

CPD

Systemic contact dermatitis, itching to find a cause: the penny drops

S. Ashcroft,¹  L. Howard,² R. Patel,³ T. Churchill,¹ E. Carras,⁴ D. Sadigh³ and R. Sullivan⁵Departments of ¹General Medicine, ³Gastroenterology, ⁴Dermatology, ⁵Care of Older People Whittington Hospital, London, UK; and ²Department of Dermatology, Kent and Canterbury Hospital, Canterbury, UK

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A 94-year-old woman presented to the acute medicine department with worsening confusion and a widespread erythematous rash. Her medical history included Alzheimer dementia and Paget disease, but she took no regular medication.

Close physical examination of the patient's skin revealed a widespread exfoliative dermatitis affecting most of her body surface area, with islands of sparing. The patient was suberythrodermic. There were areas of impetiginization and widespread excoriations, with no vesicles or targetoid lesions (Fig. 1).

Her initial investigations demonstrated leucocytosis ($17.8 \times 10^9/L$; normal range $4\text{--}11 \times 10^9/L$), eosinophilia ($1.4 \times 10^9/L$; $0.04\text{--}0.4 \times 10^9/L$) and raised C-reactive protein (101 mg/L; normal < 10 mg/L). The patient was prescribed regular emollients, oral antibiotics and a potent topical steroid; however, her skin showed only mild improvement and would quickly rebound when the topical steroid application was weaned.

A skin biopsy was taken, and histological examination demonstrated spongiosis and neutrophils in the superficial epidermal layers. Within the dermis there was oedema and a perivascular inflammatory infiltrate consisting mainly of neutrophils and occasional eosinophils. Direct immunofluorescence was normal.

Further review of the patient's medication history did not identify any drug triggers. Meanwhile, collateral history given by family members revealed a history of weight loss, so investigations for an underlying malignancy were arranged. Computed tomography

revealed a metallic density within the left upper abdomen. An upper gastrointestinal endoscopy, performed 4 weeks into the hospital stay, demonstrated an eroded British 10-pence coin, dated 2013, in the fundus of the stomach (Fig. 2). The coin was endoscopically removed using a Roth Net[®] retriever.

In view of this finding, urinary nickel levels were tested and found to be elevated at 84 600 nmol/L (nickel/creatinine ratio of 1226.1 nM/mM, normal < 19.0 nM/mM). Serum copper levels were normal.

Based on these findings, a diagnosis of systemic contact dermatitis (SCD) caused by nickel ingestion was suspected. The patient's skin condition quickly



Figure 1 Patient's back several weeks into admission, following some improvement to her skin condition with topical steroid treatment.

Correspondence: Dr Samuel J. Ashcroft, Department of General Medicine, Whittington Hospital, Magdala Avenue Archway, London, N19 5NF, UK
E-mail: samuel.ashcroft@nhs.net

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Figure 2 Endoscopic image of the coin embedded in the fundus of the stomach.

improved following endoscopic retrieval of the coin and her eosinophil count also normalized within 24 h, supporting our clinical suspicion.

This case demonstrates an interesting diagnostic challenge in identifying a cause of a widespread dermatitic rash with limited clinical history available. Although the exact prevalence is unknown, SCD is rare, and occurs in contact-sensitized persons upon re-exposure to the allergen or a cross-reacting molecule through a systemic route. However, the vast majority of patients sensitized topically to an allergen can tolerate it systemically without any symptoms; for example, most patients sensitized to the fragrances cinnamal and cinnamic alcohol can eat foods flavoured with cinnamon spice without any symptoms.

The most commonly reported dermatological manifestations of SCD include reactivation of dermatitis at previous sites or at the site of previous patch testing, development of vesicular hand dermatitis, a generalized maculopapular-vesicular rash, erythema multiforme, vasculitis, and symmetrical drug-related intertriginous and flexural exanthema (SDRIFE), also known as baboon syndrome,¹ and erythroderma. Although the pathogenesis of SCD remains incompletely understood, it is postulated to be an overlap of hypersensitivity reactions, particularly Types III and IV, resulting in inflammation by activated dendritic cells, keratinocytes, mast cells, macrophages, neutrophils and T cells.²

The most common causes of SCD are metals, medications and plants, including herbal products such as

balsam of Peru. Among metals, nickel is frequently implicated. Only a few cases of SCD from nickel have reported foreign-body ingestion, all of which were paediatric cases and involved the ingestion of Canadian coins, which have a higher nickel content than British coins.^{3–5} To our knowledge, this is the first reported case in an adult. In 2012, the Royal Mint changed the composition of British 10p coins from cupronickel (an alloy of copper and nickel), to nickel-plated steel. At the time, concern was raised by dermatologists that this distribution of nickel in the coin could result in an increased incidence of allergic contact dermatitis,⁶ and it was found that the new coins deposited four times the amount of nickel onto the skin when handling them, compared with the previous composition. Similar coinage had previously been banned in Sweden due to health risks.

This case represents an interesting, unexpected and unusual cause of a rarely recognized condition, and is a reminder that SCD should be considered as a differential in cases of erythroderma of uncertain aetiology.

References

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CPD questions

Learning objective

To gain up-to-date knowledge on the aetiopathogenesis and possible triggers of systemic contact dermatitis.

Question 1

Which immune mediator is most important in the aetiopathogenesis of systemic contact dermatitis?

A memorable patient

- (a) IgE antibodies.
- (b) IgG cytotoxic antibodies.
- (c) Immune complexes.
- (d) IgM cytotoxic antibodies.
- (e) T cells.

Question 2

Along with nickel, which of the following is a common allergen in systemic contact dermatitis (SCD)?

- (a) Balsam of Peru.
- (b) Gluten.
- (c) Nuts.
- (d) Oats.
- (e) Pollen.

Instructions for answering questions

This learning activity is freely available online at <http://www.wileyhealthlearning.com/ced>

Users are encouraged to

- Read the article in print or online, paying particular attention to the learning points and any author conflict of interest disclosures.
- Reflect on the article.
- Register or login online at <http://www.wileyhealthlearning.com/ced> and answer the CPD questions.
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