

Surgical Management of Complicated Acute Appendicitis at Brazzaville University Teaching Hospital, Brazzaville

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Abstract

Original Research Article

Objectives: To describe the epidemiological, diagnostic, therapeutic and prognostic characteristics of complicated acute appendicitis managed in the surgical emergency department. **Patients and Methods:** This was a retrospective descriptive and analytical study conducted between 1 January 2021 and 31 December 2023 in the Departments of Medical and Surgical Emergencies and Digestive Surgery at Brazzaville University Hospital. All patients managed for complicated acute appendicitis during the study period were included. Data were analysed using Microsoft Excel 2016. **Results:** During the study period, 179 cases of complicated acute appendicitis were identified among 7,365 patients admitted to the surgical emergency department, corresponding to a hospital frequency of 2.43%. There were 135 male patients, giving a male-to-female ratio of 3.06:1. The mean age was 29.42 ± 9.17 years (range: 18–52 years). Abdominal pain was the most common presenting complaint, localised to the right iliac fossa in 42 patients and generalised to the entire abdomen in 137 patients. Contrast-enhanced abdominal computed tomography (CT) was performed in three patients and demonstrated matted bowel loops suggestive of an appendiceal phlegmon. Plain abdominal radiography was performed in 32 patients, while abdominopelvic ultrasonography was carried out in 61 patients and identified an appendiceal abscess in 28 cases. Appendicectomy was performed in all patients undergoing laparotomy. The mean operative time was 89.06 ± 22.46 minutes. **Conclusion:** Complicated acute appendicitis predominantly affected young adult males and was most commonly diagnosed at the stage of generalised peritonitis. Delayed presentation remained frequent, contributing to advanced disease at admission. Open appendicectomy through laparotomy was the standard surgical approach, with generally favourable postoperative outcomes despite a significant rate of wound infection.

Keywords: complicated acute appendicitis; emergency surgery; appendicectomy; laparotomy; Brazzaville.

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INTRODUCTION

Acute appendicitis is defined as acute inflammation of the vermiform appendix [1]. It represents one of the most common surgical emergencies worldwide [2]. Although generally considered a benign condition, it may become life-threatening when complications develop, including appendiceal abscess, appendiceal phlegmon, generalised peritonitis, or acute intestinal obstruction secondary to paralytic ileus [3].

In sub-Saharan Africa, these complications are frequently associated with delayed consultation, self-medication, and the use of traditional medicine before presentation to hospital [4]. In the Republic of the Congo, uncomplicated acute appendicitis accounts for 21.15% of digestive surgical emergencies [1].

The present study aimed to describe the epidemiological, diagnostic, therapeutic and prognostic characteristics of complicated acute appendicitis managed at Brazzaville University Hospital.

PATIENTS AND METHODS

A retrospective descriptive and analytical study was conducted over a three-year period from 1 January 2021 to 31 December 2023.

The study was carried out in the Departments of Medical and Surgical Emergencies and Digestive Surgery at Brazzaville University Hospital.

All patients managed for complications of acute appendicitis during the study period were included.

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The variables analysed included:

- age;
- sex;
- socioeconomic status, classified as:
- **low:** daily income <1,000 CFA francs;
- **middle:** daily income between 1,000 and 5,000 CFA francs;
- **high:** daily income >5,000 CFA francs;
- delay before consultation;
- source of referral;
- presenting complaint;
- general clinical findings;
- physical examination findings;
- laboratory and imaging investigations;
- preoperative medical management;
- time to surgery;
- surgical approach;
- intraoperative findings;
- surgical procedures performed;
- operative duration;
- postoperative management;
- length of hospital stay;
- postoperative outcomes.

Data were collected retrospectively from patients' medical records, operating theatre registers, and operative reports using a predesigned data collection form. Statistical analysis was performed using Microsoft Excel 2016.

RESULTS

During the study period, 179 cases of complicated acute appendicitis were identified among 7,365 patients admitted to the surgical emergency department of Brazzaville University Hospital, corresponding to an in-hospital frequency of 2.43%.

Male patients predominated, accounting for 135 cases (75%), with a male-to-female ratio of 3.06:1 (Figure 1).

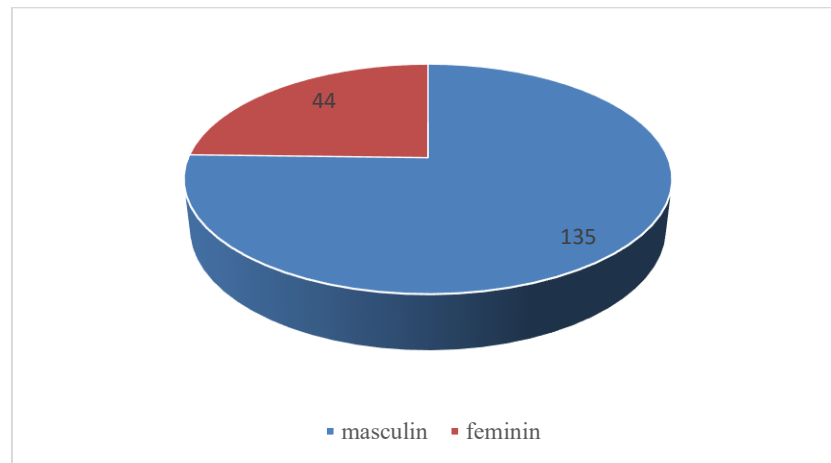


Figure 1: Distribution of patients according to sex

The mean age was 29.42 ± 9.17 years (range: 18–52 years). The most frequently represented age group was 18–27 years (Figure 2).

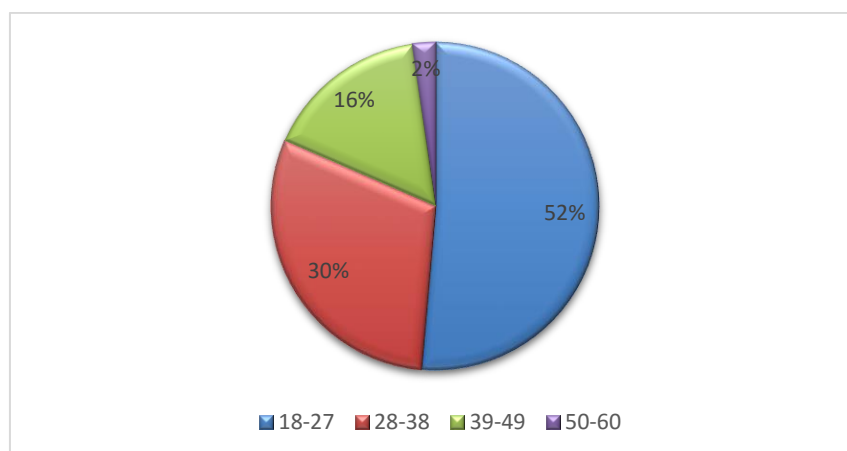


Figure 2: Distribution of patients according to age group

The mean interval between symptom onset and hospital admission was 4.56 ± 1.77 days (range: 2–12 days).

According to socioeconomic status, 97 patients (54%) belonged to the low-income group (Figure 3).

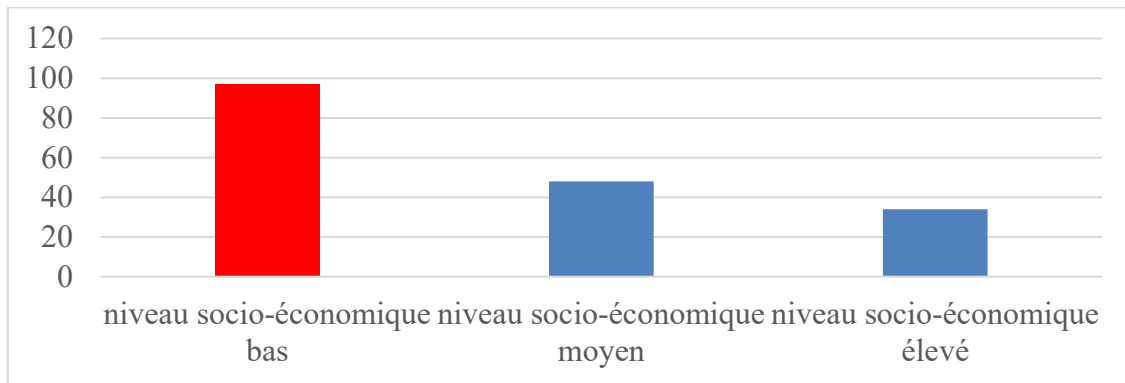


Figure 3: Distribution of patients according to socioeconomic status

Most patients (83%) were admitted directly from home.

Table I: Distribution of patients according to source of referral

Source of referral	Number	%
Home	148	83
Primary health centre	31	17
Total	179	100

Abdominal pain was the principal presenting complaint. It was localised to the right iliac fossa in 42 patients and generalised to the entire abdomen in 137 patients.

Associated symptoms included vomiting in 129 patients, cessation of flatus in 32 patients, and fever in all patients. Four patients presented with haemodynamic instability characterised by arterial hypotension.

On physical examination, diffuse abdominal rigidity ("board-like abdomen") was observed in 103 patients, generalised abdominal guarding in 34 patients, and localised right iliac fossa guarding with an inflammatory mass in 42 patients.

Laboratory investigations included a full blood count, C-reactive protein measurement, serum creatinine, serum electrolytes, and prothrombin time. Neutrophil-predominant leukocytosis was observed in 151 patients and was associated with anaemia in 43 cases. Functional renal impairment was identified in 21 patients. Hyperkalaemia was detected in four patients and hyponatraemia in seven. Prothrombin time was within the normal range in all patients.

Contrast-enhanced abdominal CT was performed in three patients and demonstrated matted bowel loops suggestive of appendiceal phlegmon. Plain abdominal radiography was performed in 32 patients, while abdominopelvic ultrasonography was undertaken in 61 patients, identifying an appendiceal abscess in 28 cases.

Table II: Distribution of patients according to diagnosis

Diagnosis	Number	%
Generalised acute peritonitis	137	77
Appendiceal abscess	24	13
Appendiceal phlegmon	18	10
Total	179	100

All patients received empirical antibiotic therapy consisting of a third-generation cephalosporin combined with an imidazole derivative.

Intravenous fluid resuscitation was required in four patients.

All patients received multimodal analgesia with paracetamol and nefopam.

The mean delay before surgical intervention was 13.96 ± 19.65 hours (range: 2–96 hours).

Ninety per cent of patients underwent a midline laparotomy.

Intraoperatively, the appendix was gangrenous in 101 patients, perforated in 29, and phlegmonous in 31. Appendicectomy was performed in all patients undergoing laparotomy.

The mean operative duration was 89.06 ± 22.46 minutes.

Postoperative recovery was uncomplicated in 148 patients. Surgical site infection was the most frequent postoperative complication, occurring in 19 patients. Four patients died during hospitalisation.

The mean length of hospital stay was 7.17 ± 1.90 days, with a range of 5–11 days.

DISCUSSION

The present study aimed to describe the epidemiological, clinical, laboratory, imaging and therapeutic characteristics of complicated acute appendicitis at Brazzaville University Hospital.

The in-hospital frequency of 2.43% (179 cases among 7,365 admissions) is comparable to that reported by Ouédraogo *et al.*, in Ouagadougou (2.8%) [5], Mboua *et al.*, in Yaoundé (2.9%) [6], and Kamanzi *et al.*, in Kigali (2.6%) [7]. However, it is lower than the 4.1% reported by Diop *et al.*, in Dakar [8]. These differences may be explained by variations in inclusion criteria, accessibility to healthcare services, and the availability of diagnostic imaging.

The marked male predominance observed in our study (male-to-female ratio: 3.06:1) is consistent with previous African studies on appendiceal disease [5,9,10]. This predominance may reflect behavioural and sociocultural factors, particularly delayed healthcare-seeking behaviour among young adult men, who constituted the largest patient group in our series. The mean age of 29.42 years, with a peak incidence between 18 and 27 years, closely resembles the findings reported by Salami *et al.*, in Nigeria (28.6 years) [10] and Nwako *et al.*, (29.1 years) [11], confirming that complicated acute appendicitis predominantly affects young adults in sub-Saharan Africa.

The mean delay before hospital admission was 4.56 days, with some patients presenting as late as 12 days after symptom onset. Such delays remain a major concern. Similar findings have been reported by Bankolé *et al.*, in Benin [12] and Ekwunife *et al.*, in Nigeria [13], who identified low socioeconomic status and self-medication as the principal causes of delayed presentation. In our study, 54% of patients belonged to the low socioeconomic group. Delayed presentation is a major determinant of disease progression towards complicated forms of appendicitis, including generalised peritonitis (77% of our cases), appendiceal abscess (13%), and appendiceal phlegmon (10%). Comparable rates of generalised peritonitis have been reported by Traoré *et al.*, in Mali (74%) [14] and by Togo *et al.*, [15].

From a clinical perspective, generalised abdominal pain (76.5% of cases), associated with abdominal rigidity or a board-like abdomen (57.5%) and universal fever, reflects the severity of disease at presentation. These clinical findings are highly suggestive of advanced peritonitis, which is frequently

diagnosed at a late stage in low-resource settings. Laboratory investigations demonstrated neutrophil-predominant leukocytosis in 84.3% of patients and functional renal impairment in 11.7%, reflecting the systemic inflammatory response and haemodynamic consequences of severe intra-abdominal sepsis.

The very limited use of computed tomography (only three patients) reflects the financial and technical constraints commonly encountered in resource-limited countries. Abdominopelvic ultrasonography was more widely available and was performed in 61 patients, identifying an appendiceal abscess in 28 cases. These findings are consistent with those reported by Niang *et al.*, in Senegal [16] and Oumarou *et al.*, in Niger [17], who emphasised the value of ultrasonography as a first-line imaging modality, with a reported sensitivity of approximately 78% for the diagnosis of appendiceal abscess.

Management was based on empirical antibiotic therapy combining a third-generation cephalosporin with an imidazole derivative, followed by surgery. Midline laparotomy was performed in 90% of patients, with appendectomy undertaken systematically. Despite the heavy workload and limited operating theatre capacity, the mean interval between admission and surgery (13.96 hours) remained acceptable.

Postoperative recovery was uneventful in 148 patients (82.7%). Surgical site infection was the most frequent complication (19 cases; 10.6%), consistent with findings reported in several African studies [3,6,12]. Our surgical site infection rate is comparable to those reported by Hakizimana *et al.*, in Burundi (11.2%) [18] and Togo *et al.*, in Mali (12%) [15].

The overall mortality rate was 2.23% (four deaths), which is lower than the rates reported by Aguehoude *et al.*, in Cotonou (3.9%) [19], Mwangi *et al.*, in Nairobi (4.2%) [20], and Ouédraogo *et al.*, (4.5%) [5]. This comparatively low mortality may reflect improvements in preoperative resuscitation and perioperative care at our institution, although the relatively small sample size precludes definitive conclusions. Soro *et al.*, in Côte d'Ivoire reported a mortality rate of 3.2% [21], while Diop *et al.*, reported 4.8% [8], placing our findings among the lowest mortality rates reported in African series.

CONCLUSION

Complicated acute appendicitis remains a common surgical emergency in Brazzaville, predominantly affecting young adult males from low socioeconomic backgrounds who frequently present after a prolonged delay. This delay contributes substantially to the high proportion of patients presenting with advanced disease, particularly generalised peritonitis.

Improving access to healthcare services, increasing public awareness of the importance of early consultation, and expanding the availability of emergency ultrasonography are essential measures to reduce the morbidity and mortality associated with complicated acute appendicitis in our setting.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Authors' Contributions

All authors contributed substantially to the conception of the study, data collection, manuscript preparation, and critical revision of the article. All authors have read and approved the final version of the manuscript.

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