

Allergic contact cheilitis in children and improvement with patch testing



Alyx Rosen, MD, Shanna Shan Yi Ng, MD, Antonella Tosti, MD, and Lawrence Schachner, MD
Miami, Florida

Key words: allergic contact cheilitis; contactants; patch testing.

INTRODUCTION

Pediatric cheilitis can be a debilitating condition for the child and parents. Patch testing can help isolate allergens to avoid. Here we describe a 2-year-old boy with allergic contact cheilitis improving remarkably after prudent avoidance of contactants and food avoidance.

CASE REPORT

A 2-year-old boy was referred by the pediatrician for recurrent lip dermatitis present for 2 years. He previously saw 2 other dermatologists. One prescribed topical tacrolimus 0.03% ointment, hydrocortisone 2.5% ointment, and desonide ointment for atopic cheilitis with minimal improvement in symptoms. The second dermatologist diagnosed lip licker's dermatitis, and the same treatment was maintained. In addition, leaky gut syndrome was ruled out, and the patient had no improvement with aloe vera supplements or a gluten-free diet for 6 months and returned to eating a normal diet. Occasionally, he experienced flares with certain foods, including brown rice, citrus foods, candies, and bread. He was using a hypoallergenic lip balm twice daily and fluoride-free toothpaste when he presented to our clinic. Medical history was otherwise unremarkable, with no history of atopy; the only medications were a daily multivitamin (Rainbow Light, Santa Cruz, CA) and occasional probiotic, and there were no known drug allergies. His family history was notable for an older brother with asthma and father with eczema and psoriasis.

Examination found pink fissured plaques with mild yellow crust involving the perioral skin including the upper and lower lips. The rest of the

Abbreviations used:

ACC:	allergic contact cheilitis
Bronopol:	2-Bromo-2-nitropropane-1,3-diol
MI:	methylisothiazolinone
MCI:	methylchloroisothiazolinone

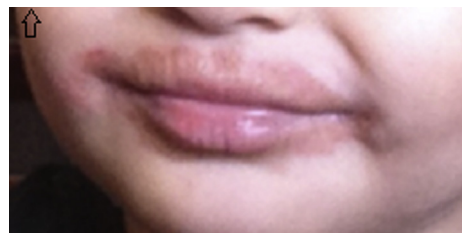


Fig 1. Allergic contact cheilitis before treatment.

skin examination was clear. Images were provided around the time of presentation (Fig 1). A differential diagnosis included lip licker's dermatitis and allergic contact dermatitis. The patient was given a 10-day course of cephalexin and was started on combination topical tacrolimus 0.03% and alclometasone ointments twice daily. The only other topical moisturizers recommended were Vanicream and CeraVe. The patient was referred for patch testing.

Patch testing with the North American Baseline Standard Series of 50 allergens (Chemotechnique/Dormer), and 3 gallates (octyl gallate, propyl gallate, and dodecyl gallate) showed +1 reaction at 48 hours and +2 at 96 hours to balsam of peru; 2-Bromo-2-nitropropane-1,3-diol (bronopol); methylisothiazolinone (MI); and

From the Department of Dermatology and Cutaneous Surgery, University of Miami Miller School of Medicine.

Funding sources: None.

Conflicts of interest: None declared.

Correspondence to: Alyx Rosen, MD, 1600 NW 12th Ave Room 2023, Miami, FL 33136. E-mail: Alyx.rosen@med.einsein.yu.edu.

JAAD Case Reports 2017;3:25-8.

2352-5126

© 2016 by the American Academy of Dermatology, Inc. Published by Elsevier, Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

<http://dx.doi.org/10.1016/j.jidcr.2016.10.002>

Table I. Allergens and patch test results (53 allergens total tested)

Allergens	1st read, 48 h	2nd read, 96 h	Allergens	1st read, 48 h	2nd read, 96 h
1. Benzocaine 5% pet	1. —	1. —	31. Sesquiterpene lactone mix 0.1% pet	31. —	31. —
2. Mercaptobenzothiazole 1% pet	2. —	2. —	32. Fragrance mix II 14% pet	32. —	32. —
3. Colophony 20% pet	3. —	3. —	33. Propylene glycol 30% aq	33. —	33. —
4. 4-phenylenediamine 1% pet	4. —	4. —	34. 2-Hydroxy-4-methoxybenzophenone (Eusolex 4360) 10% pet	34. —	34. —
5. Imidazolidinyl urea 2% pet	5. —	5. —	35. Chloro-,5-xyleneol (PCMX) 1% pet	35. —	35. —
6. Cinnamic aldehyde 1% pet	6. —	6. —	36. Ethylene urea melamine formaldehyde 5% pet	36. —	36. —
7. Amerchol L 101 50% pet	7. —	7. —	37. Iodopropynyl butylcarbamate 0.2% pet	37. —	37. —
8. Carba mix 3% pet	8. —	8. —	38. Disperse blue 106/124 Mix 1% pet	38. —	38. —
9. Neomycin sulfate 20% pet	9. —	9. —	39. Ethyl acrylate 0.1% pet	39. —	39. —
10. Thiuram mix 1% pet	10. —	10. —	40. Glycerol monothioglycolate (GMTG) 1% pet	40. —	40. —
11. Formaldehyde 2% aq	11. —	11. —	41. Toluenesulfonamide formaldehyde resin 10% pet	41. —	41. —
12. Ethylenediamine dihydrochloride 1% pet	12. —	12. —	42. Methyl methacrylate 2% pet	42. —	42. —
13. Epoxy resin 1% pet	13. —	13. —	43. Cobalt(II) chloride hexahydrate 1% pet	43. —	43. —
14. Quaternium-15 (Dowicil 200) 2% pet	14. —	14. —	44. Tixocortol-21-pivalate 0.1% pet	44. —	44. —
15. 4-tert butylphenol formaldehyde resin 1% pet	15. —	15. —	45. Budesonide 0.01% pet	45. —	45. —
16. Mercapto mix 1% pet	16. —	16. —	46. Compositae mix 5% pet	46. —	46. —
17. N-isopropyl-N-phenyl—4-phenylenediamine 0.1% pet	17. —	17. —	47. Hydrocortisone-17-butyrate 1% pet	47. —	47. —
18. Potassium dichromate 0.25% pet	18. —	18. —	48. Dimethylol dihydroxyethylene urea (Fix.CPN) 4.5% aq	48. —	48. —
19. Myroxylon pereiarae (Balsam of Peru) 25% pet	19. 1+	19. 2+	49. Cocamidopropyl betaine 1% aq	49. —	49. —
20. Nickel sulfate hexahydrate 2.5% pet	20. —	20. —	50. MI 0.2% aq	50. 1+	50. 2+
21. Diazolidinyl urea (Germall II) 1% pet	21. —	21. —	51. Octyl gallate 0.25% pet	51. —	51. —
22. DMDM Hydantoin 1% pet	22. —	22. —	52. Propyl gallate 1% pet	52. —	52. —
23. Bacitracin 20% pet	23. —	23. —	53. Dodecyl gallate 0.25% pet	53. —	53. —
24. Mixed dialkyl thioureas 1% pet	24. —	24. —			
25. Cl + Me-isothiazolinone (Kathon CG, 100 ppm) 0.01aq	25. 1+	25. 2+			
26. Paraben Mix 12% pet	26. —	26. —			
27. Methyl dibromoglutaronitrile (MDBGN) 0.5% pet	27. —	27. —			
28. Fragrance mix 8% pet	28. —	28. —			
29. Glutaraldehyde 0.5% pet	29. —	29. —			
30. Bronopol 0.5% pet	30. 1+	30. 2+			

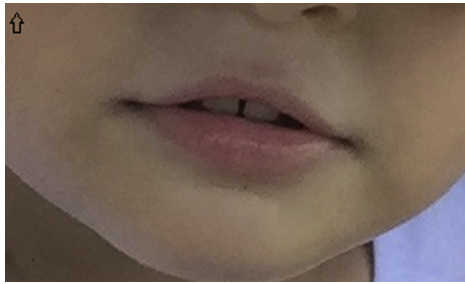


Fig 2. Resolution of allergic contact cheilitis after patch testing with avoidance of contactants, including selective food avoidance.

methylchloroisothiazolinone (MCI)/MI (Kathon CG 100 ppm aq) (Table I). His parents were provided with a safe list of products to use and a list of foods and products to avoid.

Five months after the initial visit, the patient's symptoms and clinical findings were much improved with only mild xerosis and scale at the vermilion border (Fig 2). Tacrolimus 0.03% ointment was being used 2 to 3 times weekly and daily for flares.

DISCUSSION

Cheilitis is an inflammatory disorder of the vermilion. Eczematous cheilitis may be endogenous or exogenous. Exogenous causes are from contact dermatitis, which can either be irritant contact cheilitis or allergic contact cheilitis (ACC). If a child has a personal or family history of atopy, the cheilitis is usually thought to be caused by atopic cheilitis. There are few reports on the benefits of patch testing for cheilitis in children compared with patch testing in atopic dermatitis.

Fragrance mix^{1,2} and balsam of peru² are common allergens in both adults and children with ACC. Fifty percent of the children and adolescents patch tested for oral or perioral symptoms showed relevant positive results to contactants such as fragrances, gentamicin, lanolin, dodecyl gallate, and benzoyl peroxide.¹ A study from Italy, which included adults, showed that the common relevant allergens causing ACC were nickel (14%), fragrance mix (14%), balsam of peru (11%), and euxyl K400 (11%).³ The relevance of nickel in ACC is unclear, but the metal can be found occasionally in cosmetics and canned foods. Another study from Singapore, also including adults, showed that patients' own cosmetics (34%), ricinoleic acid (22%), toothpastes (16%), fragrance mix (12%), and balsam of peru (4%) were common causes of ACC.⁴

According to the Pediatric Contact Dermatitis Registry data from 2015 to 2016, the top 10 allergens

for children (0–5 years old) include nickel (42%), balsam of peru (19%), fragrance mix I (18%), neomycin (17%), formaldehyde (15%), cocamidopropyl betaine (15%), cobalt dichloride (14%), MCI/MI (12%), propylene glycol (9%), bacitracin, bronopol, and wool alcohols (8%).⁵ These results significantly overlap those reported by a recent study of the top 10 pediatric allergens in the literature.⁶ The authors propose that up to 30% of pediatric patients with allergic contact dermatitis could benefit from avoiding the top 10 allergens, known as the *pre-emptive avoidance strategy*.

A balsam-free diet has helped patients who did not improve with external fragrance avoidance in systemic contact dermatitis.⁷ Given the perioral involvement in our case, balsam of peru was likely a strong culprit. Balsam of peru can be added to foods for flavor or spice. Besides changing toothpaste (Nature's Gate Fluoride-Free Cherry), our patient also avoided tomatoes, citrus fruits, cola, sweet flavorings, and spices with marked improvement. On follow-up, the patient's mother recalled a flare after ingestion of cake with frosting.

Formaldehyde releaser preservatives are not common allergens for ACC.² Sensitization to bronopol was judged not relevant for the cheilitis in our case. Since 2005, MI, which is a preservative frequently found in cosmetics products, has been an emerging allergen after its approval for use at a maximum concentration of 100 ppm, especially in children 0 to 5 years of age.⁸ Prior to this, MI was found in a lower concentration of 1:3 with MCI.⁹ Wet wipes contain these preservatives and are often used in the perianal region but are also used periorally causing ACC in susceptible individuals.¹⁰ Although our patient tested positive to both MCI/MI (Kathon CG) and MI, there was no exposure history to wet wipes.

We report this pediatric case of ACC to highlight the usefulness of patch testing in children with cheilitis and to show the remarkable improvement with prudent avoidance of contactants, including food avoidance. Should our patient present with recurrent flares, he may benefit from the pre-emptive avoidance strategy or additional patch testing to his own products.

REFERENCES

1. Shah M, Lewis FM, Gawkrödger DJ. Patch testing in children and adolescents: five years' experience and follow-up. *J Am Acad Dermatol*. 1997;37:964-968.
2. Zug KA, Kornik R, Belsito DV, et al. Patch-testing North American lip dermatitis patients: data from the North American Contact Dermatitis Group, 2001 to 2004. *Dermatitis*. 2008;19:202-208. contact, atopic, occupational, drug.

3. Zoli V, Silvani S, Vincenzi C, Tosti A. Allergic contact cheilitis. *Contact Dermatitis*. 2006;54:296-297.
4. Lim SW, Goh CL. Epidemiology of eczematous cheilitis at a tertiary dermatological referral centre in Singapore. *Contact Dermatitis*. 2000;43:322-326.
5. Goldenberg A, Mousdicas N, Silverberg N, et al. Pediatric Contact Dermatitis Registry Inaugural Case Data. *Dermatitis*. 2016;27:293-302. contact, atopic, occupational, drug.
6. Hill H, Goldenberg A, Golkar L, Beck K, Williams J, Jacob SE. Pre-Emptive Avoidance Strategy (P.E.A.S.) - addressing allergic contact dermatitis in pediatric populations. *Expert Rev Clin Immunol*. 2016;12:551-561.
7. Salam TN, Fowler JF Jr. Balsam-related systemic contact dermatitis. *J Am Acad Dermatol*. 2001;45:377-381.
8. Patel AN, Wootton CI, English JS. Methylisothiazolinone allergy in the paediatric population: the epidemic begins? *Br J Dermatol* 2014;170:1200-1201.
9. Commission. E. 2013. Scientific committee on consumer safety opinion on methylisothiazolinone at the 4th plenary meeting on 12 2013. Available at: http://ec.europa.eu/health/scientific_committees/consumer_safety/docs/sccs_o_145.pdf. Accessed December 22, 2016.
10. Chang MW, Nakrani R. Six children with allergic contact dermatitis to methylisothiazolinone in wet wipes (baby wipes). *Pediatrics*. 2014;133:e434-e438.