

CONTACT POINT

Allergic contact dermatitis caused by Dermabond in a paediatric patient undergoing skin surgery

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Dermabond (Ethicon, Bridgewater, New Jersey) is a liquid skin adhesive containing 2-octyl cyanoacrylate that is increasingly being used in plastic surgery.¹ Allergic contact dermatitis caused by Dermabond has been reported in the literature, but few cases have been reported in children.² We report a paediatric case of a patient who developed allergic contact dermatitis caused by Dermabond after undergoing supernumerary nipple excision.

CASE REPORT

A 15-year-old female with a history of an allergic contact reaction to neomycin underwent supernumerary nipple excision. The wound was covered with various materials, probably including Dermabond, Vaseline gauze, and bandages, with no use of any other topical agent, including neomycin. Approximately 1 week later, the patient complained of itching, erythema, and serous weeping from the surgical site (Figure 1). The rash improved with the application of pet.-based topical corticosteroids, and resolved with a 2-week prednisone taper. Excess glue was not dissolved or removed, and there was no need to re-excise the scar. The patient did not have any residual itch or recurrence of the initial rash.

One month later, the patient experienced a recurrence of a similar erythematous pruritic rash over the hands, wrists and discrete parts of the face and body in the setting of making a craft project in school that involved the use of Crazy Glue (Elmer's Products, Westerville, Ohio), which contains ethyl cyanoacrylate. The rash resolved with topical corticosteroids and a 2-week prednisone taper.

The patient subsequently underwent patch testing with allergEAZE patch test chambers (Bio-Diagnostics, Upton-upon-Severn, UK), including neomycin 20% pet., bacitracin 20% pet., ethyl cyanoacrylate 10% pet., and formaldehyde 1% aq. (all supplied by

SmartPractice Canada, Calgary, Canada), applied to the back and removed and read on day (D) 2 and D4. In addition, we tested Dermabond, povidone iodine and other wound care products that had been applied over the wound as open label tests, applied to the back without covering and read on D2 and D4. The patient developed +++ reactions to Dermabond and ethyl cyanoacrylate, and a ++ reaction to Amerchol L-101 (Figure 2). She was counselled to avoid exposure to Dermabond and products that may contain any cyanoacrylates, in addition to Amerchol L-101, although this was not thought to be relevant to her initial eruption.

DISCUSSION

We report a case of a paediatric patient who developed patch test-confirmed allergic contact dermatitis caused by Dermabond after undergoing supernumerary nipple excision. Unfortunately, we could not confirm, from chart review, that Dermabond was specifically used. However, the patient's positive patch test reaction to Dermabond and negative patch test results with other materials used during the surgery confirm that Dermabond was the probable cause of her allergic contact dermatitis.

The first report of allergic contact dermatitis caused by Dermabond was published in 2008, and increasing numbers of cases have been published in recent years.³⁻⁶ However, we are aware of only 1 published case series of allergic contact dermatitis in 3 children with positive reactions to Dermabond on patch testing.² To our knowledge, our report is the first of a paediatric patient developing allergic contact dermatitis caused by Dermabond after undergoing plastic surgery.

Our patient developed a recurrence of the rash after exposure to an ethyl cyanoacrylate-containing glue at school, and ultimately



FIGURE 1 Erythematous rash at the site of surgical excision, 11 days after surgery



FIGURE 2 Positive patch test reactions. A, Steri-strips. B, Bandage. C, Dermabond; D, Povidone iodine. E, Mastosol. F, Vaseline

reacted positively to both Dermabond and ethyl cyanoacrylate. Ethyl cyanoacrylate is the primary component of many commonly used glues. Our patient may have been previously sensitized to ethyl cyanoacrylate through contact with glues. However, our patient had no known reactions to glue prior to undergoing surgery, raising the possibility that exposure to Dermabond cross-sensitized her to ethyl cyanoacrylate. A few prior reports have noted possible cross-sensitization between 2-octyl cyanoacrylate (the primary ingredient in Dermabond) and ethyl cyanoacrylate.^{2,7,8} Sato et al reported a case of a 24-year-old female who developed allergic contact dermatitis caused by 2-octyl cyanoacrylate after an osteotomy, and subsequently developed a recurrence of the rash after exposure to Aron Alpha (Toagosei, Tokyo, Japan), which contains ethyl cyanoacrylate, despite having used Aron Alpha previously with no reactions.⁸ In addition, patients have developed allergic contact dermatitis caused by cyanoacrylates in medical devices such as glucose monitors.^{9,10}

Therefore, patients who develop allergic contact dermatitis caused by Dermabond may also be at risk of developing reactions to these medical devices.

Dermabond and 2-octyl cyanoacrylate, respectively, are not included in the commercially available patch test series, so this case illustrates the importance of testing specifically for actual materials used during surgery when allergic contact dermatitis is suspected.

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None declared.

CONFLICTS OF INTERESTS

The authors declare no potential conflict of interests.

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REFERENCES

1. Koonce SL, Eck DL, Shaddix KK, Perdakis G. A prospective randomized controlled trial comparing N-butyl-2 cyanoacrylate (Histoacryl), octyl cyanoacrylate (Dermabond), and subcuticular suture for closure of surgical incisions. *Ann Plast Surg*. 2015;74:107-110.
2. Gonzalo-Garjón MA, Pérez-Calderón R, Pérez-Rangel I, et al. Contact dermatitis after orthopaedic surgery. *Contact Dermatitis*. 2009;61:299-300.
3. Hivnor CM, Hudkins ML. Allergic contact dermatitis after postsurgical repair with 2-octylcyanoacrylate. *Arch Dermatol*. 2008;144:814-815.
4. Bowen C, Biding J, Hivnor C, Hoover A, Henning JS. Allergic contact dermatitis to 2-octyl cyanoacrylate. *Cutis*. 2014;94:183-186.
5. Caton AM, Dauphine C. Allergic contact dermatitis after repeated exposure to Dermabond™. *Am Surg*. 2014;80:520-522.
6. Lefèvre S, Valois A, Truchetet F. Allergic contact dermatitis caused by Dermabond®. *Contact Dermatitis*. 2016;75:240-241.
7. El-Dars LD, Chaudhury W, Hughes TM, Stone NM. Allergic contact dermatitis to Dermabond after orthopaedic joint replacement. *Contact Dermatitis*. 2010;62:315-317.
8. Sato M, Inomata N, Aihara M. 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. *Contact Dermatitis*. 2017;77:414-415.
9. Schwensen JF, Friis UF, Zachariae C, Johansen JD. Sensitization to cyanoacrylates caused by prolonged exposure to a glucose sensor set in a diabetic child. *Contact Dermatitis*. 2016;74:124-125.
10. Peeters C, Herman A, Goossens A, Bruze M, Mowitz M, Baeck M. Allergic contact dermatitis caused by 2-ethyl cyanoacrylate contained in glucose sensor sets in two diabetic adults. *Contact Dermatitis*. 2017;77:426-429.

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