

BRIEF REPORT

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PERSISTENT ALLERGIC CONTACT DERMATITIS TO PLASTIC TOILET SEATS

Abstract: Allergic contact dermatitis to various components of toilet seats is being recognized and reported with increasing frequency. This report details the case of an young girl who was found to be allergic to plastic found in both a toilet seat and a school chair. It highlights particular problems with patch testing young children and the difficulty in confirming allergy to plastics.

CASE REPORT

A 6-year-old Guatemalan girl presented to our pediatric dermatology clinic in July 2007 with a 4-year history of a pruritic rash on the bilateral posterior thighs and buttocks. She was toilet trained when the rash started. Throughout the years, the patient's mother reported that the patient had been treated with multiple courses of antibiotics but the rash had never resolved. Her past medical history was pertinent for well-controlled mild atopic dermatitis and a suspected allergic contact dermatitis to pimecrolimus cream causing a rash where applied. She was adopted in infancy and has had no foreign travel since arriving in the United States.

The initial physical examination showed faint pink-erythematous dry scaling patches in an arciform distribution on the superior portion of the posterior thighs. As mom gave a history of the rash being worse in summer months and associated it with the swimming pool, patch testing for chromates was performed. This was negative. Nickel allergy was also considered and avoidance measures were undertaken with no change in the rash.

In the early presentation, the rash would respond to topical fluocinonide 0.05% ointment twice daily to the affected areas, typically clearing in 3–4 days. Because of frequent flaring, tacrolimus 0.03% ointment was tried as a steroid sparing agent. Like the pimecrolimus, she developed an intensely pruritic, urticarial rash where the medication was applied so it was discontinued. Throughout the fall, the eruption was very well controlled, with mild flares occurring every 6–8 weeks. In



Figure 1. Pink-purple excoriated indurated plaques in an arcuate configuration during a flare.

February 2008, the severity of the rash intensified and was no longer responsive to topical treatments (Fig. 1). On examination, the patient had large, erythematous, dry, scaly, slightly excoriated, indurated plaques that were noted to be in an arcuate configuration along the back of the thighs. A course of prednisolone 2 mg/kg/day tapered over 10 days in conjunction with the topical fluocinonide 0.05% ointment was initiated. She experienced only mild improvement with that routine.

As a contact dermatitis was suspected, more extensive patch testing (the North American Contact Dermatitis Group Standard Allergens) was performed. The only positive test result was to cobalt. As nickel and metal allergy had already been explored and avoidance measures put in place, this was not deemed relevant.

Given the distribution of the rash, the suspicion for a contact dermatitis was still very high. It was thought that the patient was likely reacting to something that she was sitting on, perhaps a toilet seat or chair. The patient was advised to avoid contact with toilet seats, using paper liners whenever she used the toilet. Additionally, she was instructed to keep her legs covered at all times and wear leggings under dresses and skirts to avoid direct contact of the skin with any hard surfaces. Despite avoidance measures, the eruption was constant, with only minimal fluctuations in severity. Her course was complicated by several bouts of secondary staphylococcal infection for which she was treated with oral cephalexin or trimethoprim/sulfamethoxazole, and topical mupirocin. Additionally, she was empirically treated for a possible secondary fungal infection with 6 weeks of oral griseofulvin. Differing classes of topical corticosteroids were used as well but no improvement was noted. Simple bandaging with nonstick 4 × 4 pads coated with petro-

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leum jelly applied over the wounds, secured with roll gauze and no adhesive tape, worked the best.

A biopsy was performed revealing psoriasiform hyperplasia of the epidermis with superficial epithelial necrosis. Also noted were papillary dermal edema and a superficial perivascular infiltrate composed of lymphocytes, histiocytes, and eosinophils. A PAS stain was negative for fungal organisms. The histologic differential included chronic dermatitis such as contact dermatitis, intertrigo, or lichen simplex chronicus with suspected trauma or irritation.

The suspicion for a contact allergen was still very high. In two separate patch testing sessions, the patient was use-tested to samples from everything she sat on both at home and at school. Site visits by the physician to the patient's home and school were made. Using a 15 scalpel blade, shavings from all possible offending materials were obtained, including home toilet seat, school toilet seat, classroom chairs, home chairs, and classroom carpets were obtained. The results of the patch test were positive with palpable erythema to scrapings from the patient's toilet seat and library chair (Fig. 2). Both of these surfaces were comprised of plastic composites. The school toilet seat was very old and manufacturer data

were not available. The library chair was determined to be made of polypropylene. A diagnosis of allergic contact dermatitis to polypropylene was confirmed.

Throughout the summer of 2008, despite instructions for strict avoidance, the rash persisted. The patient was again counseled to avoid all skin contact with plastic and the mother assured that they always used paper liners when using the toilet. Despite continued treatment and avoidance of the offending agent, the rash persisted and again became secondarily infected. Another course of antibiotic, griseofulvin, and prednisolone were prescribed. Because the rash was not resolving with optimal treatment, a second biopsy was taken, again revealing psoriasiform dermatitis with negative cultures for fungus and bacteria.

Compliance was revisited again. Upon further questioning, the patient and her mother reported that the patient always used paper when using the toilet but was not supervised. The patient's mother began supervising the patient's toilet use and the patient would lift the seat and only make contact with the porcelain portion of the toilet. With these measures, the rash finally healed leaving mild macular hyperpigmentation.

DISCUSSION

While allergic contact dermatitis to toilet seats is well described in the literature, the offending allergens are varied. Wood toilet seats have been the most common cause of contact dermatitis (1,2). The allergy can be to either the wood itself or to an overlying varnish or stain. Delayed presentation is possible as the varnish on the toilet seat may take years to wear down, thus exposing the underlying base wood (2). Irritant reactions from harsh cleansers have also been implicated and occur in the same distribution (3). Only recently have plastic toilet seats been identified in causing allergic contact dermatitis (3). Identifying the specific component of plastic that a person is allergic to is often difficult to ascertain as the STEPS IN plastics manufacturing ARE quite convoluted and ingredient lists are not readily available. Many components of plastics are not tested for in any standard or extended patch testing series.

Based on the location of the child's rash, several possible diagnoses were considered. Nickel in chair bolts was initially considered, as nickel is the most common contact allergen in children and such presentations have been highlighted in the literature (4,5). Other possibilities were considered including an irritant contact dermatitis from cleaning solutions. Our patient's mother was instructed to thoroughly rinse the toilet seat with copious amounts of plain water after using any toilet cleansers. A localized flare of atopic dermatitis, secondary to the heat



Figure 2. Use-testing revealed palpable erythema to the patient's home toilet seat and school library chair.

and occlusion of sitting, was also considered, but deemed unlikely as her atopic dermatitis had been essentially quiescent for several years and the rash remained localized to her posterior thighs. Additionally, we considered tinea corporis; however, it did not respond to repeated courses of griseofulvin.

The child in our case was found to be allergic to polypropylene, a thermoplastic used commonly in the manufacture of pipes, containers, seats, and automotive parts (6). Polypropylene is the major component of the patient's library chair and presumably, the toilet seat as well. It is not a standard allergen on the North American Contact Dermatitis Group screening allergen patch test and therefore we followed the Contact and Occupational Dermatology guidelines for testing nonstandard antigens (7). Although in the past allergic contact dermatitis was thought to be rare in children, it has subsequently been shown that it is more common than previously thought and that performing patch testing can give clinically relevant information in children (8). Patch testing in children does pose unique problems. Children may not have enough skin surface area to apply all of the patches in a single setting. We prioritize more likely causes and apply those allergens first. In our case, the patient had to undergo three sets of patch testing. The first attempt at a patch test was unsuccessful as the patient scratched off the tape and the results were uninterpretable.

Once we determined that the patient's rash was an allergic contact dermatitis, avoidance of the allergen was a critical component of treatment. The patient could not be supervised at every bathroom break to ensure compliance and paper toilet seat covers were not fully protecting her from the plastic seat. It soon became clear that the patient had continued contact with the offending toilet seat as her rash continued to flare. Eventually a solution was found—the patient would lift the toilet seat and only make contact with the porcelain bowl. After using this technique, the rash was finally able to heal. After several weeks of following strict avoidance, the rash healed.

It is interesting that the cases of toilet seat dermatitis recently published suggest that the use of paper seat covers was enough of a barrier to protect the skin from

the offending allergen (3). In our patient's case, total avoidance was necessary to achieve clearance. Given the protracted course our patient experienced because of inadvertent noncompliance, we recommend strict and absolute avoidance measures in all patient's with a suspected contact dermatitis to toilet seats. Young children should be supervised each time they use the toilet to ensure compliance. Removing the toilet seat all together is also recommended when possible. This case report describes a case of allergic contact dermatitis to plastic toilet seats and highlights the challenges of patch testing and compliance in young children.

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