

Hand eczema in a 22-year-old woman with piercings

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In mid 2002, we examined a 22-year-old waitress who complained of a 5- to 6-month history of painful, pruritic lesions on her hands, arms, and legs. The itch often disturbed her sleep, and her quality of life was diminished by physical discomfort and feelings of embarrassment. Lesions on both palms showed minimal vesiculation, moderate papulation and scaling, moderate to severe erythema, and severe fissuring and lichenification. Lesions on her arms and legs were less severe, showing only slight erythema and papulation.

She reported a continuous course of eczematous lesions, primarily on her hands, over the previous 6 to 7 years, with the onset coinciding with a tongue piercing received in late 1995. Immediately after the piercing, she developed a significant lingual hematoma, which resolved after approximately 3 months. She received 4 subsequent piercings over the next year: one in her lip, one in her nose (transseptum) and 2 in her right pinna. Due to a persistent "raw" feeling on her tongue around the piercing site, she eventually removed her tongue stud in mid 1997, leaving a wishbone-shaped scar (Figure 1). She also reluctantly removed her facial piercings soon afterward, assuming a correlation between the jewelry and the appearance of hand eczema, which had emerged almost simultaneously.

She was not significantly affected by her eczema until early 2002, when she began the process of breaking up with a long-term boyfriend. She reported frequent and excessive consumption of beer in the months following the emotional trauma. The severity of her eczema increased to an intolerable level, and her hands were continually irritated by the frequent exposure to cleaning agents at work. Over the next 5 to 6 months, her discomfort precipitated 5 visits to her primary care physician, who treated her with diflurasone diacetate ointment 0.05%, which provided temporary relief,



Figure 1. The wishbone-shaped scar that remained after the patient's tongue was pierced with a metal tongue stud.

followed by topical pimecrolimus cream, which produced little relief. She stated that she felt hopeless and defeated.

The patient had a personal history of atopic dermatitis, chronic rhinitis, and allergic conjunctivitis since infancy; allergies to melons, latex, and animals since childhood; and depression since adolescence. Her surgical history included a tonsillectomy, correction of a deviated septum, and adenoid removal. She was taking loratadine for rhinitis and paroxetine HCl for depression. Her father and all of her siblings had histories of rhinitis, allergic conjunctivitis, and episodes of urticaria and contact dermatitis. Her father also had a history of asthma, both parents had drug allergies, and one sibling had atopic dermatitis as a child.

What is the most likely diagnosis, and what test would confirm it?

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DIAGNOSIS: Allergic contact dermatitis.

A patch test revealed a reaction to cobalt (Figure 2). No sensitivity to any other allergen, including nickel, was apparent.

DISCUSSION

Contact dermatitis, in both irritant and allergic forms, is a common cause of hand eczema. According to one study, irritant dermatitis was the most common type of hand eczema, accounting for 35% of cases, and allergic contact dermatitis accounted for 19% of all cases (1). Common characteristics of hand eczema include erythema, fissuring, scaling, vesiculation, and pruritus. The discomfort of hand eczema and concerns about appearance can compromise a patient's quality of life, impairing both social interaction and professional performance. In cases of contact allergen-induced hand eczema, performing a patch test to identify the allergen is critical in resolving the problem.

In their review of several European studies from 1972 to 1990, Reitschel and Fowler reported nickel allergy as the most common metal allergy, with a prevalence ranging from 7.3% to 17.4%, while cobalt's prevalence was somewhat lower at 4.6% to 7.7% (2). Nickel and gold have been reported as more prevalent causes of jewelry-related sensitization (3–5).

Nickel-containing jewelry alone, especially in the form of earrings, has been well established as a cause of contact dermatitis (6, 7). Nickel remains responsible for the majority of cases of contact dermatitis among women worldwide, prompting the Danish Ministry of Environment to initiate regulations to minimize the extent of nickel release in the ear-piercing process (8). Cobalt allergy is frequently related to nickel allergy, as both metals are often found together in costume jewelry and other metal-plated objects. It has even been proposed that nickel allergy may predispose one to cobalt allergy (9).

Both nickel and cobalt allergies have been associated with severe hand dermatitis, but most cobalt-related contact dermatitis studies and case reports focus almost exclusively on occupational exposure in masons and hard-metal workers (2), farmers (10), manufacturing workers (11), and a bank clerk (12). Such jobs likely involve the direct exposure of the hands to the allergen. Two studies of male cohorts have confirmed a relationship between piercing and cobalt sensitization, but the majority of these subjects had received ear piercings, with no clear relationship between oral or facial piercings and cobalt sensitization (13, 14). In our patient, however, hand eczema seemed to be induced by an allergic reaction to cobalt from a succession of oral and facial piercings, exacerbated by emotional stress and exposure to occupational irritants.

Body piercing is a form of physical ornamentation and self-expression that is prevalent in college-aged populations within the USA. A recent Mayo study found that 51% of >400 college students surveyed had some form of piercing, with ears being the most popular sites, followed by navel (17.0%) and tongue (10.5%) (15). The survey also found that the overall incidence of complications associated with all piercings was 17%, but contact dermatitis was either not investigated or not reported. Another study found that nontraditional piercings have the same incidence of complications as more traditional earlobe piercings (16).

Reported complications from oral piercings and other nontraditional piercings include cephalic tetanus (17), cellulitis (18),



Figure 2. Patch test lesion confirming a reaction to cobalt dichloride. The patient did not react to nickel; however, nickel reactions are possible in those allergic to cobalt, according to patch test guidelines.

tooth fracture (19), gingival recession (20), and even speech impairment (21), but no published case reports have described tongue piercing as the cause of cobalt-induced contact dermatitis manifesting as hand eczema.

Beer, which the patient consumed in large amounts after the breakup with her boyfriend in early 2002, historically has contained varying amounts of cobalt, which was implicated in cases of cardiomyopathy in the 1960s (22). Although one report from the National Safety Council suggests that breweries no longer use cobalt to stabilize foam (23), it may still be used by some. Therefore, excessive beer consumption, an unhealthy practice overall, may be especially harmful to cobalt-allergic patients.

Finally, a patient we shared with Dr. Alexander Fisher showed a different manifestation of cobalt allergy: she developed what looked like cauliflower ears, with an acute, weeping dermatitis on the entire concha. Once the patch tests showed cobalt sensitivity and the patient was given information about possible sources, she was able to trace each episode to a cobalt source, including blue paint, vitamin B₁₂ shots, and beer, which she used as a hair conditioner. In her case, the source of sensitization was a Harrington rod, a device made of cobalt-rich steel implanted to correct her scoliosis.

FOLLOW-UP

The 22-year-old waitress was advised to remove the jewelry from her remaining piercings and was treated with topical tacrolimus ointment twice daily. She was also given a dimethicone-based hand protectant to use while working.

After approximately 1 month of treatment and minimized exposure to cobalt-containing jewelry and irritating cleansers, the patient reported by phone that she was "almost clear" and was very pleased with the results. She was also aware of the possibility of cobalt in beer and had decreased her beer consumption.

CONCLUSION

Piercings can be a source of exposure to contact allergens such as cobalt and nickel. The prevalence of body piercing among young adults will ensure the greater rate of sensitization to both cobalt and nickel unless, as in Denmark, allergen release is minimized or a hypoallergenic material is used in piercing equipment

and jewelry. This change would be possible only with greater regulation of the piercing and body art industry.

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