

**Mohamed A. Elfeki, MD, MSc**  
Internal Medicine Resident, University of Iowa,  
Des Moines; Iowa Methodist Medical Center,  
UnityPoint Health, Des Moines, IA

**Tyler Schwiesow, MD, FACP**  
Program Director, University of Iowa,  
Des Moines; Iowa Methodist Medical Center,  
UnityPoint Health, Des Moines, IA

**Zeeshan Jawa, MD, FACP**  
Cancer Center of Iowa Medical Oncology  
and Hematology Associates, John Stoddard  
Cancer Center; Hematology/Oncology Consultant,  
Mission Cancer and Blood, Des Moines, IA

# Scurvy: Old, but still relevant

A patient with alcohol use disorder presented with fatigue, dyspnea, and bruising



**Figure 1.** Perifollicular hemorrhage involving the anterior aspect of the lower left leg.

A 54-YEAR-OLD WOMAN with alcohol use disorder presented to the emergency department with a 3-week history of progressively worsening fatigue, dyspnea on exertion, and easy bruising. She initially noticed a fingertip-size bruise on the right thigh that rapidly enlarged to involve both thighs, calves, and ankles.

She reported poor appetite, substantial weight loss, and inadequate nutrition with in-

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tentional avoidance of vegetables, fruits, and red meat for over a year. She had no history of causes of bruising, including use of oral anticoagulants or antiplatelet medications.

She appeared malnourished and frail. Her body weight was 94 lb. Physical examination revealed a cutaneous perifollicular hemorrhage, petechiae, and a large area of ecchymosis involving the thighs, calves, and ankles that was notably tender to palpation (Figures 1–3).

Laboratory testing results were significant for a hemoglobin concentration of 6.2 g/dL (reference range 12–16), mean corpuscular volume 84.5 (81–98), serum iron 14 µg/dL (37–145), iron saturation 5% (20%–50%), ferritin 90 ng/mL (13–150), soluble transferrin receptor–ferritin index 1.73 (> 1.4 has more than 90% sensitivity and specificity for the diagnosis of iron deficiency anemia), thiamine 47 nmol/L (70–180), 25-hydroxyvitamin D 15 ng/mL (> 30), and vitamin C less than 0.1 mg/dL (0.4–2). Platelet count, coagulation studies, and vitamin B<sub>12</sub> and folate levels were normal. Fecal occult blood testing was negative. A clinical diagnosis of scurvy was established based on the history of a severely restricted diet, low serum vitamin C level, and resolution of physical findings after initiating oral vitamin C replacement.

High-dose oral vitamin C was administered and a vitamin C-rich diet was prescribed, leading to resolution of her symptoms and physical findings within 10 weeks. Iron, thiamine, and vitamin D were also supplemented.

## THE CHANGING FACE OF THE SCURVY PATIENT

Scurvy, described as early as 1500 BCE,<sup>1</sup> results from severe dietary deficiency of L-ascorbic acid (vitamin C), a cofactor that humans must acquire from exogenous resources, primarily from



**Figure 2.** Ecchymosis involving the medial aspect of both thighs.

fruits and vegetables. It is well documented in the literature that sailors who spent months at sea could avoid scurvy by consuming a diet rich in vegetables and fruits.<sup>2</sup>

Ascorbic acid is a cofactor for lysyl hydroxylase, an enzyme essential in hydroxylation of proline and lysine residues in the cross-link formation of collagen. It is also essential for iron absorption. In its absence, assembly of the collagen triple helix is incomplete, rendering collagen-dependent structures such as blood vessels unstable, leading to hemorrhagic manifestations and poor wound healing.<sup>3</sup>

Scurvy is now only rarely encountered in the United States. Risk factors include alcohol use disorder, malnutrition, malabsorption, cigarette use, and psychiatric disorders. Signs and symp-



**Figure 3.** Atraumatic ecchymosis involving the left ankle area.

toms tend to manifest when the body's vitamin C stores drop below 300 mg. This can occur within as few as 1 to 3 months of absence of vitamin C from the diet.<sup>4</sup>

Clinical manifestations of scurvy can be divided into an early phase, characterized by nonspecific symptoms such as fatigue, malaise, and loss of appetite, and a late phase, with impaired wound healing, gingival bleeding, lower-extremity petechiae, and ecchymosis, along with symptoms secondary to tissue hemorrhage including bone pain and pseudoparalysis.<sup>5</sup>

The diagnosis of scurvy is primarily based on the history and physical examination,<sup>6</sup> and is confirmed with undetectable vitamin C serum levels. Iron deficiency anemia and multivitamin deficiency often occur concurrently. Clinicians should have a high index of suspicion for scurvy in the patient with alcohol use disorder who presents with poor nutritional history, extensive bruising, and iron deficiency anemia. ■

**Her signs and symptoms resolved within 10 weeks of vitamin C therapy**

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**Address:** Zeeshan Jawa, MD, FACP, Hematology/Oncology Consultant, Mission Cancer and Blood, 1221 Pleasant Street, Suite 100, Des Moines, IA, 50309; zjawa@missioncancer.com