

ACG Clinical Guideline: Diagnosis and Management of Small Bowel Bleeding

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Abstract

Bleeding from the small intestine remains a relatively uncommon event, accounting for ~5–10% of all patients presenting with gastrointestinal (GI) bleeding. Given advances in small bowel imaging with video capsule endoscopy (VCE), deep enteroscopy, and radiographic imaging, the cause of bleeding in the small bowel can now be identified in most patients. The term small bowel bleeding is therefore proposed as a replacement for the previous classification of obscure GI bleeding (OGIB). We recommend that the term OGIB should be reserved for patients in whom a source of bleeding cannot be identified anywhere in the GI tract. A source of small bowel bleeding should be considered in patients with GI bleeding after performance of a normal upper and lower endoscopic examination. Second-look examinations using upper endoscopy, push enteroscopy, and/or colonoscopy can be performed if indicated before small bowel evaluation. VCE should be considered a first-line procedure for small bowel investigation. Any method of deep enteroscopy can be used when endoscopic evaluation and therapy are required. VCE should be performed before deep enteroscopy if there is no contraindication. Computed tomographic enterography should be performed in patients with suspected obstruction before VCE or after negative VCE examinations. When there is acute overt hemorrhage in the unstable patient, angiography should be performed emergently. In patients with occult hemorrhage or stable patients with active overt bleeding, multiphasic computed tomography should be performed after VCE or CTE to identify the source of bleeding and to guide further management. If a source of bleeding is identified in the small bowel that is associated with significant ongoing anemia and/or active bleeding, the patient should be managed with endoscopic therapy. Conservative management is recommended for patients without a source found after small bowel investigation, whereas repeat diagnostic investigations are recommended for patients with initial negative small bowel evaluations and ongoing overt or occult bleeding.

Introduction

Bleeding from the small intestine remains a relatively uncommon event, accounting for ~5–10% of all patients presenting with gastrointestinal (GI) bleeding (1,2). Known previously as obscure GI hemorrhage (OGIB), we propose in this guideline that the former term referred to as OGIB be reclassified as small bowel bleeding. The reason for this change in terminology is owing to the fact that the cause of bleeding can now be detected in the majority of patients given advances in small bowel imaging with video capsule endoscopy (VCE), deep enteroscopy, and radiographic imaging. The term OGIB would then be reserved for patients in whom a source of bleeding cannot be identified anywhere in the GI tract and may represent a source of bleeding outside of the small bowel.

The purpose of this guideline will be to review the definition, epidemiology, causes of small bowel bleeding, and therapeutic options. The guideline will provide a review of diagnostic modalities for

patients with small bowel hemorrhage including VCE, endoscopic evaluation with push and/or deep enteroscopy, and radiographic modalities including cross-sectional imaging (computed tomography (CT) and magnetic resonance (MR)) enterography, angiography, and scintigraphy. Approaches to treatment will be reviewed as endoscopic, medical, and surgical options. As part of this guideline preparation, a literature search was conducted using Ovid MEDLINE from 1946 to present, EMBASE 1988 to present, and SCOPUS from 1980 to present using major search terms and subheadings including “obscure” or “occult,” “gastrointestinal hemorrhage,” “iron-deficiency anemia,” “capsule endoscopy,” “enteroscopy” “angiography,” “computed tomographic enterography,” “magnetic resonance enterography,” “tagged red blood cell,” “angioectasia,” “Meckel’s diverticulum,” and “telangiectasia.” The full literature search strategy is demonstrated in the Appendix.

To evaluate the level of evidence and strength of recommendations, we used the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) system (3). The level of evidence could range from “high” (implying that further research was unlikely to change the authors’ confidence in the estimate of the effect) to “moderate” (further research would be likely to have an impact on the confidence in the estimate of effect), “low” (further research would be expected to have an important impact on the confidence in the estimate of the effect and would be likely to change the estimate), or “very low” (any estimate of effect is very uncertain). The strength of a recommendation was graded as “strong” when the desirable effects of an intervention clearly outweigh the undesirable effects and as “conditional” when there is uncertainty about the trade-offs. We preferentially used meta-analyses or systematic reviews when available, followed by clinical trials and retrospective cohort studies. To determine the level of evidence, we entered data from the papers of highest evidence into the GRADE program (accessible at <http://www.gradepro.org>). The recommendation statements from this guideline are shown in Table 1. Summary statements, when listed, are designed to be descriptive in nature without associated evidence-based ratings.

The traditional definition of “OGIB” before the introduction of VCE and deep enteroscopy included patients with overt or occult GI bleeding who underwent normal upper and lower endoscopic examinations in addition to a small bowel series that did not reveal a source of bleeding. Patients with overt obscure bleeding were defined as patients presenting with either hematochezia or melena, whereas patients with occult obscure bleeding were classified based on the presence of a positive fecal occult blood test with or without iron-deficiency anemia.

With the introduction of VCE in the United States in 2001 and deep enteroscopy in 2004, the majority (~75%) of patients previously classified as having obscure bleeding were found to have sources of bleeding identified in the small intestine (4). The diagnostic yield included any causes of bleeding detected distal to the ampulla of Vater or proximal to the ileocecal valve by any testing modality including push enteroscopy, ileoscopy, deep enteroscopy, VCE, angiography, or an enterography examination. We would therefore propose that patients with small bowel sources identified be classified as having small bowel bleeding, reserving the prior term of OGIB for patients without a source of bleeding identified after comprehensive evaluation of the small bowel as described in the sections below.

Table 1. Recommendation statements	
Diagnosis of small bowel bleeding	
1.	Second-look upper endoscopy should be considered in cases of recurrent hematemesis, melena, or a previously incomplete exam (strong recommendation, low level of evidence).
2.	Second-look colonoscopy should be considered in the setting of recurrent hematochezia or if a lower source is suspected (conditional recommendation, very low level of evidence).
3.	If the second-look examinations are normal, the next step should be a small bowel evaluation (strong recommendation, moderate level of evidence).
4.	Push enteroscopy can be performed as a second-look examination in the evaluation of suspected small bowel bleeding (conditional recommendation, moderate level of evidence).
5.	Video capsule endoscopy (VCE) should be considered as a first-line procedure for SB evaluation after upper and lower GI sources have been excluded, including second-look endoscopy when indicated (strong recommendation, moderate level of evidence).
6.	Owing to the lower detection rate of lesions in the duodenum and proximal jejunum with VCE, push enteroscopy should be performed if proximal lesions are suspected (strong recommendation, very low level of evidence).
7.	Total deep enteroscopy should be attempted if there is a strong suspicion of a small bowel lesion based on clinical presentation (strong recommendation, moderate level of evidence).
8.	Any method of deep enteroscopy can be used when endoscopic evaluation and therapy is required based on similar diagnostic yields (strong recommendation, high level of evidence).
9.	Intraoperative enteroscopy is a highly sensitive but invasive diagnostic and effective therapeutic procedure. Its usage should be limited to scenarios where enteroscopy cannot be performed, such as patients with prior surgeries and intestinal adhesions (strong recommendation, low level of evidence).
10.	VCE should be performed before deep enteroscopy to increase diagnostic yield. Initial deep enteroscopy can be considered in cases of massive hemorrhage or when VCE is contraindicated (strong recommendation, high level of evidence).
Usage of radiographic examinations	
11.	Barium studies should not be performed in the evaluation of small bowel bleeding (strong recommendation, high level of evidence).
12.	Computed tomographic enterography (CTE) should be performed in patients with suspected small bowel bleeding and negative capsule endoscopy because of higher sensitivity for the detection of mural-based small bowel masses, superior capability to locate small bowel masses, and ability to guide subsequent deep enteroscopy (strong recommendation, low level of evidence).
13.	CT is preferred over magnetic resonance (MR) imaging for the evaluation of suspected small bowel bleeding. MR can be considered in patients with contraindications for CT or to avoid radiation exposure in younger patients (conditional recommendation, very low level of evidence).
14.	CTE could be considered before VCE in the setting of established inflammatory bowel disease, prior radiation therapy, previously small bowel surgery, and/or suspected small bowel stenosis (strong recommendation, very low level of evidence).

Table 1. Recommendation statements <i>continued</i>	
15.	In patients with suspected small bowel bleeding and negative VCE examination, CTE should be performed if there is high clinical suspicion for a small bowel source despite performance of a prior standard CT of the abdomen (conditional recommendation, very low level of evidence).
16.	In acute overt massive GI bleeding, conventional angiography should be performed emergently for hemodynamically unstable patients (strong recommendation, low level of evidence).
17.	In hemodynamically stable patients with evidence of active bleeding, multiphasic CT (CTA) can be performed to identify the site of bleeding and guide further management (strong recommendation, low level of evidence).
18.	In patients with acute overt GI bleeding and slower rates of bleeding (0.1–0.2 ml/min), or uncertainty if actively bleeding, tagged red blood cell scintigraphy should be performed if deep enteroscopy or VCE are not performed to guide timing of angiography (strong recommendation, moderate level of evidence).
19.	In brisk active overt bleeding, CT angiography (CTA) is preferred over CTE (conditional recommendation, very low level of evidence).
20.	Conventional angiography should not be performed as a diagnostic test in patients without overt bleeding (conditional recommendation, very low level of evidence).
21.	Provocative angiography can be considered in the setting of ongoing overt bleeding and negative VCE, deep enteroscopy, and/or CT examination (conditional recommendation, very low level of evidence).
22.	In younger patients with ongoing overt bleeding and normal testing with capsule endoscopy and enterography examinations, a Meckel's scan should be performed (conditional recommendation, very low level of evidence).
Treatment and outcomes	
23.	If a source of bleeding is found by VCE and/or deep enteroscopy in the small intestine that is associated with significant ongoing anemia or active bleeding, then the patient should be managed with endoscopic therapy (strong recommendation, low level of evidence).
24.	If after appropriate small bowel investigation no source of bleeding is found, the patient should be managed conservatively with oral iron or by intravenous infusion as is dictated by the severity and persistence of the associated iron-deficiency anemia. In this context, a small vascular lesion found on capsule endoscopy does not always need treatment (strong recommendation, very low level of evidence).
25.	If bleeding persists in either of the above situations with worsening anemia, a further diagnostic workup should include a repeated upper and lower endoscopy, video capsule examination, deep enteroscopy, CT or MRI enterography as is appropriate for the clinical situation and availability of investigative devices (strong recommendation, low level of evidence).
26.	If bleeding persists or recurs or a lesion cannot be localized consideration may be given to medical treatment with iron, somatostatin analogs, or antiangiogenic therapy (strong recommendation, moderate level of evidence).
27.	Anticoagulation and/or antiplatelet therapy should be discontinued if possible in patients with small bowel hemorrhage (conditional recommendation, very low level of evidence).

Table 1. Recommendation statements <i>continued</i>	
28.	Surgical intervention in massive small bowel bleeding may be useful, but is greatly aided with presurgical localization of the site of bleeding by marking the lesion with a tattoo (strong recommendation, low level of evidence).
29.	Intraoperative enteroscopy should be available at the time of the surgical procedure to provide assistance to localize the source of bleeding and to perform endoscopic therapy (conditional recommendation, low level of evidence).
30.	Patients with Heyde’s syndrome (aortic stenosis and angiodystasia) and ongoing bleeding should undergo aortic valve replacement (conditional recommendation, moderate level of evidence).
31.	For patients with recurrence of small bowel bleeding, endoscopic management can be considered depending on the patient’s clinical course and response to prior therapy (conditional recommendation, moderate level of evidence).

CTA, CT angiography; CTE, computed tomographic enterography; MRI, magnetic resonance imaging; VCE, video capsule endoscopy.

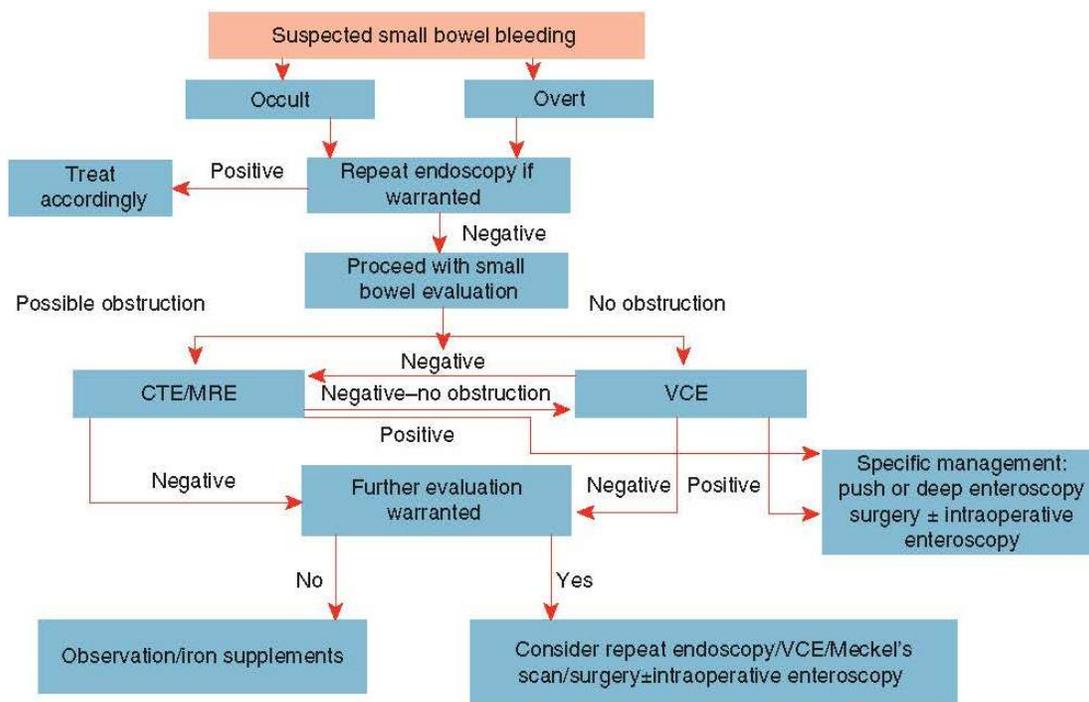


Figure 1. Algorithm for suspected small bowel bleeding. CTE, computed tomographic enterography; MRE, magnetic resonance enterography; VCE, video capsule endoscopy.

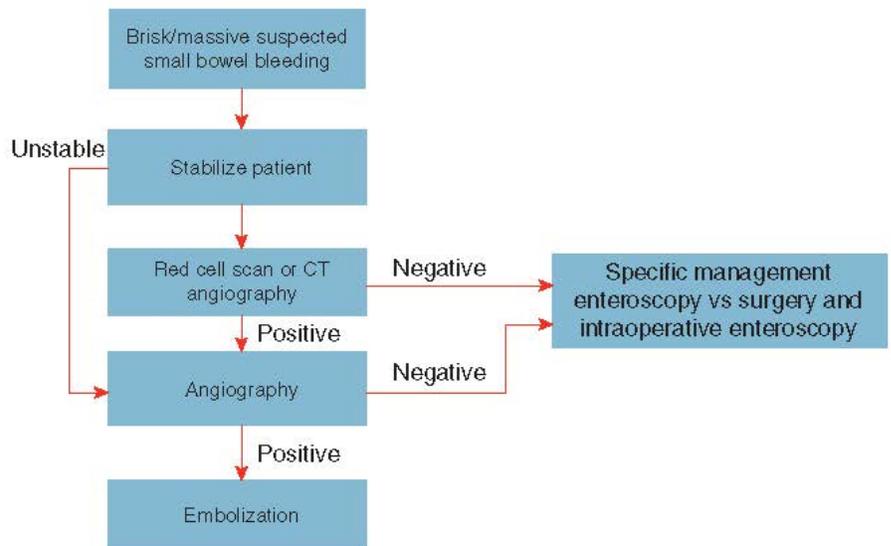


Figure 2. Algorithm for brisk or massive suspected small bowel bleeding. CT, computed tomography.

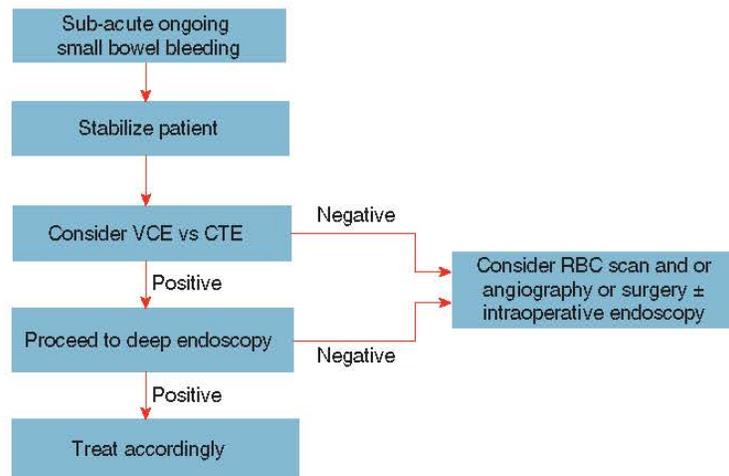


Figure 3. Algorithm for sub-acute ongoing suspected small bowel bleeding. CTE, computed tomographic enterography; RBC, red blood cell; VCE, video capsule endoscopy.

Table 2. Causes of small bowel bleeding		
Common causes		Rare causes
Under age 40 years	Over age 40 years	
		Henoch-Schoenlein purpura
Inflammatory bowel disease	Angioectasia	Small bowel varices and/or portal hypertensive enteropathy
Dieulafoy's lesions	Dieulafoy's lesions	Amyloidosis
Neoplasia	Neoplasia	Blue rubber bleb nevus syndrome
Meckel's diverticulum	NSAID ulcers	Pseudoxanthoma elasticum
Polyposis syndromes		Osler-Weber-Rendu syndrome
		Kaposi's sarcoma with AIDS
		Plummer-Vinson syndrome
		Ehlers-Danlos syndrome
		Inherited polyposis syndromes (FAP, Peutz-Jeghers)
		Malignant atrophic papulosis
		Hematobilia
		Aorto-enteric fistula
		Hemosuccus entericus
FAP, familial adenomatous polyposis; NSAID, nonsteroidal anti-inflammatory drug.		

Conclusion

The occurrence of small bowel bleeding remains a relatively uncommon event. A significant percentage of patients with suspected small bowel bleeding will have sources of bleeding detected upon repeat upper and lower endoscopic examinations. The remainder of the patients will likely demonstrate sources of bleeding in the small bowel on VCE, deep enteroscopy or CTE studies. Given the efficacy of these new imaging modalities, the prior classification of "obscure GI bleeding" should be reserved for patients in whom a bleeding source cannot be demonstrated after an extensive evaluation. Small bowel angiodysplastic lesions remain the most common cause of small bowel bleeding, and despite endoscopic therapy, demonstrate high recurrence rates. Medical therapy with somatostatin analogs or antiangiogenic agents may be an option for refractory patients. Surgical therapy should be reserved for patients requiring lysis of adhesions for successful deep enteroscopy, and aortic valve replacement should be considered for patients with Heyde's syndrome.