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

<table>
<thead>
<tr>
<th>Earrings</th>
<th>Major Components</th>
<th>Minor Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>Cu, Pb, Zn, Na, K, Fe, Al, Gd, Pd, Sn, Se, Au</td>
<td>Cr, Ni, W</td>
</tr>
<tr>
<td>M2</td>
<td>Au, Cu, Na, K, Ca, Fe, Al, Gd</td>
<td>Mg, Cr, Ni, Zn, Pd, Pb, Cd, W, Pt</td>
</tr>
<tr>
<td>M3</td>
<td>Au, Cu, Na, K, Ca, Fe, Al, Gd</td>
<td>Mg, Cr, Ni, Zn, Pd, Pb, Cd, W, Pt</td>
</tr>
</tbody>
</table>

* Earring that triggered the initial reaction.

**References**


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