

Allergic contact dermatitis caused by topical 2-octyl-cyanoacrylate

Michael M. Sachse¹, Tido Junghans², Christian Rose³ and Gunnar Wagner¹

¹Department of Dermatology, Phlebology and Allergology, Hospital Bremerhaven-Reinkenheide, 27574 Bremerhaven, Germany, ²Department of General, Visceral, Vascular and Thoracic Surgery, Hospital Bremerhaven-Reinkenheide, 27574 Bremerhaven, Germany, and ³Dermatohistologic Laboratory of Lübeck, 23562 Lübeck, Germany

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Topical skin adhesives such as 2-octyl-cyanoacrylate (CAS 133978-15-1) present in Dermabond® (Ethicon GmbH, Norderstedt, Germany) serve as alternatives to traditional sutures in many surgical fields. Allergic contact dermatitis caused by Dermabond® is often suspected without further patch testing (1, 2). However, contact allergy to formaldehyde has to be ruled out, as this substance is also released during the polymerization of cyanoacrylates.

Case Report

A 49-year-old patient with no known allergies presented 3 days after extirpation of 35 lipomas. 2-Octyl-cyanoacrylate had been used for superficial wound closure according to the manufacturer's guidelines. In some of the wounds, subcutaneous closure was also performed with absorbable sutures (Serafit®). A few hours after surgery, the patient noted a pruritic rash restricted to the adhesive sites. Initially, wound infection was suspected, but the pruritic lesions did not clear under systemic antibiotic therapy with ciprofloxacin.

Physical examination showed a poorly defined erythematous, partly urticarial and vesicular rash that was restricted to the wounds (Fig. 1a–d). The patient was treated with topical gentamicin and triamcinolonacetone emollients. The pruritic rash resolved within 7 days.

Histopathology showed birefringent suture material adjacent to a mixed inflammatory infiltrate with many eosinophils (Fig. 2a). Two months later, patch testing

was performed with the baseline patch test series of the German Contact Dermatitis Research Group (including formaldehyde 1%), an acrylate series, and Dermabond® tested 'as is'. Unfortunately, Ethicon did not support us with detailed information about the composition of Dermabond®. The patch tests were applied to the patient's upper back with an aluminium-chambered patch test device (Trolab®, Almirall Hermal GmbH, Reinbek, Germany) on Fixomull® stretch tape (Smith & Nephew GmbH, Hamburg, Germany). Readings were performed at D1, D2, and D3. There were positive reactions to 2-octyl-cyanoacrylate at D1 (+), D2 (++), and D3 (+++) (Fig. 2b). Patch tests with other allergens and intradermal sutures (Serafit®) gave negative results.

Discussion

Dermabond® is a 2-octyl-cyanoacrylate topical skin adhesive approved by the European Medicines Agency in 1999. Despite the widespread use of 2-octyl-cyanoacrylates, only a relatively low rate of sensitization has been reported. This could be because of the rapid polymerization of the cyano group upon contact with keratin (3, 4). Others have speculated that the haptens may be enclosed by keratinocytes, making it more difficult for them to trigger an immune response (1). However, octyl-cyanoacrylates may cause adverse events, including foreign body reactions (1–3, 5). Once polymerized, cyanoacrylates degrade and release formaldehyde (6). Therefore, suspected contact allergies to cyanoacrylates may be attributable to the formation of free formaldehyde. In contrast to other case reports, a contact allergy to formaldehyde could be ruled out in our patient (1, 2). Meanwhile, 10 control subjects were patch tested with Dermabond®. None of them developed a positive test reaction.

Correspondence: Michael M. Sachse, Department of Dermatology, Phlebology and Allergology, Hospital Bremerhaven Reinkenheide, Postbrookstraße 103, 27574 Bremerhaven, Germany. Tel: +49 (0)471 299 3273; Fax: +49 (0)471 299 3518. E-mail: michael.sachse@klinikum-bremerhaven.de

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Fig. 1. Clinical appearance of several wounds 3 days after extirpation of multiple lipomas. There is an erythematous, partly urticarial and vesicular rash around the wounds. (a) Right upper arm. (b) Left trunk. (c + d) Detailed images of (a).

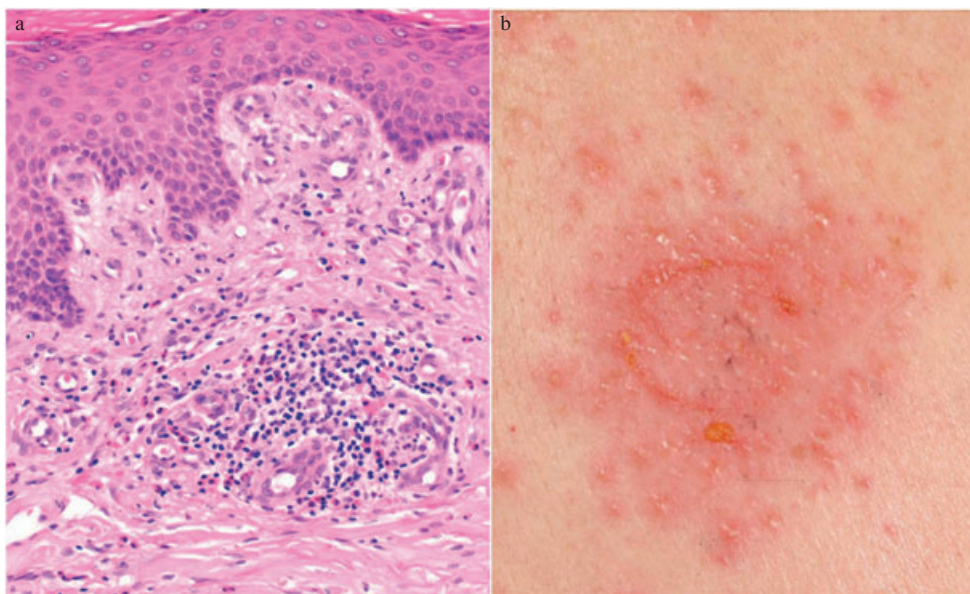


Fig. 2. (a) Dense inflammatory infiltrate with eosinophils (original magnification, $\times 200$; haematoxylin and eosin stain). (b) Positive patch test reaction to 2-octyl-cyanoacrylate (D3).

Patients who are treated with topical skin adhesives such as 2-octyl-cyanoacrylate should be informed about the potential risk of an allergic reaction. In the case of

itchy eczema following application of this topical skin adhesive, both 2-octyl-cyanoacrylate and formaldehyde should be patch tested.

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