

CONTACT POINT

A case of allergic contact dermatitis caused by Disperse Blue dye in ultrasound gel

Karin A. Skalina¹  | Manish Ramesh²

¹Albert Einstein College of Medicine, Bronx, New York

²Division of Allergy and Immunology, Department of Medicine, Montefiore Medical Center, Bronx, New York

Correspondence

Asst. Professor Manish Ramesh, Division of Allergy and Immunology, Department of Medicine, Montefiore Medical Center, 111 E 210st, Bronx NY 10583.

Email: mramesh@montefiore.org

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In this report, we describe a unique case of periorbital contact dermatitis caused by Disperse Blue dye in ultrasound gel. Its implications are important for patients and technicians alike, especially with the emergence of high-intensity focused ultrasound as a treatment for various conditions. To our knowledge, this case is the first report of allergic contact dermatitis caused by the colourant in ultrasound gel.

CASE REPORT

A 28-year-old woman, with history of allergic atopic and contact dermatitis, presented with a 1-year history of intermittent erythematous, pruritic and swollen eyelids (Figure 1). She had not used new skin care products or medications, contact lenses, or eye drops. She reported a minimal response with desonide ointment 0.05% (Taro Pharmaceuticals, Hawthorne, New York). Seven years before, she had presented with vesicular hand dermatitis, and had been patch tested with the American Contact Dermatitis Society baseline series (Dormer Laboratories, Etobicoke, Ontario, Canada) at Tufts University Medical Center (for results see Table 1). She was advised to avoid all products containing her known allergens. On the current presentation, the patient reported having been free of symptoms before the onset of periorbital dermatitis with allergen avoidance. A review of current home contactants did not show any potential allergen sources. However, the patient, a graduate student, reported performing research with focused ultrasound on mice in a horizontal laminar flow hood in which the airflow was towards the user. The procedure involved using blue ultrasound gel (Aquasonic 100 Ultrasound Transmission Gel; Parker Laboratories, Fairfield, New Jersey), containing as dye Disperse Blue 106 (Parker Laboratories, personal communication, May 16, 2017). Despite the patient using gloves and avoiding any skin contact, symptoms persisted. Switching to a dye-free ultrasound gel (Figure 2) significantly improved the eyelid dermatitis. The patient's research on focused ultrasound led to a unique

circumstance whereby the allergen was, we suspect, aerosolized, causing allergic contact dermatitis of the eyelids.

DISCUSSION

Although periorbital dermatitis is common, there are few reported cases of occupational airborne periorbital contact dermatitis. In 1 large



FIGURE 1 The patient's erythematous, pruritic, swollen eyelid

TABLE 1 Patch test results (2-day exposure, reading on day 3)

Allergen	Response
Benzalkonium chloride	+
Amerchol-L 101	+
Cocamide DEA	+
Cetearyl alcohol	+
N-cyclohexyl 2-benzothiazole sulfonamide	+
Potassium dichromate	+
Disperse Blue 106	+
Acid Red 118	+
Disperse Yellow 3	+

**FIGURE 2** Right: previously used blue-dyed ultrasound gel (Aquasonic 100 Ultrasound Transmission Gel; Parker Laboratories) Left: clear ultrasound gel (Aquasonic Clear Ultrasound Transmission Gel; Parker Laboratories)

analysis, only 0.6% of >200 000 allergic contact dermatitis cases were caused by an airborne allergen, 35% of which were attributable to occupational exposure.¹ Among almost 5000 periorbital dermatitis cases, only 2.6% were caused by an airborne allergen, and 3.6% were attributable to occupational exposure.² One previous report described a case of eyelid allergic contact dermatitis caused by Disperse Blue 106, although ~5% of patients with eyelid dermatitis react to Disperse Blue 106, one of the most common dye contact allergens tested, in patch testing.^{3–5} In our case, periorbital dermatitis was probably caused by airborne contact resulting from occupational exposure.

Resolution of symptoms after switching to dye-free gel confirmed the dye as the causative agent. Occupational hand dermatitis in ultrasound operators and ultrasound site dermatitis in patients have been reported to be caused by several ingredients, but not the colourant.⁶ This is the first reported case of disperse dye allergy causing ultrasound-associated periocular dermatitis. We conclude that it is important to test for disperse dyes in cases of eyelid dermatitis, in ultrasound operators, and in patients with dermatitis.

Conflict of interest

The authors declare no potential conflict of interests.

ORCID

Karin A. Skalina  <http://orcid.org/0000-0002-2212-3533>

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