

> THE PATIENT

40-year-old man

> SIGNS & SYMPTOMS

- Critical anemia
- Light-headedness
- Bilateral leg swelling

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> THE CASE

A 40-year-old man was referred to the emergency department (ED) with critical anemia after routine blood work at an outside clinic showed a hemoglobin level of 3.5 g/dL. On presentation, he reported symptoms of fatigue, shortness of breath, bilateral leg swelling, dizziness (characterized as light-headedness), and frequent heartburn. He said that the symptoms began 5 weeks earlier, after he was exposed to a relative with hand, foot, and mouth disease.

Additionally, the patient reported an intentional 14-lb weight loss over the 6 months prior to presentation. He denied fever, rash, chest pain, loss of consciousness, headache, abdominal pain, hematemesis, melena, and hematochezia. His medical history was significant for peptic ulcer disease (diagnosed and treated at age 8). He did not recall the specifics, and he denied any related chronic symptoms or complications. His family history (paternal) was significant for colon cancer.

■ **The physical exam** revealed conjunctival pallor, skin pallor, jaundice, +1 bilateral lower extremity edema, tachycardia, and tachypnea. Stool Hemoccult was negative. On repeat complete blood count (performed in the ED), hemoglobin was found to be 3.1 g/dL with a mean corpuscular volume of 47 fL.

THE DIAGNOSIS

The patient was admitted to the family medicine service and received 4 units of packed red blood cells, which increased his hemoglobin to the target goal of >7 g/dL. A colonoscopy and an esophagogastroduodenoscopy (EGD) were performed (FIGURE 1A-1C), with results suggestive of diverticulosis, probable Barrett's mucosa, esophageal ulcer, huge hiatal hernia (at least one-half of the stomach was in the chest), and Cameron ulcers. Esophageal biopsies showed cardiac mucosa with chronic inflammation. Esophageal ulcer biopsies revealed Barrett's esophagus without dysplasia. Duodenal biopsies displayed normal mucosa.

DISCUSSION

A Cameron ulcer is a gastric lesion that is typically linear and found in hiatal hernias. These ulcers are often localized to areas where the herniated stomach is narrowed by the surrounding diaphragm, but they can extend onto the lesser curvature.¹ They are found in approximately 5% of patients with hiatal hernias (and an even higher percentage when the hernias are >5 cm^{1,2}).³ Because physical agitation of the ulcer-containing hernia occurs when the patient breathes, these ulcers can be the source of otherwise unexplained chronic iron-deficiency anemia in this patient population.³ While some patients present with typical symptoms of anemia or gastrointestinal bleeding, such as fatigue, pallor, hematemesis, and melena, others have a much subtler clinical picture or may be asymptomatic altogether.⁴

Although rare, Cameron ulcers must be considered in the differential diagnosis of patients with chronic anemia of unknown origin. The potential for these lesions to result in chronic blood loss, which could over time manifest as severe anemia or hypovolemic shock, makes proper diagnosis and prompt treatment especially important.^{4,5}

■ **In our patient's case**, his severe anemia was likely the result of a combination of the esophageal and Cameron ulcers evidenced on EGD, rather than any single ulcer. In our review of the literature, we found no reports of any patients with anemia and Cameron ulcers who presented with hemoglobin levels as low as our patient had.

Treat with a PPI and iron supplementation

Multiple EGDs may be needed to properly diagnose Cameron ulcers, as they can be difficult to identify. Once a patient receives the diagnosis, he or she will typically be put on a daily proton pump inhibitor (PPI) regimen, such as omeprazole 20 mg bid. However, since many patients with Cameron ulcers also have acid-related problems (as was true in this case), a multifactorial acid suppression approach may be warranted.¹ This may include recommending lifestyle modifications (eg, eating small meals, avoiding foods that provoke symptoms, or losing weight) and prescribing medications in addition to a PPI, such as an H2 blocker (eg, 300 mg qid, before meals and at bedtime).

In addition, iron sulfate (325 mg/d, in this case) and blood transfusions may be required to treat the anemia. In refractory cases, endoscopic or surgical interventions, such as hemoclipping, Nissen fundoplication, or laparoscopic gastropexy, may need to be performed.²

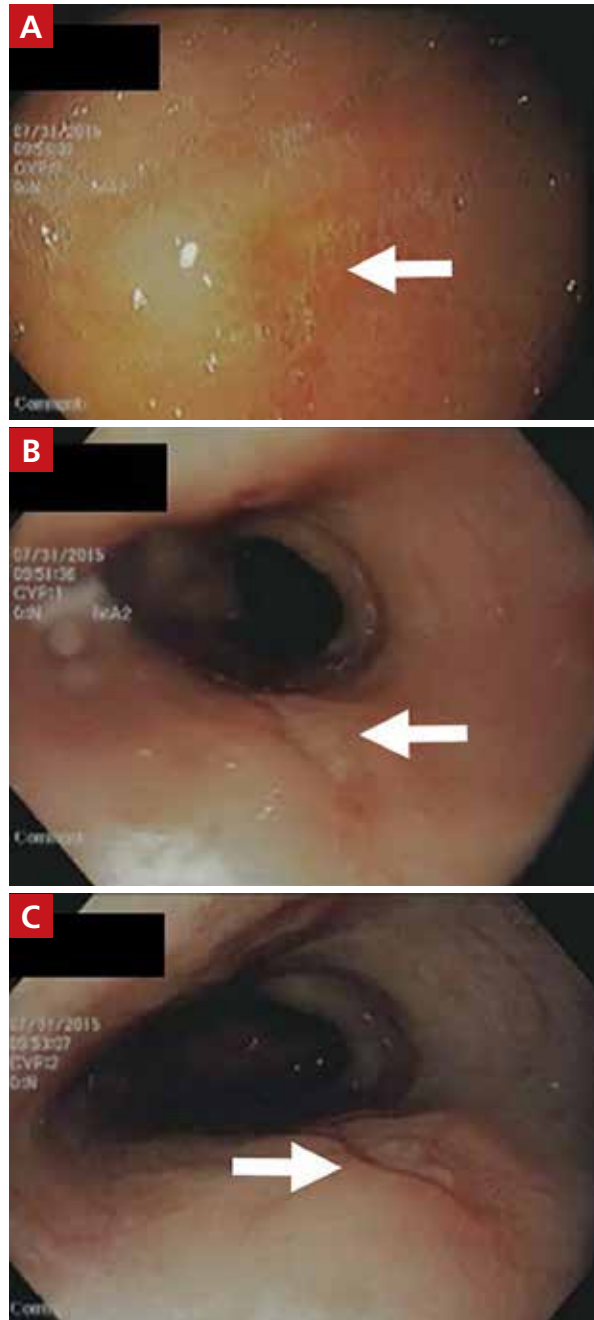
■ **Our patient** was given a prescription for ferrous sulfate 325 mg/d and omeprazole 20 mg bid. His symptoms improved with treatment, and he was discharged on Day 5; his hemoglobin remained >7 g/dL.

THE TAKEAWAY

The association between chronic iron deficiency anemia and Cameron ulcers has been

FIGURE 1

Cameron ulcer in the setting of Barrett's esophagus on EGD



IMAGES COURTESY OF: DR. KENNETH LOWEN, MERCY HEALTH SAINT MARY'S, GRAND RAPIDS, MI

Confluent salmon-colored mucosa surrounds the 1.5 x 0.5 cm esophageal ulcer noted from 23 cm to the lower esophageal sphincter at 35 cm. Biopsies of the ulcer revealed Barrett's esophagus without dysplasia (A). A very large hiatal hernia was present, with at least half of the stomach in the chest. Multiple linear ulcers consistent with Cameron ulcers (B and C) were present at the neck of the hiatal hernia. No active bleeding or visible vessels were noted in any of the identified ulcers.

established but is commonly overlooked in patients presenting with unexplained anemia or an undiagnosed hiatal hernia. This is likely due to their rarity as a cause of anemia, in general.

Furthermore, the lesions can be missed on EGD; multiple EGDs may be needed to make the diagnosis. Once diagnosed, Cameron

ulcers typically respond well to twice daily PPI treatment. Patients with refractory, recurrent, or severe lesions, or large, symptomatic hiatal hernias should be referred for surgical assessment. **JFP**

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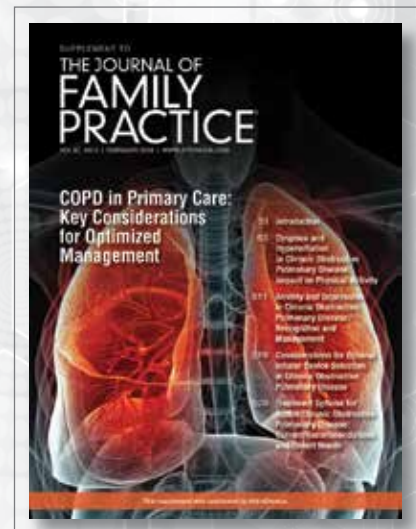
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