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Authors

Álvarez-Salafranca, Marcial
Yélamos, Oriol
Ramírez-Lluch, Mar
et al.

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Exogenous acral pigmentation induced by coleoptera: an underdiagnosed mimic of severe disease

Marcial Álvarez-Salafranca¹ MD, Oriol Yélamos² MD PhD, Mar Ramírez-Lluch¹ MD, Alberto Valero-Torres³ MD, Mariano Ara-Martín¹ MD PhD

Affiliations: ¹Department of Dermatology, Hospital Clínico Universitario "Lozano Blesa," Zaragoza, Spain, ²Department of Dermatology, Hospital de la Santa Creu i Sant Pau, Universitat Autònoma de Barcelona, Barcelona, Spain, ³Department of Pathology, Hospital Clínico Universitario "Lozano Blesa," Zaragoza, Spain

Corresponding Author: Marcial Álvarez-Salafranca MD, Department of Dermatology, Hospital Clínico Universitario "Lozano Blesa," Zaragoza, Spain, Avenida San Juan Bosco nº15, CP 50009, Zaragoza, Spain, Tel: 34-976765700, Email: marcialaspn@gmail.com

Abstract

Acral purpura is generally a hallmark for severe internal disease. However, exogenous pigmentation related to contact with invertebrates, can induce acral purpura-like lesions. Data regarding the beetle's ability to cause skin hyperpigmentation or purpura-like lesions are scarce. We report a case of exogenous pigmentation caused by accidental contact with a darkling beetle, clinically simulating acral purpuric lesions. The history of recent drug inhalation and abnormal autoimmunity tests made this diagnosis difficult.

Keywords: coleoptera, skin pigmentation, purpura

To the Editor:

Acral purpura is generally a hallmark for severe internal conditions such as sepsis, vasculopathy, or cryoglobulinemia. Additionally, acral purpura can also relate to the effect of levamisole-adulterated cocaine. However, other non-life threatening conditions such as exogenous pigmentation owing to contact with invertebrates, can induce acral purpura-like lesions [1]. Herein, we report an unusual case of exogenous pigmentation caused by accidental contact with a beetle, clinically simulating acral purpura. In our patient, the history of recent inhaled drug use made the diagnosis challenging.

A 50-year-old man, living in northeastern Spain, presented with asymptomatic skin lesions on his left foot present for 6 days. The patient had no pain, burning, or paresthesia and he denied previous trauma. However, he admitted to occasional use of cocaine as well as inhaled amphetamines the day before the onset of symptoms.

Physical examination revealed multiple well-delimited violaceous macules surrounded by a red-brownish halo, located on the distal part of the first three toes of his left foot (**Figure 1**). He did not present with systemic symptoms. Considering this clinical presentation and the patient's history, the differential diagnosis included levamisole-induced vasculopathy, connective tissue diseases, cryoglobulinaemia, cholesterol embolism, thromboangiitis obliterans, and Janeway lesions.

Chest X-ray and electrocardiogram were normal. Blood tests revealed antinuclear antibodies 1:640 and anti-DNA 1:110. The remaining autoimmunity and serological tests were normal. Considering these results, a more detailed history was performed. Hence, the patient remembered finding a black beetle inside his left work boot a few days before he detected the pigmentation. However, the patient had not given any importance to this fact.

Histopathologic examination with hematoxylin and eosin did not reveal any pigment deposit. However, a subtle brown pigmentation was visible in the



Figure 1. Clinical presentation of exogenous pigmentation induced by Coleoptera. Multiple well-demarcated violaceous macules are seen on the first three toes of the left foot.

stratum corneum by the use of hematoxylin alone. This diffuse pigmentation was more evident without any staining (**Figure 2**). Therefore, the diagnosis of exogenous pigmentation secondary to contact with a coleopter was made. The cutaneous lesions improved without any treatment and finally disappeared two months later.

Beetles can induce vesiculo-bullous dermatitis through the production of vesicant substances such as cantharidin or paederin [2, 3]. However, data regarding a beetle's ability to cause skin hyperpigmentation or purpuric-appearing lesions are scarce. Darkling beetles are one of the most common causes [4].

Tenebrionidae is a highly diverse family of beetles distributed worldwide, typically living in semi-arid and arid ecosystems. Tenebrionidae release defensive secretions containing hydrocarbons and quinines, which result in a potent pigmenting fluid [3]. More specifically, most species produce toluquinone 7, as well as the ethyl- and propyl-homologue [5]. A few cases of acral purpuric-looking lesions have been recently described after contact with *Blaps sp.* beetles [4]. The genus *Blaps* is a group of Tenebrionidae (**Figure 2D**), [6]. However, similar skin lesions can be related to other beetles as well as

millipedes. The latter have also been reported in the dermatological literature, mostly occurring in tropical areas. Since insects are the most common living animals, it is important to include contact to insects in the differential diagnosis of acral purpuric-like lesions. In fact, some authors emphasize the importance of this entity in the differential diagnosis of more serious entities [7].

Histopathological study may reveal the presence of superficial pigment in the corneal layer [4]. In our patient, this pigment was not evident with H&E. Nevertheless, with hematoxylin only and without any staining, it was possible to show the deposit of pigment in the superficial corneal layer. Management of this condition consists of watchful waiting. Hyperpigmentation disappears spontaneously [1,4], but topical corticosteroids can be used in symptomatic cases [7].

To our knowledge, this is the first reported case of exogenous acral pigmentation related to a beetle in Europe and the fifth in the literature. In addition, in our patient the diagnosis was challenging considering the recent history of inhaled drug use and the abnormal autoimmunity tests. Hence, including exogenous hyperpigmentation related to



Figure 2. Histopathological findings and image of a *Blaps sp.* **A)** Pigmentation was not detectable with the usual H&E staining. H&E, 10 \times . **B)** A light brown pigmentation was visible in the stratum corneum by the only use of hematoxylin, 10 \times . **C)** This pigmentation was more conspicuous without any staining and reached a thickness of 50 microns. Unstained, 4 \times . **D)** Tenebrionidae beetles are distributed worldwide and typically live in semi-arid and arid areas.

insects in the differential diagnosis of acral purpura is important to prevent misdiagnosis and unnecessary tests.

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Potential conflicts of interest

The authors declare no conflicts of interests.