

Allergic Contact Dermatitis Caused by P-Tert-Butylphenol-Formaldehyde Resin in Orthopedic Braces

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Abstract: P-tert-butylphenol-formaldehyde resin is a widely used adhesive chemical. It is used in a broad range of products and should be kept in mind when encountering children with suspected allergic contact dermatitis. We present a girl who developed contact allergy to p-tert-butylphenol-formaldehyde resin used in orthopedic braces.

A 6-year-old girl presented with dermatitis on the lower legs. She had congenital talipes equinovarus (club foot) and had been treated with surgery and orthopedic braces since birth. She developed dermatitis corresponding exactly to the sites of contact on the legs, giving a high suspicion of contact dermatitis (Fig 1). At one point the braces had to be adjusted. Duct tape was used to fasten the braces to the child's leg and she immediately developed dermatitis in the area of skin contact with the duct tape. The dermatitis cleared when use of the orthopedic braces was discontinued.

The girl was patch tested with our standard pediatric series of allergens and a small piece of an orthopedic brace. The patch test readings were carried out on days 3 and 7 and showed a positive (+1) reaction to p-tert-butylphenol-formaldehyde resin. We were unable to obtain precise information on the ingredients of the braces, as the data sheets were incomplete. Because p-tert-butylphenol-formaldehyde resin is a widely used adhesive chemical, it is highly probable that the braces and the duct tape contained it.



Figure 1. Dermatitis corresponding exactly to the contact sites of orthopedic braces.

A few months later the girl further developed dermatitis on the chest and abdomen after using a T-shirt with a fabric interfacing material containing glue (Fig 2), supporting our suspicion of allergic contact dermatitis caused by the adhesive chemical

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Figure 2. Dermatitis on the chest and abdomen after use of a T-shirt with a fabric interfacing material containing glue.

and confirming that p-tert-butylphenol-formaldehyde resin is ubiquitous.

DISCUSSION

Contact allergy to adhesive chemicals is a common problem (1). In Denmark, adhesive chemicals are reported to be the fourth most common allergen group in children and adolescents 1–17 years of age (2). P-tert-butylphenol-formaldehyde resin is a widely used adhesive owing to its rapid onset of action, durability, flexibility, and heat resistance (1). It is used in shoe construction, leather goods, laminating surfaces, and the rubber industry for bonding rubber to rubber and rubber to metal (3). It has been well known as a sensitizer since the initial report by Malten in 1958 (4). It is omnipresent and can be found in widely different products. Sensitization sources include prostheses, watch straps, shoes, hearing aids, electrodes, athletic tape, adhesive labels, some brands of plastic fingernail adhesive, neoprene, and wet suits (3).

Our case emphasizes the ubiquity of the allergen, but it also highlights the seriousness of acquiring a contact allergy to p-tert-butylphenol-formaldehyde resin. Children who acquire this allergy will have to

be very aware throughout life and make great efforts to avoid it to prevent recurrent episodes of dermatitis. Because it is found in so many different products, children with suspected contact dermatitis or recalcitrant dermatitis should be patch tested with a standardized series of allergens, including p-tert-butylphenol-formaldehyde resin.

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