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Cement and Retarder-Associated Systemic Contact Dermatitis in a Chromium-Negative Patch-Tested Patient

To the Editor:

A year before referral, a 44-year-old male Japanese concrete worker developed widespread pruritic rashes, especially while sweating at work (Fig. 1A). He had no medical history. He had been using a retarder (CSE-pro GmbH, Sonthofen, Germany) at work over the past 2 years and typically used a dust

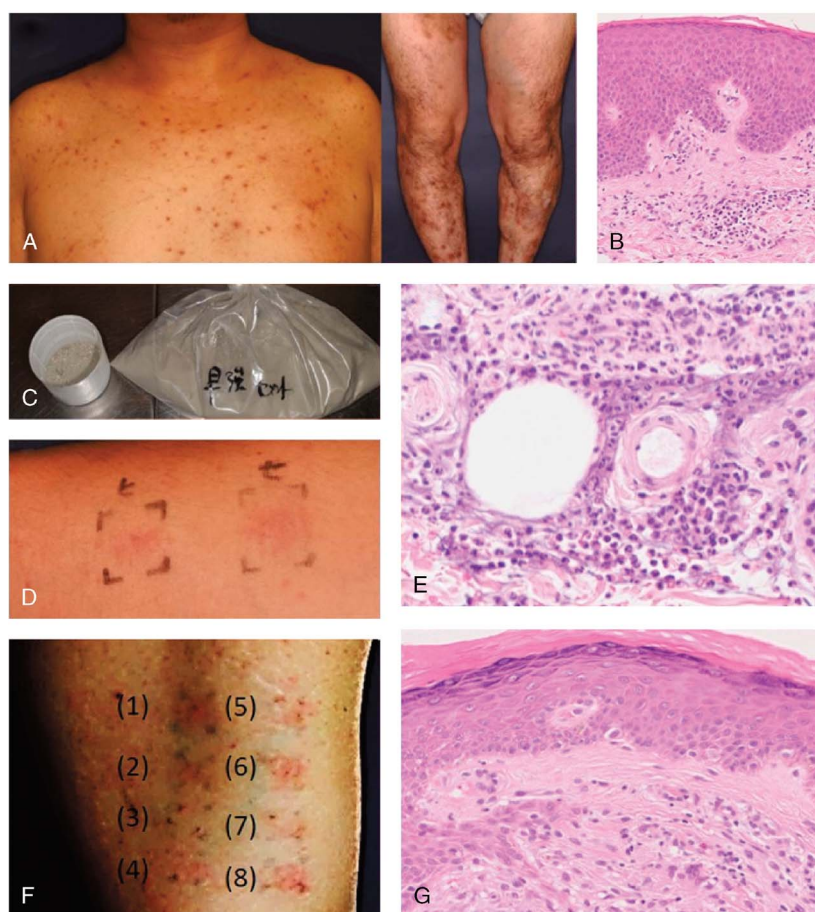


Figure 1. A, Clinical images at his first visit. Pruritic dark brown hyperpigmented nodules on the whole body. B, The skin biopsy from the chest showed epidermal mild acanthosis, a few necrotic epidermal cells, and basal hyperpigmentation (hematoxylin-eosin stain, original magnification $\times 100$). C, The retarder (left) and cement (right) used in his workplace. D, Clinical images at open patch test of the retarder and cement showed irritant reactions on the right arm. E, The closed patch test from areas numbered 6 showed on higher power from positive reactions on open patch test of cement. There is mixed inflammatory infiltrate composed of lymphocytes, neutrophilic inflammation, and few eosinophils around the sweat glands (hematoxylin-eosin stain, original magnification $\times 400$). F, Closed patch tests of cement and a retarder to check for allergic reactions, using concentration gradients of 1/1000, 1/100, and 1/10 dissolved in white Vaseline (Syowa Pharmaceutical, Co, Ltd). Positive patch test results to cement and a retarder, determined at day 7 as per the International Contact Dermatitis Research Group. Positive reactions on areas numbered 1, 2 (+), 6, and 8 (? +). G, Partial epidermal necrosis, spongiosis, dermal eosinophilia, and perivascular dermatitis (hematoxylin-eosin stain, original magnification $\times 200$).

mask; however, during summer, he worked without a mask and therefore inhaled cement dust. Although improvement was seen after administration of cyclosporine or prednisolone (0.4 mg/kg), dermatitis recurred after discontinuation of oral medication prescribed by the previous doctor. Histopathological examination showed focal liquefaction degeneration and dermal eosinophilia (Fig. 1B). Whole-body computed tomography revealed no abnormalities. A patch test for metals, including Panel (S), provided by Sato Pharmaceutical, Co, Ltd, and 17 reagents, provided by Torii Pharmaceutical, Co, Ltd, which included chromium and Japanese baseline series (Table 1), did not reveal any allergic reactions on day 2, 3, 7. Open patch tests of Portland cement and a retarder (Fig. 1C), which are unresponsive in healthy people, showed an irritant reaction after 4 hours (Figs. 1D, E).

According to the International Contact Dermatitis Research Group system,¹ results at 1 week showed a positive reaction to cement and retarder (Fig. 1F). It was thought that the barrier function of his skin had deteriorated and become sensitized by the cement.

After the patch tests, the patient experienced widespread involvement of the skin. Histopathology of the erythema was similar to type IV allergic reaction (Fig. 1G), which is often associated with eosinophil infiltration and Langerhans cell microgranuloma. In addition, it is plausible that were present.

The patient partially improved when the retarder was avoided for 4 weeks and sufficiently improved when both retarder and cement were avoided. However, he could not change employment or accept alternative work without contact with concrete. Eczema related to concrete recurred 2 weeks later.

DISCUSSION

In the case of systemic contact dermatitis due to inhalation of cement, metal patch tests of potassium dichromate 0.5% petrolatum often show false-negative results.² Like paint, a retarder can generate dust after application on the cement. Although there are no reports on closed patch tests for contact dermatitis due to cement and retarder, these agents are known skin irritants and can be tested safely using a 0.1% dilution patch test. This helps distinguish between allergic contact dermatitis and irritation, when evaluated in the context of reaction timing and delayed expression.

In this case, both cement and retarder had positive patch tests. Despite no evidence, SiO₂ might be one of the causing agents because it is the main composition of the cement and retarder but was not included in the patch test series.

Portland cement contains trace elements in addition to CaO, SiO₂, Al₂O₃, Fe₂O₃, MgO, SO₂, and Cr⁶⁺ (hexavalent chromium).³

TABLE 1. Japanese Baseline Series (Allergens and Allergen Content in Patch Test Panel (S), Mercuric Chloride, and Urushiol [A] and a Patch Test for 17 Metals Provided by Torii Pharmaceutical Co, Ltd [B])

Substance	No. Positive
A	
Nickel sulfate 0.16 mg hydroxypropyl cellulose	—
Lanolin alcohol 0.81 mg povidone	—
Fradiomycin sulfate 0.49 mg povidone	—
Potassium dichromate 0.044 mg povidone	—
Caine mix 0.51 mg povidone	—
Fragrance mix 0.402 mg povidone, β-cyclodextrin	—
Rosin 0.97 mg povidone, butylhydroxyanisole, dibutylhydroxytoluene	—
Paraben mix 0.80 mg povidone	—
Balsam of Peru 0.65 mg povidone	—
Gold sodium thiosulfate 0.061 mg hydroxypropyl cellulose	—
Cobalt chloride 0.016 mg hydroxypropyl cellulose	—
p-tert-Butylphenol-formaldehyde resin 0.036 mg hydroxypropyl cellulose	—
Epoxy resin 0.041 mg hydroxypropyl cellulose	—
Carba mix 0.204 mg hydroxypropyl cellulose	—
Black rubber mix 0.060 mg povidone	—
Isothiazolinone mix 0.0032 mg povidone	—
Mercaptobenzothiazole 0.061 mg povidone	—
Paraphenylenediamine 0.065 mg povidone	—
Formaldehyde 0.150 mg povidone, dry sodium carbonate, sodium hydrogen carbonate	—
Mercapto mix 0.060 mg povidone	—
Thimerosal 0.0057 mg povidone	—
Thiuram mix 0.022 mg povidone	—
Mercuric chloride 0.05%	—
Urushiol (0.002%)	—
B	
Aluminum chloride 2%	—
Cobalt chloride 2%	—
Stannic chloride 1%	—
Ferric chloride 2%	—
Platinic chloride 0.5%	—
Palladium chloride 1%	—
Manganese chloride 2%	—
Indium trichloride 1%	—
Iridium (IV) chloride 1%	—
Silver bromide 2%	—
Potassium dichromate 0.5%	—
Chromic sulfate 2%	—
Nickel sulfate 5%	—
Zinc chloride 2%	—
Chloroauric acid 0.2%	—
Copper sulfate 1%	—
Mercuric chloride 0.05%	—

Petrolatum was contained as a control.

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A retarder contains SiO_2 , Na_2CO_3 , $\text{C}_6\text{H}_8\text{O}_7$, and other unknown metals, as mentioned in the Material Safety Data Sheet.⁴

Because the patient's skin partially improved when avoiding the retarder, the patient had likely developed eczema from the retarder after being sensitized to the cement. Dermatologists should be aware that a retarder can also cause dermatitis in concrete workers.

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Severe Airborne Allergic Contact Dermatitis From the Invasive Species *Oncosiphon piluliferum* (Globe Chamomile)

To the Editor:

A 32-year-old otherwise healthy non-atopic man presented to the clinic complaining of 4-month history of intensely itchy, blistering, red, scaly rash that began on the face, spread to the forearms, and then spread to the trunk. He works as a car mechanic and was initially concerned that his symptoms were due to workplace exposures but did not improve with work avoidance or changing his work uniform. He had intermittent improvement

with 3 courses of oral prednisone, topical triamcinolone, and oatmeal baths. He switched to Free & Clear personal care products. When he presented for patch testing, he complained of intermittent fevers and chills and had bilateral axillary and left inguinal mobile tender lymphadenopathy. Laboratory results were pertinent for lymphocytosis with absolute eosinophilia and neutrophilia and elevated lactate dehydrogenase level at 519 IU/L.

Patch testing was performed with T.R.U.E. test, a modified American Contact Dermatitis Society core series, and a modified series based on car mechanic exposures. Non-Food and Drug Administration–approved allergens were obtained on a prescription basis from the SmartPractice Allergen Bank Compounding Pharmacy. At 96 hours, he had a 1+ reaction to Compositae mix 6% petrolatum, a doubtful reaction to parthenolide (T.R.U.E. test), and a doubtful reaction to sesquiterpene lactone mix 0.1% petrolatum. His personal care products did not contain any Compositae derivatives. He noted that there were large areas of his yard that had high-density globe chamomile growth for the last 2 years. He was subsequently patch tested with dry and fresh specimens of globe chamomile and had bullous reactions at 72 and 96 hours. He was started on cyclosporine for symptomatic control. He removed these plants from his yard and has seen good improvement at follow-up.

Globe chamomile (*Oncosiphon piluliferum*) is a winter flowering plant in the Asteraceae family that is endemic to South Africa, which has been used in traditional folk medicine and has been shown to contain sesquiterpene lactones.¹ It was introduced in California in the 1980s and has become an invasive species; it can be found in much of Southern California and South/Central Arizona.² Members of the aster family are common causes of airborne allergic contact dermatitis but are most classically seen in florists, gardeners, and farmers (Figs. 1, 2).³

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D.H. is a first-degree relative of C.H., the owner of SmartPractice, a company that manufactures and distributes patch test supplies.

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