



Allergic contact dermatitis caused by tetrahydrofurfuryl acrylate in the adhesive of clip-on earrings

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Tetrahydrofurfuryl acrylate (THFA) and tetrahydrofurfuryl methacrylate (THFMA) are components of acrylic adhesives. Although a positive reaction to THFMA has been considered a cross-reaction to other acrylic resins,^{1,2} Moffitt et al³ reported patients who were sensitized by THFA. Here, we report on nonoccupational allergic contact dermatitis due to THFA from the clip-on earring adhesive resin.

CASE REPORT

A 44-year-old woman with no history of contact or atopic dermatitis had purchased clip-on earrings approximately 5 months ago and had worn them several times without symptoms. One day, however, after wearing the earrings for several hours, she noticed erythema on her earlobes where they were in contact with the

resin of the earrings (Figure 1). Her symptoms improved with topical steroids.

Patch testing was performed on her upper back with a Japanese baseline series, acrylate series and the earring resin, using Finn



FIGURE 1 Causative clip-on earring. The clip was attached to the decoration with adhesive resin

Chambers on Scanpor tape (SmartPractice, Phoenix, Arizona). Readings were performed according to the International Contact Dermatitis Research Group recommendations⁴ on days (D) 2, D3, and D7. She showed a positive reaction to the earring resin on D7. Subsequently we analyzed the resin of the earrings using gas chromatography-mass spectrometry and detected THFA. Additional patch testing revealed positive reactions to THFA 2% pet. and THFMA 2% pet. (Table 1). We identified her causative allergen as THFA.

DISCUSSION

The patient was sensitized to THFA from wearing the clip-on earrings. Because she showed a positive reaction only to THFA and THFMA, we assumed that other acrylic resins had no cross-reactions in this case of sensitization with THFA. THFMA and THFA are used in printing ink, ultraviolet light-curable adhesive coatings, and paint because of their low viscosity and adhesion.⁵ Contact dermatitis due to THFA used in everyday products may increase in the future.

Material	Concentration/vehicle	Day 2	Day 3	Day 7
Resin of clip-on earring	"as is"	—	—	+
Tetrahydrofurfuryl acrylate	2% pet.	++	++	+
Tetrahydrofurfuryl methacrylate	2% pet.	+	+	+
1,4-Butanediol dimethacrylate	2% pet.	—	—	?+
2-Hydroxyethyl methacrylate	2% pet.	—	—	—
1,3-Butanediol dimethacrylate	2% pet.	—	—	—
2-Ethylhexyl acrylate	0.1% pet.	—	—	—
2-Hydroxypropyl methacrylate	2% pet.	—	—	—
Butyl acrylate	0.1% pet.	—	—	—
Diurethane dimethacrylate	2% pet.	—	—	—
Ethyl 2-cyanoacrylate	10% pet.	—	—	—
Ethylene glycol dimethacrylate	2% pet.	—	—	—
Pentaerythritol triacrylate	0.1% pet.	—	—	—
Triethylene glycol dimethacrylate	2% pet.	—	—	—
Ethyl methacrylate	2% pet.	—	—	—
Ethyl acrylate	0.1% pet.	—	—	—
Methyl methacrylate	2% pet.	—	—	—
Bisphenol A glycidyl methacrylate	2% pet.	—	—	—
Poly(ethylene glycol) diacrylate	2% pet.	—	—	—
Cyclohexanone	1% pet.	—	—	—
Isophorone diisocyanate	1% pet.	—	—	—
Benzaldehyde	5% pet.	—	—	—
2-Hydroxy-2-methylpropiophenone	10% pet.	—	—	—
1-Hydroxycyclohexyl phenyl ketone	10% pet.	—	—	—
Benzaldehyde	5% pet.	—	—	—
Japanese baseline series		—	—	—

Abbreviation: pet., petrolatum.

TABLE 1 Results of patch testing

CONFLICT OF INTEREST

The authors declare no potential conflicts of interest.

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