

Contact dermatitis caused by bromide compounds

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Bromide compounds are used widely in industry, and, although they are highly toxic (1), the possibility of hypersensitivity reactions exists, although these are not well known. We report a patient with a cutaneous eruption after exposure to bromide compounds.

Case Report

A 49-year-old man working in a chemistry laboratory was evaluated after experiencing several episodes of eczematous lesions on the face, neck and arms 5 hr after exposure to bromide products. He had been working for 15 years in the same laboratory, experiencing symptoms during the last 6 years.

A skin biopsy (2) taken at the time of the reaction (T1) was analysed with CD4 (Novocastra, Newcastle, UK), CD8, CD45RO and HLA-DR (Dako, Ely, UK) and CLA (BD Pharmingen, San Diego, CA, USA)

antibodies. Perivascular infiltrates were detected at the dermal–epidermal junction, and to a lesser extent in the epidermis. There was a substantial number of T lymphocytes, mainly CD4⁺, although infiltration of CD8⁺ T cells was also found, with expression of the HLA-DR activation marker and the skin homing marker CLA (Fig. 1a).

General blood tests at T1 showed mild eosinophilia (623 cells/ml) and negative viral serology. T cell markers were assessed in peripheral blood mononuclear cells (PBMCs) at T1 and 60 days later (T2) (3), with anti-CD4–APC-H7 (APC, antigen presenting cells), anti-CD8–PerCP, anti-HLA-DR–phycoerythrin, anti-CD45RO–APC, and anti-CLA–fluorescein isothiocyanate (Becton-Dickinson, San Jose, CA, USA). At T1, we found increases in the percentages of CD4⁺ and CD8⁺ cells expressing CLA, CD45RO, and HLA-DR (Fig. 1b).

At T2, skin patch testing at 0.1% wt/wt in pet. was performed as previously described (4, 5), with 4-carboxybenzyl(triphenyl)phosphonium bromide (CAS no. 17814-85-6), N-bromosuccinimide (CAS no. 128-08-5), 4-bromomethylbenzoic acid (CAS no. 6232-88-8), triphenylphosphine (CAS no. 603-35-0), 4-methylbenzoic acid (CAS no. 7697-25-8), and benzoyl

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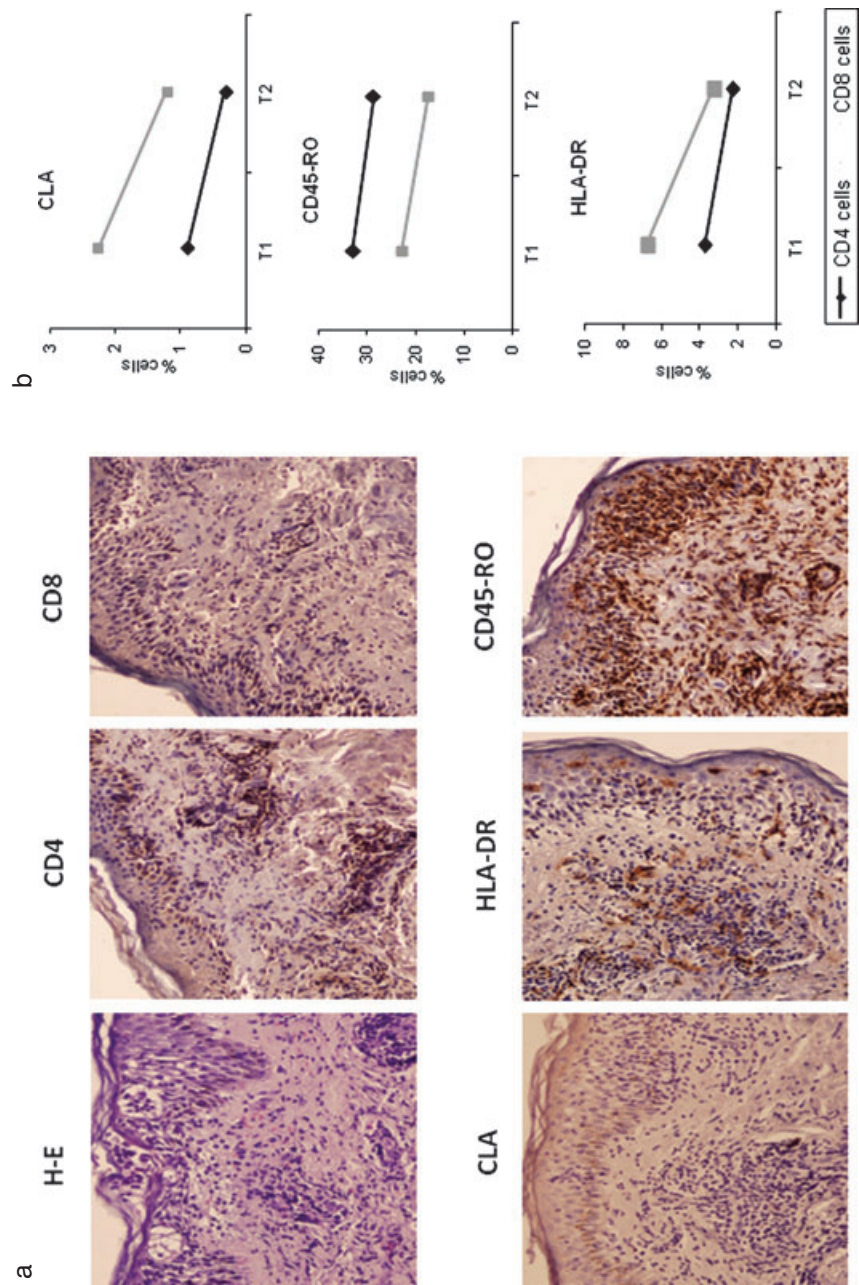


Fig. 1. (a) Haematoxylin and eosin (H-E) and immunohistochemical analysis of different markers (CD4, CD8, CLA, HLA-DR, and CD45RO) in a skin biopsy obtained during the acute reaction (T1). (b) Expression of the skin homing receptor CLA, the memory maker CD45RO and the activation marker HLA-DR in CD4 and CD8 lymphocyte populations. Results are expressed as percentage of cells. T1 indicates samples obtained in the acute phase; T2 indicates samples obtained 60 days later, when symptoms disappeared.



Fig. 2. Results of skin patch tests at the reading after 48 hr with positive reactions to 4-carboxybenzyl(triphenyl)phosphonium bromide, N-bromosuccinimide and 4-bromomethylbenzoic acid.

peroxide (CAS no. 94-36-0) for 2 days; on D2, the patient was extremely positive (erythema, oedema, and vesicles) to the first three compounds, and remained positive at D3 and D4 (Fig. 2). On D3, eczematous lesions appeared on the face and neck, lasting for 4 days. Patch testing gave negative results in 10 controls working in the same laboratory. Lymphocyte transformation tests

(LTTs) with the three patch test-positive compounds at different concentrations (100, 50, 1 and 0.1 µg/ml) gave negative results. Since the patient was transferred to another laboratory not using bromide compounds, he has remained symptom-free.

Discussion

We report a patient with occupational eczema induced by air exposure to bromide compounds, with the diagnosis confirmed by clearly positive patch test reactions accompanied by a 'recall phenomenon'. The LTT gave negative results, so the diagnosis would have been completely misleading if patch tests had not been performed.

Although rare, contact dermatitis caused by bromide products such as *p*-nitrobenzyl bromide has been reported (4, 5); however, the mechanisms involved have not been evaluated. Here, we found T cell involvement, mainly in the skin, of both CD4 and CD8 cells, with expression of the activation marker HLA-DR, the memory marker CD45RO, and the homing receptor CLA, a pattern similar to that detected in delayed hypersensitivity reactions to drugs (2, 3).

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