cocamidopropyl betaine 1%; however, the results were difficult to interpret due to the presence of numerous erythematous patches where the chambers made contact with the skin with central clearance (Figure 2). Allergen avoidance provided no improvement of his rash at 2-month follow-up, and wheals were noticed on subsequent exam. The patient was diagnosed with delayed pressure urticaria (DPU).

DISCUSSION

DPU is a type of physical and chronic inducible urticaria triggered by sustained pressure to the skin.[1] It affects men more commonly than women and manifests in 2% to 35% of patients with chronic idiopathic urticaria.[2] The pathogenesis of DPU remains unclear; mast cells, neutrophils, eosinophils, or platelets may mediate the inflammatory process by releasing histamine or inflammatory cytokines within the deep dermis and subcutis.[3,4]

DPU presents classically as delayed, recurrent, erythematous wheals in response to sustained pressure.[1-3] Lesions may manifest within 4 to 6 hours after sustained pressure and may persist between 8 and 72 hours; patients may not recognize the inciting event.[1,2] The severity of the wheals depends on the duration and intensity of pressure. Commonly affected areas include the face and chest upon awakening and the thighs and buttocks after sitting on a hard chair. Tight clothing, bra straps, belts, watches, and sleeves can also trigger lesion development.[1,2] Pressure challenge tests can confirm the diagnosis of DPU but may be falsely negative; thus, DPU remains a clinical diagnosis.

To our knowledge, patch testing has not been reported previously as a trigger of DPU; however, it likely caused false positive patch test interpretation in our patient. Patch test readings can prove challenging in patients with DPU. In cases where patch testing is needed, patients may be treated with oral antihistamines prior to and during patch testing to mitigate result misinterpretation. Although controversial, oral antihistamines may affect patch test reactivity; however, literature on this topic is limited.[5] In addition, clinicians should perform a final patch test interpretation at least 72 hours after patches are removed, with final reading at 120 hours as opposed to 72 or 96 hours as is traditionally done.

CONFLICT OF INTEREST

The authors report no conflicts of interest. This report has not been presented or published previously.

AUTHOR CONTRIBUTIONS

Marina Kristy Ibraheim: Writing – original draft (lead). **Megan Rogge:** Conceptualization (lead); investigation (lead); writing – review and editing (lead).

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Contact allergy to a shellac-containing mouthguard

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KEYWORDS: CAS no. 9000-59-3, case report, contact allergy, hockey player, lip fissures, mouthguard, oral aphthae, shellac

Shellac is a typical cosmetic allergen that can cause reactions such as eyelid dermatitis to mascara or contact cheilitis to lipstick. However, in this case report we present shellac as a relevant contact allergen in a noncosmetic context.

CASE REPORT

A 21-year-old female, with a history of asthma, presented at our outpatient clinic as third opinion with a recurrent lower median lip fissure (Figure 1A). For 3 years she experienced fissures and dry scaling of her lower lip as well as simultaneously occurring numerous mildly painful aphthae on the labial and buccal mucosa. Prior treatment with topical corticosteroids, emollients, antifungal, and antimicrobial ointments were only moderately effective. A skin biopsy showed chronic ulcerative inflammation without specific characteristics. Additional tests ruled out herpes infections, nutritional deficiencies, and immunobullous diseases. She used the same brand toothpaste for years and denied using lip cosmetics (or any other cosmetics other than shower gel and shampoo). However, as a passionate hockey player she frequently wore a hockey mouthguard. We performed patch tests with the European baseline series, and additional series containing corticosteroids, cosmetics, plastic/glues, and rubber chemicals (van der Bend B.V., Brielle, The Netherlands). Allergens were applied to the back for 2 days with Finn Chambers (SmartPractice, Phoenix, Arizona). Readings at day (D) 2 and D3 showed only positive reactions to shellac 20% in ethanol +/+ in the cosmetic series. We weekly test this series and very rarely find a positive reaction to shellac. We then contacted the manufacturer who confirmed that her mouthguard contained shellac. Replacement by a shellac-free mouthguard with similar design by her dentist resulted in complete remission of her symptoms within 1 month (Figure 1B).

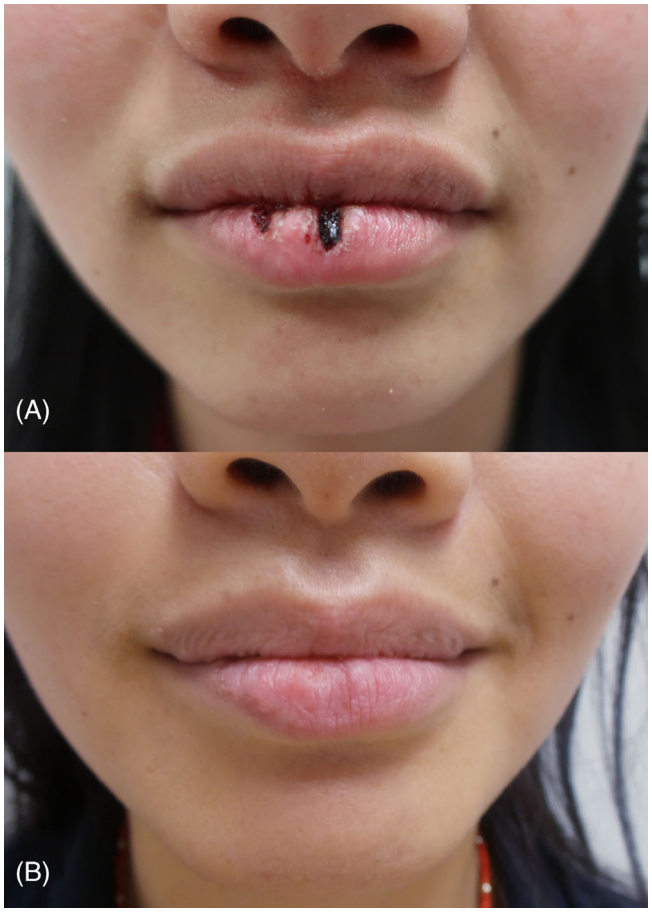

FIGURE 1 Lower median lip fissure (**A**) with a complete remission of her oral symptoms within 1 month after replacement with a shellac-free mouthguard (**B**)

DISCUSSION

Oral aphthae and lip fissures are common symptoms in dermatologists' daily practice. Arriving at a diagnosis can be challenging and the complaints are notoriously recalcitrant. The differential diagnoses for aphthae include viral infections, immunobullous diseases, and Morbus Behçet. Differential diagnoses for lip fissures include lip lick dermatitis, median lip fissure, or dermatitis artefacta. Patch tests can be useful to determine whether an underlying and relevant contact allergy is present or not. Eliminating the culprit allergen can completely resolve the often long-lasting symptoms. Most underlying causative agents for lip dermatitis include lip cosmetics, toothpaste and other dental care products, metals (dental or orthodontic devices, musical instruments), food, medications, nail varnishes, and rubber gloves.[1,2] However, in our case shellac was considered a likely culprit contributing to the clinical picture.

Shellac, also known as lacca (CAS no. 9000-59-3), is a natural resinous secretion of the insect *Laccifer lacca* (*Tachardia lacca*), currently named *Coccus lacca*.[3,4] Shellac is considered a "natural plastic" and used in the food, drug, and cosmetic industries. It is applied in cosmetics for its emollient and coat-forming characteristics.[3,4] Shellac can be found in hair sprays, lotions, shampoos, eyeliners, mascaras, nail polishes, lipsticks, and fragrances. In addition, it is used for coating or glazing of food, candies, and medicines. Furthermore, shellac is widely present in dentures and other dental products. Skin sensitization to shellac is rare. Reports of allergic contact dermatitis describe mainly eyelid dermatitis from mascara or eyeliner and contact cheilitis from lipsticks.[3,4] Patch testing is recommended with shellac 20% in ethanol.[3,4] This case report adds sport-related mouthguards as an unusual and possibly underreported cause of contact dermatitis to shellac.

CONFLICTS OF INTEREST

None declared.

AUTHOR CONTRIBUTIONS

Koen Quint: Conceptualization (equal); data curation (equal); formal analysis (equal); funding acquisition (equal); investigation (equal); methodology (equal); project administration (equal); resources (equal); software (equal); supervision (equal); validation (equal); visualization (equal); writing – original draft (equal); writing – review and editing (equal). **Esther J van Zuuren:** Conceptualization (equal); data curation (equal); formal analysis (equal); funding acquisition (equal); investigation (equal); methodology (equal); project administration (equal); resources (equal); software (equal); supervision (equal); validation (equal); visualization (equal); writing – original draft (equal); writing – review and editing (equal).

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Allergic contact dermatitis to two eye creams containing tetrahexyldecyl ascorbate

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Derivatives of ascorbic acid (vitamin C) are commonly used in products as antioxidants. Reports of contact allergy (allergic contact dermatitis [ACD]) to derivatives of vitamin C have been found, but none to tetrahexyldecyl ascorbate (THD ascorbate) (CAS no: 183476-82-6), a lipid-soluble precursor of vitamin C. We report a case of ACD in response to THD ascorbate in two eye creams and a face cream.

CASE REPORT

A 62-year-old woman experienced episodes of periocular inflammation. Each occurred 2–3 days after using two new eye creams: "products A and B" (Figure 1). Her patch testing included the Allergic Contact Dermatitis Society (ACDS) core, cosmetic, and nail polish series plus additional potential allergens found in her current topical products and a sample of product B. IQ Patch Test chambers (Chemotechnique Diagnostics, Vellinge, Sweden) were used. Patches were removed at 48 hours and read at both 48 and 96 hours.

At 96 hours, there was a 3^+ reaction to product B but no positive reactions to any other allergens tested. A request was made to the manufacturer to obtain the individual ingredients of product B at the concentrations found in the product. The patient returned to be patch tested to these samples and to a face cream similar to product B. At 120 hours, there was a 3^+ reaction to tetrahexyldecyl ascorbate (THD) ascorbate and a 2^+ reaction to the face cream. THD ascorbate was found in all three products (products A and B and the face cream). Positive reactions to THD ascorbate and two products containing this ingredient confirmed that this was the cause of her condition. Control patch tests to THD ascorbate on 24 healthy subjects were negative.

Discontinuation of both eye creams led to rapid healing and no further problems.

DISCUSSION

Many topical anti-aging products contain vitamin C or its derivatives. An early case of facial allergic contact dermatitis (ACD) to vitamin C was found in a patient using an anti-aging cream. Oral provocation tests with several doses of oral ascorbic acid were negative.[1] In another early case, oral exposure to ascorbic acid elicited dermatitis ~20 hours after ingestion and also a positive reaction on patch testing.[2] Other reported cases of topical vitamin C allergy include 3-glyceryl ascorbate in a skin-lightening lotion,[3] 3-*o*-ethyl-L-ascorbic acid in several patients[4-7] and two reported cases of ACD to ascorbyl tetraisopalmitate.[8,9] In several of these reports, other vitamin C derivatives were also tested, and all results were negative, suggesting that ACD in response to vitamin C derivatives may be specific. Data to date show a lack of cross-reactivity between vitamin C derivatives, but further data are needed. We found no previous reported cases of ACD from THD ascorbate; however, our case report shows that ACD from THD ascorbate can occur.