

Ultraviolet-Induced Fluorescence Dermatoscopy Reveals Fluorescent Clues in Pitted Keratolysis

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Introduction

Pitted keratolysis (PK) is a corynebacterial infection of the soles manifesting as multiple plantar pits caused by desmosomal alteration in the stratum corneum due to enzymatic activity of P1 and P2 bacterial serine proteases [1]. Predisposing factors include hyperhidrosis, occlusion, and reduced acidity of the skin surface [1].

Apart from the pits, patients may report burning sensation and malodour. In some instances, PK may be accompanied with other corynebacterial infections such as erythrasma and/or trichobacteriosis axillaris [2]. Although the diagnosis is mostly based on clinical presentation, differentiation from

clinically similar conditions, mainly including viral warts and tinea pedis, may sometimes be troublesome. In such cases, recognition of PK may be assisted by dermatoscopy (multiple crateriform indentations of the soles), Wood lamp examination (coral red fluorescence of the pits), direct microscopy, and culture.

Case Presentation

A 49-year-old male presented to the dermatology outpatient clinic due to genital lichen sclerosus. During the skin check, multiple plantar and interdigital pits were noted and further confirmed with dermatoscopy (Figure 1). Ultraviolet-induced

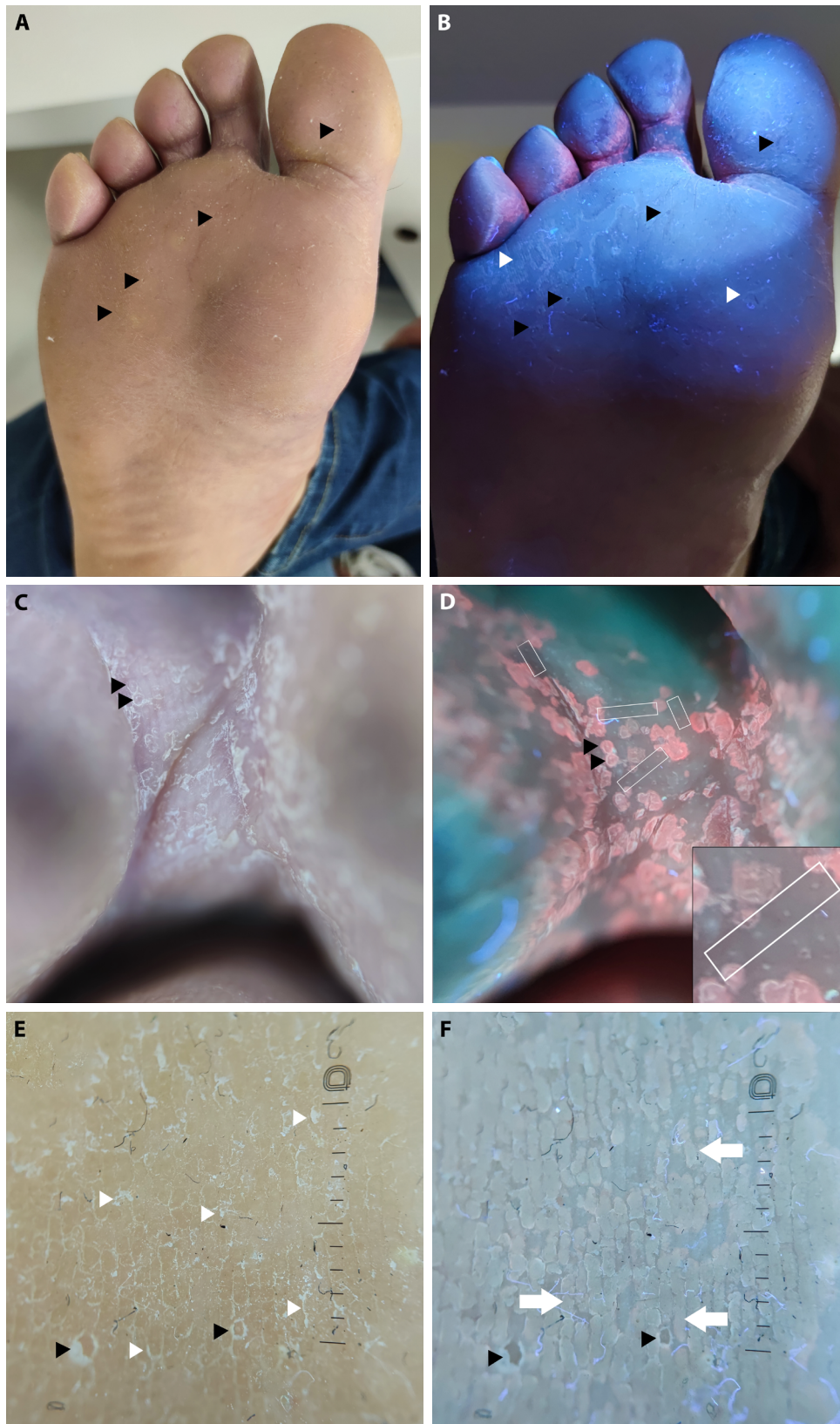


Figure 1. Pitted keratolysis in a 49-year-old patient. (A) Clinical presentation showing crateriform plantar pits (black arrowheads). (B) Examination with Wood lamp displays coral-red excited fluorescence of the pits (black arrowheads) and polycyclic figures (white arrowheads). (C) Dermatoscopy of toe web space displays small pits with a free edge of the peripheral scale that coalesce into larger areas (black arrowheads). (D) Ultraviolet-induced fluorescence dermatoscopy of toe web space reveals excited fluorescence - coral-red eccrine dots (white frames; magnified view in the box) and perieccrine clods (black arrowheads) corresponding to crateriform pits. (E) Dermatoscopy of the sole shows sparse plantar pits with a free edge of peripheral scale (black arrowheads) and irregular scaling, seen mainly in the furrows (white arrowheads). (F) Ultraviolet-induced fluorescence dermatoscopy of the sole reveals excited fluorescence - pale coral-red pits with a free edge of scale (black arrowheads) and pale coral-red parallel ridge pattern, as well as pale coral-red clods in the ridges (white arrows) (DL5, DermLite, $\times 10$ magnification).

fluorescence dermatoscopy (UVFD; peak wavelength 365nm, DL5, DermLite) displayed multiple pits surrounded with coral-red scale, coral-red parallel ridge pattern (PRP) (absent in visible light), and coral-red eccrine dots and clods.

Conclusions

UVFD is a novel diagnostic technique implementing UV radiation to produce fluorescent images based on Stokes shift phenomenon [3,4]. Coral-red excited emission spectrum is likely caused by the presence of *Corynebacteria*

producing coproporphyrin III [5]. We hypothesize that the infection might begin within the acrosyringium as a coral-red eccrine dots and clods that precede the development of coral-red PRP and finally develop into coral-red crateriform pits. The presence of the PRP pattern in miscellaneous dermatoses was summarized in Table 1. The specificity of our findings requires further confirmation in larger series of cases. In our opinion, these newly reported UVFD clues might be helpful to promptly differentiate PK from its common clinical and/or dermatoscopic mimickers.

Table 1. Differential diagnosis of parallel ridge pattern on dermatoscopy.

Diagnosis	Clues	Clinical Pearl
Acral lentiginous melanoma	Usually other clues to melanoma; chaotic distribution of structures, colours (patchy pigmentation) or border abruptness; accentuated perieccrine pigmented circles, obliterated eccrine duct openings; solitary standing-out lesion ('a priest in the snow'); large size (>7mm)	
Acral compound or combined nevus	Usually long history or congenital character; concentric architecture and/or elevation	
Exogenous pigmentation (e.g. dirt, hair dye, henna, silver nitrite, potassium permanganate, etc.)	Different shades depending on pigment colour	In many instances can be removed with alcohol pad
Ethnic pigmentation	No other melanoma features; harmonious in regard to structure and colour distribution; multiple	
Laugier-Hunziker syndrome / Peutz-Jeghers syndrome	No other melanoma features; harmonious in regard to structure and colour distribution; multiple; possibly accompanied by longitudinal melanonychia and/or mucosal melanotic macules	
Acral angioma	Presence of red dots on the ridge; organized	
Subcorneal hemorrhage	Often well-defined, 'cracked' appearance, orange, reddish-to-black colour	Can be removed with scalpel
Acral pigmented viral wart	Patchy pigmentation resembling acral lentiginous melanoma, yet no other melanoma features	
Pitted keratolysis	Multiple crateriform pits with a free edge of scale; common history of plantar hyperhidrosis	Parallel ridge pattern can be visualized with ultraviolet-induced fluorescence dermatoscopy only
Tinea nigra	Short history: brown to gray pigmentation arranged in thin bundles of short lines ('spicules') forming reticulate pattern, but also parallel ridge pattern especially at the lesion's periphery; no parallel furrow pattern	

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