Dermoscopy in the Diagnosis of Tinea Nigra Plantaris

CPT Sidney B. Smith, MC, USA, San Antonio, Texas
Scott L. Beals, DO, San Antonio, Texas
COL Dirk M. Elston, MC, USA, San Antonio, Texas
COL Jeffrey J. Meffert, MC, USAF, San Antonio, Texas

Tinea nigra is a relatively uncommon dermatiaceous fungal infection, usually caused by Phaeoannellomyces werneckii, *that may mimic a melanocytic lesion. We describe the value of epiluminescent dermoscopy of tinea nigra plantaris compared with other common diagnostic tools and procedures available (clinical appearance, potassium hydroxide [KOH], culture, culture mount preparation, and biopsy). A case of tinea nigra plantaris was evaluated clinically, microscopically with KOH, and dermatoscopically. Dermatoscopic findings were evaluated according to the Stolz system. Dermoscopy, clinical presentation, and microscopy with KOH all confirmed the diagnosis, with dermoscopy being the fastest and simplest procedure. Dermoscopy is a useful clinical adjuntive tool in differentiating tinea nigra from a melanocytic lesion.*

Tinea nigra is an uncommon superficial dermatiaceous fungal infection usually caused by *Phaeoannellomyces werneckii*.[1,2] It was first described by Alexandre Cerquerira in 1891, who named it *keratomycosis nigricans palmaris*. The pathogen was first isolated by Parreiras Horta in 1921 and was named *Cladosporium werneckii*. Later, the binomial (taxonomy) was changed to *Exophiala werneckii*.[2,3]

We report the findings of epiluminescence microscopy and discuss other tools available for the diagnosis of tinea nigra.

Drs. Smith, Elston, and Meffert are from Brooke Army Medical Center, San Antonio, Texas. Dr. Beals is from University of Texas Health Science Center, San Antonio.
The views expressed are those of the authors and are not to be construed as official or as reflecting those of the Department of Defense or of other departments of the US government.
Reprints: CPT Sidney B. Smith, MC, USA, Department of Dermatology, Brooke Army Medical Center, 3851 Roger Brooke Dr, Fort Sam Houston, TX 78234 (e-mail: sidneybsmith@pol.net).

Figure 1. Hyperpigmented macula on the plantar surface of the right foot.

Case Report

A 35-year-old man from a coastal area of Florida presented with an asymptomatic, slowly enlarging hyperpigmented macula on the plantar surface of the right foot (Figure 1). The patient had noticed the macula 6 months earlier.

Dermatoscopic (magnification ×10) examination of the lesion showed a homogeneous nonmelanocytic pigment pattern that did not follow the dermatoglyphic lines in the irregular macula (Figure 2). Microscopic examination of a superficial scraping of the lesion in 20% potassium hydroxide (KOH) with dimethyl sulfoxide showed brown, septate, branching hyphae (Figure 3). A culture of the lesion grew a non–*P werneckii* entity that could not be confirmed as either the pathogen or a common contaminant.

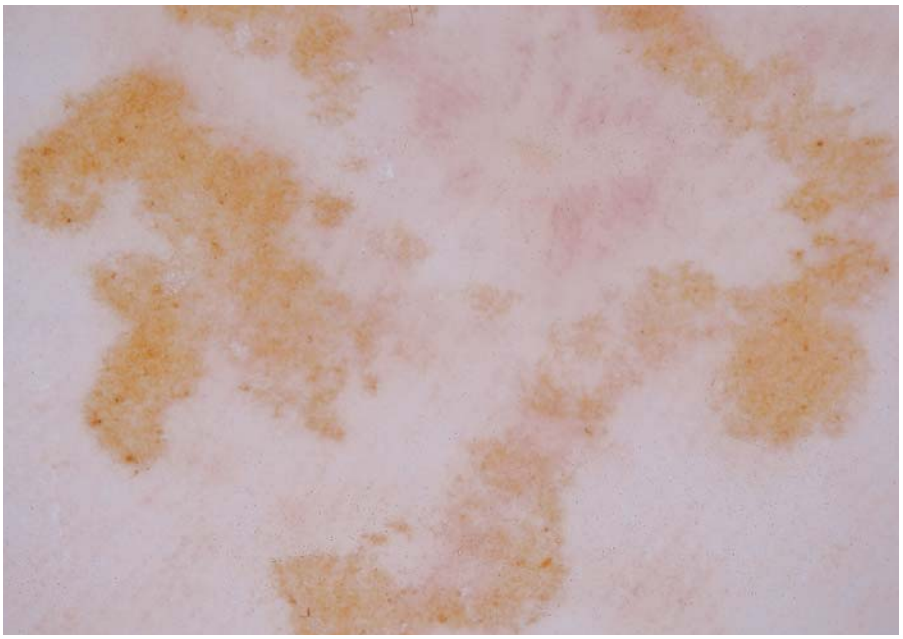

Figure 2. Dermatoscopic findings of tinea nigra (original magnification ×10). (If Stolz scoring method is used, the lesion may be misinterpreted as melanocytic lesion: asymmetric in 1 axis=1.3; abrupt cutoff in 7 of 8 segments=0.7; white, light brown, dark brown=1.5; structural components of dots, globules, structureless areas, branched streaks=2.0. Total score=5.5; score ≥5.45 is "highly suggestive" of melanoma.)

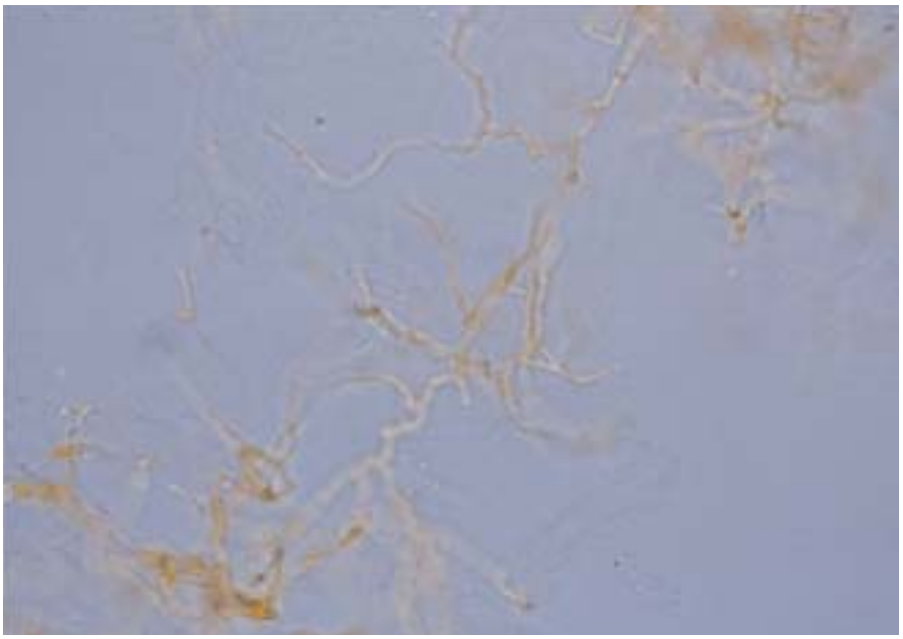

Figure 3. Superficial scraping of patient's lesion in 20% potassium hydroxide with dimethyl sulfoxide shows brown, septate, branching hyphae (original magnification ×100).

Comment

Tinea nigra is most frequently seen in tropical or subtropical areas where fungus is ubiquitous (eg, found in soil, sewage, decaying vegetation).[1,3,4] Children and young adults are most commonly infected. Predominance in females has been reported.[1,3,5] Higher incidence in the palms and soles may be related to increased concentration of sweat pores in these areas.[6] The incubation period, studied in both humans and animals, ranges from 2 to 7 weeks[5,7]; there has been a single report of a 20-year incubation after an experimental inoculation.[8]

Tinea nigra usually presents as a solitary, unilateral, brown-to-black, sharply margined, slowly enlarging macula. Bilateral and multiple lesions have been reported.[5] Tinea nigra can easily be mistaken for junctional nevi, lentigines, and malignant melanoma.[1-5,9-12]

The benign nature of this infection can be determined by KOH, culture, dermoscopy, or surgical procedure. Pigmented, septate, branching hyphae can easily be seen from KOH examination of scraped lesions. *P werneckii* grows slowly in Sabouraud dextrose agar or in an equivalent medium. Initially, the colony is yeastlike, but then it turns greenish

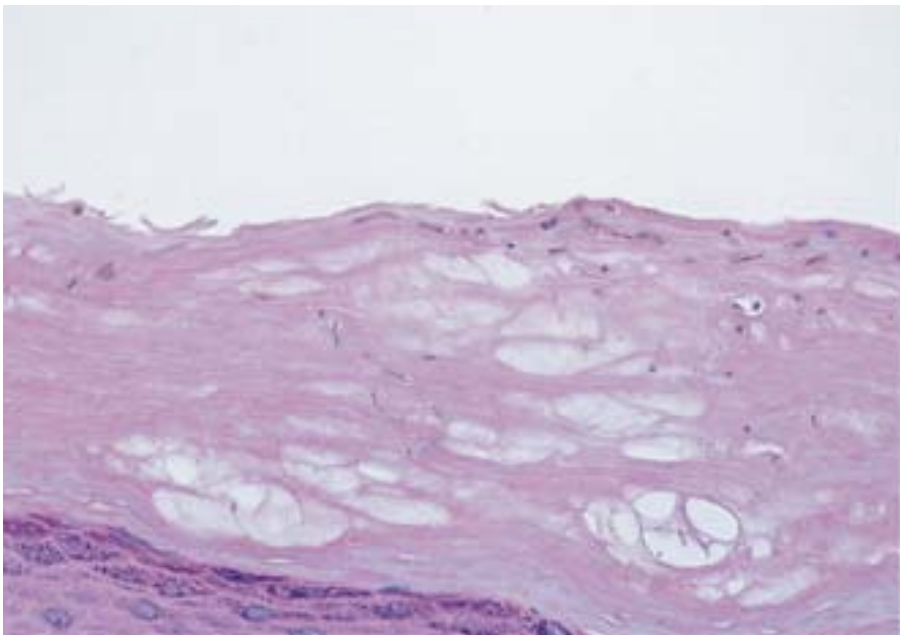

Figure 4. Tinea nigra (brown hyphae) in the stratum corneum (H&E, original magnification ×600). (Photograph courtesy of the Dermatopathology Library, Brooke Army Medical Center, San Antonio, Texas.)

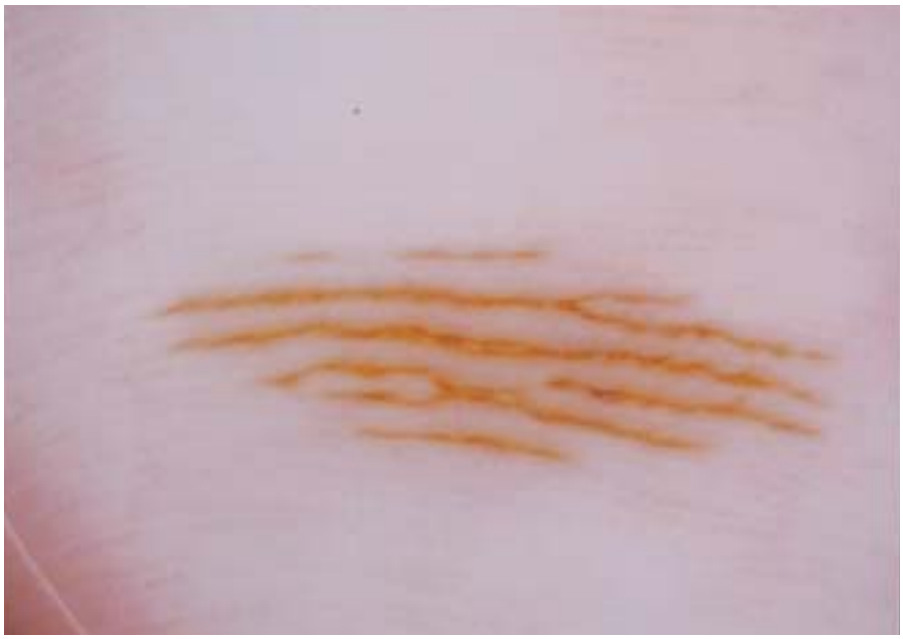

Figure 5. Dermoscopy of benign palmar junctional nevus (original magnification ×10).

black. A wet-mount preparation taken from the culture shows bilobate conidia and hyphae.[1,6,13] Biopsy specimen sections stained with hematoxylin and eosin (H&E) show brown hyphae in the stratum corneum (Figure 4).[3]

Dermoscopy offers a simple, rapid, and noninvasive alternative for the diagnosis of tinea nigra. Physicians using the dermatoscope should be familiar with the patterns of melanocytic lesions in various anatomic locations, including acral skin.

Gupta et al[13] originally described the dermatoscopic findings of tinea nigra as a nonmelanocytic pattern of pigmented spicules. The spicules and the pseudonetwork created (Figure 2) may be misinterpreted as a melanocytic pigmented network if the dermatoscopist is unfamiliar with the dermatoscopic appearance of acral melanocytic lesions. This macula, scored according to the Stolz system, could be interpreted as a melanoma and, thus, could lead to unnecessary biopsy.[14] (If a dermatoscopist interpreted the pattern as a melanocytic pattern, the score for this lesion could be as high as 5.5; scores of 5.45 or higher are "highly suggestive" of melanoma.) Dermatoscopic interpretations are

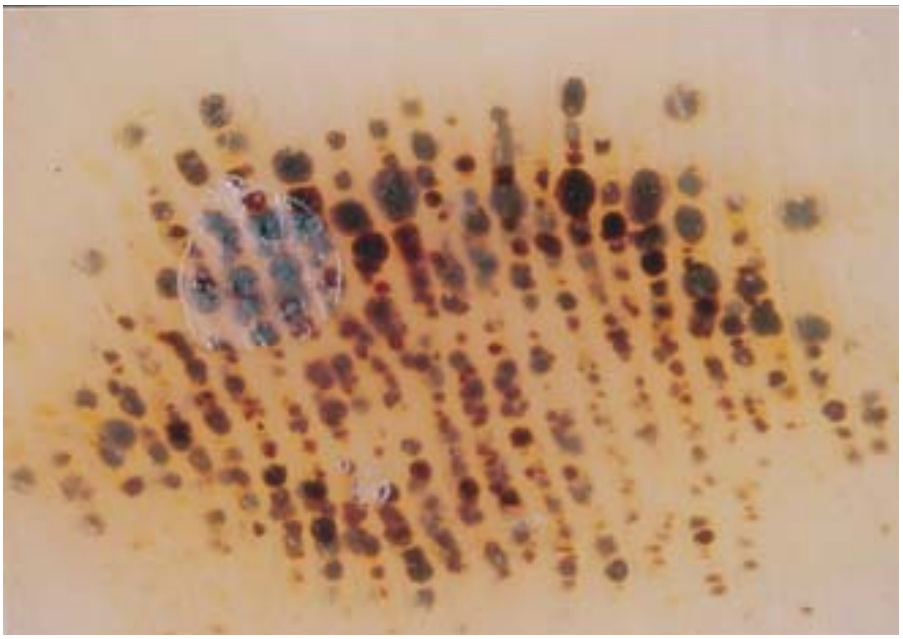

Figure 6. Dermoscopy of palmar trauma (original magnification ×10).

always best considered in the light of the histopathologic correlates of each finding. Acral skin is characterized by long parallel ridges that often follow dermatoglyphic lines. When considering the normal anatomy of acral skin, we quickly realize that the pattern seen here could not possibly be a neoplasm arising at the dermal-epidermal junction or papillary dermis because tinea nigra lacks the characteristic streaking along the papillary ridges. Figure 5 shows a benign palmar junctional nevus with a homogenous pattern of pigmentation following the dermatoglyphs. Even in nonmelanocytic lesions (eg, those resulting from trauma to acral skin), hemorrhage in the upper dermis and lower epidermis follows dermatoglyph lines (Figure 6). Melanocytic nests in the dermis may fail to show these streaks, but we would not see the fine crisp lines and "spicules." Absence of parallel streaks in tinea nigra (Figure 2) suggests that the pigment is within the stratum corneum.

Dermoscopy is a useful tool in the diagnosis of tinea nigra, thus aiding in differentiating this lesion from a pigmented lesion that should be biopsied. Until the dermatoscopic pattern of tinea nigra is verified in a larger series, dermoscopy should be used with KOH examination of superficial scrapings of the lesion for confirmation.

REFERENCES

1. Tseng SS, Whittier S, Miller SR, et al. Bilateral tinea nigra plantaris and tinea nigra plantaris mimicking melanoma. *Cutis*. 1999;64:265-268.
2. Palmer SR, Bass JW, Mandojana R, et al. Tinea nigra palmaris and plantaris: a black fungus producing black spots on the palms and soles. *Pediatr Infect Dis J*. 1989;8:48-50.
3. Babel DE, Pelachyk JM, Hurley JP. Tinea nigra masquerading as acral lentiginous melanoma. *J Dermatol Surg Oncol*. 1986;12:502-504.
4. Shannon PL, Ramos-Caro FA, Cosgrove BF, et al. Treatment of tinea nigra with terbinafine. *Cutis*. 1999;64:199-201.
5. Van Velsor H, Singletary H. Tinea nigra palmaris. *Arch Dermatol*. 1964;90:59-61.
6. Keddie F. *Cladosporium werneckii:* infection and in vivo culture. *Arch Dermatol*. 1964;89:432-435.
7. Ritchie EB, Taylor TE. A study of tinea nigra palmaris: report of a case and inoculation experiments. *Arch Dermatol*. 1964;89:601-603.
8. Blank H. Tinea nigra—a twenty-year incubation period? *J Am Acad Dermatol*. 1979;1:49-51.
9. Helfman RJ. Tinea nigra palmaris et plantaris. *Cutis*. 1981;28:81-82.
10. Hall J, Perry VE. Tinea nigra palmaris: differentiation from malignant melanoma or junctional nevi. *Cutis*. 1998;62:45-46.
11. Marks JG, King RD, Davis BM. Treatment of tinea nigra palmaris with miconazole. *Arch Dermatol*. 1980;116:321-322.
12. Burke WA. Tinea nigra: treatment with topical ketoconazole. *Cutis*. 1993;52:209-211.
13. Gupta G, Burden AD, Shankland GS, et al. Tinea nigra secondary to *Exophiala werneckii* responding to itraconazole. *Br J Dermatol*. 1997;137:483-484.
14. Stolz W, Braun-Falco O, Bilek P, et al. *Color Atlas of Dermatoscopy*. Oxford, England: Blackwell Science; 1994.