

Allergic Contact Dermatitis to a Cell Phone

Dear Editor,

Nickel is a ubiquitous allergen and an important cause of allergic contact dermatitis (ACD). Sensitized patients generally develop a localized eruption after cutaneous exposure to nickel, characterized by erythema, vesicles, eczematous plaques, and itching.

Nickel is frequently found in several everyday objects. It is used in numerous industrial and consumer products, including stainless steel, magnets, metal plating, coinage, and special alloys, and is therefore almost impossible to completely avoid in daily life (1). This metal may be found in a wide variety of items, such as jewelry, belt buckles, buttons, glasses, coins, and keys. More recently, items such as mobile phones, laptop computers, video game controllers, and other technological accessories have also been identified as a source of nickel.

The use of mobile phones has risen exponentially in recent decades. Nickel has been detected in cell phones, and reports of contact dermatitis due to metals contained in cell phones are present in the literature (2,3). Allergic contact dermatitis to a mobile phone was first described in 2000, when Pazzaglia *et al.* reported two cases of nickel allergy due to mobile phone use (4).

In addition to nickel, cobalt, which is frequently used in hard metal alloys and observed to be present in mobile phones, is a frequent cause of allergic contact dermatitis (5).

Herein we present a case of allergic contact dermatitis, possibly caused by the use of a mobile phone. A 38-year-old woman was admitted to our Depart-



Figure 1. Erythematous and squamous plaques localized at the pre-auricular and auricular region of the left ear. These lesions varied in size from 1 to 4 cm.

Table 1. Patch test SIDAPA series (SIDAPA: *Società Italiana di Dermatologia Allergologica, Professionale e Ambientale*)

Formaldehyde resin	Potassium dichromate
Fragrance mix	Neomycin sulfate
Nickel sulfate	Mercapto mix
Paraben mix	Epoxy resin
Para-phenylenediamine	Colophony
Resorcinol	Cobalt chloride
Quaternium	Balsam of Peru
Disperse red	Lanolin
Disperse blue	Benzocaine
Ethylenediamine	Imidazolidinyl-urea

Table 2. Patch test Metal series

Molybdenum	Iron
Copper	Silver
Gold	Stannic chloride
Aluminum	Zinc
Chrome	Palladium
Lead	Platinum
Cadmium	

ment of Dermatology for the presence of a pruritic eczematous solitary lesion on the face. At physical investigation, we observed the presence of confluent erythematous and squamous plaques localized at the pre-auricular and auricular region of the left ear. These lesions varied in size from 1 to 4 cm (Figure 1). As reported by the patient, the symptoms had been present for 6 months. No other cutaneous diseases or photodermatoses were reported.

As reported by the patient during the anamnestic interview, she worked as a manager for a big commercial company and used to spend many hours per day using her cell phone. She had a familiar history of atopic dermatitis and a personal history of metal allergy.

A patch test SIDAPA series was performed (Table 1). After 48 hours, the patch was removed and a preliminary reading of the skin was done. The final reading was performed after 72 hours from the patch application. The test was positive for nickel sulfate (++ after 48 hours and +++ after 72 hours) and for cobalt chloride (+ after 48 hours and ++ after 72 hours). We also performed a patch test Metal series (Table 2), which was negative at 48 and 72 hours.

Based on the patch test results and the information revealed by the patient, we hypothesized a triggering role of the cell phone to the onset of the pre-auricular dermatitis. This hypothesis stems from the literature regarding cases of dermatitis due to allergenic metals contained in cell phones.

Oral antihistamines and topical steroids were prescribed to treat the eczematous plaques. After one week of therapy, a partial improvement of the skin condition was observed.

In line with our hypothesis of a causal role of the cell phone, our patient's dermatitis completely disappeared when her usual auricular contact with her mobile phone was avoided. Following our suggestion, the patient started to use the speakerphone when needed. Six months later, she had a complete remission of the cutaneous lesions and did not present recurrences of the auricular dermatitis.

Dermatologists should be aware that mobile phone dermatitis is an emerging phenomenon, especially among young adults and adolescents. Despite efforts to control the presence of allergen metals in phones, many phones present levels of metals such as nickel and cobalt, known to induce allergic contact dermatitis.

In conclusion, it is important to suspect this diagnosis in case of patients with dermatitis of the face, neck, hands, or auricular region, especially when the lesions are unilateral. Patch test for common metal allergens may be helpful for diagnosis.

References:

1. Torres F, Das Graças M, Melo M, Tosti A. Management of contact dermatitis due to nickel allergy: an update. *Clin Cosmet Investig Dermatol*. 2009;2:39-48.
2. Richardson C, Hamamm CR, Hamann D, Thyssen JP. Mobile phone dermatitis in children and adults: A review of the literature. *Pediatr Allergy Immunol Pulmonol*. 2014;27:60-9.
3. Pazzaglia M, Lucente P, Vincenzi C, Tosti A. Contact dermatitis from nickel in mobile phones. *Contact Dermatitis*. 2000;42:362-3.
4. Aquino M, Mucci T, Chong M, Lorton MD, Fonacier L. Mobile phones: potential sources of nickel and cobalt exposure for metal allergic patients. *Pediatr Allergy Immunol Pulmonol*. 2013;26:181-6.
5. Berk DR, Bayliss SJ. Cellular phone and cellular phone accessory dermatitis due to nickel allergy: report of five cases. *Pediatr Dermatol*. 2011;28:327-31.

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