Lower Gastrointestinal Bleed

Deepak K Bhasin, Surinder S Rana

Lower GI bleeding (LGIB) is defined as bleeding that occurs from the bowel distal to the ligament of Treitz. The term “lower gastrointestinal bleeding” is therefore a misnomer as it includes both small and large bowel bleed. Advent of capsule and double-balloon endoscopy has revolutionized the management of small bowel bleeding and it is accepted that small bowel bleeding represents a different entity. Thus gastrointestinal bleeding is now divided into upper, middle and lower bowel bleeding. Lower gastrointestinal bleeding represents bleeding from colon and anorectum. Acute LGIB is defined as being of recent duration ie less than 3 days and chronic LGIB is passage of blood from the rectum over a period of several days and patients can present with positive occult blood test in stools, iron deficiency anemia, occasional episodes of melena, hematochezia or maroon stools. Majority of patients with hematochezia will be bleeding from large bowel but in 10-25% of patient’s small bowel is the source of bleed and it poses more difficult diagnostic dilemma. Also some patients with massive upper gastrointestinal bleed can present with hematochezia. Lower GI bleed represents a diverse range of bleeding sources and severities, ranging from mild hemorrhoidal bleeding to massive blood loss from vascular small bowel tumors. Massive lower GI bleed is defined as any bleeding requiring more than 3 to 5 units of blood during 24 hours to maintain hemodynamic stability.

Evaluation of hemodynamic status and resuscitation are the most important steps to be followed in the emergency in the initial treatment of patients with lower GI bleed. Along with these steps an initial history and clinical evaluation should be done to arrive at a list of possible differential diagnosis and plan further investigations. Effort should be made to identify patients with hemodynamic compromise. Postural changes, pallor, dyspnea, tachycardia and hypotension suggest hemodynamic compromise. Two large caliber peripheral venous lines or a central venous line should be placed in patients with hemodynamic compromise. Initial laboratory studies should include a complete blood count, coagulation profile, blood grouping, renal function tests and electrolytes. The use of anticoagulants or nonsteroidal anti-inflammatory drugs (NSAIDs), the presence of liver disease, and serious comorbid medical conditions like cardiac conditions should be assessed. Family history of colorectal cancer should also be asked for. Blood should be transfused as soon as possible. Coagulopathy (international normalized ratio >1.5) or thrombocytopenia (<50,000 platelets/µl) should be treated using fresh frozen plasma or platelets, respectively.

Hematochezia must be differentiated from melena, the presence of which is suggestive of an upper gastrointestinal bleeding source (although bleeding from the cecum and right-sided colon can present with melena). Patients with brown or infrequent stools are unlikely to have brisk bleeding; those with frequent passage of red or maroon stool, however, may have ongoing bleeding. Careful digital rectal examination should be done to exclude anorectal pathology as well as confirm the patient’s description of stool color.

The most common etiologies of lower gastrointestinal bleeding varies according to the age groups of the patients. In young adults and adolescents, the most common causes of bleeding are inflammatory bowel disease, Meckel’s
Nitrogen: creatinine ratio has also been shown to be helpful

If the aspirate is non diagnostic (no blood or bile), or if aspirate is bilious, an upper GI source of bleed is unlikely.

Hence, patients with hematochezia have the bleeding source localized in the upper gastrointestinal (GI) tract. Hence, patients with hemodynamic instability, ongoing hematochezia, and presence of comorbid illness have been associated with poor outcome. Starte et al proposed a simple prediction rule for severe bleeding based on 7 independent risk factors (tachycardia, hypotension, syncope, a nontender abdomen, rectal bleeding within 4 hours of presentation to the hospital, aspirin use, and 2 major comorbid conditions). The number of risk factors can predict the risk of severe or recurrent hemorrhage as well as the need for blood transfusions, surgery, and death. Patients with 4 or more risk factors (17% of patients) were in the highest risk group (80% chance of severe or ongoing bleeding) and would be the most appropriate targets for urgent interventions. Patients with 1 to 3 risk factors (designated as moderate risk) had a 43% chance of severe or recurrent bleeding and also may warrant urgent interventions. An artificial neural network has also been developed to predict the risk of death, rebleeding, and need for intervention. One study found tachycardia, systolic blood pressure less than 115 mmHg, syncope, non tender abdominal examination, rectal bleeding per rectum during the first 4 hours of evaluation, aspirin use, and more than two active comorbid medical conditions independently correlated with severe bleeding.

Should we evaluate the upper gastrointestinal tract in patients with lower gastrointestinal bleed?

10% to 15% of patients presenting with severe hematochezia have the bleeding source localized in the upper gastrointestinal (GI) tract. Hence, patients with hemodynamic compromise and bleeding per rectum should at least have a nasogastric (NG) tube placed and if the NG aspirate is bilious, an upper GI source of bleed is unlikely. If the aspirate is non diagnostic (no blood or bile), or if there is a strong suspicion of an upper bleeding source (ie, history of previous peptic ulcer disease or frequent NSAID use), then an upper GI endoscopy should be done. Blood urea nitrogen: creatinine ratio has also been shown to be helpful in predicting an upper GI source of bleed. Also, placement of NG tube helps in further preparation of the colon also.

How to proceed with investigations?

Colonoscopy

Colonoscopy is the preferred next diagnostic step after stabilization in most of the patients with lower GI bleed as it can provide both a diagnosis and hemostasis. The diagnostic yield of colonoscopy is more than radiographic tests, which require active bleeding at the time of the radiological examination, as well as is more than the flexible sigmoidoscopy, which visualizes only the left colon. The diagnostic yield of urgent colonoscopy in acute lower GI bleed has been reported to be between 75-97% depending on the definition of the bleeding source, patient selection criteria, and timing of colonoscopy.

The important questions regarding use of colonoscopy in lower GI bleed are:
- Should colonoscopy be done after bowel preparation?
- How early colonoscopy should be done?
- Does performing colonoscopy improve the outcome in lower GI bleed?

It is currently recommended to thoroughly clean the colon with bowel preparation in acute lower GI bleed as this procedure facilitates endoscopic visualization, improves diagnostic yield, and improves the safety of the procedure by decreasing the risk of perforation. Bowel preparation is also not believed to dislodge clots or precipitate bleeding. The cecum should be reached if at all possible, because a substantial proportion of bleeding sites are located in the right hemicolon. An attempt should be intubate the terminal ileum also, especially in cases where colonoscopy has not yielded any results as we have shown that a substantial number of causes of lower GI bleed can be found in terminal ileum also.

Early endoscopy is recommended for upper GI bleed as its allows identification and treatment of bleeding sources, reduces the need for blood transfusion and length of hospital stay, and facilitates the triage of patients. Usually, colonoscopy has been performed after bleeding has stopped owing to fear of increased complications, need for colon preparation, and lack of proven benefit. However, recent studies have suggested that performing colonoscopy shortly after presentation is advantageous, but studies comparing this approach with traditional delayed colonoscopy are limited. Urgent colonoscopy generally refers to colonoscopy performed within 12 hours of admission, but studies have
achieved good results even when a colonoscopy was performed within 24 hours. Early colonoscopy also helps in identifying low-risk patients and, thus reduces the need for hospitalization and costs of care. In conclusion, the current evidence suggests that colonoscopy should be performed after preparation within 12 to 24 hours in most patients with lower GI bleed.

The following criteria have been suggested for identifying site of bleeding on colonoscopy:

- Active colonic bleeding
- Non bleeding visible vessel
- Adherent clot
- Fresh blood localized to a colonic segment
- Ulceration of diverticulum with fresh blood in adjoining area
- Absence of fresh bleed in terminal ileum with fresh blood in the colon

**Radiological investigations**

The radiological investigations used in the management of severe lower GI bleed including angiography, radionuclide scintigraphy and computed tomography (CT) angiography. These tests usually are performed in patients with very brisk bleeding who cannot be stabilized for colonoscopy or for ongoing bleeding of obscure etiology. They are useful in brisk bleeding as there is no need for bowel preparation. However, in contrast to colonoscopy, these investigations require active bleeding at the time of examination for diagnosis and treatment. Barium studies are not required in patients with lower GI bleed.

**Angiography**

Angiography is the only radiographic modality that is both diagnostic and therapeutic but requires a bleeding rate of at least 0.5 to 1.0 mL/min to be positive. Systolic blood pressure < 90 mm Hg and a requirement of at least 5 units of packed red blood cells within a 24-hour period have been shown to predict positive mesenteric angiography. Therefore, angiography should be reserved for patients who have massive bleeding with hemodynamic compromise that precludes colonoscopy.

Vasopressin was the first therapeutic modality employed during angiography, and it controlled bleeding in up to 91% of cases but major complications occurred in 10% to 20% of patients and included arrhythmias, pulmonary edema, hypertension and ischemia. Moreover, rebleeding occurred in up to 50% of patients after cessation of the infusion and therefore it often was used to stabilize a patient before surgery rather than as a definitive intervention. Early attempts at embolization occasionally caused bowel infarction, but technologic advances in coaxial microcatheters and embolic materials have enabled the embolization of specific distal arterial branches with increased success and fewer complications and currently embolization is feasible in approximately 82% of patients with positive angiograms.

**Radionuclide scintigraphy**

Nuclear scintigraphy is a more sensitive method than angiography for detecting gastrointestinal bleeding as it detects bleeding as low as 0.1 ml/min. Moreover, because of being non-invasive it is often used as screening diagnostic method before performing angiography. The major disadvantage of nuclear imaging technique is that it localizes bleeding only to an area of the abdomen and also high false localization rates because the intra luminal blood is moved away by intestinal motility. It has been demonstrated that when scans are positive within 2 h after injection of the labeled erythrocytes, localization is correct in 95-100% of the patients but when scans are positive after more than 2 h after injection, the accuracy of correct localisation decreases to 57-67%. Because of lack of randomized studies and absence of therapeutic possibilities, the role of radionuclide scintigraphy in acute lower GI bleed remains controversial. Currently, it is recommended that scintigraphy should be used as a screening test for patients before the angiography or colonoscopy. However, it is important to remember that delay between a positive scan and subsequent angiography or colonoscopy may decrease therapeutic opportunities owing to the intermittent nature of lower GI bleed.

**Computed Tomography (CT)**

CT was not usually used in the management of lower GI bleed because of poor sensitivity. However, introduction of multidetector row CT (MDCT), where scan time is considerably reduced, has brought CT also into the diagnostic armamentarium for patients with lower GI bleed. Reduction of scan time this enables the accurate acquisition of arterial images, which can show contrast extravasation into any portion of the gastrointestinal tract. Bleeding rates as low as 0.3 to 0.5 cc per minute has been detected using MDCT. The yield of MDCT is highest among patients with severe ongoing lower GI bleed. The average yield of MDCT for lower GI bleed is 60%, with yields ranging from 25% to 95%. Lack of therapeutic capability is a major limitation of MDCT.
However, MDCT can guide further angioembolisation. The initial data on MDCT in lower GI bleed is encouraging, more studies are needed with larger sample sizes to determine the appropriate role for MDCT in the management of lower GI bleed.

Endoscopic Treatment Modalities
Endoscopic treatment modalities for lower GI bleed include injection, contact and noncontact thermal coagulation, and mechanical devices such as metallic clips and band ligation. In contrast to upper GI bleed where numerous trials and meta-analyses have confirmed efficacy of the endoscopic hemostasis techniques, data in LGIB are based largely on small nonrandomized trials or retrospective case series. The use of these techniques usually depends on the site and the features of the bleeding lesion, availability of the devices and the clinician’s personal experience with these devices. Endoscopic clipping is considered as a safer alternative to thermal contact methods. Hemoclips can be applied directly to the stigmata, visible vessels, or used to oppose the sides of small diverticula or post polypectomy defects. Thermal coagulation in the colon should be performed using moderately low power settings in 1- to 3-second bursts with light to moderate pressure. Thermal coagulation should be used carefully in the right colon, in the dome of diverticula, and in the presence of mucosal defects. Epinephrine (dilution, 1:10,000 or 1:20,000) can be injected in 1- to 2-mL aliquots in 4 quadrants around the lesion in cases of active bleeding. Argon plasma coagulation (APC) is useful for diffuse lesions such as radiation proctitis and large or multiple angiodysplasia. Ligation with bands is used for bleeding hemorrhoids and bleeding rectal varices and, in certain circumstances, for treatment of focal lesions that are <2 cm in diameter on nonfibrotic tissue. The amount of tissue suctioned into the cap before application of the rubber band must be carefully monitored to avoid perforation.

Is there a role of surgery?
Surgery is usually reserved for patients who are having life threatening bleed and other haemostatic techniques have failed to control bleeding. An emergency operation for lower GI hemorrhage is ultimately required in 10 to 25 percent of patients. The usual indications for an operation are hemodynamic instability, clinical deterioration, transfusion requirements >6 units, and persistent or recurrent hemorrhage. In real life situations it is usually difficult to make decisions based solely on criteria and therefore surgical consultation should be obtained early in the course of severe bleeding. Surgery is used also in patients with recurrent diverticular hemorrhage. Surgery in lower GI bleed is associated with high morbidity and mortality and localization of the bleeding source before surgery is important to prevent the excess morbidity and mortality associated with various surgical procedures like subtotal colectomy or right hemicolectomy and also help in resection of the appropriate segment of the bowel.

REFERENCES