

One Stop Management of Sigmoid Volvulus in an African Setting with Limited Resources

M.M. Achiek¹, F.K. Tawad¹, B.M. Alier², C.T.Yur¹

¹College of Medicine & University of Juba

²Juba Teaching Hospital

Correspondence to: Dr. M.M. Achiek, Email: mayen.achiek@gmail.com

Objective: To show the feasibility and safety of emergency resection of an unprepared redundant sigmoid colon and primary anastomosis.

Methods: A prospective study conducted at two Sudanese Hospitals, Nyala (Darfur) and Juba (South Sudan). Between January, 1st 2011 and December, 31st 2013, patients presenting with acute abdominal pain caused by large bowel obstruction were included on the study by two university firms.

Results: Thirty eight patients were included in the study; 33 were males and 5 were females. Of these, 9 patients were excluded at Laparotomy when the cause of their bowel obstruction was found to be due to small bowel obstruction and colonic tumour. Therefore, 29 patients were legible for the study. Of these 29 patients, 3 were females and 26 males with mean age (48), and range (22-75) years. All 29 patients at Laparotomy had redundant sigmoid colon resected. 4 (4/29) ended up with a Hartmann's procedure and 25/29 underwent redundant sigmoid colectomy and primary anastomosis. Post-operatively 6/29 had wound infections and none had a documented anastomotic dehiscence.

Conclusion: This series shows the feasibility and safety of management of large bowel obstruction caused by sigmoid volvulus by an emergency one stop resection and primary anastomosis

Introduction

Sigmoid volvulus is a significant cause of acute large intestinal obstruction and in rural Africa it is a leading cause^{1,2,3} over the years the operative management of the emergency presentation has developed from staged-surgery to a non-operative relief of the acute volvulus followed by a later elective open or laparoscopic procedure^{3,4,5}. In the African setting with limited resources it is very challenging and unsafe with inadequate patient's pathways from presentation to discharge and follow up. Most patients come from far away rural areas. When managed by open Hartmann's procedure, the patients do not accept colostomies as this is a cultural taboo^{6, 7}. In our setting there are no trained stoma therapies either in the healthcare facilities or in the communities where the patients go back to, making wound care a significant costly problem. With problematic staged-operative management the length of stay on the wards may go beyond 8 weeks on average.

Adequate resuscitation of patients with large bowel obstruction caused by sigmoid volvulus and a careful resection and double-layered primary anastomosis, is safe, feasible and cost-effective. The series of patients we are presenting does show the feasibility and safety of this procedure^{8, 9, 10}.

Patients and Methods:

This is a prospective study conducted by two surgical firms from two Sudanese Hospitals, Juba Teaching Hospital (JTH), South Sudan and Nyala Teaching Hospital (Darfur), Western Sudan. Between January 2011 and December 2013, patients admitted under the university firms with clinical and radiological diagnosis of large bowel obstruction were consecutively identified and included.

As the patients presented, careful documentations were made of demographic data, clinical presentation, and comorbidities, diagnostic and assessing investigations. The patients after the diagnosis were prepared for surgery including an informed consent for surgery. At laparotomy the cause of obstruction was specified and those with sigmoid volvulus were definitively diagnosed and managed with sigmoid resection and anastomosis with no defunctioning stoma or Hartmann's procedure ¹¹.

Results

During the specified period of the study, 38 patients were identified, 5 females and 33 males. The mean age of 49 s.d and range 22 to 75 years were recorded. They all underwent an emergency laparotomy after pre-operative resuscitation with IV fluids and broad spectrum IV antibiotics. All were taken to the operating theatres with stable vital signs of Pulse, BP, RR, and urine output. All our patients were managed as emergency cases and therefore did not have any form of bowel preparation.

At laparotomy, 7 patients were found to have small bowel obstruction with a degree of chronicity and one patient who had hepatic flexure colonic tumour and another with an advanced recto-sigmoid tumour were excluded leaving 29 patients for the analysis. There were 3 females and 26 males. All the 29 patients were diagnosed with large bowel obstruction caused by an obvious sigmoid volvulus with an evident redundancy of sigmoid colon with a lax meso-colon. Of the 29 patients, 4 had perforations at the point of the colonic twisting and 25/29 had a twist with only oedematous viable sigmoid colon. We performed resection and primary anastomosis on an unprepared large bowel if there was no perforation and faecal peritonitis, no visible ischaemic segment at the point of twist, and the patient's vital signs on monitoring were stable (Normal BP, normal urine output, normal PO₂ on the pulse oxymeter).

Based on the intra-operative criteria (Table 1) 25/29 volvulus patients underwent sigmoid resection and a doubled-layered interrupted anastomosis was fashioned using vicryl 2/0 (Ethicon).

The 4 of the 29 patients who were observed to have colonic perforation at a visibly ischaemic segment with an apparent faecal peritonitis or those patients with perforations and were not stable, had a Hartmann's procedure performed on them.

Table 1. Intra-operative Observations

Criteria/Sign	Yes	No
Perforation&faecal contamination	4	25
Visible ischaemic segment	4	25
Abnormal vital Signs	4	25

The post-operative period:

The patients with colonic perforations were continued on IV antibiotics (Metronidazole 500mg and Ceftriaxone 1g) 8-hourly for a week. One of the 29 patients who had a Hartmann's procedure did not show any signs of improvement from the time of the surgery and deteriorated developing, multiple organ failure and died within 72 hours. The two patients who were diagnosed with advanced colonic cancer died within a month, making mortality among the 38 patients was 3 giving a mortality rate of 7.9%. The surgical site infection was recorded in 6

(20.7%) of the 29 volvulus patients. All the 4 of the 29 patients who had Hartmann's procedure had wound infection and all also stayed on the ward for over two months and were discharged after the closure of their stomas.

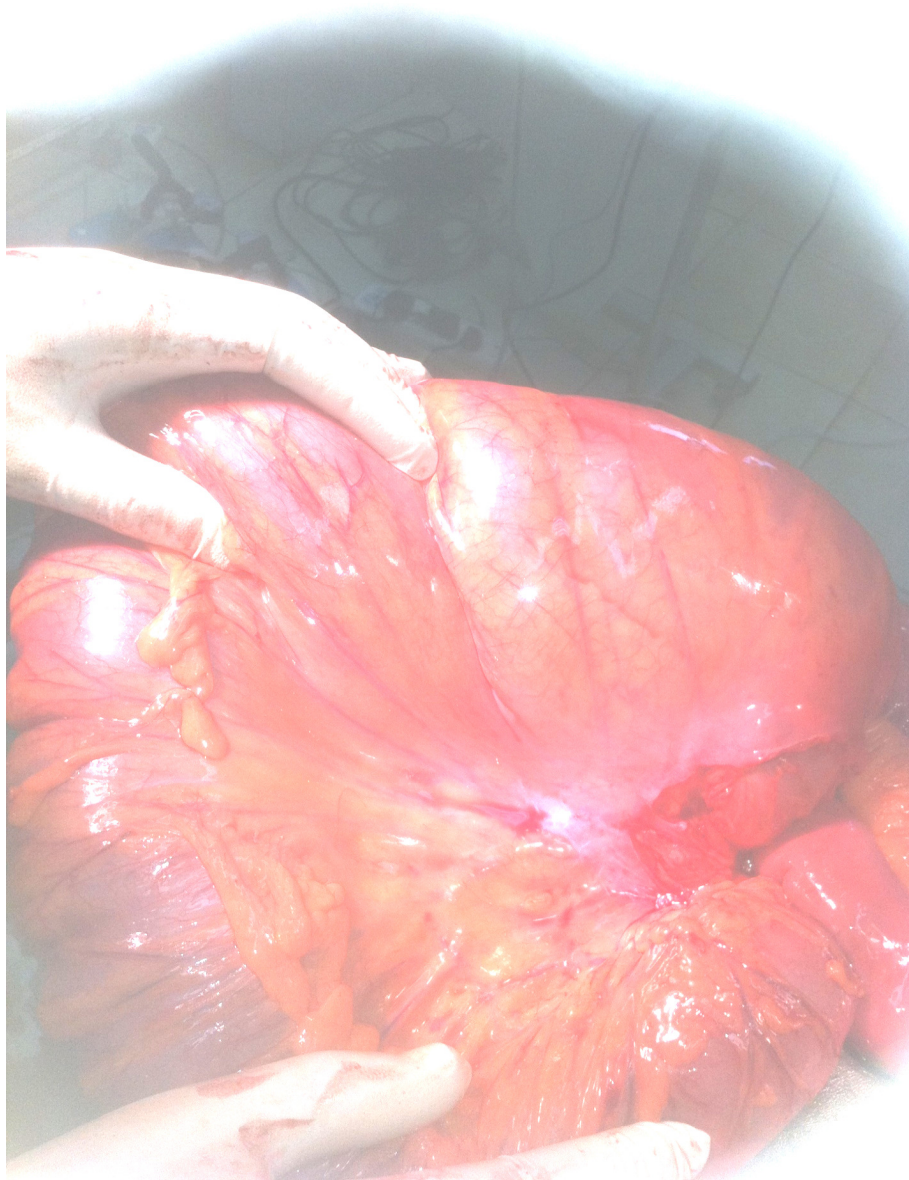


Figure 1. Intra-operative diagnosis of sigmoid volvulus (Courtesy of MM.Achiek, FRCS)

Discussion

In our series sigmoid volvulus is the commonest cause of large bowel obstruction in relatively young African males and adds significantly to the emergency surgical disease burden ¹¹. The management approaches have evolved over the years with the development of surgical

techniques and technology^{13,16}. In limited-resourced African settings open surgery has been and is still the gold standard despite the advent of the endoscopic surgery (Colonoscopic decompression and a later laparoscopic resection. Our patients presented with acute large bowel obstruction that has gone on for 48 hours or more, young with least comorbidities and largely rural.

The tough realities of resources limitation and traditional taboos, patient's misconceptions and rejection of stomas do dictate a desperate attempt to put these patients through one stop management pathway, which has been tried by others⁸. We used the intra-operative observational assessment method and carried out sigmoid colonic resection and anastomosis on an acute unprepared bowel in 25/38. We did not have a post-operative anastomotic dehiscence and a re-operation with a stoma. The mortality of 8% in our series was not related to the one-stage surgical management^{1,2,3,19}. No patients ended up with a permanent stoma. The number of patients in our series is rather small, but despite the numbers we could draw a conclusion that emergency colonic resection and end to end anastomosis on an unprepared bowel is feasible and safe.

References

1. JO Larkin, TB Thekiso, R Waldron, K Barry, and PW Eustace. Recurrent Sigmoid Volvulus – Early Resection may Obviate Later Emergency Surgery and Reduce Morbidity and Mortality. *Ann R Coll Surg Engl.* Apr 2009; 91(3): 205–209.
2. Mangiante EC, Croce MA, Fabian TC, Moore OF 3rd, Britt LG. Department of Surgery, University of Tennessee, Memphis 38163. Sigmoid volvulus. A four-decade experience, Historical Article. *The American Surgeon* [1989, 55(1):41-44]
3. G H Ballantyne, M D Brandner, R W Beart, Jr, and D M Ilstrup. Volvulus of the colon. Incidence and mortality. *Ann Surg.* Jul 1985; 202(1): 83–92.
4. James B. Peoples M.D., John C. McCafferty M.D., Kenneth S. Scher M.D. Operative therapy for sigmoid volvulus, *Diseases of the Colon & Rectum* August 1990, Volume 33, Issue 8, pp 643-646
5. Y. F. A. ChungK.-W. Eu, D. C. N. K. Nyam, A. F. P. K. Leong, Y. H. HoF. Seow-Choen. Minimizing recurrence after sigmoid volvulus. *British Journal of Surgery* 1999; 86 (2): 231–233.
6. Hiltunen KM, Syrjä H, Matikainen M. Department of Clinical Sciences, University of Tampere, Finland. Colonic volvulus. Diagnosis and results of treatment in 82 patients. *The European Journal of Surgery = Acta Chirurgica* [1992, 158(11-12):607-611]
7. G J Arnold and Nance, Volvulus of the sigmoid colon. *Ann Surg.* May 1973; 177(5): 527–537.
8. A.Z. Sule, D. Iva, P.O. Obekpa, B. Ogbonna, J.T. Momoh, B.T. Ugwu. One-stage procedure in the management of acute sigmoid volvulus *J.R.Coll.Surg.Edinb.*, 1999; 44: 164-6
9. T.E. Madiba, S.R. Thomson. The management of sigmoid volvulus *J.R.Coll.Surg.Edinb.*, 45, April 2000, 74-80
10. Laurence F. Yee, MD, FACS, FASCRS Vice Chairman, Department of Surgery California Pacific Medical Center Assistant Clinical Professor of Surgery University of California, San Francisco. Colonic Volvulus
11. Norman Williams, CJ.Bulstrode, PR.O'Connell (edit), Aetiological factors of **sigmoid** colon volvulus, it is also common in young African. *Short text of Practice of Surgery, intestinal obstruction*, Ch70, 26thEd. 2013.

12. Ali Nuhu, Abubacar Jah¹. Acute sigmoid volvulus in a West African population. *Annals of African Medicine*, Vol. 9, No. 2, April-June, 2010, pp. 86-90
13. Turan M, Sen M, Karadayı K, Koyuncu A, Topcu O, Yıldırım C, Duman M. Our sigmoid colon volvulus experience and benefits of colonoscope in detortion process. *Rev Esp Enferm Dig* 2004; 96: 32-35.
14. S. Sozen, K. Das, H. Erdem, E. Menekse, S. Cetinkunar, F. Karateke. Resection and Primary Anastomosis with Modified Blow-Hole Colostomy or Hartmann's Procedure. Which Method should be Performed for Gangrenous Sigmoid Volvulus? *Chirurgia* 2012; 107: 751-755 No. 6, November – December
15. Mealy K, Salman A, Arthur G. Definitive one-stage emergency large bowel surgery *Br J Surg*. 1988 Dec;75(12):1216-9.
16. Roberto Cirocchi¹, Eriberto Farinella, Francesco La Mura, Umberto Morelli, Stefano Trastulli, Diego Milani, Micol S Di Patrizi, Barbara Rossetti, Alessandro Spizzirri, Ioanna Galanou, Konstandinos Kopanakis, Valerio Mecarelli and Francesco Sciannameo. The sigmoid volvulus: surgical timing and mortality for different clinical types *World Journal of Emergency Surgery* 2010, 5:1
17. Taha SE, Suleiman SI Volvulus of the sigmoid colon in the Gezira. *Br J Surg*. 1980 Jun; 67(6):433-5.
18. Mehmet Ayhan Kuzu M.D., Ahmet Keşşaf Aşlar M.D., Atilla Soran M.D. Arife Polat M.D., Ömer Topcu M.D., Süleyman Hengirmen M.D. Emergent Resection for Acute Sigmoid Volvulus, *Diseases of the Colon & Rectum*, August 2002, Volume 45, Issue 8, pp 1085-1090