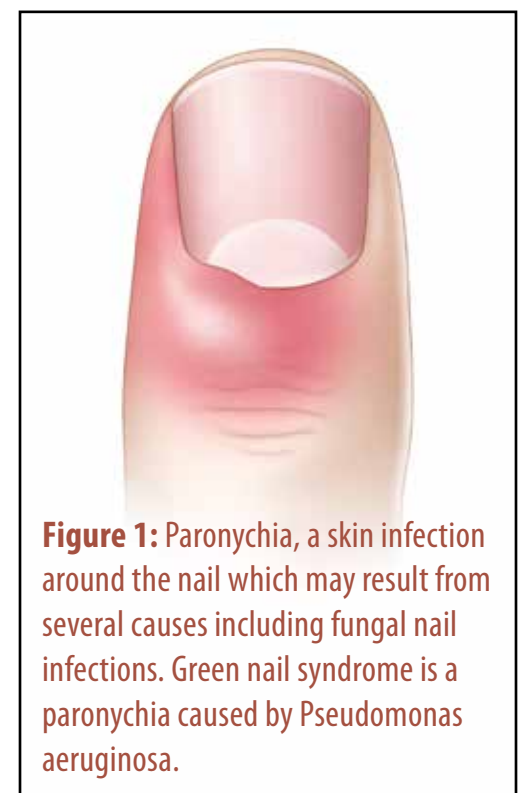


Figure 1: Paronychia, a skin infection around the nail which may result from several causes including fungal nail infections. Green nail syndrome is a paronychia caused by *Pseudomonas aeruginosa*.



ABOUT THE AUTHOR

Francesca Cheung, MD CCFP, is a family physician with a special interest in dermatology. She received the Diploma in Practical Dermatology from the Department of Dermatology at Cardiff University in Wales, UK. She is practising at the Lynde Centre for Dermatology in Markham, Ontario and works closely with **Dr. Charles Lynde, MD FRCPC**, an experienced dermatologist. In addition to providing direct patient care, she acts as a sub-investigator in multiple clinical studies involving psoriasis, onychomycosis, and acne.

Pseudomonas aeruginosa is not part of the normal flora of dry skin, but it thrives in moist areas.³ Infections of the intact nail are rare. The

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organism produces pyocyanin, a greenish-blue pigment, which contribute to the characteristic green discoloration of this condition.¹

Pseudomonas aeruginosa colonizes moist body parts, such as the axillae or the anogenital areas.⁴ People at risk include those with chronic exposure to water, soaps, or detergents. Trauma to the nails fold is also a common risk factor as infection of

the intact nail is rare. This is a condition commonly seen in homemakers, dishwashers, hair stylists, bakers, and in health care professionals.⁵

Differential diagnosis includes other conditions causing nail plate discoloration such as subungual hematoma, malignant melanoma or infections by other pathogens including *Aspergillus*, *Candida*, and *Proteus*. Chemical exposure to solutions containing pyocyanin or pyoverdine can also cause a greenish discoloration of the nail.¹

Gram stain and culture of the subungual scrapings confirm the diagnosis of suspected *Pseudomonas aeruginosa* infection. Mycology and fungal culture help to rule out secondary fungal infection.⁶

Removal of the onycholytic portion of the nail can facilitate recovery. Patients are encouraged to avoid predisposing factors such as moisture or

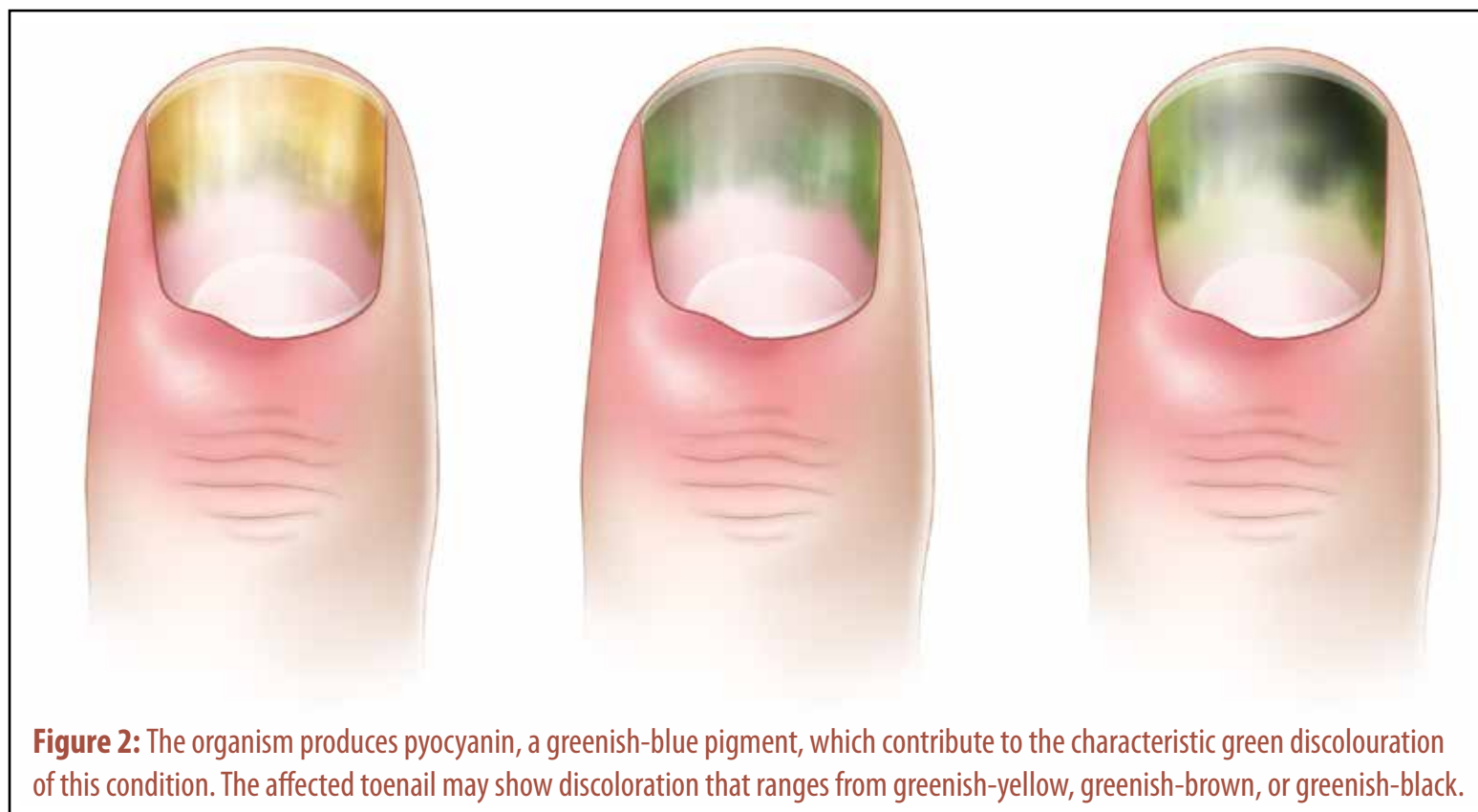


Figure 2: The organism produces pyocyanin, a greenish-blue pigment, which contribute to the characteristic green discoloration of this condition. The affected toenail may show discoloration that ranges from greenish-yellow, greenish-brown, or greenish-black.



SUMMARY OF KEY POINTS

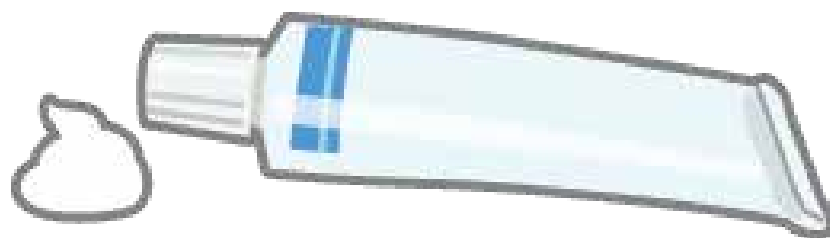
Green nail syndrome is a paronychia caused by *Pseudomonas aeruginosa*, with signs of proximal chronic paronychia and distolateral onycholysis.

Pseudomonas aeruginosa produces pyocyanin, a greenish-blue pigment, which contribute to the characteristic green discolouration of this condition.

Risk factors include chronic exposure to water, soaps, detergents, or trauma.

Gram stain and culture of the subungual scrapings confirm the diagnosis of suspected *pseudomonas aeruginosa* infection.

Oral ciprofloxacin for 2 to 3 weeks has been successful in treating patients who fail topical therapies.



Post-test CME Quiz

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trauma to the nail. Topical antibiotics, such as bacitracin, silver sulfadiazine, or gentamicin, applied 2 to 4 times daily will treat most patients within 1 to 4 months. Adjunctive treatment includes soaking the nail in a diluted 0.25% to 1% acetic acid solution or 2% sodium hypochlorite.⁷ Oral ciprofloxacin for 2 to 3 weeks has been successful in treating patients who fail topical therapies. Rarely, excision of the entire nail might be necessary to obtain a cure.¹

All of the tables and photos are original.

No competing financial interests exist in preparation of this case study.

References

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Figure 3: Green Nail Syndrome

