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Volvulus of the Sigmoid Colon without Necrosis: Therapeutic Aspects in Hospital Fousseyni Daou Hospital in Kayes, Mali

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Abstract

The volvulus of the sigmoid is known since ancient Egypt. In the 5th century BC, hippocrates laid the foundations for its management. The first observation of this condition was not reported until 1836 by Von Rokitansky, and then in 1859, Melchior described its physiopathological consequences. It was the Norwegian Brusgaard who reported, for the first time, in 1947, the effectiveness of a non-operative treatment. **Purpose:** Describe morbidity, mortality and the impact of co-morbidity factors on the choice of operative techniques. **Patients and Methods:** This is a retrospective cross-sectional study performed at the Fousseyni Daou Hospital in Kayes from January 2014 to December 2021. We included all patients operated for sigmoid volvulus without necrosis. The parameters studied were the comorbidity factor, surgical modalities, morbidity and mortality. **Results:** We collected 31 patients, of whom 29 were men and 2 were women, for a sex ratio of 14.5. The mean age was 55 years with extremes (29 - 78 years). *Sigmoidectomy with colorectal anastomosis* was performed in 19 cases (61.3%), the average age of these patients was 46.16 years, the comorbidity factor was 1 case (3.2%), the postoperative course was simple in 12 cases (63.1%), the morbidity was 6 cases (26.3%) and mortality 1 case (3.2%). *Untwisting with colopexy* was performed in 11 cases (35.5%), the average age was 65.91 years, comorbidities

were present in 9 cases (82%), the postoperative course was simple in 9 cases (82%), morbidity was 1 case (9%) and mortality 1 case (9%). *Hartman colostomy* was performed in 1 case (3.2%), the age was 60 years, the morbidity was nil. Overall, the postoperative course was simple in 22 cases (71%), the overall morbidity was 7 cases (22.6%) and mortality 2 cases (6.4%). **Conclusion:** At the end of our study, we can note that the choice of the operative technique for the volvulus of the sigmoid without necrosis can be influenced by the presence of major comorbidity and the morbi-mortality depends on it.

Keywords

Volvulus without Necrosis, Surgical Technique, Comorbidity, Morbidity, Mortality

1. Introduction

Sigmoid volvulus is the torsion of the sigmoid loop on its mesocolic axis, resulting in a low colonic occlusion by strangulation [1].

Its incidence in the world is estimated at 2 persons per 100,000 inhabitants, volvulus represents 50% of intestinal obstructions in developing countries and 5% in the West [2].

In the United States of America it is the third most common cause of colonic obstruction after colonic cancer and diverticulosis [3]. This pathology is frequently observed in young adults in African and Indian series, in the West it occurs rather in the elderly [4] [5].

The main risk factor is anatomical due to the existence of a dolichosigmoid, other risk factors are cited such as pregnancy, pelvic tumor, surgery of the small pelvis, chronic constipation and a diet rich in fiber [6] [7].

Sigmoid volvulus is a medical-surgical emergency, the diagnosis is clinical and paraclinical especially on the unprepared abdomen radiograph (ASP).

The overall mortality can reach an average of 32.1% in case of necrosis [8] [9].

The choice of operative technique has always been a subject of controversy between practitioners: the ideal colectomy, untwisting and colostomy according to Hartman.

In Mali, according to a study carried out at the CHU Gabriel TOURE in 2011, the volvulus of the sigmoid without necrosis represented 19.04% of all intestinal obstructions, in our series it was 11.6%.

We carried out this work in order to evaluate our surgical methods in an emergency context, and the influence of comorbidities factors on the choice of surgical techniques.

2. Patients and Methods

This was a retrospective cross-sectional study conducted from January 2014 to December 2021 in the general surgery department at the Fousseyni Daou Hos-

pital in Kayes.

Were included in this study all patients operated for sigmoid vovulus without necrosis, were not included patients operated for sigmoid volvulus with necrosis and other forms of volvulus.

Criteria of judgment: the diagnosis of occlusion by volvulus of the sigmoid without necrosis was evoked in front of the occlusive syndrome made of abdominal pain, vomiting, a stop of the contents and gases, an abdominal distension sometimes asymmetrical; confirmed by the presence of hydro-aeric levels higher than wide in double jamb on the radiography of the abdomen without preparation and the absence of necrosis confirmed per operatively (**Figure 1**).

The data were collected from the operative report register and the medical records, and collated on a survey form.

The data were processed using Epi info version 6 software; a survey authorization was requested and obtained from the administration of the hospital in Kayes.

This research was carried out according to the principles of the Helsinki statement (http://www.wma.net/fr/30publications/10policies/b3/).

3. Results

We collected the records of 31 patients operated for volvulus of the sigmoid colon without necrosis. There were 29 men and 2 women, *i.e.* a sex ratio of 14.5. The average age was 55 years with extremes (29 - 77 years). 45.2% (14/31) of the patients were from rural areas, 61.3% (19:31) were engaged in agro-pastoral activities. The average consultation time was 2.4 days. Comorbidities were present in 11 cases (35.5%) (see **Table 1**). Median laparotomy was the approach in all patients. The operative techniques were sigmoidectomy with immediate colorectal anastomosis in 19 cases (61.3%), untwisting with colopexy in 11 cases (35.5%), colostomy according to Hartman in 1 case (3.2%) (Cf **Table 2**).

In sigmoidectomy with immediately colorectal anastomosis (Cf **Figure 1**): the mean age was 46.16 years (Cf **Table 2**) with extremes of 29 - 60 years. The comorbidity factor was present in 1 case (5.2%) (see **Table 3**). The average duration of the operation was 3 hours and 09 minutes. The postoperative course (see **Table 4**) was simple in 12 cases (63.1%), morbidity was 6 cases (31.5%), four suppurations (4/6), two anastomotic fistulas (2/6); mortality was 1 case (5%), it was related to the complication of an anastomotic fistula; the average length of hospitalization was 9.6 days with extremes of 7 - 38 days.

In untwisting with colopexy: the average age was 65.91 years with extremes of 61 - 78 years (see **Table 2**) the comorbidity factor was present in 9 cases (9/11) (see **Table 3**), the average duration of the operation was 1 hour and 19 minutes, the postoperative course was simple in 9 cases (9/11) (see **Table 4**); the morbidity was 1 case of revolvulus (1/11); the mortality was 1 case (1/11) following a hypoglycemic coma in a diabetic patient; the average length of hospitalization was 7.2 days with extremes of 6 - 13 days.

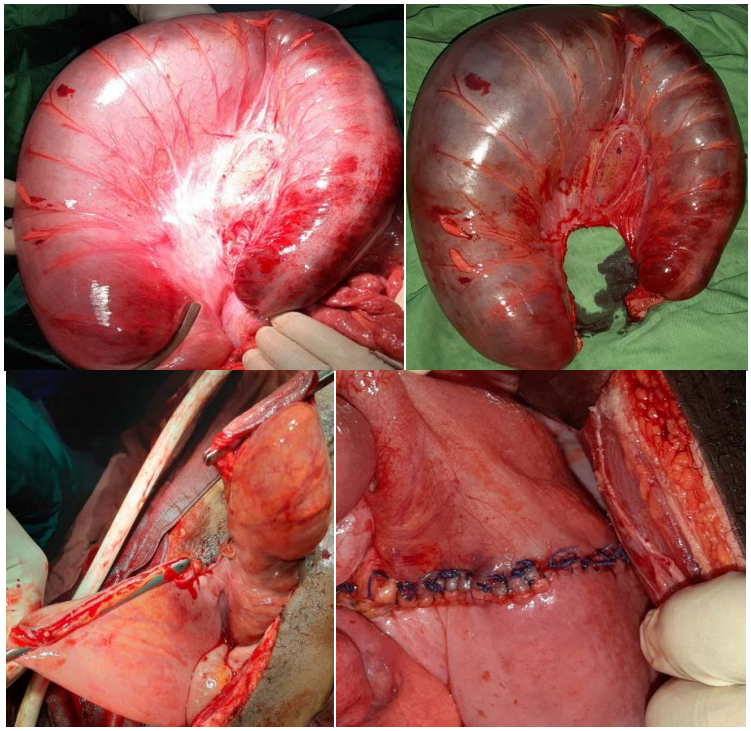

Figure 1. Sigmoid vovulus without necrosis with immediate colorectal anastomosis sigmoidectomy.

Table 1. Comorbidity factors.

Comorbidity	n	%
Absent	20	64.6
Diabetic	3	9.7
HTA	2	6.5
BPCO	1	3.2
Diabetic + HTA	1	3.2
BPCO + HTA	1	3.2
Tumor of the ovary	1	3.2
Non-obstructive tumor of the sigmoid	1	3.2
Prostatic cancer	1	3.2
Total	**31**	**100**

HTA: high blood pressure. BPCO: chronic obstructive pulmonary disease.

Table 2. Operating technical.

Operating techniques	n	%
Sigmoidectomy + immediately colorectal anastomosis	19	61.3
Untwisting of the sigmoid + Colopexy	11	35.5
Hartman Colostomy	1	3.2
Total	**31**	**100**

Table 3. Surgical techniques, age and comorbidity factors.

Surgical techniques	Average age	Comorbidity factors
Sigmoidectomy + colorectal anastomosis	46.16 years	1/19 (5.2%)
Untwisting + colopexy	65.91 years	9/11 (82%)
Colostomy according to Hartman	63 years	1/1

Table 4. Operative follow-up according to surgical technical.

Surgical technique Post-operative care	Sigmoidectomy + colorectal anastomosis	Détorsion + colopexy	Colostomy according to Hartman
Simple	12/19 (63.2%)	9/11 (82%)	1/1
Suppurating	4/19 (21%)	-	-
Anastomotic fistula	2/19 (10.6%)	-	-
Revovulus	-	1/11 (9%)	-
Death	1/19 (5.2%)	1/11 (9%)	-

In Hartman's colostomy: the age was 63 years (Cf **Table 2**), the comorbidity factor was a non obstructive sigmoid tumor (Cf **Table 3**), the duration of the operation was 2 hours 36 minutes, the hospital stay was 17 days, the morbi-mortality was null (Cf **Table 4**).

From a general point of view, the postoperative course was simple in 22 cases (71%), the overall morbidity was 7 cases (22.6%) and the mortality 2 cases (6.4%).

4. Discussion

Our study was carried out at the second referral hospital of Kayes, it focused on sigmoid volvulus without necrosis which is a medical-surgical emergency whose management is a subject of controversy among practitioners.

It took place over a period of 7 years (2014-2021), thirty-one patients (29 men, 8 women). The mean age was 55 years with extremes (29 - 77 years), this result is comparable to those reported by other African authors [10] [11] [12]. This age is lower than in European and Asian series [5] [13] in which advanced age is a comorbidity factor and the mortality rate is higher if associated with other chronic diseases [14]. The male sex was the most predominant in our study 93.5%; this male predominance has been found by other authors [13] [15] [16], only in an Australian study the female sex was predominant [17] the women would be relatively protected thanks to the anatomy of their pelvis [13].

Three surgical techniques were used in our study:

Sigmoidectomy with immediately colorectal anastomosis was performed in 61.3% of cases and the mean age was 46.16 years with extremes of 29 - 60 years, our criterion of choice for this technique was the absence of major comorbidity factors. The choice of this technique was previously a subject of controversy

among practitioners for several reasons: the colonic preparation, the various studies have removed any equivocation on this subject, Raventhiran *et al.* [18] in his study he confirmed that colonic anastomosis can be done per operatively without colonic preparation, the colonic preparation prolongs the operative time by 30 - 60 minutes [19].

The surgeon's experience in performing this technique is important because of the difference in length between the colonic and rectal portions.

Sigmoidectomy with immediate colorectal anastomosis has been performed by several authors with rates varying between 38.23% and 100% [4] [16] [20] [21] The morbidity related to this technique in our series was 6 cases (6/19), 4 parietal suppurations (4/6), 2 anastomotic fistulas (2/6) Kuzut *et al.* [22] found 7% of anastomotic fistula, and 14% of parietal suppuration. The mortality associated with sigmoidectomy with colorectal anastomosis was 5%. Kuzut *et al.* [22] found 11%.

Untwisting of the sigmoid colon with colopexy: during our study we performed this surgical technique in 35% (11/31) and the average age of the patients was 65.91 years, the presence of comorbidity factor was 82% (9/11) which was our criterion of choice for this technique.

The patients were operated on by laparotomy, unlike in the West where it is done by laparoscopy, and the success rate is 70% to 90% [8] [23]. The rate of 35% found in our study is close to those found in the literature, 33.61% [9] [24]. The advantage of this technique is the reduction in the duration of the operation, which is the shortest compared to other techniques. In our series the average duration was 1 hour 19 minutes, Diarra *et al.* found 50 minutes [25]. The disadvantages of this technique are: persistence of abdominal meteorism, intermittent constipated, refusal of a second operation and recurrence. In our study the recurrence rate was 9% (1/11), Grossman *et al.* [3] in the United States found 23%, Khanna *et al.* [2] found 38.4% recurrence.

Hartman colostomy: we performed this technique in 3.2% (1/31), the patient's age was 63 years, the comorbidity factor that motivated the use of this technique was the presence of a non-obstructive tumor on the sigmoid. The use of this technique in the literature varies from 0% to 3% [9] [21] [24]. We did not perform a colostomy according to Bouilly Volkman, contrary to Touré *et al.* in Senegal [4] who performed it in 61.76% of cases. At the end of our study the overall morbidity was 22.6%. In the literature it is 7% - 17% [16] [24] [26]. The overall mortality was 6.4%. This rate varies according to the authors between 3% and 20% [4] [16] [24].

Limitations of this study were unworkable records; the sample size was insufficient to use some statistical data.

5. Conclusion

The volvulus of the sigmoid without necrosis is a medical-surgical emergency, the choice of the operative technique can be influenced by the factors of comorbidity and the morbimortality depends on it.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Millat, B., Guillon, F. and Avila, J.M. (1993) Occlusions intestinales aiguës del'adulte. EMC Gastro-entérologie, 9-044-A-10.

[2] Khanna, A. and Kumar, P. (1999) Sigmoid Volvulus. A Study from a North Indian Hospital. *Diseases of the Colon & Rectum*, **42**, 1081-1084. https://doi.org/10.1007/BF02236708

[3] Grossman, E.M., Longo, W.E., Straton, M.D., Virgo, K.S. and Juhson, F.E. (2000) sigmoid Volvulus in Department of Veterans Affairs Medicale Centers. *Diseases of the Colon & Rectum*, **43**, 414-418. https://doi.org/10.1007/BF02258311

[4] Touré, C.T., Dieng, M., Mbaye, M., *et al.* (2003) Resultat de la colectomie en urgence dans le traitement du volvulus ducolon au centre hospitalier universitaire (CHU) Dakar. *Annales de Chirurgie*, **128**, 98-101. https://doi.org/10.1016/S0003-3944(02)00043-3

[5] Bhuiyan, M.M.Z.U., *et al.* (2005) Management of Sigmoid Volvulus in Polokwane-Mankweng Hospital. *South African Journal of Surgery*, **43**, 17-19.

[6] Cachera, J.P., *et al.* (1978) Pathologie Chirurgicale. 3ème Edition, Masson, Paris, 821 p.

[7] Perris, P. and Masella, A. (2006) Non Neoplastic Intestinal Occlusion. https://www.Pubmed.com

[8] Madiba, T.E. and Thomson, S.R. (2000) The Management of Sigmoid Volvulus. *Journal of the Royal College of Surgeons of Edinburgh*, **45**, 74-80.

[9] Mehari, H. (2002) Management of Sigmoid Volvulus in Eritrea. Thèse de Méd Genève.

[10] Bhatnagar, B.N.S., Sharma, C.L.N., Guta, S.N., Muthir, M., *et al.* (2004) Study of the Anatomical Dimension of Human Sigmoid Colon. *Clinical Anatomy*, **17**, 236-243. https://doi.org/10.1002/ca.10204

[11] Rouvier, H. and Delmas, A. (2002) Colon ileo-pelvien. Anatomie Humaine, 2ème édition, n˚15177.

[12] Sanogo, Z.Z., Yena, S., Simaga, A.K., Doumbia, D., *et al.* (2004) Stomies Digestives: Expériences du service de chirurgie A du CHU du point G. *Mali Médical*, **19**, 24-27.

[13] Alaoui, M. (1990) Le volvulus du sigmoïde à propos de 38 cas à Casablanca (MAROC). *Journal de Chirurgie*, **127**, 542-546.

[14] Delabrousse, E., Aguet, O.S., Destrumelle, N., Lucas, X. and Brunelle, S. (2001) Volvulus du sigmoide: Interet et apport de l'étude scannogtaphique. *Journal de Radiologie*, **82**, 930-932.

[15] Catalano, O. (1995) Computed Tomographic Appearance of Sigmoid Volvulus. *Abdominal Radiology*, **21**, 314-317. https://doi.org/10.1007/s002619900071

[16] Naseer, A., Ahmad, S., Naeem, M. and Safirullah (2010) One Stage Emergency Resection and Primary Anastomosis for Sigmoid Volvulus. *Journal of College of Physicians and Surgeons Pakistan*, **20**, 307-309.

[17] Lau, K.C., Miller, B.J., Sachache, D.J. and Cohen, J.R. (2006) A Study of Large-Bowel Volvulus in Urban Australia. *Canadian Journal of Surgery*, **49**, 203-207.

[18] Raventhiran, V. (2000) Emptiness of the Left Iliac Fossa Is a Valuable Diagnostic

Adjust. Positive Sign Is Pathognomonic of Sigmoid Volvulus. *Postgraduate Medicine*, **76**, 638-641. https://doi.org/10.1136/pmj.76.900.638

[19] Rault, A., Collet, D., Cunha, S.A., Larroude, F., Ndobo, E. and Masson, B. (2005) Surgical Management of Obstructed Colonic Cancer. *Annales de Chirurgie*, **130**, 331-335. https://doi.org/10.1016/j.anchir.2004.12.011

[20] Nuhu, A. and Jah, A. (2010) Acute Sigmoïd Volvulus in a West African Population. *Annals of African Medicine*, **9**, 86-90.

[21] Uptal, D. and Ghosh, S. (2003) 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 Journal of Surgery*, **73**, 390-392. https://doi.org/10.1046/j.1445-2197.2003.t01-1-02654.x

[22] Kuzu, M.A., Aslar, A.K., Soran, A., *et al.* (2002) Emergent Resection for Acute Sigmoid Volvulus: Results of 106 Consecutive Cases. *Diseases of the Colon & Rectum*, **45**, 1085-1090. https://doi.org/10.1007/s10350-004-6364-0

[23] Oren, D., Atamanalp, S.S., Aydinli, B., Yildirgan, M.I., *et al.* (2007) An Algorithm for the Management of Sigmoid Volvulus and the Safety of Primary Resection: Experience with 827 Cases. *Diseases of the Colon & Rectum*, **50**, 489-497. https://doi.org/10.1007/s10350-006-0821-x

[24] Sani, R., Ganda, O.R., Harouna, Y.D., Illo, A., Nomao Djika, M., *et al.* (2003) Traitement du volvulus du colon sigmoïde à l'hôpital national de Niamey: À propos de 68 cas. *Journal Africain de Chirurgie Digestive*, **3**, 277-280.

[25] Abdoulaye, D.G. (2011) Volvulus du colon sigmoïde sans nécrose dans le service de chirurgie générale du CHU de l'hôpital Gabriel Touré thèse n˚11M121.

[26] Obeidallah, M.S., *et al.* (2008) Sigmoid Volvulus in the Middle East. *World Journal of Surgery*, **32**, 459-464. https://doi.org/10.1007/s00268-007-9353-3