

Bleeding Colonic Diverticula

A Reappraisal of Natural History and Management

Hunter H. McGuire, Jr., M.D.

From the Surgical Service, McGuire Veterans Affairs Medical Center, Richmond, Virginia

Objective

The study was undertaken to correct or reaffirm current recommendations based on old observations of doubtful validity because of their lack of routine colonoscopy, scintigraphy, or angiography.

Method

Patterns of bleeding were derived from transfusion records of 78 patients admitted 106 times for lower gastrointestinal bleeding with no detectable cause other than colon diverticula.

Result

Bleeding stopped spontaneously in 82 of 108 episodes and in 66 of 67 patients requiring less than four units of transfusion on any day. When four or more units were required in a day, 25 of 42 patients required emergency surgery. When a bleeding site was identified and removed, only 1 of 25 patients bled again from another diverticulum. After discharge without surgery, 28 of 73 began to bleed again. After "blind" colectomy and ileoproctostomy, four of seven patients developed leaks or abscesses, and two died.

Conclusions

Bleeding stopped spontaneously in 75% of episodes and in 99% of patients requiring less than four units of transfusion per day. Bleeding continued in 25% of episodes and in most patients who required four or more units per day. Bleeding sites of those patients who continued to bleed were shown by scintigraphy or angiography. When a bleeding diverticulum is removed, rebleeding is rare. "Blind" resection is unsafe.

Descriptions in current texts of the behavior of bleeding diverticula are based on studies made before routine use of complete colonoscopy, scintigraphy, or mesenteric arteriography. By including an unknown number of doubtful diagnoses, conclusions and recommendations of old reports lack the certainty needed to treat an exsanguinating patient. This study was undertaken to

provide fresh and accurate answers to the following questions: what proportion of patients who are bleeding stop spontaneously, what proportion rebleed, and how are those who would exsanguinate most safely identified and treated?

METHOD

For all patients discharged from the McGuire Veterans Affairs Medical Center between 1976 and 1993 with diagnoses of diverticulosis and hematochezia, dates and

Address reprint requests to Hunter H. McGuire, Jr., M.D., Surgical Service (112), VA Medical Center, Richmond, Virginia 23249.

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Table 1. TRANSFUSION REQUIREMENT AND SPONTANEOUS HEMOSTASES

Maximum Transfusions/Day	No. of Episodes	Stopped Spontaneously
		No. (%)
1 unit	14	14 (100)
2 units	44	44 (100)
3 units	8	7 (88)
4 units	19	14 (74)
5 units	7	3 (43)
6+ units	16	0 (0)
Total	108	82 (76)

rates of blood transfusion were obtained from the hospital blood bank. Those who did not undergo transfusion were excluded. For those who underwent transfusion, diagnoses were confirmed by records of scintiscans, arteriograms, or operations, or other sources of bleeding were excluded by records of colonoscopy, barium enema, or pathology. For patients thus identified as bleeding from colonic diverticula, rates of bleeding, operation, morbidity, and rebleeding were determined.

RESULTS

One hundred eighteen patients were excluded because they did not undergo transfusion (80), had other sources of bleeding (22), or had insufficient study to eliminate other sources (16). Seventy-nine patients remained, 78 men and 1 woman, between the ages of 39 and 97 years (mean 63.3 years). They experienced 108 episodes of bleeding from diverticulosis. Follow-up of 74 patients was between 1 month and 16.3 years (mean 4.44 years).

Bleeding stopped spontaneously in 82 episodes (76%) and required emergency operation in 26 episodes (24%). The relationship between rates of transfusion required and spontaneous hemostasis are shown in Table 1. In 66 episodes that required no more than three transfusion on any day, 65 stopped spontaneously (98.5%). In 42 episodes that required four or more transfusions on any day, 17 stopped, and 59.5% required emergency operations.

After bleeding stopped spontaneously, 9 of 82 episodes were treated by elective colectomy because patients were young or because their bleeding was recurrent. In each of these cases, bleeding sites were localized to right, left, or sigmoid colon by scintiscan, arteriogram, or barium enema. All had resections with primary anastomoses, no complications, and no rebleeding in mean follow-up of 3.8 years.

After 73 episodes from which patients were discharged without surgery, there were 28 recurrent hemorrhages

(38.4%). Of these, 6 patients required emergency operations, and 22 (79%) again stopped spontaneously.

In 18 cases of unrelenting hemorrhage, sites of bleeding were shown before surgery by arteriograms (12) or scintiscans (6). Nine sites were in right colons, four were in sigmoid colons, and five were in descending colons. In eight cases, preoperative localization was not attempted or failed, and emergency total abdominal colectomies were performed.

Sites of anastomoses after emergency colon resections are listed in Table 2. Six patients given ileostomies or colostomies suffered two wound dehiscences, but there were no other complications. Eight primary anastomoses of ileum to transverse colon were followed by two wound infections, and two anastomoses of transverse to proximal sigmoid colon were uncomplicated. There were nine total colectomies and one sigmoid colectomy, in which primary anastomoses were to distal sigmoid colon. These were followed by three leaks, three other cases of septicemia, and two deaths.

After 19 emergency resections of known bleeding sites, there were two dehiscences, two wound infections, one leak, and no deaths. In 1 month to 13 years of follow-up (mean 5 years), one patient bled from his left colon 6 months after right colectomy. After seven emergency total colectomies for unknown bleeding sites, four patients developed peritonitis, and two died.

DISCUSSION

Current medical and surgical texts¹⁻⁴ state that diverticular bleeding stops spontaneously in 70% to 80% of cases, a rate confirmed by our observation of 76% spontaneous hemostasis. The rate of rebleeding after one episode usually is said to be 20%, a rate that may have been diluted by inclusion of other diagnoses. In this series, 38.4% of patients had recurrences of bleeding. Whether our rate is high enough to justify an aggressive search for bleeding sites and elective resections in patients whose bleeding stops spontaneously is debatable.

We performed elective resections and primary anastomoses without complications in nine patients who were

Table 2. COMPLICATIONS OF EMERGENCY ANASTOMOSES

Location of Anastomosis	Complication	Deaths
6 Ileostomies/colostomies	2 Wound dehiscences	0
8 To transverse colon	2 Wound infections	0
2 To proximal sigmoid	None	0
10 To distal sigmoid	3 Leaks, 3 sepsis	2

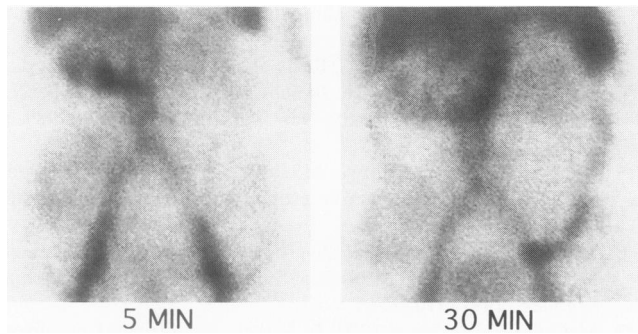


Figure 1. Bleeding into the right colon shown so clearly by scintiscan that an arteriogram was not needed.

young or had rebled and whose bleeding sites were located by scans, arteriograms, or barium enemas. Meanwhile, among those who had no surgery and rebled, 79% again stopped spontaneously; in six patients who required emergency resections, there were no deaths and only one complication. Thus, we believe that elective resection should be restricted to young or healthy patients whose bleeding sites have been demonstrated.

Patients with hematochezia need immediate exclusion of upper gastrointestinal sources followed by anoscopy and proctoscopy to rule out hemorrhoids, cancers, polyps, and ulcerative colitis. When these studies are normal, patients are observed, reserving scintiscans and arteriograms for those whose need for intervention is proven by continuous or brisk bleeding. An optimum and precise threshold for imaging and intervention has not been clear. When the rate of bleeding is between 0.5 and 1.0 mL/min (about one to three transfusions per day), the site will show on arteriogram and be controlled by infusion of vasopressin. This is recommended by many authors,¹⁻⁶ but reported success of vasopressin infusion probably includes patients who would have stopped bleeding with no treatment. All of our patients who required less than three units of transfusion per day stopped spontaneously. Therefore, we recommend withholding scintiscans and arteriograms until a patient proves that he will need, in any one day, at least four units of transfusion to maintain hemodynamic stability. This threshold is consistent with our previous study and with the limit of one unit transfusion per 8 hours, recommended by Imbembo and Bailey.⁶ We believe that any patient who exceeds this threshold should be posted for emergency colon resection and have a scan and arteriogram on his/her way to the operating room.

Since 1978, all of our patients have had preoperative scintiscans, arteriograms, or both. Reliability of scintiscans is not controversial when they are used as screening tests before arteriograms. Patients whose scans show no bleeding should not have arteriography or surgery. Those whose scans show obvious bleeding sites (Fig. 1) need

emergency operation without arteriography. In two thirds of our cases, scans were uncertain, and bleeding sites were identified by arteriograms (Fig. 2). If an arteriogram shows no contrast in the colon, bleeding probably has stopped, and the patient should be re-evaluated electively.

Most texts still state that if no bleeding site can be identified in a case of incessant hemorrhage, emergency abdominal colectomy and ileoproctostomy should be performed. We once advocated this procedure to remove all diverticula-bearing colon,⁷ but now we agree with Wagner et al.⁸ that blind colectomy is not indicated when a source of bleeding cannot be identified.

One reason blind colectomy should not be done is that the diagnosis may be incorrect. Of all our patients who were transfused and discharged with diagnoses of bleeding diverticulosis, almost 20% were shown later to have bled from other lesions. This included one patient who had a blind colectomy and subsequently bled from arteriovenous malformation. A second reason against blind colectomy is that an emergency anastomosis to unprepared proximal rectum may be unsafe in elderly patients.

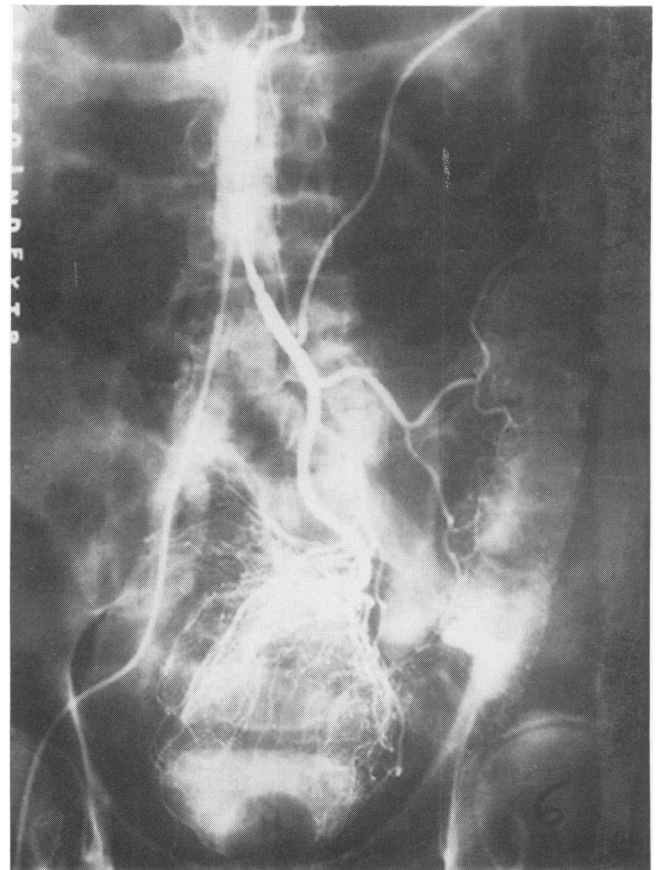


Figure 2. Bleeding into a sigmoid diverticulum shown by an arteriogram that was needed because the location by scintiscan was uncertain.

Of ten such anastomoses in our series, three leaked, three others developed peritonitis or abscess, and two died. After 16 emergency resections with more proximal anastomoses or with ostomies, there were no major complications, and only one patient rebled from a remaining diverticulum.

References

1. Haubrich WS. Diverticula and diverticular disease of the colon. *In* Berk JE, ed. *Gastroenterology*. 4th ed. Philadelphia: Saunders, 1985, pp 2445-2473.
2. Naitove A, Smith RE. Diverticular disease of the colon. *In* Sleisinger MH, Fordtran JS, ed. *Gastrointestinal Disease*. Philadelphia: Saunders, 1993, pp 1347-1363.
3. Roberts PL, Veidenheimer MS. Diverticular disease. *In*: Zuidema GD, editor. *Surgery of the alimentary tract*. Philadelphia: Saunders, 1991, pp 95-107.
4. Goldberg SM, Nivatvongs S, Rothenberger DA. Diverticular disease with acute hemorrhage. *In* Schwartz SI, Shires GT, Spencer FC, ed. *Principles of Surgery*. New York: McGraw-Hill, 1989, p 1259.
5. Browder W, Cerise EJ, Litwin MS. Impact of emergency angiography in massive lower gastrointestinal bleeding. *Ann Surg* 1986; 204:530-536.
6. Imbembo AL, Bailey RW. Diverticular disease of the colon. *In* Sabiston DC Jr, ed. *Textbook of Surgery*. 14th ed. Philadelphia: Saunders, 1991, 910-920.
7. McGuire HH Jr, Haynes BW Jr. Massive hemorrhage from diverticulosis of the colon: guidelines for therapy based on bleeding patterns observed in fifty cases. *Ann Surg* 1972; 175:847-855.
8. Wagner HE, Stain SC, Gilg M, Gertsch P. Systematic assessment of massive bleeding of the lower part of the gastrointestinal tract. *Surg Gynecol Obstet* 1992; 175:445-449.