

Wang David (Orcid ID: 0000-0001-5427-4961)

Title: Lichenoid contact reaction to hydroperoxides of linalool resembling morphoea

David Wang¹, Jane Li¹, Harriet Cheng^{1,2}

1. Auckland City Hospital, New Zealand

2. The University of Auckland Faculty of Medical and Health Sciences

Corresponding author email: Davidwang@adhb.govt.nz

Corresponding author address: 2 Park Avenue, Auckland City Hospital, Grafton, Auckland

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1. Introduction

Linalool is a terpene widely found in fragrances. We report a woman presenting with morphoeic plaques with lichenoid features on histology subsequently found to have contact allergy to hydroperoxides of linalool.

2. Case report

A 64-year-old New Zealand European female presented with discolouration and burning sensation affecting the wrists and feet bilaterally. She had a background of psoriasis and a family history of scleroderma. She reported application of perfume to the affected areas on her wrists.

On examination she had violaceous well-defined plaques with thin hyperkeratosis on the volar aspects of the wrists bilaterally (Figure 1). There was dermal induration and tethering suspicious for morphoea, although the distribution was considered atypical. There was violaceous discolouration of the dorsal feet including the toes, extending to the ankles bilaterally.

Figure 1 – A scaly, violaceous plaque on the volar aspect of the right wrist. On palpation there was induration and tethering of the skin.

Subsequent blood tests including an auto-immune screen were normal. Punch biopsy from the right wrist showed interface vacuolar change with necrotic keratinocytes in the epidermis and bandlike lymphocytic infiltrate within the dermis. Furthermore, the dermis showed superficial and deep, perivascular and perineural lymphocytic infiltration. The overall histological diagnosis was lichenoid interface vacuolar dermatitis (Figure 2). Incisional biopsy of the right lower leg showed mild interface vacuolar lymphocytic dermatitis.

Given the history of perfume application to the affected areas on the wrists we proceeded with patch testing to the Australian baseline series, a fragrance series and the patient's own perfumes. Patch testing was performed with commercial allergens in plastic chambers on adhesive hypoallergenic tape (Chemotechnique, *Vellinge, Sweden*) and readings were performed on day 2 and day 5. On the final reading there was a positive reaction (++) to hydroperoxides of linalool and a weak positive reaction to her own CK IN2U perfume (+, which contained linalool). She was also using washing powder that contained linalool, raising a possible source of exposure to her feet and ankles via contact with washed socks.

The patient was advised to stop all fragrance use and to change to a fragrance-free washing powder. On follow-up after six weeks the lesions cleared and were no longer symptomatic.

Figure 2 – Histology from the wrist showing interface vacuolar change and a band-like inflammatory infiltrate. Haematoxylin and eosin x100.

3. Discussion

Pure linalool is a weak sensitiser, however, oxidation products produced after air exposure at room temperature can cause contact allergy (1). The prevalence of contact allergy to oxidized linalool was shown to be around 6% in a population in United Kingdom dermatology clinics (2). Linalool can be found naturally in various plants, while the synthetic version is widely used in fragrances and hygiene products due to its pleasant odour and the low cost of manufacturing.

Contact allergy to linalool usually presents with dermatitis secondary to perfumes or fragranced personal care products (1). Non-eczematous contact dermatitis, including lichenoid contact reactions, are uncommon (3). This case highlights a morphoea-like manifestation of contact allergy to hydroperoxides of linalool with lichenoid changes on histology. To our knowledge this is the first report of a lichenoid contact reaction to hydroperoxides of linalool.

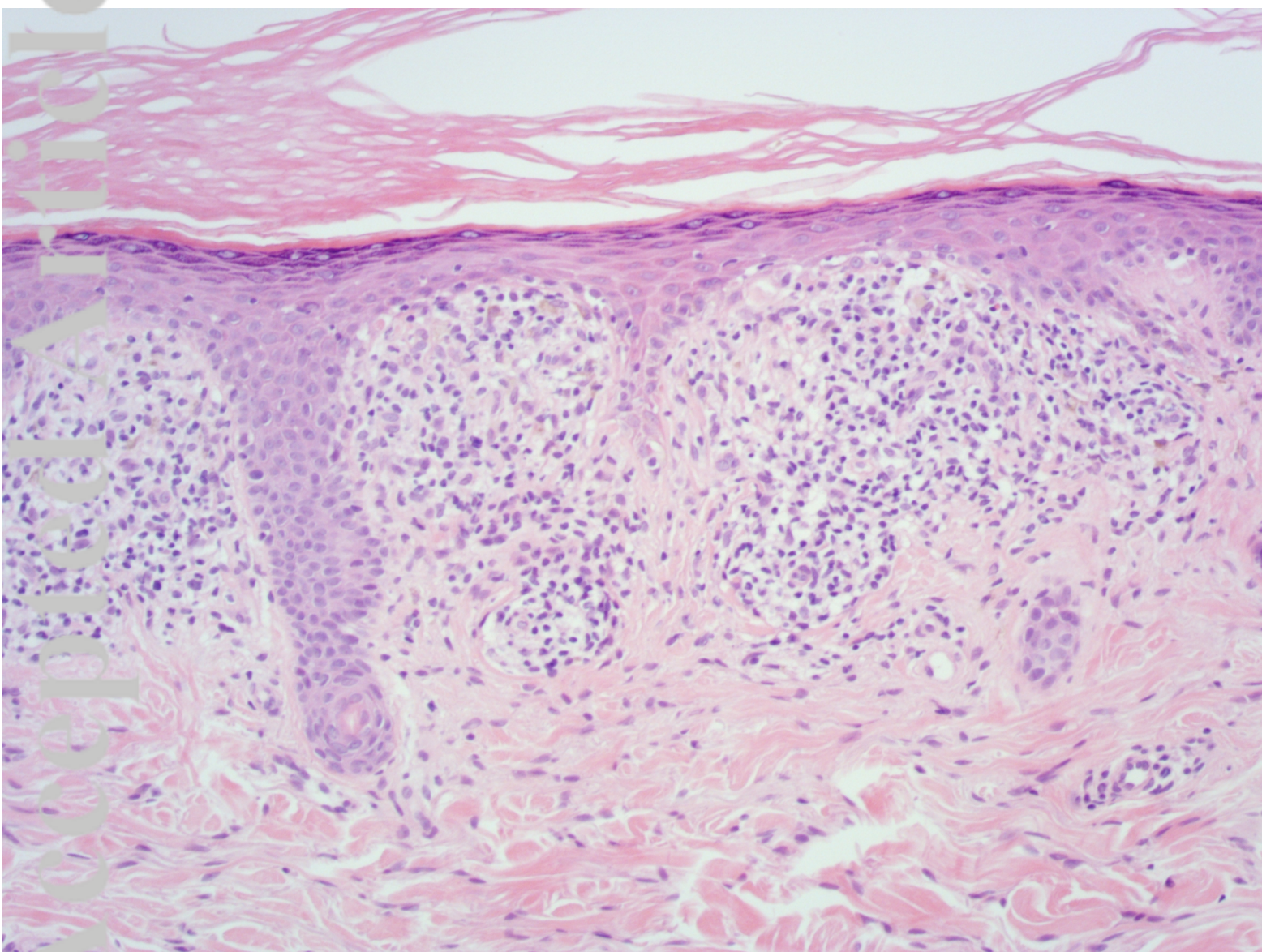
The authors have no conflicts of interests to declare.

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