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CASE AND RESEARCH LETTERS

Sarcoid-type Allergic Contact Granuloma Caused by Earrings in a Boy[☆]

Granuloma alérgico de contacto tipo sarcoideo por pendientes en un niño

To the Editor:

The formation of cutaneous sarcoid-type allergic contact granuloma is rare and was first reported by Mann et al.¹ over 20 years ago in a patient who used gold earrings. We recently studied the case of a child who developed a sarcoid-type allergic contact granuloma on the ear after wearing several earrings containing a range of metals including palladium.

The patient, an 11-year-old boy with no relevant medical history, visited his pediatrician in January 2008 with an asymptomatic papule on the lobe of his left ear. The papule had appeared 3 years earlier, specifically 3 months after the boy had started wearing an earring. The lesion was removed in the general surgery department and the patient was referred to our department with a histology report describing a "sarcoidal granulomatous infiltration with no evidence of refringent material in the sample" (Fig. 1). Physical examination revealed a papule with residual scarring on the lobe of the left ear but there were no other relevant mucocutaneous or systemic findings. A chest radiograph and laboratory tests, including angiotensin-converting enzyme and serum and urine calcium measurements, ruled out systemic sarcoidosis.

Skin patch tests were performed using the standard series of the Spanish Contact Dermatitis and Skin Allergy Research Group (GEIDAC) (T.R.U.E. TEST; Mekos Laboratories), additional allergens from Chemotechnique Diagnostics, and a series of 33 metal allergens provided by Marti Tor. Readings were performed at 48, 96, and 168 hours. At 168 hours (day 7), positive reactions were observed for palladium chloride (++), platinum chloride (++), ammonium tetrachloroplatinate (++), and mercury (++). In all cases, the lesions had an eczematous appearance (Fig. 2).

Inductively coupled plasma mass spectrometry (ICP-MS) was used to determine the metal content of the 3 earrings (M1, M2, and M3) brought in by the patient (Table 1). The

main component in all 3 earrings, including the one that had triggered the initial skin reaction (M1), was palladium. Based on these results, we established a diagnosis of allergic contact granuloma due to palladium.

The patient had 2 positive reactions on his back when examined 3 months later. The first was a persistent reaction to the palladium chloride patch. The lesion no longer had an eczematous appearance and was firm on palpation, suggesting granulomatous infiltration. Biopsy was not possible, however, as the parents withheld their consent. The second reaction was similar to the first and was located at the site of the beryllium patch, which had tested negative on day 7. The reaction was interpreted as an active sensitization. The patient had stopped wearing earrings and no recurrent lesions were identified, either on the ear lobes or at other sites. Further examination was not possible as the patient did not return for any of the scheduled follow-up visits.

Since the European Nickel Directive came into force on July 2001 limiting the amount of nickel that can be used in jewelry or released during its use, the availability of so-called safe earrings has become widespread. While these earrings contain little or no nickel they do contain other metals.² ICP-MS analysis of the earrings brought in by the patient revealed the presence of expected metals, such as palladium, but it also showed unexpected metals that could, in the future, cause unknown or potentially dangerous adverse reactions. One example is gadolinium, which was detected in all 3 earrings, and in 1 of them, in considerable concentrations.

Among other allergens, our patient was sensitized to palladium and platinum, but not to nickel. Because mass spectrometry showed that the earring that had triggered the initial reaction (M1) contained palladium as a major component and did not contain platinum, our final diagnosis was allergic contact granuloma due to palladium. The positive reaction to platinum was interpreted as a concomitant or cross-reaction with palladium, as both metals are in the same group in the periodic table.

Apart from palladium, numerous metals (and sources of exposure) have been implicated in granulomatous allergic contact dermatitis. These include beryllium (mining, fluorescent lighting tube and beryllium alloy production); aluminium (adjuvant in vaccines and hyposensitization extracts, deodorants, and tattoos); zirconium (deodorants); titanium (pacemakers); nickel (sternotomy suture material); mercury, chromium, and cobalt (mainly tattoos).³

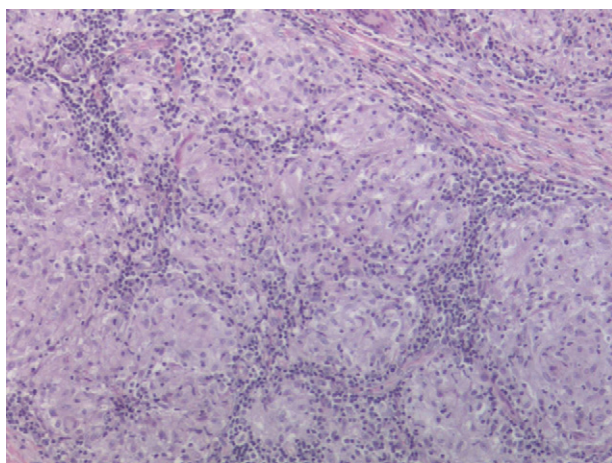
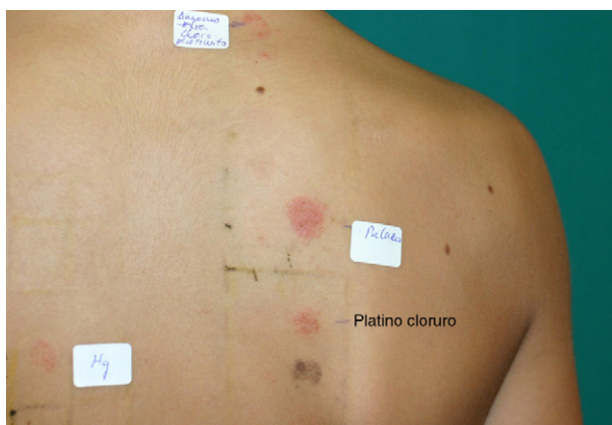
Sensitization to palladium generally manifests as eczema, but on rare occasions it can trigger the formation

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Table 1 Metal Composition of Earrings Brought in by the Patient (Semiquantitative Analysis).

Earrings	Major Components	Minor Components
M1 ^a	Cu, Pb, Zn, Na, K, Fe, Al, Gd, Pd, Sn, Se, Au	Cr, Ni, W
M2	Au, Cu, Na, K, Ca, Fe, Al, Gd	Mg, Cr, Ni, Zn, Pd, Pb, Cd, W, Pt
M3	Au, Cu, Na, K, Ca, Fe, Al, Gd	Mg, Cr, Ni, Zn, Pd, Pb, Cd, W, Pt

^a Earring that triggered the initial reaction.

**Figure 1** Sarcoid-type granulomatous inflammation (hematoxylin-eosin staining, original magnification ×10).**Figure 2** Sensitization to palladium, platinum, mercury, and ammonium tetrachloroplatinate.

of sarcoid-type granulomas due to a type IV hypersensitivity reaction. Like other authors,³ we believe that this granulomatous reaction is related to individual factors rather than to the nature of the metal and is probably an indication that individuals sensitized to the metal have a genetic predisposition that eventually induces a cytokine release pattern that favors the recruitment of macrophages, thereby resulting in the formation of a granuloma rather than the appearance of eczema. Consequently, such individuals, just like

patients who develop sarcoid-type granulomas and/or sarcoidosis following several tattoos, might constitute a risk group for systemic sarcoidosis.^{5,6}

On reviewing the literature, we found just 7 cases of contact allergic granuloma due to palladium in earrings; in 4 of these there was co-sensitization to nickel,^{3,4,7-10} which was not the case with our patient. Finally, our patient was the youngest of all the patients described in these reports, reflecting perhaps the increasing influence and popularity of piercing in young children.

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R. González-Pérez,* G. Ruiz-Carrillo, R. Soloeta

Servicio de Dermatología, Hospital Santiago Apóstol, Vitoria, Spain

* Corresponding author.

E-mail address: RICARDO.GONZALEZPEREZ@osakidetza.net (R. González-Pérez).