Volvulus of the Splenic Flexure:
Report of a Case and Review of the Literature

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This is the first case report of gangrenous colon from volvulus of the splenic flexure. It is also the first reported treatment of splenic flexure volvulus by exteriorization of the splenic flexure as a loop colostomy. Splenic flexure volvulus has been a rare cause of mechanical obstruction, producing 1 per cent of colonic volvuluses. Fifteen detailed case reports of splenic flexure volvulus were reviewed. Patients averaged 53.2 years old. Eight of 14 were women. Previous abdominal surgery, anomalies of fixation, and constipation played important roles in the pathogenesis. Diagnosis was made before surgery in two-thirds of the patients. Treatment varied. One patient died without treatment. In two, the volvulus reduced spontaneously. Eleven required emergency surgery. Three underwent operative detorsion, one exteriorization of the splenic flexure as a loop colostomy (the present report), and six partial colectomy. All treated patients survived without recurrence of volvulus. Thus, there was only one death in 14 cases, a seven per cent mortality rate. This low mortality rate was attributed to the rarity of gangrenous colon from splenic flexure volvulus. [Key words: Colon; Colostomy; Exteriorization; Splenic flexure; Volvulus]

VOLVULUS OF THE SPLenic FLEXURE was first reported in 1953, by Glazer and Adlersberg.1 Subsequently, a total of 16 episodes of splenic flexure volvulus have been reported.1-12 Thirteen cases have been described in case reports1-10 and three included in statistics of colonic volvulus.11,12 The purpose of this article is to report the 17th case of splenic flexure volvulus—the first with a gangrenous segment of colon and the first treated by exteriorization of the splenic flexure. The incidence of volvulus of the splenic flexure has been discussed based upon the previously reported series of bowel obstruction and colonic volvulus. Characteristics of patients with splenic flexure volvulus and treatment results have been compiled from the 13 previous case reports. Operative detorsion and partial colectomy have been discussed as alternate methods of treatment.

Report of a Case

A 67-year-old black man first noticed abdominal distention and pain five days before admission. Forty-eight hours later, he felt nauseated and began vomiting. His last bowel movement was six days before admission. He last passed flatus the day before hospitalization. His medical history included a right inguinal hernia repair and a transurethral resection of the prostate.

In the emergency room, his temperature was 98.6 F, blood pressure 129/80 mm Hg, respiratory rate 15 per minute, and pulse 83 per minute. His abdomen was distended and diffusely tender to direct palpation. Loops of distended bowel were easily palpable. There was no rebound tenderness. There was no stool in the rectal ampulla. Initial laboratory study results were: leukocyte count 6,960, hemoglobin 14.8 dl, hematocrit 44 per cent, sodium 139 mEq/l, potassium 3.9 mEq/l, chloride 99 mEq/l, bicarbonate 30 v, urea nitrogen 23 mg/dl, and creatinine 0.8 mg/dl. Urinalysis results were normal except for a specific gravity of 1.029. Chest x-ray film demonstrated atelectasis above an elevated left hemidiaphragm. Abdominal films revealed a large amount of gas within the right colon, transverse colon, splenic flexure, and proximal descending colon. Little air was seen in the distal descending colon, sigmoid region, and rectum. The small bowel was not distended. There was no free intraperitoneal air. Colonic obstruction was suspected.

In the emergency room, the rigid sigmoidoscope was passed to 25 cm. Sigmoidoscopy was normal except for the absence of stool. An emergency barium enema examination was performed. Barium passing into the colon outlined a redundant omega loop. The "bird's beak" of a volvulus was demonstrated in the mid-descending colon (Fig. 1). A small amount of barium passed beyond the twist. The barium enema suggested a partially obstructing volvulus of the splenic flexure.

After admission, nasogastric suctioning and broad-spectrum antibiotic treatment were started. The patient was rehydrated with intravenous solutions. He was operated upon on the night of admission.

Exploration of his abdomen revealed a dilated transverse colon with a diameter of 9 cm. A volvulus of the colon at the splenic flexure was demonstrated. Detorsion of the volvulus revealed an area of bowel wall necrosis 2 cm in diameter. There were no perforations. The small bowel was normal. The infarcted segment of transverse colon was exteriorized as a loop colostomy through a left upper quadrant incision and sutured to the surrounding fascia. A #18 Robinson catheter was passed around the loop of bowel for additional retraction. The laparotomy incision was closed with resorbable sutures. The skin was closed with staples.

In the early postoperative period, the colostomy became ischemic and darkened in color. The patient was operated upon again that same night. An area of necrosis in the descending limb had slipped back inside the peritoneal cavity. The stoma was revised by advancing both limbs of the loop colostomy through the abdominal wall. The colostomy was secured to the fascia. The skin incision was packed open.

His postoperative course was minimally complicated. Flatus passed from the colostomy within 24 hours. The leukocyte count rapidly returned to normal. The nasogastric tube was removed four days after surgery. Clear liquids were given within six days of
surgery and a soft diet within seven. Antibiotic treatment was stopped on the seventh postoperative day. His appetite remained poor, so his diet was supplemented with tube feedings. The wound granulated slowly. The patient was discharged 22 days after surgery.

At home, his appetite improved. He gained 13 lb over the next three months. His colostomy worked well. The wound closed within two weeks of discharge.

Four months later, the patient underwent elective preperitoneal colostomy closure. The procedure and his postoperative course were uncomplicated. He was discharged five days after surgery.

At home the patient has done well. Follow-up for five months suggests no evidence of recurrent volvulus of the splenic flexure.

Discussion

Volvulus of the splenic flexure went unrecognized as a cause of intestinal obstruction until 1953. It has been an extremely rare cause of mechanical obstruction. The distribution of 524 cases of colonic volvulus at four sites has been listed in Table 1. Sixteen American series have been compiled within ten years of experience at San Bernardino County Medical Center in California. At San Bernardino, one case of volvulus of the splenic flexure occurred during the decade following 1970. Volvulus of the splenic flexure has produced only 1 per cent of all colonic volvuluses.

Characteristics of patients who develop volvulus of the splenic flexure have been compiled from 14 case reports, including ours. The average age of the 14 patients was 53.2 years, with a range from 19 to 78. The majority of patients were women (eight of 14). The race of patients has been reported only six times: three white and three black. These data differ from those of patients with sigmoid volvulus. In 99 patients at Charity Hospital, New Orleans, who had sigmoid volvulus, the average age was 66 years: 55 per cent were men and 66 per cent were black. Volvulus of the splenic flexure should be considered as a diagnosis in middle-aged patients with colonic obstruction regardless of their age.

The cause of splenic flexure volvulus was suggested by review of the medical histories of these 14 patients. Nine of the 14 patients (64 per cent) had previously undergone abdominal surgery. Three patients had undergone upper abdominal surgery, two gastric surgery, and one cholecystectomy. Other operations included four appendectomies, three right inguinal herniorrhaphies, two hysterectomies, two prostatectomies, and one nephrectomy. Upper abdominal surgery with interruption of the normal parietal attachments of the splenic flexure or generation of adhesions would seem a likely cause of splenic flexure volvulus. In four case reports, indeed, adhesions to the splenic flexure were found and seemed the inciting mechanism.

Ordinarily, the splenic flexure of the colon is secured in the left upper quadrant by three attachments: the gastrocolic ligament, the phrenocolic ligament, and the splenocolic ligament. Congenital absence of these ligaments produces a floppy splenic flexure predisposed to volvulus. Complete absence of all three ligaments was reported in two patients. The phrenocolic attachment was missing in Blumberg's patient. Poppel et al. reported agenesis of the gastrocolic ligament and the lateral peritoneal attachments. Absence of the normal attachments, allowing a floppy splenic flexure, or adhesions forming a pivot for torsion explained the mechanisms that produced volvulus in some of the patients. Other mechanisms must be sought in the other patients.

Chronic constipation was a common complaint among patients with splenic flexure volvulus (43 per cent). Chronic constipation and laxative use can produce long, redundant colons that facilitate volvulus. Surgically induced adhesions, lack of normal peritoneal attachments, and chronic constipation producing a redundant colon explain the occurrence of most splenic flexure volvuluses.

Two patients suffered from neuropsychiatric disorders, one from dementia and one from chronic

![Fig. 1. The "bird's beak" in the splenic flexure demonstrated on barium enema indicated volvulus of the splenic flexure.](image-url)