

A Surgical Alternative for the Treatment of Uncomplicated Sigmoid Volvulus: Case Report

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Keywords:

Sigmoid colon; Colonic volvulus; Colonic obstruction; Left-colon emergency; Pelvic colon; Colorectal surgery; Sigmoidopexy; Non resective surgical alternative; Sigmoid-sigmoid anastomose; Large bowel obstruction

Abbreviations:

SV: Sigmoid volvulus

1. Abstract

The aim of this surgical procedure is to introduce alternative way of treating sigmoid volvulus with simple sigmoidopexy by means of a sigmoid-sigmoid anastomosis with sigmoidopexy.

2. Summary

2.1. Background: SV is a common cause of colonic obstruction in young as well as in old and frail patients. The guidelines standard management includes the endoscopic detorsion of the colonic loop, or (sometimes locally improvised flatus tubes in places where endoscopes are not available) followed by an elective sigmoidectomy to prevent recurrence. However, in resources limited countries these patients are often not stable to withstand long time recommended definitive surgeries which is sigmoidectomy and primary anastomosis, because hospitals are not reachable easily and expertise are not readily available for definitive surgery but also limited anesthesia medication.

2.2. Aim: The aim of this surgical procedure is to introduce alternative way of treating SV in poor resources countries without opting for resective surgery or simple sigmoidopexy by means of a sigmoid-sigmoid anastomosis with sigmoidopexy.

2.3. Methods: The medical records of 4 patients undergoing to the non resective procedure were retrospectively reviewed.

2.4. Results: In these patients volvulus endoscopic detorsion was

successful in all cases with no complications. The median follow-up was 2 months (1-3 months). The only death occurred in an elderly patient from cardiovascular causes on day 12, with regular emission of faeces and gas from day 3 postop. We did not detect any post-surgical complications in the other three patients.

2.5. Conclusion: Elective surgery must be planned as soon as possible after the first episode of sigmoid volvulus. We believe that sigmoid-sigmoid anastomosis associated to sigmoidopexy (without bowel resection) is a surgical alternative to be considered to both sigma resection with anastomosis in one time, to sigmoidopexy and, even more so, to Hartmann's operation.

3. Definition

Volvulus is defined as a twisting of an organ on a pedicle (stomach, spleen, gallbladder, small intestine, right colon, transverse colon, splenic flexure or sigmoid colon).

SV occurs when a redundant loop of the sigmoid colon, not secured by peritoneal attachments, twists around the own mesentery for more than 180°. This produces a closed-loop intestinal obstruction. The obstructed segment, being blocked distally, is unable to decompress proximally, producing symptoms due to narrowing of the intestinal lumen, strangulation of blood vessels, or both.

The blood supply to the affected intestine is compromised due to torsion of the mesocolon, resulting in ischaemia.

4. Statement of the Problem

First described by Rokitansky in 1836, there has been increased interest in the diagnosis and treatment of colon volvulus [1].

The incidence of volvulus is approximately 2 per 100,000 individuals worldwide. SV has the highest incidence, followed by cecal volvulus. The incidence of cecal volvulus increases per year, whereas the incidence of SV remains stable [2,3].

Colonic volvulus is the twisting of a redundant segment of colon on its mesentery that may lead to luminal occlusion in and proximal to the volvulized segment and compromise of colonic blood supply resulting in ischemia, gangrene, and potentially perforation [4,5].

Colonic volvulus accounts for 10% to 15% of all large-bowel obstructions in western countries, although its world-wide incidence is variable with a higher rate in India, Africa, and the Middle East. SV is a leading cause of acute colonic obstruction in South America, Africa, Eastern Europe and Asia. It is rare in USA, UK, Japan and Australia. Although volvulus can occur in any redundant colonic segment, it most commonly involves the sigmoid (60%–75% of all cases) and cecum (25%–40% of all cases) [6].

SV preferentially affects older men in westernized countries, although younger men are more commonly affected in african countries.

5. Pathogenesis of the Sigmoid Volvulus (SV)

A redundant colon that is mobile on a long mesentery is a prerequisite that predisposes to colonic volvulus. Redundancy of a colon is due to either colonic dysmotility, excessive fiber intake, or a genetic predisposition .

The main anatomical predisposing factor in the development of SV is dolichosigmoid, which is known as the elongation of the sigmoid colon in addition to its having a elongated and narrow-based mesentery [7]. In addition, the twisted loop expands with intestinal gas generation, and the entrapment of the distended sigmoid colon in the peritoneal cavity, within the abdominal wall and pelvic outlet precludes the untwisting due to the limited space in the peritoneal cavity. In endemic areas, where people eat a fibre-rich diet, constipation is uncommon. In these populations, bulkiness of stool as a result of undigested dietary fibre is believed to cause faecal loading resulting in SV [8-10].

6. Diagnosis

Although acute SV has a sudden onset, patients usually present with a mean delay of 1 to 4 days. Abdominal pain, distention, and constipation are the classical triad of symptoms in acute SV. Additional complaints include vomiting, nausea, pseudo-diarrhea, anorexia, rectal bleeding, faeces mixed with blood [11].

The main physical findings are asymmetrical abdominal distention and diffuse tenderness. Other findings include abnormal bowel sounds, tympany mainly localized in the centrals and left quad-

rants.

Plain abdominal radiographic findings are usually suggestive and diagnostic of SV [12].

The upright plain abdominal roentgenogram is diagnostic. Radiologic findings in SV include the “bent inner tube” or “coffee bean sign” deformity arising from the left lower quadrant; usually there is lack of air in the rectum [11]. The described diagnostic X-ray signs are an “omega” or “horseshoe sign”, “bird beak sign”, “inverted V sign”, “Y sign”, “coffee bean sign”, “bent inner tube” or “ace of spades sign”, left pelvic overlap or left flank overlap sign, liver overlap sign, and empty left iliac fossa sign. Plain abdominal radiography has been found diagnostic in 57%–90% of patients [1, 2, 13-16]

7. Treatment

SV is associated with a recurrence (55–90%) and mortality rates (40%) if not treated [17].

Delay in diagnosis and treatment can result in a mortality of up to 60% from complications including ischemia, infarction, large bowel perforation, peritonitis, and sepsis [18].

Unfortunately, guidance on indications and timing of surgery are not so very clear, and the decision remains with the emergency surgeon and the patient whose ability to understand, retain and use the information given may be impaired due to their chronic and acute illness [19,20].

Initial management is aimed at symptom control, patient stabilization and resuscitation, including the correction of hypovolaemia and electrolyte imbalance.

There is considerable controversy as to the ideal definitive procedure. Elective resection of the sigmoid colon and anastomosis is the gold standard with a mean mortality of 10%), and a morbidity of 13–26% [21-24].

However, once established, spontaneous untwisting of the volved sigmoid colon is rare and therefore a definitive treatment plan is required [25-29].

In the absence of peritonitis, endoscopic decompression and dero-tation (untwisting) should be possible in 70-90% of cases [30].

Detortion: patients with SV who undergo successful endoscopic detorsion without subsequent intervention have a 43% to 75% recurrence rate [31-33,16], and death rate of 62% in the ‘no surgery’ group versus 32% [34,35].

All patients after initial endoscopic decompression (when feasible) should therefore be considered for definitive surgery.

Sigmoidopexy: mortality of sigmoidopexy is 0–11%, cannot be recommended owing to a recurrence rate of 16–70% [36].

Mesosigmoidoplasty: a non-resective technique for the management of sigmoid colon volvulus that is still viable, technically simpler, and with less postoperative morbidity. It corrects the pathologic condition based on a long and narrow mesentery susceptible

to torsion on its axis [37].

Resectiv surgery: in the presence of viable colon, sigmoid colectomy and primary anastomosis as a one-stage procedure (with or without colostomy) during same hospital visit is the procedure of choice [38-41].

Depending on patient's co-morbidities, surgical skills, bowel viability, and the local situation other surgical procedures commonly performed include an end colostomy with closure of the rectal stump (Hartmann's procedure), a stoma, or subtotal colectomy and ileosigmoid anastomosis [42, 43].

External fixation: where co-morbidities are such that the patient is considered unfit for resectional surgery or general anaesthesia, fixation of the volved sigmoid loop by percutaneous endoscopic sigmoidopexy has been advocated as a less invasive management plan (.employing two or three percutaneous endoscopic gastrostomy -PEG- tubes or equivalent the redundant loop of bowel) [44, 45].

8. Non Resective Surgical Alternative

Given the background of the high incidence of recurrence in the case of sigmoidopexy and the morbidity and mortality of sigmoid resective surgery, we performed in 4 patients a procedure that obviates both resection and sigmoidopexy and at the same time had no procedure-related mortality or morbidity due to the procedure, with early feeding and discharge of the patient.

The procedure performed consists of a bypass by means of a wide latero-lateral sigmoid-sigmoid anastomosis (10-15 cm long) with the aim of to reduce the endoluminal pressure of the derotated sigma allowing faeces and air to be diverted into the downstream colon. This procedure effectively defunctions the large loop of the sigma, which is extended and then fixed with sutures to the descending, transverse colon, left coloparietal reflection, preventing it from falling into the abdominal cavity (Figure 1-4, Table 1).

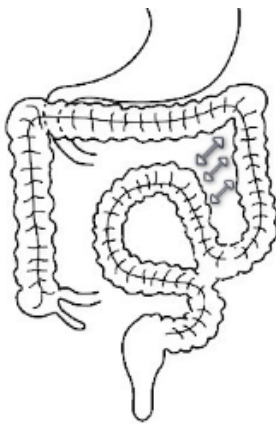


Figure 1: First step of the operation Sigmoid-sigmoid latero-lateral anastomosis



Figure 2: Second step of operation Sigmoidopexy



Figure 3: Case 1 Horse shoe



Figure 4: Case 2: coffee bean

Table 1: Patients

| | Age | Gender | Emergency | Stool | Procedure duration | Oral feeding | Outcome | Notes |
|-------|-----|--------|-----------|------------|--------------------|--------------|----------------------|-----------------|
| A.N.L | 38 | F | no | 3° post-op | 60 min | 3° postop | Discharged on day 11 | |
| S.S.N | 74 | M | no | 2 post-op | 110 min | 6 postop | Death on day 12 | Cardiac failure |
| E.M | 24 | M | yes | 2 post-op | 105 min | 3° postop | Discharged on day 13 | |
| N.J.K | 44 | M | yes | 2 post-op | 55 min | 3° postop | Discharged on day 15 | |

9. Results

In these 4 patients volvulus derotation we used a flatus tube size number 30 was successful in all cases with no complications. The median follow-up was 2 months (1-3 months).

The duration of surgery was around 1 hour (55-110 minutes), issuing air and faeces took place between the 2nd and 4th postoperative day, without haemorrhage, and discharged on day 8, taking into account the distance from the patient's home (an average of 350 km from the hospital, and living in a rural setting). Oral feeding started from day 3 postoperative.

The only death occurred in an elderly patient from cardiovascular causes on day 12, with regular emission of faeces and gas from day 3 postop. We did not detect any post-surgical complications in the other three patients.

All were performed an opaque enema with water-soluble medium on day 7 which showed patency of the anastomosis and normal transit through the lateral sigmoid-sigmoid anastomosis with rectilinear transit and negligible opacification of the defunctionalized colon.

Although it is difficult to compare the different surgical methods considering that in Western countries the laparoscopic approach is the standard, the average duration of this simple procedure is between 45 and 55 minutes: on average much faster than sigma resection-anastomosis (90-196 minutes [46-49]) (Figure 5).



Figure 5: Contrast enema made before discharging the patient

10. Conclusions

We believe that this technique, in elective, or emergency especially for unstable patients sigmoid-sigmoid anastomosis with sigmoidopexy, is an excellent alternative to both sigma resection with anastomosis and to sigmoidopexy and, even more so, to Hartmann's operation.

It is a rapid procedure (mostly around 60 min) that can be performed as an emergency or elective procedure in the case of sigma volvulus not complicated by sigma infarction.

It will be our commitment to follow up months after surgery to assess the distant outcome of this innovative procedure, which is absent in the literature.

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