Volvulus of the Sigmoid Colon in Jordan

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This report discusses 27 patients with sigmoid volvulus treated at Jordan University Hospital (JUH) during a 15-year period. These patients represented 4.7 percent of adult patients treated for intestinal obstruction in the same period. The average age was 54.5 years, and none of the patients was institutionalized. Twenty-five patients presented with acute symptoms, and two had chronic symptoms. Sigmoidoscopic detorsion was achieved in 15 patients. Emergency resection was required in two of these patients: for the development of gangrene a few hours after detorsion in one patient and for recurrence within 24 hours in the other despite the presence of a rectal tube. Early recurrence occurred in two other patients and was managed endoscopically. Emergency surgery was performed in 10 other patients: for a failed endoscopic detorsion in three patients, for ulcerated and bleeding mucosa forecasting gangrene in another, and as a primary treatment in six patients who were either misdiagnosed or suspected to have gangrenous bowel. Elective resection was performed in 13 patients. The mortality rate was 15 percent (4/27) for the whole series and 33.3 percent (1/3) for those with gangrenous bowel. [Key words: Sigmoid volvulus; Volvulus; Obstruction; Intestinal; Colonic]

Volvulus of the sigmoid is the most common subtype of colonic volvulus.[1] Although it is not a common cause of intestinal obstruction, the reported mortality rate is still as high as 30 percent.[2, 3] The incidence of sigmoid volvulus has two distinct geographic patterns.[4] In the industrialized countries, the average age of people at risk was over 60 years, and it was the cause of intestinal obstruction in 0.8 percent of the cases in the U.K. and Australia and 3.4 percent of the cases in the U.S. The second pattern involved the developing countries (India, Pakistan, Brazil, and Ghana), where the age of people at risk was 40 to 50 years and the incidence of sigmoid volvulus as a cause of intestinal obstruction ranged between 20 percent and 30 percent.[4] In JUH, sigmoid volvulus accounted for 4.7 percent of intestinal obstruction, and the average age of patients was 54.5 years.

PATIENTS AND METHODS

Five hundred seventy adult patients were treated surgically for intestinal obstruction at JUH between June 1975 and June 1990. Volvulus of the sigmoid colon was the cause of obstruction in 27 patients (4.7 percent). Their medical records were reviewed regarding age, sex, clinical presentation, radiologic studies, associated medical illness, management, and complications.

RESULTS

Age and Sex

The patients (Table 1) included 19 males and 8 females, whose ages ranged between 22 and 90 years (mean, 54.5 years).

Clinical Presentation and Radiologic Studies

Twenty-five patients presented with acute colonic obstruction manifested by acute lower abdominal pain, obstipation, and marked abdominal distention. Two patients had chronic intestinal obstruction and presented with abdominal distention and constipation. Other clinical features included nausea (11 patients), vomiting (8 patients), and tenderness (19 patients). Bowel sounds were exaggerated in 10 patients, one of whom was found to have gangrenous bowel, and were absent in 2

Table 1.
Age and Sex of Patients with Sigmoid Volvulus

Age (yr)	Male	Female	Total
20–29	3	1	4
30–39	1	1	2
40–49	3	2	5
50–59	4	0	4
60–69	2	3	5
70–75	3	0	3
>80	3	1	4
Total	19	8	27

patients, both of whom had gangrenous bowel. The duration of symptoms in acute cases ranged between a few hours and seven days (average, 2.1 days). The duration in those with chronic volvulus was between one and four months. Ten patients were clinically dehydrated and had elevated blood urea nitrogen, and four patients were hypokalemic. All patients with acute volvulus had chest and plain abdominal (erect and supine) radiograms and showed evidence of colonic obstruction, which was typical of sigmoid volvulus in 21 patients who had severely distended colon with elevated diaphragm (Fig. 1). The two patients with chronic obstruction showed distended colon, and both showed dilated tortuous sigmoid on barium studies.

Associated Medical Illness

Associated medical illness was present in seven (26 percent) patients. Two patients had cerebrovascular accidents, two had diabetes, one was hypertensive, one was schizophrenic, and one had peptic ulcer disease.

Management

All patients were hydrated, their electrolyte deficits corrected, and nasogastric tube suction instituted.

Sigmoidoscopic detorsion was attempted in 19 patients. It was successful in 15 patients, where a long rectal tube was introduced and left *in situ* for two to four days. Early recurrence occurred in three patients despite the presence of a rectal tube in one of them. Precipitous deflation was achieved in 14 patients. The 15th patient had exaggerated bowel sounds on admission and a normal-looking mucosa on sigmoidoscopy. Deflation of his sigmoid was slow, and the expelled fluid stool was free of blood. Repeated saline washouts through the rectal tube flowed easily in and out. Abdominal distention diminished markedly, there was no tenderness or rigidity in the abdomen, and bowel sounds were sluggish. A repeat abdominal radiogram showed the tube in place (Fig. 2). Infarction
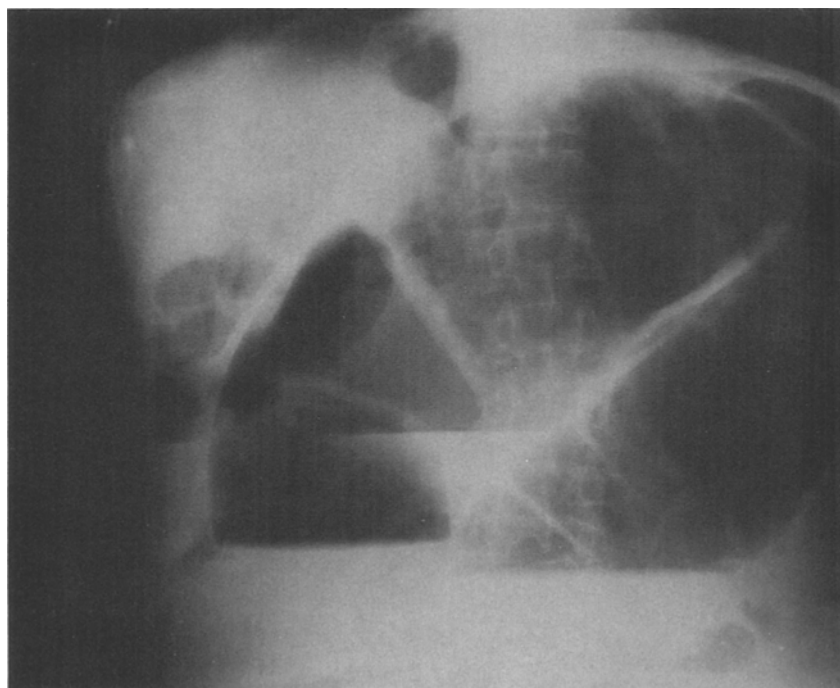

Figure 1. Erect plain x-ray of abdomen showing severely distended sigmoid loop with fluid levels.
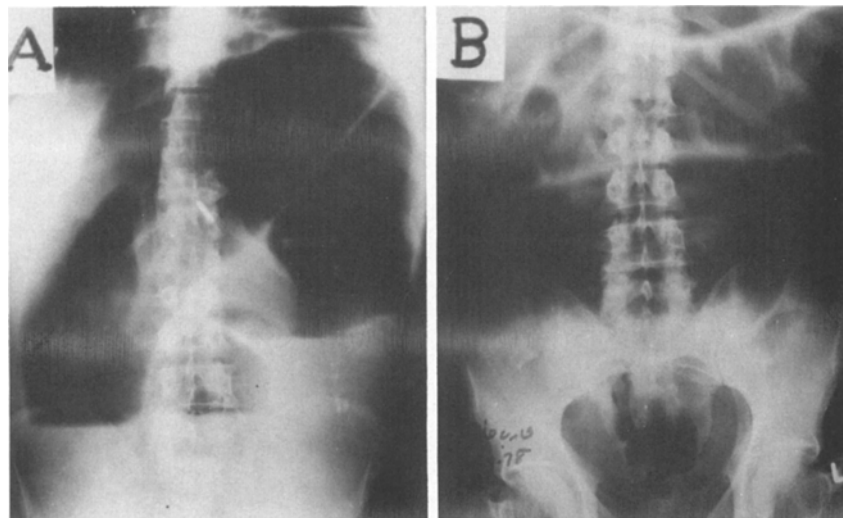
Figure 2. A. Erect plain x-ray of abdomen before detorsion. B. Same patient after detorsion showing rectal tube *in situ.*

of the bowel in a pregangrenous state was suspected. The patient was carefully observed, and, a few hours later, frank abdominal signs of peritonitis (tenderness, rigidity, and absent bowel sounds) developed. At laparotomy, a gangrenous, deflated, and derotated sigmoid was resected.

Emergency laparotomy was performed in 12 patients for the following reasons. Four patients were only diagnosed at laparotomy. Two patients were thought to have gangrenous bowel, and only one was confirmed at laparotomy. Three patients had a failed attempt at sigmoidoscopic detorsion. One patient had ulcerated and bleeding mucosa, which correctly predicted gangrenous bowel. One patient developed recurrence within 24 hours despite the presence of a rectal tube. The last patient, described earlier, did not have precipitous deflation.

Three patients were found to have gangrenous bowel. The gangrene extended in patches, in a 75-year-old patient, to the distal transverse colon, and its extent was only obvious after mobilizing the descending colon. He underwent Hartmann's operation, from which he recovered uneventfully to undergo restoration of the colon successfully eight weeks after resection. Operative procedures are summarized in Table 2. The two patients who underwent operative detorsion refused elective resection and were lost to follow-up. Only one patient with gangrenous bowel in this group died from septicemia.

Elective sigmoid colectomy was performed in 13 patients, two of whom had chronic volvulus and 11 of whom had undergone sigmoidoscopic detor-

Table 2.
Operative Procedures Used in 12 Patients who
Underwent Emergency Laparotomy

Operative detorsion	2
Sigmoid resection and primary anastomosis	5
Hartmann's procedure	2
Resection, terminal colostomy, and mucous fistula	2
Paul Mickulicz's procedure	1

sion. They underwent sigmoid resection and primary anastomosis. Two patients in this group died: one had recurrence after operative and sigmoidoscopic detorsions before elective resection, and the other died from pseudomembranous colitis.

Complications

The morbidity rate was 29.6 percent (8/27). It included wound infection (five patients), chest infection (one patient), and intestinal obstruction (two patients) requiring operative intervention at the fourth postoperative day in one patient and four years after surgery in the second. The mortality rate (Table 3) for the whole series was 15 percent (4/27). One patient died from myocardial infarction five days after sigmoidoscopic detorsion. Three patients died from sepsis. A female patient had generalized peritonitis caused by a gangrenous sigmoid and died soon after surgery. The second patient died on the tenth postoperative day; he had pseudomembranous colitis, which progressed to toxic megacolon and septicemia. The third patient

Table 3.
Analysis of the Mortality Rate

Patients	Number	Deaths	Percentage
Whole series	27	4	14.8
Emergency resection	10	1	10.0
Elective resection	13	2	15.4
Hospital recurrence	3	1	33.3
Resection of viable bowel	20	2	10.0
Resection of gangrenous bowel	3	1	33.3

was referred to JUH after operative reduction elsewhere. He had severe chest infection and poor nutritional status. He developed two recurrences, which were relieved endoscopically. Then his general condition improved when he underwent sigmoid colectomy with primary anastomosis and tube cecostomy. He later became septicemic and died on the tenth postoperative day.

DISCUSSION

Sigmoid volvulus is a rare cause of intestinal obstruction which mainly affects older people.[2,5] It constituted 4.7 percent of intestinal obstruction in our series. Our incidence is similar to reports from the U.K. and the U.S., where the incidence ranges between 0.8 percent and 3.4 percent, and it is lower than the incidence reported from India, Pakistan, Brazil, and Ghana, which ranges between 20 percent and 30 percent.[1] The average age (54.5 years) of our patients is lower than that reported from the U.K. and the U.S. and is higher than that reported from developing countries.[4] The preponderance of sigmoid volvulus in males in our series is similar to reported data.[4] We did not encounter volvulus in other sites of the colon, reported to occur in 18 percent to 44 percent of patients in some series.[4,6]

The clinical presentation in our series which led to a correct diagnosis in 85 percent of patients did not differ from what was reported by Bak and Boley,[5] where the correct diagnosis was 90 percent. None of our patients was institutionalized, and the incidence of associated disease was 26 percent; this is in contrast to Bak and Boley's report, where 57 percent of patients were institutionalized and 58 percent had concomitant disease.

It is now accepted that the initial management of sigmoid volvulus is to attempt endoscopic detorsion[7–10] if the presence of gangrenous bowel can be excluded. The presence of gangrenous bowel was predicted in four of our patients. Two

of them had abdominal signs suggestive of peritonitis, but at laparotomy only one was found to have gangrenous bowel. The third patient had mucosal ulceration and bleeding, which correctly predicted gangrene of the bowel. In the fourth, a 65-year-old male, suspicion of infarcted bowel only arose when successful endoscopic intubation failed to produce precipitous deflation. This raised the possibility of death of the muscle wall before signs of gangrene became obvious a few hours later. At laparotomy a derotated and deflated gangrenous sigmoid was successfully resected. Infarction of the bowel in a pregangrenous state may be missed at operation, and this may explain the death of one of Bak and Boley's[5] patients from an infarcted bowel two days after operative detorsion. Following successful detorsion and deflation, it is agreed that a rectal tube should be left in, but there is no agreement on how long this tube should be retained to prevent hospital recurrence. Bak and Boley[5] advise retaining the tube for four to five days, and they had three hospital recurrences. Our policy was to keep the tube for two to four days, and we had three hospital recurrences, which occurred within 24 hours after deflation in one patient despite the presence of a tube. The recurrence may be due to the possibility that endoscopic detorsion is incomplete, which may explain the higher recurrence after endoscopic detorsion (43 percent) than after operative detorsion (18.2 percent).[1]

The definitive treatment of sigmoid volvulus is sigmoid resection, preferably as an elective procedure.[1] Arnold and Nance[2] recommended elective resection only for low-risk, young patients after the first episode. This view was later challenged by Bak and Boley,[5] who found that the mortality for elective resection after the first episode (5.6 percent) is lower than the mortality related to recurrent volvulus or its treatment (33 percent). Three of our patients had recurrent volvulus, with one death. We also share the opinion of Bak and Boley[5]

and others that, if an emergency surgery is performed, some form of resection is indicated regardless of the state of the colon, not only because an infarcted bowel in its pregangrenous state may be missed, as happened in Bak and Boley's patient, but also because some patients may refuse elective surgery, as happened in our two patients who underwent operative reduction and were later lost to follow-up. In addition, this series shows that emergency resection was not accompanied by an increased mortality; on the contrary, the mortality rate was unexpectedly lower than that for elective resection.

The operative procedure for elective surgery is resection and primary anastomosis with or without a proximal colostomy or cecostomy. On the other hand, several procedures are advised in definitive emergency surgery; these include Paul Mickulicz's procedure, Hartmann's operation, resection with end colostomy and distal mucous fistula, or resection and primary anastomosis. The choice among these operations depends on the experience of the surgeon, the general condition of the patient, the presence of concomitant illness, the state of the colon, and the extent of gangrene. This explains the unexpected high mortality rates reported after simpler procedures[1] and makes the attempts to compare the results of these procedures (advised in emergency surgery mentioned above) futile. Therefore, it is difficult to construct controlled clinical trials to compare the results of the abovementioned procedures.

CONCLUSION

Sigmoid volvulus is a disease of older people who have a high incidence of concomitant ailments, and thus it is associated with a high morbidity and mortality. The initial treatment of choice, if infarcted bowel can be excluded, is nonoperative endoscopic detorsion followed by elective sigmoid resection. Gangrene of the colon may become clinically obvious after successful endoscopic detorsion; therefore, the patients should be carefully

observed after deflation of the colon, especially if deflation of the bowel is not precipitous, which may indicate an infarcted colon in a pregangrenous state. The fear of missing a similar situation and the possibility that patients may refuse elective resection may constitute a strong argument for resection of the sigmoid colon if emergency laparotomy is indicated, regardless of the state of the colon. Such a policy is not associated with an increased mortality, as is obvious in this series. Finally, gangrene of the colon may extend in patches beyond the twisted sigmoid colon, as happened in one of our patients. Unless the whole colon is carefully scrutinized, resection may be incomplete. This may be a factor in elevating the reported high mortality in cases of nonviable colon, which ranges between 10 percent and 100 percent.[1]

REFERENCES

1. Ballantyne GH. Review of sigmoid volvulus: history and results of treatment. Dis Colon Rectum 1982; 25:494–501.
2. Arnold CJ, Nance FC. Volvulus of the sigmoid colon. Ann Surg 1973;177:527–37.
3. String ST, DeCosse JJ. Sigmoid volvulus: an examination of the mortality. Am J Surg 1971;121:293–7.
4. Ballantyne GH. Review of sigmoid volvulus: clinical pattern and pathogenesis. Dis Colon Rectum 1982; 25:823–30.
5. Bak MP, Boley ST. Sigmoid volvulus in elderly patients. Am J Surg 1986;151:71–5.
6. Sawyer RB, Sawyer KC Jr, Sawyer KC. Volvulus of the colon. Am J Surg 1962;104:468–73.
7. Drapanas T, Stewart JD. Acute sigmoid volvulus: concepts in surgical treatment. Am J Surg 1961;101: 70–5.
8. Nay HR, West JP. Treatment of volvulus of the sigmoid and cecum. Arch Surg 1967;94:11–3.
9. Starling JR. Initial management of sigmoid volvulus by colonoscopy. Ann Surg 1979;190:36–9.
10. Sanner CJ, Saltzman DA. Detorsion of sigmoid colon by colonoscopy. Gastrointest Endosc 1977;23: 212–3.