

shoe. Crocs™ are made from Croslite™, a 'proprietary closed cell resin', which consists of a lofted foam material of Ethylene Vinyl Acetate copolymer (EVA) resin (commercially known as Levirex™) (1), 'growth additives' such as Engage® (a flexible thermoplastic polyolefin elastomer manufactured by DuPont™ Dow, Plaquemine, LA, USA) and 'pigments depending upon the desired color' (1). To date there are no reported cases of allergic contact dermatitis (ACD) to Crocs™.

Case Report

A 14-year-old Caucasian boy was referred to the Contact Dermatitis Clinic with a 2 years history of pruritic erythematous plaques on both the dorsal and ventral surfaces of his feet. He noted that he 'only wore Crocs™ and sneakers'. Patch testing was performed to the North American Contact Dermatitis Standard series, selected rubber based chemicals from the shoe tray and to a 10 mm punch plug of his Crocs™ (black, *Beach* model, made in China; <http://www.crocs.com>). Positive patch tests at 4 D were noted to black rubber mix 1+, thiuram mix 1+, carba mix 1+, disperse blue 106 1+, and his shoe component 2+. Of note, discontinuation of the Crocs™ and the use of socks under the sneakers resulted in clearance of his foot dermatitis.

Discussion

ACD to shoe derived rubber chemicals have been reported in children, with the most common allergens being mercaptobenzothiazole (2) and mercapto mix, followed by thiuram mix, 'para-phenylenediamine-black rubber mix' and 4,4'-diamino-diphenylmethane (3). In addition, some children tested with samples of their own shoes had also positive reactions (3). Our patient showed allergic reactions to rubber accelerators and antioxidants, as well as the shoe itself. We postulated that these chemicals were potentially the cause of the patient's shoe component reaction, however a contact allergy to the EVA resin was not disproved. Review of the literature showed that there have been no reported cases of EVA contact allergy.

We were interested to note that EVA copolymers are used for transdermal drug delivery systems (4) as penetration enhancers (5), and questioned an

Allergic contact dermatitis to Crocs™

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The Crocs™ footwear (Crocs Inc., Niwot, CO, USA) was first introduced in 2002 at the Ft. Lauderdale Boat Show as a novel 'light-weight, ventilated, slip and marking resistant'

EVA effect on absorption of rubber additives from these shoes. Correspondence with Crocs Inc. to ascertain which chemicals were used in the manufacture of the shoe and their interactions proved unsuccessful, as 'proprietary status' prevented the disclosure (Crocs Inc – Customer Service, personal communication, August 2007).

This case highlights the importance of testing shoe components and the need to obtain the individual ingredients from the product manufacturer. It also points to the potential difficulty in identifying allergens when a company is unable to provide manufacturing ingredients.

References

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