

What lash stylists and dermatologists should know!

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In the last few years it has become popular to have eyelashes extended by the use of glue-on silk lashes. Extension is performed by a lash stylist, who mounts artificial eyelashes, one by one or up to four at a time, on each hair of the eyelash, using ethyl cyanoacrylate-based glue. To protect the delicate skin below the eyes and also to hold down the lower lashes, a pad is usually placed below the eye on each side of this area and secured with tape. So-called gel pads are supposed to increase comfort during treatment, and the surface facing the skin contains a gel that, according to the producer, should cool the skin. Several brands of gel pads used in Sweden are used with gels containing the preservative methylisothiazolinone (MI) (CAS no. 2682-20-4). As the process of lash extension may take several hours, depending on the number of lashes to be glued, the use of gel pads may lead to allergic contact dermatitis if the customer is allergic to MI.

Case Report

A 34-year-old non-atopic female visited a lash stylist to have her lashes extended for the first time. Already during the procedure, she experienced a smarting pain



Fig. 1. Periorbital eczema at presentation, resulting from contact allergy to methylisothiazolinone.

where the gel pads were placed. Within 12 h, a pruritic, oedematous and eczematous rash developed around both eyes, and, because of the discomfort, the patient went back to the stylist 2 days later to have the glued-on lashes removed. Despite this, the eczema continued to trouble her; she sought acute medical help on several occasions, and was given oral corticosteroids and antihistamines, without much relief. From the emergency unit, she was finally referred to a general dermatologist, who prescribed a group III corticosteroid topically plus antihistamines, and also referred her to us for patch testing. At presentation (almost 4 months after the lash extension), she still had periorbital eczema, although

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Fig. 2. Ingredient list for the eye gel pad.

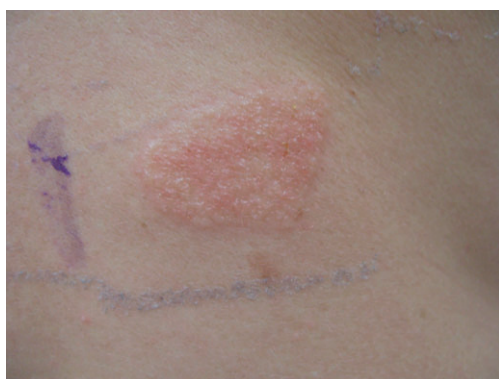


Fig. 3. Strong allergic patch test reaction to the gel pad 'as is'.

it was much improved as compared with the start of the eczema (Fig. 1). Because there was a suspicion of contact allergy to the glue, she was patch tested with the Swedish baseline series (Chemotechnique Diagnostics, Vellinge, Sweden) and an acrylate series. Patch testing was performed with Finn Chambers® (diameter, 8 mm) (Epitest, Tuusula, Finland) secured with Scanpor® tape (Norgesplaster, Vennesla, Norway). Fifteen microlitres of each test solution was micropipetted on to the filter paper discs (1). Twenty milligrams of each test preparation was placed into each Finn Chamber (2). Tests were left on the upper back for 48 h, and readings were performed according to the ICDRG criteria on day (D) 3 and D7 (3).

The patient showed a strong allergic reaction to methylchloroisothiazolinone (MCI)/MI 0.02% aq. and to MI 0.2% aq., but not to ethyl cyanoacrylate, which

Table 1. Patch test results from the first and second patch test occasion

Test substance	Concentration (ppm)	Reading day 3	Reading day 7
MCI/MI	200	++	++
MCI/MI*	50	++	NR
MCI/MI*	25	–	NR
MI	2000	+++	NR
MI*	250	+++	NR
MI*	125	++	NR
MI*	62	+++	NR
MI*	31	+	NR
MI*	15	–	NR
MCI	150	–	–
OIT*	250 eth.	+++	NR
OIT*	125	++	NR
OIT*	62.5	(+)	NR
OIT*	31.2	–	NR
Dichloro-OIT	50	–	NR
Crème Riche Désaltérante Clarins*	'as is'	+++	NR
Gel pad*	'as is'	+++	NR

Vehicle for all substances was aqua except for 2-n-octyl-4-isothiazolin-3-one and 4,5-dichloro-2-n-octyl-4-isothiazolin-3-one, which were tested in ethanol.

MCI, methylchloroisothiazolinone; MI, methylisothiazolinone; OIT, 2-n-octyl-4-isothiazolin-3-one; dichloro-OIT, 4,5-dichloro-2-n-octyl-4-isothiazolin-3-one; NR, not read, owing to topical corticosteroid treatment on the test reaction on day 3.

*Second test occasion.

Table 2. Detection of methylisothiazolinone (MI) through chemical analysis of the tested products

Product	Concentration of MI (ppm)	Surface concentration (µg/cm ²)
Crème Riche Désaltérante Clarins	76	NA
Gel pad	23	1.4

NA, not applicable.

was present in the glue. By then, she had obtained information from the stylist on the composition of the gel pads (Fig. 2), which showed that the pads contained MI. Further patch testing with serial dilutions of MI and potentially cross-reacting substances showed primary sensitization to MI and cross-reactions to 2-n-octyl-4-isothiazolin-3-one (OIT) (Table 1). The gel pad tested 'as is' gave a strong (+++) allergic reaction (Fig. 3). A cosmetic cream also gave an extreme positive reaction. This cream had been used by the patient for several months prior to her having the lashes glued, but she had not experienced any skin problems from it prior to having her lashes extended, and did not suspect MI allergy. After the extension, she occasionally

had eczematous lesions around the eyes, on the face, and on the neck, until we detected MI in her facial cream and she ceased using it. Chemical analysis with high-performance liquid chromatography was used to verify the presence of MI in the samples (4). MI was found in both the cream and the gel pad (Table 2). MCI was not present in the samples. The surface concentration of MI in the gel pad was $1.4 \mu\text{g}/\text{cm}^2$, which corresponds to a patch test concentration of ~ 47 ppm.

Discussion

Lately, there has been much information on the web and in the Swedish press about the hazards of working with lash extensions because of exposure to glues containing ethyl cyanoacrylate and the risk of getting asthma and contact dermatitis, especially for the stylist but also for the customer (contact dermatitis). However, the use of gel pads containing MI in MI-allergic individuals poses a high risk of causing allergic contact dermatitis, as the thin skin around the eyes is more susceptible than other sites would be. An allergic skin reaction around the eyes after lash extension may be misinterpreted as being caused

by the glue used during the procedure. In this patient, sensitization to MI was most probably caused by the face cream containing MI that she had used both before and after the lash extension.

As we have the possibility of patch testing with both components of MCI/MI separately, we were able to show that this patient only reacted to MI. The positive reactions to OIT should be interpreted as cross-reactions to MI (5). The patient, being an office worker, also lacked known exposure to OIT, which is usually present in water-based paints intended for outdoor use.

We propose that all patients with periorbital dermatitis should be questioned about lash extensions and whether gel pads have been used, and, if they have been used, the composition should be determined and investigations should be performed accordingly. Our patient was primarily sensitized to MI, as patch testing with MCI gave a negative result. The cause may have been exposure to MI in the facial cream. The presence of MI in the products tested here was clearly stated on the ingredients' labels, and did not exceed the current maximum allowed amount of 100 ppm.

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