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Chronic Sigmoid Volvulus Necessitating Pelvic Colectomy: A Case Report and Review of the Literature

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Abstract

The Viennese Pathologist, Von Rokitsansky, first reported the volvulus of the colon in 1896. Volvulus of the colon is said to occur when a bowel loop and its mesentery twist on a fixed point at its base. It occurs at segments of the colon where a large segment is mobile and is supported by a mesentery with a narrow base at fixation. This anatomical placement allows for axial rotation. Although, colonic volvulus usually occurs in the sigmoid or cecum, it may happen at any segment of colon. Synchronous volvulus of the sigmoid and cecum, or sigmoid and ileum may occur.

Recurrent episodes of abdominal distension, constipation and abdominal pain are the most striking symptoms (the so-called sigmoid volvulus triad). The pain is generally a mild colicky type. Symptoms usually resolve with passage of flatus, rather than faeces, or following a diagnostic barium enema. Recurrent sigmoid colon volvulus is a common phenomenon, rather than a rarity and open surgical intervention is the norm in Africa, rather than endoscopic detortion. The twisted sigmoid colon in Africans is thickened, hypertrophied, with a long and thickened mesocolon and dilated mesenteric vessels. Pelvic colectomy is preferred in patients from rural areas because, they are easily lost to follow up, only to present with a gangrenous or compound volvulus; significantly increasing surgery related morbidity and mortality.

No sufficient data has been found on systematic review of papers from Nigeria highlighting the paradigm shift for surgical resection over non operative procedures.

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The aim of this review is to investigate the extent of recurrent sigmoid colon volvulus and the role of surgical resection of sigmoid colon in African patients.

Keywords

Recurrent Sigmoid Volvulus; Africans; Pelvic Colectomy

Introduction

The sigmoid colon is said to account for 50-90% of colonic volvulus [1,2]. An axial twist of 180 and 360 degrees results in partial or complete luminal obstruction and may significantly impair mesenteric circulation at a twist of 360 degrees and above [3,4]. In the developed nations of the world such as the United States of America, Western Europe and Australia, it is responsible for about 10% of all cases of intestinal obstructions [5]. But, it is one of the most common causes of acute large bowel obstruction [5,6]. In less developed regions of the world, with a predominantly high fibre diet, such as Africa, India and South America; it accounts for 20-50% of all cases of intestinal obstruction [7]. Irrespective of the region, sigmoid volvulus has been reported as the most common cause of intestinal obstruction in pregnancy, responsible for approximately 45% of all intestinal obstructions in pregnancy [8-10].

The global incidence of sigmoid volvulus is varied, resulting in the description of high incidence zones as Volvulus belt. The countries that form the “volvulus belt” are found in Eastern Europe, Russia, India, Pakistan and Africa, most especially West and East Africa [2,11,12]. There is an obvious Male preponderance in areas of high incidence, and males are reported to constitute up to 90% of cases [13,14]. Reports from developed nations with low incidence indicated a less male preponderance or even an equal gender distribution [1,3,11]. The large number of females seen in the rich western nations are the institutionalised, elderly patients with chronic constipation [15]. Worldwide, Sigmoid Volvulus, is generally seen in adults, with the highest incidence seen in the 4th-8th decades of life [16-18]. African patients were noted to present at a relatively younger age, most are seen between 3rd and 5th decades of life and rare reports at 1st and 8th decades of life were also noted [11,13,14,19].

Case Report

History

A 70-year-old farmer was referred to the Emergency Room of the University of Maiduguri Teaching Hospital, Borno state Nigeria from the Almiskin Internally Displaced Persons' camp with a 4-day history of abdominal pain and distension. Abdominal pain was said to colicky,

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intermittent, not relieved by analgesics and severe enough to stop patient from sleeping. There was associated history of progressive abdominal distension and constipation. He vomited twice on the day of referral. Vomiting was bilious, projectile, non-feculent, containing recently ingested meal. Patient has had repeated episodes of colicky abdominal pain, abdominal distension and constipation over a period of 1 year prior to referral. Constipation often resolved spontaneously with bouts of explosive flatus and passage of large amount of stool. He was booked twice for emergency laparotomy for large bowel obstruction in the past. Surgery was postponed each time after spontaneous resolution following nasogastric tube decompression and a period on nil per oral intake. He has repeatedly used Bisacodyl for relief of constipation and a single successful enema saponis done 6 months prior to presentation.

No previous history of change in stool calibre, tenesmus, per rectal bleeding or spurious diarrhoea. Patients has never noticed any reducible groin or ventral swellings and never had previous abdominal surgery or trauma. Patient has been on psychotropic drugs or opioids.

He is not a known diabetic or epileptic, and has never been diagnosed of any motor neurone disease.

He is married in a polygamous setting with 5 children. He is currently unemployed, residing in a refugee camp.

He does not smoke cigarette nor takes alcoholic beverages and he is not on steroids or anticoagulant therapy.

Examination

Physical examination revealed a dehydrated, pale, elderly man; in obvious painful and respiratory distress. His pulse rate was 120b/m, blood pressure was 100/60mmHg and respiratory rate was 28c/m with oxygen saturation of 94% via oximetry. Temperature was 37.8°C.

The abdomen was grossly distended (Fig. 1) but moving with respiration. No previous surgical scars. There was no remarkable tenderness or guarding. Percussion notes were tympanitic and bowel sounds were high pitched and increased. Digital rectal examination revealed a roomy rectum free of faecal matter or tumour. Examining gloved finger was stained with trace of well-formed faeces.

Systemic examination was not remarkable for any abnormality.

Investigation

Biochemical panel was within normal range except for mild hypokalaemia and haematological panel was also normal.

A plane erect and supine radiograph showed a grossly dilated large bowel with a positive radiographic coffee-bean (Fig. 2) and Frimann-Dahl (Fig. 3) signs. There was scanty air in the rectum. There was no free air under the right diaphragm or a peritoneal ground glass appearance.

Resuscitation

Patient was adequately resuscitated with Hartman's solution and hypokalaemia was corrected. An indwelling urethral catheter was left in-situ for assessment of adequacy of fluid therapy and a size 18G naso-gastric tube was passed and kept in-situ for continuous decompression. A deep venous thrombosis pharmacological prophylaxis was given using low molecular weight heparin a deep venous thrombosis deterrent was used intra-operatively.

Surgery

An emergency laparotomy was done via along midline incision and no haemorrhagic or turbid effluent was noticed on peritoneal breach. A grossly distended sigmoid colon was found (85cm long 20cm wide) with a 360-degree twist at the descending colon-sigmoid and recto-sigmoid junctions and a normal looking rectum (Fig. 4). The haustrations and appendices epiplocae were absent and the taeniae coli was broad and spread out (Fig. 5). The sigmoid mesocolon was long with a narrow base, 25cm long and 4cm wide (Fig. 6). Because of the high risk for recurrence a pelvic colectomy was done with a primary end-end colo-rectal anastomosis and resected sigmoid colon was sent for histopathological assessment (Fig.7).

Figure 1: Showing grossly distended abdomen.

Figure 2: Grossly dilated sigmoid colon with coffee-bean appearance.

Figure 3: Grossly dilated sigmoid colon showing the thickened walls converging at the point of obstruction as Frimann-Dahl sign.

Figure 4: Showing grossly dilated sigmoid colon with a 360 degree twist of the mesocolon.

Figure 5: Showing grossly dilated sigmoid colon with absent haustration and a broad and spread out taenia.

Figure 6: Showing a long and thick mesocolon with narrow base.

Figure 7: The resected pelvic colon.

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Aetiology

The presence of an elongated, mobile and redundant colonic segment is a recipe for volvulus, especially, in the presence of a narrow mesenteric attachment at points of fixation. The sigmoid colon meets these criteria and is often the site of volvulus. It is most mobile and redundant at the point of fixation at the descending colon-sigmoid and the Recto-sigmoid junctions [20]. The sigmoid mesocolon anatomy has been described as “dolichomesentery”, which means a mesentery that is wider than long with a narrow base [8,17,21-24]. These anatomical peculiarities predispose the Sigmoid colon to Volvulus. Whether these peculiarities are congenital or acquired has been a source of contention [25,26].

Many reports from the affluent western countries implicated chronic constipation, mainly in the institutionalised elderly, drug addicts and those with neuro-psychiatric disorders, as the cause of volvulus [3,18]. Sigmoid Volvulus is also seen in patients with colonic motility disorders and those with postoperative peritoneal adhesions [27,28]. The high fibre, high residue diet of the African and other less developed nations is considered the most important factor in the causation of the anatomical changes in the sigmoid colon. The hygroscopic nature of the cellulose and the hemicellulose content of the fibre increase faecal bulk and weight, and the bulky stool faecal load over time enlarges and elongates the bowel [26].

Pathology

Recurrent torsion and detortion are the norm in sigmoid volvulus. The repeated episodes and the peculiarity of the African faecal profile have resulted in to a different pathological appearance compared to the Western population. El-Masri, reported that the colon in sigmoid volvulus seen in Western population, the bowel wall is not thickened or hypertrophied, with preserved haustrations and taeniae coli and the mesocolon is attenuated with normal blood vessels [11]. The colon in the sigmoid volvulus encountered in the African population has two different pathological presentations. In the predominant African type (85-90%), the sigmoid colon is grossly enlarged and thickened, tapers proximally and extends beyond the point of twist in to an anatomically looking rectum with no distinctly demonstrable demarcation [2]. The inner circular muscle layer is hypertrophied, the outer longitudinal muscle coat is thin and spread out, obliterating the classical haustrations and the taeniae coli are broad and flattened. The sigmoid colon is grossly enlarged with absent appendices epiplocae and the sigmoid mesocolon is thickened with increased blood vessels, which help to minimise infarction in most episodes of torsion [11]. Bruusgard coined the term “shrinking mesosigmoiditis” to describe the thickened and highly vascular sigmoid mesocolon [29]. The predominant type of sigmoid volvulus hardly results in complete bowel obstruction [11]. The significant circular muscle hypertrophy and the hypervascularity associated with mesosigmoiditis delay the onset of gangrene even in the setting of complete bowel obstruction [30]. In the less common type (10-

15%), there is no remarkable colonic enlargement and the characteristic haustrations, taeniae coli and appendices epiplocae are preserved. The so-called mesosigmoiditis is not seen and gangrene easily sets in when complete bowel obstruction occurs [30]. This closely resembles that seen in western patients.

Pathophysiology

The three pathological types of intestinal obstruction may occur in sigmoid volvulus. Closed loop obstruction within the twisted sigmoid colon, simple obstruction in colonic segment proximal to the site of torsion and gangrenous obstruction if the twist is severe enough to cut off mesenteric perfusion. A double closed loop obstruction may also occur in protracted sigmoid volvulus with competent Ileo-Caecal valve [31]. The pathophysiologic changes responsible for the array of clinical symptoms and signs arise due to two pathological events in sigmoid volvulus: luminal obstruction and impairment of mesenteric vascular flow [16,32]. The mechanical bowel obstruction creates stasis, raises both luminal and intrinsic pressures and impairs mucosal integrity. Bacterial proliferation occurs intraluminally with widespread fermentation of undigested food particles, fibres and faecal matter; with generation of large amount of gases. The accumulated intraluminal content and gas cause the distention of the twisted-loop of colon and the proximal colon [16,33]. When both intracolonic and intrinsic pressures rise above arteriolar pressure, a significant decrease in capillary perfusion occurs. Both mechanical occlusion and thrombosis of the vessels contribute to ischemia [16,31]. The loss of mucosal integrity due to ischemic injury causes bacterial translocation, bacteraemia and subsequent toxemia. Colonic gangrene from sustained infarction may result. Bowel perforation, faecal peritonitis and anaerobic septicaemia are some of the fatal outcomes. Increased intra-abdominal pressure, if not relieved urgently, causes abdominal compartment syndrome [4,16].

The course and prognosis of sigmoid volvulus depend on the preoperative and intraoperative states of patient and the bowel. Atamanalp et al., in 2008 developed a prognostic classification for surgically managed sigmoid volvulus as follows:

Class 1: Patients with no risk factor (advanced age, associated disease)

Class 2: Those with no shock or bowel gangrene but with other risk factors mentioned above

Class 3: Those with shock

Class 4: Those with bowel gangrene

Class 5: Those with both shock and bowel gangrene

This classification has been found to correlate with the postoperative morbidity and mortality. [34,35].

Clinical Presentation

The patient is usually a male, may be in a nursing home in the West, an Opiate drug addict or on psychotropic drugs. A history of recurrent constipation is common, often relieved by repeated use of Aperients or Enemas. Recurrent constipation is often followed by repeated expulsion of flatus or passage of large amount of faeces after a spontaneous resolution. Progressive abdominal distension is a common symptom and patients or their care givers may report a prolonged interlude between episodes of defaecation. They hardly report colicky abdominal pain despite the constipation, pain is often vague or mere discomfort [36,37]. Younger patients in Western countries report recurrent constipation, abdominal distension, and abdominal mild pain as the most common symptoms [31].

In majority of patients, onset is insidious, with progressive abdominal pain, abdominal distension, nausea and constipation [1]. In those with acute onset, abdominal pain is colicky and intermittent. With bowel infarction, pain is intractable and severe and patient may present with haematochezia, early vomiting and paradoxical diarrhoea. [1]. There is often a delay in hospital presentation due to the insidious onset, most patients present three to four days after the onset of symptoms [31].

Physical examination often reveals a dramatic, asymmetrical abdominal distention, with visible distended bowel loops or even a visible peristalsis. There may be tenderness on palpation. There is an increased or abnormal bowel sounds and percussion notes are tympanitic. Digital rectal examination may reveal an empty rectum. Rebound tenderness, voluntary abdominal guarding and presence of blood stained or melenic stools on rectal examination usually indicate bowel gangrene, perforation and peritonitis [38-40].

Investigation

A plain abdominal radiograph is reported to have a 60-75% sensitivity in diagnosing cases of sigmoid volvulus. The typically appearance of large bowel distension and, to some extent small bowel distension, in the presence of competence of the ileocecal valve [41]. The classic “Omega sign” sign may be seen. It represents the thickened walls of a single, grossly distended loop of colon arising out of the pelvis and extending towards the right hemidiaphragm [31]. The radiological “Frimann-Dahl sign” could also be seen. This is demonstrated as three dense radiographic lines, representing the sigmoid walls, converging to the site of twist and an associated gas free rectum [42]. Barium Enema, in the absence of contraindications such as, gangrene or perforations, has a 100% sensitivity. A dilute/water soluble contrast is used. It shows the radiographic “Bird beak/Ace of spades appearance” [43]. In the remaining 25-40% of cases, where plain film is not diagnostic, superior imaging modalities such as Computed Tomography and Magnetic Resonance Imaging are utilised, and almost 100% sensitivity has been reported. Colonoscopy is both diagnostic and therapeutic for a suspected case of sigmoid

volvulus. The finding of a twist with luminal obstruction at the recto-sigmoid joint is diagnostic [44].

Resuscitation

Based on the 2008 Atamanalp classification, patients presenting with class 3,4 and 5 will have either hypovolaemic shock, septic shock or both [34]. Quick and effective resuscitation must be ensured to correct fluid/electrolyte imbalance, sepsis, lactic acidosis, anaemia and toxemia. Decompressive nasogastric tube should be passed to improve breathing and prevent aspiration pneumonia. Urethral catheterisation and dynamic central venous pressure should be done to assess adequacy of intravascular volume restitution. Pulse oximetry, arterial blood gases and serum lactic acid assay help to assess the adequacy of tissue perfusion and oxygenation [16,39].

Treatment

In acute and uncomplicated chronic sigmoid volvulus Flexible endoscopic detorsion is considered the primary treatment of choice, with a success rate of 33% to 91% [35]. A higher successful decompression rate of 70%-80% has been reported [27,41,45-47]. Successful decompression is usually followed by spontaneous release of flatus and faeces, this may splash on to the clothes and shoes of an inexperienced surgeon, and an immediate relief of abdominal distension is noticed. A well lubricated rectal tube should then be gently inserted into the colon to a point beyond the site of twist, which is 18-20 cm from the anal verge. The rectal tube should be safely secured and left in-situ for continuous decompression and to prevent immediate recurrence of volvulus. It is left for 72-96 hours. A plain abdominal radiograph should be taken to confirm resolution of volvulus and right placement of rectal tube [48].

Colonoscopy should be done to rule out proximal tumours, and patient should be discharged home with complete resolution of symptoms and absence of synchronous colonic pathology [48]. The recurrence rate for sigmoid volvulus is reported to be in excess of 25% [49,50]. Higher recurrence rate of greater than 50%, and as high as 80%-90% were also reported [51]. However, there is a single center report that indicated that up to 52% of patients with sigmoid volvulus decompressed endoscopically never required surgery [52]. Although rigid sigmoidoscopic detorsion has been used for decompression with variable success rates, there is a gradual shift away from it because of high perforation rate and it is estimated that in 25% of cases, the site of the twist will be beyond the reach of a rigid sigmoidoscope [44, 48].

Attempts at detorsion using blind introduction of a rectal tube is being frowned at. In the presence of an infarcted colon, perforation and peritonitis may ensue. The presence of a nonviable twisted sigmoid can be inferred from the history of fever, intractable abdominal pain, passage of blood stained stool and localized tenderness over the sigmoid loop [48].

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Elective Laparoscopic repair of sigmoid volvulus has been reported but the attempt is often frustrating, because the redundant distended colon obscures the working space it is difficult to deliver the resected specimen through a port. Added to these is the enormous challenge of performing an adequate resection and anastomosis [52-54].

For uncomplicated cases, an elective sigmoid resection and anastomosis is the treatment of choice for low-risk patients after a successful endoscopic decompression. These procedures are safe, with a mortality rate of 0% to 15% [55,56]. Emergency open surgery is the treatment of choice for patients presenting with generalised peritonitis, bowel gangrene or perforation and after a failed non-operative treatment [2,55]. The scope of intraoperative procedures is wide, depending on the intraoperative finding. This ranges from simple detorsion with or without sigmoidopexy or mesosigmoidoplasty, and pelvic colectomy with a primary colo-colic or colorectal anastomosis. These procedures carry an 8% to 33% mortality rate and are the most recommended, because of the high recurrence rate of non-definitive procedures [57-59]. Following surgical resection of a gangrenous sigmoid, Hartmann's or Mikulicz procedures are preferred, especially in a clinically unstable patient. Mortality rate for these temporary stomas is estimated to be 25% to 67% [16,39]. In the presence of a resected gangrenous bowel with stump of doubtful viability, a tube sigmoidostomy may be performed. Also, extraperitonealization of the sigmoid colon, and percutaneous endoscopic colostomy are viable options [60-63].

Discussion

Sigmoid colon is the most common site of volvulus in the Gastro-Intestinal tract worldwide [48]. However, there is a geographical variation in global incidence. It is most commonly seen in countries with a high fibre, high residue diet, like East and West Africa [2]. In Africa, there is a noticeable variation among the various tribes of some countries [2,3,11]. The fibres in African diet have a water holding property, making stools bulky and result in colonic enlargement [28]. The bowel motion is also affected by the fibre-induced changes in stool calibre. The native Africans who pass bulky stools are known to have a short colonic transit time and hardly gets constipated [4,11,12]. In contrast, Western diet, has relatively lower amounts of fibre, resulting in a long transit time, increased exposure to carcinogenic faecal bile acids and much higher incidence of colorectal cancer. Colorectal cancers and diverticular disease are the more common cause of constipation and colonic obstruction [48]. The intra-continental and inter-ethnic variation in incidence cannot be explained on the basis of diet alone. Sigmoid volvulus is commoner in countries situated at high altitudes, such as Ethiopia, Uganda and the Andes, than countries at low altitudes [64,65]. High-altitude is thought to cause persistent high colonic pressure, that results in redundancy of the sigmoid colon [66].

Our patient is a male, and a global male preponderance has been noted especially, in developing countries [67]. Gender related variation in the anatomy of the pelvis has been proposed as the

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reason for male preponderance of sigmoid volvulus among Africans. The more spacious gynaecoid pelvis is thought to allow for spontaneous detorsion of an ensuing sigmoid volvulus, while dolichomesentery and smaller android pelvic inlet in the males, cause torsion and do not allow for spontaneous detorsion. Females are thus less likely to present with sigmoid volvulus [29,21,1]. Certain cultural practices in Africa result in gender specific defaecation patterns that predispose the male to sigmoid volvulus. Males squat in a way during defaecation that accentuates the angulation at the Recto-Sigmoid junction and the males are noticed to have a relatively longer sigmoid colon than females in some parts of Africa [68]. Many Authors have drawn a positive correlation between advanced age and high occurrence of sigmoid colon redundancy and dolichomesentery at old age [69]. Our patient presented at 70 years of age, which is considered to be the age of peak incidence worldwide [1].

Our patient presented with features of acute intestinal obstruction in contrast to the most common presentation as chronic large bowel obstruction. There are reports of presentation of sigmoid volvulus as acute intestinal obstruction with a mean delay of 1-4 days like the index patient [35]. In most cases the onset is insidious characterised by history of recurrent constipation and spontaneous resolution, culminating in progressive abdominal distension, colicky abdominal pain and Obstipation [70]. Colicky pain is often mild. A sharp, prolonged, pain with radiation to the back is often associated with bowel gangrene or an Ileo-Sigmoid Knotting [8,11]. The index patient reported having repeated episodes of the sigmoid volvulus triad of abdominal distension, pain and constipation in the past. Previous reports indicated that 40%-60% of patients will report having similar episodes in the past [9,31]. Patient reported use of laxatives for relief of constipation and the use of enema in the past. This is similar to reports from other workers and the use of the laxatives has been associated with worsening of abdominal distension and delay in hospital presentation [45,46].

The patient presented with class 3 sigmoid volvulus and had an isotonic fluid resuscitation and intra nasal oxygen supplementation. Gross abdominal distension, restricting abdominal breathing was noted but, no clinical features of bowel gangrene, perforation or generalised peritonitis. Digital rectal examination revealed a rectal ampulla free of faecal load or masses. Previous reports have consistently shown an examination findings of abdominal distension, tenderness to palpation, tympanitic percussion notes and emptiness of the iliac fossae of bowel loops as pathognomonic [16,71]. The finding of an empty rectal ampulla is important in a case of sigmoid volvulus in the elderly. Faecal impaction with chronic large bowel obstruction is common and a rectum filled with hard faecal boluses is characteristic [48]. A plane erect and supine radiograph showed a grossly dilated large bowel with a positive radiographic coffee-bean (Fig. 2) and Frimann-Dahl (Fig. 3) signs. There was scanty air in the rectum. There was no free air under the right diaphragm or a peritoneal ground glass appearance. Plain abdominal X-ray radiographs have been reported to have a diagnostic yield of 57-90% and the usual findings are a dilated sigmoid colon and multiple small or large intestinal air-fluid levels [16, 38,39,72,73]. The reported X-ray signs are an omega or horseshoe sign, bird beak sign, inverted

V sign, Y sign, northern exposure sign, left pelvic overlap or left flank overlap sign, liver overlap sign, and empty left iliac fossa sign [1,74-78].

An emergency laparotomy was done via along midline incision and no haemorrhagic or turbid effluent was noticed on peritoneal breach. A grossly distended sigmoid colon was found (85cm long 20cm wide) with a 360 degree twist at the descending colon-sigmoid and recto-sigmoid junctions and a normal looking rectum (Fig. 4). The haustrations and appendices epiplocae were absent and the taeniae coli was broad and spread out (Fig. 5). The sigmoid mesocolon was long with a narrow base, 25cm long and 4cm wide (Fig. 6). Because of the high risk for recurrence a pelvic colectomy was done with a primary end-end colo-rectal anastomosis and resected sigmoid colon was sent for histopathological assessment (Fig. 7). Malene E et al., reported the following: “In 2016 the American Society of Colon and Rectal Surgeons published a number of guidelines regarding treatment of colon volvulus. It states that the first line treatment for colonic volvulus in absence of perforation or ischemia should be endoscopy, as the purpose is both diagnostic and in some cases therapeutic through decompression, de-torsion and insertion of a rectal tube. This is to be done with or without colonic lavage. Surgery has earlier been secondary in cases where colonoscopy is insufficient, and primary in cases of dominating peritoneal irritation and signs of mucosa necrosis. However recent studies suggest that because of a high risk of recurrent volvulus, which increases with every episode, surgical intervention such as sigmoid colectomy should be considered after endoscopy once the patient is stable, still within the initial admission, or soon afterwards to prevent reoccurrence. This leads to the endoscopy converting an acute situation into an elective state, so that all preparations can be made prior to the surgery. Urgent surgery is indicated when endoscopic de-torsion of the sigmoid is not possible or in case of peritonitis, necrosis or perforation” [70].

The open surgical resection and anastomosis was the adopted method in our centre for chronic sigmoid volvulus due to fear of reoccurrence with non-resective methods, preponderance of default to follow up visits and the relative cheapness of the open resective repair over laparoscopic methods. In tertiary health institutions with advanced health care system other non-resective repairs are done, such as nonsurgical endoscopic sigmoidopexy with or without tube fixation, extra-peritoneal sigmoidopexy, sigmoidopexy to the transverse colon and/or the parietes, mesosigmoplasty, colopexy with banding, mesenteric fixation and laparoscopic fixation [1,17,61,63,79-83]. A recurrence rate in excess of 25% has been reported following the ‘pexy’ repair [31].

Ballantyne has reported higher peri-operative mortality following sigmoid resection and primary anastomosis [84]. Surprisingly, poor outcomes are seen in developed nations than in developing countries. The relatively older age of the patients and presence of riskier comorbidities in patients from Western nations have been implicated as a cause. Non-operative decompressive procedures carry the risk of 0%-12% mortality. This is mostly attributed to detorsion in the presence of bowel gangrene. But, operative detorsion with or without pexy has the same mortality risk of 8-14% like elective resection and anastomosis [9,31].

Morbidity is estimated to be at 6% to 24%. Surgical Site Infection, operative wound breakdown, intra-abdominal abscess, anastomotic leakage, and stoma complications are the most frequently seen complications [55].

Conclusion

The gross abdominal distension seen in cases of sigmoid volvulus is dramatic and is an important marker for diagnosis in the presence of history of recurrent constipation and abdominal pain in the elderly. Plain abdominal radiograph is sufficient to establish the diagnosis in most cases. Prompt detorsion of the twisted colon relieves symptoms but, higher recurrence rate is associated with non-resective procedures alone. Mortality is higher with operative resection and anastomosis. Higher mortality rates are more associated with hypovolaemic shock, bowel gangrene, bowel perforation, presence of significant co-morbidity, advanced age, and emergency surgery.

References

1. Avots-Avotin KV, Waugh DE. Colon Volvulus in the geriatric patient. *Surg Clin N Am*. 1982;62:249-60.
2. Madiba TE, Thomson SR, Corr P. Volvulus of the sigmoid colon. *Gastroenterol Forum*. 1997;8:28-33.
3. Reilly PM, Jones B, Bulkley GB. Volvulus of the colon. In Cameron JL (Ed). *Curr Surg Ther*. 1992:170-4
4. Shepherd JJ. The epidemiology and clinical presentation of sigmoid volvulus. *Bri J Surg*. 1969;56(5):353-9.
5. Osiro S, Cunningham D, Tubbs S, Shoja MM, Gielecki J. The twisted colon: a review of sigmoid volvulus. *Am Surg*. 2012;78(3):271-9.
6. Frizelle F, Wolff B. Colonic volvulus. *Adv Surg*. 1996;29(1):131-9.
7. Heis H, Bani Hani K, Rabadi D, Elheis MA, Bani Hani BK, et al. Sigmoid volvulus in the Middle East. *World J Surg*. 2008;32(3):459-64.
8. Puthu D, Rajan N, Shenoy GM, Pai SU. The ileosigmoid knot. *Dis Colon Rectum*. 1991;34:161-6.
9. Ballantyne GH, Brandner MD, Beart RW, Ilstrup DM. Volvulus of the colon: incidence and mortality. *Ann Surg*. 1985;202:83-92.
10. Rabinovici R, Simansky DA, Kaplan O, Mavor E, Manny J. Caecal volvulus. *Dis Colon Rectum*. 1990;33:765-9.
11. Davey WW, Adeloje A, Davey WW. Davey's companion to surgery in Africa. Churchill Livingstone. 1997:335-48.
12. Sroujeh AS, Farah GR, Jabaiti SK. Volvulus of the Sigmoid colon in Jordan. *Dis Colon Rectum*. 1992;35:64-8.
13. Ejumu M. Early resection of the sigmoid colon following volvulus. *Proc Assoc Surg East Afri*. 1985;1:85-91.
14. Osime U. Volvulus of the sigmoid colon. *J R Coll Surg Edinb*. 1980;25(32):35.
15. Baker DM, Wardrop PJC, Burrell H, Hardcastle JD. The management of acute sigmoid volvulus in Nottingham. *J R Coll Surg Edinb*. 1994;39:304-6.
16. Raveenthiran R, Madiba TE, Atamanalp SS, De U. Volvulus of the sigmoid colon. *Colorectal Dis*. 2010;12:1-17.
17. Lal SK, Morgenstern R, Vinjirayer EP, Matin A. Sigmoid volvulus an update. *Gastrointest Endoscopy Clin N Am*. 2006;16:175-87.
18. Ballantyne GH. Review of sigmoid volvulus: history and results of treatment. *Dis Colon Rectum*. 1982;25:494-501.

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19. Mokoena TR, Madiba TE. Sigmoid volvulus among Africans in Durban. *Trop Geogr Med*. 1995;47:216-7.
20. Rabinovici R, Simansky DA, Kaplan O. Caecal volvulus. *Dis Colon Rectum*. 1990;33:765-9.
21. Bhatnagar BN, Sharma CL, Gupta SN, Mathur MM, Reddy DCS. Study on the anatomical dimensions of the human sigmoid colon. *Clin Anat*. 2004;17:236-43.
22. Madiba TE, Haff ajee MR, Sikhosana MH. Radiological anatomy of the sigmoid colon. *Surg Radiol Anat*. 2008;30:409-15
23. Tubes MN. Volvulus of the sigmoid colon in relation to the anatomy of the pelvic colon. *South Afr Med J*. 1963;37:1151-5.
24. Katsarski M, Singh U. Anatomical characteristics of the sigmoid intestine and their relationship to sigmoid volvulus among the population of Uganda and the city of Plovdiv, Bulgaria. *Khirurgiia Sofia*. 1977;30:159-63.
25. Shepherd JJ. The epidemiology and clinical presentation of sigmoid volvulus. *Br J Surg*. 1969;56:353-9.
26. Northeast AD, Dennison AR, Lee EG. Sigmoid volvulus: new thoughts on the epidemiology. *Dis Colon Rectum*. 1984;27:260-1.
27. Friedland JD, Odland MD, Bubrick MP. Experience with colonic volvulus. *Dis Colon Rectum*. 1989;32:409-16.
28. Trowell HC. Dietary fibre and diseases of the large bowel. *The Practitioner*. 1977;219:350-4.
29. Bruusgard C. Volvulus of the sigmoid colon and its treatment. *Surg*. 1947;22:466-78.
30. Strom PR, Stone HH, Fabian TC. Colonic atony in association with sigmoid volvulus: its role in occurrence of recurrent symptoms. *South Med J*. 1982;75:933-6.
31. Gibney EJ. Volvulus of the sigmoid colon. *Surg Gynaecol Obstet*. 1991;173:243-5.
32. Arigbabu AO, Badejo OA, Akinola DO. Colonoscopy in the emergency treatment of colonic volvulus in Nigeria. *Dis Colon Rectum*. 1985;28:795-8.
33. Sinha RS. A clinical appraisal of volvulus of the pelvic colon with special reference to aetiology and treatment. *Br J Surg*. 1969;56:838-40.
34. Atamanalp SS, Aydinli B, Öztürk G, Başoğlu M, Yildirgan MI, Ören D, et al. Classification of sigmoid volvulus. *Turk J Med Sci*. 2008;38(5):425-9.
35. Atamanalp SS. Sigmoid volvulus. *EAJM* 2010;42:142-7.
36. Geer DA, Arnaud G, Beitler A, Holcomb J, Homan J, James L, et al. Colonic volvulus. The Army Medical Center experience 1983-1987. *Am Surg*. 1991;57(5):295-300.
37. Ballantyne GH. Review of sigmoid volvulus: clinical patterns and pathogenesis. *Dis Colon Rectum*. 1982;25:823-30.
38. Arnold GJ, Nance FC. Volvulus of the sigmoid colon. *Ann Surg*. 1973;177:527-37.
39. Atamanalp SS, Yildirgan MI, Basoglu M, Kantarci M, Yilmaz I. Sigmoid colon volvulus in children: review of 19 cases. *Pediatr Surg Int*. 2004;20:492-5.
40. Bak MP, Boley SJ. Sigmoid volvulus in elderly patients. *Am J Surg*. 1986;151:71-5.
41. Mangiante E, Croce M, Fabian T, Moore O, Britt LG. Sigmoid volvulus: a four-decade experience. *Am Surg*. 1989;55(1):41-4.
42. Burell HC, Baker DM, Wardrop P, Evans AJ. Significant plain film findings in sigmoid volvulus. *Clin Radiol*. 1994;49(5):317-9.
43. Tsushima GK, Fleshner PR. Colonic volvulus: imaging, diagnosis and differential diagnosis. *Semin Colon Rectal Surg*. 1999;10:139-44.
44. Brothers TE, Strodel WE, Eckhauser FE (1987) Endoscopy in colonic volvulus. *Ann Surg*. 1987;206(1):1-4.
45. Burrell HC, Baker DM, Wardrop P, Evans AJ. Significant plain film findings in sigmoid volvulus. *Clin Radiol*. 1994;49(5):317-9.
46. Hiltunen KM, Syrja H, Matikainen M. Colonic volvulus. Diagnosis and results of treatment in 82 patients. *Eur J Surg*. 1992;158:607-11.
47. Wertkin MG, Aufses AH Jr. Management of volvulus of the colon. *Dis Colon Rectum*. 1978;21:40-5.
48. Maddah G, Kazemzadeh GH, Abdollahi A, Bahar MM, Tavassoli A, Shabahang H. Management of sigmoid volvulus: options and prognosis. *J Coll Physicians Surg Pak*. 2014;24(1):13-7.
49. Chung YF, Eu KW, Nyam DC, Leong AF, Ho YH, Seow-Choen F. Minimizing the recurrence after sigmoid volvulus. *Br J Surg*. 1999;86:231-3.

50. Hines JR, Geurkink RE, Bass RT. Recurrence and mortality rates in sigmoid volvulus. *Surg Obstet Gynaecol*. 1967;124:567-70.
51. Nivatvongs S, Bubrick MP. Volvulus of the colon. In: Nivatvongs S, Gordon P principles and practice of surgery for the colon, rectum and anus. 2nd Ed. St Louis, MO: Quality Medical Publishing. 1999:1046-63.
51. Theuer C, Cheadle WG. Volvulus of the colon. *Am Surg*. 1991;57:145-50.
52. Chung CC, Kwok SPY, Leung KL, Kwong KH, Lau WY, Li AK. laparoscopic-assisted sigmoid colectomy for volvulus. *Surg Laparosc Endosc*. 1997;7:423-425.
53. Chung RS. Colectomy for sigmoid volvulus. *Dis Colon Rectum*. 1997;40:363-5.
54. Fleshman JL. Laparoscopic management of colonic volvulus. *Semin Colon Rectal Surg*. 1999;10:154-7.
55. Ören D, Atamanalp SS, Aydinli B, Yildirgan Mİ, Başoğlu M, Polat KY, et al. An algorithm for the management of sigmoid colon volvulus and the safety of primary resection: experience with 827 cases. *Dis Colon Rectum*. 2007;50(4):489-97.
56. Atamanalp SS, Oren D, Aydinli B, ÖZTÜRK G, Polat KY, Başoğlu M, et al. Elective treatment of detorsioned sigmoid volvulus. *Turk J Med Sci*. 2008;38:227-34.
57. De U, Ghosh S. Single stage primary anastomosis without colonic lavage for left-sided colonic obstruction due to acute sigmoid volvulus: a prospective study of one hundred and ninety-seven cases. *ANZ J Surg*. 2003;73:390-2.
58. Irabor DO. Acute sigmoid volvulus: experience with primary resection and anastomosis in a tropical African population. *J Chinese Clin Med*. 2008;3:343-6.
59. Nasir M, Khan IA. Resection and primary anastomosis in the management of acute sigmoid volvulus. *Pakistan J Surg*. 2008;24:95-7.
60. Jagetia A, Verma S, Mittal D, Das Agarwal P, Jain S, Prasad P. Sigmoidopexy (tube sigmoidostomy) as definitive surgical procedure for sigmoid volvulus. *Indian J Gastroenterol*. 1998;17:129-30.
61. Bhatnagar BN, Sharma CL. Non-resective alternative for the cure of non-gangrenous sigmoid volvulus. *Dis Colon Rectum*. 1998;41:381-8.
62. Bach O, Rudloff U, Post S. Modification of mesosigmoidoplasty for non-gangrenous sigmoid volvulus. *World J Surg*. 2003;27:1329-32.
63. Subrahmanyam M. Mesosigmoidoplasty as a definitive operation for sigmoid volvulus. *Br J Surg*. 1992;79:683-4.
64. Wapnick S, Mufundi F, Musenges L. Aetiological factors related to intestinal obstruction. *Centr Afr J Med*. 1975;21:53-7.
65. Asbun HJ, Castellanos H, Balderrama B. Sigmoid volvulus in the high altitude in the Andes. Review of 230 cases. *Dis Colon Rectum*. 1992;35:350-53.
66. Annand AC, Sashindran VK, Mohan L. Gastrointestinal problems at high altitude. *Trop Gastroenterol*. 2006;27:147-53.
67. Tan PY, Corman ML. History of colonic volvulus. *Semin Colon Rectal Surg*. 1999;10:122-8.
68. Tegegne A. Cultural Bowel patterns and sex differences in sigmoid volvulus morbidity in an Ethiopian hospital. *Trop Geogr Med*. 1995;47:212-25.
69. Sadahiro S, Ohmura T, Yamada Y, Saito T, Taki Y. Analysis of the length and surface area of each segment of the large intestine according to age, sex and physique. *Surg Radiol Anat*. 1992;14:251-7.
70. Malene E, El-Hussuna A. Recurrence of volvulus of sigmoid colon after sigmoid colon partial resection: a systematic review and case report. *EC Gastroenterol Digestive Sys*. 2018;5(10):787-98.
71. Raveenthiran V. Emptiness of the left iliac fossa: a new clinical sign of sigmoid volvulus. *Postgraduate Med J*. 2000;76(1):638-41.
72. Mellor MF, Drake DG. Colonic volvulus in children: value of barium enema for diagnosis and treatment in 14 children. *Am J Roentgenol*. 1994;162:1157-9.
73. Heis HA, Bani-Hani KE, Rabadi DK. Sigmoid volvulus in the Middle East. *World J Surg*. 2008;32:459-64.
74. Wai CT, Lau G, Khor CJL. Clinics in diagnostic imaging. *Singapore Med J*. 2005;46:483-7.
75. Tsang TK, Siu KW, Lai A, Kwok PC, Chan S. Images of interest: Sigmoid volvulus. *J Gastroenterol Hepatol*. 2005;20:790.
76. Slidell M, Samir SA, Feller ER. Sigmoid volvulus in three college age teenagers. *J Clin Gastroenterol*. 2004;38:910-11.

77. Chen SY, Liu CT, Tsai YC, Yu JC, Lin CH. Sigmoid volvulus associated Chilaiditi's syndrome. *Rev Esp Enferm Dig.* 2007;99:476-83.
78. Javors BR, Baker SR, Miller JA. The northern exposure signs: a newly described finding in the sigmoid volvulus. *AJR.* 1999;173:571-4.
79. Chiulli RA, Swankowski TM. Sigmoid volvulus treated with endoscopic sigmoidopexy. *Gastrointest Endosc.* 1993;39:194-6.
80. Pinedo G, Kirberg A. Percutaneous endoscopic sigmoidopexy in sigmoid volvulus with T-fasteners. Report of two cases. *Dis Colon Rectum.* 2001;44:1867-70.
81. Akgun Y. Mesosigmoidoplasty as a definitive operation in treatment of acute sigmoid volvulus. *Dis Colon Rectum.* 1996;39:579-81.
82. Salim AS. Management of acute volvulus of the sigmoid colon: a new approach by percutaneous deflation and colopexy. *World J Surg.* 1991;15:68-73.
83. Miller R, Roe AM, Eltringham WK, Espiner HJ. Laparoscopic fixation of sigmoid volvulus. *Br J Surg.* 1992;79:435.
84. Ballantyne GH. Sigmoid volvulus: high mortality in county hospital patients. *Dis Colon Rectum.* 1981;24:515-20.