

Airborne occupational contact dermatitis from epoxy resin in an immersion oil used for microscopy

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Epoxy resins are a frequent cause of occupational allergic contact dermatitis (1–3). 90% of epoxy resins are produced by reacting epichlorohydrin and bisphenol A, and this is the epoxy resin used in the European standard series. Diglycidyl ethers are reactive diluents and can also cause sensitization (1).

Case Report

A 23-year-old non-atopic woman presented with a 4-month history of a patchy, red, itchy rash on her face and neck, which settled at the weekends and reappeared 1 to 2 days after returning to work. Her job involved handling materials for microscopy and using a microscope for several hours daily. Protective latex gloves were always worn. She was patch tested with the European standard series and her own products, which included Leica® immersion oil (45% modified cyclohexyl epoxy resin, 35% modified bisphenolic epoxy resin, 5% phthalates, 10% 1,4-butanediol glycidyl ether) diluted to 10% and 1% in petroleum (pet.) and Olympus® immersion oil (60% polybutane and 40% di-allyl alkanes) diluted to 20% and 2% pet. At D4, she was positive (++) to epoxy resin and Leica® immersion oil 10% and 1%. Since avoiding Leica® immersion oil, her symptoms have resolved.

Discussion

Epoxy resin of bisphenol A is a major constituent of Leica® immersion oil, in a modified state, and it is the likely cause of this patient's airborne contact dermatitis. Initial sensitization may have occurred by direct contact with the immersion oil, and protective gloves have prevented the eruption from developing on her hands. Even when in a modified state, epoxy resin of bisphenol A is still a potent sensitizer and is generally revealed on standard patch testing (4). A review of 40 cases of epoxy resin sensitivity secondary to occupational exposure found that 53% of cases had facial involvement consistent with airborne contact dermatitis (5). Cyclohexyl epoxy resins have only rarely been reported as sensitizers

(1). 1 previous report has shown contact sensitivity to an epoxy-resin-containing immersion oil (6): 1 of the patients was also patch-test-positive to dibutyl phthalate and the other to cresyl glycidyl ether. The high boiling points of phthalates and 1,4-butanediol glycidyl ether make either compound an unlikely cause of airborne contact dermatitis (7). Compounds containing epoxy resin groups do not necessarily cross-react with standard epoxy resin, and it is important to patch test patients to their own products (8). Patch testing with specific series of epoxy resins will only find a small number of positive cases not discovered through the standard series (3), and it is reasonable to test initially with standard epoxy resin and then an aimed series for further information or if no positive responses are seen.

References

1. Angelini G, Rigano L, Foti C et al. Occupational sensitization to epoxy resin and reactive diluents in marble workers. *Contact Dermatitis* 1996; 35: 11–16.
2. Jolanki R, Tarvainen K, Tatar T et al. Occupational dermatoses from exposure to epoxy resin compounds in a ski factory. *Contact Dermatitis* 1996; 34: 390–396.
3. Holness D L, Nethercott J R. The performance of specialized collections of bisphenolic A epoxy resin system components in the evaluation of workers in an occupational health clinic population. *Contact Dermatitis* 1993; 28: 216–219.
4. Jolanki R, Kanerva L, Estlander T. Allergic patch reaction to diglycidyl ether of bisphenol A in hardened nail base and top coat. *Contact Dermatitis* 1996; 35: 246–263.
5. Jolanki R, Kanerva L, Estlander T et al. Occupational dermatoses from epoxy resin compounds. *Contact Dermatitis* 1990; 23: 172–183.
6. Sommer S, Wilkinson S M, Wilson C L. Airborne contact dermatitis caused by microscopy immersion fluid containing epoxy resin. *Contact Dermatitis* 1998; 39: 141–142.
7. New Chemical Rubber Company. In: Liddle D R (ed.): *Handbook of chemistry and physics* 78th edition. London: CRC Press, 1997.
8. Morris A D, Ratcliffe J, Dalziel K L, English J S C. Allergic contact dermatitis from epoxy propane. *Contact Dermatitis* 1998; 38: 57.