

## Sigmoid Volvulus and Ileosigmoid Knotting at St. Mary's Hospital Lacor in Gulu, Uganda.

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**Background:** Sigmoid volvulus is a common cause of intestinal obstruction in developing countries where it affects relatively young people. Little is known about this condition in our country and there is yet no literature from an environment like ours (northern Uganda) where civil war has devastated the economy with most of the populace displaced into internally displaced peoples' camp. The main objective of this study was to determine the demographics, treatment and outcome of sigmoid Volvulus cases seen at Lacor Hospital.

**Methods:** This was both a retrospective and prospective study of patients who presented with sigmoid volvulus at St. Mary's Hospital Lacor over a period of 6<sup>1</sup>/<sub>2</sub> years from 1<sup>st</sup> January 2002 to 31<sup>st</sup> July 2008. Medical records of patients who underwent sigmoid surgery was stratified for the following measures; demographic characteristics, presentation to hospital (emergency or elective), operative finding and operative procedure, complication, co-ominous factors and outcome. Similar data was gathered from patients who were prospectively followed up. Data was analyzed using SPSS.

**Results:** A total of 44 patients were studied. Their age ranged from 16 to 80 years with a mean of 52.2years (SD +/- 15.98) and a mode of 60years. There was a preponderance of male (84%) with a male to female sex ratio of 5.3: 1. The disease significantly affected the older males compared with females P=0.032. Approximately 77% of the patients presented acutely and had to undergo emergency surgical intervention, the rest were subacute. About 75% of the patients were treated with primary resection and anastomosis, of which 52.2% were emergency cases. Colostomy was offered to 20.5% and sigmoidoscopic derotation to 4.5%. Overall mortality rate was 15.9% and of the patients who died, 18% had primary resection and anastomosis, while 11% were offered colostomy, (P>0.05). Most of those who died were either the older ones (median age 68years) and/or had co morbid illness such as diabetes mellitus, hypertension, intra-abdominal abscess and cancer.

**Conclusion:** Sigmoid volvulus is relatively rare in our community. It commonly affect males particularly the old. Most of the patients presented acutely, requiring immediate resuscitation and surgical approach. In viable bowel, primary resection and anastomosis of the twisted sigmoid is feasible as it may not adversely affect outcome. Nevertheless colostomy should be considered if the bowel is gangrenous or perforated. Though the disease carries a high mortality, most of the patient who die are either older and/or have co-morbid conditions.

### Introduction

In the gastrointestinal tract, sigmoid colon is the most frequent site for a volvulus<sup>1</sup> and its twist is a common cause of intestinal obstruction<sup>2</sup>. In the United State, Sigmoid volvulus is the third most common cause of colonic obstruction after cancer and diverticulitis<sup>3</sup>. In the Middle East, Sigmoid volvulus is responsible for 9.2% of all cases of large bowel obstruction<sup>4</sup> while in tropical Africa, it accounts for 10.6% of patients presenting with acute intestinal obstruction<sup>5</sup>.

Nonetheless in Ethiopia, the disease is the commonest cause of emergency admissions due to intestinal obstruction<sup>6</sup>.

The etiology of sigmoid Volvulus is unclear but high altitude, along with other etiologic factors, may play an important role in its etiology<sup>7</sup>. Other mentioned etiological factors of sigmoid volvulus include anatomic variation, chronic constipation, neurological disease, and megacolon<sup>2</sup>. In their study on sigmoid volvulus in 2002, Connolly et al<sup>8</sup> found 50% of the patients with sigmoid volvulus to have at least one such risk factors as: Parkinson's disease, multiple sclerosis, Alzheimer's disease, hypokalaemia. In another study Khoury et al<sup>10</sup> found half of their patients with sigmoid volvulus to have mental illness and one-third were chronically constipated. The disease seems to have variable geographical and racial distribution, although it is extremely common in developing countries like Africa where it affects the young male patient<sup>9</sup>.

Sigmoid Volvulus may present with acute sigmoid torsion, recurrent previous torsion or ileosigmoid knotting<sup>11</sup>. The most common symptoms and signs of sigmoid volvulus are abdominal pain and tenderness (98.7%), distention (96.0%), and constipation (92.3%). Abdominal X-ray radiograph always revealed findings typical of volvulus in only 65.0% of cases<sup>12</sup>. Many other authors have reported similar symptoms and signs plus; vomiting, empty rectal ampulla, associated mental and other medical illnesses in sigmoid volvulus presentation<sup>4, 10, 13, 14</sup>. The management of sigmoid volvulus remains controversial, as its treatment consists of endoscopic derotation and decompression, laparotomy and derotation, or sigmoidopexy and either of these may be followed by elective sigmoidectomy. On the other hand it's, treatment may consist of sigmoid resection and primary anastomosis but if gangrenous then Hartmann's procedure is recommended.

Despite the controversy, usually the aim of treatment is to relieve the obstruction and decompress the twisted sigmoid colon. Many authorities now agree that, in uncomplicated sigmoid volvulus (perforation or gangrene) sigmoid resection with immediate primary anastomosis is a first choice single-stage operation as it does not increase morbidity or mortality rates. Although sigmoid volvulus is also frequently successfully treated by endoscopic decompression, the principal therapy of this condition is surgery. Nevertheless, patients with advanced age and multiple co-morbidities might deteriorate on surgical repair<sup>2,11,15,16,17,18,19,20</sup>.

Sigmoid volvulus is often associated with a high mortality because it affects elderly patients who may have severe co morbid conditions. Patients older than 70 years represent a high risk group if subjected to surgical intervention<sup>21,22</sup>. However, when volvulus necessitates emergency surgery, it also carries a substantial mortality even in relatively young patients<sup>23</sup>. The highest mortality usually occurs in cases of resection and primary anastomosis of gangrenous sigmoid colon<sup>18</sup>. Most authors have reported a high mortality of sigmoid volvulus varying between 6% to 64% but this depend on whether there was gangrene, perforation, emergency surgery, toxic shock post operatively, co morbid conditions and other postoperative complications<sup>14,16,25,26,27</sup>. However, the complication of anastomotic failure frequently seen in sigmoid colonic surgery may be related to chronic ischaemia in sigmoid volvulus, other than the surgical technique<sup>24</sup>.

Little is yet known about sigmoid volvulus in our country, particularly northern Uganda, where in the last 20 years civil war devastated the economy with most of the populace displaced into internally displaced peoples' camp. In a preliminary survey, Ogwang<sup>28</sup> in 2003 found sigmoid volvulus to account for 19% of all intestinal obstructions seen in St Mary's hospital Lacor. In our center, the condition has tended to have poor outcome Coupled with the paucity of literature

on the disease from such war ravaged background like ours hence the need for such a study. The main aims of study were to:

1. Determine the demographic characters of patients with sigmoid volvulus.
2. Determine treatment and factors affecting outcome of sigmoid volvulus.

### Patients and methods

This was a 6<sup>1</sup>/<sub>2</sub> years descriptive retro-prospective and prospective study on patients admitted in St. Mary's Hospital Lacor, for sigmoid Volvulus surgery. St. Mary's Hospital, Lacor is a 474 bed hospital located in the war torn Northern Uganda district of Gulu and is a University teaching site for Medical students of Gulu University. Of the hospital's 474 beds, department of surgery has 134 beds.

The study consisted of retrospective consecutive review of charts of patients admitted with sigmoid volvulus from 1<sup>st</sup> January 2002 to 31<sup>st</sup> Dec 2007 inclusive and prospective follow-up of patient admitted with sigmoid volvulus from 1<sup>st</sup> January 2008 to 31<sup>st</sup> July 2008. The study periods 2002-2007 were retrospective and Jan 2008 to July 2008 was prospective. Medical records of patients who underwent sigmoid surgery was stratified for the following measures; demographic characteristics, presentation to hospital (emergency or elective), operative finding and operative procedure, complication, co-ominous factors and outcome. Similar data was gathered from patients who were prospectively followed up. Data collected was analyzed using SPSS.

### Results

A total of 44 cases were studied. All the patients were from Gulu and the surrounding districts. All our catchments area districts had been affected by the protracted northern Uganda civil war and were represented. The patients' ages ranged from 16 to 80 years, with a mean of 52.2 (SD +/- 15.98) and a mode of 60 years. The peak age was 51-60 years for males and 41-50 for females. The frequency of sigmoid volvulus rose with increasing age and this was more so for the males. Males accounted for 84% of cases; the male to female ratio sex ratio was 5.3:1. The mean age for males was 54.4years compared with 40.4years for females (P =0.032).

The majority (77%) of the cases presented as emergency and required immediate resuscitation and relief of the sigmoid obstruction. Of these, 61.3% had acute sigmoid volvulus and 16% had ileosigmoid knotting. Three main types of surgical interventions were offered to patients of sigmoid volvulus (Table 1). These were primary resection and anastomosis (75%), colostomy (20.5%) and sigmoidoscopy derotation and deflation (4.5%). Among the cases who presented as emergency with acute obstruction, 23 (52%) were treated with primary resection and anastomosis, (acute volvulus 45.5% & ileo-sigmoid knotting 6.82%) while 9 (20.5%) were treated with colostomy (P> 0.05). All the patients who presented with sub-acute obstruction were treated with primary resection and anastomosis (Table 1). There was no significant difference in the type of surgical intervention offered to patients who presented with acute sigmoid volvulus. Of the patients studied, 37 (84.1%) were successfully treated, recovered and were discharged alive (Table 2). There were 7 deaths giving an overall mortality rate of 15.9%. Amongst those who survived, 27 (73%) had primary resection and anastomosis. Only 8 (21.6%) were treated with colostomy (Table 2).

**Table 1.** Diagnosis and Operation

Operative finding	Primary resection & anastomosis	Colostomy	Sigmoidoscopy	Total
Sigmoid volvulus	20	5	2	27 (61.3%)
Iliosigmoid knotting	3	4	0	7 (16%)
Cancer sigmoid	1	0	0	1 (2.3%)
Subacute/chronic sigmoid volvulus	9	0	0	9 (20.4%)
<b>Total</b>	<b>33 (75%)</b>	<b>9 (20.5%)</b>	<b>2 (4.5%)</b>	<b>44 (100%)</b>

**Table 2 .** Outcome of Sigmoid Volvulus Treatment.

Diagnosis	Outcome		Total
	Died	Survived	
Cancer	1	0	1
Iliosigmoid knotting	1	6	7
Sub acute sigmoid volv.	3	6	9
Sigmoid volvulus	2	25	27
<b>Total</b>	<b>7 (15.9%)</b>	<b>37 (84.1%)</b>	<b>44 (100%)</b>

Amongst the patients treated with primary resection and anastomosis, 18% died while 11% of those who had colostomy died, however this difference was not significant ( $P=0.5$ ). Therefore primary resection and anastomosis in sigmoid volvulus did not adversely affect outcome of treatment. Furthermore, amongst the 7 patients who died, 4 had presented as emergency and of these 3 were treated with primary resection and anastomosis and 1 with colostomy but there was no statistical difference ( $P=0.56$ ). Therefore the outcome was probably not affected by the type of surgical treatment offered.

Of the 7 patients who died, 3 had chronic/sub acute sigmoid volvulus besides which, one had hypertension with respiratory distress and the others had diabetes and hypertension. Two of the dead had acute sigmoid volvulus and was later found to be diabetic and the other also had intra-abdominal abscess (in liver and subphrenic area). Among the dead was a pregnant lady with cancer of sigmoid colon causing volvulus. One case of ileo-sigmoid knotting died (Table 2).

The age of those who died ranged from 60 to 73 years with a mean of 62.3 years and median 68 years ((95% confidence interval). Ages of those who survived ranged from 16 to 80 years with mean of 52.3 years and median of 50 years (95% confidence interval). The only one female who died was a 27 years old pregnant patient with cancer of the sigmoid colon. The majority of the dead were older male patients but the difference in mean ages between those who survived and those who died was not statistically significant ( $P=0.06$ ).

## Discussion

Of the 44 patients evaluated in this study, the age ranged from 16 to 80 years with a mean of 52.2 years (SD +/- 15.98) and mode was 60 years. However in two separate studies, similar mean age and ranges was reported by Ali in 1998<sup>6</sup> and Hies et al<sup>4</sup> in 2008.

Our finding of male predominance was in agreement with what Atamanalp et al<sup>12</sup> reported in 2005. Other authors have also alluded to the disease being more frequent in the older male age group<sup>5,18</sup>. The frequency of sigmoid volvulus tended to rise with increasing age especially in males. We found a significant mean age difference between males (54.4 years) compared with females (40.4 years) ( $P=0.032$ ).

Atamanalp et al<sup>11</sup> and Mokoena and Madiba<sup>23</sup> respectively found that 77.8% and 84% of their patients with sigmoid volvulus presented acutely. Their findings were comparable to finding in this study. Bhuiyan et al<sup>18</sup> found that 10.7% of their patients with sigmoid volvulus were managed electively. In our study, 22.7% of our cases were handled as sub-acute volvulus of which 20.4% had chronic/subacute sigmoid obstruction and 2.3% had cancer of the sigmoid causing volvulus. Therefore, sigmoid volvulus may present acutely as an emergency or sub-acutely especially when it is with associated recurrent symptoms of constipation and distention.

In this study we found three cardinal types of surgical interventions were offered to patients with sigmoid volvulus; Primary resection and anastomosis, colostomy and sigmoidoscopy derotation and deflation. Many authors have reported similar approach with proportions equal to ours<sup>4,15</sup>. Amongst the patients who had acute obstruction, 52.2% underwent emergency primary resection and anastomosis while colostomy was offered to 20.5% ( $P>0.05$ ). Irrespective of the presentation the major determining factor for primary resection and anastomosis is the presence or absence of complication such as gangrene or perforation. Many authors now prefer one stage primary resection and anastomosis procedure and colostomy if there are complication<sup>2,11,15,16,17,18,19,20</sup>. In this study, where 20.5% of the patients were offered colostomy, we found that 44.4% had gangrenous ileo-sigmoid knotting and 55.5% had gangrenous sigmoid colon. Colostomy is often advised in cases where the gut is gangrenous<sup>9</sup>.

A total of 84.1% of our patients recovered well and was discharged. However 15.9% (7) died. Amongst those who survived, a big proportion (73%) underwent primary resection and anastomosis of their twisted sigmoid. The 21% that were treated with colostomy had precarious sigmoid colon ( $P>0.05$ ). This finding was consistent with the one of Akcan et al<sup>15</sup> in 2007, that there is often no significant statistical difference whether a patient is treated with primary resection anastomosis or colostomy in terms of morbidity, complications and mortality.

Overall, the mortality of sigmoid volvulus in our setting was 15.9% which was similar to the 15.8% mortality reported by Oren et al<sup>17</sup> in 2007. Many other authors have reported mortality rates within the same range<sup>25,29</sup>. However in this study, of the patients who had primary resection anastomosis, 18% died while 11% of those treated with colostomy died ( $P= 0.5$ ). Our finding confirmed what other authors had noted that mortality due to sigmoid volvulus is often related to advanced age and multiple co morbid ailments other the surgical technique<sup>2,11,15,16,17,18,19,20</sup>. In our study out of the 7 patients who died, 2 had diabetes, 1 had hypertension and respiratory distress, 1 had intra-abdominal and liver abscess, 1 was pregnant lady with cancer of sigmoid colon.

The ages of the dead ranged from 60 to 73 years (median 68 years) the mean 62.28 years (95% confidence interval) and when compared, the mean age of those who survived was 52.29 years (95% confidence interval)  $P= 0.06$ . Amongst those who died, only one was female 27 years old, pregnant and had cancer sigmoid died. The high mortality rate amongst patients 70 years and above in sigmoid volvulus has been reported by Peoples et al<sup>22</sup> and Remes-Trocher et al<sup>30</sup> similar to the finding of median age of 68 years among those who died of sigmoid volvulus in

this study. However it should be noted that a patient in the developing world who thrive under prolong civil war, poverty and malnutrition as in our setting may become frail at an earlier age, thus less able to withstand the disorder and treatment of sigmoid volvulus.

## Conclusion

Sigmoid volvulus is a relatively rare condition in Northern Uganda. It mostly affect men especially the older ones in comparison to females. Most of the patients present acutely and therefore require immediate resuscitation and surgical intervention. In viable bowel, primary resection and anastomosis of the twisted sigmoid is feasible even in unprepared bowel as this may not affect outcome. Nevertheless colostomy should be considered if the bowel is gangrenous or perforated. Though the disease carries a high mortality, most of the patients who die are either elderly, have co-morbid conditions or both.

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