

# Co-occurring features of scurvy and phrynoderma in the same patient



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## INTRODUCTION

Cutaneous lesions can be the first manifestation of many systemic diseases, including nutritional deficiencies. Although it is rare in developed countries, scurvy can still occur in malnourished patients, and it is far from being eradicated. Low levels of vitamin C can interfere with multiple organic functions and potentially be life-threatening. Dermatologists must be aware of cutaneous signs of nutritional deficiencies in order to provide comprehensive management of their patients' nutritional status, sometimes together with social intervention. We report co-occurring clinical findings of scurvy and phrynoderma in a patient with a limited diet.

## CASE REPORT

A 62-year-old woman with a personal history of depression presented with yellowish, scaly, waxy plaques on her forehead, nose, and cheeks (Fig 1, A). Physical examination revealed slight peeling and perifollicular erythema on her lower limbs (Fig 1, B). Two biopsy specimens were obtained from the facial and lower limb lesions for histopathologic study. The facial lesion showed dilated follicular infundibula filled with parakeratotic plugs (Fig 2, A to D). The biopsy specimen from the lower limb lesions showed hyperkeratosis, epidermal atrophy, mild lymphocytic perivascular and perifollicular inflammation, and marked red blood cell extravasation around hair follicles (Fig 3, A to D). The hair shafts of the involved follicles were twisted and fragmented. A histopathologic diagnosis of phrynoderma involving the face and scurvy involving the lower limbs was established. Laboratory evaluation disclosed low



**Fig 1.** **A**, Yellowish, scaly, waxy plaques on the patient's forehead. **B**, Perifollicular erythema with corkscrew hairs and slight peeling on the lower limbs.

levels of folic acid, vitamin C, vitamin D, and zinc. Vitamins A, E, and B<sub>12</sub>, proteins, and albumin were within normal limits. The patient was unemployed, living on her own, and on a low income. She reported not having eaten any fruits or vegetables in the previous months. The situation was brought to the attention of social services, and the patient was started on daily vitamins C, B<sub>12</sub>, and D, folic acid, and zinc supplements. A profound restructuring of her diet was carried out, with significant improvement of her cutaneous lesions.

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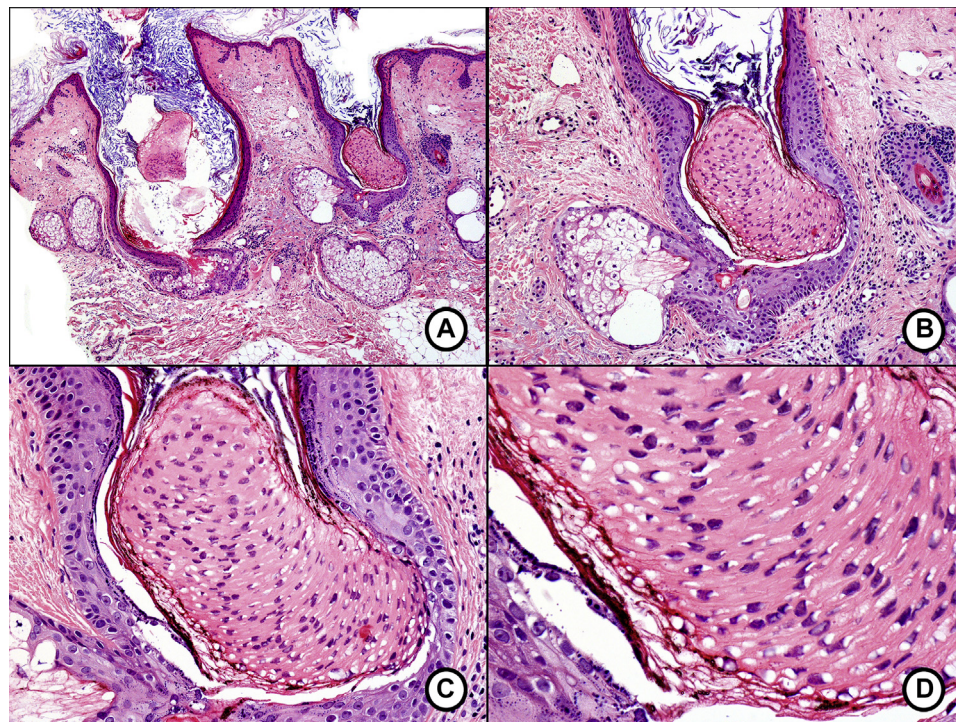
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**Fig 2.** Facial biopsy. **A**, Dilated follicular infundibula filled with parakeratotic plugs. **B to D**, Higher magnification of the parakeratotic plug. (Hematoxylin-eosin stain.)

## DISCUSSION

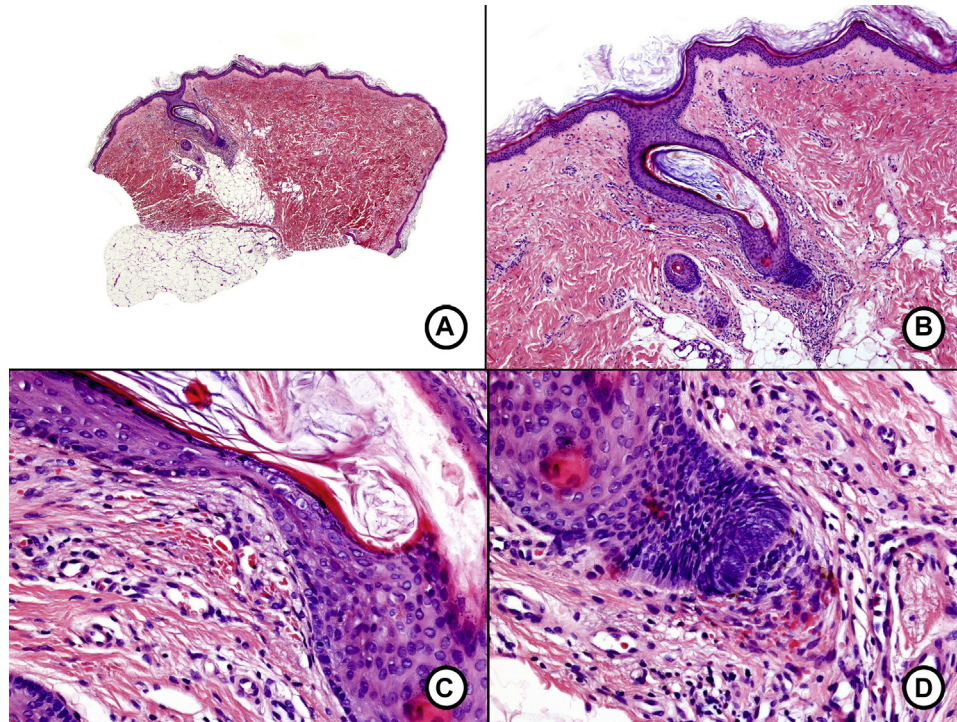
Scurvy is a nutritional disorder resulting from a sustained and severe vitamin C deficiency.<sup>1</sup> Vitamin C, or ascorbic acid, is a water-soluble molecule that is absorbed in the small intestine.<sup>1</sup> It is a cofactor in 15 enzyme pathways, playing a crucial role in the conversion of procollagen into structurally normal collagen. For this reason, its deficiency results in capillary and tissue fragility, leading to hemorrhage.<sup>2,3</sup> In addition to its contribution to the maintenance of soft tissue structure, vitamin C is important for immune regulation, immunity against infections, and hematopoiesis.<sup>1</sup> Humans cannot synthesize ascorbic acid. The main dietary sources of ascorbic acid are vegetables and fruits; there are minimal amounts in meat and milk.<sup>2</sup>

The skin is usually the first organ to show signs of scurvy. The classic cutaneous findings are dryness and roughness with hyperkeratotic follicular papules, corkscrew hairs, and perifollicular erythema, especially on the legs and buttocks.<sup>2</sup> These findings are correlated with skin biopsy results showing thickened stratum corneum and extravasated red blood cells in the upper dermis and around the hair follicles and other adnexal structures.<sup>1</sup> The gums may become friable, with swelling and bleeding.<sup>2</sup> Poor wound healing and blood vessel fragility manifesting with petechiae and ecchymoses can

also be seen.<sup>1</sup> Subungual bleeding may produce splinter hemorrhages. In more severe cases, bleeding can occur into the gastrointestinal tract, muscles, and joints and beneath the periosteum. Other manifestations can include lassitude and personality changes.<sup>2</sup> Anemia is another hallmark of scurvy, usually multifactorial in its pathogenesis.<sup>3</sup> It is important to have a high index of suspicion of scurvy if hemorrhagic skin lesions are present, even in the absence of classic signs of the disease, since the absence of timely treatment can be life-threatening. Death most often occurs from hemorrhage or infection and may be sudden.<sup>2</sup> When the appropriate replacement regimen is started, the clinical response is dramatic, with improvement of symptoms within 3 to 5 days and complete resolution in 1 to 2 weeks.<sup>2,3</sup>

Our patient also presented with clinical and histopathologic findings consistent with phrynoderma. Phrynoderma presents with hyperkeratotic follicular papules and plaques with conical keratotic plugs. These findings typically involve the extensor surfaces of the extremities and buttocks, although they can appear elsewhere or spread over the entire body.<sup>4</sup> Common histopathologic findings include prominent parakeratotic follicular plugging, lamellated hyperkeratosis next to hair follicles, atrophy of the sebaceous glands, and squamous metaplasia of





**Fig 3.** Lower limb biopsy. **A**, Hyperkeratosis with epidermal atrophy, mild lymphocytic perivascular and perifollicular inflammation, and red blood cell extravasation. **B**, Hair shafts of the involved follicles are twisted and fragmented and red blood cell extravasation around the hair follicles can be seen on higher magnification. **C** and **D**, Higher magnification of perifollicular red blood cell extravasation. (Hematoxylin-eosin stain.)

the eccrine and sebaceous ducts.<sup>4,5</sup> Phrynoderma was originally thought to be a cutaneous manifestation of vitamin A deficiency, but actually seems to be associated to general malnutrition, not necessarily vitamin A deficiency.<sup>4</sup> Several studies have demonstrated the association of phrynoderma with deficiencies of vitamin E,<sup>6,7</sup> vitamin B complex,<sup>7</sup> and essential fatty acids<sup>8</sup> and improvement or resolution of the lesions following replacement of the deficiency. Therefore, it is important to perform a rigorous screening for major micronutrients, including vitamins A, E, B<sub>12</sub>, C, and D; folic acid; zinc; essential fatty acids; and proteins, in the setting of cutaneous features of malnourishment, including those of scurvy or phrynoderma. The pediatric population; persons with alcohol abuse disorder; food faddists; patients with underlying eating disorders, Crohn disease, or food allergies; patients undergoing hemodialysis; and patients with a history of major gastrointestinal surgery, as well as elderly or indigent people who live alone, are at risk of developing general malnutrition.<sup>1,3-5</sup>

It is important for dermatologists to recognize the cutaneous signs of nutritional deficiency in order to initiate early evaluation and intervention, which can

be life-saving. With widespread social distancing, lockdowns, and economic hardships during the COVID-19 pandemic, vulnerable populations may be even more susceptible to malnutrition. Because cutaneous manifestations may be the presenting feature, dermatologists are uniquely positioned to identify these individuals and help provide them with the necessary support.

#### Conflicts of interest

None disclosed.

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