

Case Report

A 38-year-old woman with itching and burning foot attended our outpatient clinic. These complaints were present for the last 3 months. She used many topical antimycotic therapies, with a misdiagnosis of tinea pedis. On dermatological examination, there was erythema on her feet, which were strictly exposed to the shoes she was wearing (Figs 1 and 2). The patient's interdigital areas were normal. No other body area was affected. A KOH preparation was evaluated for tinea pedis, and it was negative. Patch testing was performed with the European Standard Series. The patient denied giving a small piece of her shoes for patch testing. She showed a 2+ reaction to *para*-tertiary butylphenol formaldehyde. Topical midpotent steroid preparation and systemic antihistamines as well as emollients were started. The patient was instructed to avoid preparations containing *para*-tertiary butylphenol formaldehyde, and cotton socks usage was advised as a barrier.

Shoe dermatitis from *para*-tertiary butylphenol formaldehyde

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Shoe dermatitis is a form of contact dermatitis resulting from exposure to shoes. Different chemicals, with a hot and humid environment within the shoe, make an ideal situation for the development of allergic or irritant dermatitis (1).

Discussion

Contact dermatitis lesions usually appear symmetrically. Occlusion, sweating, and friction may trigger episodes of foot dermatitis (2). Although foot dermatitis observed during daily practice is not infrequent, the patch test positivity is rare (3). The list of allergens causing shoe dermatitis found in the literature is summarized in Table 1.

Para-tertiary butylphenol formaldehyde is included in many adhesive formulations. Glues containing this



Fig. 1. Feet of the patient showing sharply demarcated erythema.



Fig. 2. Lesion of the patient that is in the shape of the shoe she wears.

allergen are used in leather products such as shoes, watchstraps, handbags, building materials, motor cars, and electrical products. Nagashima et al. reported a woman who developed contact dermatitis from *para*-tertiary butylphenol formaldehyde in a wetsuit she used for scuba diving (4). Ozkaya-Bayazit and Buyukbabani also reported watchstrap dermatitis from *para*-tertiary butylphenol formaldehyde (5).

The exact frequency of shoe dermatitis and allergens among Turkish population is not absolutely reported. Onder et al. published reports on 4 patients suffering from shoe dermatitis in whom potassium dichromate, genuine leather, nickel sulfate and thiuram mix were the offending allergens (2). In our case, patch testing showed a reaction to *para*-tertiary butylphenol formaldehyde.

As a result, dermatologists should know foot dermatitis and the possible causes supported by patch testing. *Para*-tertiary butylphenol formaldehyde is one the major causative agent of foot dermatitis, as in our case.

References

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Table 1. The most common allergens in shoe dermatitis found in the literature

Study	Holden and Gawkrödger 2005 (British population) (3)	Rani et al. 2003 (Pakistani population) (1)	Lazzarini et al. 2004 (Israel population) (6)	Freeman 1997 (Australian population) (7)	Onder et al. 2004 (Turkish cases) (2)
Most common allergens in descending order	1. Chromate 2. Neomycine 3. Rubber chemicals 4. Paraphenylenediamine 5. Tixocortol pivate	1. Neomycin 2. Cobalt chloride 3. Fragrance mix 4. Quinolone mix 5. Benzocaine 6. Wool alcohols 7. Balsam of Peru 8. Sesquiterpene lactone mix	1. <i>Para</i> -tertiary butylphenol formaldehyde 2. Chromate 3. Rubber chemicals and dyes 4. Neomycine	1. Rubber 2. Chromate 3. <i>Para</i> -tertiary butylphenol formaldehyde 4. Colophony	1. Potassium dichromate 2. Potassium dichromate and genuine leather 3. Nickel sulfate 4. Thiuram mix