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CASE REPORT | SMALL BOWEL

# Not Your Everyday Duodenal Ulcer: Massive Gastrointestinal Bleed Secondary to Extramedullary Plasma Cell Myeloma

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## ABSTRACT

The differential for gastrointestinal (GI) bleeding is broad, ranging from peptic ulcers and *Helicobacter pylori* infection to variceal hemorrhage and neoplasms. The rarer causes of GI bleeds are frequently overlooked and as such can ultimately be more dangerous. Extramedullary multiple myeloma, an atypical plasma cell dyscrasia arising outside of the bone marrow, involves the GI tract in <5% of cases and often presents with nonspecific symptoms. We describe a rare case of such GI involvement of a plasma cell tumor, with subsequent transmural duodenal ulceration involving the gastroduodenal artery, ultimately resulting in a fatal GI bleed.

**KEYWORDS:** multiple myeloma; gastrointestinal extramedullary plasmacytoma; gastroduodenal artery; gastrointestinal hemorrhage

## INTRODUCTION

Plasma cell neoplasms are defined by a monoclonal proliferation of a single clone of immunoglobulin producing plasma cells. Extramedullary plasmacytomas are rare plasma cell dyscrasias that arise outside of the bone marrow. Extramedullary multiple myeloma (MM) involves the gastrointestinal (GI) tract in <5% of cases, often presenting with nonspecific symptoms, including abdominal pain, anorexia, nausea, vomiting, or infrequently in the form of a GI bleed from an ulcerated lesion.[1,2] Though incredibly uncommon, GI involvement by plasma cell tumors must be immediately diagnosed and treated because patients can present with profound instability and high mortality rate.

## CASE REPORT

The patient is a 62-year-old man with a history of active lambda light-chain MM on chemotherapy, with pancytopenia, gastroesophageal reflux disease, and remote history of testicular cancer. He presented to the emergency department with 3 weeks of global fatigue, nausea, and diarrhea. A few days earlier, while receiving his first belantamab infusion for refractory MM, he was found to have a hemoglobin level (Hgb) of 4.9 g/dL and was transfused with 2 units of packed red blood cells. The day before presentation, he endorsed several episodes of hematemesis and darkened diarrhea with flecks of bright red blood. He denied use of alcohol, nonsteroidal anti-inflammatory drugs, or blood thinners.

Initial blood pressure was 90/62 mm Hg, and the heart rate was 95 bpm. Laboratory results revealed significant leukopenia of $2.2 \times 10^9$/L and normocytic normochromic anemia with Hgb 3.9 g/dL, mean corpuscular volume 93.4 fL, mean corpuscular Hgb 31.3 pg, and mean corpuscular Hgb concentration 33.5%, indicating severe rapid blood loss. He was volume resuscitated with normal saline and 4 units of packed red blood cells, and underwent prompt esophagogastroduodenoscopy (EGD), which revealed a nonbleeding

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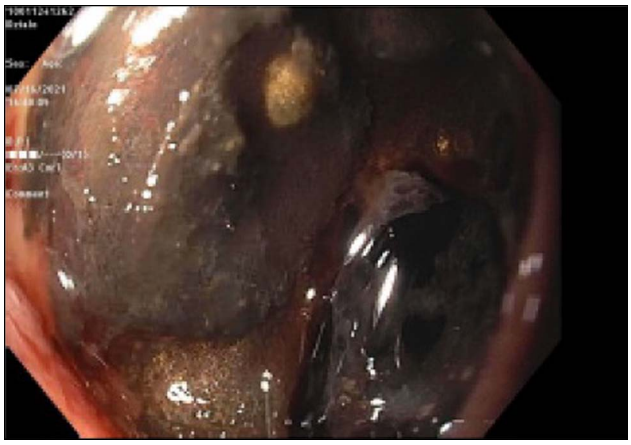

**Figure 1.** Ulcer at the duodenal bulb, completely obstructing duodenum.

cratered duodenal ulcer with adherent clot (Forrest 2b) (Figure 1), causing duodenal obstruction, not amenable to intervention including optimal prophylactic injection therapy.[3] The stomach and esophagus, both grossly normal, were biopsied. Hemostatic clips were placed proximal to the ulcer in the duodenal bulb for location marking in case of future intervention. He subsequently had an uneventful hospital stay and remained hemodynamically stable, with appropriate Hgb response to 8.6 g/dL and no additional melena; he received no heparin products throughout hospitalization. Given lack of evidence for ongoing GI bleed, vascular and interventional radiology embolization was deferred, and he was discharged on a proton pump inhibitor, with plan for repeat Hgb within 1 week and repeat EGD in 4–6 weeks.

Less than 24 hours later, he represented in cardiac arrest, after being found unresponsive and bradycardic with oropharyngeal blood and melena, consistent with acute upper GI bleed. Electrocardiogram revealed a wide-complex bradycardic agonal rhythm, which progressed to pulseless electrical activity.

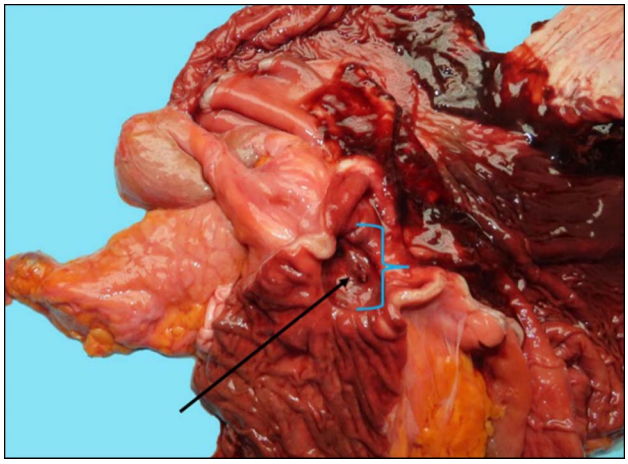

**Figure 2.** 2.8 × 1.9 cm gastroduodenal ulcer (brackets) with eroded gastroduodenal artery (arrow).

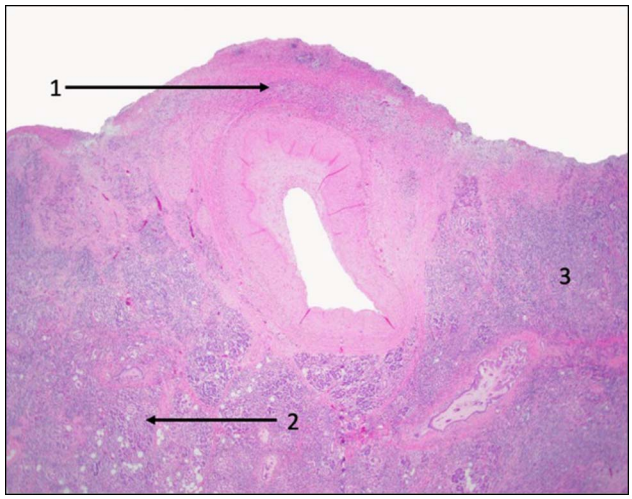


**Figure 3.** Artery with overlying fibrin cap (1) and surrounding pancreatic parenchyma (2) with plasma cell infiltrate (3) (hematoxylin and eosin, 2×).

Cardiopulmonary resuscitation was unsuccessful, and he was pronounced dead.

The duodenal ulcer was ultimately determined to be extramedullary involvement of his plasma cell myeloma. Of note, he had been diagnosed with MM 5 years prior, with magnetic resonance imaging (MRI) revealing multiple lytic lesions in the spine and pelvis. His first hospitalization was for worsening back pain, unveiling hypercalcemia, and acute renal failure (not requiring dialysis). Flow cytometry revealed a monoclonal lambda light chain, and bone marrow biopsy confirmed a lambda-restricted plasma cell neoplasm involving 75% of the marrow. Subsequent MRI showed diffuse myelomatous infiltration of his spine with numerous metastatic lesions. His case proved to be refractory, and at time of this admission was status post multiple cycles of chemotherapy and radiation. Recent MRI and positron emission tomographic computed tomography (PET-CT) within 6–10 months of this hospitalization had demonstrated partial response of his recurrent MM to therapy, with no signs suggesting extramedullary involvement.

Autopsy was performed, with cause of death determined to be due to complications of extramedullary disease from plasma cell myeloma. Gastroduodenal plasma cell infiltration had led to consequent transmural duodenal ulceration involving the gastroduodenal artery (Figures 2–6), resulting in acute hemorrhage.

## DISCUSSION

Plasma cell neoplasms are characterized by increased production of monoclonal immunoglobulin or M protein. M protein binds to clotting factors and can cause bleeding and clotting abnormalities.[4] When deposited in tissues, M protein causes organ dysfunction manifesting as the characteristic signs and symptoms of MM, including hypercalcemia, anemia,

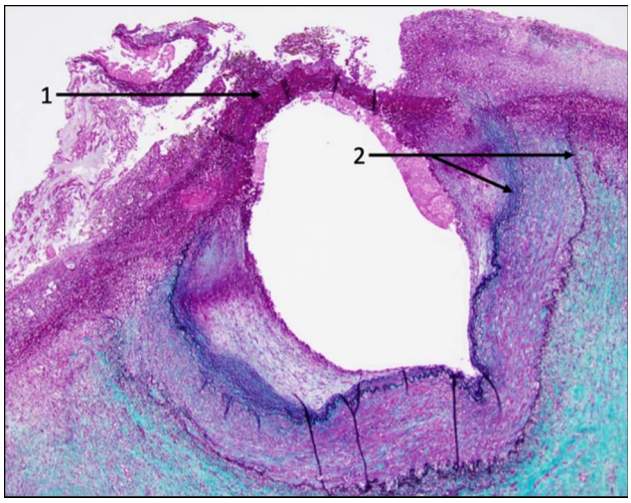


**Figure 4.** Eroded/ruptured artery (1) with partial mural fibrinoid necrosis and disruption of the internal and external elastic layer (2) (elastic trichome, 2×).

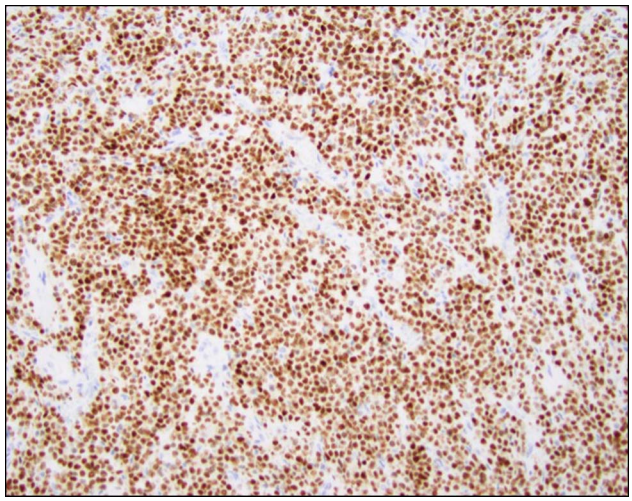

**Figure 6.** Plasma cell infiltrate (multiple myeloma oncogene 1, 20×).

fatigue, renal failure, infections, lytic lesions, and bone pain.[5] These symptoms add a level of complexity to our case because they overlap significantly with the signs of acute GI bleed and therefore may mask its presentation. Anemia in MM may be in the setting of renal dysfunction causing relative erythropoietin deficiency, dilution given significant M protein burden, or bone marrow replacement; however, it could also be secondary to a GI bleed from extramedullary involvement of MM. GI involvement of plasmacytomas is rare and presents most commonly in the stomach, with infrequent duodenal, jejunal, or ileal presentation.[4]

Development of any form of extramedullary disease is known to have poor prognosis and presents a treatment challenge. Although impossible to determine which patients will develop extramedullary myeloma, there seems to be some protective benefit of high-dose therapy, immunomodulatory drugs, and autologous transplantation.[6] Importantly, most patients with extramedullary myeloma are asymptomatic, so the use of advanced imaging studies such as PET-CT and MRI is crucial for early diagnosis and increased survivorship. Although MRI is more sensitive for bone involvement, whole body PET is the preferred imaging study to detect extramedullary disease. If GI involvement is suspected, endoscopic evaluation is the investigational modality of choice.

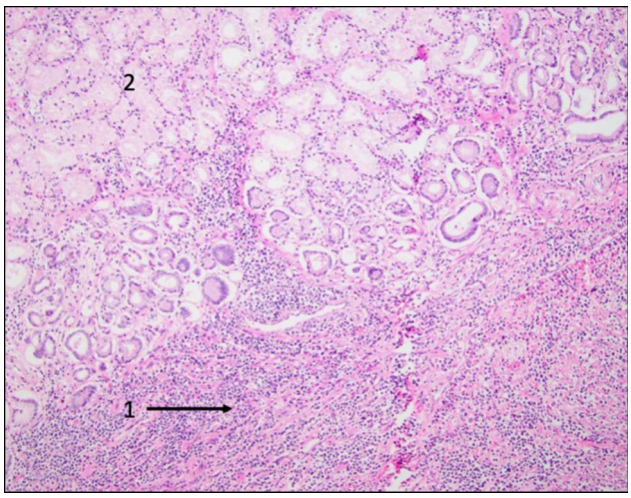


**Figure 5.** Plasma cells (1) infiltrating Brunner glands (2) of the deep duodenal mucosa (hematoxylin and eosin, 10×).

Although incredibly rare, due to high mortality rate and swift progression, it is crucial for providers to consider gastrointestinal plasmacytomas in patients with a history of plasma cell neoplasm who present with upper GI bleeding. In the case described above, the patient presented with what seemed to be a typical GI bleed. He underwent appropriate resuscitation and EGD, remained hemodynamically stable with apparent resolution of symptoms, was discharged with appropriate follow-up, and died less than 24 hours later. In patients with known MM presenting with a GI bleed in the setting of a lesion not amenable to endoscopic therapy, it may be prudent to consider gastrointestinal extramedullary disease before discharge. In these patients, observation for an additional 24 hours, repeat endoscopic surveillance before discharge, or consideration of vascular and interventional radiology embolization, deferred in this case given clinical cessation of bleeding, could be lifesaving.

## DISCLOSURES

Author contributions: H. Fiske performed background research, drafted, and revised the article. B. Dougherty provided background information on the patient. C. Ward proofread and critically revised the article. J. Claus, K. Dannheim, and S. Chen acquired and analyzed the pathology images. J. Ferreira provided final approval of the article. H. Fiske is the article guarantor and accepts full responsibility for the conduct of the study.

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Informed consent was obtained for this case report.

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