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Pustular contact dermatitis from fluorine in an antirust solution

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Antirust solutions often contain hydrofluoric acid or oxalic acid, which are strong acids and calcium-chelating agents. These acids can burn and necrose the skin (1-3).



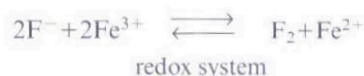
Fig. 1. Erythematous pustular dermatitis on the dorsum of the right foot.

Case Report

A mother decided to clean the rusted buckles of the shoes of her 19-month-old son. She applied an antirust solution Eau Ecarlate[®] (SA Eau Ecarlate, Sainte Geneviève des Bois 91000 France) only on the right shoe. 12 h later, the little atopic boy wore both shoes; the antirust composition had not been rinsed or wiped from the right shoe. The next day, he developed an erythematous pustular dermatitis on the area of the treated buckles. There was no pruritus. The lesions were over the whole the dorsum of the right foot (Fig. 1). There was no fever, no adenopathy and no lymphangitis. Culture of a swab was sterile. He stopped wearing the shoes and the lesions cured spontaneously within 7 days with no relapse.

Discussion

Rust appears after oxidation of iron into ferric ions. Antirust action is the result of reduction of these ferric ions (Fe^{3+}) into ferrous ions (Fe^{2+}). The antirust composition Eau Ecarlate[®] contains 20% ammonium bifluoride diluted in water. The halogen fluorine (F_2) is released from ammonium bifluoride in a redox system between fluoride ions (F^-) and the ferric ions (Fe^{3+}) of the rust.



Topical use of fluorine can induce cutaneous manifestations. The use of fluoride toothpastes can cause an acne-like eruption extending from the corner of the mouth to the chin (4, 5). A severe case of acne with systemic involvement was reported following occupational exposure to a fluorinated aromatic compound, dihydrotrifluoromethylphenyl benzothioipyranopyrazolone (6). Papulonodular eruptions were reported after the use of fluoride gel

preparations on the teeth (7). Contact urticaria from topical sodium fluoride was reported (8). A worker who carried fluorine-containing foam rubber developed pustular lesions on the arms, wrists, thighs and trunk (9). Pustular patch tests have been reported with ammonium fluoride 2% aq. (10). Some authors consider that these are the consequence of acute irritancy, though Becker & O'Brien (11) thought that they represented dermal sensitivity. Fisher et al. (10) believe that pustular patch test reaction due to halogens (and heavy metals) are distinct from both allergic and irritant patch test reactions. Lachapelle et al. (12) described follicular pustular reactions as appearing mainly but not exclusively in atopic patients.

We regard our case as most probably having been acute irritant contact dermatitis in an atopic child.

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Erysipelas-like mercury exanthem

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Case Reports

Case no. 1

A 30-year-old 30-weeks-pregnant woman was referred to the obstetrical unit with a risk of premature delivery. On the 2nd day after admission, she suddenly exhibited a burning oedematous erythema. She has been treated with salbutamol and progesterone for 36 h. Physical examination revealed an intensely oedematous and burning erythema on the external aspect of her right thigh and on the right side of her back. There was neither general malaise nor pyrexia. A diagnosis of mercurial exanthem was proposed 2 days later, when the oedematous lesions worsened and became scattered with numerous non-follicular white pustules, none over 2 mm in diameter. This hypothesis was confirmed by the information that a medical thermometer had been broken on the floor the day before the development of the skin manifestations. Bacteriological culture of a pustule was

sterile. A biopsy specimen of a pustular lesion was taken from the thigh, showing a subcorneal pustule in the upper 1/3 of epidermis, filled with polynuclear neutrophils. Skin lesions gradually subsided with desquamation with 15 days of topical corticosteroids.

Case no. 2

A 32-year-old HIV-positive man, who was classified C3 (CD4<200/ml), had been treated for a purulent pleurisy for 4 days with a regimen of 3 antibiotics. When apyrexia had been obtained for 2 days, he spiked a fever of 39°C and developed an oedematous erythematous plaque on the lateral aspect of the trunk. Due to the similar presentation to case no. 1, a diagnosis of mercurial exanthem was made. A nurse confirmed that the day before the development of skin signs, a medical thermometer had been broken on the floor. The antibiotic regimen was unchanged and the fever and skin lesions faded spontaneously.

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