

Original Article

SIGMOID VOLVULUS: THE BAYELSA STATE EXPERIENCE

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Abstract

Background: Sigmoid volvulus is a leading cause of acute large bowel obstruction in many parts of Africa and developing countries. Its incidence in the Niger Delta region appears to be lower than in other parts of Africa, yet delays in diagnosis and management contribute to significant morbidity and mortality.

Objectives: To determine the pattern of presentation, clinical features, and treatment outcomes of sigmoid volvulus at a tertiary institution in Bayelsa State, Nigeria.

Methods: This was a retrospective study of all cases of sigmoid volvulus admitted at the Niger Delta University Teaching Hospital, Okolobiri, and Divine Grace Medical Center, Okolobiri, between December 2006 and January 2016. Data were extracted from patient case notes, ward, and theatre records, and analysed using SPSS version 11.0.

Results: Fifteen cases were seen during the study period, with males predominating (13/15; 86.67%). All males were over 40 years of age. The majority (46.67%) presented 3–4 days after onset of symptoms. Abdominal pain, distension, and dehydration were present in all patients (100%). The omega/bird's beak sign was identified on plain abdominal radiograph in 80% of cases. All patients underwent surgical intervention. Primary resection and anastomosis were performed in 66.67% of cases. Wound infection and prolonged ileus were the most common postoperative complications. The overall mortality rate was 26.67%.

Conclusions: Sigmoid volvulus is relatively uncommon in the Niger Delta region and predominantly affects males. It carries a significant mortality rate. Early presentation, prompt diagnosis, and definitive surgical intervention are key to reducing complications and mortality.

Keywords: Sigmoid volvulus, large bowel obstruction, Niger Delta, Nigeria, colonic resection, gangrene

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INTRODUCTION

Sigmoid volvulus is responsible for 9.2% of all cases of large bowel obstruction,[1,2,3,4] but in some parts of Africa, it accounts for 10.6% of cases of acute intestinal obstruction presenting to surgical emergency departments.[5] While sigmoid volvulus is a leading cause of acute colonic obstruction in South America, Africa, Eastern Europe, and Asia,[6,7,8,9] it is rare in developed countries such as the United States, United Kingdom, Japan, and Australia.[1] Jumbi et al working in East Africa noted that sigmoid volvulus accounted for 14.1% of all cases of intestinal obstruction and 80% of large gut obstruction.[6]

Sigmoid volvulus is exclusively a male disease in certain parts of Africa,[10] where it commonly affects young men in their fourth decade of life.[11] However, in Europe and America, sigmoid volvulus is a disease of the elderly, occurring more commonly in the sixth to eighth decades of life, and it affects males and females in nearly equal proportion. [12,13,14]

Although the aetiology of sigmoid volvulus is uncertain, a high-fibre diet and anatomical variation have been implicated.[15] A high incidence is also noted among patients with Parkinson's disease, multiple sclerosis, spinal cord injury, chronic constipation, megacolon, and

those on psychotropic and anticholinergic medications.[8,9,16,17] Other contributory factors include adhesive bands, high altitude, pregnancy, and Chagas' disease.[16] A racial trend has also been implicated in several studies.[3,4]

Bands of adhesion, overloading of the pelvic colon, long pelvic mesocolon, narrow attachment of the pelvic mesocolon, high-residue diet, and chronic constipation have also been identified as predisposing factors. [1,15,16] Madiba et al demonstrated a higher prevalence of redundant sigmoid colon in Black Africans than in Indians and Whites, which may partly explain the higher incidence among the Black population. [15]

Dodiyi-Manuel et al noted that sigmoid volvulus carries high recurrence and mortality rates following non-operative decompression, and recommended definitive surgery for effective treatment. [18] Ballantyne et al similarly observed that without definitive operative treatment, colonic volvulus tends to recur, with each episode presenting a risk of ischaemia and perforation. [14]

Untreated, sigmoid volvulus rapidly progresses to ischaemia, gangrene, and colonic perforation. Timely recognition and therapeutic intervention are therefore essential. Adequate and prompt fluid resuscitation, decompression, and resection of gangrenous bowel are key in management. [17,19]

Although sigmoid volvulus is common in parts of East Africa, its incidence appears to be low in the Niger Delta region. [5,20] In a study at the Niger Delta Teaching Hospital by Alagoa PJ et al, the incidence of sigmoid volvulus was 3.4% of all cases of intestinal obstruction. [21] The low incidence, coupled with the non-availability of imaging in most remote health facilities in the Niger Delta, could lead to delays in diagnosis and intervention, thereby increasing the mortality rate. [7,9,17] There is also a paucity of published literature on sigmoid volvulus from this region. The aim of this retrospective study was therefore to determine the pattern of presentation, clinical features, and treatment outcomes of sigmoid volvulus at our institution.

PATIENTS AND METHODS

This was a retrospective study of all cases of acute sigmoid volvulus admitted at the Niger Delta University Teaching Hospital (NDUTH), Okolobiri, and Divine Grace Medical Center, Okolobiri, over a ten-year period from December

2006 to January 2016. The study was approved by the institutional ethics committee.

Data were extracted from patient case notes, ward records, and theatre records. Demographic data including age, sex, occupation, detailed clinical history, duration of symptoms before hospital presentation, comorbid factors, duration of hospital stay, investigations performed, mode of treatment, operative findings, and treatment outcomes were collected. The likely aetiology and predisposing factors were also noted. Patients with caecal, gastric, and small intestinal volvulus were excluded from the study.

Data were analysed using the Statistical Package for the Social Sciences (SPSS), version 11.0. Simple descriptive statistics and tables were used to present results.

RESULTS

Fifteen cases of sigmoid volvulus were seen over the study period. All patients had plain abdominal radiograph signs suggestive of large intestinal obstruction, including dilated bowel and multiple air-fluid levels. Three patients had air under the diaphragm, suggestive of colonic rupture secondary to gangrenous sigmoid colon. The omega sign was identified in 12 (80%) of cases.

All patients were resuscitated with intravenous fluids. The most common operative procedure was primary resection and anastomosis, performed in 10 (66.67%) of cases with satisfactory outcomes. No tubal deflation or endoscopic dextrorotation was performed.

Outcome of treatment

The mean duration of hospital admission was 11 days. Four patients died from complications following surgical treatment of sigmoid volvulus, giving an overall mortality rate of 26.67%. Of those who died, three were diabetic, and two had severe hypertension in addition. The two patients who had ileo-sigmoid volvulus developed perforated colon and died of overwhelming sepsis. Two patients had postoperative intestinal obstruction secondary to adhesive bands, and two developed intra-abdominal abscesses following colonic resection. There were no cases of recurrence of volvulus during the follow-up period.

Table 1: Age and Sex Distribution of Patients

Age Group (Years)	Males	Females	Percentage (%)
<30	0	0	0
31–40	0	2	13.33
41–50	7	0	46.67
51–60	5	0	33.33
>60	1	0	6.67
Total	13	2	100

Table 2: Occupation of Patients

Occupation	Frequency	Percentage (%)
Farmer	6	40.00
Fishing	3	20.00
Teacher	2	13.33
Civil Servant	1	6.67
Business	1	6.67
Driver	1	6.67
Unemployed	1	6.67
Total	15	100.00

Table 3: Duration of Symptoms Before Presentation

Duration (Days)	Frequency	Percentage (%)
1–2	1	6.67
3–4	7	46.67
5–6	5	33.33
>7	2	13.33

Table 4: Clinical Features at Presentation

Clinical Feature	Number (n=15)	Percentage (%)
Abdominal pain	15	100.00
Abdominal distension	15	100.00
Dehydration	15	100.00
Constipation	14	93.33
Nausea	13	86.67

Abdominal tenderness	13	86.67
Visible peristalsis	10	66.67
Vomiting	9	60.00
Empty rectum	9	60.00
Fever	7	46.67
Shock	4	26.67
Diarrhoea	1	6.67

Table 5: Plain Abdominal Radiograph Findings

Radiological Finding	Frequency	Percentage (%)
Distended bowel	15	100.00
Multiple air-fluid levels	15	100.00
Omega/bird's beak/ace of spades sign	12	80.00
Air under the diaphragm	3	20.00
Pneumatosis intestinalis	4	26.67

Table 6: Intra-operative Findings

Finding	Frequency	Percentage (%)
Distended sigmoid colon	15	100.00
Viable colon	8	53.33
Haemoperitoneum	7	46.67
Gangrenous colon	7	46.67
Ileo-sigmoid knotting	2	13.33
Perforated colon	2	13.33

Table 7: Surgical Procedures Performed

Procedure	Frequency	Percentage (%)
Primary resection and anastomosis	10	66.67
Paul-Mikulicz procedure	3	20.00
Hartmann's procedure	2	13.33
Endoscopic derotation	0	0.00
Rectal tube deflation	0	0.00
Total	15	100.00

Table 8: Postoperative Complications

Complication	Frequency	Percentage (%)
Wound infection	6	17.65
Prolonged ileus	6	17.65
Burst abdomen	3	8.82
Chest infection	3	5.88
Septicaemia	3	5.88
Acute renal failure	3	5.88
Incisional hernia	2	5.88
Anastomotic leak	2	5.88
Faecal fistula	2	5.88
Intestinal obstruction	2	5.88
Intra-abdominal abscess	2	5.88
Total complications	34	—

DISCUSSION

Sigmoid volvulus is common in certain parts of developing countries, where it accounts for 20–54% of all cases of large bowel obstruction. [10] It ranks among the most common causes of acute intestinal obstruction in many African countries and is one of the leading causes of benign large bowel obstruction. [10,22] Its incidence varies considerably from one geographical area to another. [3,4,22]

In the United States and other high-income countries, sigmoid volvulus is predominantly a disease of elderly patients with chronic medical conditions and a history of disordered bowel habits. [11,22] The highest incidence in these settings occurs between the sixth and eighth decades of life. [15] Our study contrasts with these findings, as the majority of our patients were middle-aged men below 60 years, with the peak incidence occurring between the ages of 41 and 50 years. This finding is consistent with those of Shepherd et al in East Africa, who documented sigmoid volvulus occurring most commonly in the fourth decade of life. [11] It also concurs with Heis et al, who noted that sigmoid volvulus occurs between the ages of 40 and 60 years in the developing world, compared with 70–80 years in Western countries. [4] The reasons for this younger age at onset in African populations remain unclear. Genetic

predisposition, dietary factors, and other undetermined factors may account for the observed differences.

Sigmoid volvulus has been documented as a predominantly male disease in numerous reports. [3,6,11,22] In our series, 13 (86.67%) of the 15 patients were male, with a male-to-female ratio of 7.5:1. This is consistent with the findings of Nuhu et al, who reported a ratio of 14.3:1. [22] In contrast, Anderson and Lee reported that in Europe and America, sigmoid volvulus affects males and females in nearly equal proportions. [12] The higher prevalence of redundant sigmoid colon in Black Africans, as demonstrated by Madiba et al, [15] may partly explain the higher overall incidence in this population but does not adequately explain its predominantly male nature in Africans. Further research is needed to determine the underlying factors responsible for this sex predilection.

The predominant presenting symptoms of sigmoid volvulus — abdominal pain, progressive abdominal distension (92–95%), constipation (92%), and vomiting (approximately 60%) — have been well described in the literature. [7,9,11,23] Our findings were consistent with these reports. Notably, 9 (60%) of our patients had a prior history of recurrent colicky abdominal pain that resolved with the passage of large amounts of flatus, possibly

representing previous episodes of self-limiting torsion and spontaneous derotation.

The diagnosis of sigmoid volvulus can be established clinically and radiologically in 60–80% of cases using plain abdominal radiographs alone. [24] In our series, plain abdominal radiography was diagnostic in 12 (80%) of cases, with the omega/bird's beak sign identified in all 12. No contrast studies were performed. This finding supports the utility of plain abdominal radiographs as a practical diagnostic tool, particularly in resource-limited settings where contrast studies or advanced imaging may not be readily available.

All patients in our study underwent definitive surgical intervention, and no cases of recurrence were observed during the one-year follow-up period. This supports the recommendation for definitive operative management of sigmoid volvulus to prevent recurrence and its associated risks.[14,18] Non-operative management such as endoscopic derotation or rectal tube deflation, though potentially useful in frail or elderly patients,[25] was not employed in our cohort as most patients were younger and fit for surgery.

The reported incidence of gangrenous bowel at laparotomy for sigmoid volvulus approaches 50% in some African and Asian series, with a high concomitant incidence of ileo-sigmoid knotting. [7,17,26] In our study, 7 (46.67%) of patients had gangrenous bowel at laparotomy, which is comparable to the 50% reported by Bagarani et al and Okello et al. [7,26] However, the incidence of ileo-sigmoid knotting in our series (13.33%) was lower than that reported in these East African studies. Haemoperitoneum was present in all seven patients with gangrenous bowel. This may be attributed to bleeding from the gangrenous bowel into the peritoneal cavity, potentially exacerbated by abdominal massage — a common local practice in this environment prior to hospital presentation.

Resection of the redundant sigmoid colon remains the gold standard treatment for sigmoid volvulus. [27] Primary resection and anastomosis was performed in 10 (66.67%) of our patients with satisfactory outcomes, while Hartmann's procedure was reserved for those with gangrenous bowel. These findings are consistent with the recommendations of Bagarani et al⁷ and the reports of

Oludiran and Osime, who advocated one-stage resection without mechanical bowel preparation for acute sigmoid volvulus. [7,28]

The overall mortality rate in our study was 26.67%, which is within the range of 6–64% reported in the literature for sigmoid volvulus. [7,17] The most significant risk factors for mortality in our series were delayed presentation, gangrenous bowel with perforation, and the presence of comorbid conditions including diabetes mellitus and hypertension, leading to overwhelming sepsis. These findings are in keeping with reports by Oren et al and Bhatnager et al, who identified gangrenous bowel and delayed decompression as the most important determinants of mortality in sigmoid volvulus. [9,17]

CONCLUSION

Sigmoid volvulus, though common in some parts of Africa, appears to be relatively uncommon in the Niger Delta region. It predominantly affects males and mostly presents in the fourth to sixth decades of life. Early presentation, prompt diagnosis, and definitive surgical intervention are essential for survival. Gangrenous bowel and the presence of comorbid conditions adversely affect both morbidity and mortality outcomes. Increased awareness among healthcare workers in the region, coupled with improved access to diagnostic imaging, may help to reduce delays in management and improve survival rates.

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