

CONTACT POINTS

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Octocrylene: really non-allergenic?

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Key words: contact dermatitis; cosmetics; octocrylene; photoallergy; photopatch test; sunscreens.

Octocrylene (2-ethylhexyl-2-cyano-3,3-diphenylacrylate; CAS No. 6197-30-4) is a solar filter belonging to the cinnamate family, providing protection in the UVB and the near-UVA range. Known to be very stable and hydrophobic, its combination with other sunscreen ingredients may improve the overall photostability or enhance the SPF value. Octocrylene is considered until now as a non-allergenic, non-irritant molecule showing no mutagenic effect (1, 2). These attractive properties have contributed to its widespread use in sun care and cosmetic preparations during the last 10 years.

We describe 2 cases of contact allergy to octocrylene observed over a 1-year period.

Patients and Methods

From the start of 2004, we decided to modify our sunscreen series by including octocrylene (10% pet.) because of a strong suspicion of allergy to this UV filter in a patient. Indeed, results of patch and photopatch tests in this patient were negative to the Chemotechnique sunscreen series but positive to 3 commercial products, for which the formulation analysis showed octocrylene to be the common denominator. L'Oréal Recherche kindly provided a sample of octocrylene on our request. Unfortunately, it was not possible to confirm the suspected allergy to

octocrylene as the patient did not present again to our department.

Since then, for all patients with suspected allergy to sunscreen (20 cases over 1 year), patch and photopatch tests were performed in duplicate with the modified sunscreen series, Chemotechnique photoallergen series, the patient's own sunscreen products and the cosmetic and medical products used. 1 set was irradiated after 1 day (D1) with UVA (5 J/cm²). Readings were performed following ICDRG guidelines at D2 and D3 after irradiation.

Case no. 1

A 7-year-old, atopic girl presented with an acute eruption at the site of application of a sunscreen product (Garnier Ambre Solaire Kids SPF30[®]) and after moderate sun exposure. She took no medication and had no known allergy.

Photoallergologic investigation showed positive reaction to octocrylene, Anthélios XL 60+[®] and the patient's own sunscreen product, the last two containing octocrylene (+ + with and without UVA).

Case no. 2

A 48-year-old man presented with a papulovesicular, demarcated eruption on the face after moderate sun exposure.

Since years, he experienced several similar eruptions always after sun exposure. He had a history of cutaneous allergic reactions after topical use of ketoprofen (Ketum[®]). His current oral treatment is based on vitamins (œnobiol[®], omega 3) and Ibuprofen.

While a negative reaction to the standard photoallergens and to his own cosmetic and medical products (including Ibuprofen) was observed, a positive reaction to ketoprofen 10% pet. (+), Anthélios XL 60+[®] (+) and octocrylene (+ +) was observed only when exposed to UVA.

Discussion

To the best of our knowledge, only 2 cases of contact photoallergy to octocrylene have been reported so far in the literature (3). The inclusion of this filter in our sunscreen test series allowed us to identify 1 additional case of contact photoallergy and a 1st case of contact allergy.

With its increasing use in sunscreen products and cosmetics, sensitization is expected to increase in the near future. Awareness of the allergenic potential of octocrylene should, through increased screening, lead to better recognition.

Chemotechnique patch testing sunscreen series has been amended in January 2005 with five new allergens including octocrylene. We expect other companies to follow. Continuous revision of the UV absorber patch test series by including newly reported allergens is necessary to be closer to the clinical reality.

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Allergic Contact Cheilitis

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Key words: Allergic contact cheilitis, cosmetics, irritant contact cheilitis, patch test

Cheilitis is an inflammatory reaction of the lips which may arise as a primary disorder of the vermillion or be secondary to an inflammation of the nearby skin or the oral mucosa. Eczematous cheilitis may be endogenous or caused by exogenous factors: the latter include irritant contact cheilitis and allergic contact cheilitis (ACC).

This article reviews the epidemiology of contact cheilitis and perioral dermatitis seen in the Department of Dermatology of the University of BOLOGNA over a 4-year period.

Patients and Methods

83 patients with cheilitis or perioral dermatitis referred to our department for patch testing during the period of 4 years (January 2001–February 2005) were reviewed.

All patients have referred by other dermatologists and undergone a detailed history and physical examination.

54 patients presented a cheilitis, 4 presented an angular cheilitis, 20 a perioral dermatitis and 5 both the lesions.

Females [59 (71.1%)] predominated over males [24 (28.9%)], and the age range was from 3 to 84 years with a mean age of 40.3.

The mean duration of lesions was 22 months. The average duration in males (27 months) was significantly longer than in females (18 months).

A personal history of atopy was recorded in 29 patients (34.9%) with a prevalence statistically different between females [22 (37.2%)] and males [7 (29.1%)].

All the patients were undergone patch tests with SIDAPA's standard series of allergens and with any additional suspected series and allergens

that could have contributed to patients' cheilitis and perioral dermatitis.

Allergens were placed in Finn Chambers[®] and applied to the subject's back using Scampor[®] tape. Readings were taken at 48 hr (D2) and 72 hr (D3). When necessary to dispel doubts, the readings were taken additionally on D4.

Patch test procedure, reading and scoring were carried out according to the International Contact Dermatitis Research Group recommendation.

Results

Results are summarized in Table 1.

The most common diagnosis was irritant contact dermatitis (ICD). 31 patients (37%), 20 females (64%) and 11 males (36%), presented an ICD. This diagnosis was made by a combination of history, physical examination, negative patch tests and negative atopic history.

Among all 83 patch tested patients, 45 (54.2%) had a positive reaction to 1 or more haptens. 15 patients (18%) had allergic contact dermatitis (ACD) with a positive

Table 1. Positive reactions (all in pet. unless otherwise indicated)

Allergens	Male	Female	Total	%	Positives relevant	%
Nickel sulfate	2	14	16	18	4	14
Thimerosal	8	5	13	15	0	0
Cobalt chloride	0	6	6	7	0	0
p-phenylenediamine	1	4	5	6	0	0
Myroxylon pereirae resin	1	4	5	6	3	11
Fragrance mix	0	5	5	6	4	14
Euxyl K400	2	3	5	6	3	11
Euxyl K400 (aq.)	1	3	4	5	3	11
Wool wax alcohols	1	2	3	3	1	4
Benzocaine	2	0	2	2	0	0
Potassium dichromate	0	2	2	2	0	0
Disperse blue 124	1	1	2	2	0	0
Colophonium	0	2	2	2	0	0
Own cosmetics	0	2	2	2	2	7
Budesonide	1	0	1	1	0	0
Ethylendiamine dichloridrate	1	0	1	1	0	0
2-Hydroxy ethyl methacrylate	1	0	1	1	1	4
Mercury	1	0	1	1	1	4
Methylmethacrylate	1	0	1	1	1	4
Composite mix	1	0	1	1	0	0
Thiuram mix	1	0	1	1	0	0
Oak musk	0	1	1	1	1	4
Neomycin sulfate	0	1	1	1	0	0
Palladium chloride	0	1	1	1	0	0
Propolis	0	1	1	1	1	4
p-t-butylphenol-formaldehyde resin	0	1	1	1	0	0
Toluene sulfonamide formaldehyde resin	0	1	1	1	1	4
Cooper sulfate	1	0	1	1	1	4
4-Tolyldiethanolamine	1	0	1	1	0	0
Triethanolamine	0	1	1	1	0	0
Total	28	60	88	100	27	100

patch test to a relevant allergen. Among them, personal atopy was recorded in 8 patients (53.3%), 6 women and 2 men with a frequency of 50% for first and 66.7% for latter. In the 15 patients with ACC or perioral dermatitis, the most frequent allergens were fragrance mix [4 (14%)], nickel sulfate [4 (14%)], euxyl K400 [3 (11%)], Myroxylon pereirae resin [3 (11%)] and own cosmetics in 2 cases (7%).

6 cases were attributed to allergens present in cosmetics and lipsticks (fragrance mix, oak musk, euxyl K400, Myroxylon pereirae resin and wool wax alcohols). We considered nickel a relevant allergen in 4 patients. The relevance was confirmed by the clinical remission of symptoms owing to the use of nickel-free cosmetic products. 2 patients were positives to cosmetics which were tested. In the first case, we found an allergy to a foundation cream, but we could not identify the responsible allergen, while the second patient resulted sensitized to her lip salve (Prolisan[®]) and to propolis, the main component of the stick at the same time. 1 patient resulted allergic to toluene sulfonamide formaldehyde resin in nail varnish (and presented other characteristic lesions as periocular and neck dermatitis). In 2 cases, dental materials contained relevant allergens: copper sulfate in a dental brace and 2-hydroxy ethyl methacrylate, mercury, methylmethacrylate in a orthodontic prothesis.

Atopic dermatitis was considered be the cause in 18 patients (26%). This diagnosis was based on a negative history of exposure to a contact irritant, a negative patch test and a positive history of atopy or features of atopic dermatitis in the past. In 19 patients (23%), a diagnosis of dermatitis of unknown cause was made. In these patients, there was no known irritant or allergen and no history of atopy.

Discussion

Although ACC is not an uncommon problem, with a frequency ranging from 25% (1) to 34% (2), few reports deal with this subject (Table 2).

Even if the most common cause of cheilitis was irritation, our study has confirmed that about 1/5th (18%) of cases of cheilitis or perioral dermatitis were caused by ACD.

The most frequent allergens were ingredients of cosmetic products (in 12 patients = 80%). However, we had 4 cases of contact cheilitis caused or aggravated by nickel. Nickel allergy is the most common allergy, especially between children and adolescents, with a frequency ranging from 0.9% to 14.9% (3). It is often difficult determining the relevance of this sensitization in all patients. However, it is well known that trace amounts of nickel as a pollutant may be contained in poor-quality cosmetic products (4). The advice given to all 4 patients of using nickel-free cosmetics induced a clinical remission of symptoms, pointing to the relevance of positive patch test responses.

According to the literature (2), our findings indicated that there were many more females with an ACC than males (ratio 4 : 1). Females are more likely to use lip cosmetics than men and hence are more frequently exposed to potential contact allergens. Women are also more interested in their cosmetics appearance than men and are more likely to seek treatments, as suggested by the average duration of lesions between the 2 groups (females = 18 months, males = 27 months). This study also confirmed the effect of age on the induction and elicitation of ACD (5). The incidence of ACC was low in childhood and tended to increase with age.

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Mechanical irritation triggering allergic contact dermatitis from essential oils in a masseur

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Key words: essential oils; mechanical irritation; occupational contact dermatitis.

Skin irritation plays an important adjuvant role in the sensitization as well as elicitation phase of contact hypersensitivity by delivering non-specific pro-inflammatory signals promoting clinical reactions to allergen concentrations otherwise not provoking symptoms (1–3). Mechanical skin injury may be as effective as chemical irritation in this context (2, 4).

Case Story

A 61-year-old masseur put on a worn-out black rubberized jacket,

Table 2. Commonest causes of allergic contact cheilitis according to the literature

Causes of ACC	Lim and Goh (2000) (2)	Freeman and Stephens (1999) (1)
Cosmetics	58%	24%
Toothpastes	29%	14%
Medicaments	7%	24%
Nickel	6%	5%
Sunscreens	–	14%
Nail varnish	–	10%
Colophony	–	9%



Fig. 1. Contact eczema of backs of the hands after 9-day treatment with topical steroids.

which he had used to wear without complaints years before. The rubber coating of the sleeves' margins was broken and edgy, leading after a few days to local redness, excoriation and mild pain on the upper side of both wrists where the skin came into

contact with the rubber coating. Despite rolling up the sleeves, dermatitis spread over the whole backs of the hands within the next days, and he additionally experienced pruritus, oedema, vesicles and fissuring. Self-treatment with salt compresses and

lavender oil was not helpful. Prescribed topical corticosteroids gave slow but continual relief over the next 9 days when patch testing was performed (Fig. 1, Table 1).

In his profession as a masseur, the patient has had regular contact with different kinds of essential oils for years without problems. He reported that he used to rub excess oil over the backs of the hands instead of wiping it off.

Discussion

Masseurs are known to be at high risk of developing occupational contact dermatitis from fragrances (5). Although we could demonstrate work-related sensitization to fragrance compounds in our patient, he never developed eczema from essential oils used at work before. We assume that mechanical skin irritation by the jacket, leading to visible erythema and discomfort, promoted the onset of allergic contact dermatitis by injuring the skin barrier and by releasing from keratinocytes pro-inflammatory and chemotactic cytokines such as TNF- α , IL-1- α and IL-8 contributing to the elicitation phase of contact hypersensitivity (1, 2).

Mechanical skin irritation exerts a synergistic effect in experimental sensitization protocols comparable with that of chemicals (2), and subclinical disruption of the skin barrier by tape stripping has been shown to induce the local production of pro-inflammatory cytokines (4). The adjuvant role of mechanical irritation is not well documented from clinical cases of allergic contact eczema. Meneghini (6) showed that sensitization occurs more likely in microtraumatized skin. More recently, Berndt *et al.* (7) identified mechanical irritation as an underestimated risk factor for the manifestation of occupational allergic contact dermatitis in metalworkers.

Table 1. Patch test results with plastic series, rubber series, piece of the jacket as is, standard series and fragrance series after 72 h and 96 h.

ALLERGEN	CONC.	RESULTS	
		72 h	96 h
plastic series		–	–
rubber series		–	–
piece of the jacket	as is	–	–
STANDARD SERIES			
fragrance mix	8%	+	+
Myroxylon pereirae	25%	+	+
turpentine	10%	+	+
FRAGRANCE SERIES			
lemongrass oil	2%	+	++
orange oil	2%	+	+
clove oil	2%	–	–
cedarwood oil	10%	–	–
laurel oil	2%	–	–
lemon oil	2%	–	–
benzyl salicylate	1%	–	–
benzaldehyde	5%	–	–
benzyl cinnamate	5%	–	–
vanillin	10%	–	–
COMPOUNDS OF THE FRAGRANCE MIX			
cinnamaldehyde	1%	+	+
cinnamyl alcohol	1%	+	+
α -amylcinnamal	1%	–	–
oakmoss absolute	1%	–	–
eugenol	1%	–	–
geraniol	1%	–	–
hydroxycitronellal	1%	–	–
isoeugenol	1%	–	–
sorbitan sesquileate	20%	–	–

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Contact allergy to triphenyl phosphate: probable cross-reactivity to triphenyl phosphite present in an EN46001 System 22 clear oxygen facemask

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Key words: allergic contact dermatitis; EN46001 System 22 clear face oxygen mask; facial dermatitis; triphenyl phosphate; triphenyl phosphite.

Triphenyl phosphate (TPP) is a plasticiser present in some formulations of polyvinyl chloride (PVC). It is also

Table 1. Positive patch tests

	Day 2	Day 4
Triphenyl phosphate 5% pet	+	++
EN46001 System 22	++	++
Clear face mask- as is		
Wool alcohols 30% pet	–	?+
Amerchol L101, 100%	–	?+

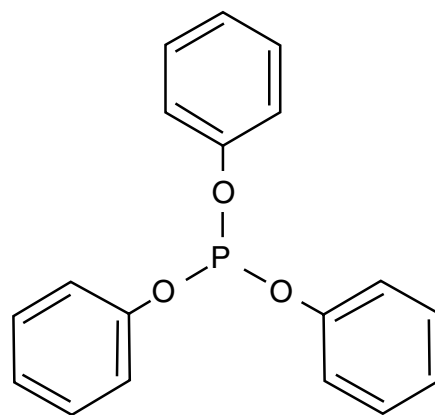
used as a plasticiser for cellulose and nitrocellulose and is additionally a fire-retarding agent (1). We report contact allergy demonstrated on patch testing, to TPP in a patient who developed a contact dermatitis on exposure to a plastic facemask, which contained a similar allergen, namely triphenyl phosphite. TPP and related compounds are widely used, but allergy to them seems to be uncommon.

Case Report

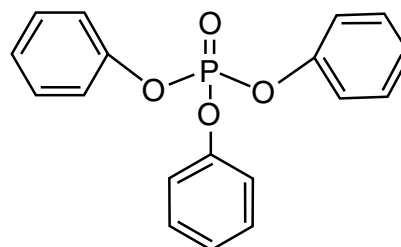
A 71-year-old woman was admitted with an acute respiratory problem and was treated with oxygen using an EN46001 System 22 clear facemask. Erythema developed around her nose and mouth on the second day of admission, corresponding to the areas where the facemask had

been in contact with her skin. By day 5, she had an acute facial eczema, which was diagnosed as an allergic contact dermatitis in view of the striking distribution. She was treated with mometasone cream, and the eruption cleared within 2 weeks. The patient gave no prior history of reacting to plastics and does not seem to have been previously exposed to a facemask.

Patch tests were performed to the British Contact Dermatitis Society standard series, to the plastics/glue series, the rubber chemicals series, a piece of the EN46001 System 22 oxygen facemask and a piece of the strap (lycra). Of the triaryl phosphates, triphenyl phosphate and tricresyl phosphate are available (Trolab Hermal, Reinbek, Germany and Chemotechnique, Malmo, Sweden). The positive patch test results are



Triphenyl phosphite



Triphenyl phosphate

Fig. 1. Molecular structures of triphenyl phosphite and triphenyl phosphate.

summarized in Table 1 (the reactions to wool alcohols and Amerchol L101 may have been irritant). Prick tests to latex were negative.

Discussion

Few cases of contact allergy to TPP have been reported. Camarasa and Serra-Baldrich described a carpenter with hand dermatitis, who seems to have been exposed to TPP in plastic glue (1). In this patient, patch testing was positive for TPP and also for chromate and formaldehyde (1). Allergy to TPP or related chemicals has been reported from exposure to a cellulose acetate film (2), to plastics in PVC-covered furniture and a spectacle frame (3), and to spectacle frames (4).

The manufacturers of the EN46001 System 22 clear facemask reported that TPP is not used in its formulation, but that the facemask contains small amounts of triphenyl phosphite, likely to be similar allergenically to TPP (Fig. 1). TPP is chemically related to the other triaryl phosphates, tri-*M*-cresyl phosphate and tri-*P*-cresyl phosphate, and cross-reactivity seems possible between these compounds.

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Allergic contact dermatitis to petrolatum

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Key words: contact dermatitis; patch test; patch testing vehicle; petrolatum.

A 72-year-old mulatto woman had presented stasis dermatitis for years. During this time, she had been treated with many topical medications, and emollients. At the moment of the examination, a few chronic eczematous lesions widespread on legs, arms and trunk were observed.

She was patch tested to Brazilian standard series, which contains 30 allergens. Readings were performed at 48 h and 96 h and showed positive reactions 1+ to 29 of 30 allergens. The only negative allergen was formaldehyde whose vehicle was aqueous. Because of the unexpected multiple positive readings, it was thought it could be an angry back case. The patch test was repeated 2 months later, when she was completely free of lesions, and we were able to observe just a light hypopigmentation at the site of the previous test. It showed the same results. At this time, we asked her if she used to put petrolatum on the skin, and she said that she had done it before, but now she could not because of itch. Another patch test was performed with a yellow petrolatum which was used by her and a white one, which was the patch test vehicle, given by the manufacturer of the series. The results showed positive reactions 1+ for both. An open application of petrolatum did not show any immediate response.

Comments

This is a rare case of allergic contact dermatitis to the petrolatum used as patch test vehicle, as evidenced by the reactivity at the patch test site. Like in the other cases previously described (1–3), the patient had presented a chronic dermatitis, which had been treated with many topical medications. Otherwise, she did not

show any hyperpigmentation on her lesions, as had been reported in a black patient (4), but a light residual hypopigmentation at the patch test site was observed. The petrolatum used as a vehicle of the series is white, imported from Italy, but the manufacturer did not detail its composition. Over 6,000 tests to Brazilian series were performed, and just one similar case was related (oral communication). Petrolatum is non-sensitizing, non-irritating and so occlusive that it is considered the best vehicle for most patch test allergens (1, 3, 5).

Few sensitizing cases have been reported. Some showed reactions to yellow petrolatum, and others to both, the yellow and white varieties, such as in the case reported. Other signs of intolerance to petrolatum includes chronic dermatitis and hyperpigmentation and long-lasting contact urticaria (1, 5).

It has been established that the allergens present in pharmaceutical and cosmetic petrolatum are probably polycyclic aromatic hydrocarbons. These are impurities, difficult to identify, but most probably phenanthrene derivatives with molecular weight of 230 and 244 (1).

Synthetic petrolatum might be the best, because a synthetic mixture of hydrocarbons is more easily controlled (3).

Petrolatum is worldwide used, not only as a patch test vehicle but also as a cheap therapeutic agent. Therefore, it is worth paying attention to cases of chronic long-term dermatitis which present several allergen reactivities at the patch test site, because it might be due to petrolatum vehicle sensitivity.

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Mechanical onycholysis of 2 fingernails in a 7-year-old girl

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Key words: children nails; occupational nail disorders; onycholysis; student.

Case Report

A 7-year-old girl was referred to our outpatient consultation for nail disorders for a nail dystrophy affecting her right hand. The clinical examination revealed onycholysis of the first and the second right fingernails (Fig. 1). In both digits, the onycholysis involved the distal third of the nail and had a proximal convexity, nail plate–nail bed detachment gradually decreasing towards the laterodistal margin of the nail (Fig. 2). In the second digit, onycholysis was more marked on the lateral part of the nail. The subungual space was white and the nail plate was normally transparent.

The other fingernails and the toenails were normal. Physical examination did not reveal any other skin or mucosal abnormality. The child was in good health and did not take any medication.

Onycholysis had been first noticed by the child's mother 3 weeks before and was completely asymptomatic. A detailed clinical history of the patient did not reveal any sport activity or



Fig. 1. Right hand of a 9-year-old girl: the first and second fingernails show onycholysis.

hobby that could have provoked trauma to the fingernails.

The girl attended the primary school in the morning and every afternoon studied at home. When asked, she admitted to 'play' with the corners of the pages of books and copybooks when attending to her afternoon duties. In particular, she used to insert the bottom corner of the right page under the first right fingernail and rub it underneath it and to do the same with the upper corner of the page and the second right fingernail.



Fig. 2. Closer view of the first fingernail showing the proximally convex onycholysis that involved the 1/3 of the nail.

Fingernail onycholysis was therefore explained by the repetitive rubbing of the paper sheets under the distal nail. Treatment consisted in clipping away the detached nail plate and interruption of the child habit. The fingernails were completely normal at the 3-month follow-up visit.

Discussion

In normal condition, the nail plate adheres strictly to the nail bed, especially in distal part of the nail, in correspondence of the onychocorneal band, a thin distal transverse white band visible in more than 90% of fingernails (1). This area represents an important anatomical barrier and its disruption produces nail plate detachment with onycholysis.

Onycholysis is a very common nail symptom that may result from different local or systemic causes, including inflammatory, infective and traumatic nail diseases, systemic disorders and drugs (2).

Isolated onycholysis of the fingernails is frequent in women and in certain professions and usually results from chemical or mechanical traumas to the nails. Chemical onycholysis results from exposure to strong detergents and wet environment with chemical damage to the onychocorneal band and can have an acute or subtle onset, with or without pain and periungual skin signs, depending on the causative agent (3, 4).

Onycholysis induced by mechanical trauma is often a consequence of over aggressive manicure with utilization of sharp tools to clean the ventral surface of the nail plate free margin (4). Traumatic onycholysis may also be seen in workers who utilize the nails as tools and apply strong mechanical stress to the distal nail plate. These include butchers, slaughterhouse workers, chicken-processing workers and people uplifting heavy bags (5). Onycholysis is more marked in the central portion of the nail and often associated with subungual haemorrhages (3).

In our patient, onycholysis was caused by the repetitive insertion and rubbing of a thin paper sheet under the nail plate. This mechanical trauma damaged the onychocorneal band impairing the distal nail plate–nail bed adhesion with nail plate detachment. Onycholysis gradually

progressed proximally due to continuation of the habit.

The diagnosis of the cause of our child onycholysis was based on the absence of other objective symptoms and on the characteristic shape and location of the onycholysis. A careful anamnesis revealed the mechanical process responsible for the onychodystrophy. We may consider this onycholysis a 'professional' onychodystrophy, as it was strictly related to our child profession, which was that of a student, constantly handling and concentrating on paper sheets.

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