

Persistent granulomatous contact dermatitis due to palladium body-piercing ornaments

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Key words: palladium chloride; epithelioid granuloma; allergic contact dermatitis; body piercing; jewelry; nickel; cobalt; cross-sensitivity. © Munksgaard, 1999.

There are few reports of granuloma induction by metals and their salts. Beryllium-induced granulomas are an occupational disease in mining and fluorescent tube production (1, 2). Metal-induced granulomatous reactions have been reported for aluminium, used as an adjuvant in vaccines and hyposensitization extracts, as well as in antiperspirants and in tattoos (3–7), zirconium (antiperspirants) (7, 8), mercury, chrome, cobalt (pigments in tattoos and orofacial granulomatosis) (8–11), nickel (sternotomy wires) (12) and gold (jewelry) (13).

Case Report

A 15-year-old girl presented with nodules on both ear helices, where she had been pierced for wearing palladium earrings 5 years earlier. Conventional piercing of the earlobes, performed shortly after birth for silver earrings, remained asymptomatic. Other body piercing locations (i.e., umbilicus, tongue), housing titanium ornaments, were symptomless. Clinical examination revealed 3 yellowish-brown nodules on both helices, tender on pressure, 0.4 to 0.5 cm in diameter, corresponding to the sites of piercing. There was no regional lymphadenopathy. Biopsies demonstrated epithelioid, non-caseating, acid-fast-negative dermal granulomas, rich in lymphocytes, showing an outer rim of CD8+ T-cells, while CD4+ T-cells homogeneously interspersed the infiltrate. Blood counts, blood chemistry and calcium, phosphate and angiotensin-converting enzyme levels were within normal range. Chest X-ray showed no evidence of sarcoidosis. Tuberculin testing (Multitest, Merieux®) was negative.

Patch testing was performed with a standard series (German Contact Dermatitis Research Group) and various metals (copper II sulfate 1% aq., and cobalt chloride 1%, nickel sulfate 5%, sodium thiosulfatoaurate 0.25%, palladium chloride 1%, cadmium chloride 0.5%, chromium 1%, all pet.). Cobalt chloride and nickel sulfate gave positive patch test reactions after 2 and 3 days, as did palladium chloride, which was +++ after 4 days and persisted for more than 25 days, transforming during this period from an initial typical acute eczema-like, Type IV allergic reaction to a persistent, nodular dermatitis without epidermal involvement. Biopsy of this patch test site revealed dermal granulomas like those found in the original lesions.

Discussion

In 1958, Shelley & Hurley (8) demonstrated that intradermal injection of high doses of zirconium induced for-

eign-body-type granulomas, while small doses induced epithelioid granulomas. Such reactions do not always coincide with positivity on routine patch testing; sometimes, only a subsequent intradermal test is positive, though such testing is not free from side-effects (14).

Allergies to palladium chloride develop typically as non-granulomatous contact reactions to constituents of denture materials or jewelry. Most such patients are female. The majority of palladium-chloride-allergic patients also show sensitization to nickel sulfate, as was the case in our patient. This cross-reactivity may explain why nickel-sensitive patients often react to nickel-free, but palladium-containing, jewelry and ornaments marketed as "non-allergic". Because of the patient's history, the results of patch testing, dermatohistopathology and the fact that mycobacteriosis, sarcoidosis and foreign-body reaction were excluded, we conclude that our patient showed a granulomatous contact dermatitis due to palladium chloride. To the best of our knowledge, this is the 1st observation of its kind to be reported.

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Adverse cutaneous reactions to cosmetic allergens

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We report a retrospective European survey of allergic contact reactions to cosmetics. Data on 475 patients with contact allergy to cosmetic ingredients, observed during a 4-month period (January–April 1996), were collected in 5 European dermatology centres: 1.: 40%, 2.: 16%, 3.: 8%, 4.: 18%, 5.: 18%. Results are given in Tables 1–3.

Although perfume components are still the most frequent allergens in cosmetics (e.g., (1)), they rank 2nd here (Table 1) since data on perfumes and toilet waters, aftershave lotions, and deodorants, the main agents of perfume allergy, were excluded from this study.

Individual differences between clinics (countries) may be ascribed to several factors.

Table 1. Number of positive reactions to cosmetic allergens by class

1. preservatives	165
2. perfume components ^{a)}	144
3. active/category-specific ingredients	112
4. excipients/emulsifiers	105
5. sunscreens	43
6. antioxidants	22

^{a)} Not including fragrance mix ingredients.

Table 2. Reaction rate of each class of cosmetic allergens identified in the various groups of cosmetic products

	Preservatives	Perfume components	Excipients/emulsifiers	Sunscreens	Active/specific	Antioxidants
cleansers	35	26	20	1	1	3
skin care	92	91	61	8	24	9
hair care	12	7	4	–	72	1
suncare	7	9	4	31	1	3
make-up	19	11	16	3	14	6

Table 3. Allergens (INCI) identified and categorized per class and per centre

	Total	Belgium	UK	Germany
(a) Preservatives				
methyl(chloro)isothiazolinone	47	31	14	2
formaldehyde	21	14	9	–
diazolidinyl urea	19	10	9	–
quaternium-15	19	4	15	–
methyldibromoglutaronitrile	15	11	1	3
imidazolidinyl urea	14	8	6	–
2-bromo-2-nitropropane-1,3-diol	10	1	8	1
parabens	8	3	3	2
DMDM hydantoin	4	3	–	1
phenoxyethanol	3	3	–	–
chloroacetamide	2	1	1	–
thimerosal	1	–	–	1
phenyl mercuric borate	1	1	–	–
methyldibromoglutaronitrile (and) phenoxyethanol	1	1	–	–
Antioxidants				
propyl gallate	8	1	7	–
t-butyl hydroquinone	6	–	6	–
BHA	3	2	1	–
vitamin E	2	1	1	–
ethylenediamine	1	1	–	–
sodium metabisulfite	1	1	–	–
octyl gallate	1	–	–	1
(b) Perfume components				
fragrance mix	95	56	27	12
balsam of Peru	41	29	9	3
rosin ^{a)} (=colophony)	3	3	–	–
limonene	1	1	–	–
lemongrass oil	1	–	–	1
salicylaldehyde	1	–	–	1
vanillin	1	–	1	–
wood tars	1	1	–	–

^{a)} Also ingredient in make-up (e.g., eyeshadow, mascara).