

Letter: Allergic contact dermatitis from sculptured acrylic nails: Special presentation with a possible airborne pattern

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Abstract

INTRODUCTION: Sculptured artificial acrylic nails are widely used in developed countries. Methylmethacrylate was first reported in 1941 as a cause of allergic contact dermatitis. Since then, occupational contact allergies to acrylates in dentistry, orthopedic surgery, printing industry and other industries have been reported. **OBJECTIVE:** We describe 3 patients with contact allergy to acrylates in artificial nails. **DESIGN AND METHODS:** Patch tests with the Portuguese baseline series of contact allergens and an extended series of acrylates was applied. **RESULTS:** We observed three female patients with allergic contact dermatitis from sculptured acrylic nails. Two of these patients were both customers and also technical nail beauticians. Two patients developed periungual eczema; one patient presented only with eyelid dermatitis and no hand or periungual lesions. The tests showed positive reactions to 2-hydroxyethylmethacrylate (2-HEMA) and 2-hydroxypropylmethacrylate (2-HPMA) in three patients. **CONCLUSION:** Our cases demonstrate the variety of clinical presentations of allergic contact dermatitis from acrylic nails. They show the need to warn patients of persistent and sometimes permanent side effects of these nails. They also emphasize the importance of cosmetic ingredient labeling.

Introduction

Sculptured artificial acrylic nails, have gained popularity over recent years. They can cause allergic contact dermatitis both in occupational and non-occupational settings. Acrylates are known allergens and irritants [1]. Methylmethacrylate was the first reported in 1941 as a cause of contact dermatitis [2]. Since then, occupational contact allergies to acrylates in dentistry, orthopedic surgery, printing industry, and other industries have been reported [3].

Polymerization of acrylate occurs when the polymer and the monomer are mixed together in the presence of an organic peroxide catalyst and accelerator. Hardening occurs at room temperature. However with photo-bonded sculptured acrylate nails, polymerization requires exposure to UV radiation [4].

Methods

In this study, we describe 3 patients with distinct clinical presentations of contact allergy to acrylates present in artificial nails observed in a Contact Dermatitis Unit. Patch tests with the Portuguese baseline series of contact allergens and an extended series of acrylates were applied (2-hydroxyethylmethacrylate (2-HEMA); 2-hydroxypropylmethacrylate (2-HPMA); triethylene glycol diacrylate; 2-hydroxyethyl methacrylate; ethylacrylate; hydroxyethyl acrylate).

Results

We observed three female patients aged 35-50 years old (mean 41.5 years) with allergic contact dermatitis from sculptured acrylic nails.

Two of these patients were both customers and also professional nail beauticians. Two patients (one customer and the other both customer and professional nail beautician) developed periungual eczema two and four months respectively after the first application of acrylic gel (Figure 1); one of them had clinically an airborne pattern.



Figure 1

Figure 1. Clinical aspect of periungual dermatitis

The third patient only presented with eyelid dermatitis four months after starting with sculptured acrylic nails and had no hand/periungual lesions.

The tests showed positive reactions to 2-hydroxyethylmethacrylate (2-HEMA) and 2-hydroxypropylmethacrylate (2-HPMA) in three patients.



Figure 2

Figure 2. Patch test results at 48 hours



Figure 3

Figure 3. Patch test results at 96 hours

Positive reactions to other acrylates were also found. In all our patients allergies to 2-hydroxypropyl methacrylate and triethylene glycol diacrylate were identified; two of our patients tested positive for 2-hydroxyethyl methacrylate, ethylacrylate and hydroxyethyl acrylate (Figures 2 and 3). This shows that allergic sensitization induced by one acrylic compound may extend to one or more other acrylic compounds.

One patient tested also positive to nickel with probable relevance to jewelry and to metallic pigment nail polish.

The dermatitis resolved in all patients after having their acrylic gel nails removed and stopped working with acrylate.

Conclusions

Currently, there are three distinct types of sculptured acrylic nails: (i) acrylate monomers and polymers that polymerize at room temperature in the presence of an organic peroxide and accelerator, (ii) photo-bonded sculptured acrylate nails in which polymerization of the acrylate requires exposure to UV radiation; (iii) cyanoacrylate nail preparations.

Our cases only used sculptured acrylic nails. Initial formulations contained methyl methacrylate monomer, which caused severe contact dermatitis, paronychia, and nail dystrophy. Since 1974, the Food and Drug Administration banned the use of this monomer in artificial nails [5]. Currently marketed artificial nails contain various methacrylate ester monomers such as ethyl, butyl, and isobutyl methacrylate monomers, dimethacrylates, and trimethacrylates.

The reported cases demonstrate the variety of clinical presentations of allergic contact dermatitis from acrylic nails. Reactions in sensitized patients include contact dermatitis, transient or permanent nail dystrophies, paronychia and subungual pain, and persistent peripheral paresthesias [6, 7]. Eyelid and face dermatitis can be caused by airborne dusts of completely polymerized resins that have become depolymerized by the filing process or by exposure to organic vapors and polymethacrylate dusts [6, 9]. However, eyelid dermatitis can be, in some cases, related to eyelid touching by the fingertips bearing acrylic nails [10].

Our cases show not only the variety of clinical presentations but also the need of being aware of persistent and sometimes permanent side effects of these nails, particularly in the occupational setting. The particular clinical presentation with a possible airborne pattern following exposure to methacrylate ester monomers has been reported in the English literature in dentistry, orthopedic surgery, and the printing industry, but never in patients with sculptured artificial acrylic nails thus far as we know.

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