

Patch testing showed +++ reactions to nickel and cobalt. Thus, we decided to remove the sternal wires. 7 such wires were removed and closure provided with braided polyester. Histologic examination of samples of granulation-like tissue around the sternal wire revealed a granulomatous inflammatory infiltrate with epithelioid macrophages and foreign body giant cells.

1 month later, erythema around the sternal scar and soft nodules were reduced, but soon soft nodules began to develop again at the site of sternal wire. These nodules consisted of some sequestra, granulation tissue and remnants of subdermal sutures. Repeated removal of the sequestra and granulation tissue was performed and finally the nodules disappeared.

Discussion

Stainless steel devices have been used widely for internal fixation and there are many reports of sensitivity

to stainless steel. However, there are few reports of allergic reaction to sternal wire (1, 2). In 1 case, there was itching and erythema widely around the sternal scar (1). In another, there was granuloma and erythema narrowly around the sternal wire (2). Our patient's reaction was stronger than in either of these previous reports.

References

1. Gordon P M, Buxton P K, McLaren K M, Aldridge R D. Sensitivity to sternotomy wires may cause post-operative pruritus. *Ann Thorac Surg* 1996; 61: 1514–1516.
2. Ishii A, Nakayama H. A case of nickel dermatitis due to metal implant. *Environ Dermatol* 1994; 1: 123–127.

Dithranol treatment of psoriasis in dithranol-sensitive patients

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Extreme sensitivity to dithranol has been described by several authors (1–5). The irritant potential of dithranol makes the distinction between allergy and irritation by patch testing difficult. Dithranol treatment may remain possible even in very sensitive patients.

Case Report

A 39-year-old female psoriatic patient had been successfully treated with dithranol elsewhere. During short contact treatment with dithranol in our day-care centre, she developed a generalized severe exanthemic reaction after 2 days of widespread application of dithranol cream

0.1% for 15 min. A biopsy showed subacute dermatitis. She recovered in a few days and after 2 weeks, the majority of her psoriatic lesions had disappeared. We performed patch testing with the constituents of the dithranol cream base (Table 1), to which she showed no reaction. 9 months later, we performed patch testing with serial dilutions of dithranol in the cream base (Table 2).

When her psoriasis deteriorated (PASI 11.3, with 20% involved skin), she started short contact therapy with 0.01% dithranol cream. The cream was applied widely, left in place for 5 min and washed off with tap water only. After 3 days, the exposure time was pro-

Table 1. Constituents of the dithranol cream base

Vehicle
cetiol V
cetomacrogol emulsifying wax
liquid paraffin (viscosity 110–230 mPa)
Stabilizers
sorbic acid
ascorbic acid
salicylic acid pulv <90
distilled water

Table 2. Patch test results after 1 day (D) of application of serial dilutions of dithranol cream, read after D2 and D3

dithranol concentration	D2	D3
0.00025%	–	?+
0.0005%	–	?+
0.001%	+	?+
0.0025%	+	?+
0.005%	+	+
0.01%	+	+

?+: erythema, no induration; +: palpable erythema.

longed to 10 min and 3 days later, to 20 min. The exposure time was gradually prolonged to 45 min and thereafter the concentration was elevated to 0.03%, with an application time of 15 min. At this step, she experienced irritation. Treatment was stopped for 3 days, after which she continued with 0.03% for 5 min. She experienced no more irritation and treatment was successfully ended 2 weeks later (PASI 0.4, with an area of 0.5%). The dithranol concentration had not exceeded 0.03%.

Discussion

Viluksela et al. (5), in animal models, concluded that dithranol had only minor contact sensitizing potential. Patch testing with dithranol in sensitive patients is advised by most authors, though they describe different irritant thresholds (1–5, 7–11). Short contact treatment was started in our patient with a low dithranol concentration, 10× higher than the minimal erythema concentration (MEC) determined by patch testing. The dithranol concentration was increased gradually (11) and the psoriatic lesions cleared.

In patients with a history of increased sensitivity to dithranol, we suggest that patch testing with serial dilutions of freshly prepared dithranol be carried out to determine the patients' individual threshold. Treatment should then be resumed with an adjusted dithranol concentration. Gradual increase in concentration and/or exposure time should be adopted, according to the patient's skin reaction. We postulate that in most patients with increased dithranol sensitivity, their psoriasis can still be cleared in this man-

ner, regardless of whether they have delayed-type allergy or intolerance.

References

1. De Groot A C, Nater J P. Contact allergy to dithranol. *Contact Dermatitis* 1981; 6: 5–8.
2. Burden A D, Stapleton M, Beck M H. Dithranol allergy: fact or fiction? *Contact Dermatitis* 1992; 26: 291–293.
3. Di Landro A, Valsecchi R, Cainelli T. Contact allergy to dithranol. *Contact Dermatitis* 1992; 26: 49–50.
4. Lawlor F, Hindson C. Allergy to dithranol. *Contact Dermatitis* 1992; 26: 137–138.
5. De Groot A C, Nater J P, Bleumink E, De Jong M C J M. Does DNCB therapy potentiate epicutaneous sensitization to non-related contact allergens? *Clinical and Experimental Dermatology* 1981; 6: 139–144.
6. Viluksela M, Haasio K, Mannisto P T. Studies on the contact sensitizing activity of dithranol (anthralin) and 10-butyryl dithranol (butantrone). *Contact Dermatitis* 1990; 22: 103–110.
7. Mustakallio K K. Irritation and staining by dithranol (anthralin) and related compounds (I). Estimation with chamber testing and contact thermography. *Acta Dermatovenereologica* 1979; 55: 125–132.
8. Burden A D, Muston H, Beck M H. Intolerance and contact allergy to tar and dithranol in psoriasis. *Contact Dermatitis* 1994; 30: 185–186.
9. Green P G, Grattan C E H, Kennedy C T C, Forbes D R. Patch testing with dithranol and its degradation products. *Contact Dermatitis* 1988; 18: 117–119.
10. Willis C M, Stephens C J M, Wilkinson J D. Experimentally-induced irritant contact dermatitis. *Contact Dermatitis* 1988; 18: 20–24.
11. Hausteil U-F, Lorisich I. Irritant potential of dithranol. *Dermatologica* 1986; 14: 288–293.

Occupational allergic contact dermatitis, partly airborne, due to isocyanates and epoxy resin

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Allergic contact dermatitis from isocyanates has comparatively rarely been described (1–4).

Case Report

A 32-year-old woman, with no previous history of skin or atopic diseases, worked in a plant manufacturing grinding tools. She glued single sheets of sandpaper together creating an endless belt, using a 2-component adhesive, freshly prepared each shift by herself. After 1½ years, she

developed dermatitis of both hands, forearms and face. Clearance was achieved with systemic corticosteroids. Thereafter, she was transferred to where moulds were built from various epoxy resins. However, despite avoidance of contact with polyurethane resins, she developed recurrences of dermatitis with a similar airborne distribution. After the patient quit her job, her dermatitis cleared completely and did not recur.

Patch testing was performed according to ICDRG guidelines and after complete resolution of dermatitis (Table 1).