

The term 'edge effect' was originally suggested to describe the ring- or square-shaped (depending on the shape of the patch test chamber) positive (allergic) patch test reaction that is stronger at the rim of the patch test chamber, particularly with allergens dissolved in a liquid vehicle (1, 2). The term might be generally applied to any peculiar patch test reaction at the periphery of the patch test site. Physically induced edge effect and chemically induced edge effect are the two distinct types (3), the latter occurring as an irritant or positive (allergic) edge effect (Table 1). The classical positive edge effect is induced mainly by liquid allergens as in the original description, and exceptionally by allergens dispersed in pet. (2–4). A specific pattern induced by potent topical corticosteroids is well-documented (5, 6) (Table 1). Recently, 'extra-edge effect' was described as a new pattern that might also be regarded as a patch test side-effect (7). We here introduce the 'passe-partout effect' as a novel pattern of positive edge effect.

Case Reports

18-, 24- and 22-year-old non-atopic Turkish girls (Case 1–3) with suspected

hair dye allergy, and 52- and 59-year-old non-atopic Turkish men (Case 4 and 5) with suspected allergic contact dermatitis from rubber gloves and topical medicaments, respectively, underwent patch testing in our department. Patch testing was performed with an extended European baseline series in all cases, and additionally with hair-dressing (Case 1–3), textile dye (Case 3), rubber (Case 4), and medicament series (Case 5) (Brial Allergen®, Greven, Germany and Chemotechnique Diagnostics®, Vellinge, Sweden), using square-shaped IQ Chambers® (Chemotechnique Diagnostics, Vellinge, Sweden). Occlusion was for 2D and test areas were evaluated according to International Contact Dermatitis Research

Group criteria at 2, 3, 4, and 7D (8). At D2, +++ reactions to *p*-phenylenediamine (1.0% pet.) (Case 1–3), diaminodiphenylmethane (0.5% pet.) (Case 3), 4-aminoazobenzene (1.0% pet.) (Case 3), thiuram mix (1.0% pet.) (Case 4), quinoline mix (6.0% pet.) (Case 5), and a ++ reaction to *p*-toluenediamine sulfate (1.0% pet.) (Case 1) were observed. As a striking feature, each positive reaction was surrounded by a spared zone forming a cutout, thus showing a 'passe-partout effect', and a vesicular positive

'Passe-partout effect' in positive patch test reactions: a novel pattern of edge effect

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Fig. 1. (a) A +++ reaction to 4-aminoazobenzene (1.0 pet.) showing a 'passe-partout effect' at D2; (b) a more diffuse reaction at D3 due to gradual resolving of the cutout (spared zone).

Table 1. Suggested classification of previously reported types and patterns of 'edge effect' in patch test reactions (1–3, 5–7)

Edge effect type	Reaction pattern	Inducer agent	Suggested mechanism
Physically induced edge effect (3)	Transient, red, depressed, 'imprinted' pressure mark in the shape of patch test chamber or the tested solid material (3)	Patch test chamber's rings or squares (3) Edges of the solid test material (3)	Pressure effect
Chemically induced irritant edge effect	Ring- or square-shaped erythema at the rim sparing the central test area showing a decrescendo course	Irritant chemicals	Pressure effect/capillary effect (for liquids)-induced accumulation of the irritants at the periphery
Chemically induced positive (allergic) edge effect			
• Classical edge effect	Stronger positive reaction at the rim in addition to positive reaction within the central test area	Mainly: Allergens in liquid vehicles, e.g. formaldehyde, MCI/MI (1–3) Exceptionally: Allergens in pet., e.g. <i>p</i> -phenylenediamine (3) Potent corticosteroids (5, 6)	Pressure effect/capillary effect (for liquids)-induced accumulation of the allergens at the periphery
• Special edge effect	Red outer edge and a whitish central area at early readings		Vasoconstrictive and anti-inflammatory effect of the corticosteroid
• Extra-edge effect (7)	External edge reaction around the patch test sites sparing the central test areas that are in vertical neighbourhood to the positive patch test site	Disperse Blue 124 (7)	Excessive amount of patch test material/pressure effect/hyper-perspiration?
• Passe-partout effect (this report)	A cutout (spared zone) surrounding the central test area in strong positive patch test reactions extending over the edges of the test area	<i>p</i> -Phenylenediamine ($n = 3$), other para-group allergens ($n = 3$), thiuram mix ($n = 1$), quinoline mix ($n = 1$)	Excessive amount of patch test material/pressure effect of the squares of the patch test chamber

MCI/MI, methylchloroisothiazolinone/methylisothiazolinone.

reaction spreading beyond this spared zone (Fig. 1a). The cutout zone gradually resolved, and the positive reactions became more homogenous over D3 (Fig. 1b) and D4. Positive reactions were found to be clinically relevant. Patients showed one or more additional +, ++, or +++ patch test reactions to mainly cross-reacting allergens, but without a 'passe-partout effect'.

Discussion

The word 'passe-partout', best known in art terminology, is used for a cardboard cutout surrounding a picture as an inner frame both for protective and aesthetic purposes. As a metaphor highlighting the visual art in patch testing, we coined the phrase 'passe-partout effect' for this particular phenomenon of the cutout (spared zone) surrounding the central test area in positive patch test reactions extending over the edges of the test area.

It was observed in 8 patch test reactions to six different allergens,

all dispersed in pet., in a total of five patients; apparently independent of age, gender, atopic skin status, application site on the back, or the tested individual. *p*-Phenylenediamine ($n = 3$), and cross-reacting para-group allergens ($n = 3$) were the main responsible allergens, but this effect seems not to be allergen-specific as it occurred with thiuram mix and quinoline mix as well. However, it might be related with the strength of the patch test reaction as it was almost exclusively observed with +++ reactions. This might also explain the predominance of para-group allergens, in particular *p*-phenylenediamine, because vesiculobullous patch test reactions are usually observed at test concentrations of 1.0% pet. in sensitized individuals so that a very diluted patch test concentration (0.01% pet.) was recently recommended (9). However, additional strong patch test reactions were also observed in these patients without the 'passe-partout effect'. A most reasonable explanation would be that excessive amount of allergens were placed into the test chambers, causing the

leakage of the pet. preparation from the chamber and the subsequent spreading of the positive reaction beyond the test area. An exaggerated pressure of the occlusive borders of the patch test chamber would lead to the pressure-induced spared zone in between. The occurrence of the 'passe-partout effect' exclusively on D2 with gradual resolving of the spared zone to form a homogeneous positive reaction on later readings might support a pressure-induced mechanism.

In conclusion, the term 'passe-partout effect' was coined to describe the striking cutout zone in strong positive patch test reactions spreading beyond the application area as a novel pattern of positive edge effect.

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