

# Black Dots on the Scalp of a Child

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A 4-year-old boy was referred to the dermatology clinic by his pediatrician for evaluation of persistent black spots on the scalp of 1 month's duration. The patient was otherwise healthy, and his mother stated that the lesions had appeared gradually, were not tender or pruritic, and did not wash off with shampoo and scrubbing. The patient had no history of any systemic illness, recent travel, genetic disorders, or genodermatoses. Physical examination revealed multiple well-circumscribed, 1- to 2-mm black papules and macules with confluence scattered over the vertex scalp. No erythema, scale, or induration was noted.

## WHAT'S YOUR DIAGNOSIS?

- acanthosis nigricans
- black dot tinea capitis
- epidermal nevi
- metastatic melanoma
- terra firma-forme dermatosis

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## THE DIAGNOSIS: Terra Firma-Forme Dermatitis

During clinical examination, a 70% alcohol swab was utilized to gently rub several of the lesions, which were successfully removed. This confirmed a diagnosis of terra firma-forme dermatosis (TFFD) (also known as Duncan's dirty dermatosis). The patient's mother was counseled about the diagnosis and was instructed on how to use alcohol pads to remove the remaining lesions. Three days later, after several treatment sessions at home, the mother reported complete resolution of the lesions with no residual pigmentary changes, ulceration, or scarring (Figures 1 and 2).

Terra firma-forme dermatosis was first described in 1987 in a 12-year-old girl with hyperpigmented plaques on the neck that cleared when rubbing alcohol was applied before biopsy.<sup>1,2</sup> The term *terra firma* is Latin for "firm land" (or essentially "dirt") in reference to what often is described as a characteristically "dirty" clinical appearance.<sup>2</sup> Terra firma-forme dermatosis can manifest anywhere on the body but shows a predilection for the neck, arms and legs, axillae, inguinal region, and umbilicus.<sup>3</sup> Lesions typically are described as asymptomatic, smooth, well-circumscribed, reticular papules or patches that are brown or black. Terra firma-forme dermatosis also may demonstrate secondary features such as hyperkeratotic, scaly, velvety, or verrucous plaques and nodules.<sup>3</sup>

The etiology of this condition is theorized to be a result of abnormal or delayed keratinization and prolonged keratinocyte adhesion.<sup>3,4</sup> There are limited epidemiologic data, but TFFD has shown a predominance in children younger than 18 years (average age of onset, 10 years) with no known predilection for sex or race and no recognized pattern of inheritance.<sup>3,5</sup> Histopathology typically demonstrates epidermal atrophy, hyperkeratosis, and often a component of trapping and compaction of melanin, sebum, microorganisms, and environmental debris.<sup>5</sup>

Management of TFFD is straightforward and generally consists of rubbing with 70% isopropyl alcohol to remove the lesions. For more adherent lesions or for extensive involvement, other keratolytics such as salicylic acid or alpha-hydroxy acids may be used.<sup>5</sup> For TFFD manifesting in infants and young children, widespread involvement, or lesions involving the face or genitals, a urea-based keratolytic with or without a topical anti-inflammatory is suggested.<sup>5</sup> Other treatment options include other alpha-hydroxy acids, topical retinoids, and nonpolar solvents such as acetone or CO<sub>2</sub> laser for recalcitrant cases.<sup>4,5</sup> Fortunately, most TFFD lesions respond well to conservative therapies, with recurrence reported only in 6.3% (5/79) of patients in one study.<sup>3</sup>

Dermatosis neglecta is clinically similar to TFFD and often is considered on the same spectrum of disease<sup>6</sup>; however, this entity is associated with decreased bathing or limited hygiene, which could be related to child or elder abuse/neglect or comorbid psychiatric disorders.



**FIGURE 1.** Focal improvement of terra firma-forme dermatitis after rubbing with a single 70% isopropyl alcohol pad.



**FIGURE 2.** Near-complete resolution of terra firma-forme dermatitis after several applications of 70% isopropyl alcohol pads over 3 days.

These conditions can be distinguished by attempting to remove the lesions using soap and water; lesions of dermatosis neglecta will clear, whereas those of TFFD will not.

Metastatic melanoma in pediatric patients has a polymorphous appearance and may or may not be pigmented. Lesions often may be associated with lymphadenopathy of the draining lymph node basins, and nodules and lesions may be firm on palpation.<sup>7</sup> Linear configurations of metastatic melanoma may represent a satellite or in-transit metastasis. Fortunately, melanoma is extraordinarily rare in children, with an estimated incidence of 2.1 per million for individuals younger than 20 years.<sup>8</sup>

Acanthosis nigricans is characterized by velvety plaques most commonly affecting the posterior neck, axillae, and flexor extremities. These lesions commonly are associated with obesity and insulin resistance but occasionally can be associated with underlying malignancy. In the latter association, acanthosis nigricans lesions tend to manifest more abruptly, often are pruritic, and can involve

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the mucous membranes. Fortunately, acanthosis nigricans related to malignancy in the pediatric population is rare.<sup>9</sup>

Epidermal nevi may exhibit clinical similarities to TFFD, particularly in lesions with brown/black pigment or with a reticulated or verrucous appearance; however, epidermal nevi often are congenital or manifest within the first few years of life. They commonly are distributed over the lines of Blaschko and have a linear appearance; they also enlarge and thicken as the patient ages.<sup>10</sup>

Black-dot tinea capitis, a classic manifestation of endo-thrix infection, manifests as alopecia with broken hairs and is most commonly caused by *Tinea tonsurans*.<sup>11</sup> The black dots refer to the appearance of the infected hair shafts, which have been weakened and broken off at the follicular ostia. As such, lesions typically are monomorphic and may be interspersed with uninvolved hair shafts. There often is associated scale and a lack of inflammation.<sup>11,12</sup>

Additional differential diagnoses to consider include seborrheic keratoses and confluent and reticulated papillomatosis. Further workup (eg, potassium hydroxide preparation of skin scrapings or skin biopsy) may help elucidate the diagnosis.<sup>5</sup> A simple and cost-effective initial diagnostic tool involves wiping suspicious lesions with a 70% isopropyl alcohol pad to confirm this diagnosis.

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