

Epidemiological, Clinical, and Therapeutic Characteristics of Acute Appendicitis at the Reference Health Center in Commune I of the District of Bamako Mali

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Abstract

Acute appendicitis is the most common abdominal surgical emergency. This work is a prospective study from January 2012 to December to analyze the epidemiological, clinical and therapeutic aspects of acute appendicitis in the Cs ref of commune I of the district of Bamako and the results obtained were then compared with those reported in other countries. Our study included 72 patients. The appendectomy surgical specimens were the subject of an anatomical pathology study at Point G University Hospital in Bamako in Mali, 1.4% of cases of which were healthy. All our operated patients received antibiotics (mono or dual antibiotics) with a post-operative hospitalization duration of 1.5 (36 hours) days on average. We recorded 6 complications such as parietal suppuration, *i.e.* 8.33% of cases. No 5th day syndrome or late complications were noted. The average length of hospitalization was 36 hours. Abdominal ultrasound; used as an additional examination was carried out in 55 of our patients or 76.39% of cases. We have not recorded any deaths. Raising awareness among patients about the dangers of complications motivated patients to undergo surgery as soon as possible.

Keywords

Acute Appendicitis, Epidemiology, Clinic and Therapy, Surgery, Csref CI, Mali

1. Introduction

Acute appendicitis is an acute inflammation of the vermiform appendix [1] [2].

Acute appendicitis is the most common abdominal surgical emergency; 500 to 600 inhabitants with a predominance among young people [3].

In the USA: hospital frequency of 7.62% to 9.38% of appendicitis between 1993 and 2008 [4]. In Europe and the United States: Incidence: 100 cases per 100,000 inhabitants represented 26% of digestive surgical interventions, including appendicitis in 60% of these appendectomies [5].

In Australia: 103 to 122 cases per 100,000 inhabitants [5] [6].

In black Africa: acute appendicitis had been described as rare, less than 1% [7] [8]. In Central Africa (1991): 42.3% of abdominal emergencies [7].

In Nigeria (2004): 38.9% of surgical emergencies [9].

In Ivory Coast (1984): 30.3% of surgical interventions [10].

Mortality was 0.1% in the uncomplicated form and 1.5% to 5% in cases of appendiceal perforation. The main risk of appendicitis is progression towards appendiceal perforation and then generalized peritonitis, which is life-threatening [11].

The diagnosis is clinical, dominated by pain in the right iliac fossa (Mac Burney point region). The recommended treatment for acute appendicitis is currently surgical [12] [13].

Laparoscopy is less invasive with minimal postoperative complications and a fairly short hospitalization period, which is not feasible in our context.

Has the policy of decentralization in the field of health through the creation of reference health structures been effective in the management of this pathology? Given the scarcity of the work carried out and the high frequency of this appendicular pathology in community reference health centers, we carried out this work.

In Mali: The hospital frequency of acute appendicitis in 1983 (multicenter study) was 6.31% of surgical interventions performed in the three hospitals in Mali: Gabriel TOURE, Point G and Kati [14]. At the Gabriel TOURE hospital in 2003: Appendicitis represented 28.77% of surgical emergencies compared to 37.4% of acute abdomens [15].

2. Research Methodology

This work was carried out in the general surgery department Reference Health Center of Commune I of the District of Bamako. This was a prospective cross-sectional study running from January 1, 2012 to December 31, 2012.

Inclusion criteria: All patients admitted to the general surgery department for acute appendicitis whose diagnosis was confirmed intraoperatively were included in the study. Non-inclusion criteria: Were not included in this study:

1) Patients whose clinical and paraclinical examinations have not revealed any signs of acute appendicitis, 2) Patients operated on for an indication other than appendicitis.

The variables studied were sociodemographic (age, sex, profession, residence); physical examination (general, functional, physical signs); additional examinations (ultrasound); emergency biological assessment (hemoglobin level, hematocrit, Rhesus group, TP, TCK, blood sugar) and surgical treatment: technique and short and medium term operative consequences.

The supports used were the patients' medical files, the outpatient consultation and hospitalization registers, recording the patients' reports, the individual investigation sheet and the anesthesia protocol.

Data entry and analysis were carried out using Epi-info version 3.5.1 software. The comparison tests used are Chi2 and P with a significance threshold of $P < 0.05$. Word processing was carried out on Windows 7 full Word 2007 software.

3. Results

During our study period, 1558 consultations were carried out, 590 surgical interventions carried out including 138 acute surgical abdomens or 23.39% of cases. We identified 72 cases of acute appendicitis, *i.e.* 12.20% of surgical interventions and 52.17% of digestive surgical emergencies.

The age group of 25 to 34 was the most represented, accounting for 51.39% of cases. The average age was 27.26 years with extremes of 15 and 54 years and standard deviation of 9.50. The male sex represented 78% with a sex ratio of 3.5 in favor of men. School age was the most represented with 33.33% of cases. Most of our patients resided in commune I, *i.e.* 65.28% of cases. (**Table 1**)

Pain was the main functional sign, present in all our patients. The pain was located in the right iliac fossa in 79.20%, stinging (44.4%), moderate intensity

Table 1. Socio-demographic characteristics.

	Socio-demographic characteristics	Number	Percentage
Age	15 - 24 years old	9	12.50
	25 - 34 years old	37	51.39
	35 years and over	26	36.11
Sex	Male	56	77.80
	Feminine	16	22.20
Occupation	Pupil/Student	18	25
	Workers	10	13.90
	Peasants	14	19.44
	Household	6	8.33
	Others	24	33.33
Origin	Municipality I	47	65.28
	Other municipalities	9	12.50
	Other regions	16	22.22
Total		72	100

(61.11% of cases) (**Table 2**), fever (72.2% of cases) and 80.55% of our patients took analgesics before their admission to the surgical department. The clinical examination showed pain in the iliac fossa, *i.e.* 98.61% of cases.

Ultrasound revealed uncomplicated acute appendicitis in 83.64% of cases (**Table 3**). Intraoperative diagnosis showed uncomplicated acute appendicitis in 90.28% of cases (see **Figure 1**).

Table 2. History.

	History	Number	Percentage
Functional signs	Nausea/vomiting	64	88.87
	Constipation	24	33.33
	Diarrhea	7	9.70
		72	100
Seat of pain	Pain	57	79.16
	Right iliac fossa	4	5.56
	Umbilical peri	2	2.78
	Epigastrium	9	12.50
Beginning	Others	28	38.89
	Brutal	44	61.11
Type of pain	Progressive	32	44.44
	Sting	25	34.72
	Burn	13	18.06
	Twist	2	2.78
Intensity	Weak	3	4.17
	Moderate	44	61.11
	Strong	25	34.72
Total		72	100

Table 3. Clinical examination and ultrasound results.

	Clinical examination and ultrasound results	Number	Percentage
Physical signs	Pain in the right iliac fossa	71	98.61
	Defense in the right iliac fossa	66	91.66
	Blumberg sign	63	87.50
	Rovsing sign	47	65.28
	Psoitis sign	26	36.11
	Others	9	12.50
Ultrasound results	Uncomplicated appendicitis	65	90.28
	Complicated appendicitis	5	6.94
	Cooled breastplate	2	2.78

The surgical approach was the Mac Burney point in 98.6% of cases. Intraoperatively the appendix was latero-coecal in 41.70%. Burial of the stump was the surgical procedure performed in 94.44%. (Table 4) Postoperative follow-up after ten days was simple in 91.70% of cases. (Table 5) Wall suppuration was observed in 8.30% of cases. Mortality was zero. The average cost of care was 54,820 F CFA with extremes of 34,765 F CFA and 63,765 F CFA. (Table 6)



Figure 1. Acute appendicitis.

Table 4. Treatment.

	Treatment	Number	Percentage
Approaches first	MacBurney	68	94.44
	Jalaquier	4	5.56
	Lateral-cecal	30	41.70
	Meso-caecal	25	34.72
	Retro-cecal	14	19.44
	Pelvic	2	2.78
	Subhepatic	1	1.4
Macroscopic appearance	Catarrhal	45	62.50
	Phlegmonous	12	16.67
	Abscess	10	13.89
	Gangrene	5	6.94
Surgical procedure	Burial of the stump	68	94.44
	Peritoneal washing	15	20.83
	Without burial	2	2.78
Length of hospitalization	A day	65	90.28
	Two days	4	5.56
	Three days	3	4.16
Total		72	100

Table 5. Distribution of patients according to surgical outcomes.

Aftermath of surgery	Effective	Percentage
Simple	66	91.67
Parietal suppurations	6	8.33
Total	72	100

Table 6. The cost of support.

Cost of support	Price in CFA francs
Surgical procedure	20,000
Anesthetic Kit	10,000
Appendectomy kit (Medicines)	14,765
Emergency assessment	10,000
Total	54,765

4. Discussion

Our study was prospective, single-center, running from January 2012 to December 2012.

In 2005 in France, a single-center retrospective study covering two populations (adult and child) in the Nantes region was carried out [16]. The prospective study has the advantage of planning accurately and controlling the data collected, but the retrospective has the advantage of being less expensive and relatively quick. We chose the prospective approach to minimize errors and better answer the different questions of our objective.

During the study period; 1558 consultations were carried out, including 590 surgical interventions. We identified 72 cases of appendicitis, representing 52.17% of digestive surgical emergencies. Acute appendicitis ranks first among surgical emergencies at the Cs ref of commune I. Our rate of 52.17% agrees with those of the authors: Perri S.G. [17] 57% and DIALLO Brahim [18] 56.07%. According to Patel, this high incidence of appendicitis compared to other emergencies is linked to dietary factors, intestinal parasitoses and contiguity infections (Adnexitis) [2].

The sex ratio favoring men [11] [19] [20] does not represent a risk factor according to the literature [4] [14]. Appendicitis is a pathology of young people [3] [8]. According to Becker, its incidence increases from the age of 4 and declines at the age of 40 [5]. The fever is around 37°6 to 38°5 within 24 hours of development. It was found in 72.20% of our patients as in other series [11] [21] [22] [23] [24]; exceeding 38°5 C implies complications [14].

Pain, the main symptom preceding the signs (nausea, vomiting, diarrhea or constipation) are reported at different rates depending on the authors [18] [24] [25]. This pain is located in the vast majority of cases in the right iliac fossa according to the literature [12] [16]. In our series the location of the right iliac fos-

sa (79.20%) does not differ from that of Maïga B. (63.30%) in Mali and Harouna in Niger (62.20%) [15] [26].

Appendicitis has a clinical polymorphism (FID pain, defense in FID, Blumberg sign, Rovsing sign, psaitis, mass in FID, abdominal contracture). The location of the appendix is in the FID; defense in IDF represented 91.66% of cases, although other locations are possible (pelvic, mesocolic, subhepatic [11] [21] [25]).

This rate is comparable to those of the authors: Hartwing [27] 85% $P = 0.98$ and Diallo B. [18] 85% $P = 0.2$. The sign of Blumberg 87.5% in our series is comparable to that of Hartwing 91% with $P = 0.02$ and different from Diawara M. 57.3% with $P = 0.00001$.

This statistical difference could be explained by the use of analgesics masking the physical signs in the Diawara M series. The blood count (CBC) in emergency was difficult to carry out given the performance of our laboratory. It could only be performed in two of our patients [12]. Given the urgency, we can only do the hemoglobin level, hematocrit, rhesus grouping and thick blood flow.

Abdominopelvic ultrasound was the examination of choice in doubtful cases. It was performed in 55 of our patients and revealed appendicular involvement in 54 cases, representing a sensitivity of 98.2%. Some authors [10] [11] [28] [29] [30] believe that its sensitivity varies from 48% to 90% and its specificity from 83% to 100%. This sensitivity drops to 30% in front of an appendix perforated [11]. The Mac Burney incision was the most frequent in all series as in our series: 82.2% in America [11]; 94.2% in France [12]; 65% in Senegal [6] and 94.44% for our series. The median route or the para-rectal route (5.56%) was chosen due to the signs suggestive of a complication for complete exploration.

The laparoscopic approach is not practicable in the reference health centers of Mali except the Point G University Hospital. It allows a panoramic vision of the abdominal cavity, very often corrects the diagnosis, objectifies the associated pathologies and minimizes the risks of post-operative infection. It is also indicated in complications (appendicular abscess) [6] [8].

Wall suppuration was the only cause of morbidity in our study. In addition, other authors have noted fistula of the stump, intestinal obstruction by strangulation of the small intestine or omentum in the surgical solution and post-appendectomy peritonitis [12] [16]. We did not record any deaths unlike other authors [3] [11] [12]. In industrialized countries it is between 0.1 and 0.25% [16].

The average cost of care was 54,250 CFA francs; significantly higher than the Malian SMIG equal to 28,460 F CFA. The cost was increased by the occurrence of complications. Our cost was lower than that of Konaté Madiassa [14] which was 86,750 CFA francs. We have developed an affordable operating kit of 34,765 CFA francs.

5. Conclusion

Acute appendicitis is the most common surgical emergency at the reference

center of commune I of Bamako in Mali. Its treatment in our second-reference health centers is effective (transfer of skills). His diagnosis was essentially clinical. Imagery can be useful in atypical forms and particularly in associated forms. Morbidity and mortality are low subject to early diagnosis and surgical treatment.

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Conflicts of Interest

There is no conflict of interest.

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