

A Review of Non-Traumatic Gastrointestinal Surgical Emergency Cases at the Brazzaville University Hospital

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Abstract

Review Article

The aim of this work is to improve the management of non-traumatic digestive surgical emergencies in the surgical emergency department of the University Hospital of Brazzaville. **Patients and method:** This was a descriptive study with a prospective data collection method from January 1, 2022 to December 31, 2022. It involved 458 patients operated on for a non-traumatic digestive surgical emergency in whom the epidemiological, diagnostic, therapeutic and prognostic aspects were collected and analyzed. **Results:** The hospital frequency was 9.8% of all surgical emergencies. The average age of onset was 40 ± 11.7 years. The most affected age group was 28 to 37 years. There was a male predominance with a sex ratio of 1.3. The average consultation time was 72 hours. 15.7% of patients had comorbidity. Peritonitis was the most common etiology, with appendicular origin in the foreground. All patients underwent exploratory laparotomy, 98.2% of which were open. The most commonly performed procedure was appendectomy. The average hospital stay was 5 days. Morbidity was around 15%, dominated by parietal suppurations. **Conclusion:** Non-traumatic digestive surgical emergencies represent an important diagnostic entity in our context and affect young adults; its etiology is dominated by secondary acute generalized peritonitis.

Keywords: surgical emergencies, acute abdomen, non-traumatic, Brazzaville University Hospital.

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INTRODUCTION

Surgical abdominal emergencies reflect an acute pathological or traumatic abdominal condition that, within a very short timeframe, compromises one or more vital functions and therefore warrants rapid diagnostic assessment and surgical treatment [1]. They are predominantly characterised by acute non-traumatic abdominal conditions, which represent the leading cause of emergency surgical indications worldwide [2]. They can be life-threatening in the short term if management is delayed [3]. In the medical and surgical A&E department of the Brazzaville University Hospital, there is little data on the management of non-traumatic surgical abdominal emergencies; we therefore decided to conduct this study with the aim of improving the management of non-traumatic surgical abdominal emergencies.

PATIENTS AND METHODS

This was a descriptive study involving prospective data collection over a period of twelve (12) months, from 1 January 2022 to 31 December 2022.

The study population consisted of patients admitted to and operated on in the surgical A&E department of the Brazzaville University Hospital for acute non-traumatic gastrointestinal conditions. We did not include the records of patients who were not operated on or who died on admission.

The variables studied were:

- Epidemiological: these included the frequency, age, sex, occupation, place of origin and aetiologies.
- Clinical: Time to consultation (the time elapsed between the onset of symptoms and admission to the surgical A&E department). Functional signs (subjective symptoms reported by the patient and/or their carers, namely: abdominal

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pain, vomiting, bowel dysfunction such as constipation and/or flatulence), General signs (clinical manifestations indicating a deterioration in general health: fever or hypothermia, clinical anaemia, weight loss, physical weakness, anorexia, haemodynamic status, level of consciousness), Physical signs (clinical findings reported by the medical or paramedical team during the physical examination of patients: peritoneal irritation syndrome, obstructive syndrome, appendicitis, painful swelling around the natural orifices and/or areas of weakness in the abdominal wall.

- Biochemical: these comprised the results of additional tests carried out on blood samples: complete blood count, creatinine clearance, blood urea, blood electrolyte profile.
- Radiological: these were the results of radiological examinations: abdominal computed tomography (CT) scan, standard abdominal X-ray without preparation (ASP) combined with a chest X-ray, and abdominal ultrasound.
- Therapeutic: these were actions related to medical treatment (measures taken to prepare the patient prior to surgery) and surgical treatment (surgical procedures and interventions carried out when managing patients admitted for non-traumatic emergency gastrointestinal surgery).
- Prognostic factors: we assessed the average length of hospital stay and morbidity by classifying post-operative outcomes into two categories, namely uncomplicated (characterised by the resolution of symptoms and primary wound healing) and complicated (characterised by secondary wound healing following intervention by healthcare staff, or parietal suppuration); in-hospital mortality

The data were recorded on a pre-designed questionnaire and analysed using Excel 2016.

RESULTS

Frequency

During the study period, 4,633 patients were admitted to the emergency surgical unit. Of these, 458 underwent surgery for a non-traumatic digestive surgical emergency, representing 9.8% of all surgical emergencies.

Age and Sex

The mean age of the patients was 40 ± 11.7 years, with a range from 17 to 90 years. The most represented age group was 28–37 years, comprising 148 patients (32.31%) (Table I).

Table I: Distribution of patients according to age

Age group	Number	%
17 – 27	77	16.81
28 – 37	148	32.31
38 – 47	89	19.43
48 – 57	64	13.97
58 – 67	39	8.52
68 – 77	27	5.90
≥ 78	14	3.06
Total	458	100

There were 260 male and 198 female patients, giving a male-to-female ratio of 1.3

Clinical Findings

The mean consultation delay was 72 hours, ranging from 2 to 720 hours (1 month). A total of 198 patients (43.2%) belonged to a low socioeconomic group.

Abdominal pain was the presenting symptom in all patients (100%). Other presenting symptoms included nausea and/or vomiting in 116 patients (25.3%), cessation of bowel movements and flatus in 84 patients (18.3%), painful abdominal wall swelling in 64 patients (13.9%), and diarrhoea in 8 patients (1.7%).

Seventy-two patients (15.7%) had at least one comorbidity, including cardiovascular disease in 42 patients, diabetes mellitus in 11, functional renal failure in 9, human immunodeficiency virus (HIV) infection in 6, and sickle cell disease in 4.

On general examination, fever was present in 306 patients (66.8%). General condition was impaired in 91 patients (19.86%). Forty-five patients (9.8%) presented with shock. Poor hydration status was observed in 37 patients (8.0%), haemodynamic instability in 29 (6.33%), and poor nutritional status in 27 patients.

Physical examination revealed signs of peritoneal irritation in 244 patients (53.3%), intestinal obstruction syndrome in 84 (18.4%), a positive Blumberg's sign in 66 (14.4%), and painful abdominal wall swelling in 64 patients (13.9%).

Laboratory and Imaging Findings

All patients underwent a full blood count (Table II). Blood urea, serum creatinine, and serum electrolyte measurements were performed in 217 patients.

Neutrophil-predominant leukocytosis was found in 166 patients, while functional renal failure was identified in 51 patients. Hyponatraemia and hypokalaemia were observed in 56.2% and 51.1% of tested patients, respectively.

Table II: Laboratory findings

Laboratory test	Below normal	Normal	Above normal	Mean $\pm$ SD
White blood cell count	34	98	326	11,665 $\pm$ 2,687
Haemoglobin	97	340	21	11.2 $\pm$ 3.7
Platelet count	42	405	11	305,817 $\pm$ 84,520
Serum creatinine	—	157	60	13.7 $\pm$ 4.2
Blood urea	—	157	60	0.33 $\pm$ 0.15
Sodium (Na ⁺)	122	82	13	
Chloride (Cl ⁻)	96	111	10	
Potassium (K ⁺)	111	98	8	

Radiological investigations included plain abdominal radiography, abdominal ultrasonography, and abdominopelvic computed tomography (CT), performed in 304, 54, and 9 patients, respectively. Plain abdominal radiographs demonstrated pneumoperitoneum (Figure 3) in 140 patients, multiple air-fluid levels (Figure 4) in 84 patients, and diffuse abdominal opacity in 80 patients.

Diagnosis

The diagnoses, ranked by decreasing frequency, were generalised peritonitis (53.2%), acute intestinal obstruction (17.9%), strangulated hernias and incisional hernias (14.9%), and uncomplicated acute appendicitis (14%) (Table III).

Table III: Diagnoses and underlying causes

Diagnosis	Aetiology	Number	%
Peritonitis	Complicated appendicitis	100	21.9
	Perforated peptic ulcer	94	20.6
	Ileal perforation	32	6.8
	Colonic perforation	12	2.6
	Primary peritonitis	3	0.7
	Ruptured liver abscess	2	0.4
	Pycholecystitis	1	0.2
Acute intestinal obstruction	Adhesive bands	48	10.5
	Tumour	21	4.6
	Volvulus	11	2.4
	Acute intussusception	2	0.4
Uncomplicated acute appendicitis	—	64	14.0
Strangulated hernia	—	59	12.9
Strangulated incisional hernia	—	9	2.0
Total		458	100

Medical Management

Medical management consisted of pre-, intra-, and postoperative resuscitation, together with antibiotic and analgesic therapy. All patients received dual antibiotic therapy combining a third-generation cephalosporin with an imidazole derivative. Intravenous paracetamol was administered in combination with either intravenous nefopam or intravenous tramadol. Intravenous omeprazole was added in 25 patients.

Surgical Management

Following preoperative resuscitation, all patients underwent surgical exploration. Open surgery was performed in 450 patients (98.2%), while laparoscopic surgery was undertaken in eight patients (1.7%).

Among patients with generalised acute peritonitis, the most common causes identified during surgery were complicated appendicitis in 100 patients (21.83%), perforated gastroduodenal ulcer in 94 (20.52%), and ileal perforation in 32 (6.9%).

Among patients with acute intestinal obstruction, adhesive bands were the leading cause (48 cases; 10.48%), followed by intestinal tumours (21 cases; 4.5%) and volvulus (11 cases; 2.4%).

In patients with strangulated hernias and incisional hernias, bowel loops constituted the hernia sac contents in 42 cases (9.1%), of which 17 (3.71%) were necrotic.

Among patients with uncomplicated acute appendicitis, phlegmonous, abscessed, and catarrhal appendicitis were the most frequent pathological findings, accounting for 28 (6.1%), 14 (3.0%), and 13 cases (2.8%), respectively.

The surgical procedures performed were determined according to the intraoperative findings (Table IV). Appendectomy was the most frequently performed procedure (35.8%), followed by excision and closure of gastroduodenal perforation (20.5%), intestinal resection with stoma formation, and hernia repair.

Table IV: Surgical procedures

Procedure	Number	%
Appendicectomy	164	35.08
Excision and primary closure	94	20.52
Stoma formation	71	15.50
Hernia repair	59	12.88
Adhesiolysis	34	7.42
Intestinal resection with anastomosis	22	4.80
Incisional hernia repair	9	1.96
Peritoneal lavage and drainage	4	0.87
Liver abscess drainage	1	0.21

Treatment Outcomes

The mean length of hospital stay was 5 days, ranging from 3 to 29 days.

An uncomplicated postoperative course was observed in 362 patients (79.1%). Postoperative complications occurred in 69 patients, corresponding to an overall morbidity rate of 15%. These included surgical site infections in 50 patients, faecal fistulae in 11, wound dehiscence with evisceration in 5, and deep intra-abdominal infections in 3 patients.

Twenty-seven deaths were recorded, giving an overall mortality rate of 5.9%. Eighteen deaths (3.9%) occurred in patients with generalised acute peritonitis, eight (1.7%) in patients with acute intestinal obstruction, and one (0.2%) in a patient with a strangulated hernia.

DISCUSSION

During the study period, 7,026 patients were assessed in the emergency surgical unit, of whom 4,633 were admitted. Among the admitted patients, 458 underwent surgery for a non-traumatic digestive surgical emergency, corresponding to an in-hospital frequency of 9.8%. This figure is lower than that reported by Kambiré *et al.*, [4] in Burkina Faso (16.7%). This difference may be explained by variations in sample size and the number of patients admitted during the study period. However, our findings are comparable to those reported by Ananivi *et al.*, [1] in Togo.

In the present series, non-traumatic digestive surgical emergencies predominantly affected young adult males, consistent with findings from most published studies on the subject [5–8]. Nevertheless, there is no evidence of a direct relationship between sex and the occurrence of these conditions. In African series, these emergencies mainly affect young adults [1,2,9], which may reflect the predominantly young demographic structure of populations in most sub-Saharan African countries. The mean age of our patients was 40 years.

Low socioeconomic status, the absence of universal health insurance in several African countries, and widespread self-medication contribute to delayed consultation. Such delays inevitably postpone definitive

management and are recognised as important predictors of adverse postoperative outcomes [10,11]. In our study, the mean delay before consultation was 72 hours.

In both traumatic and non-traumatic abdominal surgical emergencies, abdominal pain remains the cardinal presenting symptom [12,13]. It may occur in isolation or in association with other gastrointestinal symptoms and systemic manifestations depending on the underlying pathology. Abdominal pain was present in all patients in our series.

Several clinical presentations are highly suggestive of the principal causes of non-traumatic abdominal emergencies, including localised or generalised peritoneal irritation, intestinal obstruction syndrome, and painful irreducible abdominal wall swelling. These clinical findings may be associated with systemic inflammatory features and varying degrees of general deterioration.

Secondary generalised peritonitis was the most frequent diagnosis in our study. It resulted either from perforation of a hollow viscus or from the spread of an intra-abdominal infectious focus, most commonly complicated appendicitis. These findings are consistent with those reported by Kambiré *et al.*, [4], Kinda *et al.*, [14], Adamou *et al.*, [15], and Kassegne *et al.*, [6].

Perforation of a hollow viscus, particularly perforated gastroduodenal ulcer, represented the leading cause of secondary peritonitis in our series. This may be explained by inadequate prevention and management of peptic ulcer disease, including widespread self-medication, particularly with non-steroidal anti-inflammatory drugs (NSAIDs), as well as the consumption of gastro-irritant substances such as tobacco, alcohol, and spicy foods. Delayed diagnosis and inappropriate treatment of peptic ulcer disease may also contribute to this high prevalence. Similar observations have been reported in other African studies [14,16,17].

Radiological imaging plays a pivotal role in the management of non-traumatic digestive surgical emergencies. Contrast-enhanced abdominopelvic computed tomography (CT) is currently regarded as the diagnostic gold standard. In our series, however, CT was performed in only nine patients. CT is an essential

investigation because it establishes the diagnosis, accurately identifies the anatomical location and underlying cause, assesses disease severity, and guides therapeutic decision-making [18]. Nevertheless, access to CT remains limited in our setting because of financial and logistical constraints.

Where CT is unavailable, abdominal ultrasonography and plain abdominal radiography remain valuable diagnostic alternatives and can often confirm the diagnosis of a non-traumatic digestive surgical emergency [5,19]. However, radiological investigations should never delay definitive surgical management. Before surgery, patients should undergo an appropriate laboratory assessment, including a full blood count, serum creatinine, blood grouping, blood urea, and serum electrolyte measurements [5].

Following adequate preoperative resuscitation, all patients underwent surgical treatment. Open surgery was performed in 98.25% of cases. The preferred approach was a midline laparotomy extending above and below the umbilicus, followed by a McBurney incision. Laparoscopic surgery was reserved for selected cases of uncomplicated acute appendicitis. The limited use of laparoscopy in our series is attributable to the lack of emergency laparoscopic equipment and the limited availability of surgeons with advanced laparoscopic expertise in our setting.

Surgical site infection was the most frequent short-term postoperative complication in our study, a finding that has also been reported in several African series [1,8,12].

The overall mortality rate was 2.18%, which is comparable to the 2.14% reported by Ananivi *et al.*, in Togo [1]. This relatively low mortality rate may be explained by the early management achieved in our institution through a financial support scheme established by the General Directorate of the Brazzaville University Hospital, which subsidises emergency surgical care for patients with limited socioeconomic resources.

CONCLUSION

Non-traumatic digestive surgical emergencies are common in the emergency surgical department of the Brazzaville University Hospital. They predominantly affect young adult males, and secondary generalised peritonitis remains the leading underlying pathology. In our setting, open midline laparotomy extending above and below the umbilicus continues to be the most frequently employed surgical approach. Improving access to early diagnosis, advanced imaging, and minimally invasive surgery could further enhance patient outcomes.

Conflicts of interest: The authors declare no conflicts of interest.

Authors' contributions: All the authors played an active part in drafting and editing the article. They have read and approved the final version of the manuscript.

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