

Chapter 76: Lower Gastrointestinal Bleeding

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INTRODUCTION AND EPIDEMIOLOGY

Lower GI (LGI) bleeding is the loss of blood from the GI tract distal to the ligament of Treitz. LGI bleeding is a common problem in emergency medicine and should be considered potentially life threatening until proven otherwise.

LGI bleeding occurs less often than upper GI (UGI) bleeding, with an annual incidence of approximately 36 per 100,000.¹ Because blood must travel through the UGI tract down to the LGI system, UGI bleeds are the most common source for all causes of blood detected in the LGI system. **Among patients with an established LGI source of bleeding (i.e., bleeding past the ligament of Treitz), the most common cause is diverticular disease, followed by colitis, adenomatous polyps, and malignancies.**^{2,3} LGI bleeding is more common among females and increases significantly in the elderly.¹

About 80% of episodes of LGI bleeding resolve spontaneously.⁴ However, one cannot predict which episodes will spontaneously resolve or which episodes will result in complications. This is partly due to the difficulty in establishing a pathophysiologic diagnosis. In one study, a cause for bleeding was found in <50% of the cases.⁵

PATHOPHYSIOLOGY

Hematochezia is either bright red or maroon-colored rectal bleeding. If hematochezia originates from a UGI source, it indicates brisk UGI bleeding, which may be accompanied by hematemesis and hemodynamic instability. Approximately 10% of hematochezia episodes may be associated with UGI bleeding.⁶ **Melena** is dark or black-colored stools and usually represents bleeding from a UGI source (proximal to the ligament of Treitz) but may also represent slow bleeding from an LGI source.

DIVERTICULOSIS

Diverticular bleeding is usually painless and results from erosion into the penetrating artery of the diverticulum. Diverticular bleeding may be massive, but up to 90% of episodes will resolve spontaneously. Bleeding can recur in up to half.^{7,8} Although most diverticula are located on the left colon, right-sided diverticula are thought to be more likely to bleed.⁹ Elderly patients with underlying medical illnesses, those with increased needs for transfusion, and those taking anticoagulants or nonsteroidal anti-inflammatory drugs have increased morbidity and mortality.⁷

VASCULAR ECTASIA

Vascular ectasia, which includes arteriovenous malformations and angiodysplasias of the colon, is a common cause of LGI bleeding. Vascular ectasia can also be present in the small bowel and is difficult to diagnose. The development of vascular ectasia in the large bowel seems to be due to a chronic process and increases with aging. Inherited conditions can also give rise to arteriovenous malformations. There is also a suggestion that valvular heart disease is a risk factor for developing bleeding vascular ectasias, although this is an area of debate.⁴

ISCHEMIC COLITIS AND MESENTERIC ISCHEMIA

Ischemic colitis is the most common cause of intestinal ischemia and is usually transient. The colon is predisposed to ischemia because of its poor vascular circulation and high bacterial content. Aneurysmal rupture, vasculitis, hypercoagulable states, prolonged strenuous exercise, cardiovascular insult, irritable bowel syndrome, and certain medications that cause vasoconstriction or slow bowel motility are known risk factors. Diagnosis is usually made by endoscopy. Although most cases will resolve on their own, up to 20% will require surgical intervention.¹⁰

Mesenteric ischemia can lead to bowel necrosis. Causes include thrombosis or embolism of the superior mesenteric artery, mesenteric venous thrombosis, and nonocclusive mesenteric ischemia associated with low arterial flow with vasoconstriction. Diagnosis is difficult, and the presentation can mimic other intra-abdominal pathologies. Diagnosis requires a high index of suspicion, especially in patients >60 years old and in those with atrial fibrillation, congestive heart failure, recent myocardial infarction, postprandial abdominal pain, or unexplained weight loss. CT has a specificity of 92% but only a sensitivity of 64%. Angiography remains the diagnostic study of choice. Despite aggressive treatment, prognosis is poor, with a survival of 50% if diagnosed within 24 hours.¹¹

MECKEL'S DIVERTICULUM

Meckel's diverticulum consists of embryonic tissue, most commonly found in the terminal ileum. More than half of lesions contain ectopic gastric tissue, which can secrete gastric enzymes, eroding the mucosal wall and causing bleeding. It is a rare but important condition, especially in the younger population.

OTHER CAUSES OF LOWER GI BLEEDING

Numerous other lesions may result in LGI hemorrhage ([Table 76–1](#)), including infectious colitis, radiation colitis, rectal ulcers, trauma, and inflammatory bowel disease. Polyps and carcinomas can cause LGI bleeding and are usually a source of chronic anemia. Delayed hemorrhage can occur up to 3 weeks after polypectomy. Patients with left ventricular assist devices are prone to GI bleeding especially due to anticoagulation, risk of arteriovenous malformations, and acquired von Willebrand's disease.¹² Although hemorrhoids are the most common source of anorectal bleeding, massive hemorrhage is unusual.¹⁰ For further discussion of hemorrhoids, see [chapter 85](#), "Anorectal Disorders."

Table 76–1

Causes of Lower GI Bleeding

| |
|---------------------------------|
| Upper GI bleed |
| Diverticulosis |
| GI carcinoma |
| Angiodysplasia |
| Arteriovenous malformations |
| Mesenteric ischemia |
| Ischemic colitis |
| Meckel's diverticulum |
| Hemorrhoids |
| Infectious colitis |
| Inflammatory bowel disease |
| Polyps |
| Radiation colitis |
| Rectal ulcers |
| Trauma |
| Foreign bodies |
| Carcinoma |
| Prostate biopsy sites |
| Endometriosis |
| Dieulafoy lesions |
| Colonic varices |
| Portal hypertensive enteropathy |

DIAGNOSIS

As with any emergency, the medical history, physical examination, and diagnostics often must be accomplished simultaneously with resuscitation and stabilization. **Factors associated with a high morbidity rate are hemodynamic instability, repeated hematochezia, gross blood on initial rectal examination, initial hematocrit <35%, syncope, nontender abdomen (predictive of severe bleeding), [aspirin](#) or nonsteroidal anti-inflammatory drug use (predictive of diverticular hemorrhage), and more than two comorbid conditions.**^{2,3,13}

HISTORY

Although most patients will volunteer complaints of hematochezia or melena, signs and symptoms of hypotension, tachycardia, angina, syncope, weakness, or altered mental status can all occur as a result of LGI bleeding.

Ask about previous GI bleeding as well as a history of pain, trauma, ingestion or insertion of foreign bodies, and recent colonoscopies. Weight loss and changes in bowel habits may suggest malignancy. A history of an aortic graft may suggest the possibility of an aortoenteric fistula. Medications, such as salicylates, nonsteroidal anti-inflammatory drugs, and warfarin, increase the risk of LGI bleeding.^{14,15,16} Ingestion of iron or bismuth can simulate melena, and certain foods, such as beets, can simulate hematochezia. However, stool guaiac testing in those cases will be negative.

PHYSICAL EXAMINATION

Hypotension and tachycardia, or decreased pulse pressure or tachypnea, develop with significant bleeding. However, changes in vital signs may be masked by concurrent medications, such as β -blockers, or medical conditions such as poorly controlled hypertension. Thus, relative tachycardia and hypotension may represent subtle clues to ongoing bleeding. Some patients can tolerate substantial volume losses with minimal or no changes in vital signs.

Cool, pale skin and an increase in capillary refill can be signs of shock. Physical findings of liver disease, as well as petechiae and purpura, suggest an underlying coagulopathy. The abdominal examination may disclose tenderness, masses, ascites, or organomegaly. In patients with LGI bleeding, a lack of abdominal tenderness suggests bleeding from disorders involving the vasculature, such as diverticulosis or angiodysplasia. Inflammatory bowel disorders with LGI bleeding are associated with abdominal tenderness on examination.

Thorough examination of the rectal area may reveal an obvious source of bleeding, such as a laceration, masses, trauma, anal fissures, or external hemorrhoids. A vaginal or urinary source of bleeding mistaken for a GI source will be identified by examination and testing. Perform a digital rectal examination to detect gross blood (either bright red or maroon) and for guaiac testing. Rectal examination can also detect the presence of masses.

Anoscopy can also be performed at the bedside. A source of bleeding such as hemorrhoids can sometimes be elucidated by anoscopy. However, blood originating beyond the level of visualization should raise the suspicion for other causes.¹⁰

LABORATORY TESTING

The most important laboratory tests are the CBC, coagulation studies, and typed and cross-matched blood. Coagulation studies, including prothrombin time, partial thromboplastin time, and platelet count, are of obvious benefit in patients taking anticoagulants or those with underlying hepatic disease. In addition, obtain blood urea nitrogen, creatinine, electrolytes, glucose, and liver function studies. In acute, brisk bleeding, the initial hematocrit level may not reflect the actual amount of blood loss. **Bleeding from a source higher in the GI tract may elevate blood urea nitrogen levels through digestion and absorption of hemoglobin.**

Obtain an ECG in patients with coronary artery disease. **Silent ischemia can occur secondary to the decreased oxygen delivery accompanying significant GI bleeding.**

IMAGING

Routine abdominal radiographs are of limited value without specific indications such as perforation, obstruction, or foreign bodies. Similarly, routine admission chest x-rays for patients with acute GI hemorrhage, even those admitted to the intensive care unit, are of limited utility in the absence of known pulmonary disease or abnormal findings on lung examination.¹⁷ Barium contrast studies are not helpful and can interfere with subsequent emergent endoscopy or angiography.

The initial diagnostic procedure of choice—angiography, scintigraphy, or endoscopy—depends upon resource ability and consultant preference.^{18,19,20,21} Angiography can sometimes detect the site of bleeding and help guide surgical management. Moreover, angiography permits therapeutic options such as transcatheter arterial embolization or the infusion of vasoconstrictive agents. However, **angiographic diagnosis and therapy require a relatively brisk bleeding rate (at least 0.5 mL/min). Serious complications can also occur with angiography in up to 10% of cases.**¹⁰

Technetium-labeled red cell scans can also localize the site of bleeding in obscure hemorrhage. Such localization can be used to help determine if angiography or surgery is the optimal approach. **Scintigraphy appears more sensitive than angiography and can localize the site of bleeding at as low a rate as 0.1 mL/min. It also has potential value over angiography if bleeding occurs intermittently but requires a minimum of 3 mL of blood to pool.**²²

Multidetector CT angiography has a sensitivity and specificity of up to 100% and 99%, respectively, for detecting active or recent GI bleeding and is about 93% accurate in determining the site of bleeding.^{23,24} It can be a useful tool prior to treatment with conventional angiography.

TREATMENT

Resuscitate unstable or actively bleeding patients. Administer [oxygen](#) and institute cardiac monitoring. Place two large-bore IV lines and replace volume with crystalloids. Correct coagulopathy. Blood transfusion should be based on the clinical findings of volume depletion or continued bleeding rather than on initial hematocrit values. In acute bleeding, hematocrit values may not represent true blood volume status, because it takes several hours for the hematocrit to decrease. **General guidelines for initiation of blood transfusion are continued active bleeding and failure to improve perfusion and vital signs after the infusion of 2 L of crystalloid.** The threshold for blood transfusion should be lower in the elderly.

Consider the placement of a nasogastric tube if LGI bleeding is significant. **Hematochezia unexpectedly originates from UGI sources approximately 10% to 14% of the time.**^{6,25} Factors that suggest a UGI source for hematochezia include anemia and previous history of UGI bleeding.⁶ Nasogastric aspiration has low sensitivity and negative predictive value for UGI bleeding.²⁶ In one study, 15% of patients with hematochezia had a negative nasogastric aspirate but had a UGI source of bleeding.²⁶ A nasogastric tube is likely beneficial only for those with significant ongoing UGI bleeding in whom immediate intervention will occur.^{10,26}

Obtain early consultation for severe LGI bleeding to expedite the next steps of care. Surgical consultation along with consultation from the gastroenterologist is prudent for uncontrollable bleeding.

ENDOSCOPY AND SURGERY

Flexible sigmoidoscopy can evaluate possible distal colonic and rectal sources of bleeding but cannot identify more proximal sources of bleeding. Colonoscopy can diagnose various sources of LGI bleeding, such as diverticulosis or angiodysplasia, and may allow ablation of bleeding sites with various endoscopic hemostasis methods (injection sclerotherapy, electrocoagulation, heater probe therapy, banding, and clipping). If colonoscopy fails to determine the source of bleeding, the specialists may consider upper endoscopy to evaluate for a UGI source of bleeding, although upper endoscopy may be indicated first in certain situations.²⁷ Timing of endoscopy can vary. Some studies suggest that urgent colonoscopy is both safe and accurate within 12 to 24 hours of admission, but others report that delayed colonoscopy is appropriate in stable patients.^{8,9,10,27}

Patients with continued bleeding and failure of endoscopic hemostasis may need emergency surgery. The reported proportion of patients requiring surgery varies from 5% to 25%.^{10,18}

DISPOSITION AND FOLLOW-UP

Patients with LGI hemorrhage will often require hospital admission and early referral to an endoscopist. Those who are unstable or with active bleeding may require admission to the intensive care unit. Variables associated with morbidity include **hemodynamic instability, repeated hematochezia within 4 hours of evaluation, nontender abdomen, aspirin use, and more than two comorbid conditions.**^{2,3} Although risk stratification scores have been developed for UGI bleeding for possible outpatient management, **no reliable scoring system exists to risk stratify which patients with LGI bleeding may be discharged home safely.** However, those with an obvious cause of mild bleeding (such as mild bleeding from hemorrhoids or anal fissures), or who have no bright red blood or maroon or melanotic stool on rectal examination and are hemodynamically stable and without major comorbidities, may be candidates for outpatient treatment.

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