Dermatology Practical & Conceptual

Are Blue Straggler Stars a Hidden Clue? Intriguing Discovery in Pityriasis Rubra Pilaris Under UV-Induced Fluorescence Dermoscopy

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Introduction

Ultraviolet-induced fluorescence dermoscopy (UVFD), a novel non-invasive diagnostic tool, visualizes the fluorescence of skin chromophores through the Stokes shift phenomenon [1]. Here, we report two cases utilizing UVFD in pityriasis rubra pilaris (PRP), discovering unique fluorescence patterns resembling "blue straggler stars" (BSS).

Case Presentations

Case 1: A 50-year-old male farmer presented with a 4-month history of scaly, pruritic, erythematous raised lesions that initially appeared on the scalp and progressively spread cephalocaudally to involve the entire body. There was photosensitivity. Physical examination revealed grade IV clubbing and pitting pedal edema. Cutaneous examination showed multiple follicular keratotic papules coalescing into plaques with 'islands of sparing' distributed over the trunk and extremities (Figure 1A), along with waxy yellow-orange palmoplantar keratoderma and scaling over the scalp. Differential diagnosis of erythroderma secondary to psoriasis and PRP was considered. Dermoscopic examination (DermLite 5; 3Gen, San Juan Capistrano, CA) of the back revealed multiple round-to-oval white areas with central keratotic follicular plugs, and white scales (Figure 1B). UVFD (peak wavelength 365 nm, DermLite 5) displayed multiple round-to-oval faint bluish areas with central bright bluish-white fluorescence resembling BSS (Figure 1C). Histopathological examination confirmed the diagnosis of classical adult-type PRP and oral isotretinoin was prescribed followed by narrowband-ultraviolet B (NB-UVB) phototherapy.

Case 2: A 37-year-old male presented with a 10-day history of itchy, scaly, dark raised lesions initially involving

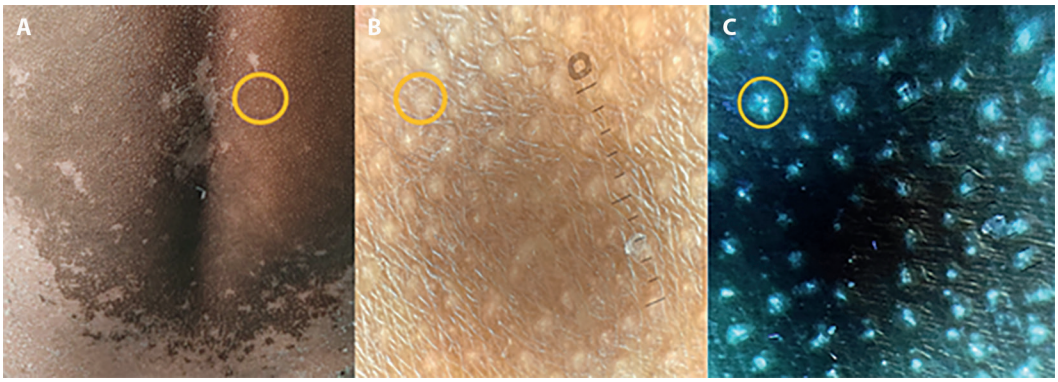

Figure 1. (A) A clinical image of multiple erythematous follicular papules (yellow circle) coalescing to form plaques with scaling over the back and islands of sparing in a 50-year-old patient. (B) Dermoscopic image of the lesion revealed multiple round to oval white areas with central whitish keratotic follicular plugs (yellow circle) and white scales (×10 magnification, DermLite DL5; 3Gen, San Juan Capistrano, CA, USA). (C) UV-induced fluorescence dermoscopy (peak wavelength 365 nm, ×10 magnification) presented multiple round to oval bluish areas with central dense bright bluish white fluorescence corresponding to the follicular keratotic plug and perifollicular area resembling blue straggler stars (yellow circle).

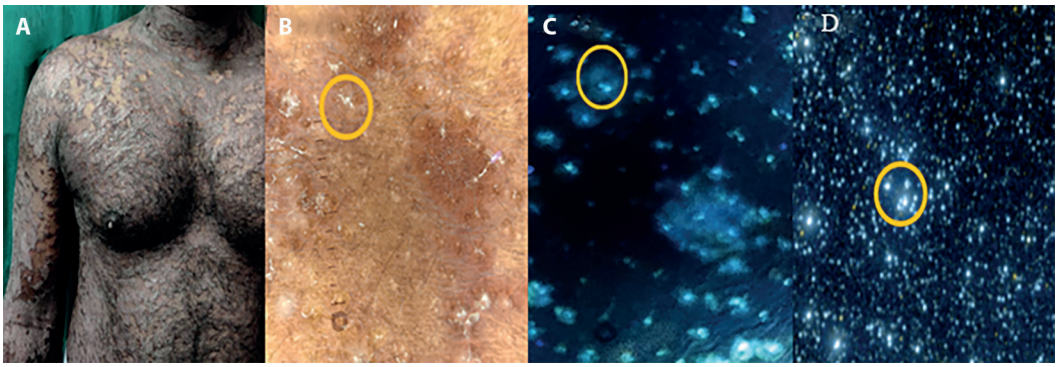

Figure 2. (A) A 37-year-old patient with well-defined multiple hyperpigmented hyperkeratotic follicular papules coalescing into plaques with white scales over the trunk and bilateral upper limbs with "islands of sparing. (B) Dermoscopic examination of a follicular papules over the trunk showed whitish keratotic follicular plugs (yellow circle), perifollicular scaling and white scales on dark structureless areas interspersed with normal-appearing skin (×10 magnification, DermLite DL5; 3Gen, San Juan Capistrano, CA, USA). (C) UV-induced Fluorescence Dermoscopy (peak wavelength 365 nm, ×10 magnification) presented with central keratotic follicular plug appeared as dense bluish white round-to-oval areas with a dull blue perifollicular glow (yellow circle), creating a "blue straggler stars" (BSS) appearance with the affected area brighter than normal skin. (D) BSS in globular star cluster NGC 362, (NASA's Galaxy Evolution Explorer. Image credit: NASA/JPL-Caltech/Univ. of Virginia [5]).

the face, progressively spreading to the trunk and extremities with associated photosensitivity. Physical examination showed bilateral pitting pedal edema. Cutaneous examination revealed well-defined multiple hyperpigmented hyperkeratotic papules coalescing into plaques with white scales over the face, trunk, and bilateral upper and lower limbs with islands of normal skin (Figure 2A). There was palmoplantar keratoderma and fine-powdery scales on the scalp. A differential diagnosis of follicular lichen planus and PRP was considered. Dermoscopic examination of follicular papules over the trunk showed faint whitish keratotic follicular plugs and perifollicular and white scales on dark structureless areas interspersed with normal-appearing skin (Figure 2B). UVFD enhanced the presence of central keratotic follicular plugs appearing as dense bluish white areas with a dull blue perifollicular glow giving a BSS appearance, with the affected area appearing brighter than normal skin (Figure 2C). Histological examination confirmed the diagnosis of Type I PRP. The patient was treated with oral methotrexate and topical corticosteroids.

The dermoscopic, UVFD, and histopathology findings of the two clinical cases are shown in Table 1.

Table 1. Skin Type, Differential Diagnosis, Dermoscopic Findings, Histopathology, and UV-Induced Fluorescence Dermoscopic Findings of Our Two Clinical Cases.

Case	Fitzpatrick Skin Type	Differential Diagnosis	Dermatoscopic Examination	Histopathology	UV-Induced Fluorescence Dermoscopy Examination
1	Type IV	Erythroderma secondary to 1. Psoriasis 2. Pityriasis Rubra Pilaris	Back: Multiple round-to-oval white areas, central whitish keratotic follicular plugs and white scales	Back: Basket weave orthokeratosis, irregular acanthosis, and broad rete ridges, with the dermis showing perivascular and interstitial chronic inflammatory infiltrate.	Multiple round-to-oval bluish areas with central dense bright bluish-white fluorescence resembling blue straggler stars (BSS)
2	Type VI	1. Follicular Lichen planus 2. Pityriasis rubra pilaris	Whitish keratotic follicular plugs, perifollicular scaling, and white scales on dark, structureless areas interspersed with normal-appearing skin	Trunk: Mild hyperkeratosis, alternating orthokeratosis and parakeratosis, keratotic follicular plugging, mild acanthosis with short broadened rete ridges, and mild perivascular lymphocytic infiltrate in the dermis.	Central keratotic follicular plug appeared as dense bluish-white round to oval areas with a dull blue perifollicular glow, creating a BSS appearance. The affected area was brighter than the surrounding normal skin.

Conclusion

Pityriasis rubra pilaris (PRP) is a rare papulosquamous disorder that is often challenging to diagnose [2]. Dermoscopic features of PRP are non-specific, with whitish keratotic plugs, white scales on a red-orange background and scattered red dotted vessels [3]. While histopathology offers clues for differentiation, it is not pathognomonic. UVFD offers a promising auxiliary tool in diagnosing PRP. Blue straggler stars are peculiar, hydrogen-burning stars that appear more luminous and bluer [4]. This pareidolia, reflecting keratinization and follicular plugging, is accentuated by UV light, providing a unique dermoscopic marker.

In our experience, keratosis pilaris and lichen planus lack this distinct fluorescence pattern, though its presence in other follicular hyperkeratotic disorders warrants further investigation. We propose the term "blue straggler stars" to describe this pattern and suggest incorporating UVFD into diagnostic protocols and artificial intelligence-driven models.

Patient Consent: The subjects in the article have provided written consent to the publication of all material, including photographs, within the article. We confirm that this manuscript contains original unpublished work that is not being considered for publication elsewhere at the same time.

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