

Case Report:

Shoe Contact Leucoderma: A Case Report with Serial Dermoscopic Evaluation

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Abstract

Shoe contact leucoderma is an uncommon acquired depigmenting disorder caused by repeated exposure to melanocytotoxic chemicals present in footwear materials. Clinically, it may closely mimic acral vitiligo, often resulting in misdiagnosis. We report a case of bilateral, symmetrical depigmented patches over the dorsum of both feet induced by prolonged contact with a PU (polyurethane) synthetic sandal strap. Serial dermoscopic evaluation demonstrated preserved follicular structures and progressive perifollicular repigmentation following avoidance of the offending footwear, confirming the diagnosis of contact leucoderma. This case highlights the diagnostic and prognostic value of serial dermoscopy in differentiating contact leucoderma from early vitiligo.

Keywords: Shoe contact leucoderma; Chemical leukoderma; Footwear-induced depigmentation; Polyurethane sandal strap; Acral depigmentation; Serial dermoscopy; Perifollicular repigmentation; Vitiligo mimic.

Introduction

Contact leucoderma is characterized by localized hypopigmentation or depigmentation resulting from repeated exposure to chemical agents capable of impairing melanocyte function. Footwear-related contact leucoderma is a well-recognized yet underdiagnosed entity, commonly associated with rubber accelerators, antioxidants, adhesives, and dyes used in shoe materials [1,2].

Due to its bilateral and symmetrical presentation over acral sites, shoe contact leucoderma often closely mimics acral vitiligo, posing a diagnostic challenge for clinicians. While several case reports and series of footwear-induced depigmentation have been described, most diagnoses have relied primarily on clinical distribution and exposure history, with limited documentation of dermoscopic findings [3–5].

Dermoscopy, a non-invasive diagnostic tool, can provide valuable insight by distinguishing reversible melanocyte dysfunction from irreversible melanocyte destruction seen in vitiligo. However, reports demonstrating serial dermoscopic evolution in shoe contact leucoderma are scarce. We present a case illustrating the role of serial

dermoscopy in confirming diagnosis and documenting recovery.

Case Report

A 55-year-old female presented with asymptomatic, gradually progressive depigmented patches over the dorsum of both feet for several months. There was no associated pruritus, scaling, erythema, trauma, or history of preceding inflammatory dermatoses. The patient had no personal or family history of vitiligo, autoimmune disease, or chemical exposure.

On detailed history, the patient reported prolonged daily use of a sandal. Notably, the upper strap of the sandal was composed of PU (polyurethane) synthetic material, which remained in direct and repeated contact with the dorsum of both feet. The sole and footbed did not correspond to the affected areas. There was no history of wearing classic rubber Hawai chappals or rubber-based straps.

Clinical Findings

Cutaneous examination revealed bilateral, symmetrical, well-defined hypopigmented to depigmented patches

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Cite this Article:

Hossain MM, Mohit I, Wahab F. Shoe Contact Leucoderma: A Case Report with Serial Dermoscopic Evaluation. Ban Acad Dermatol. 2025; 05 (02): 8-14

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Available at: www.jbadbd.com

An official publication of Bangladesh Academy of Dermatology (B.A.D.)

involving the dorsum of both feet. The lesions were sharply confined to areas corresponding exactly to the sandal strap contact, forming a patterned and geometric distribution.

The surrounding skin appeared normal, with no erythema, scaling, or signs of active inflammation. Hair shafts within the lesions retained normal pigmentation, and leukotrichia was absent, suggesting preservation of follicular melanocyte units [Fig-1a].



Figure.1a:



Figure.1b:

Dermoscopy Findings

Baseline Dermoscopy-

Dermoscopy of the lesions revealed the following features [Fig-1b]:

- Structureless whitish areas, corresponding to clinically depigmented zones
- Marked reduction of pigment network, without complete network loss
- Preserved follicular openings, indicating intact follicular architecture
- Residual perifollicular pigmentation, seen as faint brown halos around follicles
- Absence of leukotrichia
- No follicular dropout or scarring change

These findings favoured melanocyte dysfunction rather than irreversible melanocyte destruction, making vitiligo less likely.

Follow-up Dermoscopy (After 1 Month)-

After strict avoidance of the suspected footwear and initiation of conservative topical therapy, follow-up dermoscopy demonstrated- [Fig-2a][Fig-2b]

- Increase in perifollicular pigmentation, indicating early melanocyte recovery
- Initial reappearance of pigment network, predominantly around follicular units
- Reduction in structureless whitish areas, correlating with clinical improvement



Figure.2a:

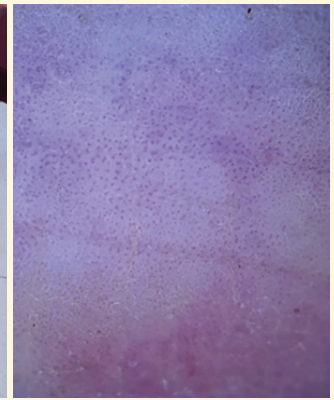


Figure.2b:

Latest Follow-up(After 2 Months)-

Clinical Features At the most recent follow-up, the depigmented patches appeared less conspicuous, with partial blending into the surrounding skin. No new lesions were observed, and there was no extension beyond the original contact sites, supporting a non-progressive and reversible process.[Fig-3a]



Figure.3a:



Figure.3b:

Dermoscopy Findings-

Dermoscopy at this stage demonstrated- [Fig-3b]

- Further enhancement of perifollicular repigmentation
 - Gradual and more uniform restoration of pigment network
 - Persistent preservation of follicular openings
- These findings confirmed ongoing repigmentation and recovery of melanocyte function.

Diagnosis

Based on the characteristic contact-site distribution, exposure to a PU synthetic sandal strap, absence of vitiligo-specific dermoscopic features, and progressive improvement following avoidance, a diagnosis of shoe contact leucoderma was established.

Discussion

Shoe contact leucoderma represents a localized form of chemical leukoderma caused by repeated exposure to footwear-related melanocytotoxic substances. Rubber accelerators, antioxidants, dyes, and adhesives are most commonly implicated [1,2]. However, modern footwear increasingly incorporates synthetic polymers such as polyurethane, particularly in sandal straps, which may contain residual monomers, plasticizers, and colorants capable of inducing localized melanocyte dysfunction [3]. Clinically, shoe contact leucoderma closely resembles acral vitiligo due to its bilateral symmetry and sharply demarcated depigmentation. Nevertheless, strict confinement to contact areas, lack of progression, and potential reversibility are key distinguishing features [4,5].

Most previously reported cases have relied primarily on clinical correlation and, in some instances, patch testing, with limited documentation of dermoscopic findings [3–5]. In contrast, the present case demonstrates serial dermoscopic changes, highlighting preserved follicular openings and progressive perifollicular repigmentation following removal of the offending agent. These features strongly indicate melanocyte survival and help differentiate contact leucoderma from vitiligo, where dermoscopy typically reveals complete loss of pigment network, follicular dropout, and leukotrichia [6]. Thus, dermoscopy not only aids in diagnosis but also serves as a valuable follow-up tool to document reversibility—an aspect that remains underreported in existing footwear-related contact leucoderma literature.

Conclusion

Shoe contact leucoderma should be considered in patients presenting with acral depigmentation strictly limited to footwear contact sites. PU synthetic sandal straps may act as causative agents. Serial dermoscopy provides critical diagnostic and prognostic information, helping to differentiate contact leucoderma from vitiligo and preventing misdiagnosis and unnecessary long-term treatment.

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