

Contact Dermatitis from Acrylics in a Histology Laboratory Assistant

Luciana Molina, Antoine Amado, Peter L. Mattei IV, and James S. Taylor

The use of acrylics has expanded enormously, resulting in a vast range of products for both occupational and non-occupational purposes. Acrylics reported to cause allergic contact dermatitis in histology technicians are 2-hydroxyethyl methacrylate and 2-hydroxyethyl acrylate.

SINCE THEIR DEVELOPMENT in the 1930s, acrylic resins have found widespread use in industry as sealants, paints, printing inks, adhesives, nail cosmetics, and viscosity-reducing agents; in medicine as acrylic bone cement for orthopedic surgery; in dentistry for fillings and dentures; and in microscopy research as an embedding medium for biologic tissue.¹

These applications have resulted in a vast range of products, for both occupational and non-occupational use, and an expanded number of dermatologic problems, particularly allergic contact dermatitis (ACD).²

We report a case of ACD in a histology laboratory assistant who worked with acrylic-based embedding resins.

Case Report

A 40-year-old histology laboratory assistant presented with a 2-month history of hand eczema that developed 6 months after initial exposure to two Technovit resin systems at work. These products are based on 2-hydroxyethyl methacrylate (2-HEMA) and methyl methacrylate (MMA). Two outbreaks occurred approximately 1 week apart, and the patient suspected one of the Technovit resins (Heraeus Kulzer GmbH, Wehrheim, Germany) as the cause of her dermatitis. She was able to avoid acrylic exposure when she moved to another area of the laboratory, which (in conjunction with topical corticosteroid therapy) resulted in the clearing of her dermatitis. The patient's skin condition recurred when she was asked to

return to work with the Technovit resins. When she was evaluated 2 months later, her hands were clear of active dermatitis, although she complained of numbness in her fingertips, absent central nervous system symptoms.

Material Data Safety Sheets were reviewed, and patch testing was performed, according to methods of the North American Contact Dermatitis Group (NACDG), with the first 20 chemicals from the NACDG standard screening tray, selected acrylics, and other chemicals. Positive reactions are listed in Table 1 and shown in Figure 1.

Discussion

Technovit resins are well-known acrylic-based chemicals used by histologists to embed tissues for use in light or electron microscopy in medicine, botany, and zoology. Our patient had contact with two resins: Technovit 7100 (2-HEMA, dibenzoyl peroxide, and dimethyl sulfoxide) and Technovit 3040 (MMA, N,N-dimethyl-p-toluidine, and dibenzoyl peroxide). She was allergic to 2-HEMA, had a questionable reaction to MMA, and also had symptoms consistent with a sensory peripheral neuropathy. The reactions to ethylene glycol dimethacrylate and 2-hydroxypropyl methacrylate represent either concomitant or cross-sensitization.

There are very few reports of allergic reactions in histologists or their assistants. Mathias and colleagues reported a histologist technician with ACD of the hands that was associated with paresthesia and gastrointestinal symptoms. The technician was exposed to 80% HEMA in absolute alcohol, which was used in the preparation of a tissue-embedding medium.³ In 1989, Taylor JS reported 16 cases of contact allergy to acrylics seen over a 10-year period, including one case in a histology technician.⁴ Tobler and colleagues identified occupational contact dermatitis in 3 of 6 chemistry laboratory workers who

From the Section of Industrial Dermatology, Department of Dermatology, Cleveland Clinic, Cleveland, OH.

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Table 1. Patch-Test Results in a Histology Assistant

<i>Chemical or Material</i>	<i>D2</i>	<i>D7</i>
NACDG standard tray allergens		
Allergens 1–20	NEG	NEG
Ethyl acrylate 0.1% pet	NEG	NEG
Methyl methacrylate 2% pet	NEG	?
Glutaral 1% pet	NEG	NEG
Other acrylics		
2-Hydroxyethyl methacrylate (2-HEMA) 2% pet	+	++
2-Hydroxypropyl methacrylate (2-HPMA) 2% pet	+	++
Ethylene glycol dimethacrylate (EGDMA) 2% pet	+	++
Additional chemicals		
Benzoyl peroxide 1% pet	NEG	NEG
Diaminodiphenylmethane 0.5% pet	NEG	NEG
Hydroquinone 1% pet	NEG	NEG
Personal protective equipment		
Rubber glove	NEG	NEG

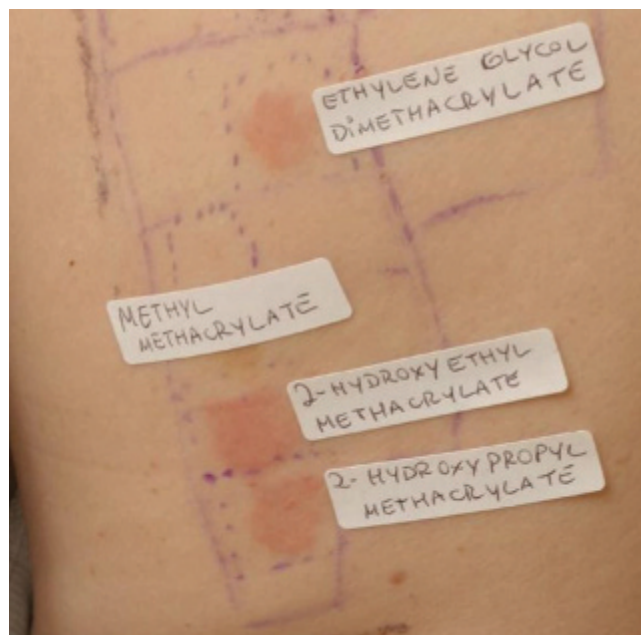
D2 = day 2; D7 = day 7; NACDG = North American Contact Dermatitis Group; NEG = negative; pet = petrolatum.

were using Lowicryl embedding media, which contain (meth)acrylate monomer mixtures, for electron microscopy.¹ Positive reaction to 2-HEMA was common in two of the three reports,^{3,4} and 2-hydroxyethyl acrylate (2-HEA) was listed as the allergen in the third.¹

There was a clear-cut relationship between our patient's occupational exposure to Technovit acrylic resin, her positive patch-test reaction to 2-HEMA, and the development of her contact dermatitis and symptoms of numbness. Avoidance of acrylic exposure in conjunction with topical corticosteroid therapy resulted in resolution of her dermatitis.

ACD from acrylics may be accompanied by burning, tingling, and slight numbness of the fingertips, which may persist for several weeks or months after the dermatitis has subsided. MMA and 2-HEMA had previously been implicated.^{3,5,6} To evaluate possible late effects and prognosis, follow-up would be necessary; however, that was not possible in this case.

We emphasize the importance of patch-testing with a variety of acrylics for patients who have occupational exposure to acrylic resins. Contact allergens reported to affect histology technicians are 2-HEMA and 2-HEA.

**Figure 1.** Positive patch-test reactions to acrylics on a histology assistant.

Conclusion

There are very few reports of histologists' or their assistants' allergic reactions to acrylics. Technovit acrylic resins were not mentioned before.

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