

Acute Myelogenous Leukemia as a Rare Cause of Duodenal Ulcers

Lindsay A. Sobotka, DO¹, Tessa Crilley, APRN¹, Edward Levine, MD¹, and Anita Afzali, MD, MPH, FACG¹

¹Department of Internal Medicine, Division of Gastroenterology, Hepatology and Nutrition, The Ohio State University Wexner Medical Center, Columbus, OH

ABSTRACT

Acute myelogenous leukemia (AML) is the most prevalent acute leukemia and is defined by the presence of myeloid blasts in the blood or bone marrow. Rarely, AML can be present in the gastrointestinal tract. We present a patient with AML undergoing treatment with decitabine who presented with hematemesis. He underwent endoscopy which revealed two 5 mm duodenal ulcers that were biopsied, and pathology was consistent with AML. Endoscopy should be considered in patients with leukemia who present with nausea, vomiting, or signs of bleeding to evaluate for gastrointestinal involvement. Patients diagnosed with AML are treated with chemotherapy.

INTRODUCTION

Acute myelogenous leukemia (AML) is one of the most prevalent acute leukemias in the United States with an incidence of 3 to 5 per 100,000 patients.¹ Patients with AML tend to present with fatigue, weight loss, bleeding, or infection due to profound cytopenia. AML is defined by the presence of abnormal proliferation and differentiation of myeloid stem cells. These abnormal cells typically populate within the bone marrow and peripheral blood. A diagnosis is confirmed when these cells represent 20% of the marrow or blood. Rarely, this disease can affect other organs including the skin, lymph nodes, and gastrointestinal tract.¹⁻³ We present a patient undergoing treatment for AML who presented with hematemesis and was found to have gastrointestinal involvement of his malignancy.

CASE REPORT

A 65-year-old man with a medical history of recently diagnosed myelodysplastic syndrome with evolving mixed phenotype of AML and acute lymphoblastic leukemia undergoing treatment with decitabine presented as a transfer from outside hospital for evaluation of hematemesis. During evaluation at the referring facility, he was found to have an initial hemoglobin of 5.8 g/dL decreased from 7.8 g/dL 1 week ago, platelet count of 56 K/ μ L, and international normalized ratio of 1.4. He was started on pantoprazole 40 mg intravenous twice daily. Over the course of a week, he required a total of 5 units of packed red blood cells to maintain a hemoglobin greater than 7.0 g/dL. Computed tomography of the abdomen and pelvis revealed inflamed and thickened appearing proximal and mid transverse duodenum with a filling defect within the proximal transverse duodenum, suggestive of possible intussusception. After transfer, esophagogastroduodenoscopy was performed within the first 24 hours and revealed erythematous mucosa in the gastric fundus, body, and antrum, duodenitis, and two 5 mm duodenal ulcers in the second portion of the duodenum with no stigmata of recent bleeding (Figure 1).

Given the patient's medical history, random biopsies were obtained from the stomach and duodenum and targeted biopsies of the ulcers. Histopathology of the duodenal ulcers revealed myeloid blasts with infiltration into the mucosa and submucosa with dispersed small patches of large immature-looking cells with large round nuclei and prominent nucleoli, consistent with gastrointestinal involvement of myeloid leukemia. Other biopsies were negative for malignancy and *Helicobacter pylori*. The immunohistochemical characteristics were similar to the bone marrow biopsy obtained at the time of diagnosis of AML. Hemoglobin

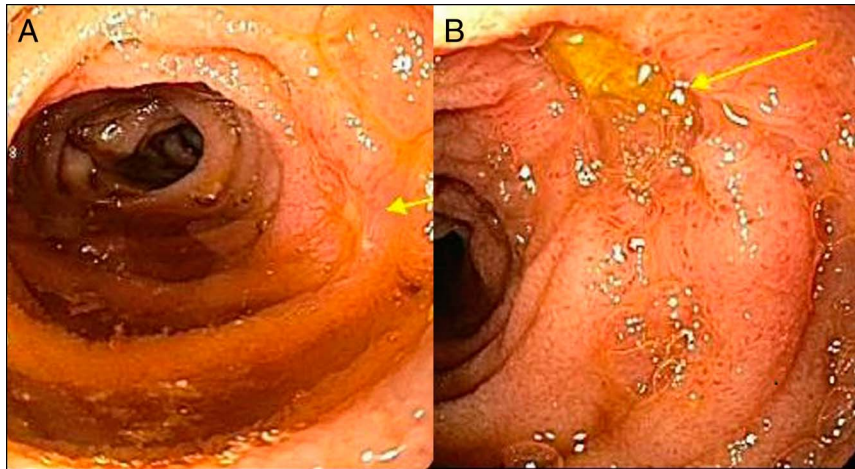


Figure 1. (A and B) Upper endoscopy performed within the first 24 hours showing erythematous mucosa in the gastric fundus, body, and antrum, duodenitis, and two 5 mm duodenal ulcers in the second portion of the duodenum with no stigmata of recent bleeding.

stabilized without further transfusions. Hematology offered the patient continued chemotherapy once the performance status improved; however, the patient ultimately elected to pursue hospice care.

DISCUSSION

It is estimated that peptic ulcer disease affects approximately 6 million people each year in the United States; however, the incidence decreases annually, given prompt recognition and treatment of the 2 most common etiologies of ulcers: *Helicobacter pylori* and nonsteroidal anti-inflammatory medications.^{4,5} Other rare causes of ulcers include infections with *Cytomegalovirus* and herpes simplex virus in addition to medications, gastrinomas, systemic macrocytosis, and gastrointestinal malignancies.^{6–8} Rarely, hematologic malignancy can present as gastric or duodenal ulcer, and there are only a few documented cases in the literature. We presented a case of gastrointestinal bleeding due to duodenal ulcers caused by AML.

Patients with AML involvement of the gastrointestinal tract can have varied presentations. Our patient presented with hematemesis and acute blood loss anemia, requiring multiple blood product transfusions prompting endoscopic evaluation. Cases in the literature describe symptoms of upper gastrointestinal bleeding including melena, coffee-ground emesis, or abdominal imaging with evidence of hemorrhage in the stomach.⁹ Other patients presented with a large mass in the gastric antrum causing obstructive jaundice from compression of the biliary system or bowel obstruction.^{2,10} Other case reports have highlighted the presence of an acute blood loss anemia from a gastric chloroma, which is a mass of extramedullary myeloid cells that typically predates the onset of AML by a few years.¹¹ This variety of presentations highlights the rare and unpredictable nature of AML involvement in the gastrointestinal tract.

If endoscopic evaluation is performed in patients with AML, it is crucial to obtain biopsies if mucosa abnormalities are noted. Our patient had erythema in the stomach and duodenum in addition to 2 clean-based ulcers in the duodenum with biopsies consistent with AML. Although our patient already had a diagnosis of AML and was undergoing chemotherapy, other case reports have noted patients that were in remission and biopsy results were consistent with relapsed AML.¹² Treatment for patients with AML involvement in the gastrointestinal tract includes chemotherapy.

In conclusion, AML involvement in the gastrointestinal tract is rare and can present in multiple ways, including bleeding, nausea, abdominal pain, and obstruction. In patients with a history of AML undergoing endoscopy, biopsies of mucosal abnormalities should be performed to evaluate for AML involvement because this could represent persistent disease despite therapy or relapsed disease. Treatment is guided by oncology and primarily by chemotherapy.

DISCLOSURES

Author contributions: LA Sobotka wrote and edited the manuscript and is the article guarantor. T. Crilley, E. Levine, and A. Afzali edited the manuscript.

Financial disclosure: None to report.

Informed consent was obtained for this case report from the deceased patient's next of kin.

Received January 31, 2019; Accepted May 31, 2019

REFERENCES

- De Kouchkovsky I, Abdul-Hay M. Acute myeloid leukemia: A comprehensive review and 2016 update. *Blood Cancer J.* 2016;6(7):e441.

2. Gajendra S, Gogia A, Das P, Gupta R, Tanwar P. Acute myeloid leukemia presenting as "bowel upset": A case report. *J Clin Diagn Res.* 2014;8(7):FD09–10.
3. Breccia M, Mandelli F, Petti MC, et al. Clinico-pathological characteristics of myeloid sarcoma at diagnosis and during follow-up: Report of 12 cases from a single institution. *Leuk Res.* 2004;28(11):1165–9.
4. Sandler RS, Everhart JE, Donowitz M, Adams E, Cronin K, Goodman C. The burden of selected digestive diseases in the United States. *Gastroenterology.* 2002;122:1500–11.
5. Uyankoglu A, Danaloglu A, Akyuz F, et al. The etiological factors of duodenal and gastric ulcers. *Peptic Ulcer Dis.* 2012;23(2):99–103.
6. Meko JB, Norton JA. Management of patients with Zollinger-Ellison syndrome. *Annu Rev Med.* 1995;46:395–411.
7. Cherner JA, Jensen RT, Dubois A, O'Dorisio TM, Gardner JD, Matcalfe DD. Gastrointestinal dysfunction in systemic mastocytosis: A prospective study. *Gastroenterology.* 1988;95:657.
8. Archimandritis A, Markoulatos P, Tjivras M, et al. Herpes simplex virus types 1 and 2 and cytomegalovirus in peptic ulcer disease and non-ulcer dyspepsia. *Hepatogastroenterology.* 1992;39:540–1.
9. Yamamoto S, Miike T, Kubuki Y, et al. Gastrointestinal bleeding in acute myeloid leukemia patients receiving intensive induction chemotherapy. *JSM Gastroenterol Hepatol.* 2014;2(3):1019.
10. Yu T, Xu G, Xu X, Yang J, Ding L. Myeloid sarcoma derived from the gastrointestinal tract: A case report and review of the literature. *Oncol Lett.* 2016;11(6):4155–9.
11. Priebe W, Senecal F. Gastric chloroma associated with upper gastrointestinal tract bleeding. *Gastrointest Endosc.* 1991;37(4):482–4.
12. Singh R. Acute myeloid leukemia infiltration of the stomach. *Consultant* 360. 2017;57(1).

Copyright: © 2019 The Author(s). Published by Wolters Kluwer Health, Inc. on behalf of The American College of Gastroenterology. This is an open-access article distributed under the terms of the Creative Commons Attribution-Non Commercial-No Derivatives License 4.0 (CCBY-NC-ND), where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially without permission from the journal.