IMAGE | PATHOLOGY

Primary Duodenal Aspergillosis in a Patient With Alcoholic Cirrhosis and Poorly Controlled Diabetes Mellitus

Mihajlo Gjeorgjievski, MD[1], Estela Mogrovejo, MD[1], Mitual B. Amin, MD[2], and Mitchell S. Cappell, MD, PhD[1,3]

[1]Division of Gastroenterology & Hepatology, William Beaumont Hospital, Royal Oak, MI
[2]Anatomic Pathology, William Beaumont Hospital, Royal Oak, MI
[3]Oakland University William Beaumont School of Medicine, Royal Oak, MI

CASE REPORT

A 74-year-old recovering alcoholic man presented with progressively increasing epigastric pain for 2 months. The patient had a prior medical history of Child-Pugh Class A alcoholic cirrhosis and esophageal varices, gastric ulcer diagnosed 4 years earlier with documented endoscopic healing of the ulcer after 6 weeks of omeprazole therapy (40 mg/d), and poorly controlled diabetes with a recent hemoglobin A1c level of 9.2%. He had never received corticosteroids or other immunosuppressive therapy and was HIV seronegative. At the time of presentation, he reported nausea and a 10-kg weight loss. Physical examination revealed epigastric tenderness without rebound tenderness. Abdominal computed tomography revealed periduodenal edema. Esophagogastroduodenoscopy revealed duodenitis, a 25-mm ulcer in the descending duodenum, and a 10-mm bulbar ulcer, without stigmata of recent hemorrhage (Figure 1). Histological examination of ulcer biopsies revealed duodenal inflammation and necrotic debris (Figure 2). Grocott's methenamine silver stain revealed fungal organisms with hyphal forms, highly consistent with *Aspergillus*. Immunohistochemistry was negative for *Helicobacter pylori*. Chest x-ray and computed tomography of the sinuses did not reveal evidence of invasive aspergillosis. The patient was treated with voriconazole 100 mg/d for 6 weeks and omeprazole 40 mg twice a day. Repeat esophagogastroduodenoscopy, 4 months later, revealed healed ulcers with minimal scarring. Repeat biopsies demonstrated normal duodenal mucosa without *Aspergillus*. The patient died 18 months later from liver failure, without recurrent aspergillosis.

Patients with primary invasive gastrointestinal aspergillosis usually have severe underlying immunodeficiency from neutropenia, hematopoietic stem cell or solid organ transplantation, acute leukemia, or acquired immunodeficiency.[1] However, gastrointestinal aspergillosis has been recently reported in patients with milder immunodeficiencies, such as from poorly controlled diabetes mellitus or cirrhosis.[2-4] *Aspergillus* is usually acquired by inhalation of airborne spores that cause sinopulmonary infection, but *Aspergillus* spores can be ingested and cause primary gastrointestinal aspergillosis.[5] Invasive disease is characterized by tissue invasion and
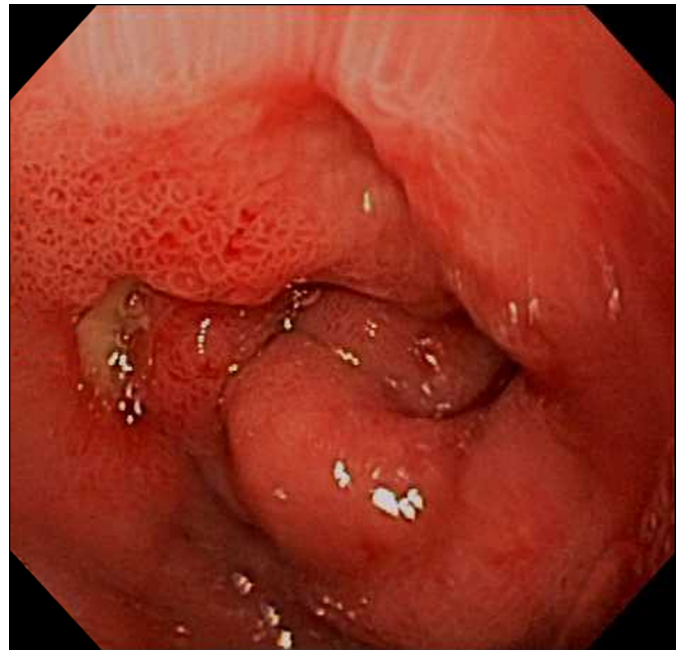

Figure 1. Endoscopic view of a 2.5-cm ulcer in the proximal descending duodenum without stigmata of recent hemorrhage. Part of the ulcer base is concealed by surrounding edema. Note the mural spasm near the ulcer.

Correspondence: Mihajlo Gjeorgjievski, Department of Internal Medicine, William Beaumont Hospital, 3601 W 13 Mile Rd, Royal Oak, MI 48073 (mihajlo.gjeorgjievski@beaumont.org).
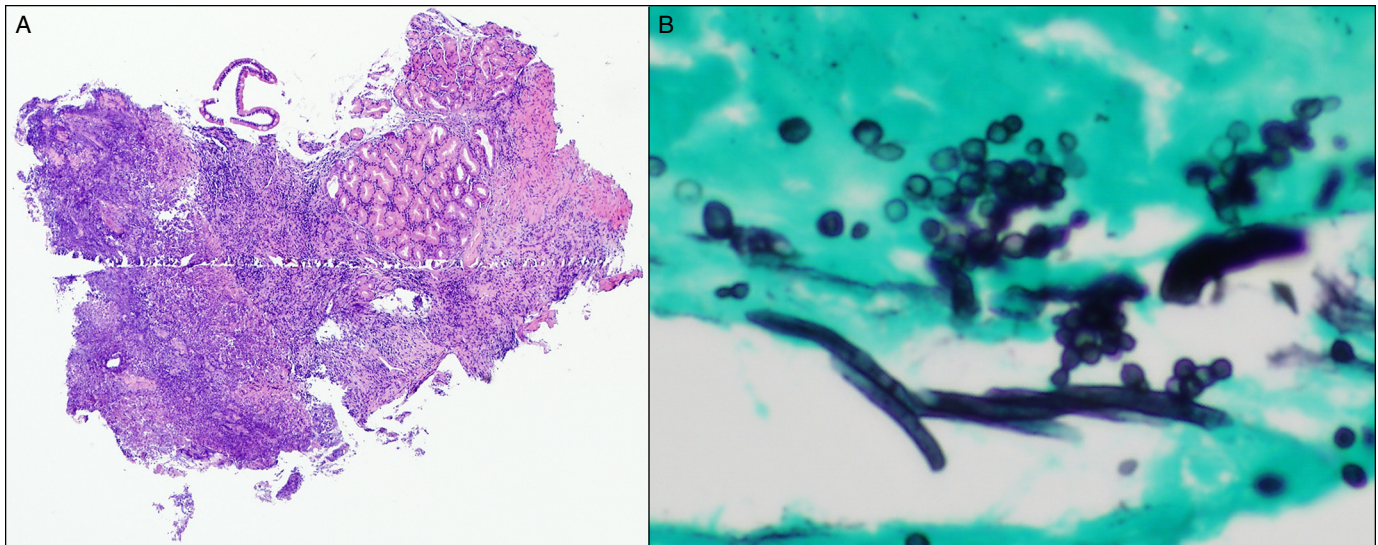
Figure 2. (A) Photomicrograph with hematoxylin and eosin stain reveals duodenal mucosa with active duodenitis and ulceration, as well as necrotic debris and reactive changes. (B) High-power photomicrograph of Grocott's methenamine silver stain of the same area reveals the presence of characteristic *Aspergillus* hyphae and budding yeast forms.

secondary bloodstream dissemination. Diagnosis of invasive aspergillosis requires histologic findings of septated hyphae, with characteristic acute dichotomous branching, tissue invasion, and tissue destruction.[5] Confirmation by isolating *Aspergillus* from cultures is helpful.

Recent reports reveal pulmonary aspergillosis in patients without severe immunodeficiency, in association with pneumonia, chronic obstructive pulmonary disease, sepsis, liver failure, diabetes, alcoholism, and hemodialysis.[6] The current patient with *Aspergillus* duodenitis lacked definitive risk factors for *Aspergillus* infection but had mild risk factors for invasive aspergillosis of cirrhosis,[2,3] diabetes,[4] and alcoholism. Literature review did not reveal prior cases of primary, invasive, duodenal aspergillosis in patients with cirrhosis or diabetes. Treatment with omeprazole as well as voriconazole may have contributed to the reported ulcer healing and *Aspergillus* infection eradication.

DISCLOSURES

Author contributions: M. Gjeorgjievski and MS Cappell wrote and revised the manuscript, and they share lead authorship. E. Mogrovejo wrote the manuscript. MB Amin supplied the pathology photographs and wrote the pathologic descriptions. MS Cappell is the article guarantor.

REFERENCES

1. Eggimann P, Chevrolet JC, Starobinski M, et al. Primary invasive aspergillosis of the digestive tract: Report of two cases and review of the literature. *Infection.* 2006;34(6):333–8.
2. Lipke AB, Mihas AA. Non-decompensated cirrhosis as a risk factor for invasive aspergillosis: A case report and review of the immune dysfunction of cirrhosis. *Am J Med Sci.* 2007;334(4):314–6.
3. Jeurissen S, Vogelaers D, Sermijn E, et al. Invasive aspergillosis in patients with cirrhosis, a case report and review of the last 10 years. *Acta Clin Belg.* 2013;68(5):368–75.
4. Komase Y, Kunishima H, Yamaguchi H, et al. Rapidly progressive invasive pulmonary aspergillosis in a diabetic man. *J Infect Chemother.* 2007;13(1):46–50.
5. Segal BH. Aspergillosis. *N Engl J Med.* 2009;360(18):1870–84.
6. Stevens DA, Melikian GL. Aspergillosis in the 'nonimmunocompromised' host. *Immunol Invest.* 2011;40(7-8):751–66.