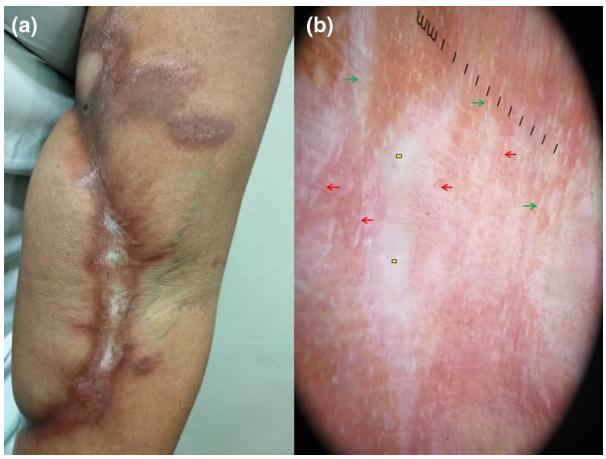

Figure 2 (a) After 1 month of treatment, the ulcerated annular plaque over the elbow has healed with morpheaform scarring seen as an ivory white sclerotic center and hyperpigmented border. The scar is encircling the medial aspect of the elbow causing restriction of movement. (b) Dermoscopy using the DermLite DL4 polarized mode (×10) shows whitish amorphous structureless areas (yellow boxes), chrysalis-like structures (green arrows), and linear irregular blood vessels (red arrows)

interspersed linear irregular blood vessels (Figure 2b). Biopsy showed epidermal atrophy and fibrocollagenous dermis.

Type I lepra reaction is seen in leprosy patients in the borderline spectrum and is commonly encountered in leprosy clinics. The usual presentation is increased erythema and/or edema in pre-existing skin lesions with or without neuritis. Ulcerated skin lesions are rarely encountered in severe reaction and usually heal with minimal or no scarring.[1–4] Healing with morpheaform scarring as in our case has hitherto not been reported. Increased skin levels of transforming growth factor (TGF-β1) which has fibrogenic properties may play a role in such presentation.[5]

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Hair analysis in the diagnosis of argyria

Dear Editor,

Argyria, an acquired condition caused by exposure to or ingestion of silver, presents with progressive onset of blue-gray discoloration of the sun-exposed skin, nails, and mucous membranes. Argyria presents as diffuse discoloration of the skin in up to 67% and isolated blue lunula in 20% of patients.[1,2] Diagnosis is usually clinical and can be confirmed by skin biopsy showing brownish-gray granule deposition in the dermis,[3] but diagnosis using other methods such as hair analysis has not yet been widely reported.

Hair can be easily utilized to detect exposure to toxins, chemicals, and trace elements.[4,5] We report here the ability to detect silver in a hair sample using scanning electron microscopy coupled with energy-dispersive x-ray spectroscopy (SEM/EDX). Our patient presented with chronic blue-gray discoloration affecting her skin, mucous membranes, and nails (Figure 1). History revealed she had ingested colloidal silver 0.35% droplets (Microdyn, Mexico) to "prevent infections" for 9 years in the past. As the patient's silver serum levels were normal (0.1 mcg/L; normal <5 mcg/L) and she refused a skin biopsy, we decided to evaluate the patient for argyria by hair shaft analysis using SEM/EDX. SEM

Figure 1 Clinical image of nails affected by argyria revealing black splinter hemorrhages, ridging of the nails, and bluish discoloration most prominently in the lunula

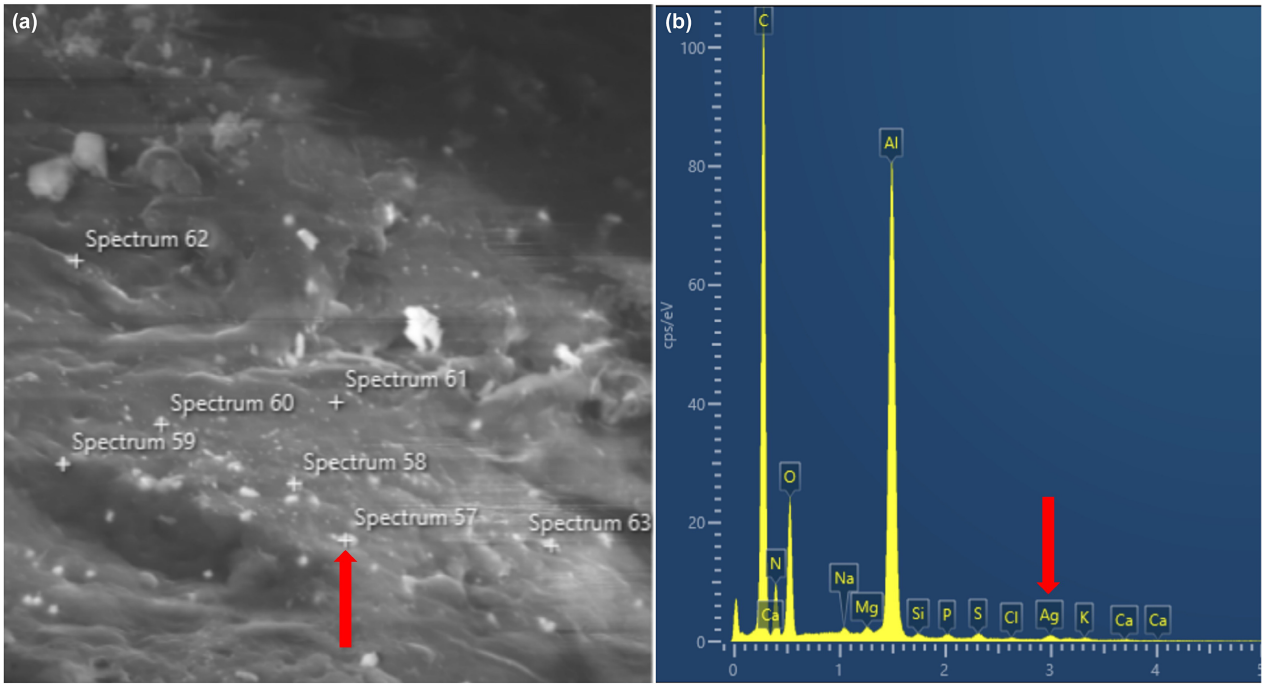

Figure 2 (a) Scanning electron microscopy with energy-dispersive x-ray spectroscopy (SEM/EDX) of the hair shaft showing multiple particles of exogenous material marked "Spectrum" followed by #57 to 63, and (b) the element analysis of the Spectrum #57. The peak size correlates with the amount of each element comprising the particle. Ag: silver, Al: aluminum, C: carbon, Ca: calcium, Cl: chloride, K: potassium, Mg: magnesium, N: nitrogen, Na: sodium, O: oxygen, P: phosphorus, S: sulfur, Si: silicon

revealed multiple particles on the hair shaft (Figure 2a). Analysis of these particles with EDX showed peaks corresponding to relative composition of each element. In addition to elements composing normal hair (e.g., carbon, nitrogen, oxygen, sulfur, silicon), silver was also identified (Figure 2b). Common simple salts (e.g., calcium, potassium, phosphorus, aluminum, chloride, sodium, magnesium) were also seen.

EDX is an analytical technique that determines the elemental composition of a sample by analyzing the x-rays emitted after passing an electron beam through the sample. Together with SEM, EDX can provide both qualitative and quantitative elemental analysis of samples as small as 1 nanometer in diameter. EDX analysis of hair has various applications in medicine, including detecting levels of micronutrients to assess the nutritional status in patients with inflammatory bowel disease[6] and identifying exposure to other heavy metals, such as nickel and molybdenum.[7]

In our patient, SEM/EDX was able to identify the presence of silver on the hair shaft. Hair analysis is more sensitive than serum testing, as trace metals have been shown to have elemental concentrations of about 10-fold greater in hair than in serum or urine.[8] However, the technology has several limitations that currently prevent widespread adaptation. There has not been a published correlation between levels of silver detected in hair and clinical symptoms, and it is currently difficult to discern whether the presence of silver on hair is because of ingestion or environmental contamination. Moreover, commercial hair analysis laboratories may have not validated their analytical techniques against standard reference materials. Although hair analysis is a potential noninvasive modality for diagnosing argyria, future studies are needed to refine methodology and establish diagnostic criteria.

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Detection of *Propionibacterium acnes* in cutaneous lichenoid sarcoidosis in a patient with Blau syndrome

Dear Editor,

Blau syndrome is a rare autosomal dominant genodermatosis caused by mutations in the NOD2 (also known as CARD15) and is clinically characterized by idiopathic granulomatous inflammation of multiple organs, mainly the skin, eyes, and joints.[1,2] Cutaneous manifestations of Blau syndrome are discrete, small lichenoid papules or ichthyosiform eruptions on the extremities and trunk.[2–4] Histopathology typically reveals non-caseating epithelioid cell granulomas in the dermis, and thus Blau syndrome is considered to overlap with early-onset sarcoidosis. We here retrospectively examined the localization of *Propionibacterium acnes* (*P. acnes*) by immunohistochemistry of a skin biopsy specimen.

A 3-year-old girl visited our hospital with asymptomatic skin eruptions that her parents had first noticed 1 year previously. Physical examination showed disseminated lichenoid eruptions distributed on the trunk and extremities (Figure 1a,b), and a skin biopsy specimen from the right lower leg showed non-caseating epithelioid granulomas containing giant cells in the dermis (Figure 2a). The patient was diagnosed with juvenile sarcoidosis. Although involvement of the lungs and eyes was not observed, she was followed up thereafter. Joint manifestations

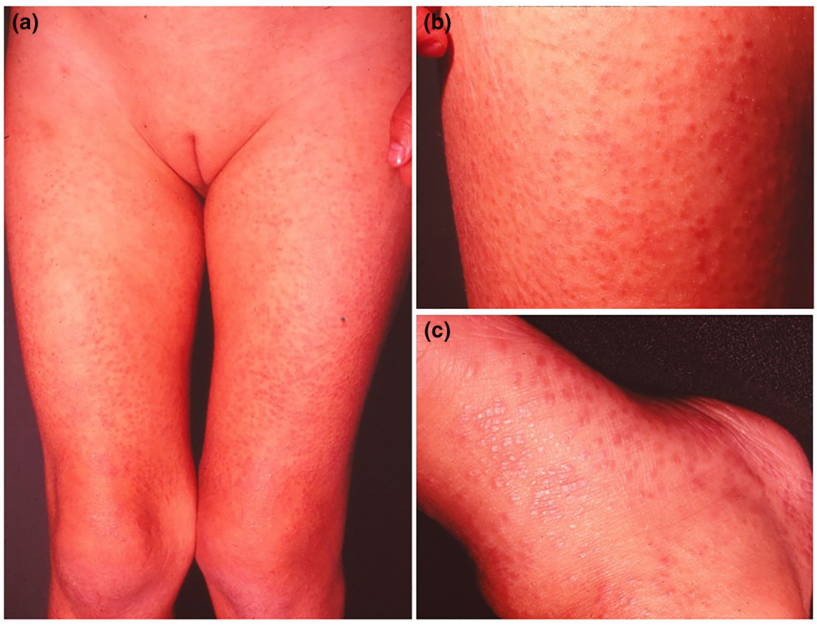

Figure 1 Clinical features showing disseminated flat lichenoid eruptions on the lower extremities (a–c)