

## Textile Contact Dermatitis in a Patient Sensitized to Reactive Orange 107 Dye

### Dermatitis de contacto por textiles en paciente sensibilizada al tinte *Reactive Orange 107*

To the Editor:

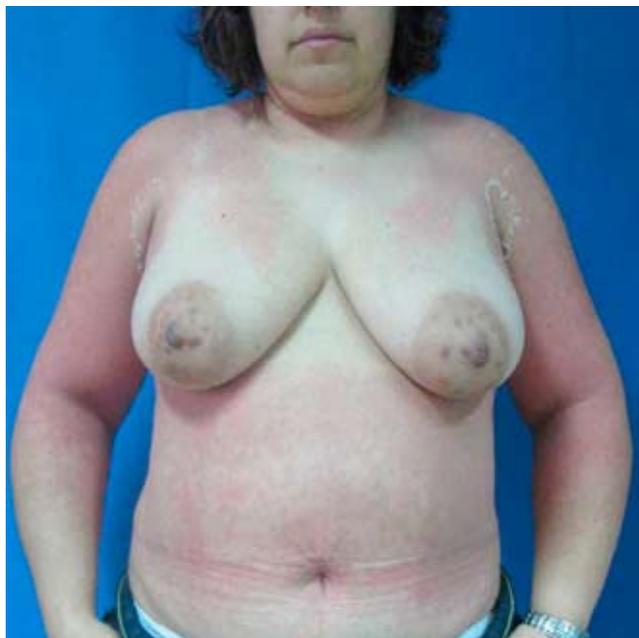
Textile contact dermatitis (TCD) results from contact between the skin and substances used in clothing. Incidence varies according to the inclusion criteria used, and TCD is more frequent than was once thought.<sup>1-4</sup> Finishing products (finish resins) and dyes are the main causes of TCD. We describe a case of TCD in response to Reactive Orange 107, a dye that very infrequently causes sensitization.

A 37-year-old woman presented with 2 flare-ups of pruriginous lesions separated by an interval of 7 months. The lesions commenced in the axillas, and subsequently spread symmetrically to the neck, cubital fossas, chest, abdomen, and lumbar region. Physical examination revealed a maculopapular rash in these regions that spared the skin in contact with the bra (Figure 1). The first flare-up was preceded by a respiratory tract infection associated with fever, but no results of relevance were obtained from a full workup that included serology for viral exanthematic diseases. Following the second flare-up, the patient was questioned in detail, and reported having worn the same red viscose sweater before each flare-up. The lesions responded to treatment with topical corticosteroids and oral antihistamine agents. A biopsy taken from the arm revealed spongiotic dermatitis, vacuolar interface dermatitis, and a superficial and interstitial perivascular inflammatory infiltrate with abundant eosinophils and necrotic keratinocytes.

Patch tests were conducted with the standard Spanish Contact Dermatitis and Skin Allergy Research Group (GEIDAC) battery, with a textile battery of 14 allergens (Martí Tor, Barcelona, Spain), and with the sweater itself; readings were taken at 48 and 96 hours. Only the sweater test was positive (+ + +) (Figure 2). Given these results, the tests were repeated using a larger textile battery of 32 allergens (Chemotechnique, Vellinge, Sweden). Results were positive for Reactive Orange 107 (+ +) (Figure 3). Biopsy of the positive patch tests was not performed.

TCD sensitizing agents can be fibers, dyes, dye coupling and fixing agents, finish resins, and compounds used in accessories. Up to the 1960s the most frequent allergens were finish resins that released formaldehyde. Since the introduction of resins that released lower amounts of formaldehyde, the most important sensitizing agents have been dyes.<sup>5</sup>

Dyes can be classified according to their chemical structure as azo group, anthraquinone dyes, nitro dyes, etc, and according to textile application as disperse or nondisperse (reactive, basic, acid, or direct) dyes. Disperse dyes, which are used for both synthetic and



**Figure 1** Maculopapular rash on the torso, sparing the area of the bra.

artificial textiles, bind weakly to the textile and are easily released. For this reason, they are among the most frequent sensitizing agents.<sup>6,7</sup> Reactive dyes are used for natural or mixed fibers, including viscose, which is obtained from wool or cotton cellulose subsequently modified chemically. Strong covalent binding of the reactive dyes to the textile means they generally do not cause contact dermatitis.<sup>7</sup> In a prospective study performed in Israel,<sup>1</sup> 77% of 644 patients reacted to disperse dyes, compared to 13% to reactive dyes, and just 0.3% to Reactive Orange 107. It should be borne in mind that reaction results vary between studies because of the different batteries used, and also because different dyes are used in different countries. Manzini et al,<sup>8</sup> for example, only obtained 0.99% positivity to reactive dyes for 1813 patients patch tested for suspected contact eczema. The frequent use of mixed dyes can often give rise to multiple reactions; this may be due to cross-reactions, concomitant sensitization, or impurities in the preparation of the patch tests.<sup>2</sup>

Although concomitant sensitization is also occasionally encountered with paraphenylenediamine, its low frequency means that it is not a good screening approach to TCD. The mixing of a group of antigens to enhance sensitivity has been studied, but to date no group has been found suitable for inclusion in standard batteries.<sup>1,2,9</sup>

A positive patch test result does not necessarily identify the source of the problem given that the composition of dyes is often unknown. Although the composition of the dyes in the sweater used by our patient was not analyzed, we believe Reactive Orange 107 to be the cause of the condition, given the positive results for the sweater and for the dye itself, and the absence of any other positive results.



**Figure 2** Patch test positivity (96 hours) to the sweater (inside and outside surfaces).



**Figure 3** Patch test positivity (96 hours) to Reactive Orange 107.

Symptoms for TCD vary, but include eczematous dermatitis (in most cases), urticaria, purpura, erythema multiforme, and erythroderma.<sup>5</sup> Our patient presented with a noneczematous rash whose histology revealed interface dermatitis. The marked variability in clinical presentation, and sometimes even in the histological findings, means that diagnostic suspicion is fundamental to diagnosis. However, diagnosis can be hindered by a lack of

knowledge of the composition of the textile in question, and by the fact that some textile batteries are poorly representative. For this reason it is important to always patch test using the textile itself. In relation to our case, we would like to draw particular attention to the clinical and histological features (a noneczematous reaction), and also the positive reaction to Reactive Orange 107, a dye that very rarely causes TCD. We underline the need for a high degree of clinical suspicion in the study of such patients.

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A. Sánchez-Gilo,\* E. Gómez-De La Fuente, L. Calzado, and J.L. López-Estebanz

*Unidad de Dermatología, Hospital Universitario Fundación Alcorcón, Alcorcón, Madrid, Spain*

\*Corresponding author.

*E-mail address:* masanchez@fhalcorcon.es (A. Sánchez-Gilo).