

## ”Extra-edge Effect”: A Further Problem in Patch Test Diagnosis?

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Sir,

*In vivo* diagnostic tests may cause side-effects. The well-known, typical side-effects of patch testing are active sensitization, irritant reactions, scars, alteration of pigmentation, pustular or microbial infection, reaction to plaster or test devices, and “angry back syndrome” (1). Systemic symptoms are not unusual among patients undergoing patch tests; 5% of tested patients complain of rashes, high temperature and flare-up reactions (2).

A particular patch test side-effect, the “edge-effect”, is reported for irritant substances. A similar reaction is also described sporadically for different allergens using Finn Chambers on Scanpor; test substances, not evenly dispersed under the Finn Chamber accumulate around the perimeter of the chamber, causing a stronger allergic reaction at the rim (3, 4). Another peculiar “edge-effect” has been observed testing potent corticosteroids: at the 48-h control the eczematous reaction is evident only on the outer edge of the patch test site, while at the later readings, the entire patch test site becomes eczematous. This phenomenon may be explained by the anti-inflammatory effect of the corticosteroid reinforced by the patch test occlusion during the first 48 h (5).

In the case presented here, a strange patch test side-effect was observed, characterized by an allergic skin reaction localized on the external edge of some patch test cells.

### CASE REPORT

A 60-year-old non-atopic woman with a 5-month history of chronic pruriginous erythematous-papular dermatitis involving the arms was referred to our allergological outpatient clinic. Patch tests with the Italian standard SIDAPA (Società Italiana di Dermatologia Allergologica, Professionale e Ambientale) series were performed applying Haye’s Test Chamber® (F.I.R.M.A. Spa) made of an acrylic hypoallergenic adhesive sticking plaster, binding squared polypropylene chambers filled with square filter papers. At the 48-h control only a positive (++) reaction to Disperse Blue 124 (DB124) was observed. At the successive 72-h control the reaction to DB124 was stronger (+++), with an erythematous-vesicular reaction with crusts, and a positive (++) reaction to disperse yellow 3. Unexpectedly, a widespread erythematous-vesicular reaction developed beyond the DB124 patch test cell, involving, in particular, the patch test sites situated above and

below the DB124 application site. However, the allergic reaction spared the central part of the patch test areas, corresponding to the filter paper chambers (Fig. 1). The allergens applied in the 2 upper patch tests were: methylchloroisothiazolinone/methylisothiazolinone (MCI/MI) and mercaptobenzothiazole, while those tested in the 2 lower sites, were White petrolatum and Disperse red 1, respectively. The confluence of these reactions led to a marked rectangular-shaped, widespread reaction.

### DISCUSSION

An allergic reaction to plaster was certainly excluded, due to the absence of any reaction in other sites of application of the adhesive sticking plaster belonging to the same batch.

An “angry back” reaction could be hypothesized. In fact, one month later, patch tests with the separated allergens involved in the reaction (methylchloroisothiazolo-



Fig. 1. Rectangular-shaped erythematous-vesicular reaction extending above and below the positive reaction to DB124.

linone/methylisothiazolinone, mercaptobenzothiazole, White petrolatum, Disperse red 1), were all negative. The “angry back syndrome” is defined as a regional phenomenon caused by the presence of a strongly positive reaction that causes a skin hyper-reactivity state in which other patch-test sites become reactive (6). However, the angry back reaction does not explain the vertical and squared morphology of the erythematopapulo-vesicular reaction described in our case.

Another hypothesis is that the full development of the very strong allergic reaction to DB124 was hindered by the pressing effect made by the nearest patch test cells during the first 48 h. In fact, at this control time, the eczematous manifestation was limited only to the DB124 application site. During the 24 h following plaster removal (48–72 h), when there was no longer any pressing effect, the oedematous-vesicular reaction of DB124 also spread to involve the adjacent areas. However, this hypothesis does not explain the sparing of the central portion of the patch test cells close to DB124.

A further explanation may be related to the dilution of DB124 due to patient hyper-perspiration. In fact, during the removal of the plaster, we noticed that it was damp (revealed by a diffuse blue colouration of the plaster) by DB124 above and below its cell; this dampening of the plaster may have caused the dispersion of the allergen and a broader reaction to DB124 involving the adjacent regions, with the cells being spared, probably because they adhered firmly to the skin. The delayed reaction may be explained by the lower concentration of DB124 allergen due to sweat; whereas the shape of the reaction could be conditioned by the vertical arrangement of the plasters. Finally, it is also possible that an excessive amount of petrolatum preparation was placed in the

test chambers, causing the leakage of DB124 from its cell and the consequent contact reaction around the site of application.

Following further focused questioning, the patient reported that during the hours following removal at 48 h, the vesicular (++) lesion that had developed in the site of contact with DB124, became wetter and more exudant. To plug the exudates she applied a sterile gauze to her back, held in place with plasters. The sterile gauze may have spread the residual allergen DB124 to the nearest patch tests cells, inducing a contact allergic reaction even in these sites. However, this hypothesis does not explain the square areas corresponding to the patch test cells.

This case highlights how unexpected side-effects may occur even during the routine activity of an allergologic clinic, thus enlarging the list of patch test side-effects.

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