

CASE REPORT

Allergic contact dermatitis from acrylic nails in a flamenco guitarist

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Abstract

Acrylates are molecules that are well known for their strong sensitizing properties. Historically, many beauticians and individuals using store-bought artificial nail products have developed allergic contact dermatitis from acrylates. More recently, the use of acrylic nails among flamenco guitarists to strengthen their nails has become very popular. A 40-year-old non-atopic male patient working as a flamenco guitarist developed dystrophy, onycholysis and paronychia involving the first four nails of his right hand. The lesions were confined to the fingers where acrylic materials were used in order to strengthen his nails to play the guitar. He noticed improvement whenever he stopped using these materials and intense itching and worsening when he began reusing them. Patch tests were performed and positive results obtained with 2-hydroxyethyl methacrylate (2-HEMA), 2-hydroxyethyl acrylate (2-HEA), ethyleneglycol-dimethacrylate (EGDMA) and 2-hydroxypropyl methacrylate (2-HPMA). The patient was diagnosed with occupational allergic contact dermatitis likely caused by acrylic nails. Artificial nails can contain many kinds of acrylic monomers but most cases of contact dermatitis are induced by 2-HEMA, 2-HPMA and EGDMA. This is the first reported case of occupational allergic contact dermatitis from acrylates in artificial nails in a professional flamenco guitar player. Since the practice of self-applying acrylic nail products is becoming very popular within flamenco musicians, we believe that dermatology and occupational medicine specialists should be made aware of the potentially increasing risk of sensitization from acrylates in this setting.

Key words

Acrylates; contact dermatitis; occupational.

Introduction

The incidence of allergic contact dermatitis from acrylates related to manicure techniques has increased in recent years [1,2]. Photobonded acrylic nails (gel nails and particularly long lasting nail polish), requiring UV light to polymerize, are becoming very popular, with an increasing number of beauty salons offering them. This has resulted in a corresponding increase in cases of allergic contact dermatitis in both manicurists and clients [3]. In our experience, photobonded acrylic nails are displacing the sculptured traditional acrylic nails (where a polymer powder and a liquid monomer solution cure in the presence of catalysts), and most cases of sensitization from acrylates in manicure procedures involve female beauticians applying long lasting nail polish at work. The use of both acrylic and gel nails among flamenco guitarists has become a common practice to strengthen and reconstruct their nails and it is now common within this profession. The first case of

contact dermatitis from acrylic nails within this occupational setting is reported.

Case report

A 40-year-old non-atopic male, working as a flamenco guitarist and formerly as a construction worker, consulted us with a 1-year history of changes affecting the first four nails of his right hand. The lesions were confined to the fingers where acrylic materials were used in order to strengthen his nails for guitar playing and consisted of dystrophy, onycholysis and paronychia (Figure 1). He had been intermittently applying a liquid monomer containing ethyl methacrylate (EMA), triethyleneglycol-dimethacrylate (TEGDMA) and *N,N*-dimethyl-*p*-toluidine and a powder composed of polyethyl methacrylate, polymethyl methacrylate, benzoyl peroxide and silica for >10 years that he bought from sellers over the internet. He noticed improvement whenever he stopped using these materials and intense itching and



Figure 1. Nail dystrophy, onycholysis and paronychia involving the first four fingers of the patient’s right hand.

worsening once he began reusing them. Microbiological culture was positive for *Candida albicans*; however, anti-fungal therapy was undertaken without improvement. Patch tests with allergens shown in Table 1 were performed and positive results obtained with 2-hydroxyethyl methacrylate (2-HEMA), 2-hydroxyethyl acrylate (2-HEA), ethyleneglycol-dimethacrylate (EGDMA) and 2-hydroxypropyl methacrylate (2-HPMA). Based on the clinical findings and despite the results of the patch tests (that yielded positive results with acrylic compounds different from those included in the labels of his own nail materials), the patient was diagnosed with occupational allergic contact dermatitis likely caused by acrylic nails.

Discussion

Flamenco is a genre of music and dance native to the southern Spanish regions of Andalusia, Extremadura and Murcia. It includes *cante* (singing), *toque* (guitar playing), *baile* (dance) and *jaleo*, which refers to the vocalizations and rhythmic sounds of *palmas* (handclapping) and *pitos* (finger snapping). It is common for flamenco musicians to connect with each other through online social media such as discussion forums and blogs. Flamenco guitarists are known to exchange ideas regarding strengthening of their finger nails noting that many of them experience fingernail weakness. A common practice is to self-apply acrylic products [4,5]. This case illustrates occupational allergic contact dermatitis from acrylates in artificial nails involving a male flamenco guitarist. No other cases have been published thus far in this professional setting. However, guitar players have been described to suffer from contact dermatitis related to the nickel contained in guitar strings [6,7]. Nail dystrophy due to acrylic nails has a multifactorial aetiology including irritation, allergy and trauma [8]. Furthermore, onycholysis facilitates

Table 1. Patch tests results

Series and allergens ^a	Readings	
	Day 2	Day 4
Standard (GEIDAC) ^b	–	–
2-HEMA	++	++
2-HEA	++	++
EGDMA	++	++
2-HPMA	++	++
Butyl acrylate	–	–
Ethyl methacrylate	–	–
Tetrahydrofurfuryl methacrylate	–	–
Ethyl acrylate	–	–
Bisphenol A glycidylmethacrylate (BIS-GMA)	–	–
Bisphenol A	–	–
Dimethyl-p-toluidine	–	–
Methyl methacrylate	–	–
TEGDMA	–	–
N,N-Dimethyl-4-toluidine	–	–
Benzoyl peroxide	–	–
Eugenol	–	–
Hydroquinone	–	–
Resorcinol	–	–

^aAll performed allergens by True test and AllergEaze, SmartPractice, Canada.
^bGEIDAC: Spanish Contact Dermatitis Research Group Series.

bacterial and candidal infections that may worsen the condition [1]. It is very possible that the combination of all these factors contributed to these findings in our patient.

The relevance of the patch test results was difficult to assess in this case since positive results were obtained with 2-HEMA, 2-HEA, EGDMA and 2-HPMA, which were not contained in the products used by the patient, and patch tests with some of the components of his own products such as EMA, TEGDMA, N,N-dimethyl-p-toluidine and benzoyl peroxide were negative. Reasons for this include:

1. The possible contamination of the products with other acrylates, for example, during the manufacturing process. The presence of impurities that might not be disclosed on material safety data sheets has been described in some acrylate-based industrial products [9]. Unfortunately, samples of our patient’s products were not available for chromatographic evaluation which is why this hypothesis could not be ruled out;
2. The possible volatility or polymerization of acrylate molecules in commercial patch tests leading to false negative results [9] and/or false positive results due to the presence of impurities [9];
3. A cross-reactivity phenomenon through which the patient might have been sensitized to acrylates not present in his artificial nails, for instance through a past exposure or while he was in the construction sector, that induced a cross-reaction to the acrylates he came in contact with by using the acrylic nails.

Although cross-reactivity in the field of acrylates has not been adequately mapped [9,10], in theory, it seems likely that molecules that are chemically as close as EGDMA and TEGDMA or ethyl methacrylate and hydroxyethyl methacrylate might cross-react.

Although assessing the relevance of the results was particularly challenging in this patient, the clinical findings and history (with elicitation at use, recovery after avoidance and relapse after re-use) were consistent with hypersensitivity to acrylic nails.

The common practice among flamenco artists of self-applying acrylic products has, in our opinion, become widespread and there is a strong likelihood that sensitization from acrylics will increase in this setting. We believe that dermatology and occupational medicine specialists should be aware of the potential risks associated with this practice in order to detect new cases that might arise in the future.

Key points

- We report the first case of occupational contact dermatitis from acrylic nails in a flamenco guitar player, who developed nail dystrophy and paronychia on the fingers where acrylic materials were used.
- Nail dystrophy due to acrylic nails has a multifactorial aetiology including irritant, allergic and traumatic. Onycholysis facilitates infections that may worsen the condition.
- The practice of self-applying acrylic products is currently very popular among flamenco artists and dermatology and occupational medicine specialists should be aware of the associated potential risk of sensitization.

Conflicts of interest

The authors do not have any conflict of interests to declare regarding this article.

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