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## Allergic Contact Dermatitis to Superglue

[L Sornakumar](#), [C Shanmugasekar](#), [Reena Rai](#), and [S Priya](#)

Department of Dermatology, PSGIMSR, Coimbatore, Tamil Nadu, India

**Address for correspondence:** Dr. L Sornakumar, Department of Dermatology, PSGIMSR, Coimbatore, Tamil Nadu, India. E-mail:

[drsornakumar@yahoo.com](mailto:drsornakumar@yahoo.com)

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### Abstract

Wigs are commonly used to cover baldness. A 28 year old male presented with itchy oozy erythematous lesions on the forehead where the wig was affixed to the scalp. Patch testing with Indian standard series and dental series revealed positivity to 2-hydroxy ethyl methacrylate present in superglue. We report this case for its clinical rarity.

**Keywords:** Patch test, superglue, wig

### INTRODUCTION

Wigs are cosmetic devices used to cover baldness. Cyanoacrylate (CA) is used as adhesives in wigs. CA and its homologous variants have a variety of medical, dental, and commercial applications as adhesives. We present a case of allergic contact dermatitis due to polymethylmethacrylate which is used as an adhesive to fix the wig.

### CASE REPORT

A 28-year-old man who was using wig for androgenic alopecia presented with itchy, oozy erythematous plaque on the anterior hair line since 3 months [Figure 1]. Patient used superglue to fix the wig to the scalp. The lesions were restricted to the area where adhesive was used to fix the wig. A diagnosis of allergic contact dermatitis to superglue was made.

The patient was patch tested with Indian Standard Series, Dental series (Chemotechnique Diagnostics, Vellinge, Sweden) which contained the acrylates series. An open patch test with the superglue was done to the patient. The readings were taken at 48 and 72 h. He developed a positive (1+) allergic reaction to 2-hydroxyethyl methacrylate [Figure 2] in dental series and superglue. Biopsy showed evidence of chronic lymphocytic spongiotic dermatitis. The patient was advised to abstain from using the wig and treated with topical steroids. The lesions subsided after 2 weeks.

### DISCUSSION

CAs were first described in 1949 and their potential as adhesives was quickly recognized.[1] Various homologues of CA adhesive have been studied and used, including methyl-CAs, ethyl-CAs (ECAs), isobutyl-CAs, isohexyl-CAs, and octyl-CAs. Commercial CA adhesive or “superglue” now has widespread use as an all-purpose adhesive in various industries and around the home.

CA adhesive is a compound synthesized by condensation of a cyanoacetate with formaldehyde in the presence of a catalyst.[2] The application of an adhesive film of CA develops by rapid polymerization (5–60 s), triggered by hydroxyl groups on the surface to be glued.[3] Water can act as a catalyst to activate this anionic polymerization.[3]

The wigs are usually fixed to the scalp using the adhesive glue which is a mixture of ECA 90.6%, hydroquinone 0.4%, polymethacrylate (2-hydroxyethyl methacrylate) 9.0%, and traces of organic sulfonic acid. Although reactions to CA glues are considered rare, more widespread use of these products by nail salons are likely to be associated with an increased incidence of positive reactions.

For patients suspected of allergy to plastics and glues, patch testing with specialized series of plastics and glues allergens is an important adjunct to patch testing with baseline series.[4]

The patterns of concomitant reactions imply that exposure to methacrylates may induce cross-reactivity to acrylates, whereas exposure to acrylates usually does not lead to cross-allergy to methacrylates.[5]

Allergic reactions to CA glues are considered unlikely because of the immediate bonding of the acrylate to surface keratin. When contact dermatitis is suspected, the monomer may polymerize on Finn chambers and give false negative reactions. Suspension in petrolatum retards the polymerization and allows the use of Finn chambers to detect the allergy. Tomb *et al.*'s[6] reported finger and eyelid dermatitis from occupational use of ECA used to glue on artificial hairs.

Our patient had dermatitis limited to the site where adhesives were used to fix the wig. The presence of positive patch test reaction to acrylates and the subsidence of lesions after abstaining the use of wig confirmed our diagnosis. This case is reported to highlight the workup required if any case of wig dermatitis is suspected.

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### Footnotes

**Source of Support:** Nil

**Conflict of Interest:** None declared.

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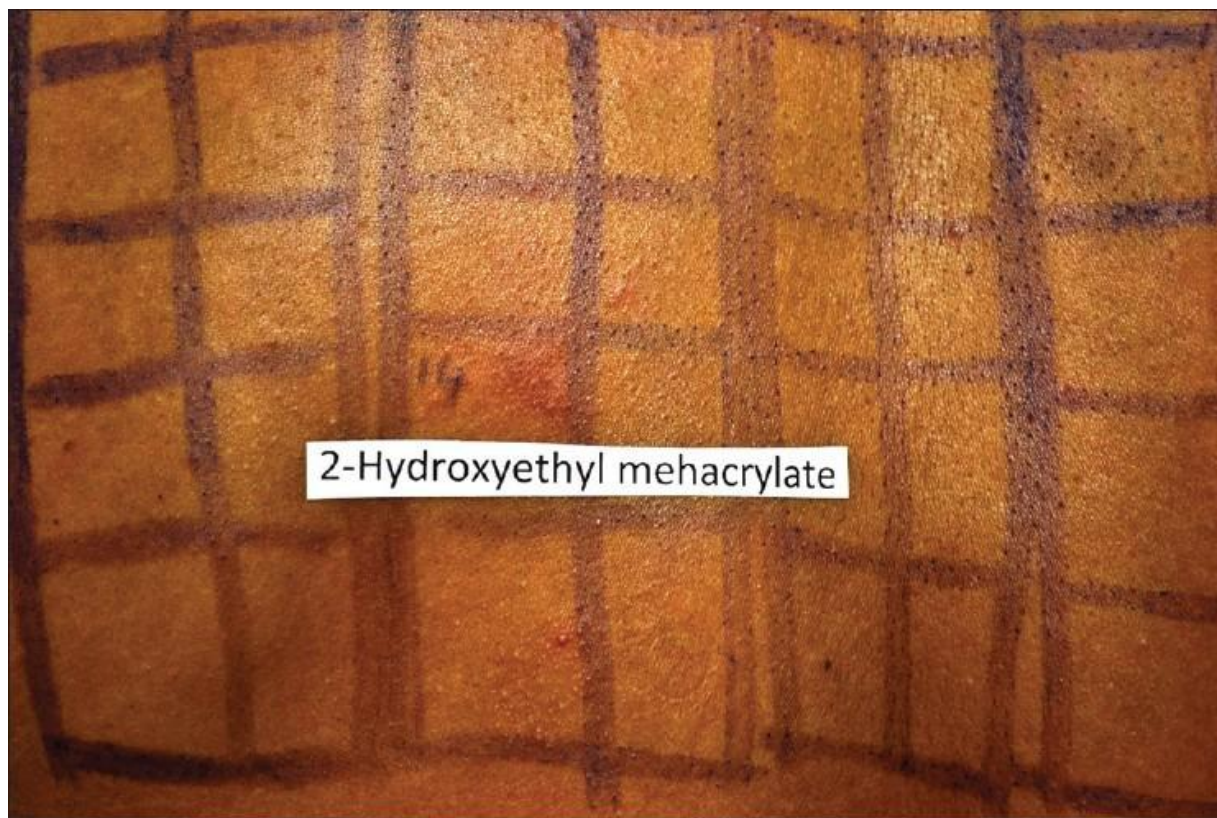
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### Figures and Tables

**Figure 1**



Erythematous plaque on the anterior hair line

**Figure 2**

Positive (1+) allergic reaction to 2-hydroxyethyl metha-acrylate

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