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CORRESPONDENCE

Allergic contact dermatitis caused by Dermabond® Advanced: The role of temperature as a potential risk factor

Allergic contact dermatitis (ACD) caused by Dermabond® Advanced (Ethicon, Tokyo, Japan) has been reported in the literature. We herein report a case of ACD caused by Dermabond® Advanced, which was diagnosed by a patch test using SurgiSeal® (Nitcho Kogyo, Tokyo, Japan), which contains an equivalent amount of 2-octyl cyanoacrylate (2OCA), as a control. A difference in the temperature increase at the time of application suggested that temperature may be a risk factor for sensitization.

A 55-year-old woman developed pruritic rashes on her right-sided chest 3 days after superficial wound closure with Dermabond® Advanced following thoracoscopic lung resection (Figure 1A). Blood tests showed eosinophilia (eosinophil count, 1209/μL; normal 70–440/μL) and the elevation of serum thymus and activation-regulated chemokines (TARC 2737 pg/mL; normal <450 pg/mL). The patient was treated with fexofenadine hydrochloride and topical diflorazone acetate. The skin rashes resolved within a month, and the laboratory data simultaneously normalized. Two months later, patch testing was performed. Unfortunately, the manufacturer could not provide the ingredients. Dermabond® Advanced and SurgiSeal® were applied 'as is' to the patient's upper arm. Readings were performed on Days (D) 2, D3, and D7 (Figure 1B–D). There was a positive patch test reaction to Dermabond® Advanced (D3, +; D7, ++) which was stronger than SurgiSeal® (D3, ?+; D7, ?+).

Since the manufacturer supported us with further information, we practically applied Dermabond® Advanced and SurgiSeal® to suture pad (Nihon Light Service, Tokyo, Japan) and measured the temperature using type K thermocouple (model No. HTK3004 Hakko Electric Co., Ltd, Tokyo, Japan). The maximum temperature values were 65.6°C for Dermabond® Advanced and 24.7°C for SurgiSeal®, with a difference of 40.9°C (Figure 1E).

To our knowledge, ACD caused by SurgiSeal® has not been reported. Although we could not perform a component patch test, we believe that 2OCA was the responsible sensitizer in our case based on other reports.[1,2] The manufacturer disclosed to us that Dermabond® Advanced and SurgiSeal® contain an equivalent amount of 2OCA. As the skin surface temperature rises, the subcutaneous capillaries dilate, and the intercellular lipids in the stratum corneum melt, increasing the permeability of the skin and increasing transdermal absorption.[3,4] Therefore, the increase in temperature during the application of Dermabond® Advanced may increase the

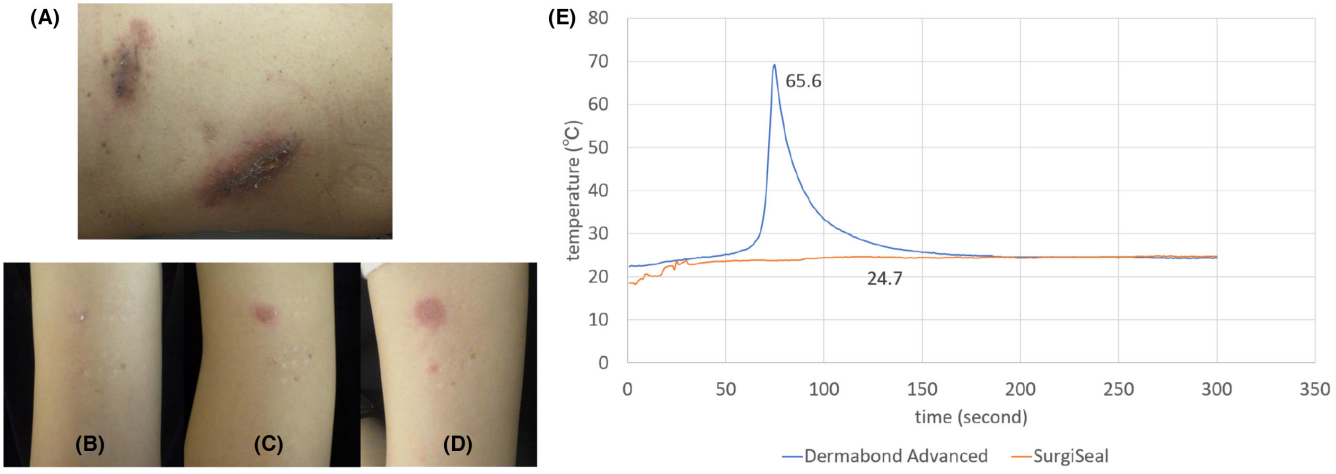

FIGURE 1 (A) The clinical picture. Eruptions on the right-sided chest, consistent with the surgical wounds. (B–D) Positive reactions after an open patch test with Dermabond® Advanced (upper side) and SurgiSeal® (lower side; for comparison) on the extensor side of the upper arm. (B) Day 2, (C) Day 3, and (D) Day 7. (E) The temperature was observed to increase during application of the surgical adhesives.

transdermal absorption of 2OCA and thus, may enhance the contact dermatitis reaction. Ricciardo et al. summarized the following risk factors for sensitization to Dermabond products: the quantity of the adhesive used, occlusion, prolonged contact with the adhesive, extensor body surfaces, and a low-humidity environment.[5] We would like to suggest increased temperature as an additional risk factor.

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KEYWORDS

2-octyl cyanoacrylate, allergic contact dermatitis, Dermabond® Advanced, medical adhesive, temperature

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

ETHICS STATEMENT

Informed consent: We obtained informed written consent from the patient for the images.
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Registry and registration No. of this study/trials: N/A.
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