Acute gangrenous proctitis

James T. Diehl, M.D.
Ezra Steiger, M.D.
Victor W. Fazio, M.D.
Frank L. Weakley, M.D.

Department of Colon and Rectal Surgery

Vascular disease leading to ischemic injury of the colon has been recognized for many years. Colorectal ischemia has been reported as an infrequent complication of abdominal aortic aneurysmectomy and bypass surgery for aortoiliac occlusive disease.[1-5]

Isolated ischemic injury involving the rectosigmoid and rectum is unusual, but has been reported in up to 6% of cases in some series.[6] Typically, ischemic injury of the rectum clinically follows a protracted course, but acute transmural infarction and perforation may be presenting symptoms. We report two cases of isolated acute gangrenous proctitis that occurred in the past year at the Cleveland Clinic Hospital.

Case reports

Case 1. A 79-year-old hypertensive, diabetic woman was admitted to the Cleveland Clinic Hospital in November 1979 for evaluation of left phantom limb pain for 2 years after amputation of the left lower limb for gangrene. The patient had a history of myocardial infarction and aortoiliac occlusive disease for which she had undergone aortobifemoral reconstruction in 1977.

On November 11 she underwent placement of a left sciatic nerve stimulator. She did well until the second postoperative day when she had a temperature of 102 F and a decrease in mentation. She complained of crampy

lower abdominal pain that was most severe in the left lower quadrant and not associated with nausea, vomiting, diarrhea, or rectal bleeding. On physical examination her abdomen was soft, nondistended but tender to palpation in both lower quadrants (most severe on the left). Bowel sounds were absent. The pelvic examination was nonrevealing and the rectal examination was negative for the presence of a mass lesion or blood. Her white blood cell count was 15,900 mm^3 and arterial blood gas results and electrocardiogram were normal. She was given broad spectrum antibiotics and an aortogram was obtained. This showed an aortobifemoral graft with a right renal revascularization and a nonfunctioning left kidney. The inferior mesenteric artery was not present. The internal iliac arteries were not studied.

A laparotomy was performed and a small area (2 × 2 cm) of rectal wall of questionable viability immediately below the peritoneal reflection was found. The entire small bowel and colon were pale but intact pulsations were present in the major vascular branches. A left lower quadrant diverting sigmoid loop colostomy was constructed and the patient was returned to the intensive care unit where she remained stable for 2 days postoperatively. She then became profoundly acidotic and hypotensive. A proctosigmoidoscopy revealed circumferential necrosis of the rectum for 12 cm from the anorectal ring.

The patient was returned to the operating room and a proctosigmoidectomy was performed with preservation of the anus and low rectum. A pelvic abscess developed on the 26th day after operation and was drained through the anorectal stump. The patient was discharged from the hospital one month later.

Case 2. A 67-year-old hypertensive man was admitted to the Cleveland Clinic Hospital in August 1979 for coronary artery bypass surgery. He had been on chronic hemodialysis since 1974 because of end-stage renal disease. He had a several-month history of lower abdominal crampy pain associated with diarrhea but without any bleeding from the rectum.

On September 7, 1979, the patient underwent a triple coronary bypass uneventfully. On the first postoperative day a low grade temperature elevation (100 F) developed associated with diarrhea without rectal bleeding. A proctoscopic examination at this time was normal. On the second postoperative day, the patient became acidotic and hypotensive, and he began to pass melanotic stools. A flat plate of the abdomen revealed distended loops of small bowel with nondifferential air-fluid levels. Physical examination revealed a nondistended abdomen without bowel sounds and with lower midline tenderness and guarding. The rectal examination revealed the presence of black hematest positive stool.

A laparotomy was performed on the third postoperative day and circumferential necrosis of the rectum was discovered extending to the rectosigmoid junction. An abdominoperineal resection was performed. Several hours postoperatively the patient died of cardiopulmonary insufficiency. Autopsy findings revealed a recent anteroseptal and posterior wall myocardial infarction, and moderate atherosclerosis of the mesenteric, superior rectal, and hypogastric vessels.

Vascular anatomy of the rectum

The collateral circulation of the rectum is rich and varied. Support may be drawn from five vascular networks to supply the rectum via peripheral branches of the inferior mesenteric artery in cases of inferior mesenteric artery ostial occlusion.

The first major collateral pathway is comprised of vascular anastomoses between the inferior mesenteric artery and the superior mesenteric artery via the marginal artery of Drummond. Blood destined for the rectum via the superior rectal artery may be derived from the superior mesenteric artery through the anastomosis of the left branch of the middle colic artery and the left colic artery.

The inferior mesenteric artery and the internal iliac artery form a second collateral network supplying the rectum with anastomoses between the superior,

middle, and inferior rectal arteries, the inferior vesical artery (which may occasionally give rise to the middle rectal artery), and via the arteries supplying the levator ani muscles.

The rectum may also receive blood from a third source, the external iliac vessels through collaterals between the inferior mesenteric artery and the obturator, internal pudendal, and superior gluteal arteries.

The fourth source for collateral supply is directly from branches of the abdominal aorta. The superior and middle rectal arteries anastomose with the lateral and middle sacral vessels. The fifth and final pathway involves retroperitoneal plexus of Turner, which consists of branches of the lumbar, ileolumbar, and renal arteries and the inferior mesenteric artery.

Discussion

Colorectal ischemia occasionally leading to gangrene and perforation is well documented in the surgical literature, especially after operations on the abdominal aorta.[1-6] Ischemic disease confined to the rectum is unusual due to the presence of the intricate collateral network described. Several cases of ischemic proctitis have been reported.[1-10] In 1968, Kilpatrick et al[7] reported ten cases of rectal ischemia that were characterized by a chronic clinical course with lower abdominal pain, alteration in bowel function, and rectal bleeding in an elderly population with evidence of cardiovascular compromise. Rectal ischemia was diagnosed on the basis of barium enema, proctosigmoidoscopy, and rectal biopsy.

Most cases of ischemic proctitis and ischemic colitis follow a chronic course. The rectal mucosa is the first layer of the bowel wall to manifest the effects of diminished blood supply. Submucosal inflammation, mucosal edema, and epithelial sloughing result in ulceration, and polypoid thickening may be demonstrated on barium enema examination or directly visualized with proctosigmoidoscopy. In many instances differentiation between ischemic colitis and ulcerative colitis may be difficult. A rectal biopsy specimen may reveal mucosal infarction with crypt abscesses and attempted epithelial regeneration. If the remaining blood supply is adequate, epithelial regeneration may occur; if insufficient, healing by fibrosis with stricture formation is the result. In the series of Kilpatrick et al, rectal stricture developed in two of the ten patients.

Rectal ischemia may also follow an acute course leading to transmural infarction and perforation. Saegesser et al,[10] in 1977, reported two cases of acute gangrene of the rectum. Both patients were elderly with documented cardiovascular insufficiency. Necrosis of the rectum developed postoperatively following aortic surgery in the first patient; in the second patient, necrosis developed after several episodes of diminished cardiac output on the basis of a supraventricular tachycardia.

Isolated transmural rectal infarction developed in the two patients reported here. Patient 1 had a history of myocardial infarction and 3 years before had undergone aortoiliac reconstruction for atherosclerotic occlusive disease in which the inferior mesenteric artery was sacrificed. Patient 2 had recently undergone coronary artery bypass for medically intractable angina. He also had a history of cardiac problems. Both patients had moderate to severe atherosclerotic disease affecting their mesenteric and hypogastric vasculature, both had recently undergone surgery, and both had an episode of hypotension before the onset of the signs and symptoms associated with the ischemic injury. In addition, both patients were being

maintained on digoxin, which is thought to be a vasoconstrictor of the splanchnic vasculature.[11]

The patients had elevated temperatures and lower abdominal crampy pain most severe in the left lower quadrant. Patient 1 also had melanotic stool; patient 2 had no evidence of rectal bleeding. Results of physical examination revealed abdominal tenderness in the lower quadrants, but physical findings were not in proportion to the severity of the complaints. Elements of systemic toxicity included leukocytosis with a shift to the left, a febrile clinical course, and evidence of severe metabolic acidosis. Both patients were hypotensive on initial examination. Diagnosis was established by proctosigmoidoscopy, and treatment consisted of surgical resection of the necrotic rectum with or without preservation of the anorectum.

Summary

Rapid onset of abdominal pain in the elderly patient with a history of cardiovascular disease is suggestive of ischemic insult to the bowel. The end result of an attenuated blood supply to the bowel is dependent upon the extent of compromise and the time course of deprivation (gradual versus rapid). The rectum has numerous collateral vessels that may come into use in case of gradual occlusion of the mesenteric vasculature. In many of these instances, ischemic proctitis follows an indolent course and may be managed conservatively.[7] Gangrenous proctitis (with or without involvement of the colon) with perforation and peritonitis may develop in patients with presenting symptoms of atherosclerotic disease of the mesenteric and hypogastric arteries in the acute setting of a "low flow state" (i.e., decreased perfusion secondary to a primary cardiac event or low cardiac output due to hypovolemia). The diagnosis is easily confirmed by proctosigmoidoscopy, and an abdominoperineal resection or a Hartman procedure with preservation of the anorectum is the indicated therapy.

References

1. Birnbaum W, Rudy L, Wylie EJ: Colonic and rectal ischemia following abdominal aneurysmectomy. Dis Colon Rectum **7:** 293–302, 1964.
2. Launer DP, Miscall BG, Beil AR Jr: Colorectal infarction following resection of abdominal aortic aneurysms. Dis Colon Rectum **21:** 613–617, 1978.
3. Johnson WC, Nabseth DC: Visceral infarction following aortic surgery. Ann Surg **180:** 312–318, 1974.
4. Young JR, Britton RC, deWolfe VG, et al: Intestinal ischemic necrosis following abdominal aortic surgery. Surg Gynecol Obstet **115:** 615–620, 1962.
5. Young JR, Humphries AW, deWolfe VG, et al: Complications of abdominal aortic surgery. Part II. Intestinal ischemia. Arch Surg **86:** 51–59, 1963.
6. Wald M: Gangrene of the distal two thirds of transverse colon, left colon, rectum and anal canal due to superior mesenteric vascular insufficiency. Dis Colon Rectum **7:** 303–305, 1964.
7. Kilpatrick ZM, Farman J, Yesner R, et al: Ischemic proctitis. JAMA **205:** 74–80, 1968.
8. Cynn WS, Rickert RR: Ischemic proctosigmoiditis; report of a case. Dis Colon Rectum **16:** 537–541, 1973.
9. Ganchrow MI, Clark JF, Ferguson JA: Ischemic proctitis with obliterative vascular change; report of a case. Dis Colon Rectum **13:** 470–474, 1970.
10. Saegesser F, Roenspies U, García-Gil, et al: Rectites nécrosantes d'origine ischémique 'spontanées' et après chirurgie angioplastique aorto-ilio-fémorale et sympatectomie lombaire. Chirurgie **103:** 907–921, 1977.
11. Boley SJ, Brandt LJ, Veith FJ: Ischemic disorders of the intestines. Curr Probl Surg **15:** 1–85, April 1978.
12. Michels NA, Siddharth P, Kornblitt PL, et al: The varient blood supply to the descending colon, rectosigmoid and rectum based on 400 dissections; its importance in regional resections, a review of medical literature. Dis Colon Rectum **8:** 251–278, 1965.