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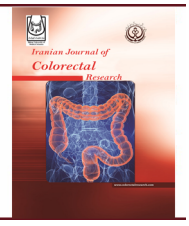

Acute Intestinal Obstruction: Epidemiological Profile and Management from Two Years of Surgical Pratice in the Central Hospital of the Army of Algiers

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Abstract

Background: Acute intestinal obstruction (AIO) is a major public health problem. Despite advances in surgery and medical imaging, this emergency is still diagnosed late, which explains why its mortality has remained unchanged. We aimed to determine the epidemiological profile of AIO in our institution, as well as the rank of AIO in terms of the volume of our activity.
Methods: We conducted a survey of AIO operated in our General Surgery Department of the Central Army Hospital of Algiers over two years (2016–2017). The inclusion criteria were all patients aged over 16 years with mechanical AIO. The statistical study was based on Excel software version 2013.
Results: AIO represented 10% of all surgical emergencies in our practice. The mean age of patients was 61 years (range 16–90). There was a predominance of males in patients with AIO with a sex ratio of 1.45. The majority of patients (70%) had a past surgical history. Small bowel obstructions were dominated by adhesions in 53% of cases, and 72% of colonic obstructions were caused by cancer. The mortality rate was 7.6%.
Conclusions: The high rate of AIO due to cancer should call on the health authorities in our country to undertake an urgent plan for targeted screening of populations at risk of developing colorectal cancer.

Keywords: Intestinal obstruction, Epidemiology, Delayed diagnosis

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Introduction

Acute intestinal obstruction (AIO) is a frequent and serious medical and surgical emergency. In developing countries, the etiologies of AIO are dominated by strangulated hernias, whereas in developed countries, obstruction is mostly caused by postoperative adhesions, which account for 40% of cases (1). In the United States, 300,000 AIOs adhesions were operated on each year, generating a global cost of $1.3 billion in 1994 (2). More recently, the management of short bowel obstruction due to

adhesions accounted for more than 960,000 days of hospitalization and $2.3 billion in annual spending in the United States. As a result, AIO constitutes a major public health problem (3, 4).

Mortality remains high even in countries such as England, where the mortality rate for small bowel obstruction is 10%, and the mortality rate for colonic obstruction is over 30% (5). Only rapid diagnosis and management can ensure a reduction in the morbidity and mortality of AIO. In this study, we aimed to determine the epidemiological profile of AIO in our institution and its rank among our different cases. We were also interested in the morbidity and mortality of this pathological entity and in the evaluation of the management.

Methods

We conducted a survey of AIOs operated in our General Surgery Department of the Central Army Hospital of Algiers over two years (2016–2017). This was a retrospective uni-centric study.

The inclusion criteria were all patients aged over 16 years with mechanical AIO.

The data collection was based on the computerized patient record, medical observations, hospitalization registers, and operating protocol registers.

The statistical study was based on the Excel software version 2013.

Results

In terms of frequency, AIO represented 2% of all surgical activity and 10% of all surgical emergencies managed in our department during the specified period.

The different surgical emergencies operated on in order of frequency are presented in Table 1.

There was a predominance of males in patients with AIO with a sex ratio of 1.45 to 1.

The average age of our study population was 61 years, with extremes ranging from 16 to 90 years. We note in Figure 1 that there is a peak in the 76–90 age group.

More than half of the patients operated on for AIO had a medical history of diabetes and/or hypertension, while 70% had a surgical history. ASA I patients represented 44.32% of the series.

As for the diagnostic means, AIO was confirmed after history taking and clinical examination by the unprepared abdominal film in 92.10% of cases. A computerized tomography scan was requested in 84.81% of cases. Other complementary examinations were used less frequently, such as ultrasound (15.78%) and colonoscopy (2.64%).

In terms of the etiologies of AIOs, 53% of small bowel obstructions were caused by adhesions, while 72% of colonic obstructions were caused by cancers (Table 2).

Table 1: Frequency of different surgical emergencies operated in our department during 2016–2017

Surgical emergency	Frequency	Percentage
1. Appendicitis	388	49.0
2. Pilonidal abscess	146	18.4
3. Acute intestinal obstruction	79	10.0
4. Anal margin abscess	55	6.9
5. Diabetic foot	32	4.0
6. Acute cholecystitis	30	3.8
7. Peritonitis	29	3.7
8. Appendicular abscesses	19	2.4
9. Strangulated hernia	11	1.4
10. Road traffic accident	3	0.4
11. Ballistic trauma	1	0.1
Total	793	100

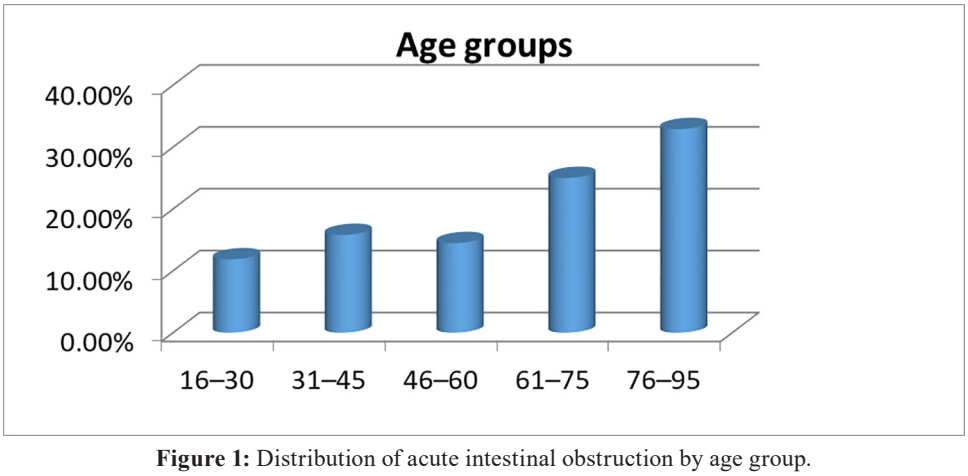

Figure 1: Distribution of acute intestinal obstruction by age group.

Table 2: Etiologies of small bowel acute intestinal obstruction

	Frequency	Percentage
Adhesions	28	53.0
Cancer	7	13.2
Volvulus	2	3.8
Strangulated hernia	5	9.4
Meckel's diverticulitis	3	5.7
Crohn	6	11.3
Entero-mesenteric infarction	1	1.9
Bezoar	1	1.9
Total	53	100

Table 3: Postoperative morbidity in acute intestinal obstruction according to the Clavien-Dindo classification

	Type of complication	No.	%
Grade I	Wall sepsis	6	24.0
Grade II	Dehydration	3	44.0
	Acute renal failure	2	
	Hypokalemia	2	
	Digestive hemorrhage	2	
	Vomiting	1	
	Digestive fistula	1	
Grade III	Evisceration	3	20.0
	Peritonitis	2	
Grade IV	Hemodynamic instability	3	12.0

The site of the obstruction in colonic occlusions was dominated by the left colon in 78.6% of cases. It should be noted that in these colonic obstructions due to cancer, 26.31% of the patients were in peritoneal carcinomatosis.

The preparation for the operation consisted of placing a nasogastric tube in 42.1%, analgesic treatment based on paracetamol in 34.21%, rehydration for a quarter of the patients, and antibiotic therapy in the event of the presence of signs of sepsis in 6.57% of cases.

Intraoperative procedures (IOP) performed in small bowel obstruction were sectioning of flanges with complete enterolysis in 49.05% of cases, resection-anastomosis in the same percentage, and extraction of a bezoar in 1.88% of cases.

For colonic AIOs, the techniques performed consisted of near upstream colostomy in colonic AIOs due to neoplasia in 73%, anastomotic resection in 23.07% of cases of pelvic colonic volvulus, and flange section in one case (3.84%).

Morbidity was dominated by Clavien and Dindo grade II complications (Table 3). Concerning hospital stay, 31.57% had a stay of less than 5 days (Figure 2).

The overall all-cause mortality rate was 7.6%. The most common mortality factors were advanced age, the presence of a serious medical and surgical history (ASA IV and V), the existence of signs of severe disease (hemodynamic instability, signs of sepsis), and the need to carry out an intestinal resection.

Discussion

Acute intestinal obstruction (AIO) represented 2% of our surgical activity, which is close to an American series where this surgical emergency represented 1.9% of their activity (6). This emergency represents 10% of all emergency operations in our general surgery department. The sex ratio of 1.45 in our department is similar to an African series, where this rate was 1.82 (7).

In 70% of cases, our patients had a surgical history, which is similar to a German series where a surgical history was found in 78% of cases (8),

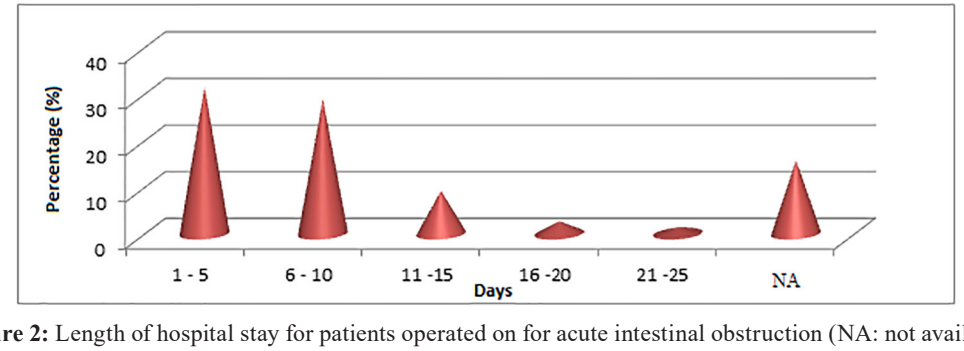

Figure 2: Length of hospital stay for patients operated on for acute intestinal obstruction (NA: not available).

and a Sudanese series in which this history was found in 60% of patients (9).

The average consultation time was 3 days in our series; it was 4.2 days in a Nigerian series by Harouna et al. (10).

In our series, we note a predominance of small bowel obstruction compared to colonic obstruction (70% vs. 30%), similar to the results found in the literature (4).

In our study, we note a predominance of cancerous pathology in 33% of cases, which is twice as high as the results found in the literature (11, 12). This high rate of colonic obstruction due to cancer should call on the public authorities in our country to develop means of screening, especially in families carrying the HNPCC spectrum, where colonoscopies should be performed. For the general population, from the age of 50 years, we recommend the search for blood in the stools by Hemocult* strips, and in the event of positivity, a colonoscopy must imperatively be performed or, failing that, a rectosigmoidoscopy.

In our series, especially in cases of bowel obstruction, we noted a high rate of intestinal resection of around 70%, compared to 41% in the Malian series by Sidibe, representing almost twice as many resections as that seen in the literature (4). This means that in our practice, patients often require resections because they arrive late to our emergency ward. A biological tool that can help surgeons to limit the delay of surgery, particularly in small bowel obstruction, consists of measuring the levels of procalcitonin (PCT). A PCT assay ≥0.57 mcg/L at admission or ≥0.25 mcg/L at 24 h after admission are indications for a quick surgical intervention (13). The rate of the rise of the serum PCT level on the 5th and 7th days after elective colon cancer surgery could predict the incidence of postoperative acute intestinal obstruction in a recent study conducted by Ye (14).

In our series, we found an overall mortality rate of 7.6%. This mortality rate was 2.5% in an Ethiopian series (15), 9% in Mali (4), and reached 20% in England (5). In surgical series published since 2017, mortality from surgical treatment of small bowel obstruction was between 0% and 3.9% after laparoscopy and between 2% and 11.8% after laparotomy; morbidity was between 8% and 50% after laparoscopy and between 24% and 68% after laparotomy (16). However, mortality in our series rises to 26% in colonic occlusions of neoplastic origin with an odds ratio of 3.4 compared to mortality in occlusions due to other etiologies. This means that neoplasms increase the mortality proportion of intestinal occlusions. Sharma & Milsom found a mortality of 50% (twice as high as ours) in acute intestinal obstructions due to colonic neoplasia. In this study, mortality was essentially due to diagnostic delay (11). The mortality factors identified by Soressa et al. were non-viability of the intestine (forcing the surgeon to perform intestinal resections), a delay in consultation of more than 24 hours from the onset of symptoms, and a hospital stay of more than 7 days (8).

More recently, McFadden et al. (17) showed in a retrospective study of a cohort of 287 patients with AIO for whom only 16% had a large bowel obstruction that the AAST (American Association for the Surgery of Trauma) intestinal obstruction grade had predictive validity in predicting the outcome. This severity grading (From I to V) had shown a significant statistical value (P<0.001) with prolonged mechanical ventilation and septic shock. The same degree of significance (P<0.001) was associated with the need for abdominal operation in the emergency setting and the increased postoperative complications.

As for preventive means to reduce the formation of postoperative adhesions, we would mention the use of non-talcated gloves, the non-closure of the pelvic peritoneum in surgery of the small pelvis (18), and the recovery of any foreign body (clip, calculus, non-resorbable thread, etc.) that has fallen into the operating field. Furthermore, the generalization of laparoscopy will reduce the formation of postoperative adhesions (19). The laparoscopy approach is very useful, particularly in the case of a band responsible for the AIO. It reduces the length of hospital stay and the cost of care (16).

This study points out certain things that must be taken into consideration. Despite the progress in both resuscitation and surgery of acute intestinal obstructions, media outlets must inform the public about this extremely serious surgical emergency since a delay in diagnosis is the main cause of mortality. Secondly, patients with inguinal hernias should be operated on as soon as possible before they are strangled. For patients with abdominal scars, the slightest cessation of gas should prompt them to consult a surgeon, who should not rush to operate. In this particular case, any absence of opacification of the cecum on transit with water-soluble solutions after 24 hours should indicate surgery, as well as an increase in PCT level (5, 13).

Regarding neoplastic occlusions, screening of at-risk populations (subjects over 50 years of age, family history of colonic neoplasia, HNPCC spectrum) must be included in the priorities of each health system (Cancer Plan). This roadmap should standardize practices, favoring colostomy in every case of colonic occlusion due to cancer. For patients who are tired and cannot undergo this procedure, a colonic stent placed by trained hands allowing a success rate of over 75% is a good alternative in order to reduce mortality and hospital stay with the corollary of reducing the healthcare cost. Short strictures of malignant etiology with wide angulation distal to the stricture have the best clinical success rates (20).

Conclusion

The high rate of AIO due to cancer should call on

the health authorities in our country to undertake an urgent plan for targeted screening of populations at risk of developing colorectal cancer. Efforts to reduce the rate of postoperative adhesions should also be prioritized since they were the leading cause of small intestinal obstruction.

Author Contribution

Study concept and design: Rezki Touati. Analysis and interpretation of data: Ali Baba. Drafting of the manuscript: Saïd Haddadi. Critical revision of the manuscript for important intellectual content: YasminaYahia-Messaoud, Ladjel Khelafi. Statistical analysis: Rabah Ourdane. All authors approved this publication.

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Ethics Code

The ethics committee of our institution approved the study protocol.

Conflicts of interest: None declared.

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