

Acute Bowel Obstructions of the Elderly in a Low African Country

Kouame Bernadin Kouakou*, Kouakou Ibrahim Anzoua, Mamadou Traore, Ismael Kalou Leh Bi, Ahou Bernadette N'Dri, Aka Gerard Kakou, Serge Amos Ekra, Blaise Amos Kouakou, Inza Bamba, Djahou Ezechiel Akowendo, Roger Lebeau, Bamourou Diane

General and Digestive Surgery Department, University Hospital of Bouaké, Bouake, Ivory Coast
Email: *kbernadin7@gmail.com

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Abstract

Background: Acute bowel obstruction is one of the main causes of non-traumatic gastro—intestinal surgical emergencies. When they occur in elderly patients, they seem to induce higher morbi-mortality. The aim of our study was to identify the causes of these bowel obstructions in elderly patients and to expose the results of their surgical management. **Patients and Methods:** Retrospective and analytical study of patients aged 65 years and over, operated on between January 2013 and December 2019 for acute bowel obstruction at the University Hospital of Bouake. Demographic, diagnostic, therapeutic and evolutionary data were analysed. **Results:** The study involved 36 men and 23 women (sex ratio = 1.6). The mean age of these patients was 70 ± 4.6 years (65 and 90 years). A history and/or co-morbidities were found in 67.8% of them. Patients were classified as ASA I (20.3%), ASA II (42.4%), ASA III (33.9%) or ASA IV (3.4%). The average consultation time was 5.3 ± 4.1 days (2 days and 28 days). Bowel obstructions were due to colonic volvulus (38.9%), colonic cancer (22%), postoperative adhesions (18.6%), strangulated groin hernia (16.9%) or internal bowel hernia (3.3%). Volvulated or necrotic bowel and resectable cancers were resected followed by immediate anastomosis or stoma. Near upstream stomas were performed for unresectable cancers. A herniorrhaphy for groin hernias and a mesenteric breach suture for internal hernia were performed after bowel disinterment. Adhesions were released. The time to surgery was 22.3 ± 12.4 hours (2 hours and 72 hours). The post-surgery morbidity was 32.2%, marked by parietal suppurations (47.4%). The post-surgery mortality was 16.9%. Hemodynamic or septic shock, ASA score \geq III, bowel necrosis and ICU stay were the significant risk factors. **Conclusion:** Acute bowel obstructions in the elderly are dominated by colonic volvulus. The high mortality is related to various factors highlighting the frailty of the elderly. A multidisciplinary management involving the geriatrician could improve the

prognosis.

Keywords

Acute Bowel Obstruction, Elderly, Etiology, Morbi, Mortality, Surgery

1. Introduction

The attendance rate of surgical emergencies by elderly patients increases with the growth of life expectancy of populations [1]. In the developed countries, it is common to encounter in the surgical emergency departments, an elderly patient with an acute abdomen, especially an acute bowel obstruction [2] [3]. Colorectal cancers are the most common cause [2]. These obstructing cancers account for more than 40% of the indications for laparotomy in elderly patients [4] [5] [6]. In Africa, elderly patients are also operated on for non-traumatic abdominal emergencies [7] [8] [9] [10] [11]. In these studies, acute bowel obstruction is a common cause of non-traumatic digestive surgical emergencies. In Senegal, in Wade *et al.*'s study, out of 110 elderly patients operated on for a digestive emergency, more than 41% were operated on for an acute bowel obstruction [7]. Studies in Ivory Coast have reported similar results [8] [9] [10]. In spite of a limited technical platform, these African studies seem not to show significantly more adverse results than in Europe, in terms of post operative morbidity and mortality [7] [8] [11]. To our knowledge, no specific study on the surgical management of acute bowel obstructions in the elderly in Bouake has been published. The aim of our study was to specify the causes of these bowel obstructions and to expose the results of their surgical management.

2. Patients and Methods

It is a retrospective and analytical study of records of patients aged 65 years and over operated for acute bowel obstructions between January 2013 and December 2019 in the general and digestive surgery department of the University Hospital Center (CHU) of Bouake. Bowel obstructions that occurred within 30 days of an operation for a digestive injury were not included. The study also did not include bowel obstructions in patients with an intestinal stoma. Our study population was divided into geriatric (65 - 74 years), elderly (75 - 89 years), and grand elderly (≥ 90 years). The demographic, clinical and paraclinical data, the per-operative findings, the operative procedures and the post-operative results were collected on a survey form established from the Epi Info 7.2.1.0 dfr software. The complications and deaths included were those occurring during the postoperative hospitalization or during the waiting period for the restoration of digestive continuity for patients with a stoma. Microsoft Excel 2016, and SPSS 25.0 software were used for data compilation and statistical calculations. The X^2 test was applied for categorical variables and standard deviation or Student's t-test for quantitative

variables. In univariate analysis, the risk factors for mortality were statistically described. The significance threshold was set at 5% for all tests.

Anonymity and confidentiality were respected for all patients.

3. Results

3.1. Demographic Data

During the 7 years of this study, 59 patients, 36 men and 23 women (sex ratio = 1.6), aged 65 years and more, underwent surgery for acute bowel obstruction. They accounted for 30.4% of the 194 patients operated on for the same condition and 2.8% of all patients (N = 2080) operated on for a non-traumatic digestive emergency during the same period. They were classified as geriatric (n = 40; 67.7%), elderly (n = 18; 30.5%) and very old (n = 1; 1.6%). The mean age was 70 ± 4.6 years (65 and 90 years). Forty patients (67.8%) had one or more associated antecedents and/or co-morbidities (**Table 1**).

3.2. Diagnostic Data

Patients consulted for cessation of feces and gas (n = 45; 76.3%), abdominal pain (n = 40; 67.8%), nausea and/or vomiting (n = 26; 44.1%), painful groin or inguino-scrotal swelling (n = 10; 16.9%). The average delay of consultation was 5.3 ± 4.1 days (2 days and 28 days). On examination, abdominal meteorism (n = 43; 72.9%), laparotomy scar (n = 11; 18.6%), abdominal provoked pain (n = 40; 67.8%), abdominal mass (n = 8; 13.6%), abdominal tympany (n = 45; 76.3%) and groin or inguino-scrotal swelling (n = 10; 16.9) were noted. Patients were classified as ASA I (20.3%), ASA II (42.4%), ASA III (33.9%) or ASA IV (3.4%). Imaging was performed in 55 cases (93.2%); an abdominal X-ray (n = 53) (**Figure 1(a)**) and an abdominal CT scan (n = 2) (**Figure 2(a)**, **Figure 2(b)**). The X-ray showed hydro—aerial images with clear levels (**Figure 1(a)**).

Table 1. History and co-morbidities (n = 40).

History and co-morbidities		Number	Percentage (%)
Medical	Gastric or duodenal ulcer/Epigastralgia	11	27.5
	Cardiovascular (hypertension, stroke, heart disease)	10	25
	Chronic constipation	6	15
	Diabetes	3	7.5
	Lumbosacral disease	2	5
	Bronchial/Lung Disease	2	5
Surgical	Laparotomy	11	27.5
	Inguinal hernia	7	17.5
	Prostate adenoma	2	5
	Hysterectomy	1	2.5

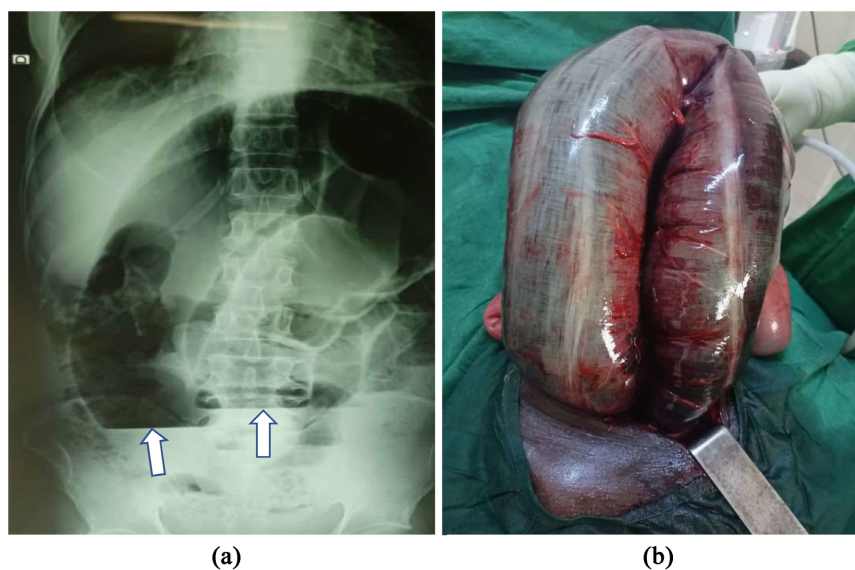


Figure 1. Necrotic volvulus of the sigmoid of a 67-year-old patient. (a) Double jamb hydro arial images with staggered levels (white arrows) on unprepared abdominal X-ray. (b) Per-operative image of necrotic volvulus of the sigmoid.

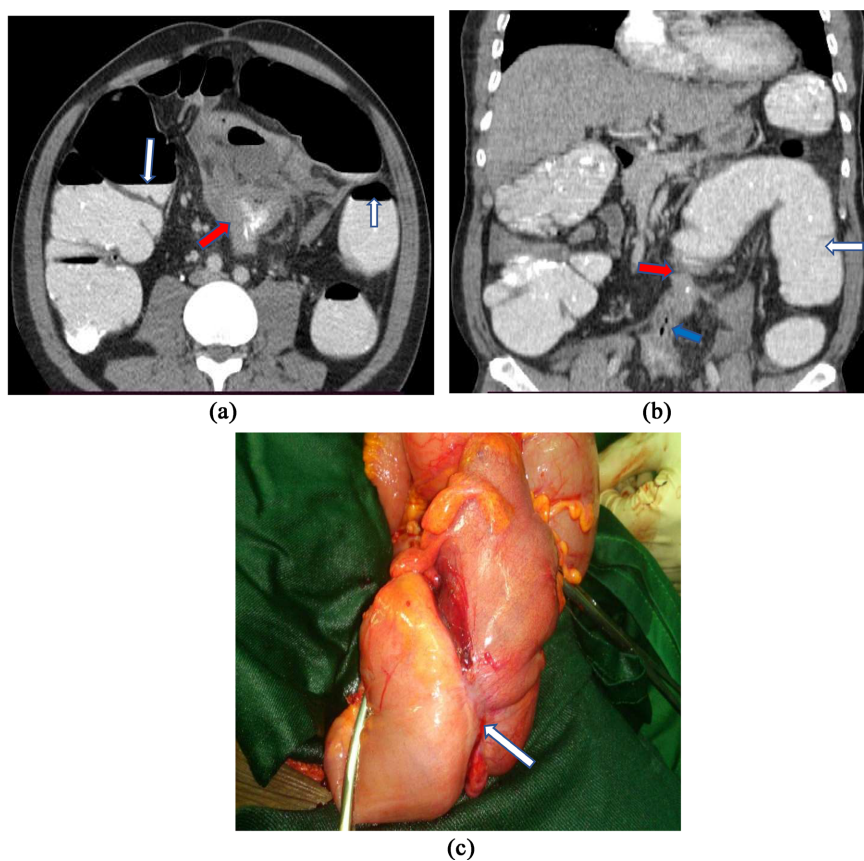


Figure 2. Obstruction on stenosing tumor of the sigmoid in a 71-year-old patient. (a) CT axial section showing colonic hydro arial images (white arrows) and stenosing sigmoid tumor (red arrow). (b) CT frontal section showing the dilated colon (white arrow) and flat colon (blue arrow) on either side of a sigmoid tumor (red arrow). (c) Per-operative image of the stenosing tumor of the Sigmoid with obstruction (white arrow).

3.3. Therapeutic Data

Resuscitative procedures were implemented for all patients. Antibiotic treatment with a 3rd—generation Cephalosporin and an Imidazole derivative was administered to all patients curatively in case of necrosis bowel or prophylactically in the absence of necrosis. The mean time to surgery was 22.3 ± 12.4 hours (2 hours and 72 hours). Fifty-six (94.9%) patients underwent surgery beyond the 6th hour after admission. Nine of these were operated on after 48 hours. The surgical treatment performed according to the per-operative diagnosis is summarized in **Table 2**.

Table 2. Surgical treatment depending on the per-operative diagnosis.

Diagnosis		Number	Surgical treatment
Colonic volvulus n = 23	without necrosis	13	Resection – anastomosis
	With necrosis	10	Resection – stoma
Colo-rectal cancer n = 13		13	Resection – anastomosis (n = 2) Resection – stoma (n = 8) Stoma (n = 3)
	without necrosis	6	Dislodgement + Herniorraphy
	With necrosis	4	Resection – anastomosis + Herniorraphy
Strangulated groin hernia n = 10	without necrosis	5	Debriding
	With necrosis	7	Resection – anastomosis
Small bowel adhesions n = 11	without necrosis	1	Dislodgement + Mesentery closure
	With necrosis	1	Resection – stoma + Mesentery closure

3.4. Surgical Treatment Outcome

Eight (13.6%) patients were admitted to the Intensive Care Unit (ICU) immediately after surgery because of a cardiac rhythm disorder (n = 3), delayed recovery (n = 3) or hemodynamic instability (n = 2). The mean length of hospitalization was 7.1 days (4 and 28 days). Morbidity was 32.2% (n = 19). Surgical complications included parietal suppuration (n = 9), parietal bleeding (n = 3), stomal necrosis (n = 2), anastomotic fistula (n = 1), evisceration (n = 1). Reoperation has been required to treat these last 4 complications.

Ten patients (16.9%) died. **Table 3** shows the characteristics of these patients.

In univariate analysis, the risk factors for operative mortality were shock, ASA stages III and IV, presence of bowel necrosis, and postoperative stay in the ICU (**Table 4**).

4. Discussion

In 7 years, 30.4% of patients operated on for acute bowel obstructions were 65 years of age or older. They accounted for 2.8% of all patients operated on for a non-traumatic gastro—intestinal surgical emergency. This incidence seems low.

Table 3. Characteristics of deceased patients (n = 10).

Age (year)/ Gender	History/ Co-morbidities	ASA	Diagnosis	Surgery	Immediate postoperative ICU stay	Date of death	Cause of death
66/F	Unknown	II	Strangulated groin hernia + Bowel necrosis	Resection – anastomosis	No	D7	Intra-peritoneal suppuration + Peritonitis
69/M	High Blood Pressure	IV	Colonic volvulus + necrosis	Resection – stoma	No	D2	Septic shock
69/M	Chronic constipation Inguinal hernia	III	Strangulated groin hernia + intestinal necrosis	Resection – anastomosis	Yes	D6	Anastomotic fistula + Peritonitis
75/F	Broncho pneumopathy Laparotomy*	III	Strangulated groin hernia	Dislodgement + Herniorrhaphy	Yes	D30	Severe pneumonia
70/F	Hysterectomy	III	Colonic cancer	Resection – stoma	No	Per-operative	Haemodynamic shock
78/M	High Blood Pressure	III	Small bowel adherence + necrosis	Resection – anastomosis	No	Per-operative	Haemodynamic shock
79/M	Stroke	III	Colonic volvulus	Resection – anastomosis	Yes	D1	Haemodynamic shock
82/M	Chronic constipation	III	Colonic volvulus + necrosis	Resection – stoma	Yes	D4	Haemodynamic shock
84/M	Diabetes	III	Colonic volvulus	Resection – anastomosis	Yes	D20	Massive Ischemic Stroke
89/M	Bronchopneumonia	III	Colonic volvulus + necrosis	Resection – stoma	No	Per-operative	Haemodynamic shock

*No indication provided

Table 4. Risk factors for surgical mortality.

Parameter	Number	Death	Alive	Percentage	p
Age	65 - 75	40	4	36	0.0618
	≥75	19	6	13	
Sex	M	36	7	29	0.7254
	F	23	3	20	
Co-morbidities	Yes	45	9	36	0.4248
	No	14	1	13	
Consultation delay	<48 h	9	1	08	1.0000
	≥48 h	50	9	41	
ASA	I; II	37	1	36	0.0003
	III; IV	22	9	13	
Intervention delay	<6 h	3	2	1	66.6

Continued

	≥6 h	56	8	48	14.2	
Bowel necrosis	Yes	21	7	14	33.3	0.0020
	No	38	1	37	2.6	
Shock	Yes	11	6	5	54.5	0.0015
	No	48	4	44	8.3	
Post-operative ICU stay	Yes	9	6	3	66.6	0.0003
	No	50	4	46	8	
Post-operative complications	Yes	19	5	14	26.3	0.2663
	No	40	5	35	12.5	

It is lower than in the studies from developed countries [2] [12] [13] but close to those from African countries [9] [10] [11]. In contrast to developed countries, the populations of African countries are young [14]. These different incidences could therefore be related to the age curves of these populations [14] [15]. The mean age of our patients was 70 ± 4.6 . They were mostly gerontine (67.7%). The sex ratio was in favour of males. In the developed countries, as life expectancy is higher, it is usual to see elderly people in the emergency room for an acute surgical abdomen [1] [3]. In this age group, women are the most numerous. This could explain the sex ratio in favour of women in their different studies [12] [13].

In our study, as in those of several African studies [7] [8] [9] [10] [11], the delay of consultation was long. It was 5.3 ± 4.1 days on average with extremes of 2 and 28 days. In Ivory Coast, as in many African countries, health care is the responsibility of the patient. The impoverishment of the population, aggravated by certain cultural beliefs, means that patients only arrive at the hospital after informal care has failed [7] [9]. These facts may also explain the long delay in surgical intervention. Almost all of our patients (94.9%) underwent surgery beyond the 6th hour after admission and 16.1% were operated on after 2 days. These long delays have certainly resulted in 35.6% of cases of bowel necrosis observed in our study. In view of this finding, we agree with Ong [16] that, these long delays in management were a loss of chance for the patients. While in our study, the obstructions were mainly colonic and caused mainly by a volvulus, in Europe, small bowel obstructions are the most frequent, and usually caused by a groin hernia or adhesions [2] [11] [17]. These European studies also indicate that cancer is the leading cause of colonic obstruction in elderly patients [2] [5] [12]. Cancer was in 2nd position in our study. The surgical management of our patients was based on the per-operative findings, the haemodynamic status of the patient, the technical facilities available and the experience of the surgeon.

The operative morbidity ($n = 19$; 32.2%) is high in our study. Oldani, Springer *et al* made the same observation [12] [18]. It was dominated by parietal complications, in particular parietal suppurations (47.4%). A re-operation was neces-

sary to treat 21% of the operative complications. These re-operations led to a longer hospital stay and an increased financial burden for the patient. Prevention of surgical site infections could help to reduce the incidence. The operative mortality was 16.9% in our study. Half of the patients who died were admitted to the ICU immediately after the operation. This shows not only the seriousness of the lesions, but above all the failure of the mechanisms of adaptation of the vital functions in the elderly patient faced with the disorders created by bowel obstruction [12] [17]. This difficulty of adaptation is due to the physiological fragility observed in elderly, as well as to their co-morbidities which are often ignored or under-evaluated in emergency situations [19] [20] [21]. Peri-operative resuscitation in such a context with a limited technical platform is a nearly impossible challenge to achieve. In univariate analysis of our results, ASA score \geq III, bowel necrosis, immediate postoperative ICU stay and haemodynamic or septic shock were identified as significant risk factors for mortality. Other risk factors reported in the literature include age over 80 years, male sex, delay in admission, colorectal surgery and association with metastatic cancer [3] [22] [23] [24]. Some authors consider that these factors are part of the concept of physiological and induced frailty, that characterizes the elderly patient [21] [25] [26]. Taking this notion into account in the initial management of elderly patients in surgical emergencies could improve their prognosis. Hence the interest of the contribution of the geriatrician at all stages of this management. His expertise seems necessary both in the diagnostic approach and in the implementation of a peri-operative resuscitation adapted to these fragile patients. We did not have a geriatrician in our hospital at the moment of our study. Another limitation of this study was that the nutritional status of the patients was not assessed. Hypoalbuminemia in some of them must have favoured the occurrence of complications by default or extension of the healing time and the hospital rehabilitation time. Also, no germ could be isolated from the surgical site infections. This could have allowed us to establish the bacterial ecosystem of these infections for a more effective antibiotic therapy. Finally, the delay in consultation, the absence of emergency CT scans and the self-funding of care by patients are all factors that led to a delay or absence of diagnosis of certain patients in the emergency room. Some patients certainly died or were discharged against medical advice without a diagnosis having been found, thus creating a bias in patient recruitment.

5. Conclusion

Acute bowel obstructions in patients aged 65 and over are relatively rare in our practice. The causes are mainly volvulus for the colon, adhesions and hernias for the small bowel. The high operative mortality of these obstructions shows a real difficulty in the peri-operative resuscitation of elderly patients often frail due to unrecognized co-morbidities. A multidisciplinary management involving the geriatrician and focused on the notion of frailty of the elderly patient could

improve the prognosis.

Conflicts of Interest

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

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