

Nail Deformities and Injuries



James Rory J. Tucker, MD

KEYWORDS

- Toenail • Deformities • Onychomycosis • Nail avulsion

KEY POINTS

- Nail deformities are common and easily detected by physical examination in an office setting by the primary care provider.
- Onychomycosis is highly prevalent and treatable in the primary care office setting. It causes prominent cosmetic disorder. Oral treatment duration can last 12 to 24 months and is capable of producing favorable results.
- To astute clinicians, a variety of systemic diseases, such as psoriasis, renal dysfunction, and iron deficiency, can present with nail findings.
- Nail avulsion is a simple procedure that can be performed in an outpatient office setting. For an ingrown toenail this procedure can provide immediate relief and eradication of the disorder.

NAIL ANATOMY

Nails offer protection for the dorsal aspects of fingers and toes and anatomically are composed of multiple parts. The most visible and recognizable nail segment is the nail plate, comprising what is commonly thought of as the nail. This structure is constructed largely of keratin, similar to hair, although of a different type. The plate is produced by the matrix, and multiple nail deformities result from altered keratinization at this location. Melanocytes are present in the matrix, but in a lower density than surrounding skin, giving nails their lighter color relative to the adjacent skin.¹ Surrounding the nail are the nail folds, with the cuticle at the proximal aspect. Deep to the nail plate is the nail bed. Proximally is the lunula, a lightly colored region so named for its shape. Fingernails grow about 1 cm in 3 months and toenails at about a third of this rate. Growth is slower on the nondominant hand and in old age.² See **Fig. 1** for a diagram of nail anatomy.

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Department of Family and Community Medicine, Penn State Milton S. Hershey Medical Center, 500 University Avenue, Hershey, PA 17033, USA

E-mail address: jtucker@hmc.psu.edu

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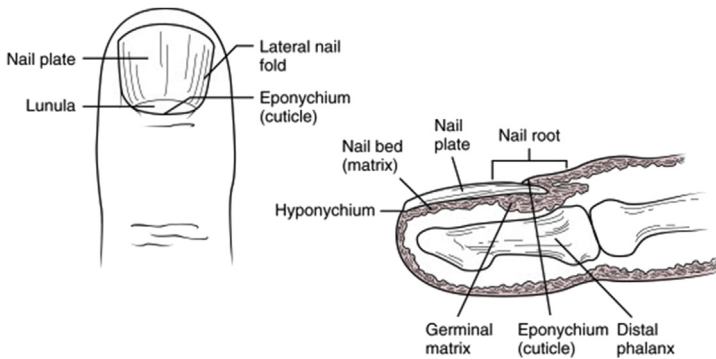


Fig. 1. Nail anatomy. (From Trott AT. *The hand*. In: *Wounds and lacerations: emergency care and closure*. 4th edition. Philadelphia: Saunders; 2012. p. 161–91; with permission.)

NAIL ABNORMALITIES

Onychomycosis

Fungal infection is the most common disease in ungual disorders, with a wide range of prevalence depending on geographic region.¹ Onychomycosis accounts for 40% to 50% of nail dystrophies. Risk factors for this infection include aging, diabetes, hemodialysis, poorly fitting shoes, and the presence of tinea pedis.^{3,4} Transmission between family members is common and can be horizontal (eg, between spouses), or vertical between generations, which is more common than horizontal spread. Additional sources of infection are showers in locker rooms, public showers such as at pools, and mats in athletic facilities.⁵ Intact skin serves as the primary barrier to infection. However, this may fail because of trauma or maceration.³ Toenails are 25 times more likely than fingernails to be infected because of repeated blunt pressure from footwear.⁶ Through this repetitive micro-trauma, the distal edge of the nail is repeatedly lifted, giving opportunity for dermatophytes to establish residence.

Diagnosis of onychomycosis is made largely by physical examination. The primary part of the nail that is affected is the most distal, typically of the great toe. Assessment should be made regarding which part of the nail is involved, such as the nail plate distally, proximally, or the nail bed.² Distal onychomycosis is most common and can lead to thickening and yellowish discoloration (**Fig. 2**). Because the pharmacologic treatment of this can last up to 24 months, it is recommended to have definitive diagnosis before initiating treatment. Formal diagnosis can be made by testing nail scrapings using potassium hydroxide or pathology analysis of nail clippings.

Treatment can be difficult, with cure rates varying depending on the modality used. Topical treatment is available with ciclopirox nail lacquer 8% topical solution applied daily for 48 weeks, although, with eradication rates less than 50%, it is generally considered ineffective.^{3,4} Oral treatment is recommended with either azoles or allylamines. The benefit of oral medications may not be visible for 12 months or longer because of infection being embedded within the nail plate and the slow growth rate of the nail. Common medications used include ketoconazole, itraconazole, terbinafine, and naftifine. Because of the prolonged duration of treatment required it is a good idea to know the patient's baseline liver function before beginning treatment.

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