CASE REPORT

Jejunal Gastrointestinal Stromal Tumor as a Source of Small Bowel Bleeding: A Case Report

Jacob Burch, DO1; Iftiker Ahmad, MD2

ABSTRACT

Introduction: In a minority of patients with gastrointestinal bleeding, the offending lesion is not able to be identified using colonoscopy or esophagogastrroduodenoscopy (EGD). For these patients, video capsule endoscopy has become a cornerstone for the diagnosis of gastrointestinal bleeding in the territory not accessible by colonoscopy or EGD. One uncommon cause of bleeding from the small bowel is a gastrointestinal stromal tumor.

Case Presentation: We present the case of a 76-year-old man who presented with 2 weeks of melena that began after starting dual antiplatelet therapy with aspirin and clopidogrel after undergoing coronary artery stenting. After EGD and colonoscopy failed to identify the culprit, the patient underwent video capsule endoscopy, which identified a suspicious area concerning for intussusception. Computed tomography enterography was then performed and showed a short segment of bowel wall thickening. The patient underwent laparoscopic small bowel resection and was found to have a gastrointestinal stromal tumor.

INTRODUCTION

Obscure gastrointestinal bleeding is defined by the American Gastroenterological Association as bleeding from the gastrointestinal tract that persists or recurs without an obvious etiology after esophagogastrroduodenoscopy (EGD), colonoscopy, and radiologic evaluation of the small bowel.1

In patients presenting with gastrointestinal bleeding, EGD and colonoscopy fail to identify the offending lesion(s) in 5% of cases.2 Video capsule endoscopy (VCE) and double-balloon enteroscopy, however, have proven capable of finding the source of bleeding in approximately 75% of these cases.3,5 The most common causes of small bowel bleeding include inflammatory bowel disease, angiodysplasia, Dieulafoy lesions, neoplasms, ulcerations, and Meckel diverticulum.5 Among this group, the most common etiology is angiodysplasia.4,5 While neoplasms represent the second most common cause of small bowel bleeding, they still comprise only 5% to 10% of cases.4 Even more rare among this group is the gastrointestinal stromal tumor (GIST), which accounts for only 7.1% of small bowel malignancies.6 We present the case of a 76-year-old man who was found to have a jejunal GIST as the source of gastrointestinal bleeding. This case highlights the critical role that VCE can play in the diagnosis of obscure gastrointestinal bleeding. This case was prepared following CARE guidelines.7

CASE PRESENTATION

Our patient is a 76-year-old man with a past medical history of hypertension, coronary artery disease, myocardial infarction, gastroesophageal reflux disease, and cataracts. He had previously undergone single-vessel coronary artery bypass grafting on 2 occasions and had subsequently undergone coronary artery stenting 5 times.

The patient presented to the outpatient gastroenterology clinic with complaints of 2 weeks of melena that had resolved 1 week before being seen (Table 1). His melena started following a heart catheterization with stenting and initiation of dual antiplatelet therapy. His complete blood count on the day of presentation showed a hemoglobin of 7.9 g/dL (normal: 12.6-16.5 g/dL). The patient underwent EGD 4 days later, which showed no abnormalities. Repeat complete blood count on the day of his EGD revealed hemoglobin of 6.7 g/dL. Following the completion of his EGD, the patient was admitted to the hospital for transfusion of 2 units of packed red blood cells. He underwent colonoscopy the following day, which also found no source for his melena. Capsule endoscopy was performed 1 week later and revealed a questionable segment of intussusception of the terminal ileum (Figure 1). Computed tomography (CT) enterography with contrast was performed 1 month later and revealed a short segment of hyperenhancement and eccentric, mural bowel wall thickening measuring up to 8 mm in the left lower quadrant, likely corresponding to the distal jejunum (Figure 2).

The patient underwent laparoscopic segmental small bowel resection 2 months after his initial presentation. During the course of surgery, he was found to have a freely movable 3.3 × 3.0 × 2.7 cm mass in the mid-jejunum, which was resected. Histology demonstrated a mixed-type GIST with predominantly spindle cell proliferation that stained positive for CD117 and discovered on GIST 1 (DOG1) (Figure 3). The final tumor staging

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was T2N0M0 and the patient did not require adjuvant therapy.

**DISCUSSION**

GISTs are typically benign, mesenchymal tumors found throughout the entirety of the gastrointestinal tract. Given that just 30% are malignant, GISTs represent only 0.1% to 3% of gastrointestinal malignancies despite making up 80% of gastrointestinal mesenchymal tumors.8,9 The stomach represents the most common primary location of GISTs, accounting for approximately 60% of cases, while the small bowel is the second most common, accounting for 20% to 30% of GISTs.10-13 Despite only accounting for 20% to 30% of GISTs, an analysis of 2015 US cancer statistics found that the incidence of localized and small bowel GISTs has been increasing since the turn of the 21st century.13 Approximately 70% of patients with GISTs have symptoms related to their disease, 20% of patients remain asymptomatic, and 10% of GISTs are found on autopsy.14 The most common presentations associated with GISTs are gastrointestinal bleeding with associated anemia, weakness, and abdominal pain.15,16

GISTs are known to arise from the same lineage as the interstitial cells of Cajal; however, the specific cell type from which they arise remains unknown.9,17 While GISTs are most commonly sporadic, they can also be associated with inherited tumor syndromes such as neurofibromatosis type 1, Carney-Stratakis syndrome, and Carney triad.9,15,17,18 Approximately 85% of sporadic GISTs are caused by mutations of either KIT (CD117) or platelet-derived growth factor receptor alpha. These mutually exclusive mutations subsequently lead to activation of the tyrosine kinase receptors encoded by these genes.9 The activation of these tyrosine kinase receptors subsequently leads to neoplastic growth.

The definitive diagnosis of GISTs is based on both the morphologic and immunohistochemical findings.10,16 The 3 morphologic patterns of GISTs are spindle cell (70%), epithelioid cell (20%), or mixed (10%).10,12,16 Spindle cell GISTs are composed of short fascicles or whorls of cells. Epithelioid-type GISTs are composed of diffuse or nested epithelioid cells. Mixed-type GISTs demonstrate a

### Table 1. Case report timeline

<table>
<thead>
<tr>
<th>Date</th>
<th>Summaries from initial and follow-up visits</th>
<th>Diagnostic testing (including dates)</th>
<th>Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 17, 2019</td>
<td>Patient presented 1 wk following the resolution of 2 wk of melena that began after starting aspirin and clopidogrel following coronary artery stenting</td>
<td>CBC showed hemoglobin of 7.9 g/dL (normal: 12.6-16.5 g/dL)</td>
<td>Scheduled for diagnostic EGD</td>
</tr>
<tr>
<td>June 21, 2019</td>
<td>EGD performed; no abnormalities seen</td>
<td>CBC repeated, with hemoglobin of 6.7 g/dL</td>
<td>Patient hospitalized for transfusion of 2 units of PRBCs</td>
</tr>
<tr>
<td>June 22, 2019</td>
<td>Colonoscopy performed during hospitalization; no abnormalities seen</td>
<td>CBC repeated, with hemoglobin of 8.6 g/dL</td>
<td>Patient discharged following normal colonoscopy and stabilization of hemoglobin</td>
</tr>
<tr>
<td>June 28, 2019</td>
<td>Capsule endoscopy performed: questionable segment of intussusception seen at terminal ileum</td>
<td></td>
<td>Patient scheduled for CTE to further evaluate possible segment of intussusception</td>
</tr>
<tr>
<td>July 19, 2019</td>
<td>CTE hyperenhancement and bowel wall thickening in the left lower quadrant, likely corresponding to the distal jejunum</td>
<td></td>
<td>Referred to general surgery for excision of concerning segment of bowel</td>
</tr>
<tr>
<td>August 21, 2019</td>
<td>3.3 × 3.0 × 2.7 cm resected from jejunum</td>
<td>Histology significant for spindle cell GIST with CD117 and DOG1 staining</td>
<td></td>
</tr>
</tbody>
</table>

*With regard to the patient’s relevant past medical history and interventions, he had hypertension, coronary artery disease, myocardial infarction, gastroesophageal reflux disease, and cataracts. The patient had undergone single-vessel coronary artery bypass graft 2 times and subsequent coronary artery stenting 5 times and was taking aspirin and clopidogrel.*

**CBC** = complete blood count; **CTE** = computed tomography enterography; **DOG1** = discovered on GIST 1; **EGD** = endoscopic gastroduodenoscopy; **GIST** = gastrointestinal stromal tumor; **PRBC** = packed red blood cell.

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Figure 1. Capsule endoscopy showing a questionable segment of intussusception.
combination of spindle and epithelioid cell architectural patterns. The diagnosis of GISTs is confirmed with immunohistochemical markers. KIT (CD117) is present in approximately 95% of GISTs and serves as a confirmation of this diagnosis. In the absence of KIT, DOG1, also known as anoctamin, or CD34 can be used to confirm this diagnosis. In rare cases in which GIST is strongly suspected but testing for KIT, DOG1, and CD34 is negative, mutational analysis of known KIT or platelet-derived growth factor receptor alpha mutations can be used to confirm the diagnosis.

The diagnostic workup of GISTs is often determined by size, location, and presenting symptoms. For patients who present with the most common symptom of GISTs, gastrointestinal bleeding (and sequalae), the diagnostic workup often begins with endoscopy. On endoscopy, GISTs will present as a subepithelial lesion. For patients with a suspicious subepithelial lesion seen on endoscopy, endoscopic ultrasound is the best method of obtaining a biopsy for pathologic diagnosis prior to surgical resection. For patients with gastrointestinal bleeding in whom no offending lesions can be seen on endoscopic evaluation with EGD and colonoscopy, VCE and double-balloon enteroscopy are additional methods that can be used to try to identify the culprit in the region of the gastrointestinal tract not accessible by these other modalities. For patients presenting with abdominal pain or obstructive symptoms, CT imaging may be the initial modality employed to evaluate the symptoms and may identify a mass, but it does not offer a definitive diagnosis. Contrast-enhanced CT of the abdomen and pelvis also serves as the recommended imaging modality for evaluating and staging patients with known GIST, performing surveillance after surgical resection, and monitoring treatment response in patients receiving adjuvant or neoadjuvant therapy. Positron emission tomography-CT may be useful in evaluating for early response to tyrosine kinase inhibitors, but it does not provide a significant advantage over contrast-enhanced CT of the abdomen and pelvis in the routine evaluation of patients with GISTs and may actually lead to more poorly defined images; therefore, positron emission tomography-CT does not represent the preferred imaging for patients with GISTs.

Despite significant advancements in medical therapies for GISTs, surgical resection remains the cornerstone of therapy for resectable GISTs. In easily resectable tumors greater than 2 cm, the therapeutic goal is complete resection obtaining negative margins without rupture of the tumor’s pseudocapsule. Due to the low propensity for GISTs to spread lymphatically, lymph node resection is not required in all cases, and it is recommended to pursue this only in patients with clinical suspicion of lymph node involvement. For patients without metastatic disease but in whom surgical resection cannot be easily obtained, neoadjuvant therapy can be used to make the tumor more amenable to resection.

The discovery of the role that KIT mutations play in the development of GISTs has been pivotal not only in the diagnosis of GISTs but also in their treatment. Tyrosine kinase inhibitors have come to comprise the backbone of medical therapy for GISTs. The tyrosine kinase inhibitor...
imatinib serves as first-line medical therapy for neoadjuvant, adjuvant, and advanced GISTs. Adjuvant therapy following successful surgical resection should be reserved for those with high-risk disease.\textsuperscript{12,18,19} For patients who do not respond to initial medical therapy with imatinib, the dose of imatinib can be increased or the patient can be transitioned to second-line therapy. The second-line agent for the medical therapy of GISTs is also a tyrosine kinase inhibitor, sunitinib.\textsuperscript{12,18,20}

**CONCLUSION**

Overlapping timelines in the approval of VCE as well as the classification and treatment of GIST have led to paralleled growth in each of these fields. We feel that these paralleled growths likely contribute to the previously described increases in the incidence of localized and small intestinal GISTs. It is our hope that improved recognition of GISTs as a source of gastrointestinal bleeding and the role VCE can play in this diagnosis will lead to more timely diagnosis, treatment, and ultimately the survival of small bowel GISTs.\textsuperscript{2}

**Disclosure Statement**

The author(s) have no conflicts of interest to disclose.

**Authors’ Contributions**

Jacob Burch, DO, participated in drafting and submitting the manuscript. Ifthker Ahmad, MD, reviewed and edited the manuscript. All authors have given final approval to the manuscript.

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**References**