Surgical Management of Colonic Diverticulosis with Massive Hemorrhage by Subtotal Colectomy:*

Report of Two Cases

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MASSIVE RECTAL HEMORRHAGE is a serious diagnostic and therapeutic problem. Diverticulosis of the colon is recognized as the leading cause of exsanguinating hemorrhage of colonic origin in adults. In Noer's series of 24 cases of massive colonic bleeding, 70.8% were due solely to diverticulosis; whereas colonic cancer was found more often in cases of mild or moderate hemorrhage. Since Stone's report in 1944, there have been many instances in which it was acknowledged that diverticular disease is a leading cause of massive colonic hemorrhage.1, 5, 8, 10

In recent years, it has become apparent that exsanguinating hemorrhage occurs more commonly in diverticulosis than in diverticulitis. Usually, massive hemorrhage occurs in patients more than 60 years of age and, in these persons, the entire colon is involved by diverticula.7 Although there are numerous theories concerning the pathogenesis of this type of hemorrhage, the cause is not known. It is likely that an area of erosion involves the neck of the diverticular sac and penetrates a relatively large adjacent arterial branch. Since these patients usually are elderly, and many have significant associated disease, it is considered important to deal with their problem in the most conservative manner possible. In the two cases of massive hemorrhage reported in this presentation, subtotal colectomy was performed as a one-stage procedure without prior colotomy.

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Report of Cases

Case 1: A 69-year-old white woman was admitted with a 6-hour history of bright red rectal bleeding accompanied by syncope. On transit to the hospital and after admission, she continued to pass mixed bright red blood and dark stools. There had been no previous rectal bleeding or change in bowel habit. She suffered with hypertension. Physical examination revealed that she was well developed, obese, and in acute distress. Her skin was moist and cold. The blood pressure was 110/70, pulse rate, 94, and the central venous pressure was 0. The hematocrit was 36%. After administration of 1,000 cc. of whole blood, rectal bleeding diminished, the hematocrit was 33%, and the central venous pressure was 5.5 cm. At this time she appeared to be quite stable. The following day, sigmoidoscopic examination was performed, and it revealed that the source of the blood was beyond reach of the instrument (25 cm.). Roentgenologic examination of the colon after administration of a barium enema revealed diverticula throughout the colon. Forty-eight hours after admission, five voluminous stools of dark and bright red blood were expelled. The central venous pressure dropped to 0 and her skin again became cold and moist. Another 1,500 cc. of whole blood was administered and an operation was performed. A left para-median incision was made and it could be observed that the entire large bowel was widely dilated and distended by blood. Soft, grossly unirritated diverticula were discovered throughout the entire colon. The small bowel contained no blood and no other source of bleeding could be found. The splenic flexure, descending colon, ascending colon and sigmoid flexure were mobilized. The terminal portion of the ileum was transected 15 cm. proximal to the ileocecal valve and the entire colon was removed down to the proximal portion of the rectum above the peritoneal reflection. An end-to-end ileorectal anastomosis was performed. During the operation, 1,500 cc. of whole blood was administered. The central venous pressure rose to 10 cm. while she was in the recovery unit. The postoperative course was uneventful until the thirteenth day, when a large subcutaneous wound infection had to be drained and the culture revealed *Escherichia coli*. On the twentieth day after operation, she had severe diarrhea and the abdomen became distended.
A diagnosis of partial obstruction of the small intestine was made and a long tube was passed. Her condition improved on the thirty-second day and a full diet was allowed. By the thirty-fourth day, she was having two formed bowel movements a day; her wound was healing satisfactorily and she was discharged. Shortly thereafter, the wound was completely healed and she was passing one formed stool a day. Pathologic examination revealed that the colon was distended by blood and involved by diffuse diverticula. Most of the diverticula contained blood, but the bleeding point could not be discovered.

Case 2: An 85-year-old white man was admitted with a history of passing six large, bright red stools on the day of admission. His past history revealed no previous rectal bleeding or change in bowel habit. It had been established that he had diverticula in his colon. He was acutely ill, his skin was cold and moist, and his blood pressure was 70/50. The pulse rate was 120 and regular. Dextran, 500 cc., and 1,500 cc. of whole blood were administered on admission. Subsequently, his hematocrit was 29%, his central venous pressure was 6 cm., and his blood pressure was 90/70. Rectal bleeding continued and he was given another 1,500 cc. of whole blood. Sigmoidoscopic examination to 20 cm. revealed no source of bleeding. Ten hours after admission, through a left paramedian incision, a subtotal colectomy was performed, and an ileo-rectal end-to-end anastomosis was established. During the operation, three units of whole blood were administered, and when he was returned to the recovery unit, the central venous pressure was 9 cm. The entire colon was distended with blood and it was involved by diverticula. The postoperative course was uneventful until the fifteenth day, when his temperature rose to 102°F. after removal of drains. The fever subsided in 48 hours, but the patient was troubled, during the following week, with diarrhea (eight or nine bowel movements per day). This subsided, and the twenty-ninth day, when he was having two to three formed stools a day, he was discharged. Pathologic examination revealed that the colon was greatly distended by blood and it was involved by diffuse diverticulosis. No evidence of inflammation was noted. The source of bleeding was not discovered.

Discussion

Patients with massive bleeding from the colon require surgical intervention when the bleeding is unremitting and does not respond to bed rest and blood replacement. It is tempting to defer operation while continuing observation because, usually, the patient is old and quite ill. Absence of a definite plan of action is likely to increase the morbidity and mortality rate.

As is common with many unsolved problems, several procedures have been advocated when surgical intervention is required. Attempts to localize the bleeding area by multiple colotomies and endoscopic examination have been carried out with or without luminal occlusion. On occasion, but infrequently, the bleeding point has been discovered and ligated or a limited resection has been performed. Blind limited resections have been performed in the hope of removing the bleeding site. Division procedures, such as transverse colotomy, have been employed with the hope of stopping hemorrhage or possibly localizing the source of bleeding.

Experience with operative coloscopy has been disappointing. The colon is full of thick, tarry, inspissated blood which prevents accurate visualization of the colon. Furthermore, even under the most careful conditions and employing expert technic, substantial contamination of the peritoneal cavity occurs during coloscopy. It has been observed that even when the bowel is well prepared, contamination during operative coloscopy increases the morbidity and mortality rate.

Limited resections are not satisfactory for several reasons. The source of bleeding may not be removed; the anastomosis has to be made in an area where the bowel wall is thinned out and involved by diverticula, thus increasing the hazard at the point where the anastomosis is made. The fact that the diverticula are not removed leaves a potential for subsequent hemorrhage or other complications.

Although determination of the bleeding site is highly desirable and operative arteriography may help, the fact remains that the search for the source of bleeding often results in failure. The important fact is that the massive hemorrhage must be stopped. Generally, a subtotal colon resection is considered to be more hazardous than segmental resection. However, in cases