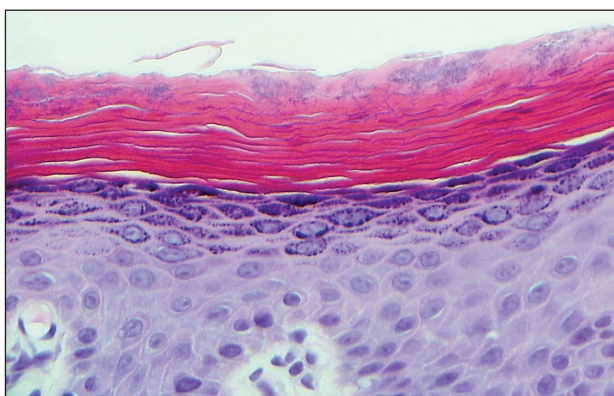


Red-Brown Patches in the Groin

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H&E, original magnification $\times 600$.

A 66-year-old man presented with reddish arciform patches in the inguinal area.

THE BEST DIAGNOSIS IS:

- a. candidiasis
- b. erythrasma
- c. pitted keratolysis
- d. tinea cruris
- e. tinea versicolor

PLEASE TURN TO **PAGE 419** FOR THE DIAGNOSIS

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The authors report no conflict of interest.

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THE DIAGNOSIS: Erythrasma

Erythrasma usually involves intertriginous areas (eg, axillae, groin, inframammary area). Patients present with well-demarcated, minimally scaly, red-brown patches. The interdigital web space of the toes also can be involved with macerated white plaques, often with coexistent dermatophyte infection. *Corynebacterium minutissimum*, the bacteria responsible for erythrasma, produces coproporphyrin type III, which emits coral red fluorescence under Wood lamp examination.¹ Bathing may result in removal of the porphyrin and result in a false-negative finding. Potassium hydroxide preparation of skin scrapings can show chains of bacilli. Biopsy appears relatively normal at low power but reveals compact orthokeratosis with coccobacilli and filamentous organisms in the superficial stratum corneum (quiz image). When not obvious on hematoxylin and eosin-stained sections, the organisms are Gram-positive and also are seen with periodic acid-Schiff (PAS) and methenamine silver stains. Unlike fungal hyphae, these organisms are thinner and nonrefractile. Inflammation typically is minimal. Due to the subtle histologic findings at low power, erythrasma is considered one of the invisible dermatoses.² The differential diagnosis of these inconspicuous dermatoses that appear normal at first glance can be approached in a stepwise fashion starting in the stratum corneum, followed by the granular layer, basal layer, dermal papillae, dermal inflammatory cells, dermal connective tissue, and eccrine glands, and should consider each of the following diagnoses: candidiasis, dermatophytosis, ichthyosis vulgaris, vitiligo, macular amyloid, urticaria, telangiectasia macularis eruptiva perstans, connective tissue nevus, and argyria.²

Candidiasis, most commonly caused by *Candida albicans*, usually involves the oral cavity (eg, thrush, median rhomboid glossitis, angular cheilitis), intertriginous zones, nail fold (paronychia), genital areas (eg, vulvovaginitis, balanitis), and diaper area.³ The web space between the third and fourth fingers (erosio interdigitalis blastomycetica) can be involved in patients whose hands are frequently in water. Intertriginous candidiasis presents with bright red, sometimes erosive patches with satellite lesions. Spores and mycelia (filamentous forms) are noted on potassium hydroxide preparation of skin scrapings. Histologically, the epidermis often is acanthotic, mildly spongiotic, and contains groups of neutrophils in the superficial layers. The mnemonic device for diseases with clusters of neutrophils in the stratum corneum is PTICSS (psoriasis, tinea, impetigo, candida, seborrheic dermatitis, syphilis).² Yeast, pseudohyphae, and even true hyphae can be seen in the stratum corneum with hematoxylin and eosin-stained sections and PAS. The filamentous forms tend to be vertically oriented in relation to the skin

surface (Figure 1) compared to dermatophyte hyphae that tend to be parallel to the surface.²

Pitted keratolysis is a superficial bacterial infection involving the soles of the feet. The classic clinical findings are shallow 1- to 2-mm pits in clusters that can coalesce on pressure-bearing areas. Hyperhidrosis, malodor, and maceration commonly are associated. Microscopic examination reveals clusters of small cocci and filamentous bacteria located in the dell or pit of a thick compact orthokeratotic stratum corneum of acral skin with no notable inflammatory infiltrate (Figure 2).² Special stains such as Gram, methenamine silver, or PAS can assist in visualization of the organisms. Pitted keratolysis is caused

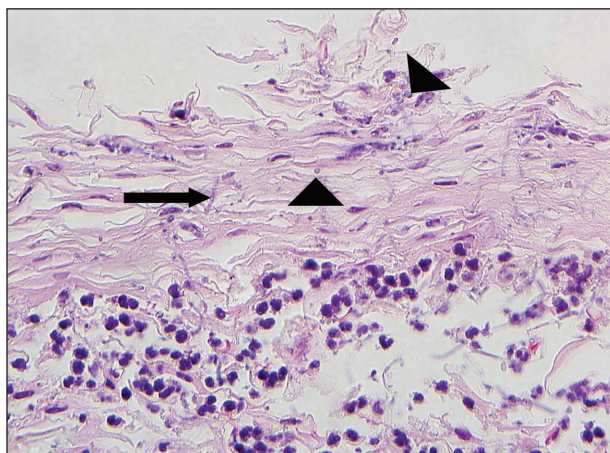


FIGURE 1. Candidiasis histopathology shows round yeast (arrowheads) and vertically oriented pseudohyphae (arrow) in a stratum corneum containing neutrophils (H&E, original magnification $\times 600$).

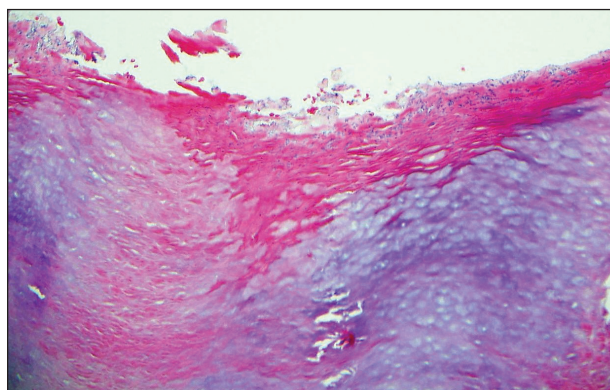


FIGURE 2. Pitted keratolysis histopathology shows clusters of small cocci and filamentous bacteria in the dell or pit of acral stratum corneum with no notable inflammatory infiltrate (H&E, original magnification $\times 200$).



FIGURE 3. Tinea cruris histopathology shows refractile hyphae (arrows) sandwiched between an upper basket weave layer and a lower compact cornified layer (H&E, original magnification $\times 600$).

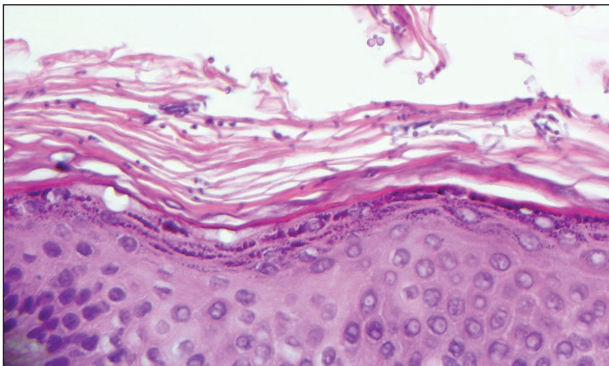


FIGURE 4. Tinea versicolor histopathology shows round yeasts and short septate hyphae scattered in loose basket weave hyperkeratosis (H&E, original magnification $\times 600$).

by *Dermatophilus congolensis* and *Kytococcus sedentarius* (formerly *Micrococcus sedentarius*), which produce keratinolytic enzymes causing the defect in the stratum corneum.³

Tinea cruris, also known as jock itch and ringworm of the groin, presents with advancing pruritic, circinate, erythematous, scaling patches with central clearing on the inner thighs and crural folds. Similar to tinea pedis, *Trichophyton rubrum* is the most common dermatophyte to cause tinea cruris.⁴ Potassium hydroxide preparation of skin scrapings from the advancing border show fungal hyphae that cross the keratin cell borders. The histopathology of dermatophyte infections can be subtle and resemble normal skin before close inspection of the stratum corneum, which can show compact orthokeratosis, neutrophils, or “sandwich sign” where hyphae are sandwiched between an upper basket weave layer and a lower compact cornified layer (orthokeratotic or parakeratotic) (Figure 3).¹ The presence of these patterns in the stratum corneum should result in performance of PAS to highlight obscure hyphae.

Tinea versicolor, also called pityriasis versicolor, usually presents with hypopigmented or less commonly hyperpigmented circular patches that coalesce on the upper trunk and shoulders. There is a fine fluffy scale that is most notable after scraping the skin for a potassium hydroxide preparation, which shows “spaghetti and meatballs” (hyphae and spores). Tinea versicolor typically is caused by the mycelial phase of the lipophilic yeast *Malassezia globosa*.³ Histologically, there are yeast and short septate hyphae scattered in a loose basket weave hyperkeratotic stratum corneum with minimal or no inflammation (Figure 4). On occasion, PAS is required for identification.

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