

Immediate resection and anastomosis in sigmoid colon volvulus (analysis of 32 cases)

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In this study, our experience during the last 5 years, in sigmoid colon volvulus, treated with primary resection and anastomosis, supported by complementary tube cecostomy has been reviewed. Patients were classified into two main groups, those with viable colon (21 cases) and nonviable colon (11 cases). Overall morbidity and mortality rates were; 15.6%, and 12.4% respectively. Operative mortality rates were; 15.6%, and 12.4% respectively. Operative mortality was found to be 3.1 %, when 3 deaths due to cardio-respiratory failure were excluded. In conclusion, we decided that this method is reliable in the treatment of sigmoid colon volvulus, even in gangrenous cases. [Turk J Med Res 1994; 12(2): 78-82]

Key Words: Volvulus, Sigmoid colon, Gangrene, Cecostomy tube

Volvulus of the colon is a surgical emergency that can lead to significant morbidity and mortality, if unrecognized or inadequately treated. Torsion of the bowel on its mesentery occurs most commonly in patients with an excessively mobile colon and may compromise the blood supply to the colon (1). Factors that may predispose to excessive motility include a congenital or acquired long, loose and floppy mesentery. The loop is of usually considerable length, so that two ends of the loop may be brought as close together as possible (2-4).

Sigmoid volvulus has been recognized by physicians and surgeons since ancient times. The need for reducing the twisted bowel has been long understood. Since early times, two strategies have existed for treating sigmoid volvulus; nonoperative and operative (3,5,6).

Although several treatment methods have been developed, some factors such as, the recurrence rate, the choice of conservative or surgical means, and patient follow-up remain to be debatable. In this article, immediate resection and anastomosis, supported by complementary tube cecostomy in the treatment of sig-

moid colon volvulus is compared to other therapeutic methods.

MATERIALS AND METHODS

32 patients were operated due to sigmoid colon volvulus at Surgical Emergencies and Trauma Unit between the years 1986 and 1991. Immediate resection and anastomosis, supported by complementary tube cecostomy was performed in all of the patients.

Patients were classified in two main groups; the former of which consisted of 21 cases with twisted viable colon, and the latter 11 cases with nonviable strangulated colon. The first group consisted of 11 men and 10 women, with a mean age 63.1 years (26-83); and the second group consisted of 1 man and 10 women, with a mean age of 66.6 years (36-87). The viability of colon was determined some factors such as the pulsation of mesenteric vessels, colour of the colon and the presence peristaltic movements.

The patients were initially resuscitated with fluid and electrolytes. A nasogastric tube and a central venous line were used in all patients. Antibiotics were administered in the preoperative, peroperative and postoperative periods. Preferred combinations were cefotaxime and metranidazole in 18 patients, clindamycin and gentamycin 14 patients.

Patients were explored via a midline laparotomy. Bowel anastomoses were performed end-to-end by two layers of interrupted 000 chromic catgut and silk sutures. If present, the appendix was removed following sigmoid colon resection. Two purse-string sutures of

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Table 1. Presenting symptoms of patients with sigmoid colon volvulus

Symptom	Viable Colon		Nonviable Colon	
	n:21	%	n:11	%
Abdominal Pain	20	95.2	11	100.0
Abdominal Distention	18	85.7	10	90.9
Nausea and Vomiting	18	85.7	9	81.8
Obstipation	19	90.4	8	72.7
Diarrhea	—		1	9.0

000 silk were applied and opening large enough to insert a 28-30F Foley's catheter was made of the anterior tenia of the cecum. The catheter was inflated with 5 ml of 0.9% saline and purse-string suture of 000 silk was tied. The cecum was held snugly against the anterior abdominal wall and anchored with silk stures. Foley's catheter was removed on the 10.th to 12.th postoperative days, when normal bowel actions established.

RESULTS

The presenting symptoms of the patients were; abdominal pain in 31 (96%), abdominal distention in 28(87.5%), nausea and vomiting in 27(84%), and diarrhea in 1(3.1%) (Table-1).

The WBC levels of the groups averaged a mean leukocytosis of 12600/mm³ (8000-26000 mm³). In 7(21%) of the patients, the difference of rectal and axillary temperature exceed 1° C. In plain abdominal radiography; "Bird's beak sign" was present in 8 patients of the first, and 5 patients of the second group, and the "air-bubble sign" was present in 18 patients of the first, and 10 patients of the second group (Table 2).

Upon surgical intervention the recorded concomittant findings were; dolico colon in 3 patients of the second group, acute cholecystolithiasis in 1 patient of

the first group, gangrenous gallbladder, and gallbladder perforation in 1 patient of the second group, respectively (Table 3).

All of the patients were treated with immediate resection and primary anastomosis, supported by complementary tube cecostomy. Cases with a gallbladder pathology underwent cholecystectomy. Peroperative colonic enema was applied to 3 patients (14.3%) of the first, and 1 patient (9%) of the second group.

In the viable colon group, the morbidity rate was 14,2%, which was due to evisceration in 2 cases, and to cecal fistula in 1 case. In the nonviable colon group, the morbidity rate was 18.2%, which was anastomotic leakage in 1 case, and wound infection in 1 case (Table 4). Two patients from the first, and 1 patient from the nonviable colon group died with sepsis due to anastomotic leakage. The mortality rates of the first and second groups were 9.5%, and 18.2% respectively. The average hospital stay ranged between 12 and 38 days, with a mean of 16.2 days. The overall mortality rate was 12.4% (Table 5).

DISCUSSION

Among certain populations in Africa, Brasil, Western Europe, and Iran volvulus of the sigmoid colon is the most common cause of intestinal obstruction, due to the high residue diet habit in these areas (2,3,5). Volvulus of the colon is responsible for 1.2% to 20% of all intestinal, obstruction causes in USA whereas, this amounts to 42.0% in Iran, and 54.6% in the CIS. (3,5) This rate was found to be 12.9% in our group (Table 6). In Brazil, sigmoid volvulus commonly afflicts patients suffering from Chagas' disease, in which the trypanosomes destroy the myenteric plexus of the colon, leading to colonic inertia and megacolon (3).

In the United States, cecal volvulus accounts for about one-third of cases colonic volvulus, whereas sigmoid volvulus produces somewhat less than two-thirds of cases. In other countries, cecal volvulus causes

Table 2. Plain Abdominal Radiography Results in Sigmoid Volvulus Cases.

Sign	Viable Colon		Nonviable Colon		Total	
	n:21	%	n:11	%	n:32	%
"Bird's Beak sign"	8	38.0	5	45.5	13	40.6
"Air-Bubble sign"	16	76.1	10	90.9	26	81.2

Table 3. Concomitten Findings in Sigmoid Volvulus Cases.

Operative Findings	Viable Colon		Nonviable Colon		Total	
	n:21	%	n:11	%	n:32	%
Dolico colon	3	14.3	2	18.2	5	15.6
Acute Cholecystitis	1	4.8	—	—	1	3.1
Gangrenous Gallbladder	—	—	2	18.2	2	6.2
Total	4	19.1	4	36.4	8	24.9

Table 4. Morbidity in Sigmoid Volvulus Cases

Morbidity	Viable Colon		Nonviable Colon		Total	
	n	%	n	%	n	%
Evisceration	2	9.5	—	—	2	6.2
Cecal Fistula	1	4.8	—	—	1	3.1
Anastomotic Leakage	—	—	1	9.1	1	3.1
Wound Infection	—	—	1	9.1	1	3.1
Total	3	14.2	2	18.2	5	15.6

Table 5. Mortality in Sigmoid Volvulus Cases

Cause of Deaths	Viable Colon		Nonviable Colon		Total	
	n	%	n	%	n	%
Cardiopulmonary Failure	2	9.5	1	9.1	3	9.3
Sepsis	—	—	1	9.1	1	3.1
Total	2	9.5	2	18.2	4	12.4

about one-sixth of cases of colonic volvulus and sigmoid volvulus, about five-sixths (3). In the USA, sigmoid volvulus is found most frequently in elderly, or chronically constipated persons (2,7). Similar to the African and Asian countries, sigmoid volvulus is frequent in Turkey, which we relate with the high consumption of dry chickpeas and beans that are sources of intestinal gases (8-10).

Plain abdominal radiographs, barium enema and sigmoidoscopy are the essentials of diagnosis. Plain abdominal radiographs are diagnostic in 37-69%, and barium enema in 20-92% "Ace of spades" or a "bent inner tube" signs arising from the left quadrant on an abdominal radiograph or a "bird beak sign" with barium are the characteristic signs (1-3, 7,11). The diagnoses were confirmed by plain abdominal radiographs, and the "birds beak sign" could be ensued in 41% of the present series.

In the treatment of sigmoid volvulus, nonoperative and operative modalities have been established. Usage of rectal tubes, saline or water enemas, barium enema or endoscopic detorsión are the means of non-operative treatment (1-3,5,7,12-15;. In the critically ill patients detorsión or temporary colostomy have been established. Recurrences have been reported in 30 to 90 percent of patients after reduction without a definitive operation, but the adequacy of follow-up is rarely mentioned (7). In 19 American series, 596 patients of sigmoid volvulus, a 70% of nonoperative reduction rate is reported. 40.1% of this accomplished by proctoscopy and rectal tube application; 19% by proctoscopy and 5.4% by barium enema, 3% by luke-worm water enemas, 0.2% by colonoscopy while 2.3% resolved spontaneously (1,3,5,11,16). The dangers of endoscopic examination in cases of suspected colon volvulus include colonic perforation, missing a segment of

a necrotic segment (4). Age alone does not appear to be a reason for adapting a nonoperative approach (7,13).

Operative methods are summarized as staged procedures, and primary resection to be the definitive treatment for sigmoid volvulus, but still conflict exist in the choice of the operative method (2,5,12,14,15,18). Colostomy is not favoured by the surgeon, as well as the patient, since colostomy closure is associated with a morbidity rate of 0 to 34 percent(17). In various series (3,12,15), treatment of sigmoid volvulus by only colostomy carries a mortality rate of 25.0 to 76.2%. These rates are reported to be 14.2% for operative detorsión, 50.0% for Hartmann's procedure, 35.7% for Paul Mikulicz type of resection, 25.0% for primary anastomosis, and 8.5% for elective resection and primary anastomosis.

More recently, intracolonic bypass procedure, developed by Ravo(17-19) is reported to prevent anastomotic leakage, following primary anastomosis for the obstructed left colon, with no operative mortality. We have no experience with the procedure.

It has been suggested that obstruction may result in proximal colonic ischemia and that ischemia in association with the harmful effects of bacterial toxins leads to necrosis of the bowel wall(21). The most important prognostic factor for the patient with volvulus is the viability of the colon at operation (2). If gangrenous bowel is present, everyone agrees that a resection should be performed, but few investigators advocate a primary anastomosis (7). Following endoscopic detorsión Brother(1) reported a mortality rate of 8% for viable colon and 25% for nonviable colon. Operative mortality for viable sigmoid colon varies between 2.9% to 30.2%, averaging 12.4% throughout the world

Table 6. Causes of small and large bowel obstruction in 248 patients.

Cause	n
Adhesions (n:90)	
Previous Operations	86
Tuberculosis	2
Cause not found	2
Volvulus (n:48)	
Sigmoid	32
Small intestine	15
Sigmoid and small intestine	1
Colonic Tumours (n:46)	
Cecum	3
Ascending Colon	7
Hepatic Flexure	2
Transverse Colon	4
Splenic Flexure	3
Descending Colon	13
Sigmoid Colon	3
Rectum-Recto sigmoid junction	8
External Hernias (n:22)	
Inguinal	10
Others	12
Peritonitis Carcinomatosa	
Intussusception	
Others (Internal hernia, Ogilvie's sendrome), Foreign body,	
Bezoars (Jejunum and terminal ileum), Gallstone ileus,	19
Sigmoid diverticul perforation	

(14,16). In international series reviewed by Ballantyne(3), strangulated nonviable sigmoid mortality ranges between 17.4% and 100% with a mean of 52.8%.

In our series, the mortality rates for viable and nonviable colon are 9.5% and 18.2%, respectively, and the overall mortality rate was 9.3 %. In the first group the only death cause was cardiorespiratory failure, and in the second group one patient died of anastomotic leakage and the other of cardiorespiratory failure.

Local cellulitis and wound infection, cecal fistula, excessive fecal drainage after removal of the cecostomy tube, and herniation at the cecostomy site, are reported complications of complementary tube cecostomy (22). Several authors (12-15) report an anastomotic leakage rate of 2.2-17% and a wound infection rate of 20 - 40 % for urgent operations. Operative morbidity was 14.2 % for the first group, and 18.2 % for the second group. Two cases of evisceration, and a cecal fistula were recorded in the viable colon group. Secondary suture was required for eviscerated cases, and the fistula healed spontaneously in 4 weeks. In the second group, anastomotic leakage was noticed in one patient who expired on the sixth postoperative day, and wound infection was recorded in one patient.

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In the light of these results, immediate resection and primary anastomosis, supported by complementary tube cecostomy, can easily be administered to patients with sigmoid volvulus in one-stage with no recurrence, and low morbidity and mortality. We believe that critically ill patients need temporary colostomy or staged procedures. Since primary resection is the definitive treatment of sigmoid volvulus, this method seems to be the procedure of choice even in gangrenous cases with unprepared bowel.

Sigmoid kolon volvulusu tedavisinde rezeksiyon ve primer anastomoz

Bu çalışmada, son 5 yılda sigmoid kolon volvulusu tedavisinde primer rezeksiyon-anastomoz ve tüp çekostomi uygulanan 32 olgudaki deneyimimiz gözden geçirilmiştir. Hastalar gangrensiz (21 olgu) ve gangrenli kolon (11 olgu) olmak üzere iki gruba ayrılmıştır. Genel morbidite ve mortalite oranları sırası ile %15.6 ve %12.4 olmuştur. 3 olgunun kardiy-respiratuvar yetmezliğe bağlı olarak kaybedildiği göz önüne alındığında, cerrahi girişime özgün mortalite oranının %3.1 olduğu belirlenmiştir. Sonuç olarak, sigmoid kolon volvulusunun tedavisinde bu tekniğin gangrenli vakalarda bile, güvenle uygulanabileceği kanısına varılmıştır.[Turk J Med Res 1994; 12(2): 78-82]

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