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Research Article

Elective Sigmoidectomy Laposcopic Assisted for Sigmoid Volvulus in a Rural Setting

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Abstract

Background and purpose: Our aim was to describe the results of the management of elective laparoscopic sigmoidectomy in successfully detorsion sigmoid volvulus.

Materials and methods: Three patients were operated with this technique for a total of 11 patients who presented with sigmoid colon volvulus during the study period (May 2022-April 2023).

Results: The patients were two men and one woman, aged 55, 42 and 65 years, respectively. The diagnosis of volvulus was based on the clinical and radiological aspect without signs of severity. The patients benefited from detorsion with rectal probe and an elective laparoscopic sigmoidectomy was performed during the same hospitalization respectively at the 7th day for the 2 cases and at the 10th day for the first case after detorsion. The operative time was 110 min, 90 min and 100 min. The estimated average blood loss was 112.5 cc. One patient presented with a postoperative fever. The average postoperative hospital stay was 4.67 days [4 - 6 days]. Mortality was nil.

Conclusion: We believe that elective laparoscopic sigmoidectomy can offer distinct advantages in the surgical management of sigmoid volvulus with success without signs of detorsion complications.

Keywords: Laparoscopy; Sigmoid colon volvulus; sigmoidectomy; Ziguinchor

Introduction

Colonic volvulus is a surgical abdominal emergency with the most common location at the sigmoid level (63%). It represents 3 to 5% of all acute intestinal obstructions [1,2]. The standard surgical treatment is based on a median laparotomy with sigmoidal resection and primary or delayed anastomosis depending on the condition of the colon [1]. Recently several techniques have been described: the elective mini-laparotomy technique, laparoscopic assisted endoscopic sigmoidopexy and laparoscopic assisted elective sigmoidectomy [2-4]. After the success of cholecystectomy, appendectomy and laparoscopic hernia repair, we have extended the scope of this minimally invasive technique to colectomies. This ambition was based on the progressive assurance of the surgical team, first for benign lesions of the colon allowing the acquisition of surgical know-how, then for selected malignant lesions of the colon. Thus we performed our first laparoscopic colectomy in September 2022. Nevertheless, it should be noted that its practice in developing countries remains difficult, mainly due to the non-availability of consumables and limited professional skills. We report a series of 3 cases of the first elective laparoscopic sigmoidectomy performed at the hospital of Peace in Ziguinchor.

Our objective was to describe the results of this technique and to discuss the possible advantages through a review of the literature.

Patients and Methods

We conducted a retrospective study during the year 2022-2023 at the Peace Hospital in Ziguinchor. All patients received for surgical management of pelvic colon volvulus (sigmoid volvulus) performed under laparoscopic surgery were included. We excluded all cases of colonic volvulus operated by laparotomy. After the diagnosis of sigmoid colon volvulus, we perform workup (FBC, CRP, blood ionogram) and abdominal CT scan to eliminate signs of severity. We propose to the patients a colonic decompression/detorsion by rectal probe. If this maneuver is successful, a colonic preparation with betadine and normal saline was performed followed by an elective laparoscopic sigmoidectomy. The variables studied were: age, sex, detorsion technique, surgical technique, duration of the procedure, morbidity, mortality and hospital stay. Surgical technique: The procedure used was as follows: the patients are installed in the supine position, gynecological position, under general anesthesia and oro-tracheal intubation. Open laparoscopy was performed in all cases. The exploration started with an 11 mm umbilical optical trocar (30°) and the other operating trocars (5 mm) were introduced under visual control, left flank and left hypochondrium respectively. The laparoscopy tower was a double screen Storz column. The equipment consisted of two grasping forceps, a pair of laparoscopic scissors, bipolar forceps, suction-irrigation system, needle holder, clip forceps, ligaSure forceps. The instruments were multipurpose (Figure 1).

Figure 1: Equipment (column and instrumentation table).

Results

We report three patients (2 men and 1 woman) with sigmoid colon volvulus treated by elective laparoscopic sigmoidectomy. The age of the patients were 55, 42 and 65 years. They were received in the emergency room with a frank occlusive syndrome with abdominal pain, cessation of feces and gas evolving between 24 and 48 hours. The examination revealed abdominal asymmetric abdominal distension and tympanic. A plain abdominal X-ray confirmed the diagnosis of sigmoid volvulus by showing a hoop-shaped image and the abdominal Computed Tomography (CT) scan requested for the 3 cases, found a mesenteric-axial sigmoid volvulus without signs of gravity (Figure 2). Table 1 summarizes the clinical, biological and surgical procedures of the patients. In the absence of clinic-biological signs of severity, we perform a detorsion by rectal probe which resulted in a gas and stool discharge with a collapse of the abdomen and a decrease in pain (Figure 3). The catheter was fixed for 3 days before removal. A control plan abdominal X-Ray was performed at Day 1 post detorsion. A preparatory colonic irrigation with normal saline was performed a day prior to surgery. The surgical intervention was performed at day 7 for the 2 cases and at day 10 for one case after detorsion. After laparoscopic exploration of the abdominal cavity, dissection, section-hemostasis of the meso with the ligaSure, the redundant sigmoid was exteriorized by a 4 cm mini laparotomy to the left iliac fossa and resected extracorporeally (Figure 4). Primary colo-colic end-to-end anastomosis with 3/0 Vicryl was performed (Figure 5). The operative time was 110 min, 90 min and 100 min respectively. The average blood loss was estimated at 112.5 cc. Postoperative treatment was paracetamol (60 mg/kg/d), amoxicillin clavulanic acid (80 mg/kg/d), metronidazole (30mg/kg/d) and preventive heparin therapy. The transit in the form of gas was notified after 48 h postoperatively in 2 patients with a progressive resumption of feeding from the 3rd day. There was

morbidity in one case with fever of 38.7° C with delay in recovery of transit in a patient who presented hypokalemia of 2.2 corrected by electric push syringe through central route. The blood culture reported negative. The evolution was favorable under medical treatment. The average postoperative hospital stay was 4.67 days [4 - 6 days]. The histological examination of the surgical specimen showed an inflammatory colitis without histological signs of malignancy. Mortality was nil with a low follow-up of 3 months.

Parameters	**Patient 1**	**Patient 2**	**Patient 3**
Age	55 years	42 years	65 years
Sex	F	M	M
Weight (kg)	70	74	64
Pulse (b/min)	105	124	59
BP (mm Hg)	120/68	141/89	96/62
T (°C)	36,9	37,4	37
WHO Score	I	II	I
Blood Group	B+	O+	A+
Leucocytes	7640	8790	5800
Hemoglobin	15,6	12,6	12,7
• Platelets	348 000	285 000	216 000
Hématocrit (%)	45,2	37,7	33,6
Creatininemie (mg/l)	11	09	12,7
Na+ (umol/l)	133	140	138
K+ (umol/l)	2,7	2,2	2,6
C Reactive Protein (mg/l)	06	24	50,4
Abdominal CT scan	Mesenteric-axial volvulus Caecal diameter =92mm	Mesenteric-axial volvulus Caecal diameter = 89 mm	Mesenteric-axial volvulus Caecal diameter = 96mm
Time of detorsion	Day 2 of evolution	Day 3 of evolution	Day of evolution
ost-detorsion intervention time	Day 10	Day 7	Day 7
ASA Score	I	II	I
Operating time (min)	110 min	100min	90 min
Hospital stay	4 days	6 days	4 jours

Table 1: Clinical, biological, radiological and operative characteristics of patients.

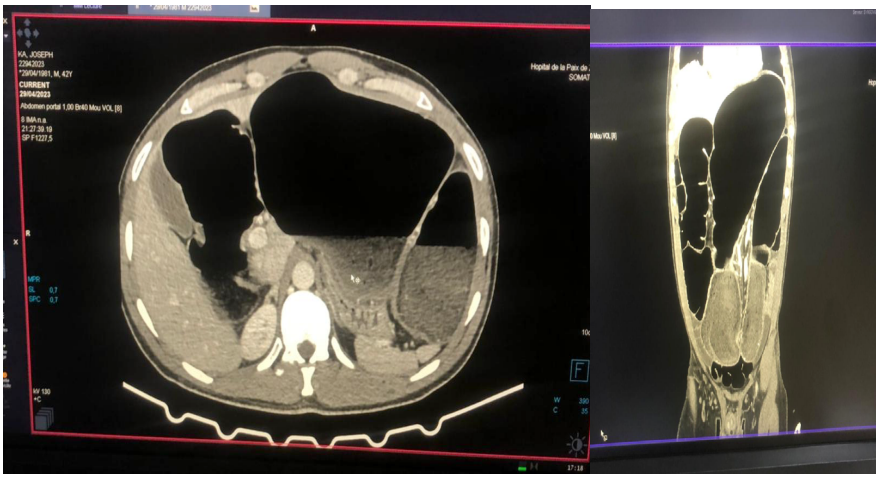

Figure 2: CT scan image of mesenteric-axial volvulus.

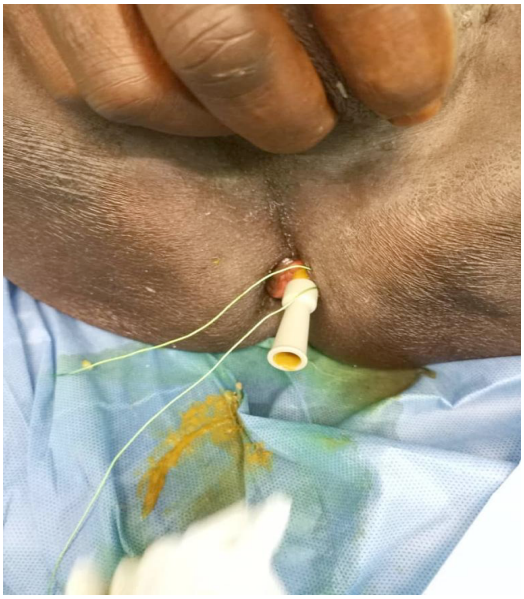

Figure 3: Rectal prop detorsion with evacuation of stool and gas.

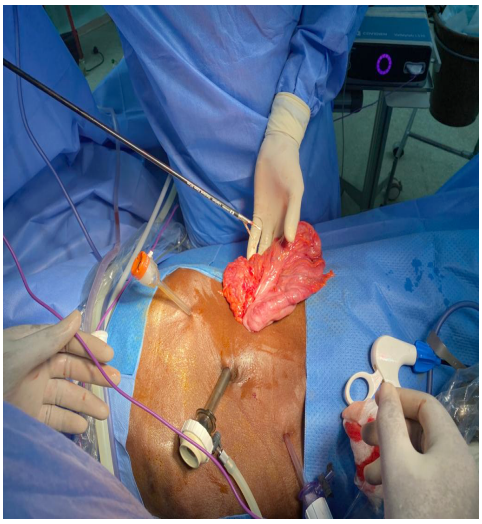

Figure 4: Extracorporeal elective laparoscopic sigmoidectomy.

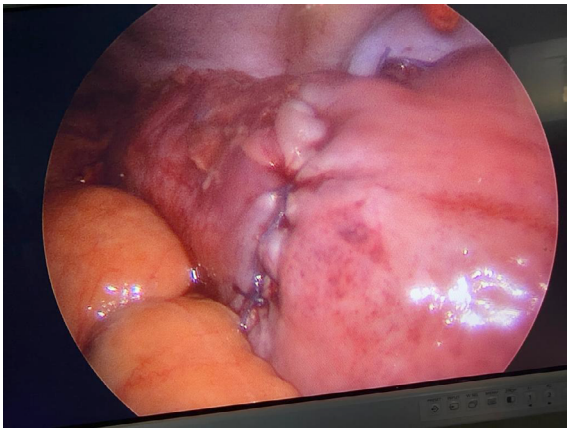

Figure 5: Intraoperative image of the T-T manual colo-colic anastomosis.

Discussion

The emergency surgical management of sigmoid volvulus depends on the presence or absence of clinico-biological signs of severity. A median laparotomy should be performed urgently for patients with signs of severity (ischemia, perforation and peritonitis) because of the poor prognosis. For patients without complications, detorsion should be performed urgently. This detorsion is performed with a flexible endoscope [2,3]. According to the authors, success is obtained in 70 to 90% of cases [2,5]. In our series, we performed detorsion by rectal probe blindly. This is due to the fact that therapeutic endoscopy is not available in our facility. The use of the rectal probe as a means of decompression/detorsion has been described by some African authors [5]. It is a simple, easy, quick and inexpensive technique with a low risk of iatrogenic colonic perforation. The definitive treatment, after a successful detorsion, is controversial. Several approaches have been described: meso-sigmoidoplasty, open sigmoidopexy, endoscopic or laparoscopic, and elective sigmoidectomy, by median laparotomy or total laparoscopic or laparoscopic-assisted [2-5]. A systematic review and meta-analysis of the safety and efficacy of laparoscopic surgery in the management of sigmoid volvulus performed by Ndong A in 2022 including a total number of 30810 patients with 29874 cases of volvulus, showed that laparoscopic surgery was performed in only 7% of cases (N =2089) [6]. Several options are possible concerning this route: sigmoidectomy, sigmoidopexy, stoma inversion. In our series, we chose an elective laparoscopic sigmoidectomy as a technique. It is particularly useful in elderly patients, sometimes with important comorbidities. Apart from the fact that it is expensive and technically difficult for beginners, sometimes linked to a reduced working space due to a volvulus dolico megacolon, this technique is increasingly used for the management of decompressed volvulus with success [6,7]. Some authors advocate laparoscopic intracorporeal anastomotic resection and extraction of the specimen by natural transanal route [3,8]. Extracorporeal resection through a mirror Mc Burney incision followed by direct manual or mechanical anastomosis is feasible [5]. In resource-limited countries, mechanical forceps are expensive and inaccessible, we prefer an old-fashioned anastomosis. Compared to conventional surgery, the laparoscopic approach has a longer operative time. In the literature, the average operating time varies between 100 and 150 min depending on the authors [6,8,9]. Laparoscopic surgery was associated with a low risk of recurrence (less than 2%), anastomotic fistulas (5.25%), parietal suppurations (3.27%), a mean blood loss of 78.25 ml and a short hospital stay of 7.3 days [3,6,9]. The laparoscopic approach allows for a reduction in postoperative pain, early resumption of transit and feeding, rapid recovery and has an aesthetic advantage over the open approach (Figure 6).

Figure 6: Image of surgical wounds at the end of the operation.

Conclusion

We believe that elective laparoscopic sigmoidectomy can offer distinct advantages in the surgical management of sigmoid volvulus without signs of detorsion complications with success. Laparoscopy has become a reference technique in developed countries, but is still difficult to perform in our context. It is a safe and reproducible technique with a reduction in the length of hospitalization, pain and a low morbi-mortality.

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