Acrodermatitis Enteropathica in a Patient With Short Bowel Syndrome

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PRACTICE **POINTS**

- Acrodermatitis enteropathica can be a manifestation of zinc deficiency.
- Acrodermatitis enteropathica should be considered in patients with poor intestinal absorption of nutrients.

To the Editor:

Acrodermatitis enteropathica (AE) is an inherited defect in zinc absorption that leads to hypozincemia. Its clinical presentation can vary based on serum zinc level and ranges from periorificial erosive dermatitis to psoriasiform dermatitis.[1] Recognition of the cutaneous manifestations of zinc deficiency can lead to early intervention with zinc supplementation and prevention of long-term morbidity and even mortality. In our case, the coexistence of a bullous acral dermatosis with the additional feature of extensor digital dermatitis with fissuring suggests a diagnosis of AE and can alert the astute clinician to the need for testing of serum zinc levels and/or treatment with zinc supplementation. Causes of acquired zinc deficiency that have been reported in the literature include eating disorders such as anorexia nervosa and bulimia nervosa, Crohn disease, food allergy, intestinal parasitic infestations, and an inborn error of metabolism known as nonketotic hyperglycemia (Table).[2-4]

A 42-year-old woman with a medical history of rheumatoid arthritis and short bowel syndrome due to multiple small bowel obstructions with subsequent bowel resections who was on chronic total parenteral nutrition (TPN) presented with bullae on the hands, shins, and feet. The patient initially noticed small erythematous macules on the hands and feet months prior to presentation. Three weeks prior to presentation, bullae started to form on the hands, mostly between the web spaces; dorsal aspects of the feet; and anterior aspects of the shins. The patient denied any oral ulcers. One day prior to presentation the patient was seen at an outside hospital and was started on prednisone 5 mg daily, oral clindamycin, mupirocin ointment, and nystatin-triamcinolone cream. These medications failed to improve her condition. On review of systems, the patient denied any fever, chills, eye pain, or dysuria.

Upon initial presentation the patient appeared weak and fatigued, though vital signs were normal. Physical examination revealed multiple flaccid bullae in the web spaces of the hands and shallow erosions with hemorrhagic crusts on the bilateral wrists. She also had violaceous patches in the extensor creases of the metacarpophalangeal, proximal interphalangeal, and distal interphalangeal joints, which were strikingly symmetric (Figure 1). Prominent flaccid bullae and shallow erosions with hemorrhagic crusts also were present on the bilateral shins and dorsal aspects of the feet (Figure 2). No oral ulcers were present. A punch biopsy from the dorsal aspect of the left foot revealed psoriasiform hyperplasia of the epidermis with

Causes of Acquired Acrodermatitis Enteropathica[4,5]

Anorexia nervosa
Bulimia nervosa
Crohn disease
Food allergy
Intestinal parasitic infestations
Nonketotic hyperglycemia

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The authors report no conflict of interest.

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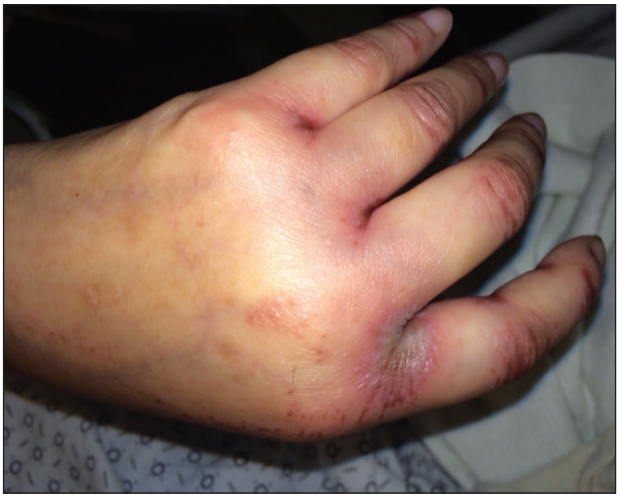

FIGURE 1. Acrodermatitis enteropathica with violaceous patches and fissuring in the extensor creases of the metacarpophalangeal, proximal interphalangeal, and distal interphalangeal joints.

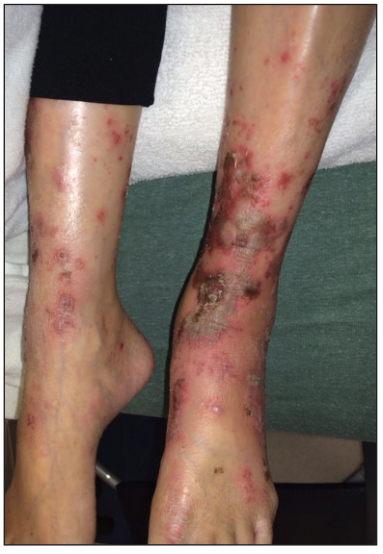

FIGURE 2. Acrodermatitis enteropathica with prominent flaccid bullae and shallow erosions with hemorrhagic crusts on the bilateral shins and dorsal aspects of the feet.

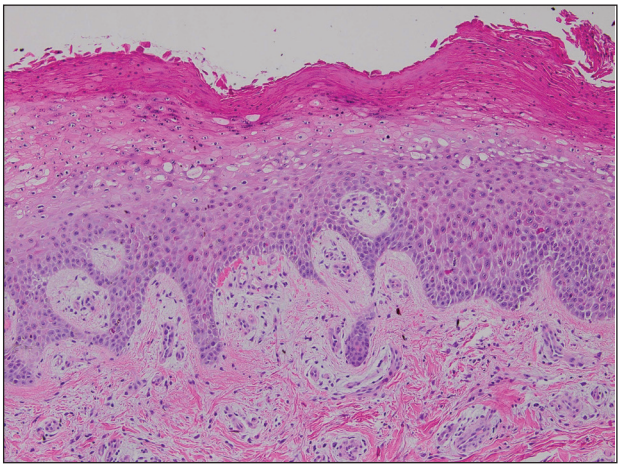

FIGURE 3. Histopathology revealed psoriasiform hyperplasia of the epidermis with mild spongiosis, a markedly diminished granular layer, and overlying confluent parakeratosis. There was pallor of keratinocytes in the upper layers of the epidermis, and cytoplasmic vacuolar change with ballooning degeneration was evident (H&E, original magnification ×100).

prominent ballooning degeneration and hyperkeratosis/parakeratosis (Figure 3); a periodic acid–Schiff stain was negative for fungal organisms.

Given the biopsy results and clinical presentation, a nutritional deficiency was suspected and serum levels of zinc, vitamin B_1, vitamin B_2, and vitamin B_3 were assessed. Vitamins B_1, B_2, and B_3 all were within reference range, but the patient's serum zinc level was found to be low at 11 μg/mL (reference range, 55–150 μg/mL). The alkaline phosphatase level also was measured to be low at 22 U/L (reference range, 31–103 U/L). Additionally, a hepatitis panel was drawn and glucagon levels were checked, which were found to be within reference range. These findings were consistent with a diagnosis of acquired AE. Prednisone and clindamycin were stopped and the patient was started on zinc supplementation in her TPN therapy. Mupirocin ointment was continued on the existing bullae. Upon discharge 10 days later, there were no new bullae and the existing bullae had sloughed off, revealing healthy skin underneath.

Zinc is an essential trace element and can be found in high concentration in foods such as shellfish, green vegetables, legumes, nuts, and whole grains.[6] The majority of zinc is absorbed in the jejunum; as such, many cases of acquired zinc deficiency leading to AE are due to disorders that affect the small intestine.[2] Conditions that may lead to poor gastrointestinal zinc absorption include alcoholism, eating disorders, TPN, burns, surgery, and malignancies.[2,7]

Diagnosis typically is made based on characteristic clinical features, biopsy results, and a measurement of the serum zinc concentration. Although a low serum zinc level supports the diagnosis, serum zinc concentration is not a reliable indicator of body zinc stores and a normal serum zinc concentration does not rule out AE. The gold standard for diagnosis is the resolution of lesions after zinc supplementation.[1] Notably, because the production of alkaline phosphatase is dependent on zinc, levels of this enzyme also may be low in cases of AE,[6] as in our patient.

The clinical manifestations of AE can vary greatly; patients may initially present with eczematous pink scaly plaques, which may subsequently become vesicular, bullous, pustular, or desquamative. The lesions may develop over the arms and legs as well as the anogenital and periorificial areas.[5] Other notable manifestations that may present early in the course of AE include angular cheilitis followed by paronychia. In patients who are not promptly

treated, long-term zinc deficiency may lead to growth delay, mental slowing, poor wound healing, anemia, and anorexia.[5] Of note, deficiencies of branched-chain amino acids and essential fatty acids may appear clinically similar to AE.[2]

Zinc replacement is the treatment of choice for patients with AE due to dietary deficiency, and replacement therapy should begin with 0.5 to 1 mg/kg daily of elemental zinc.[5] Response to acquired AE with zinc supplementation often is rapid. Lesions tend to resolve within days to weeks depending on the degree of deficiency.[2]

Although AE is an uncommon dermatosis in the United States, it is an important diagnosis to make because its clinical features are fairly specific and early zinc supplementation allows for full resolution of the disease without permanent sequelae. The diagnosis of AE should be strongly considered when features of an acral bullous dermatosis are combined with a fissured dermatitis of extensor joints of the hands or elbows. It is particularly important to recognize that alcoholics, burn victims, postsurgical patients, and those with malignancies and eating disorders are at an increased risk for developing this nutritional deficiency.

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