



High-magnification universal serial bus dermoscopy: A convenient alternative to direct microscopic examination

Sidharth Sonthalia, MD, DNB, MNAMS,^{a,b} Sambit Nath Bhattacharya, MD,^{c,d}
Mahima Agrawal, MD, DNB, MRCP (SCE),^c and Shukla Das, MD^{d,f,g}
Gurugram and New Delhi, India and Graz, Austria

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TECHNOLOGIC CHALLENGE

Direct microscopic examination of 10% potassium hydroxide (KOH) mounts of skin and hair for diagnosing dermatophytosis warrants a light microscope with high-power field magnification ($\times 400$). However, the cost, bulk, maintenance, and limited utility of the microscope render the device impractical in a busy contemporary skin clinic. Although pocket dermatoscopes, like the DL4, enable in vivo diagnostic differentiation between tinea capitis and alopecia areata,¹ diagnostic confirmation by demonstration of fungal elements by conventional microscopy might be required; visualization of these elements are infeasible with the dermatoscope's limited 2-dimensional magnification ($\times 10$). Moreover, the need for direct contact between the naked, ice-capped lens and the KOH-mounted slide make the approach difficult. The newer and affordable universal serial bus (USB) videodermoscopes provide $\times 500$ and 2-dimensional magnification. Moreover, their acrylic rim touches the target, thereby maintaining the gap from the lens.

SOLUTION

A toddler with a gray, clean-looking alopecic patch (Fig 1, A) negative for Wood's light fluorescence demonstrated mixed features of tinea capitis and alopecia areata on DL4 evaluation (Fig 1, B). The hair root KOH mount was examined at high power ($\times 475$) with a proprietary USB videodermatoscope positioned around the coverslip (Fig 2). Fungal hyphae and spores in chains were seen invading the hair (Fig 3) with clarity comparable to that of the high-power field of a light microscope. Four weeks of treatment with oral terbinafine resulted in complete resolution. Fungal culture from the follicle confirmed *Trichophyton violaceum*. By extrapolation, this approach may be improvised for visualizing stained smears and even histopathology slides. Device disinfection after each use is imperative.

From the SKINNOCE: The Skin Clinic and Research Center, Gurugram^a; International Dermoscopy Society, Graz, Austria^b; Department of Dermatology and STD, University College of Medical Sciences, New Delhi^c; Guru Teg Bahadur Hospital, New Delhi^d; Department of Dermatology and STD, Lady Hardinge Medical College and Associated Hospitals, New Delhi^e; and Department of Microbiology^f and Mycology Unit,^g University College of Medical Sciences, New Delhi.

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Correspondence to: Sidharth Sonthalia, MD, DNB, MNAMS, SKINNOCE: The Skin Clinic and Research Center, C-2246, Sushant Lok-1, Block-C, Gurugram 122009, India. E-mail: sidharth.sonthalia@gmail.com; drsidharthsonthalia@gmail.com.

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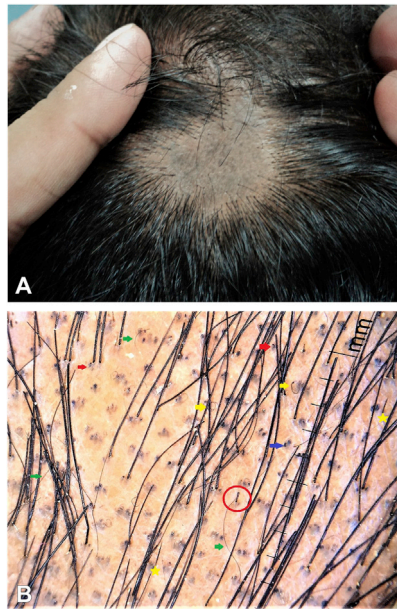


Fig 1. A, Gray patch of noninflammatory localized scalp alopecia on a boy. This presentation is suggestive of the gray-patch variant of tinea capitis or patch of alopecia areata. **B,** Dermoscopic features from lesional edge using Dermlite 4 (polarized; 3Gen, San Juan Capistrano, CA). Image shows black dots; a few comma-shaped hairs (*red arrows*); occasional corkscrew hairs (*blue arrow*); perifollicular and interfollicular scales; vellus hairs (*green arrows*); tapering hairs, including an exclamation mark hair (*red circle*); fractured shafts; and multiple circular hairs, including pigtail hairs (*yellow arrows*) and many upright regrowing hairs (*yellow stars*). These are mixed features of tinea capitis and alopecia areata. (Original magnification: $\times 10$.)



Fig 2. Stable perpendicular placement of a high-magnification universal serial bus dermatoscope (Escopie USB videodermatoscope; Timpac Healthcare Pvt Ltd, New Delhi, India) rimming a potassium hydroxide mount of extracted hair follicles placed over a glass slide.

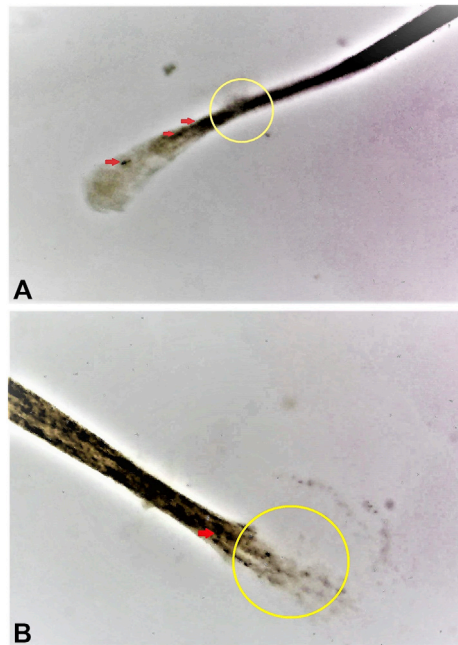


Fig 3. **A** and **B**, Instant direct microscopic examination of a 10% potassium hydroxide mount of extracted hair follicles with a good-quality, cost-effective USB dermatoscope (Escope USB videodermatoscope; Timpac Healthcare Pvt Ltd, New Delhi, India) under high magnification. Semi-polarized images were captured on a laptop in real-time, confirming diagnosis of the gray-patch variant of tinea capitis with endothrix involvement. **A**, Fungal spores invading the hair root and proximal shaft (*red arrows*), leading to near destruction of the hair shaft (*yellow circle*). **B**, Chain of fungal spores invading the shaft of another hair follicle (*red arrow*), resulting in near-complete destruction of the root and proximal shaft (*yellow circle*). (**A** and **B**, Original magnification: $\times 475$.)

REFERENCE

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