

A 14-year-old boy is brought to the office due to skin rash for 3 weeks. The patient first noted red spots on his arms and legs that itched and burned; these have since filled with clear fluid, and some have crusted over. He has also had less energy to participate in after-school activities. The patient's medical history includes type I diabetes mellitus diagnosed at age 10. He is on insulin pump therapy with daily glucose measurements of 90-160 mg/dL. The patient has lost 3.6 kg (8 lb) in 4 months. Physical examination shows conjunctival pallor and an erythematous, vesicular, symmetrically distributed rash over the extensor surfaces of his elbows and knees. Laboratory results are as follows:

Hemoglobin	10 g/dL
Mean corpuscular volume	72 fL
Platelets	240,000/mm ³
Leukocytes	8,000/mm ³
Ferritin	9 ng/mL

Fecal occult blood testing is negative on 3 samples. Which of the following is the best next step in management of this patient?

- ☐ A. Anti-tissue transglutaminase antibody assay
- ☐ B. Bone marrow biopsy
- ☐ C. Colonoscopy
- ☐ D. Hemoglobin electrophoresis
- ☐ E. Iron supplementation
- ☐ F. TSH level

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- ☒ A. Anti-tissue transglutaminase antibody assay [74%]
- ☐ B. Bone marrow biopsy [3%]
- ☐ C. Colonoscopy [3%]
- ☐ D. Hemoglobin electrophoresis [3%]
- ☐ E. Iron supplementation [16%]
- ☐ F. TSH level [1%]

Proceed to Next Item

Explanation:

User Id: [redacted]

Celiac disease	
	• First-degree relative with celiac disease

Explanation:

User Id: [REDACTED]

Celiac disease	
Risk factors	<ul style="list-style-type: none"> • First-degree relative with celiac disease • Autoimmune thyroiditis • Type 1 diabetes • Down syndrome • Selective IgA deficiency
Symptoms	<ul style="list-style-type: none"> • Gastrointestinal <ul style="list-style-type: none"> ◦ Abdominal pain ◦ Nausea &/or vomiting ◦ Diarrhea (rarely, constipation) ◦ Flatulence & bloating • Extraintestinal <ul style="list-style-type: none"> ◦ Short stature & weight loss ◦ Iron deficiency anemia ◦ Dermatitis herpetiformis
Diagnosis	<ul style="list-style-type: none"> • ↑ Tissue transglutaminase IgA • ↑ Anti-endomysial antibodies • Duodenal biopsy showing ↑ intraepithelial lymphocytes & flattened villi

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Celiac disease is an immune-mediated hypersensitivity to gluten leading to impaired nutrient absorption in the proximal small intestine. Classic celiac disease presents with gastrointestinal symptoms of abdominal pain, nausea, vomiting, diarrhea, and/or **weight loss**. Adolescents and adults may have extraintestinal symptoms such as fatigue, **iron deficiency anemia** (microcytic anemia, low ferritin), and **dermatitis herpetiformis**, as in this patient. Iron deficiency anemia in celiac disease is attributed to poor iron absorption secondary to duodenal villous atrophy. Iron supplementation (**Choice E**) can be considered after an underlying cause is confirmed and would likely improve anemia in celiac disease after initiation of a gluten-free diet. Dermatitis herpetiformis, a pruritic papular or vesicular rash associated with celiac disease, is located on the knees, elbows, forearms, and buttocks.

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Celiac disease is associated with other autoimmune conditions (eg, type I diabetes, thyroiditis); it should be screened for in this diabetic patient with an **anti-tissue transglutaminase antibody IgA** level, followed by endoscopic duodenal biopsy for confirmation.

(**Choice B**) Bone marrow biopsy is performed to assess for primary hematopoietic disorders and is indicated for unexplained abnormalities in peripheral cell counts (eg, pancytopenia, leukocytosis). Microcytosis and low ferritin confirm the diagnosis of iron deficiency, and bone marrow biopsy is not needed.

(**Choice C**) Colonoscopy should be performed in older men and postmenopausal women presenting with iron deficiency anemia. However, in a young patient with negative fecal occult blood testing, an occult lower gastrointestinal tract bleed is less likely.

(**Choice D**) Hemoglobin electrophoresis can exclude thalassemia and other hemoglobinopathies in patients with microcytic anemia. These patients typically have normal or elevated ferritin levels and iron stores.

(**Choice F**) TSH should be followed every 1-2 years in patients with type I diabetes to screen for the development of autoimmune thyroiditis. The associated hypothyroidism may present with fatigue and anemia, similar to the patient above; however, hair loss, brittle nails, and constipation are typical, and dermatitis herpetiformis is strongly associated with celiac disease.

Educational objective:

Celiac disease results in small intestinal malabsorption and can present with weight loss and iron deficiency anemia. Common associations include type 1 diabetes and dermatitis herpetiformis.

References:

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References:

1. [Clinical and immunological features of celiac disease in patients with type 1 diabetes mellitus.](#)
2. [Iron deficiency anemia in celiac disease.](#)
3. [ACG clinical guidelines: Diagnosis and management of celiac disease.](#)

Media Exhibit

is Herpetiformis



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is Herpetiformis

