

A case of contact dermatitis syndrome caused by Dermabond®, followed by contact dermatitis caused by false eyelash glue and Aron Alpha® glue: possibility of cross-reactions among cyanoacrylates

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Cyanoacrylates, such as ethyl cyanoacrylate, butyl cyanoacrylate, and 2-octyl cyanoacrylate, are used as adhesives in surgical, dental and cosmetic procedures. Herein, we report a case of allergic contact dermatitis (ACD) caused by Dermabond® (Ethicon, Tokyo, Japan) containing 2-octyl cyanoacrylate, followed by ACD caused by a false eyelash glue and Aron Alpha® glue (Toagosei, Tokyo, Japan), both containing other cyanoacrylates, suggesting the possibility of cross-reactivity.

Case Report

A 24-year-old woman developed a pruritic rash and vesicles on her right thigh 1 day after superficial wound closure with Dermabond® (2-octyl cyanoacrylate) after an osteotomy (Fig. 1a). Three months later, she noticed papules on her upper eyelids, arms and legs after using a handicraft adhesive, Aron Alpha®, which contains ethyl cyanoacrylate, silica, and a stabilizer, according to information supplied by the manufacturer. One and a half years previously, as an initial event, she had developed

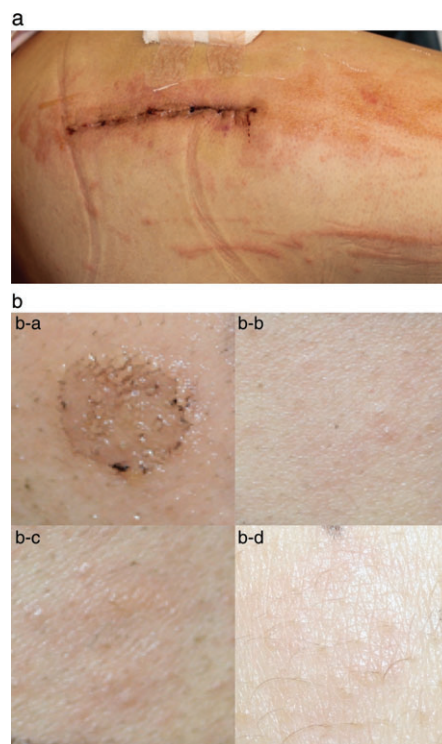


Fig. 1. (a) Clinical appearance of contact dermatitis caused by Dermabond®. Erythema and aggregated papulo-vesicles spread beyond the wound area on the thigh 1 day after surgery. (b) Allergic reactions after patch tests with Dermabond® (b-a), the false eyelash glue (b-b), and Aron Alpha® (b-c), all three after open patch testing, and ethyl cyanoacrylate (b-d) (day 2).

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erythema, papulo-vesicles and oedema on her upper eyelids 1 day after her first use of a false eyelash glue containing *n*-butyl cyanoacrylate, BHA (butylated hydroxyanisole), carbon black, and an acrylic resin. Two years previously, she had been treated with Dermabond® after an osteotomy, and experienced no allergic symptoms.

The patient was patch tested with the Japanese baseline series recommended by the Japanese Society for Dermatoallergy and Contact Dermatitis, an acrylate series, a metal series, and a dental series. In an open test, Dermabond®, the false eyelash glue and Aron Alpha® were applied 'as is' (Online supplemental Table 1). The patch tests were applied to the patient's upper back with Finn Chambers® and Patch test panel® (Sato, Tokyo, Japan) on Medipore™ tape (3M, St Paul, MN, USA). Readings were performed on day (D) 2, D3, and D7, according to the criteria of the ICDRG (1). There were positive patch test reactions to Dermabond® (D2, +++; D3, +++; D7, +++), the false eyelash glue (D2, +; D3, +), Aron Alpha® (D2, +++; D3, +++), ethyl cyanoacrylate (10.0% pet.) (D2, +; D3, +; D4, +), and 2-hydroxyethyl methacrylate (2-HEMA) (2% pet.) (D7, +) (Fig. 1b and Online supplemental Table 1).

Discussion

This patient was probably sensitized during the first use of Dermabond®, and the subsequent use of the false eyelash glue caused ACD within 1 day. The false eyelash glue was used for the first time, so ACD may have been caused by

n-butyl cyanoacrylate, owing to a cross-reaction with 2-octyl cyanoacrylate. Although the patient had used Aron Alpha® previously, ACD appeared only following its use after ACD caused by Dermabond®. Therefore, ethyl cyanoacrylate might also cross-react with 2-octyl cyanoacrylate.

Among patients with ACD caused by Dermabond®, the current case was apparently the first who was first sensitized and developed ACD caused by glues containing ethyl and butyl cyanoacrylate with cross-reactivity to 2-octyl cyanoacrylate, leading to subsequent ACD. El-Dars et al. reported a case of ACD induced by Dermabond® with cross-reactivity between 2-octyl cyanoacrylate and ethyl cyanoacrylate suspected on the basis of patch tests (2). Gonzalo-Garijo et al. suggested co-sensitization to 2-octyl cyanoacrylate and ethyl cyanoacrylate (3), and McDonald et al. reported cases with simultaneous positive patch test reactions to 2-octyl cyanoacrylate and butyl cyanoacrylate (4). Concerning contact allergy to 2-HEMA, the patient had worn false nails in her teenage years, but had never experienced a rash after using these. Although the exact ingredients were unknown, wearing false nails containing 2-HEMA might have caused sensitization to 2-HEMA.

In conclusion, patients who are sensitized to Dermabond® should be careful when using other cyanoacrylates, because of their potential cross-reactions, and vice versa.

References

- 1 Johansen JD, Aalto-Korte K, Agner T et al. European Society of Contact Dermatitis guideline for diagnostic patch testing – recommendations on best practice. *Contact Dermatitis* 2015; **73**: 195–221.
- 2 El-Dars LD, Chaudhury W, Hughes TM, Stone NM. Allergic contact dermatitis to Dermabond after orthopaedic joint replacement. *Contact Dermatitis* 2010; **62**: 315–317.
- 3 Gonzalo-Garijo MA, Perez-Calderon R, Perez-rangel I et al. Contact dermatitis after orthopaedic surgery. *Contact Dermatitis* 2009; **61**: 299–300.
- 4 McDonald BS, Buckley DA. Severe dermatitis from Dermabond® surgical glue. *Br J Dermatol* 2014; **170**: 739–741.