

Granuloma Possibly Induced by Palladium after Ear Piercing

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A case of sarcoidal-type allergic contact granuloma due to palladium is presented. The patient developed papulonodular lesions at the right earlobe after ear piercing, which after 3 to 4 years became more granulomatous and very resistant to treatment. Repeated intralesional injections with corticosteroids produced only a temporary regression of the lesions. Patch testing revealed a strong positive reaction to palladium (and nickel). Biopsy specimens taken from the persistent granulomatous lesion in the nodule at the earlobe, as well as from the site of the positive test reaction to palladium several weeks after patch testing, indicated epithelioid granulomas with some multinucleate histiocytes surrounded by a lymphocytic-histiocytic infiltrate. Similar cases (also with other metals) have been reported in the literature.

Case Report

A 21-year-old woman consulted our outpatient clinic in August 2006 because a progressively growing nodulocystic lesion on her right earlobe had been developing for 1 year. The lesion was exactly located on the site where she had had her ear pierced 5 years previously. She had removed the earring 2 years previously because of recurrent inflammation that had started almost immediately after the piercing.

Clinical examination revealed a reddish purple coloration on the ventral side and a small and rather hard red nodule on the dorsal side of the right earlobe (Fig 1). She had never had the left earlobe pierced.

The differential diagnosis of sarcoidosis, foreign-body granuloma, and allergic contact granuloma was put forward.

A biopsy specimen showed a histopathologic picture of a granulomatous skin reaction with epithelioid histiocytes surrounded by a dense infiltrate of lymphocytes (Fig 2). No foreign material could be detected by polarized light microscopy.

Systemic localization of sarcoidosis at this time was excluded by radiography of the chest and by several laboratory tests (normal blood count, normal liver and kidney function, normal calcium, and no elevated angiotensin-converting enzyme). Patch testing with the

standard series (Trolab, Hermal, Germany) and the metal series¹ revealed a positive reaction to nickel and a strong positive reaction to palladium (Fig 3).

Five weeks later, the patient consulted the clinic again with a persistent skin reaction at the site of the palladium patch test; a more granulomatous rather than eczematous skin reaction was now present (Fig 4) and was confirmed by histopathologic examination (Fig 5). The application of a strong corticosteroid (betamethasone dipropionate [Diprolene cream, Schering-Plough, Heist-op-den-Berg, Belgium]) for 1 month brought no relief. We then treated both the earlobe and the patch-test sites with injections of another corticosteroid (betamethasone disodium phosphate [Celestone, Schering-Plough]) at a dosage of 5.3 mg/mL every 4 weeks. The granulomatous reaction on her back disappeared after one injection. However, there was only minimal improvement after three injections of the nodule on the right earlobe; hence, surgical excision was advised.

Discussion

Palladium is a rare silver-white transition metal of the platinum group. Along with nickel and silver, palladium can be alloyed with gold to produce white gold; moreover, it is used in dentistry, in watchmaking, in aircraft spark plugs, and for the production of medical instruments and electronic contacts.² Contact allergic (eczematous) reactions to palladium are usually seen in relation to “hypoallergenic” jewelry¹ because it frequently replaces nickel, with which it frequently cross-reacts.^{1,3} According to some authors, this could be explained by the fact that they both

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Figure 1. Dorsal side of the right earlobe, showing a small and rather hard red nodule.

belong to group VIII of the periodic table.^{3,4} However, Vincenzi and colleagues suggested that the cross-reaction was due rather to a similar stereochemical arrangement.⁵ In 7 of 9 cases described in the literature (and as in this case), a positive patch-test reaction to nickel as well as palladium was found.^{1,6-9}

In the case presented here (as in two previously reported cases¹ in which the presence of palladium in the earrings that caused the reaction was confirmed by

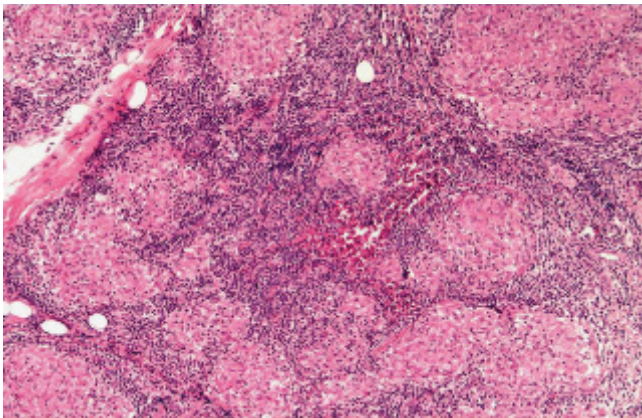


Figure 2. Histopathologic examination shows numerous granulomas of epithelioid histiocytes surrounded by a dense infiltrate of lymphocytes (hematoxylin and eosin staining, $\times 5$ original magnification).



Figure 3. A strong positive reaction to palladium.

chemical analysis), the diagnosis of an allergic contact granuloma is most likely; indeed, the positive patch-test reaction to palladium, and not the reaction to nickel, became itself granulomatous. Eight such cases have been reported in the literature; in the first case reported, by Jappe and colleagues in 1999,¹⁰ the results of histologic



Figure 4. Persistent positive reaction to palladium 5 weeks after testing.

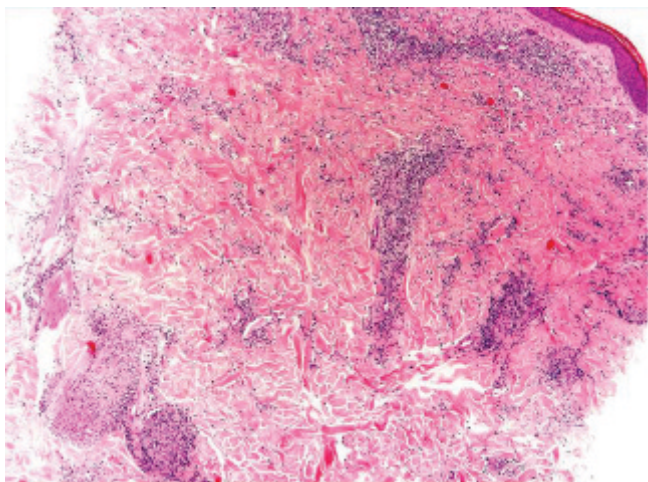


Figure 5. Histopathologic picture of the granulomatous palladium-positive patch-test site 5 weeks after testing (hematoxylin and eosin staining, $\times 5$ original magnification).

examination of both the original piercing site (always on the earlobe) and the positive palladium patch-test site were identical to ours. In just one patient, a persistent reaction on the patch-test sites for both nickel and palladium was reported.⁸ Similar cases have occurred with nickel, gold,^{11,12} and platinum from ear piercings.

Histopathologic examination revealed sarcoidal granulomas, which can fit with an allergic contact granuloma, but sarcoidosis also had to be considered especially because sarcoidal granulomas may occur in scars following trauma. In some cases, these lesions may be the first manifestation of sarcoidosis. However, the result of systemic investigation for sarcoidosis was negative. Nevertheless, in our case, a Koebner phenomenon cannot be excluded. This means that the development of the sarcoidal granulomatous reaction, which is characteristic of sarcoidosis, may not be caused by palladium itself but might be a secondary phenomenon caused by the intense allergic reaction to palladium.

We have not found any case reports in the literature that describe an allergic contact granuloma as a complication of piercing on other sites of the body. Perhaps on these sites titanium ornaments are more often used¹⁰ although a granulomatous allergic reaction even to titanium (due to its presence in a pacemaker) has been described.¹³ Indeed, allergic granulomatous reactions to other metals and their salts from several exposure sources have been described^{8,10}; these sources include beryllium in mining, fluorescent tube production, and beryllium alloy production¹⁴; aluminium as adjuvant in vaccines and hyposensitization extracts and in antiperspirants and

tattoos (also for cosmetic purposes)^{15,16}; zirconium in antiperspirants; mercury, chromium, and cobalt used as pigments in tattoos; and in orofacial granulomatosis. Moreover, a case of a granulomatous contact dermatitis due to a lotion containing 20% propolis has also been described.¹⁷

Conclusion

A case of sarcoidal-type allergic contact granuloma caused by exposure to palladium was presented. On histopathologic examination, both the piercing site and the site of a positive patch-test reaction to palladium (5 weeks after the test) showed a granulomatous skin reaction with epithelioid histiocytes surrounded by a dense infiltrate of lymphocytes.

When a patient presents with the clinical and histopathologic diagnosis of a granulomatous reaction, contact with metals, especially at ear-piercing sites, should be considered. Such reactions are very resistant to treatment and often require surgical excision.

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