

## CASE REPORT

## Recalcitrant Palmoplantar Pustulosis: Have You Considered Allergic Contact Dermatitis?

*Pustulose Palmoplantar Recalcitrante: Já foi Considerada a Hipótese de Dermite de Contacto Alérgica?*Received/Recebido  
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2021/06/30J. M. Neves<sup>1\*</sup>, A. Brasileiro<sup>1</sup>, P. Mendes-Bastos<sup>2</sup><sup>1</sup>Department of Dermatology and Venereology, Hospital de Santo António dos Capuchos, Centro Hospitalar Universitário de Lisboa Central, Lisboa, Portugal.<sup>2</sup>Dermatology Centre, Hospital CUF Descobertas, Lisboa, Portugal.

**ABSTRACT** – Palmoplantar pustulosis (PPP) is a chronic and relapsing disease of the palms and soles, which tends to be difficult to treat. Classically it was described as a subtype of psoriasis. Nowadays it is regarded as a separate entity, although plaque-type psoriasis affects concomitantly many patients with PPP. A link between allergic contact dermatitis (ACD) and PPP has been described, and the former may encompass a potential to perpetuate the latter.

Hereby we report two cases of difficult to treat plantar pustulosis. Underneath the dermatosis's refractive nature was an allergic sensitization to potassium dichromate and cobalt chloride. Leather shoes and leather insoles were commonly worn, and both allergens are employed by the leather industry. Clinical remission was achieved in both cases with allergen eviction. Patch testing must be considered in cases of PPP without response to treatment. If relevant sensitization is found, allergen eviction measures are mandatory.

**KEYWORDS** – Dermatitis, Allergic Contact; Foot Dermatoses; Patch Tests; Potassium Dichromate/adverse effects.

**RESUMO** – A pustulose palmoplantar (PPP) é uma doença crónica e recorrente das palmas e plantas, que tende a ser difícil de tratar. Classicamente era descrita como um subtipo de psoríase. Actualmente é considerada uma entidade distinta, embora psoríase em placas afecte concomitantemente muitos doentes com PPP. Uma relação entre dermite de contacto alérgica (DCA) e PPP já foi descrita, e a primeira acarreta um potencial de perpetuar a última. Aqui descrevemos dois casos de pustulose plantar de tratamento difícil. Subjacente à natureza refractária da dermatose, encontrava-se uma sensibilização alérgica ao dicromato de potássio e ao cloreto de cobalto. Sapatos e palmilhas de cabedal eram comumente usadas pelas doentes, e ambos os alérgenos referidos são utilizados na indústria do cabedal. Remissão clínica foi atingida em ambos os casos com evicção alérgica. Os testes epicutâneos devem ser considerados em casos de PPP refractários ao tratamento. Se for demonstrada sensibilização relevante, medidas de evicção alérgica são obrigatórias.

**PALAVRAS-CHAVE** – Cobalto/efeitos adversos; Dermite Alérgica de Contacto; Dermatoses do Pé; Dicromato de Potássio/efeitos adversos; Testes Epicutâneos.

## INTRODUCTION

Palmoplantar pustulosis (PPP) is a chronic and relapsing inflammatory disease of the palms and soles, characterized by the appearance of crops of scattered sterile pustules, in conjunction with erythematous keratotic plaques.<sup>1-4</sup> It has been classically described as a variant of psoriasis, although some authors nowadays regard it as a separate entity.<sup>1-3</sup> Concurrent plaque-type psoriasis has been reported in 18%-27% of the patients. PPP seems to be more prevalent in women, and is highly associated with smoking.<sup>1,4,5</sup> A link between PPP and allergic sensitization has been described.<sup>1,4</sup> Hereby we report two cases of difficult to treat plantar pustulosis perpetuated by allergic contact dermatitis (ACD).

## CASE REPORT

A fifty two year-old woman with a twenty two year history of PPP was referred to our clinic. She also suffered from hidradenitis suppurativa (HS) and was receiving weekly subcutaneous adalimumab (40

mg), with clinical remission of HS and palmar involvement. However, lesions on the soles persisted for more than 6 months after clearing of the palms (Fig. 1. A), even after treatment with oral methotrexate (weekly doses of 20 mg). Subacute eczema of the dorsal surface of both feet was also evident.

The second case refers to a forty eight year-old woman with a fifteen year history of plantar pustulosis unsuccessfully treated with topical clobetasol ointment (the patient refused other treatments).

On both cases microbiological smears disclosed no dermatophytes or bacteria. To exclude a possible concomitant ACD, patch testing was performed with the Portuguese Contact Dermatitis Research group baseline series, alongside with shoe series (BIAL Aristegui). Following the European Society of Contact Dermatitis guidelines, the allergens were applied on the back for 48 hours and readings were performed on day (D) 3 and D7. On both days, positive reactions (2+ to 3+) to cobalt chloride 1% pet, potassium dichromate 0.5% pet and paraphenylenediamine (PPD) 1% pet were observed in the first patient, whereas cobalt chloride 1% pet, potassium dichromate 0.5% pet and nickel sulfate 5% pet were positive in the second. Contact sensitization to potassium dichromate was considered to have current relevance, since it is



**Figure 1** - A) Plantar pustulosis with sensitization to cobalt chloride, potassium dichromate and paraphenylenediamine (first patient); B) Clinical response after two months of allergenic eviction (first patient).

commonly used by the leather industry, as a tanning agent. Association between sensitization to cobalt and the use of leather shoes has also been shown,<sup>6</sup> and it may encompass a current relevance. Leather shoes and leather insoles were commonly worn by the first and the second patient, respectively. PPD sensitization is less likely relevant, although it can be employed in the dyeing process of the shoes and cross-reactive azo dyes may be used to dye socks. Nickel sensitization was considered to have past relevance. Clinical remission was observed after allergenic eviction in both cases after two months of leather eviction (Fig. 1. B).

## DISCUSSION

The relationship between PPP and ACD is still a matter of debate. According to a recent systematic review, concomitant contact sensitization has been shown in 23.5% of 519 patients with PPP and allergen eviction seems to be beneficial in most cases, although most of the follow-up data collected refers to metals mainly present in dental amalgams.<sup>1</sup> PPP lesions are frequently more resistant to treatment than typical psoriatic plaques.<sup>3</sup> To deal with a refractory dermatosis the usual option taken by the clinician is therapeutic optimization, with dosage increase or the addition of alternative agents. However, we highlight the role of ACD in the perpetuation of recalcitrant cases of PPP, probably due to koebnerization triggered by the allergic inflammatory response.<sup>1,4</sup> Patch testing must be considered in cases of absence of clinical response to treatment. Chromium and cobalt are known metal allergens, and their role in the onset/exacerbation of PPP has been described.<sup>1,7</sup> If relevant sensitization is found, establishing measures for allergen eviction is mandatory, since it encompasses the potential to achieve complete remission.<sup>1</sup>

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### ORCID

J. M. Neves: <https://orcid.org/0000-0002-9014-2031>  
 A. Brasileiro: <https://orcid.org/0000-0002-8359-6561>  
 P. Mendes-Bastos: <https://orcid.org/0000-0002-2439-920X>

**Corresponding Author:** José Miguel Oliveira das Neves

**Address:** Department of Dermatology and Venereology, Hospital de Santo António dos Capuchos, Centro Hospitalar Universitário de Lisboa Central  
 Alameda de Santo António dos Capuchos, 1169-050 Lisboa  
**E-mail:** josemoneves@gmail.com

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## REFERENCES

- Verneti A, Puntoni M, Massone C. Palmoplantar Pustulosis and Allergies: A Systematic Review. *Dermatol Pract Concept*. 2019;9:105-10.
- Misiak-Galazka M, Wolska H, Rudnicka L. What do we know about palmoplantar pustulosis? *J Eur Acad Dermatol Venereol*. 2017;31:38-44. doi:10.1111/jdv.13846
- Al-Mutairi N, Abdalla TO, Nour TM. Resistant palmoplantar lesions in patients of psoriasis: Evaluation of the causes and comparison of the frequency of delayed-type hypersensitivity in patients without palm and sole lesions. *Med Princ Pract*. 2014;23:561-7. doi:10.1159/000365573
- Oktem A, Uysal PI, Akdoğan N, Tokmak A, Yalcin B. Clinical characteristics and associations of palmoplantar pustulosis: an observational study. *An Bras Dermatol*. 2019;(in press). doi:10.1016/j.abd.2019.04.008
- Becher G, L, Jamieson L, J, Leman J. Palmoplantar pustulosis – a retrospective review of comorbid conditions. *J Eur Acad Dermatol Venereol*. 2015;29:1853-4. doi:10.1111/jdv.12542
- Bregnbak D, Thyssen JP, Zachariae C, Menné T, Johansen JD. Association between cobalt allergy and dermatitis caused by leather articles - A questionnaire study. *Contact Dermatitis*. 2015;72:106-14. doi:10.1111/cod.12319
- Chowdhuri S, Ghosh S. Epidemio-allergological study in 155 cases of footwear dermatitis. *Indian J Dermatol Venereol Leprol*. 2007;73:319-22. doi:10.4103/0378-6323.34011