

CONTACT POINT

Urushiol-induced airborne and systemic pustular dermatitis from Japanese lacquer

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1 | INTRODUCTION

Systemic allergic dermatitis (SAD) due to *Rhus* (lacquer), containing the highly potent contact allergen urushiol, is common in East Asia.

The most frequent SAD subtype is an erythematous maculopapular rash. Other subtypes like erythema multiforme and erythroderma have been reported, but pustular and purpuric skin manifestations are rare.¹



FIGURE 1 Edematous erythema of the face with vesicles and pustules, and an erythematous maculopapular rash on the trunk and extremities, showing a mixture of purpura and vesicles

2 | CASE REPORT

A 57-year-old Japanese man with untreated type 2 diabetes presented with acute fever, facial edema, and a 3-day history of generalized erythematous and pruritic lesions. He complained of no respiratory symptoms. He had repaired broken ceramics using lacquer for several days until 4 days before consultation. He had no history of psoriasis, medication use, or allergies. Physical examination revealed fever (38.9°C), and facial edema was accompanied by multiple, small facial vesicles and pustules on a background of erythema. An erythematous to purpuric maculopapular rash was observed on the trunk and extremities. Moreover, vesicular, erythematous skin lesions were noted on the neck, upper limbs, and lower abdomen (Figure 1); no mucosal lesions were present. Laboratory studies revealed leukocytosis (20 100/ μ L [normal range, 3900 – 9000/ μ L]) and neutrophilia (94.0% [30%-70%]) without eosinophilia. A skin biopsy revealed epidermal pustules containing lymphocytes, eosinophils, and neutrophils, along with marked spongiosis, intraepidermal lymphocytic infiltration, advanced dermal edema, and perivascular lymphocytic infiltration with few eosinophils in the upper dermis (Figure 2). Bacterial culture of the pustules was negative. The patient was hospitalized and treated with topical corticosteroids and oral antihistamines, followed by a short course of systemic corticosteroids; subsequently the symptoms and skin lesions rapidly resolved. As urushiol-induced airborne and SAD from inhalation was suspected, a patch test was performed using 0.002% urushiol pet. (Torii Pharmaceutical Co., Tokyo, Japan)² and pet. (control) 4 weeks after lesion resolution and systemic steroid discontinuation. The patch was applied with an adhesive tape (Torii Pharmaceutical Co.)² for 2 days. Based on ICDRG guidelines, the results were + on day (D)2 and ++ on D3 and D7.

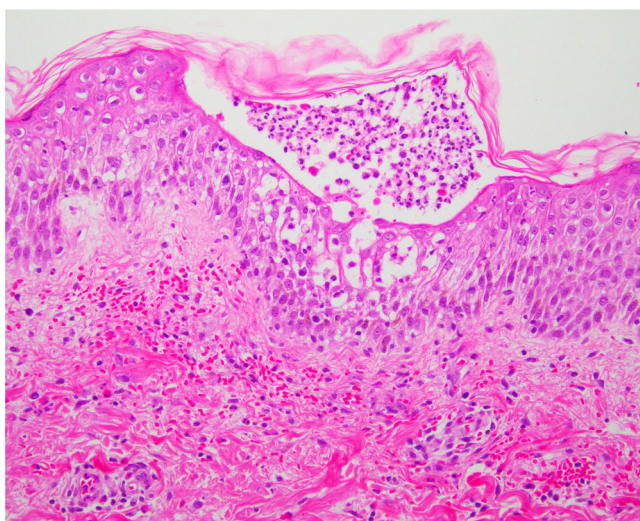


FIGURE 2 Epidermal spongiosis, dermal edema, and perivascular infiltration of lymphocytes and eosinophils, with an epidermal pustule comprising lymphocytes, eosinophils, and neutrophils (hematoxylin & eosin staining; original magnification, $\times 100$)

3 | DISCUSSION

SAD may develop when an individual who was sensitized to a contact allergen (cutaneous route) is re-exposed to the same allergen via the systemic route (ingestion or inhalation).³ During his professional activities, our patient applied lacquer to pottery using a handheld brush on the first day. He repeatedly wiped undried lacquer in a small, humid room with inadequate ventilation on the following days. Except for the first day, he wore gloves when he worked, but no mask was worn throughout the process. Hence, cutaneous (direct and/or airborne) sensitization to urushiol might have developed, with subsequent elicitation of airborne and systemic dermatitis; the latter was likely owing to the inhalation of lacquer fumes.¹ Our patient had polymorphic skin lesions, including facial pustules, truncal purpura, and fever, which are features of lacquer-induced SAD.¹ The localized pustular facial skin lesions are also reminiscent of pustular allergic contact dermatitis (PACD), a rare variant of allergic contact dermatitis, presenting with multiple, small pustules on an erythematous and edematous background; lymphocytic infiltration of epidermal pustules are characteristic histological findings.⁴ Moreover, our observation of SAD might represent another case of acute generalized exanthematous pustulosis (AGEP)-like dermatitis induced by a contact allergen; typical AGEPs are associated with the ingestion of *Rhus* in food (eg, “lacquer chicken”) or herbal medicine.^{5,6} The severe edematous facial erythema in our case was probably caused by severe focal allergic reactions following facial exposure to lacquer-related airborne allergens, whereby cytokines and chemokines may have induced leukocyte migration to the epidermis, leading to localized pustular eruptions, as reported in patients with PACD.⁷ Recognizing this rare partially pustular and occupational manifestation of *Rhus* (lacquer)-induced airborne and systemic dermatitis is crucial for diagnosis and management of similar cases.

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CONFLICT OF INTEREST

None to declare.

AUTHOR CONTRIBUTIONS

Takahiro Mizuta: Visualization (equal); writing – original draft (equal).
Satie Kasami: Writing – review and editing (supporting). **Yohya Shigehara:** Writing – review and editing (supporting). **Miyuki Kato:** Writing – review and editing (lead).

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