

### DEFINITION

Lower gastrointestinal bleeding (LGIB) is generally defined as gastrointestinal bleeding that occurs distal to the ligament of Treitz.

### INCIDENCE / EPIDEMIOLOGY

The incidence of LGIB in the western world is approximately 20.5-27 per 100 000 people per year and increases with age. There is large geographical variation in the frequency of LGIB and the incidence increases with age. It is more common in men than in women.

### CLINICAL PRESENTATION

Lower gastrointestinal bleeding encompasses a large spectrum of clinical scenarios. It is generally divided into acute, chronic and occult bleeding

Massive LGIB presents with some or all of the following:

- Passage of large amounts of red or maroon blood per rectum (haematochezia)
- Haemodynamic instability or shock
- An initial haemoglobin of 8g/dl or less
- The need to transfuse more than 2U of blood
- Bleeding that continues for 3 days
- Significant rebleeding within a week

Patients with chronic bleeding notice small amounts of blood in their stools. Additionally, they may present with faecal occult blood positivity or iron deficiency anaemia.

Occult LGIB is where patients show evidence of blood loss without any obvious signs or symptoms. It is detected with a positive faecal occult blood test.

It is mandatory to take a careful history and do a full examination of patients

with LGIB as the information gathered will help identify the probable source and cause of the blood loss. Younger patients with abdominal pain, diarrhea and rectal bleeding are likely to have inflammatory bowel disease whereas an older patient with weight loss and a severe iron deficiency anaemia may have a large caecal tumour. Bleeding associated with anal pain and other symptoms is usually due to perianal pathology.

Acute bleeding in the lower gastrointestinal tract stops spontaneously in the majority (80%) of cases. The overall mortality of LGIB is 2-4% and it increases with age and comorbidity.

### AETIOLOGY

Whilst LGIB is defined as being distal to the ligament of Treitz, bleeding from the small bowel until the ileocaecal valve is rare relative to true colorectal bleeding.

The most common causes of LGIB are:

- Diverticulosis
- Angiodysplasia
- Colitis
- Neoplasia
- Haemorrhoids and other anorectal disorders
- Drug related

### Diverticular Disease

Diverticulosis is the presence of pouchlike herniations through the muscular layers of the colon. It most commonly affects the sigmoid colon but can affect the entire colon. Diverticular bleeding usually presents with acute, painless bright red bleeding. It is thought that the blood vessels going through the bowel wall at the site of the diverticulae (vasa recta) become more prone to injury and therefore bleed. Bleeding settles spontaneously in the majority of cases

(>80%) but can occasionally become life threatening.

### **Angiodysplasia**

These are degenerative vascular malformations of the gastrointestinal tract characterized by fragile blood vessels leading to GIT bleeding and anaemia. They are most commonly in the caecum and ascending colon. They are responsible for around 5% of acute LGIB but the vast majority of angiodysplasia never bleed. Generally, bleeding is a result of coagulopathy or platelet dysfunction.

### **Colitis**

There are various forms of colitis that may lead to LGIB. Ischaemic colitis presents with abdominal pain associated with haematochezia or bloody diarrhea. It is a result of a sudden, usually temporary, reduction in mesenteric blood flow. It typically affects the watershed areas of the colon – the splenic flexure and rectosigmoid areas. The increasing prevalence of older patients with cardiovascular disease has led to seeing this condition more commonly in clinical practice. Ulcerative colitis and Crohn's disease do not commonly cause massive LGIB but do cause bloody diarrhoea that may lead to an iron deficiency anaemia. Infectious colitis may cause some colonic bleeding but it is not usually clinically relevant.

### **Neoplasia**

Both polyps and carcinomas can cause LGIB. The bleeding is usually low grade and often leads to an iron deficiency anaemia. Although patients with neoplastic lesions can have haematochezia, massive bleeding is unusual.

### **Anorectal Disease**

Anorectal disease, particularly haemorrhoids, presents with intermittent bright red bleeding. It is rare for anorectal bleeding to cause significant anaemia. Anal fissure and fistula-in-ano generally present with

intermittent spotting. Bleeding from anorectal disease is more common in immunocompromised patients

### **Drug Related**

Oral anticoagulants, aspirin and non-steroidal anti-inflammatory drugs can potentiate or aggravate bleeding from existing lesions. It is important to fully investigate the cause of LGIB in any patient on medication that may affect clotting.

## **DIAGNOSIS**

The history and examination generally point towards a rational diagnostic approach. The stability and comorbidities of the patient will determine the appropriateness of the various diagnostic modalities.

### **Laboratory testing**

In all patients who present with LGIB, it is appropriate to perform a full blood count with platelets. A low mean cell volume suggests chronic blood loss. A normal haemoglobin does not discount gastrointestinal blood loss. The clotting factors should be checked and a specimen taken to crossmatch blood in patients with an acute bleed. Other laboratory investigations should be performed as appropriate.

### **Radiology**

Imaging plays an important role in the workup and management of LGIB. Interventional radiology facilitates the control of bleeding without the need for operative surgery.

- ***Plain Radiography***

Plain abdominal X-rays are useful in patients with rectal bleeding related to inflammatory bowel disease. A patient with a toxic megacolon and rectal bleeding need a different approach from those without a dilated colon. Ultrasound of the abdomen is generally not useful in patients with LGIB.

- **CT scanning**  
CT scanning of the abdomen with mesenteric angiography will demonstrate the site of the bleeding in 50-90% of patients. CT scanning will pick up bleeding from 1ml/minute and is more accurate in patients with active bleeding at the time of scanning.
- **Technetium-labeled red blood cell scanning**  
Tagged red cell scanning is a nuclear medicine technique where radiolabelled red cells are used to localize the site of bleeding in the colon. It will localize bleeding from 0.1ml/minute. Its use is often limited by availability of resources to perform the scan and a false localization rate of up to 25% of cases.
- **Selective mesenteric angiography**  
Percutaneous techniques have become popular in the evaluation of LGIB because they are both diagnostic and therapeutic. Bleeding rates as low as 0.5-1.0ml/minute can be identified. Infusion of vasopressin into the bleeding vessel will stop the bleeding in the majority of cases but has a rebleeding rate of 50%. Therefore, angioembolisation is the preferred method of interventional radiology as it will stop the bleeding in most cases. Superselective angiography significantly reduces the risk of bowel ischaemia. This procedure is being used more commonly for therapeutic intervention and less commonly as a diagnostic test as CT and MR angiography improve.

### **Endoscopy**

Endoscopy is the primary diagnostic and therapeutic modality in LGIB. All patients who present with LGIB should have upper endoscopy performed to exclude any proximal cause of bleeding.

A rapid bowel preparation can be performed in hospital for those patients with an acute LGIB. For more elective patients, a standard bowel preparation is performed. A sigmoidoscopy will usually be adequate in a young patient with LGIB of anorectal origin.

### **Colonoscopy**

At colonoscopy the endoscopist should be able to evaluate the entire colon up to the ileocaecal valve. It will be possible to accurately identify the source of bleeding in approximately 50% of cases presenting with an acute bleed. Multiple interventions may be performed endoscopically in order to stop the bleeding.

### **TREATMENT**

The therapeutic approach to LGIB involves three phases:

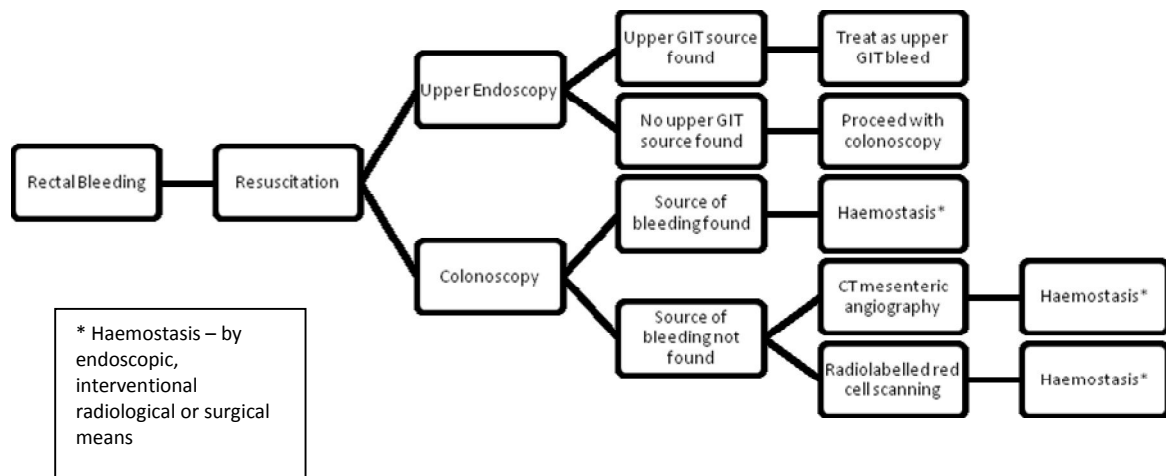
- Resuscitation
- Localisation of bleeding point
- Haemostasis

#### **Resuscitation**

Standard resuscitation techniques apply to all patients with LGIB. The airway should be secured if necessary, intravenous access acquired and monitoring instituted as appropriate. Blood should be obtained for crossmatch and arterial blood gas analysis. A nasogastric tube is often useful to identify an upper gastrointestinal source of bleeding but is not necessary as a routine in patients with a LGIB. Many patients are best managed in an intensive care unit, especially if they have multiple comorbidities. It may be necessary to reverse anticoagulation with the use of clotting factor replacement and vitamin K.

#### **Localisation of bleeding point**

In most institutions, colonoscopy is the primary method of identifying the source of the bleeding. Should this be unsuccessful, CT scanning with mesenteric angiography is the next step. Percutaneous angiographic



techniques are reserved for use for interventional radiology rather than localization of the bleeding point. Tagged red cell scanning is useful in stable patients where it has proven difficult to find the source of the bleeding.

### Haemostasis

LGIB will stop spontaneously in approximately 80% of cases. Nevertheless all patients who present with a LGIB should be investigated at some point.

Colonoscopy usually is the first modality used to stop bleeding. Multiple endoscopic interventions are available, including coagulation, haemoclip application and injection therapy. If the bleeding point has been accurately located by imaging or endoscopy, the success rate of endoscopic haemostasis is high (80-90%).

Should colonoscopy prove unsuccessful in stopping the bleeding, formal angiography should be performed with a view to transcatheter embolization of the bleeding vessel.

Surgery is indicated if the patient is too unstable for angiography or if it is unavailable. Every effort should be

made to identify the source of bleeding pre-operatively. If a patient has a segmental colectomy of a bleeding segment of bowel, the rebleeding rate is 0-15% with a mortality of less than 10%. If it has been impossible to localise the source of bleeding before operation, on-table colonoscopy may be useful to guide the resection. A total colectomy is a procedure of last resort if the bleeding persists but the exact colonic source has not been identified. The decision to perform an anastomosis should be made on a case by case basis

### CONCLUSION

The majority of patients who present with LGIB will recover adequately without significant medical intervention. Nevertheless, there is a significant number of patients who will need aggressive resuscitation and active intervention to stop the bleeding. There are multiple methods of both diagnosing and treating LGIB and it is vital to understand the role of each one.



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