

Short Communication

Allergic contact dermatitis from a neoprene elbow splint

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Case Report

A 19-year-old woman was supplied with a neoprene splint to treat "tennis elbow". Talcum powder had been applied to the skin before using the support. A week later, she noticed a burning sensation of the skin and subsequently swelling and pruritus. She was admitted with a presumptive diagnosis of cellulitis and treated with penicillin V and flucloxacillin. When seen by a dermatologist, there was well-defined erythema localized to the area of the splint, associated with vesiculation and scale. There was no previous history of skin disease. She was treated with a short course of oral prednisolone and topical betamethasone valerate, with resolution of the suspected acute allergic contact dermatitis.

Patch tests were performed to a standard series, a rubber chemical series and a sample of the splint. The positive results are summarized in Table 1. The neoprene splint consisted of foam material fixed to knitted nylon fabric on both sides. It was later established that diphenylthiourea was used within the adhesive. The splint did not contain cyclohexylthiophthalimide or tetramethylthiuram disulfide.

Discussion

Thiourea compounds are used in industry predominantly in the production of neoprene rubber where they have been shown to be the most effective vulcanization accelerators, and also to function as antioxidants (1–7). Thioureas are also used as antioxidants in photocopy

paper, and diphenylthiourea as a heat-stabilizer in PVC adhesive tape backing and adhesive plasters. Neoprene is the basis of many consumer items, including wet-suits, swimming goggles, protective gloves and orthopaedic devices, all of which have been implicated in cases of allergic contact dermatitis (1–5). Due to the lack of cross-reactivity between the substituted thioureas, it is important to patch test with each compound separately (2).

Orthopaedic conditions often require prolonged use of splints or supports that may have rubber components. A series of reports by Kanerva et al. (2) implicated various thiourea-containing products, including a knee-brace containing diethylthiourea. Romaguera et al. have described a reaction to an elastic elbow guard (3), and De Vallejo (4) has described diphenylthiourea allergy resulting from the use of a knee brace (4).

References

1. Wilson H T H. Rubber dermatitis. An investigation of 106 cases of contact dermatitis caused by rubber. *British Journal of Dermatology* 1969; 81: 175–179.
2. Kanerva L, Estlander T, Jolanki R. Occupational allergic contact dermatitis caused by thiourea compounds. *Contact Dermatitis* 1994; 31: 242–248.
3. Romaguera C, Grimalt F, Vilaplana J, Castel C. Contact dermatitis to thioureas. *Contact Dermatitis* 1988; 18: 175–176.
4. Villareal Balza De Vallejo O. Contact dermatitis from diphenylthiourea in a knee brace. *Contact Dermatitis* 1997; 36: 166–167.
5. Doms-Goossens A, Chrispeels M T, De Veylder H, Roelands R, Willems L, Degreef H. Contact and photocontact sensitivity problems associated with thiourea and its derivatives: a review of the literature and case-reports. *British Journal of Dermatology* 1987; 116: 573–579.
6. Estlander T, Jolanki R, Kanerva L. Dermatitis and urticaria from rubber and plastic gloves. *Contact Dermatitis* 1986; 14: 20–25.
7. Van der Leun J C, De Kreek E J, Deenstra van Leeuwen H, Van Weelden H. Photosensitivity owing to thiourea. *Archives of Dermatology* 1977; 113: 1611.

Table 1. Positive patch test results

	D 2	D 4
neoprene splint	++	++
diphenylthiourea	++	++
cyclohexylthiophthalimide	++	++
tetramethylthiuram disulfide	+	++