

## Eyelid dermatitis caused by allergic contact to acrylates in artificial nails

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### Abstract

Over the past few years, there has been an increase in cases of allergic contact dermatitis caused by acrylates, because of the growing popularity of artificial nails. Pathological reactions to artificial nails typically occur on or around the nail area. Eyelid contact dermatitis due to artificial nails is rarely seen, especially in a non-occupational setting. The authors report the case of a 45-year-old female accountant who developed eyelid dermatitis due to artificial nails.

### Introduction

The eyelid is one of the most sensitive areas of the body as the skin of the eyelid is extremely thin and is exposed to an extraordinary number of substances. For this reason, eyelid dermatitis is a common disease, and a variety of factors, including primary skin diseases and external insults may cause eyelid erythema. Determining the underlying etiology may prove especially challenging, because eyelid rashes, regardless of the cause, look very similar.

Allergic contact dermatitis (ACD) is considered the most common cause of eyelid dermatitis, and its prevalence ranges from 46% to 74%.<sup>1,2</sup>

Acute ACD often presents with intense pruritus and a well-demarcated erythema of the eyelids whereas subacute and chronic forms are less erythematous, and are characterized by dry, scaly and lichenified skin.<sup>3</sup>

The list of allergens that are potentially associated is extensive, and it includes topical pharmaceutical products, cosmetics, metals, rubber derivatives, and plants.<sup>4</sup> The causal contact allergens may be of occupational or non-occupational origin and may come into contact with the eyelid skin in several ways. Most often, eyelid contact dermatitis is the result not from direct periorcular exposure, but rather due to ectopic reactions, caused by substances applied to the hair, face, scalp or fingernails.<sup>5</sup> The eyelid is also particularly susceptible to ACD

from airborne allergens.<sup>5</sup> Due to its exceptional vulnerability, eyelid skin may be the initial or only area that demonstrates signs of contact dermatitis, while other areas of the body remain unaffected by the same exposure.<sup>5</sup>

Here, we present the case of a woman who developed eyelid dermatitis due to acrylates in artificial nails.

### Case Report

A 45-year-old female accountant presented with a one-week history of a pruritic and symmetric redness of the eyelids.

Examination showed edema and a well-defined erythema of both eyelids (Figure 1). At the slit lamp exam, eye examination was normal. There was no personal or family history of atopy.

A detailed history of her exposures revealed that she wore photobonded acrylic gel nails. She had no skin lesions elsewhere, namely on the hands, periungual area or nails.

Patch tests with the Portuguese Standard and Acrylates series (Chemotechnique® Diagnostics, Vellinge, Sweden) applied using Finn® Chambers on Scanpor® tape (Epitest Ltd Oy, Tuusula, Finland) were performed and readings at D2 and D4 revealed positive reactions to ethylacrylate 1% (++) , methyl methacrylate monomer 10% (+), and 2-hydroxyethyl-methacrylate (++) .

The results were consistent with the diagnosis of allergic contact dermatitis to artificial nails containing acrylates.

The eyelid dermatitis resolved following application of topical corticosteroid and removal of the artificial nails.

### Discussion

Acrylates are plastic materials that are formed by the polymerization of monomers derived from acrylic or methacrylic acid. They can be found in a wide variety of products, including adhesives, glues, paints, and artificial nails.

Acrylates are well-known for their sensitizing potential, and for causing ACD in those exposed to the monomers. Classically, ACD caused by acrylates was considered primarily an occupational disease, affecting mainly dentists, prosthesis technicians, painters, and workers in the fiberglass and graphic printing industries.<sup>6</sup> In the last few years, with the widespread use of artificial nails, an increasing number of cases of allergic contact dermatitis caused by acry-

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lates have been reported particularly in nail technicians, but also among artificial nail users.<sup>7-9</sup>

Exposure to acrylates in artificial nails may induce a wide variety of clinical manifestations. Reactions in nail users, most commonly, occur on or around the nail area, and include paronychia, onychodystrophy, onycholysis, nail bed hyperkeratosis, painful nails, and occasionally, paresthesia.<sup>10,11</sup> In the case of the nail technicians, the most frequent adverse reaction is hand dermatitis, through manipulation of unpolymerized acrylates.<sup>7</sup>

Unlike what happens with traditional nail varnishes, ACD caused by the acrylates present in the artificial nails usually produces lesions at the site of application to the nail itself, and only very rarely affects distant areas, such as the face and eyelids.<sup>7,8,12</sup> Distant ACD can be explained by hand transportation or airborne dissemination of the allergen.<sup>13</sup>

The acrylate monomer is a powerful sensitizer, whereas the polymer is significantly weaker or non-sensitizing, and because of this feature, distant allergic reactions to acrylate-containing artificial nails



**Figure 1. Periorbital eczema.**

are uncommon.<sup>5,6</sup> In our case, contact with monomer might have occurred before polymerization, or small amounts of monomer might have remained unpolymerized, or the filling process of completely polymerized resins might have released the monomer.<sup>11,14</sup>

## Conclusions

Contact dermatitis is the most common cause of eyelid dermatitis, therefore, a detailed exposure history is essential for an accurate diagnosis and successful management. This report highlights a hypersensitivity reaction to artificial nails involving an unusual location, particularly in a non-occupational setting, and stresses the importance of considering nail cosmetics in the evaluation of eyelid dermatitis.

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