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Research Article

Sigmoid Volvulus Management in Developing Country at University Hospital of Treichville

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Abstract

Background: Management of sigmoid volvulus is a challenge in developing country where the emergency sigmoidectomy is the only therapeutic used. As, primary anastomosis or stoma still a subject of debate.

Purpose: To report our experience in the management of sigmoid volvulus in order to identify a suitable management safely in our local setting.

Patients and methods: The records of 30 patients who underwent emergency laparotomy for sigmoid volvulus in the Digestive and Proctologic Surgical Unit at University Hospital of Treichville from January 2012 to December 2016, were reviewed retrospectively.

Three operative procedures were made: Emergency Sigmoid with Primary Anastomosis (ESPA), Colostomy like Hartmann or Bouilly-Volkman procedures.

Mortality was the parameter used to analyze the outcome.

Results: Laparotomy noted sigmoid volvulus in 28 (93%) cases and gangrenous ileosigmoid knotting in 2 (7%) cases. 13 (43%) patients had viable sigmoid and 15 (50%) had gangrenous sigmoid.

Emergency Sigmoidectomy with Primary Anastomosis was performed in 13 (43%) cases while colostomy (Bouilly-Volkman or Hartmann) involved 17 (57%).

No anastomotic leak was found.

Mortality was about 3 (10%) patients.

Several risk factors of mortality were noted in deceased patients two or three times each: sigmoid necrosis, advanced age, comorbidities (hypertension, diabetes), ASA ≥ III and shock at admission.

Conclusion: The choice of Emergency Sigmoidectomy with Primary Anastomosis or colostomy should no longer be dogmatic. It must take into account the risk factors, operative findings and the experience of surgeons in order to save the patient's life.

Keywords: *Sigmoid Volvulus; Sigmoidectomy; Colostomy; Hartmann; Bouilly-Volkman*

Abbreviations

ESPA: Emergency Sigmoidectomy with Primary Anastomosis; PAR: Plain Abdominal Radiograph; ASA: American Society of Anesthetists; M: Male; F: Female

Introduction

The sigmoid volvulus is the third leading cause of colonic obstruction in the world and affects the sigmoid in 60 to 75% of cases [1]. It is more frequent in the endemic zone that includes Africa with rates ranging from 13 to 42% intestinal obstruction [1].

Currently, its management benefits from two essential advances. CT scan allows positive diagnosis and detects signs of severity. In the absence of peritonitis or bowel gangrene, an initial attempt with non-surgical reduction is indicated, followed by elective sigmoidectomy under better conditions to prevent recurrence. Meanwhile in our practice, plain abdominal radiograph remains the key diagnosis examination and we do not have endoscopic unit at our's disposal so emergency sigmoidectomy is the only therapeutic option used.

Emergency sigmoidectomy with primary anastomosis or stoma are subject of debate. ESPA is appealing method because it allows to avoid stoma, its drawbacks (morbidity, financial and psychological cost) and a second operation; on the contrary, it presents a risk of anastomotic dehiscence due to fecal and bacterial load of an unprepared left colon. Choosing one or two stages is the problem that surgeons in our context are confronted.

Aim of the Study

The aim of this study was to report our experience in the management of SV in order to consider a suitable management safely in our local setting.

Patients and Methods

The records of 30 patients who underwent emergency laparotomy for sigmoid volvulus in the Digestive and Proctologic Surgical Unit at University Hospital of Treichville from January 2012 to December 2016, were reviewed retrospectively. The diagnosis was established on clinical, radiological (PAR) pictures and/or operative findings. All patients had preoperative anesthetic assessment using the American Society of Anesthetists (ASA) classification.

After nasogastric aspiration, fluid and electrolytic resuscitation, broad spectrum antibiotic, laparotomy was performed in all patients.

The indications for laparotomy were retrospectively defined in this study: laparotomy was indicated in peritonitis, shock and typical radiological signs of SV. In the remaining patients, the indication for laparotomy was based on suspect mechanical obstruction in lack of clinical and radiological improvement.

The operative procedures depended on intra-operative findings. Three operative procedures were made: ESPA, Hartmann and Bouilly-Volkman (double barrel colostomy) procedures.

For each patient, gender, age, associated diseases, clinical presentation, pictures on plain radiograph, operative findings, operative procedures, perioperative outcome (morbidity and mortality), and hospital stay were noted. Mortality was the parameter used to analyze the outcome

Results

Most of the patients were male (21/9). Their age ranged from 20 to 70 years with a mean of 45 years. Chronic Constipation was the most risk factor (n = 16; 53%), while one (3%) patient had previous laparotomy. Hypertension and diabetes were observed in one case each (3%).

When admitted at hospital, 2 (7%) patients had peritonitis, 28 (93%) presented clinical features of bowel obstruction including 5 (17%) patients with shock.

Plain abdominal radiograph revealed air fluid level in all of the patients. Typical radiological signs of SV like coffee bean, omega or inversed U were noted in 16 (53%) cases.

Patients were divided into 4 groups according ASA classification: ASA I: 33% (n = 10); ASA II: 40% (n = 12); ASA III: 20% (n = 6); ASA IV: 7% (n = 2).

Laparotomy noted sigmoid volvulus in 28 (93%) cases. Ileosigmoid knot was found in 2 (7%) cases according to type I of Alver., *et al*'s classification [2]. The operative findings and procedure were summarized in table 1.

Viability of the sigmoid	Reybard	Hartmann	Bouilly-Volkman	Number	Percentage
Viable sigmoid	12	-	1	13	43
Gangrenous sigmoid	1	5	6	12	40
Gangrenous and perforated sigmoid	-	1	2	3	10
Gangrenous ileosigmoid knotting	-	2*	-	2	7
Total	13 (43%)	8 (27%)	9 (30%)	30	100

Table 1: *Operative findings and procedure.*

**They were treated by ileum resection and primary anastomosis and Hartmann procedure after sigmoidectomy.*

Hospital stay ranged from 6 to 26 days with a mean of 10 days. Morbidity was about 6 (20%) involved wound infection with good evolution after treatment by local care and antibiotherapy. No anastomotic leak was found.

Three (10%) cases of death were noted. The mean age of these patients was 54 years (40-64 years). Their other characteristics were specified in table 2 and 3.

Deceased Patients	Age/Sex (years)	Associated diseases	Shock	Cause of death	Sigmoid Viability	Surgical procedure	
						Reybard	Hartmann
Patient 1	40 /M	None	Present	septic shock	gangrenous		Yes
Patient 2	58/F	Hypertension	Absent	Pulmonary oedema	gangrenous	Yes	
Patient 3	64/M	Diabetes	Present	Septicemia	Viable	Yes	

Table 2: *Characteristics of deceased patients (1).*

Deceased patients	ASA class	Delay of surgery* (hours)	Time of death after surgery (hours)
Patient 1	IV	24	24
Patient 2	III	48	48
Patient 3	III	< 24	96

Table 3: *Characteristics of deceased patients (2).*

**Time between admission and intervention*

Our analysis of tables 1, 2 and 3 shows that the following risk factors of mortality were noted in the event of death: gangrenous sigmoid (patient 1 and 2), advanced age and comorbidity (patient 2 and 3), ASA ≥ III (all the 3 patients), shock at admission (patient 1 and 3).

Discussion

Sigmoid volvulus is the most common cause of colonic obstruction in Africa [3]. In our practice, it is on the 3rd place of intestinal obstruction after post-operative intra-abdominal adhesions and strangulated hernias [4]. Patients are young in better physical condition as confirmed by our study with an average age of 45 years unlike Western countries where they are older with multiple defects [1,3,5]. The diagnosis of SV was clinical, mainly assisted by PAR. The diagnostic accuracy of PAR, which was 53%, is lower than the rates observed in the literature ranging from 57 to 90% [6]. For Cirocchi., *et al*. [7], in 30 to 40% of the cases, PAR is not diagnostic for SV because the transverse colon or small bowel distension can superimpose upon sigmoid loop [7]. PAR is an easily accessible and inexpensive examination whose performance is limited. The current radiological examination of reference is CT scan which makes it possible to confirm the diagnosis with near 100% sensitivity and more than 90% specificity [1]; it also eliminates other diagnosis and detects complications such

as ischemia or perforation. It is present in our practice but its use could be limited by the cost. CT scan would be indicated in the absence of typical radiological findings of SV to clarify the diagnosis, especially in cases of previous laparotomy that represents both a risk factor for bowel obstruction on post-operative intra-abdominal adhesions and SV. It would thus shorten the resuscitation so as not to let ischemic lesions evolve.

Sigmoidectomy is the best option during emergency laparotomy because conservative treatment (detorsion, sigmoidopexy and meso-sigmoidoplasty) have high incidence of recurrence [6,8]. The risk of recurrence ranges from 9 to 44% after detorsion without resection and 20 to 30% after sigmoidopexy [1].

As far as the technique concerned, we performed 13 (43%) ESPA in 12 cases where the sigmoid loop was viable and in 1 case of gangrenous whereas the colostomy (Bouilly-Volkman or Hartmann) involved 17 (57%) cases including gangrenous or perforated loops and 1 case of viable loop. Our ESPA rate is in the range of those of several recent African studies [6,9-11] which varies from 25.60 to 63%, reaching 100% in that of Kante [12] which was performed since more than two decades.

Indications for different surgical techniques have evolved in recent years. At Origin Hartmann procedure was systematic after emergency sigmoidectomy. Thereafter it was relegated to cases of gangrenous. Today, Hartmann procedure is recommended when the general and local conditions are not favorable (perforation and/or unstable hemodynamic state). As for the ESPA indications, intraoperative on-table lavage was introduced to improve the safety of anastomosis. Currently, ESPA without colonic lavage has been shown to be safe and extended to selected cases of gangrenous with good results [3,13,14].

Regarding evolution, the mortality rate in our study was 10%. It was the same as that of Ba., et al. [5] and in the interval of several African Studies [9,10,12] ranging from 7,15 to 12,9%. The risk factors of perioperative mortality (advanced age, high ASA score, admission shock, comorbidity, gangrene or perforation) described in the literature [6,12] were found in our study. All of our deceased patients had 3 of these factors each. Delayed consultation is another frequent factor in our context because of traditional therapy, low financial resources, self-medication and sometimes lack of experience of practitioners at the initial consultation [5,15]; this could partly explain the high rate of gangrenous (53%) in our series.

In the emergency surgical treatment for SV, sigmoidectomy followed by colostomy may be a lifesaving option in the presence of risk factors of mortality regardless of the condition of the sigmoid or in case of gangrenous or perforation volvulus.

Two techniques are possible: Hartmann or Bouilly-Volkman procedures. The advantage of the latter is that it allows monitoring of the downstream colonic segment and a restoration of continuity by elective procedure. Hartmann's intervention is reserved for cases of low volvulus located with colonic gangrene down to the colorectal hinge making it impossible to bring the distal segment up to the skin. In addition, the colostomy is poorly lived in our cultural context, we must explain to the patient that it is temporary and propose the restoration of digestive continuity as soon as possible, after six weeks [5], if the general condition of the patient allows it.

ESPA may be performed in the absence of risk factors if local conditions are favorable (the cut ends are well perfused and can be approximated without tension and discrepancy) [15]. One of the most important factors involved in success of ESPA is the surgeon's experience [16].

Accordingly, in our context because of non-availability of experienced surgeons during emergency time, we agree that Hartmann procedure is the best alternative, especially in patients with gangrene or perforation and risk factors of mortality.

Popularization of CT scan and the use of endoscopy in the management of sigmoid volvulus in our practice would improve the prognosis of this disease by earlier diagnosis and convert emergency in elective surgery because emergency surgery is associated with high morbidity and mortality. In case of gangrenous sigmoid mortality can reach 33% in ESPA [16].

Conclusion

SV is a relatively common surgical emergency in developing countries. This study confirmed that it remains a disease of young African male and showed that the contribution of PAR is limited for the diagnosis that is now supplanted by CT scan. Several risk factors of mortality were founded. The choice of performing ESPA or colostomy should no longer be dogmatic. It must take into account the risk factors and the experience of surgeons in order to improve the prognosis.

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