Phlegmonous gastritis presenting with melena: A case report

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Abstract. Phlegmonous gastritis is a rare, yet life-threatening bacterial infection characterized by suppurative gastritis. It has historically been associated with high mortality and is most commonly observed in immunocompromised patients. The present case report describes the case of an 83-year-old immunocompetent female patient who was admitted with the complaint of melena and was diagnosed with phlegmonous gastritis based on histopathological findings following esophagogastroduodenoscopy. The patient was clinically stable at the time of admission and exhibited normal laboratory and imaging results. The patient was successfully treated with antibiotic therapy alone. On the whole, the present case report highlights an unusual presentation of phlegmonous gastritis with associated diagnostic challenges and underscores the importance of early recognition and conservative management with antibiotics.

Introduction

Phlegmonous gastritis is an uncommon form of severe bacterial gastritis characterized by purulent, transmural inflammation of the gastric wall (1). Of note <100 cases have been documented in the literature (1,2). It classically presents as a rapidly progressive, severe illness with epigastric pain, nausea, vomiting and systemic signs of infection (1,3). However, gastrointestinal bleeding in the form of melena is a rare manifestation of phlegmonous gastritis. In the event that it is left untreated or diagnosed at a late stage, phlegmonous gastritis may progress to peritonitis and shock, and has been reported to have mortality rates as high as 50-70% (3). However, it has recently been suggested to have an overall mortality rate of ~27%, likely reflecting improved recognition and outcomes with antibiotic therapy (1).

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The pathogenesis of phlegmonous gastritis involves the bacterial invasion of the gastric mucosa and submucosa, often following a mucosal injury or in the setting of impaired host defense (4). Identified risk factors include immunosuppression, malignancy, chronic alcohol use, recent endoscopic intervention and other causes of gastric mucosal compromise (3). Nevertheless, ~40-50% of reported cases have no obvious predisposing condition; these 'idiopathic' cases occur even in healthy individuals (2,3).

The most commonly implicated organisms are hemolytic *Streptococcus* species (~57-70% of cases), with *Staphylococcus aureus*, *Enterococcus*, *Pneumococcus* and polymicrobial infections also reported (1,4). The diagnosis of phlegmonous gastritis requires a high index of suspicion. Computed tomography (CT) imaging typically reveals the diffuse thickening of the gastric wall and inflammatory changes in adjacent tissues (4). Endoscopy is often the diagnostic tool of choice, revealing characteristic findings, such as edema and erythema of the gastric folds, diffuse fibrinopurulent exudates, erosions or ulcers and occasional hemorrhage (3,4). Biopsy with histopathology confirms the neutrophil-rich infiltrate in the submucosal layer of the stomach wall, and culture can identify the causative organism (3).

The recommended management has evolved over time: Historically, a number of patients required surgical gastrectomy; however, accumulating case reports indicate that early and aggressive antibiotic therapy can often eradicate the infection without surgery (1,4). Broad-spectrum intravenous antibiotics should be initiated empirically, covering streptococci and staphylococci (and Gram-negatives/anaerobes if polymicrobial infection is suspected) (4). Surgical intervention is currently reserved for patients who fail to improve on medical therapy or develop complications (e.g., perforation, abscess) (4).

The present case report describes the case of phlegmonous gastritis in an immunocompetent elderly patient with an atypical presentation and discusses the successful non-surgical management in light of the current literature.

Case report

An 83-year-old female patient with a past medical history of atrial fibrillation (not on apixaban), hypertension, hyperlipidemia and gastrointestinal stromal tumor (GIST) was referred at the University of Utah Hospital, Salt Lake City, UT, USA for further evaluation after abnormal results from a recent

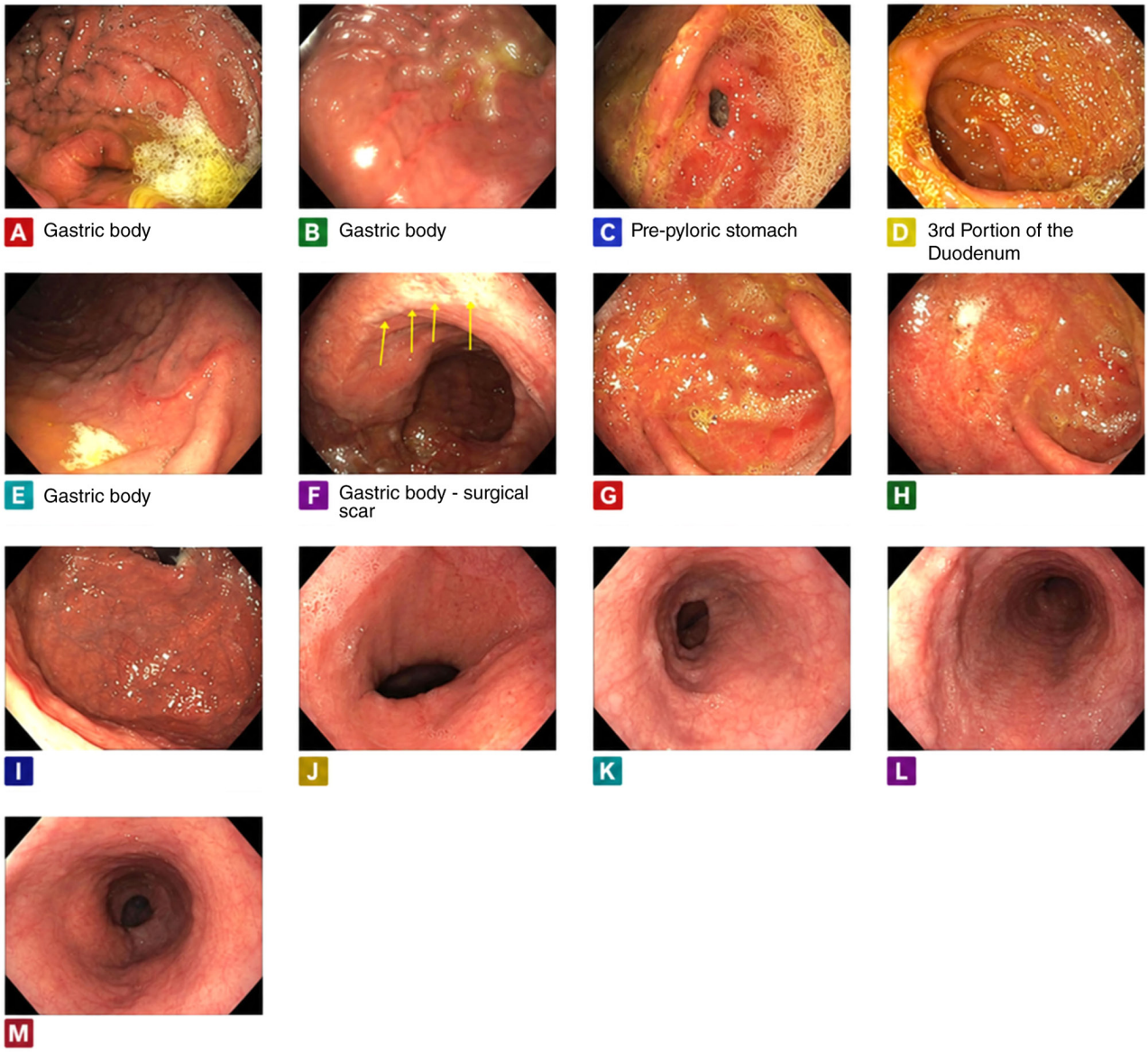


Figure 1. Esophagogastroduodenoscopy findings. (A and B) Gastric body demonstrating prominent mucosal folds, erythema, edema, and areas of yellowish-white material. (C) Pre-pyloric stomach showing focal mucosal abnormalities with surrounding erythema. (D) Third portion of the duodenum showing orange-yellow luminal contents. (E) Gastric body showing prominent mucosal folds and focal whitish material. (F) Surgical scar in the gastric body, indicated by yellow arrows. (G-I) Additional gastric views demonstrating varying degrees of mucosal erythema, edema, and prominent folds. (J-M) Additional upper gastrointestinal luminal views showing mucosal folds and variable luminal caliber.

outpatient esophagogastroduodenoscopy (EGD) performed for melena. The patient initially presented with melena for 3 days, which spontaneously resolved. The patient had mild left upper quadrant discomfort which continued for several months. The patient denied having any other symptoms, such as fever, chills, weight loss, nausea, or vomiting. The patient did not have any known underlying conditions, such as immunodeficiency disorders, liver disease, or immunosuppression. The patient previously had a 2.8x2.7x3.4 cm low-grade GIST at the medial wall of the fundus/body (greater curvature) of the stomach, which had been resected 10 years prior, and she was not on chemotherapy.

The initial upper endoscopy, performed 4 days following the resolution of melena, revealed moderate inflammation with hemorrhage, erosions and mucus throughout the stomach. The EGD findings are illustrated in Fig. 1. Biopsies with a histopathological examination [histopathological analysis was performed on 5-μm-thick paraffin-embedded sections. The sections were fixed in formalin (cardinal health) at ambient 15-30˚C temperature for 22 h and subsequently stained with hematoxylin and eosin (Epredia Co.) for 45 min to 1 h at an ambient 15-30˚C temperature. The sections were then examined under a light microscope (Olympus Corporation)] revealed reactive gastropathy in the gastric antrum and dense neutrophilic infiltration in the gastric body, which was reported as indicative of phlegmonous gastritis (Fig. 2). As the specimens were preserved in formalin, microbiological cultures could not be performed. However, it is most commonly associated with organisms, such as *Streptococcus*, *Staphylococcus* and *Clostridium*.

The patient was subsequently admitted 3 days following the EGD for further evaluation and management. Upon

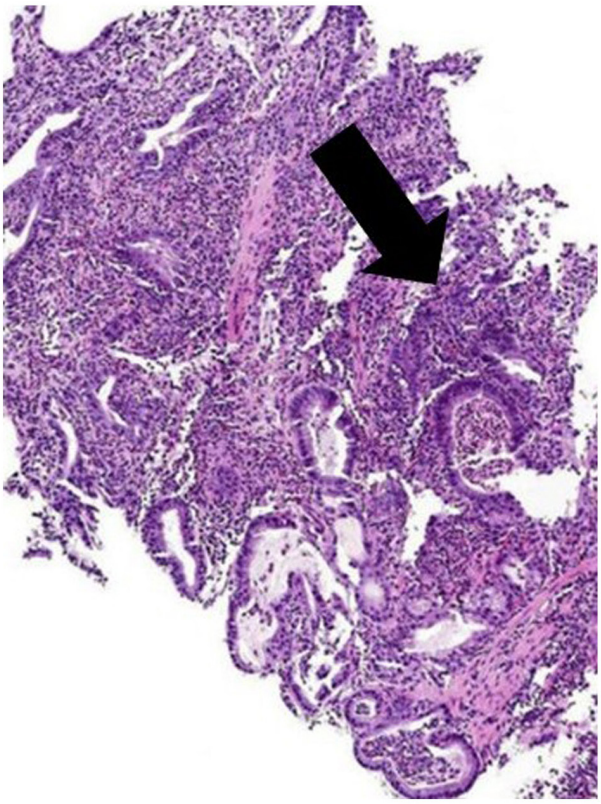


Figure 2. Biopsy with histopathological examination (hematoxylin and eosin staining; magnification, x40 μm). The black arrow indicates dense neutrophilic infiltration in the submucosal layer of the stomach.



Figure 3. Computed tomography scan of the abdomen and pelvis, suggesting no evidence of acute abnormalities.

examination, her vital signs were notable for a blood pressure of 152/83 mm Hg, but were otherwise normal. A physical examination revealed a well-appearing woman in no distress with a soft, non-tender, non-distended abdomen and normal bowel sounds. There were no signs of peritonitis or systemic infection. An initial laboratory evaluation did not demonstrate leukocytosis ($8.96x10^3/\mu l$), abnormal hematocrit (45.2%), abnormal platelet count ($202x10^3/\mu l$), or inflammatory markers, including C-reactive protein (0-0.8 mg/dl), which were within normal limits. HbA1c was 5.5%. Blood cultures were obtained and remained negative. A computed tomography (CT) scan of the abdomen and pelvis revealed no evidence of acute abnormalities, with a normal-appearing stomach without evidence of bowel obstruction, gastric wall thickening, abscess formation, or perforation (Fig. 3).

Given the biopsy-confirmed diagnosis of phlegmonous gastritis and the potentially fulminant nature of the condition, the patient was commenced on empiric intravenous antibiotics with vancomycin at 1 g daily and ampicillin-sulbactam at 3 g every 6 h, considering polymicrobial infection with recommendation from the gastroenterology and infectious disease team. Following a negative nasal swab for methicillin-resistant *Staphylococcus aureus*, vancomycin was discontinued. Oral amoxicillin-clavulanate at 875-125 mg twice a day was used to complete a total 14-day course of antibiotics. The patient remained clinically stable during her period of hospitalization without any evidence of melena or abdominal pain. The repeat EGD of the patient revealed an improvement in inflammation compared with her previous examination (Fig. 4). Biopsy results revealed evidence of reactive gastropathy and chronic inactive gastritis, with negative immunohistochemistry for *Helicobacter pylori*. These findings suggested the resolution of the previously noted acute neutrophilic inflammation.

The patient was subsequently discharged on hospitalization day 3, with a follow-up appointment with gastroenterology for further evaluation. The patient remained asymptomatic and was advised to seek urgent care for fever, chills, abdominal pain, recurrent melena, hematochezia, vomiting, or inability to tolerate oral intake.

At the follow-up evaluation, which took place at ~1 month following the initial evaluation, the patient reported that the mild left upper quadrant discomfort that had been ongoing for several months prior to the diagnosis remained stable and had not progressed. A repeat EGD revealed normal gastric mucosa, and a laboratory evaluation revealed a normal white blood cell count, C-reactive protein (0.1 mg/dl) and erythrocyte sedimentation rate (10 mm/h). The plan was continued clinical monitoring with consideration of repeat endoscopic evaluation if symptoms worsened or gastrointestinal bleeding recurred.

Discussion

Phlegmonous gastritis is a rare, yet life-threatening bacterial infection of the gastric wall characterized by exudative changes and suppurative inflammation, most commonly involving the submucosa. In 1852, Cruveilhier reported the first case in an autopsy study (5). Of note, <100 cases have been reported in the literature, underscoring its rarity. The condition is associated with a high mortality rate, particularly when diagnosis and treatment are delayed. It is caused by the local or diffuse inflammation of the gastric wall. The diffuse type is more common and has a higher mortality rate than the localized type (6).

There are three types of phlegmonous gastritis (primary, secondary and idiopathic) depending on the cause of the disease (7). Primary phlegmonous gastritis, the most common type, is caused by direct microbial invasion through the

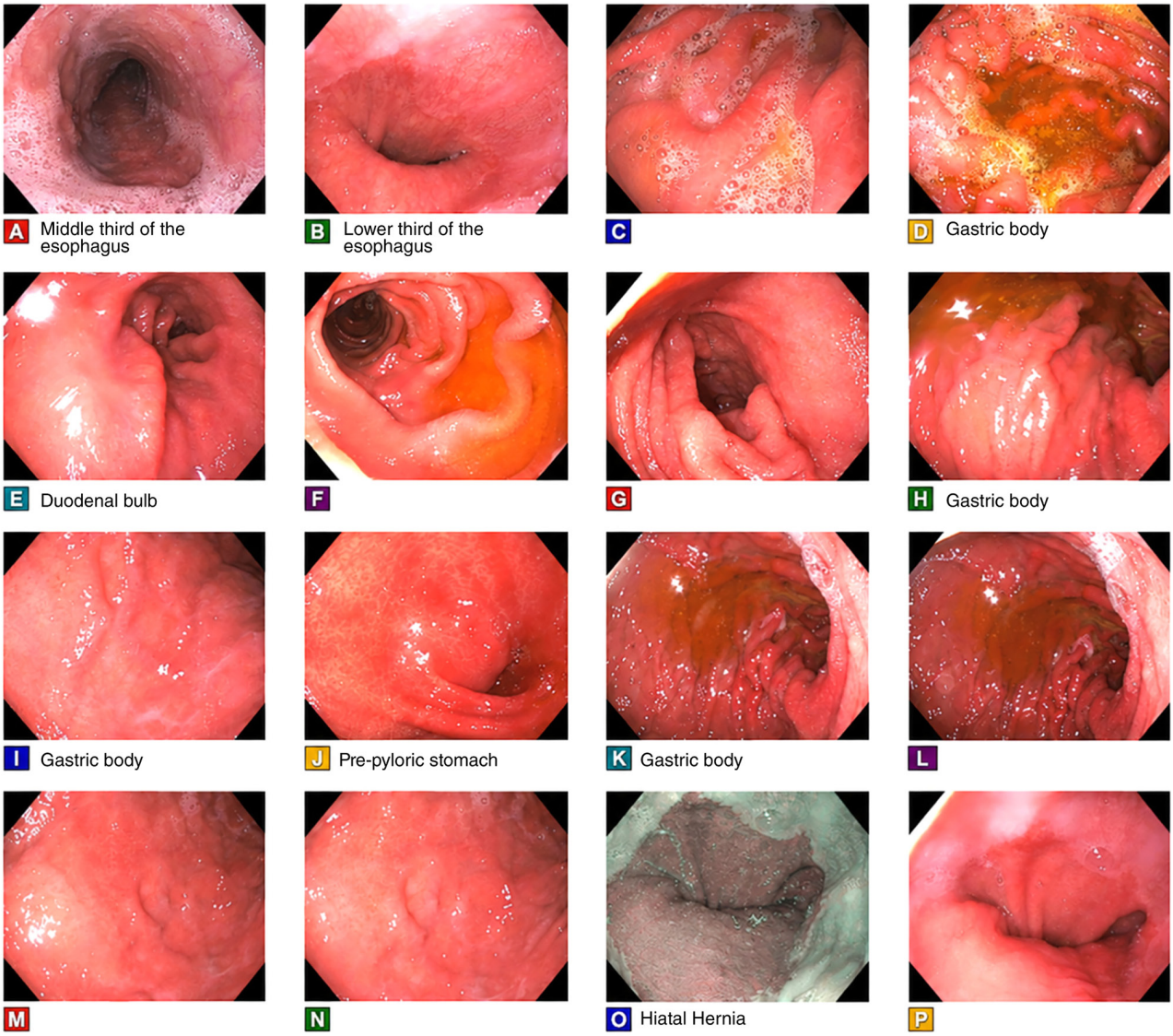


Figure 4. Repeat EGD demonstrating improvement in gastric mucosal inflammation compared with the initial EGD. (A and B) The middle and lower thirds of the esophagus, (C and D) gastric body, (E-G) duodenal bulb, (H-N and P) additional gastric views demonstrating improvement in edema and inflammation, and (O) 3-cm hiatal hernia. EGD, esophagogastroduodenoscopy.

mucosa damaged by gastric ulcers, cancer, foreign objects, biopsy and endoscopic interventions (8). Secondary phlegmonous gastritis is caused by hematogenous spread from infective foci in other organs (e.g., septicemia, endocarditis), or by direct influence of inflammation in neighboring organs (e.g., pancreatitis, cholecystitis) (9). Idiopathic phlegmonous gastritis has an unknown cause with the absence of a primary lesion, as in the patient described herein, and it mostly occurs in a compromised host.

Phlegmonous gastritis typically presents with non-specific symptoms such as acute epigastric pain, fever, nausea and vomiting (9). Purulent emesis might be considered pathognomonic, although it rarely occurs in clinical practice. Gastrointestinal bleeding is rare, and this may be the only presenting symptom in some instances. It may lead to diagnostic confusion with more prevalent causes, such as peptic ulcer disease or gastritis. In the present case report, the presentation with melena highlights an atypical clinical manifestation that may delay consideration of this diagnosis and emphasizes the need for a high index of suspicion in appropriate clinical settings.

Contributing factors include regular alcohol consumption, infection, chronic gastritis, gastric cancer, aging, excessive food intake, extreme exhaustion, elevated pH of gastric juice, and the use of steroids and other immunosuppressive agents (10). However, phlegmonous gastritis can also occur in immunocompetent individuals in the absence of predisposing factors. In the case described herein, the patient had a low-grade GIST, which may be a risk factor for phlegmonous gastritis.

A comprehensive approach, including various imaging modalities, is used for its diagnosis. An upper gastrointestinal endoscopy often reveals erosion, ulcers and diffuse edema (11). A biopsy is required for diagnosis. Identifying the microbial species by gastric mucosal culture is also useful for diagnosis and for the selection of appropriate antibiotics. An abdominal ultrasound and CT scan typically reveal the thickening of the gastric wall and localized fluid accumulation (11). The absence of any notable findings on the CT scan in the case described

herein may be attributed to the limited sensitivity of a CT scan for detecting early or mild-to-moderate phlegmonous gastritis. However, the diffuse and localized types are often misdiagnosed as gastric cancer and gastric submucosal tumors, respectively. Prominent edema, mainly in the submucosa, is characteristic of phlegmonous gastritis. The infiltration of neutrophils can be observed at the early stage, while the infiltration of monocytes, lymphocytes and plasma cells becomes prominent at a later stage (8). Indeed, in the patient in the present case report, the marked infiltration of inflammatory cells was found.

Conservative approaches (e.g., antibiotic therapy) and invasive approaches (e.g., gastrectomy) are currently used for the treatment of phlegmonous gastritis (12). Early antibiotic therapy with appropriate stewardship is essential, as demonstrated in the present case report. In the past, this has often required surgical intervention in the form of partial or total gastrectomy due to the virulent nature of this infection. However, recent case reports indicate that early diagnosis and conservative management with broad-spectrum antibiotics can be effective in clinically stable patients (10,12). Surgery should be considered in patients with a lack of response and/or worsening symptoms despite conservative treatment (6). In the present case report, stable clinical condition of the patient motivated conservative treatment with an optimal response leading to a favorable outcome. However, further studies and reports are warranted to establish appropriate guidelines to identify and manage this disease.

The case described herein is unique for the absence of apparent predisposing factors or comorbidities associated with phlegmonous gastritis. Melena is an uncommon presentation of phlegmonous gastritis. In 2020, Rim and Kim (13) reported the case of an 85-year-old woman with phlegmonous gastritis who presented with melena; a CT scan revealed antral wall edema and an intramural abscess, and endoscopy revealed ulcerative, inflamed mucosa with purulent discharge. A penetrating toothpick was identified as the likely source of infection (13). By contrast, the patient in the present case report had no identifiable foreign body or other apparent source, highlighting the diagnostic challenge of phlegmonous gastritis presenting primarily with gastrointestinal bleeding.

In conclusion, the present case report emphasizes the need for awareness about atypical presentations of phlegmonous gastritis in immunocompetent individuals presenting with gastrointestinal bleeding. Given its rarity and the fact that many physicians may not encounter a case in their lifetime, increasing awareness of phlegmonous gastritis as a potential differential diagnosis is essential. Prompt diagnosis through endoscopy and antimicrobial therapy can result in a successful outcome without the need for surgical intervention. Physicians should maintain a high index of suspicion for phlegmonous gastritis in high-risk patients presenting with melena, even in the absence of classic symptoms.

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Availability of data and materials

The data generated in the present study may be requested from the corresponding author.

Authors' contributions

RJ was involved in writing the initial draft and in editing the manuscript. RJ and MF obtained CT and biopsy images. MS was involved in the patient diagnosis, providing treatment, collecting EGD images, and providing guidance to RJ throughout. MF analyzed patient data. All authors (RJ, MF and MS) were involved in the conception and design of the study. RJ and MS critically reviewed the manuscript for important intellectual content. RJ was also involved in manuscript submission. RJ and MS confirm the authenticity of all the raw data. All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Ethics approval and consent to participate

Ethical approval is not required for this case report format in accordance with local or national guidelines. Written informed consent was obtained from the patient for her participation in the present case report.

Patient consent for publication

Written informed consent was obtained from the patient for the publication of the details of her medical case and any accompanying images.

Competing interests

The authors declare that they have no competing interests.

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