

Original Article

Acute sigmoid volvulus in a West African population

Ali Nuhu, Abubacar Jah¹

Department of Surgery, University of Maiduguri Teaching Hospital, Maiduguri, Borno State, Nigeria;
¹Royal Victoria Teaching Hospital, Banjul The Gambia

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Correspondence to: Dr. Ali Nuhu, Department of Surgery, University of Maiduguri Teaching Hospital, PMB 1414, Maiduguri, Borno State, Nigeria. E-mail: nuhualinwa@yahoo.com

Abstract

Background: Acute sigmoid volvulus is one of the commonest causes of benign large-bowel obstruction. Its incidence varies considerably from one geographic area to another. This study reviews its management in a relatively high-prevalence area.

Materials and Methods: All adult patients with acute sigmoid volvulus seen at the Royal Victoria Teaching Hospital (RVTH), Banjul, between September 2000 and January 2005 were retrospectively studied. Demographic data, clinical features, resuscitative measures, results of investigations, findings at surgery and postoperative course, and complications were retrieved from the patients' clinical records and analyzed.

Results: A total of 48 patients, 45 (93.8%) males and 3 (6.3%) females, with a male: female ratio of 14.3:1, age range of 19 to 78 years and mean age of 45.8 ± 17.6 years underwent treatment for acute sigmoid volvulus. Twenty-one (43.8%) of the patients were aged 40 to 49 years. Two (4.2%) had rectal tube detortion followed by elective sigmoidectomy and primary anastomosis on the same admission, while 24 (50%) had emergency laparotomy, at which bowel decompression, one-stage resection and primary anastomosis without on-table lavage were done. The rest of the patients, 22 (45.8%), had gangrenous sigmoid colons at laparotomy and consequently underwent resection and Hartmann's procedure. Fourteen (29.1%) patients developed wound infection; and 5 (10.4%) had prolonged ileus, which was managed conservatively. There was no anastomotic leak. The mean hospital stay was 11.1 days. There were 5 deaths, giving a mortality rate of 10.4%.

Conclusion: Acute sigmoid volvulus in The Gambia is almost exclusively a male disease. Sigmoid colectomy and primary anastomosis can be carried out safely in those with viable colon without on-table colonic lavage.

Keywords: Acute sigmoid volvulus, presentation, surgical management

Résumé

Arrière-plan: La sigmoïde volvulus aigu est l'une des plus fréquente causes de tumeurs bénigne qui crée une grande obstruction intestinale. Cet incident varie considérablement d'une région géographique à une autre. Cette recherche a été effectuée dans une région donc la prévalence est relativement dominante.

Matériaux et Méthodes: Tous les malades adultes du sigmoïde volvulus aigu consultés au Centre Hospitalier Universitaire Royal Victoria (Royal Victoria Teaching Hospital- RVTH) de Banjul, entre septembre 2000 et janvier 2005 étaient rétrospectivement étudiés. Des données démographiques, des caractéristiques des études cliniques, des mesures réanimatrice des résultats des investigations, des constatations chirurgicales et durant la période post-opérative et des complications étaient récupérées des archives et d'analyses clinique des malades.

Résultats: Sur un total de 48 malades donc 45 hommes soit (93,8%) et 3 femmes soit (6,3%), avec un ratio de homme/femme de 14,3/1, une tranche d'âge allant de 19 à 78 ans avec pour moyen d'âge de $45,8 \pm 17,6$ ans sous traitement de la sigmoïde volvulus aigu. Vingt un soit (43,8%) des malades étaient âgés de 40 à 49 ans. Deux, soit (4,2%) avaient une détortion du tube rectal suite à la sigmoïdectomie et l'anastomose primaire pour la même admission. Pendant que 24, soit (50%) des malades avaient une laparotomie urgente à la décompression intestinale une résection à un niveau et une anastomose primaire sans on-table lavage. soit faite. le reste des malades 22 soit (45,8%) avaient une sigmoïde gangreneuse du gros intestin à la laparotomie et avaient conséquemment la résection et la procédure d'Hartmann. Quatorze malades soit (29,1%) ont développé des blessures infectées et 5 soit (10,4%) des malades avaient un prolongement d'iléus, qui fut conservativement géré. Il n'y eu aucune fuite anastomotique la durée

moyenne d'hospitalisation fut de 11,1 jours. Il y eu 5 morts donnant une mortalité du 10,4%.

Conclusion: Le sigmoïde volvulus aigu en Gambie est exclusivement une maladie masculine. Le sigmoïde de colectomie et l'anastomose primaire peuvent être effectués en toute sécurité sur ces malades avec un gros intestin viable sans on-table colonic lavage.

Mots clés: Sigmoïde volvulus aigu, présentation, gestion chirurgicale

Introduction

Sigmoid volvulus is an important cause of colonic obstruction worldwide. It has been known to man since time immemorial. Detailed records of sigmoid volvulus were found in the Egyptian Papyrus Ebers and in ancient Greek and Roman writings.^[1] Insufflation, with air to untwist a sigmoid volvulus, a treatment advocated by Hippocrates, is still the basis for the nonoperative approach in the treatment of sigmoid volvulus accepted by surgeons worldwide.^[2] It ranks high as a cause of acute intestinal obstruction in many African countries.^[3-5] In such areas, its classical presentation is well known to many health workers, but its definitive treatment is varied, depending on the condition of the patient and the state of the sigmoid colon. Initial nonoperative management, that is, sigmoidoscopic decompression as advocated by Bruudsgaard,^[2] followed by semi-elective sigmoidectomy and primary anastomosis after on-table lavage has hitherto been widely accepted as standard management.^[6,7] The nonresectional procedures sigmoidopexy and mesosigmoidoplasty have no need for bowel preparation and have lower morbidity and mortality rates but have high incidence of recurrence.^[8] Where the decompression fails and there are signs of colonic gangrene, sigmoid resection and Hartmann's procedure or colostomy with mucous fistula is done to avoid the high mortality associated with primary anastomosis in this situation.^[9] Recently laparoscopic resection has been used in high-risk or elderly patients who may not tolerate conventional surgery.^[10] A more critical appraisal is however needed for its general use. The treatment of choice at this time is resection with primary anastomosis (with or without on-table lavage) in patients with viable sigmoid colons and Hartmann's procedure in those with gangrenous bowel.^[7] The purpose of this retrospective study is to evaluate our policy in the management of this condition and to compare it with other studies.

Materials and Methods

All patients with acute sigmoid volvulus seen and managed at the RVTH between September 2000 and January 2005 were retrospectively studied. Data extracted from their hospital records included age, sex, presenting signs and symptoms, investigations, treatment and postoperative complications. All

the patients were resuscitated and had electrolyte deficits corrected where necessary. Plain abdominal radiographs in erect and supine positions were also done. A urine output of 30-40 mL/h was taken as an indication of adequate hydration. The patients underwent 1) emergency or elective sigmoid colectomy and primary anastomosis without on-table lavage when the sigmoid colon was viable; 2) sigmoidectomy and Hartmann's procedure, when the colon was gangrenous. Those that had semi-elective sigmoidectomy had an initial rectal tube detortion of their volvulus. Perioperative intravenous antibiotics were given to all the patients in combination with ampicillin 500 mg, gentamicin 80 mg and metronidazole 500 mg. Intravenous ampicillin was given 6 hourly, while gentamicin and metronidazole were given every 8 hours for a period of 72 hours. These were given for a further 48 hours for those with gangrenous bowel.

Intraoperatively, manual untwisting relieved the obstruction, and the distended hypertrophied sigmoid colon was decompressed by a tube passed through its wall, surrounded by a seromuscular purse string of 2/0 chromic catgut and attached to a suction machine. The contents of the sigmoid colon, primarily gas and liquid feces, were evacuated as much as possible. A nasogastric tube was routinely used in all the cases to decompress the small bowel. The redundant sigmoid colon became evident, and the line of resection was decided. The descending colon and proximal rectum were mobilized, their vascularity was ensured and a resection and two-layered anastomosis with chromic catgut 2/0 and outer layer of interrupted silk 2/0 or a single interrupted all-layer anastomosis with 2/0 silk was carried out. If the sigmoid colon was gangrenous, it was resected without untwisting and a Hartmann's procedure fashioned. The peritoneal cavity was lavaged with warm normal saline and the abdomen closed by mass-closure technique, leaving a pelvic drain. A digital rectal dilatation was carried out as soon as the patient began to recover from anesthesia, to enhance drainage of mucoid colonic contents. Skin sutures were removed between 7 and 10 days and patients advised on follow-up.

Results

A total of 48 patients were seen, 45 (93.8%) males

and 3 (6.3%) females. The male: female ratio was 14.3:1. Their hospital stay ranged from 4 to 26 days (mean, 11.1 ± 5.02 days). The age of the patients ranged between 19 and 78 years, with a mean age of 45.8 ± 17.6 years. Twenty-one (43.8%) of the patients were in the 40-49 years age group, and 8 (16.7%) were aged between 70 and 79 years. Only 2 (4.2%) patients were below 20 years of age [Table 1]. Thirty-seven (77.1%) of the patients had had previous episodes of colicky abdominal pain. The mean duration of symptoms was 3.97 ± 1.8 days (range, 2-8 days). Gross abdominal distention in 43 (89.6%) patients, colicky abdominal pain in 42 (87.5%), constipation in 33 (68.8%), vomiting in 28 (58.3%) and fever in 13 (27.1%) patients were the main symptoms; while dehydration in 16 (33.3%) patients, abdominal tenderness in 17 (35.4%) and visible peristalsis in 20 (41.7%) patients were the main signs. Four (8.3%) of the patients presented in shock (a diastolic blood pressure of less than 80 mmHg). Preoperative diagnosis of sigmoid volvulus was made clinically and confirmed at laparotomy, though 39 (81.3%) had classical plain abdominal X-ray features (grossly distended and twisted sigmoid loop filling the abdomen, with multiple air fluid levels and the 'omega' or 'coffee bean' sign). Two (4.2%) of the patients had rectal tube detortion of their sigmoid volvulus followed by elective sigmoid colectomy and primary anastomosis on the same admission, after bowel preparation, while 24 (50%) had emergency resection of the sigmoid colon and primary anastomosis in two layers without on-table lavage [Table 2]. There was no mortality in the former group, but one (4.2%) of those that had emergency sigmoid colectomy died. All those that had sigmoid colectomy and primary anastomosis had viable sigmoid colons at operation and had presented to the hospital within 48 hours of onset of symptoms. Twenty-two (45.8%) patients had gangrenous sigmoid colon at operation and were offered resection and Hartmann's colostomy; four (18.2%) of these patients died in the postoperative period. Wound infection was the commonest postoperative complication, seen in 14 (29.1%) patients, followed by prolonged ileus in 5 (10.4%) and chest infection in 3 (6.2%) patients. There was no anastomotic leak [Table 3]. There were 5 deaths, giving a mortality rate of 10.4%. Four of the deaths were among those who had gangrenous bowel at laparotomy and one among those who had viable bowel. Three of the deaths were due to septicemia, one had a background heart disease (congestive cardiac failure) while the other had acute renal failure. The average duration of follow-up was 6 months, during which 3 (6.2%) of the patients were found to have developed intestinal obstruction secondary to adhesions and 1 (2.1%) had incisional hernia. These complications were managed accordingly.

Table 1: Age and sex distribution of 48 patients with acute sigmoid volvulus

Age (years)	Males	Females	Total (%)
10-19	2	-	2 (4.2)
20-29	11	-	11 (23.0)
30-39	4	-	4 (8.3)
40-49	11	1	12 (25.0)
50-59	7	2	9 (18.7)
60-69	2	-	2 (4.2)
70-79	8	-	8 (16.7)
Total	45	3	48 (100)

Table 2: Operative treatment offered to the patients

Treatment modality	Frequency (%)	Mortality (%)
Resection and primary anastomosis	26 (54.2)	1 (2.1)
Resection and Hartmann's colostomy	22 (45.8)	4 (8.3)
Total	48 (100)	5 (10.4)

Two patients had successful sigmoidoscopic detortion with subsequent sigmoidectomy and primary anastomosis on the same admission. Twenty-six patients had viable sigmoid colons at laparotomy.

Table 3: Postoperative complications

Postoperative complication	Frequency (%)
Wound infection	14 (29.1)
Pneumonia	3 (6.2)
Wound dehiscence	2 (4.2)
Fecal fistula	1 (2.1)
Septicemia	3 (6.3)
Incisional hernia	1 (2.1)
Adhesive bowel obstruction	3 (6.3)
Prolonged ileus	5 (10.4)

Discussion

A total of 48 patients with acute sigmoid volvulus were seen in our hospital over a 4-year period, an average of 12 patients per year. This is a high figure compared to that in a similar series from the sub-region.^[11,12] The male: female ratio of 14.3:1 makes this an almost exclusive male disease in The Gambia; this corroborates other African series.^[4] In Europe and America, sigmoid volvulus affects males and females in nearly equal proportion,^[13,14] and many of them are above 60 years of age with history of institutional care. The male preponderance of this condition in parts of Africa, Asia and Latin America still awaits satisfactory explanation. Earlier explanations of this marked gender difference were based on the wider, more relaxed female pelvis, allowing for spontaneous reduction of a sigmoid volvulus. Furthermore, other studies have found that males have longer and narrower sigmoid mesenteries than females, resulting in a male predisposition to axial rotation of the sigmoid colon.^[15] The mean age of 45.7 years is similar to that

found in other studies in Africa where the disease affects young males.^[4,16] The classical features of acute sigmoid volvulus are not difficult to identify in patients from areas where the condition is common. Gross abdominal distention is invariably present. In some, the distention is moderate. The general condition of the patient with uncomplicated acute sigmoid volvulus is usually good despite a history of previous episodes of colicky abdominal pain and other features of colonic obstruction.

The management of uncomplicated acute sigmoid volvulus has been nonoperative at the first instance; that is, sigmoidoscopic detortion, followed by a semi-elective sigmoidectomy and anastomosis on the same admission.^[2,17] This is because detortion with a sigmoidoscope alone is associated with high recurrence. Sigmoidoscopic detortion was carried out in 2 patients in this series, both of whom had definitive sigmoidectomy and primary anastomosis on the same admission. After adequate resuscitation, all the other patients underwent laparotomy, with the aim of resection and primary anastomosis when the sigmoid was viable or resection and Hartmann's procedure when the sigmoid colon was gangrenous. Faranisi and other workers^[18,19] found that the twisted, obstructed and grossly distended sigmoid colon has hypertrophied muscular wall that holds sutures well, producing a secure anastomosis. The mainly liquid and gaseous content of the sigmoid colon can also be evacuated well through a tube in the rectum, a Foley's catheter or a savage decompressor through the sigmoid wall. These qualities of the obstructed sigmoid colon in volvulus informed the possibility of a one-stage procedure.^[18] Therefore, staged operations or primary anastomosis after intraoperative antegrade colonic lavage can be avoided without increasing morbidity and mortality rates.^[20]

Twenty-four (50.0%) of the patients in this series were found to have viable colon and had one-stage resection and primary anastomosis without antegrade intraoperative colonic lavage. Two other patients with viable sigmoid colons had an initial rectal tube detortion and semi-elective sigmoidectomy and primary anastomosis after a routine bowel preparation on the same admission. Rectal tube detortion is usually attempted in patients that present early (within 24-72 hours in our series), and the presence of blood or necrotic tissue in the effluent is highly suggestive of a nonviable colon. Such gangrenous sigmoid colons are found in patients presenting upwards of 5 days after the onset of symptoms, their poor clinical states leading to further delay before surgical intervention. There was no anastomotic leak, and one death was recorded in a patient who already had an intercurrent medical condition. Similar results were reported by other

workers,^[18,20] suggesting that resection and primary anastomosis of acute left colonic obstruction due to sigmoid volvulus without on-table lavage gives acceptable results.

Twenty-two (45.8%) of the patients had gangrenous colon. In such patients, it is safest to resect the gangrenous colon and construct a colostomy and mucous fistula or do a Hartmann's procedure. Resection and primary anastomosis in this condition is associated with high morbidity and mortality.^[21] Despite the high incidence of gangrenous bowel at laparotomy, the overall mortality rate was 10.5%. This is lower than that in other reports from Nigeria^[11] and Ethiopia,^[12] where though the age distribution was similar, there were more patients with gangrenous bowel in their series. In conclusion, our series suggests that if patients are in good condition, one-stage sigmoid resection and primary anastomosis can be done with acceptable results in patients with left colonic obstruction due to acute sigmoid volvulus. This reduces the operation time and the morbidity that may result from on-table colonic lavage or a staged operation. Those with gangrenous bowel should have sigmoid resection and Hartmann's procedure or colostomy and a mucous fistula.

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