

Short Communication

Acrylate, a hidden allergen of electrocardiogram electrodes

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Contact dermatitis from electrocardiogram electrodes, particularly in children (1–3) has repeatedly been reported over the last 10 years. Recently, 16 cases were reported to REVIDAL (French Skin Allergy Monitoring Network), created by GERDA (French Contact Dermatitis Research Group), all in infants (4).

Case Report

A 53-year-old woman presented with 5 eczematous patches: 2 symmetrically on the anterior shoulders, 2 symmetrically on the posterior shoulders and 1 on the left flank. Over the past few years, she had taken the following drugs: omeprazol, calcium gluconolactate, progesterone, oestradiol and indapamide. She had undergone thyroidectomy a month before and taken Levothyrox® for the past month. During the intervention, she noted irritation (that regressed in 5 days) at the sites where electrocardiogram patches were applied, seeming to correspond to the zones where the electrodes were applied, and leaving fixed pigmented erythema.

Topical steroid treatment soothed the itching but only slowly improved the erythema, which was still visible 4 months later.

Biopsy showed an acanthotic epidermis without parakeratosis, a dense predominantly lymphocytic inflammatory infiltrate of the papillary dermis, with epidermal exocytosis and spongiosis, cell damage to the basal layer and pronounced oedema of the superficial dermis, compatible with both fixed drug eruption and acute dermatitis.

The first patch test session, carried out 1 month later with the Trolab European standard series, the Trolab preservatives and excipients series, and the Trolab plastics and glues series, was negative. The components of the T 601 Dorvit Skintact electrocardiogram electrode were strongly positive to the viscous gel located in the centre of the electrode, while all other components, in particular the paper, were negative.

Further patch testing was carried out 3 months later with 20 allergens from the Chemotechnique (meth)acrylates series. She was positive (+) to hydroxyethyl acrylate 0.1% pet., urethane diacrylate aliphatic 0.1% pet.,

butanediol diacrylate 0.1% pet., and above all (++) to ethyl acrylate 0.1% pet.

Discussion

This case is of interest for several reasons: clinically, the late onset and lengthy persistence of the eruption; histologically, the dense lymphocytic infiltrate; investigatively, the negativity to the Trolab plastics and glues series, which mainly covers methacrylates, but also the positivity to the electrode gel itself and to ethyl acrylate in the Chemotechnique (meth)acrylates series.

Skintact electrodes are made in Austria and distributed in France by Dorvit. They have an adhesive viscous gel at their centre. The electrode itself is silver-plated, nickel-free, and coated with adhesive acrylic paper. The solid gel consists of glycerol, polyethylene glycol, acrylic acid derivatives (90%), potassium chloride (<10%), and traces (<1%) of tylose, benzoic acid and Euxyl K400.

In children, Red Dot electrodes produced by 3 M Santé are most often involved. During 2000, Beer (4) in Dijon reported 16 cases of such dermatitis to REVIDAL, without being able to identify the allergen. Contact allergies to other gels, for ECG, EEG, ultrasound, have been reported, but these were induced by other substances, such as propylene glycol or Euxyl K400 (5–8). As far as we are aware, this is the 1st report indicating that ethyl acrylate is a hidden allergen in electrocardiography gel.

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