

Digestive Surgical Emergencies at the “Mother Child” Hospital Center Luxembourg in Mali

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Abstract

Digestive surgical emergencies concern all patients admitted urgently, for whom a decision for surgical intervention may be necessary within 24 hours. They are on guard duty day and night. To carry out this work, we set ourselves the objectives of: 1) Studying digestive surgical emergencies in the general surgery department of the “Mother Child” Le Luxembourg hospital in Bamako, Mali; 2) Determine the frequency of digestive surgical emergencies, 3) Describe the clinical and therapeutic aspects, and 4) Analyze the results of treatment. From November 1, 2022 to October 31, 2023, the general surgery department of the “Mother Child” Luxembourg Hospital Center in Bamako, Mali, carried out 139 digestive surgical emergencies whose files were usable; 75 men and 64 women, a sex ratio of 1.2. The 20 - 40 years old age group was the most represented, at 40.29%. The average age was 39 years; the extremes 16 years and 93 years with a standard deviation of 21.65 years. The reference concerned 51.08% of our patients. Abdominal pain was the main reason for consultation (100% of cases). In the majority of cases, the physical examination made it possible to make the diagnosis. Faced with certain clinical cases, we requested ultrasound (109/139), ASP (46/139) and CT (15/139). The main etiology was acute appendicitis with 42.45% of cases. The frequency of digestive surgical emergencies was 10.71% of all activities in the general surgery department of the “Mère Enfant” Le Luxembourg hospital center in Bamako. All our patients were seen in consultation by an anesthesiologist before entering the operating room. The surgical consequences were complicated in 11.51% of cases with 7.91% deaths. Surgical site infections accounted for

12.5% of postoperative complications. Eleven deaths were noted, representing 68.75% of complications and 7.91% of our sample. Acute peritonitis was the cause of death in 100% of cases. The average cost of care was 329,000 FCFA.

Keywords

Emergency, Digestive Surgery, Post-Operative Complication

1. Introduction

Surgical emergencies concern all patients admitted urgently, for whom a decision for surgical intervention may be necessary within 24 hours [1].

According to the WHO, digestive surgical emergencies are abdominal pain lasting a few hours or a few days related to a surgical pathology, requiring emergency treatment: traumatic or non-traumatic disorder in the abdominal area requiring urgent surgical intervention [2].

In the USA in 2004 by BROWER A.: 1000 patients with an acute abdomen, six surgical etiologies were found (acute appendicitis, acute cholecystitis, acute intestinal obstructions, perforated duodenal ulcer, torsion of the ovarian cyst, rupture of aneurysm) [3].

In France, ETIENNE J.C. *et al.* in 1994: 5 of the first 10 etiologies of abdominal emergencies were surgical (acute appendicitis, acute cholecystitis, acute intestinal obstructions, perforated ulcers, neoplastic pathologies) [4].

In Senegal (1973-1979), PADONOU N. *et al.*: Out of 1167 non-traumatic abdominal emergencies, 5 etiologies (acute intestinal obstructions, acute peritonitis, acute appendicitis, ruptured G.E.U., evisceration) [5].

In Ivory Coast, in 1998 ISSMAILA K. found a rate of 33.32% for digestive surgical emergencies [6]. In Mali according to OUOLOGUEM M.O. in 2009, surgical emergencies: 32.1% of the overall activity of the general surgery department of the Sikasso hospital [7]; Yacouba FANE: 35.1% in Cs. Ref of commune I in 2017 [8] and BERTE I. D.: 19.32% in the surgery department "A" of Point G University Hospital in 2008 [9].

The prognosis for surgical emergencies is serious. KEÏTA S. in 1996 reported a mortality rate of 17% at Point G Hospital [10]. This seriousness would be due to: 1) The delay in diagnosis resulting from a late consultation; 2) The poor conditioning of patients preoperatively, due to lack of equipment. Digestive surgical emergencies are pathologies which occupy an important place in surgery due to their high frequency, their difficult management, and their high morbidity and mortality rate [3].

Surgical emergency requires not only an accurate presumptive diagnosis but also flawless surgical intervention and constitutes a concern for the surgeon due to its frequency and its management which is often multidisciplinary, difficult and complex in our context.

These data show the importance and frequency of digestive surgical emergencies. However, no study has been carried out despite the technical platform and the presence of an intensive care unit at the “Mother-Child” Hospital Center Le Luxembourg Bamako. So we initiated this work by setting ourselves objectives for carrying out this study.

2. Research Methodology

This work was a prospective study running from November 1, 2022 to October 31, 2023. Our study was carried out in the general surgery department of the “Mère-Enfant” Le Luxembourg Hospital Center in Bamako, Mali.

We identified 139 patients during our study period.

- **Inclusion criteria:** Any patient who was admitted to the general surgery department of the “Mother-Child” Hospital Center Le Luxembourg in Bamako for an acute surgical abdomen for which treatment was carried out within 24 hours.
- **Non-inclusion criteria:** Any patient not presenting a digestive surgical emergency and any digestive surgical emergency not operated on in the department.

All patients on admission to the general surgery department underwent a complete clinical examination. At the end of this examination, all those whose diagnostic hypothesis converged towards an acute surgical abdomen were sent for a confirmatory imaging examination; an emergency biological assessment.

Surgical interventions were directed by the surgeon who decided on the surgical technique. All patients were seen and conditioned by the anesthetist on duty before entering the operating room. The patients benefited from a post-operative hospitalization of at least 24 hours in anesthesia-intensive care before being transferred to the surgery department. Complications were looked for at the bedside during the hospitalization period.

3. Results

During our study we recorded 139 cases of digestive surgical emergencies out of 1298 consultations and performed 470 surgical interventions. Digestive surgical emergencies represented 10.71% of consultations and 29.57% of surgical interventions carried out in the department.

The 20 - 40 year old age group was the most represented, at 40.29%. The average age was 39 years with extremes ranging from 16 years to 93 years and a standard deviation of 21.65 years. The male sex was the most represented, *i.e.* 53.96% of cases and a sex ratio of 1.2 in favor of the male sex (**Table 1**). Pupils/students and housewives represented 44.60% of cases, respectively 22.30% each. 51.08% of our patients were referred to us. 67.62% of patients had no medical history; 68.34% without surgical history and 85.61% without gynecological history (**Table 2**).

Abdominal pain was the most frequent functional sign, *i.e.* 97.84% of cases. (**Table 3**) The physical signs were dominated by abdominal contractures

Table 1. Socio-demographic data.

Socio-demographic data		Number	Percentage
Age	15 - 19 years old	19	13.67
	20 - 40 years	56	40.29
	41 - 60 years old	38	27.34
	>60 years old	26	18.70
Occupation	Trader	18	12.95
	Farmer/Worker	26	18.70
	Student/Pupil	31	22.30
	Household	31	22.30
	Others	33	23.74
Sex	Male	75	53.96
	Feminine	64	46.04
Total		139	100

Table 2. Distribution of patients according to mode of admission and history.

Mode of admission and background		Number	Percentage	
Admission method	Referred	71	51.08	
	Came of his own accord	68	48.92	
Background	Medical	HT	21	15.11
		Diabetes	11	7.91
		Asthma	3	3.16
		Sickle cell disease	3	3.16
		Others	7	5.04
		None	94	67.62
	Surgical	Inguinal hernia	8	5.75
		Bowel obstruction	5	3.60
		Acute appendicitis	4	2.88
		Hemorrhoid	4	2.88
Others		3	2.16	
None		95	68.34	
Gyneco-Obstetrics	Caesarean section	9	6.47	
	Uterine myoma	4	2.88	
	Hysterectomy	4	2.88	
	Ovarian tumor	2	1.44	
	Ectopic pregnancy	1	0.72	
	None	119	85.61	
Total		139	100	

Table 3. Distribution according to functional signs and characteristics of pain.

Functional signs and characteristics of pain		Number	Fréquence
Functional signs	Abdominal pain	136	97.84
	Anal pain	3	2.16
	Stopping materials and gases	38	27.34
	Constipation	11	7.91
	Diarrhea	21	15.11
	Vomiting	93	66.91
Seat of pain	Right hypochondrium	7	5.030
	Epigastrium	5	3.68
	Peri-umbilical	18	13.24
	Hypogastrium	6	4.41
	Right iliac fossa	56	41.18
	Left iliac fossa	7	5.03
	Diffuse	37	27.21
	Anal	3	2.16
Type of pain	Burn	35	25.18
	Cramp	29	20.86
	Tingling	42	30.22
	Sting	33	23.74
Total		139	100

(20.14%), abdominal guarding (96.40%) and pain in the Douglas (57.55%) of cases (**Table 4**). The pain was located in the right iliac fossa in 41.18% of cases. Acute appendicitis was the most common diagnosis, *i.e.* 41.01% of cases and acute intestinal obstruction 33.09% of cases. General anesthesia was practiced in 68.35% of cases. Laparotomy was performed in 97.84% of cases and laparoscopy in 3 patients or 2.16% of cases (**Table 5**).

Appendectomy plus burial was the surgical procedure used in 43.88% of cases. The average duration of operating time was between 30 minutes and 1 hour in 41.73% with extremes ranging from less than 30 minutes to more than 1 hour 30 minutes. The duration of hospitalization did not exceed 72 hours in 58.27% (**Table 6**). All our patients (100% of cases) were seen by an anesthetist on call and conditioned before access to the operating room, the complete ionogram of which was requested in 13 patients or 9.35% of cases and 8 patients admitted to intensive care, postoperatively, *i.e.* 5.75% of cases. General anesthesia was performed in 95 patients or 68.35% of cases and loco regional anesthesia in 31.65% of cases (**Table 7**).

Table 4. Distribution of patients according to physical signs, hemoglobin level and rhesus group.

Physical and biological signs		Number	Percentage
Physical signs	Abdominal contracture + TR pain	28	20.14
	Abdominal defense + TR pain	134	96.40
	Meteorism + Abdominal Defense	53	38.13
	Pain in the Douglas at TR	80	57.55
Hemoglobin level	<6 g/dl	1	0.72
	6 - 8 g/dl	10	7.20
	9 - 11 g/dl	21	15.11
	>11 g/dl	107	76.97
Rhesus Group	A+	31	22.30
	A-	7	5.04
	AB+	4	2.88
	B+	32	23.02
	B-	7	5.04
	O+	53	38.13
	O-	5	3.59
Total		139	100

Table 5. Distribution according to the time taken for treatment and pre- and intra-operative diagnosis.

Delay in treatment and diagnosis		Effective	Frequency
Delivery time	<30 mins	6	4.32
	30 mins - 1 hour	58	41.73
	1 hour - 1 hour 30 minutes	22	15.83
	>1 hour 30 mins	53	38.13
Pre diagnosis Operative	Acute appendicitis	57	41.01
	Strangulated hernia	6	4.32
	Acute peritonitis	23	16.55
	Acute intestinal obstruction	46	33.09
	Hemorrhoidal thrombosis	2	1.44
	Appendiceal abscess	5	3.59
Personal diagnosis Operative	Acute appendicitis	59	42.45
	Strangulated hernia	8	5.75
	Peritonitis	20	14.39
	Bowel obstruction	43	30.94
	Hemorrhoidal thrombosis	2	1.44
	Appendiceal abscess	7	5.03
Total		139	100

Table 6. Distribution according to surgical treatment, surgical technique and length of hospitalization.

Surgical treatment, surgical technique and length of stay		Effective	Frequency
Treatment Surgical	Yes	139	100
	Adhesiolysis	15	10.79
	Appendectomy with burial	61	43.88
	Appendectomy + Lavage with drainage	12	8.63
Operating technique	Colostomy	17	12.23
	Hernia repair	6	4.32
	Hemorrhoidectomy	2	1.44
	End-to-end anastomosis resection	16	11.51
	Ileostomy	10	7.19
Length of hospital stay	1 - 3 days	81	58.27
	4 - 7 days	53	38.13
	>7 days	5	3.60
Total		139	100

Table 7. Distribution of patients according to the approach and the type of anesthesia.

Approach and type of anesthesia		Effective	Percentage
Look first	Celiosurgery	3	2.16
	Laparotomy	136	97.84
Type of anesthesia	Locoregional	44	31.65
	General anaesthesia	95	68.35
Total		139	100

Surgical site infections represented 12.5% of post-operative complications or 1.44% of patients, digestive fistulas 18.75% (N = 3/139). Death was the most frequent complication, *i.e.* 68.75% of cases (N = 11/139) (**Table 8**). The average cost of care was 329,000 FCFA with extremes of 107,000 F and 825,000 F CFA.

4. Discussion

The advantage of our study is that it was prospective, allowing the collection of information through the questioning of patients, operating room and hospitalization registers, recording operating reports and individual investigation sheets. However, we encountered certain difficulties, namely:

- 5 surgical units (General Surgery, Trauma-Orthopedic Surgery, Pediatric Surgery, Urological Surgery and Neurosurgery) grouped into a single surgery department making post-operative monitoring difficult by healthcare assistants;

Table 8. Distribution according to operating time, length of hospitalization and post-operative complications.

Operating time/hospitalization duration and post-op complications		Effectif	Fréquence
Duration of surgical intervention	<1 hour	6	4.32
	1 hour - 1 hour 30 minutes	58	41.73
	>1 hour 30 minutes	22	15.83
	Undetermined	53	38.13
Length of hospitalization	1 - 3 days	81	58.27
	4 - 7 days	53	38.13
	>7 days	5	3.60
Postoperative complications	Surgical site infection	2	1.44
	Digestive fistulas	3	2.16
	Death	11	7.91
	None	123	88.49
Total		139	100

- Delay in consulting patients.
- Insufficient medium and long-term post-operative follow-up due to non-compliance with post-operative appointments by patients.

During our study, emergency digestive surgery represented 29.57% of all activities in the general surgery department of the “Mère Enfant” Le Luxembourg Hospital Center in Bamako. Lower rates were found in the study by Berthe I.D. [9] in Mali: 19.32% with $P = 0.0049$. This lower rate compared to that of our study could be explained by the easy access to our Hospital. In Niger Harouna Y. [11] found 25.60%. These data demonstrate the importance of surgical emergencies.

In our series, the most represented age group was 20 to 40 years old with 40.29% of cases.

This result is lower than that of Berthé I.D. who found the same age group in his series with 70% of cases ($P = 0.0031$) [9]. This difference could be due to the size of our sample. Digestive surgical emergencies concern young adults with an average age varying from 30 to 45 years [6] [11] [12], as in our series.

The male gender was predominant, *i.e.* 53.96% with a sex ratio of 1.2; comparable to that of Berthé I. D [9] who found a sex ratio of 2.34 as.

In African, Asian and European literature [5] [11] [13] digestive surgical emergencies concern young adult males. Pupils/students and housewives were in the majority, respectively 22.30% each. This situation has no scientific value because digestive surgical emergencies are not linked to a defined professional activity [9].

Our patients were seen urgently in 51.08%. This is justified by the existence of

an intensive care unit at the “Mother-Child” Luxembourg hospital center in Bamako.

Pain was the first reason for consultation in all patients, *i.e.* 100% of cases.

Its semiological characteristics and other associated signs allowed diagnostic guidance in all our patients. This pain has been reported in the literature as the most frequent reason for consultation [8] [9] [14]. Mabalababela J.R. *et al.* [15] found 100% of cases of pain in their series. The pelvic touch was systematic for diagnostic guidance (80 patients or 57.60% of cases in our study, comparable to that by Sangaré Seydou [16]; 52.50% of cases.

Acute appendicitis was found in 42.45% of cases intraoperatively. These data have been reported in the European literature [4] [8] [13] and African [3] [17]. Our rate (42.45% of cases) corroborates with that of Zoguerech D.D [18], 42.30% of cases ($P = 0.009$) in the RCA and Cassina P. [13], 47.40% ($P = 0.002$). Acute appendicitis is considered the primary etiology of digestive surgical emergencies; described in African series [8] [9]. Our rate is lower than that of Yacouba Fané [8], 59% ($P = 0.0000$) and higher than that of Berthé I. D [9], 21.27% ($P = 0.0015$). This could be linked to the fact that the “Mother Child” center is a third level hospital structure and that appendicitis is treated much better in the CS. Ref only in university hospitals in Mali.

The diagnosis of acute peritonitis was made intraoperatively in 20 cases. In all cases, ultrasound helped to indicate the indication for surgery. Authors [4] [5] [19] reported that ultrasound is the morphological examination of choice in the diagnosis of peritonitis. Peritonitis occupied third place (14.39%) of digestive surgical emergencies after acute appendicitis and intestinal obstruction in our practice. This result is comparable to those of Harouna Y [11], 20.8% with ($P = 0.4678$) and Yacouba Fané [8], 16.5% with ($P = 0.0000$) but higher than that by Lorand M. [20] who found 3% with $P = 0.0000$. We retained preoperatively the diagnosis of hemorrhoidal thrombosis in 2 patients or 2.16% of cases. The diagnosis of hemorrhoidal thrombosis is clinical and should not wait for a paraclinical examination to make the surgical indication because it is a surgical emergency [8]. Our result is statistically lower than a study carried out at the Inezgane prefectural hospital which found 3.33% with $P = 1.4924$. This could be explained by the size of the sample.

Strangulated hernia represented 5.76% of cases in our series. This rate is comparable to that of Samaké B. in Mali [21] which had 4.9% of cases with $P = 0.7201$. It is lower in Europe, *i.e.* 1/1500 of cases for Papagrigroriadas S. *et al.* [22], 1% of cases for Bargy F *et Coll.* [23]. This could be explained by the earlier treatment of hernias in Europe than in Africa.

Acute intestinal obstruction was diagnosed in 43 patients or 30.94% of cases. This rate is comparable to that of Samassékou P. [24] in Mali who found 25.40% of cases. The abdomen without preparation helped with the diagnosis because it was systematic as in the literature [8] [24] [25]. Liver abscess represented 1.44% of cases; comparable to that of Alaoui S.E. O. in Morocco [26] or 0.1% of cases

and that of Kodjoh N, Hountoundji A. or 1.6% of cases in Cotonou [27]. These results show that liver abscess is not a frequent etiology of digestive surgical emergencies.

Post-operative evisceration was observed in 2 patients or 1.44% of cases. This rate is comparable to that of a study carried out in Greece by Pavlidis T.E. *et al.* [24] or 0.46% of cases. During our study we had a single case of digestive fistula, *i.e.* 0.72%, which is comparable to the result of Sacko S. [28] in Mali, *i.e.* 1.2% of cases.

We collected one case of GEU or 0.72%. This result is almost similar to that of Sanogo B. D. in 2012 in Mali [29] who reported a frequency of 0.75%. On the other hand, lower than that of El-Harrach M. [25] in 2017 in Marrakech, Morocco, 1.40%. This difference in proportion could be explained by the size of our samples. Postoperative morbidity was favored by the electrolyte disturbances encountered especially during peritonitis. The postoperative course was simple in 89.21% of cases; complicated in 10.79% of cases. We observed 2 cases of surgical site infection; 3 cases of digestive fistula (N = 139) and 11 deaths or 7.91% of cases. A rate of 4.46% of cases of death was noted by Boubacar B.D. [14] (112) with P = 0.043782 and 6.96% of cases by Dembélé M. [30] in Mali (273) with P = 0.000563. This could be explained by the difference in the size of our samples but also we are 5 surgical units grouped into a single general surgery department where postoperative monitoring was complex for the on-call staff. Peritonitis was the main cause of death in our patients (100%) of cases as reported by Yacouba Fané [8] at Cs REF Commune I (100%) in Mali. The average cost of treatment was 329,000 FCFA with extremes of 107,000 F and 825,000 FCFA. Which is higher than the Guaranteed Minimum Wage, hence the need to popularize universal health coverage.

5. Conclusions

Digestive surgical emergencies occupy an important place in surgical pathology due to their high frequency. The etiologies are multiple and varied, requiring close multidisciplinary collaboration for better care.

Early diagnosis and delay in treatment constitute the main prognostic factors. A well-conducted clinical examination is the key to diagnosis in our context. Paraclinical examinations are sometimes difficult to obtain or provide little contribution and should not delay therapeutic sanction.

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Conflicts of Interest

There is no conflict of interest.

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