


Small Bowel Obstruction: Epidemiological, Clinical and Therapeutic Aspects in the General Surgery Department of Hôpital Sominé DOLO de Mopti

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Abstract

Small bowel obstruction (SBO) is defined as a complete and persistent cessation of the transit of materials and gases. It occurs in a segment of the digestive tract located between the pylorus and the colorectal junction. We report an observational study which aims to describe the epidemiological, clinical and therapeutic aspects of small bowel obstruction. This study was carried out in the General Surgery Department of Hôpital Sominé DOLO de Mopti from October 1, 2016 to October 1, 2018. A total of 114 patients were recorded for whom the diagnosis was related to an occlusion. The median age was 37 years with extremes ranging from 6 months to 90 years. Male sex was predominant with a sex-ratio of 1.8. The frequency of small bowel occlusions over all occlusions was 74.03%. The most encountered clinical signs were as followed: abdominal pain (100%), vomiting (88.6%), cessation of materials



and gas (79.9%) and meteorism (62.3%). All patients underwent medical imaging, the most common of which was an abdomen without preparation X-ray (AWP). On the etiological level, the main causes found postoperatively were: flanges and adhesion (55.2%), strangulated hernias (28.0%), acute intussusception (6.1%), small bowel volvulus (3.5%) and small bowel tumor (1.6%). Releasing the bridles was the most common surgery process (28.0%). The morbidity of the immediate follow-up was (13.1%) and the mortality was (7.0%). This high mortality is due to ignorance of the signs of seriousness and the socio-cultural barrier (decision of the patriarch to agree to a surgical intervention), the late use of hospital facility and the limited financial capability of the patients.

Keywords

Occlusions of the Small Intestine, Etiology, Surgical Treatment, Hôpital Sominé DOLO de Mopti

1. Introduction

Bowel obstruction is defined as a complete and persistent cessation of transit (materials and gases) in a segment of the digestive tract located between the pylorus and the colorectal junction [1]. They are the cause of 10.0% to 20.0% of acute abdominal pain in adults in general [2]. In Europe, bridge and adhesions were the etiology in 70.0% of cases with a non-negligible mortality of 4.0% to 17.0% depending on the series [3]. In the United States, Williams S.B. *et al.*, found a death rate of 2.1% in 2001 in about 339 cases [4]. In Africa and Morocco, 128/191 (67.02%) of cases of intestinal obstruction were in the small bowel, with an overall mortality of 7.85% according to Canis M. *et al.* [5]. Harouna *et al.*, in Niger reported 39.36% of bowel obstruction in emergency department [6]. Dembélé B.T. *et al.* reported 659 acute intestinal obstructions, including 100 small bowel obstructions on flanges and adhesions, *i.e.* a frequency of 17.8% [7]. Acute small bowel obstruction (SBO) is a pathology whose character of extreme medical and surgical emergency has long been illustrated by the famous aphorism: “you should never let the sun rise and set on an intestinal obstruction” [3] [4] [8]. The most common cause of SBO is the development of adhesion, abdominal surgery or spontaneous flanges, which account for 50% to 80% of cases [4]. SBO diagnosis relies on the medical examination and medical imagery such as X-ray of the abdomen without preparation (AWP), abdomen ultrasonography and computed CT scan. These can be used respectively as the first-line examination, and by extension as a second-line, and thereby provide sufficient information necessary for conservative medical treatment or surgery decision-making process [5] [6]. Nevertheless, CT scan remains the goal standard, because it provides information on the cause, location, and especially the vitality of the loop [9]. SBO treatment is medico-surgical, the decision of conservative or surgical

treatment remains a clinical challenge in a large number of cases [10]. Its prognosis depends on the early diagnosis and management. Herein, we discuss the epidemiology, diagnosis, clinical features and our experience in the management of SBO.

2. Patients and Methods

We carried out a prospective and retrospective observational study over two years from 2016-2018 at Hôpital Sominé DOLO de Mopti by successive recruitment. The diagnosis of the small bowel obstruction (SBO) was made by the help of surgeon physician examination, abdominal X-ray and was confirmed intraoperatively. Were included in this study all patients who underwent surgery for acute bowel occlusion at the general surgical department. Those whose diagnosis were not bowel occlusion at physical examination, medical imaging and postoperatively, and non-consenting patients were not enrolled in this study. As an observational study, subjects were enrolled by successive recruitment and the sample was set to 114 at the end of the study period. All patients gave the fully informed written consent prior to their enrollment. SBO frequency, etiology and the technique used during surgical intervention were the variables studied in this work. Data were collected from physical examination, surgery and hospitalization reports. Also the anatomopathological examination reports were recorded postoperatively for all subjects. Laparotomy and inguinitomy have been used as the initial surgical management. Resection of the bridge, resection anastomosis of the small bowel and adhesiolysis were the main used surgical techniques. Data were recorded in Microsoft Excel and then captured in Epi-info version 7.0 for analysis. Pearson Chi2 test was used for proportions comparison. P-value less than 0.05 was considered for having statistical significant.

3. Results

A total of 114 cases of SBO were identified in the department of general surgery of Hôpital Sominé DOLO de Mopti (**Table 1**). The mean age was 37 years with extremes ranging from 6 months to 90 years. SBO accounted for 7.52% (114/1514) of consultations, 8.27% (114/1378) of hospitalizations, 3.98% (114/2866) of surgeries, and 74.03% (114/154) bowel occlusion (**Table 2**). Acute intestinal obstruction on an isolated bridge was found in 45.6% and occlusion on a bridge associated with adhesions was more frequent intraoperatively (55.2%) of cases (**Table 3**). All of our patients were resuscitated before, during and postoperatively. General anesthesia with orotracheal intubation and antibiotic prophylaxis have been taken in all patients. The occlusion was on the ileum in 53.5% (**Figure 1**) and the loop was healthy in 81.6% of cases. Laparotomy was the most common route of entry in 81.6% of cases. The section of the bridge was the most performed procedure (28.1%) followed by anastomosis resection in 18.4% of cases (**Table 4**). The average duration of the intervention was 97 minutes with extremes ranking from 35 min to 206 min. The immediate postopera-

tive effects were straightforward in 86% of cases. The most common postoperative morbidity was surgical site infection in 8.8% of cases. Mortality was 8 cases (7.0%) of cases. The average length of hospital stay was 8 days with extremes ranging from 3 days to 45 days. Patients with necrotic bowel loops died in 87.5% (7/8). Mortality was higher in patients in whom we performed an anastomosis resection in one step (18.2%).

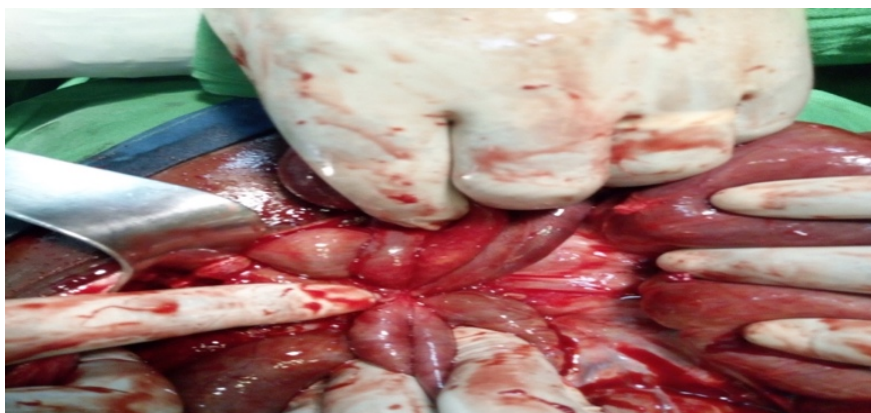


Figure 1. Occlusion on the ileo-ileal flange. Hôpital Sominé Dolo de Mopti.

Table 1. Distribution of patients according to surgical techniques.

Surgical technique	Table Column Head	
	Number	Pour cent
Bridle resection	32	28.0
Small bowel anastomosis resection	21	18.4
Adhesiolysis	15	13.2
Aponeuroathy treatment	14	12.2
Cure according to Bassini	13	11.4
Cure according to shouldice	8	7.0
Ostomy	7	6.1
Extrication	2	1.8
Disinvagination	2	1.8
Total	114	100

Table 2. Frequency of small bowel obstructions (SBO) across all intestinal obstructions.

Authors/SBO frequencies	Table Column Head		
	Number	Pour cent	p-value
Arnold <i>et al.</i> , France 2003 [11]	131	32.00	<0.001
Mehmet U. <i>et al.</i> , Maroc 2012 [13]	128	67.02	0.25
Kurem R.T. <i>et al.</i> , Pakistan 2014 [12]	102	54.55	0.24
Our study	114	74.03	

Table 3. Comparison of the etiologies found.

Etiology/Authors	Table Column Head				
	Adhesion N (%)	Bridle N (%)	Adhesion-bride N (%)	Hernia N (%)	Tumor N (%)
Goussous <i>et al.</i> , USA 2015	84 (56.0)	0 (0.0)	0 (0.0)	32(26.9)	7 (5.0)
Kouadio <i>et al.</i> , RCI 2001 [10]	7 (14.3)	39 (79.5)	3 (6.8)	0(0.00)	0 (0.0)
Miller <i>et al.</i> , Canada 2005 [22]	200 (22.0)	102 (25.0)	106 (26.0)	0(0.00)	0 (0.0)
Harouna <i>et al.</i> , Niger 2005 [6]	0 (0.0)	72 (82.8)	15 (38.6)	0(0.00)	0 (0.0)
Mehmet U. <i>et al.</i> , Maroc 2012 [13]	38 (30.0)	0 (0.0)	14 (11.0)	67(52.0)	9 (7.0)
Our Study	11 (9.6)	52 (45.6)	63 (55.2)	21(18.4)	2 (1.6)

Table 4. Comparison of the surgical techniques used.

Authors	Table Column Head			
	Bridle resection N (%)	Ostomy N (%)	Adhesiolysis N (%)	Anastomosis Resection N (%)
Kouadio <i>et al.</i> , CI 2001 [10]	25 (51.0)	0 (0.0)	5 (10.2)	17 (34.7)
Beyrout <i>et al.</i> , Tunisie 2006 [18]	152 (59.0)	0 (0.0)	54 (21.1)	30 (11.6)
Our study	32 (28.1)	7 (6.1)	15 (13.2)	21 (18.4)

4. Discussion

We conducted a prospective and retrospective observational study from 2016 to 2018 at the general surgery department of Hôpital Sominé DOLO de Mopti. A total of 114 cases of SBO was enrolled in this study, 53 prospectively and 61 retrospectively. We found (114/154) or 74.03% of SBO. This rate was higher than that of Arnold PB *et al.*, 2000 [11]. This difference could be explained by the rarity of bridle occlusions in the French series due to the contribution of minimally invasive surgery (laparoscopy). In contrast, our result does not differ statistically from those of the Pakistani and Moroccan series [12] [13], p-value > 0.05.

The age is discussed to be or not considered as a risk factor for SBO [11], we found no difference in term of age between our series and those from Russia and Côte d'Ivoire. However, it was significantly lower than that of French series [11], p-value = 0.003. This could be explained by the youth of the African population in general and Malian in particular [7]. The gender influence on the occurrence of SBO is also discussed, however in our study as well as in the other series [6] [10] [14] the majority of patients were represented by men. The 28-day consultation period of our study is statistically comparable to those of the Japanese and French series [15] [16] with p-value = 0.05. On the other hand, it is lower than that of Beyrout in Tunisia [17], p-value < 0.05. Occlusion syndrome is the main symptom of SBO [16]. The proportion of 18.4% of occlusive syndrome in our study is significantly lower than those of the Japanese, French and Tunisian series which respectively reported 100.0%, 50.0% and 57.0%, all p-value < 0.05.

This difference could be due to the inconsistency of certain signs of SBO such as abdominal distension, stopping of materials and gas in our study. Abdominal pain and vomiting are very common symptoms of SBO [18]. Abdominal pain was observed in all of our patients and in all other series [6] [10] [14]. The proportion of vomiting and cessation of materials in our study were 88.6% and 79.8%, respectively. These proportions did not differ from those of other African series [6] [14]. The abdominal X-ray (ASP) is the first-line examination followed by abdomen ultrasonography and CT scan for any suspicion of small bowel obstruction [19] [20], in our study, abdomen X-ray was performed in 95.6%. This proportion was in line with those of the other African series [6] [10] [14]. When it happens to deal with SBO, the surgical procedure depends on the condition of the loops, the etiology and the hemodynamic condition of the patient. The section of the bridge was the most performed surgical procedure in our series with 28.1%. This proportion was significantly different from those of Kouadio and Beyrou [10] [17] p -value < 0.05 . This difference could be explained by the condition of the loop and other associated lesions in our series. Adhesiolysis and anastomosis resection were performed in 13.2% and 18.4%, respectively in our study. The proportion of adhesiolysis in our series did not differ from those reported by Kouadio and Beyrou [10] [17]. We have performed ileostomy in 6.1% unlike the other series [10] [17]. The high proportion of ileostomy in our series can be explained by the delay in patients' management, itself linked to the delay in seeking medical facilities. The bridge and adhesion were the most frequent etiologies in our study 55.2% which was higher than that of the other series [6] [10] [14] [21] with a p -value < 0.05 . This difference could be related to the sample size, medical and surgical history. Morbidity in our study was 13.2% and was dominated by surgical site infection with a rate of 8.8%. This was comparable to those reported by the Ivorian and French authors [10] [22] with p -value > 0.05 . However, we found a significant difference with the Tunisian, American and Japanese series [17] [20] [23], p -value < 0.05 . This difference could be related to the surgical technique, the age and the general condition of our patients. The average length of hospital stay in our series was 8 days. This hospital stay was comparable to that reported by Arnold P.B. *et al.* [11], p -value > 0.05 . However, it is lower than that reported by Harouna *et al.* [6]. This difference could be linked to the high number of postoperative complications in their series.

5. Conclusion

SBO is a medico-surgical emergency that requires early management to improve the prognosis. In Africa, it often affects very young population and occurs most frequently after an inflammatory process in the abdominal cavity even in the absence of history of surgery. The delay in seeking medical facilities and the advanced age of the majority of these patients make the seriousness of this pathology. Despite the multiplicity of diagnostic, therapeutic and surgery modalities, morbidity and mortality still remain high.

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Statement of Informed Consent

The patients gave fully informed written consent prior to this publication.

Conflicts of Interest

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

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