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ACUTE MASSIVE HEMORRHAGE FROM THE COLON AND RECTUM

By
Ahmed M. Hussein, MCh, DrCh, PhD
Professor of Surgery Unit of Colon and Rectal Surgery, University of Alexandria, Egypt

Acute massive bleeding from the large intestine is an uncommon emergency that usually occurs in elderly[1] with a mortality rate of 4% to 21%[1-6] Unfortunately, the evaluation of acute massive hemorrhage from the colon and rectum has not been supported by comprehensive prospective randomized controlled trials. The studies in the literature about this problem include wide range of pathological disorders and lack of standard diagnostic and treatment modalities.
Bleeding from the colon and rectum is considered massive if it results in hemodynamic instability (hematocrit < 30, orthostatic changes in blood pressure) and/or need for blood transfusions (3-5 units /24 hours) to maintain stability[2, 7, 8]
The commonest causes for acute massive hemorrhage from the colon and rectum are diverticulosis in about 40% of cases, vascular ectazia in 30%, neoplasia in 14%, colitis (either from radiation, ischemia, or inflammatory bowel disease) in 20% and anorectal causes in 10%[2, 8-11]

Resuscitation and Evaluation

The history should focus initially on documenting the bleeding intensity and symptoms of hemodynamic instability. Resuscitation and hemodynamic stabilization are important initial steps. The medical history should identify previous bleeding episodes, the use of non-steroidal anti-inflammatory drugs (NSAIDs), co-morbid medical conditions, clotting disorders and the use of anticoagulants.

Physical examination should instantly identify signs of hemodynamic instability and must include digital anorectal examination.

Initial laboratory tests should include a complete blood count, coagulation profile, and typing and cross-matching for blood[12]

The upper gastrointestinal tract should be evaluated by nasogastric intubation. It is estimated that 11% of patients are found to have a source of bleeding in the upper gastrointestinal tract[13]

Diagnostic and Treatment Modalities

There is no clear consensus regarding the sequence and efficacies of the available diagnostic and treatment modalities for massive bleeding from the colon and rectum[12] Most of the diagnostic tests are useful when the bleeding is continuing. However, in majority of cases, the bleeding from the colon and rectum stops spontaneously by the time of patient presentation[2, 9, 14, 15]

Colonoscopy

Urgent colonoscopy, after rapid bowel preparation, is the most frequently used diagnostic modality.[1,3,9,13,16,17] Colonoscopy has an overall high diagnostic yield and potential therapeutic value, but it should be done only by experienced endoscopists.[12, 18] Diverticular bleeding may be controlled by endoscopic thermal methods (bipolar/multipolar coagulation), with or without epinephrine injection.[18] Endoscopic therapy in bleeding diverticulosis may prevent recurrent bleeding and reduce the need for surgery.[13]

Endoscopic thermal therapy is used in treatment of vascular ectazia with a success rate of about 87%.[19,20] Telangiectatic lesions due to radiation are also effectively treated with thermal therapy. In the setting of post-polypectomy bleeding, endoscopic therapy is usually curative.[18] Hemorrhoidal disease is uncommon cause of massive bleeding from the anorectum.[1] The bleeding can be controlled easily with proctoscopic rubber band ligation or suture ligation.

Nuclear Scintigraphy

Nuclear scintigraphy, using technetium-labeled red blood cell scan (Fig. 1,2), may be indicated for hemodynamically stable patients when nuclear radiologic expertise is available. This bleeding scan may be useful if the bleeding rate exceeds 0.1 ml/min.[21] The bleeding must be active during the performance of the test, which takes about 30 minutes. There is a controversy concerning the usefulness of Tc-RBC scan in localizing the site of bleeding. The controversy is due to extremely variable results.[12] The Tc-RBC scan may be useful as a screening procedure to increase the yield of mesenteric angiogram. The finding of immediate blush on nuclear scintigraphy led to a 60% positive predictive value for mesenteric angiogram.[22]

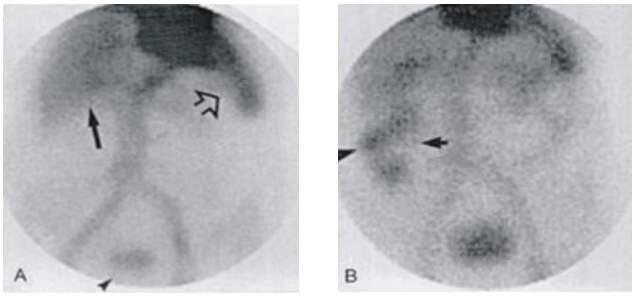

Fig 1.Right colonic bleeding from diverticulosis demonstrated by a Tc-99m erythrocyte scan. A, One hour postinjection of isotope: Only normal bladder (arrowhead), vasculature, liver (solid arrow), and spleen (open arrow) are visualized. B, Eight hours postinjection: Focus of increased tracer activity is seen in the right colon (arrows). Lefkovitz et al. Gastroenterol Clin North Am 2000. (28)

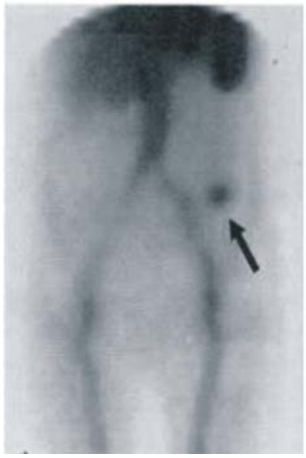

Fig 2. Focus of increased uptake of isotope immediate blush is seen in left midabdomen (arrow). Lefkovitz et al. Gastroenterol Clin North Am 2000.(28)

<u>Mesenteric Angiography</u>

Mesenteric angiography may be indicated in patients with massive bleeding that precludes colonoscopy, or after a non-diagnostic colonoscopy (Fig. 3). Angiography is diagnostic in 40%-78%.[4] A positive result can be obtained when bleeding rate is estimated to be greater than 0.5-1 ml/min during angiography.[23]

Angiography has a potential therapeutic role with initial control of bleeding in 50% to 100%, although rebleeding rate is about 50%.[18,24] Vasopressin infusion used mainly for bleeding diverticulosis (Fig. 4) and vascular ectazia is associated with serious complications in 10% to 20%,[4,11] including arrhythmias, bowel infarction, myocardial infarction, and hypertension. Selective embolization of bleeding sites (Fig. 5) is also associated with a significant rate of complications, including intestinal infarction.[18]

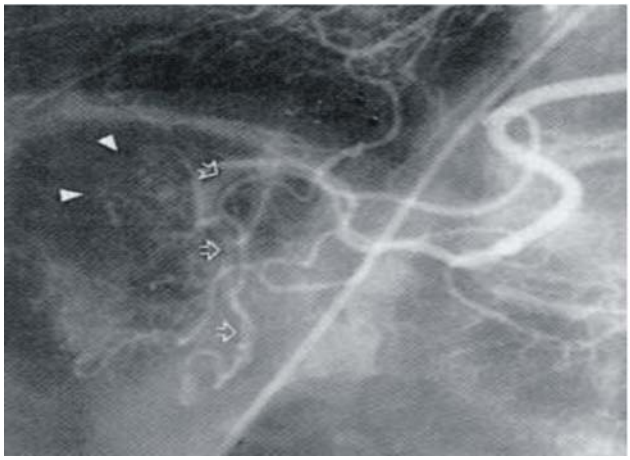

Fig 3. Angiodysplasia of cecum. Superior mesenteric arteriogram reveals in the cecum an area of increased vascularity (arrowheads) with an early draining vein (arrows). Lefkovitz et al. Gastroenterol Clin North Am 2000.(28)

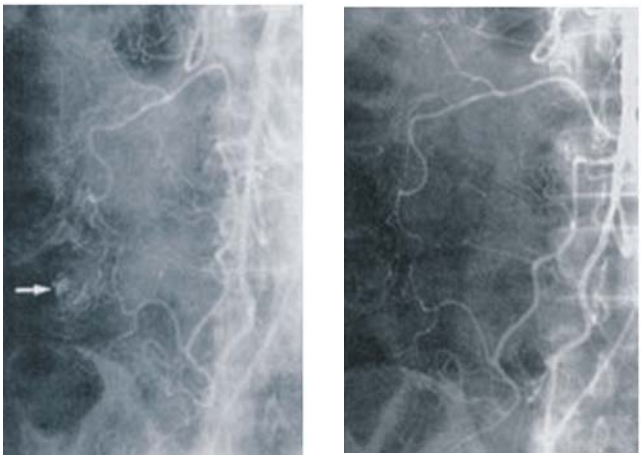

Fig 4. Vasopressin treatment of diverticular bleeding of the ascending colon. A, Pretreatment superior mesenteric arteriogram shows extravasation in the right colon (arrow). B, Twenty minutes following infusion of vasopressin at 0.2 units/min. The extravasation has ceased. Lefkovitz et al. Gastroenterol Clin North Am 2000.(28)

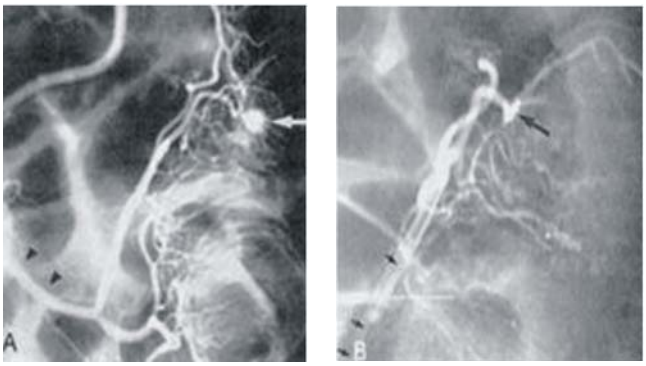

Fig 5. Descending colon bleeding from diverticulosis treated with microcoil embolization. A, Arteriogram of the inferior mesenteric artery (arrowheads) reveals extravasation of contrast material (arrow). B, Microcatheter (small arrows) was used to deliver coil (large arrow) to bleeding site. The extravasation has ceased. Lefkovitz et al. Gastroenterol Clin North Am 2000.(28)

Surgery

Preoperative accurate identification of the site and cause of bleeding should be attempted prior to surgical intervention. In the absence of secure preoperative localization, an intraoperative colonoscopy after on-table lavage can be done for relatively stable patients.[25,26] Segmental bowel resection with a primary anastomosis is possible when the bleeding site is identified preoperatively or intraoperatively. Such surgical decision depends on the hemodynamic stability, pre-existing co-morbid illness and individual surgical practices. In rare situations, without preoperative or intraoperative localization of the bleeding site, a total abdominal colectomy can be done with acceptable morbidity and mortality.[26,27]

Summary

The selection of particular diagnostic and therapeutic procedures for management of acute massive bleeding from the colon and rectum depends more on local availability and expertise than on an algorithmic approach (Fig. 6). The advances in experience and technology of colonoscopy, nuclear scintigraphy and mesenteric angiography have allowed more targeted surgery. In addition, endoscopic or angiographic therapeutic interventions are effective in control of bleeding in many patients. Although surgical interventions are less frequently needed, emergency undirected surgery may be necessary in some instances

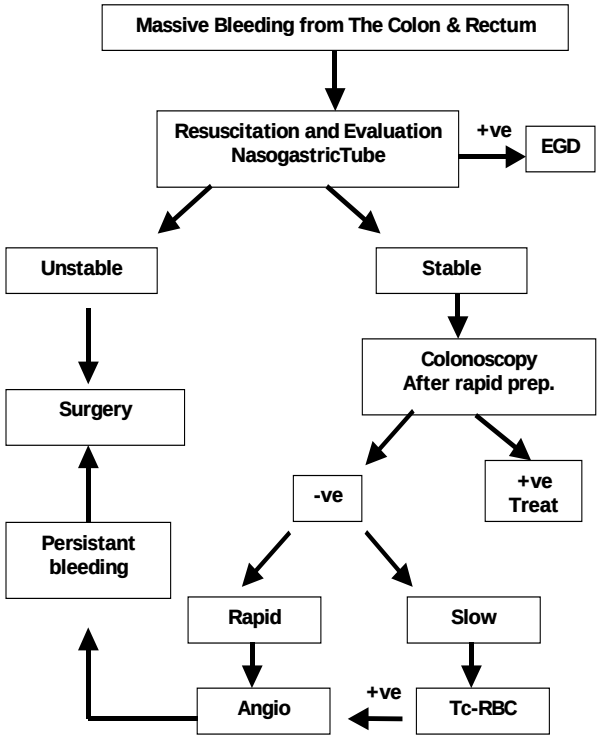

Fig 6. An evidence-based algorithmic approach for management of massive bleeding from the colon and rectum

REFERENCES

1. Longstreth GF. Epidemiology and outcome of patients hospitalized with acute lower gastrointestinal hemorrhage: a population-based study. Am J Gastroenterol. 1997;92:419-24.

2. Billingham RP. The conundrum of lower gastrointestinal bleeding. Surg Clin North Am 1997;77: 241-52.

3. Bramley PN, Masson JW, McKnight G, Herd K, Fraser A, Park K, Brunt PW, McKinlay A, Sinclair TS, Mowat NA. The role of an open-access bleeding unit in the management of colonic haemorrhage. A 2-year prospective study. Scand J Gastroenterol. 1996;31:764-9.

4. Leitman IM, Paull DE, Shires GT. Evaluation and management of massive lower gastrointestinal hemorrhage. Ann Surg. 1989;209:175-80.

5. Makela JT, Kiviniemi H, Laitinen S, Kairaluoma MI. Diagnosis and treatment of acute lower gastrointestinal bleeding. Scand J Gastroenterol. 1993;28:1062-6.

6. Peura DA, Lanza FL, Gostout CJ, Foutch PG. The American College of Gastroenterology Bleeding Registry: preliminary findings. Am J Gastroenterol. 1997;92:924-8.

7. Zuckerman GR, Prakash C. Acute lower intestinal bleeding. Part II: etiology, therapy, and outcomes. Gastrointest Endosc. 1999;49:228-38.

8. Zuccaro G. Management of the adult patient with acute lower gastrointestinal bleeding. American College of Gastroenterology. Practice Parameters Committee. Am J Gastroenterol. 1998;93:1202-8.

9. Jensen DM, Machicado GA. Colonoscopy for diagnosis and treatment of severe lower gastrointestinal bleeding. Routine outcomes and cost analysis. Gastrointest Endosc Clin N Am. 1997;7:477-98.

10. Talbot-Stern JK. Gastrointestinal bleeding. Emerg Med Clin North Am. 1996;14:173-84.

11. Vernava AM, Moore BA, Longo WE, Johnson FE. Lower gastrointestinal bleeding. Dis Colon Rectum. 1997;40:846-58.

12. Peter DJ, Dougherty JM. Evaluation of the patient with gastrointestinal bleeding: an evidence based approach. Emerg Med Clin North Am. 1999;17:239-61.

13. Jensen DM, Machicado GA, Jutabha R, Kovacs TO. Urgent colonoscopy for the diagnosis and treatment of severe diverticular hemorrhage. N Engl J Med. 2000;342:78-82.

14. Bokhari M, Vernava AM, Ure T, Longo WE. Diverticular hemorrhage in the elderly--is it well tolerated? Dis Colon Rectum. 1996;39:191-5.

15. McGuire HH. Bleeding colonic diverticula. A reappraisal of natural history and management. Ann Surg. 1994;220:653-6.

16. Jensen DM. Current management of severe lower gastrointestinal bleeding. Gastrointest Endosc 1995; 41(2): 171-3.

17. Longstreth GF. Colonoscopy and lower GI bleeding. Am J Gastroenterol 2002; 97(1): 203-4.

18. Eisen GM, Dominitz JA, Faigel DO, Goldstein JL, Kalloo AN, Petersen BT, Raddawi HM, Ryan ME, Vargo JJ, Young HS, Fanelli RD, Hyman NH, Wheeler-Harbaugh J. An annotated algorithmic approach to acute lower gastrointestinal bleeding. Gastrointest Endosc. 2001;53:859-63.

19. Santos JC, Aprilli F, Guimaraes AS, Rocha JJ. Angiodysplasia of the colon: endoscopic diagnosis and treatment. Br J Surg. 1988;75:256-8.

20. Foutch PG. Colonic angiodysplasia. Gastroenterologist. 1997;5:148-56.

21. Rossini FP, Ferrari A, Spandre M, Cavallero M, Gemme C, Loverci C, Bertone A, Pinna Pintor M. Emergency colonoscopy. World J Surg 1989;13:190-2.

22. Ng DA, Opelka FG, Beck DE, Milburn JM, Witherspoon LR, Hicks TC, Timmcke AE, Gathright JB. Predictive value of technetium Tc 99m-labeled red blood cell scintigraphy for positive angiogram in massive lower gastrointestinal hemorrhage. Dis Colon Rectum. 1997;40:471-7.

23. Zuckerman DA, Bocchini TP, Birnbaum EH. Massive hemorrhage in the lower gastrointestinal tract in adults: diagnostic imaging and intervention. AJR Am J Roentgenol. 1993;161:703-11.

24. Browder W, Cerise EJ, Litwin MS. Impact of emergency angiography in massive lower gastrointestinal bleeding. Ann Surg. 1986;204:530-6.

25. Berry R, Campbell B, Kettlewell MGW. Management of major colonic haemorrhage. Br J Surg. 1988;75:637.

26. Finne CO. III: The aggressive management of serious lower gastrointestinal bleeding. Prob Gen Surg. 1992;9:597.

27. Parkes BM, Obeid FN, Sorensen VJ, Horst HM, Fath JJ. The management of massive lower gastrointestinal bleeding. Am Surg. 1993;59: 676-8.

28. Lefkovitz Z, Cappell MS, Kaplan M, Mitty H, Gerard P. Radiology In The Diagnosis And Therapy Of Gastrointestinal Bleeding. Gastroenterol Clin North Am. 2000;29:489-512.