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Appendicular Peritonitis in the General Surgery Department of Gabriel TOURE CHU

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Abstract

The appendicular peritonitis is complications of acute appendicitis which are characterized by the diffusion of the infectious process to the peritoneal cavity thus carrying out a generalized or located purulent peritonitis. It can appear from the start or follow the stage of appendicular abscess. Our objectives were to determine the frequency, to describe the clinic and para clinic aspects, to identify the principal germs and their sensitivities to antibiotics and to describe the operative continuations. Our prospective and descriptive study focused on patients treated for appendicular peritonitis, from January 1st to December 31st 2016, in the General Surgery Department of the Hospital of Sikasso. During the period of our study, 31 cases of appendicular peritonitis were collected, which represented 4.36% of surgical interventions, 19.25% of urgent surgeries. The male sex accounted for 71.0% with a sex-ratio of 2.44 at the risk of males, the average age was of 20 years ± 12.99, the abdominal pain + vomiting was the reason for consultation in 54.8% of cases. The physical examination allowed in most cases to make the diagnosis. In doubtful cases some additional examinations have been requested (abdomen without preparation, abdominal ultrasound). The surgical treatment consisted of an appendectomy with peritoneal lavage followed by drainage. The average length of hospital stay was 8.8 days with extremes of 1 - 44 days. Hospital mortality was 9.7%. Delay in consultation and age were factors of morbidity and high mortality.

Keywords

Appendicular Peritonitis, Surgical Emergencies, Hospital of Sikasso

1. Introduction

Appendicular peritonitis is complications of acute appendicitis characterized by the spread of the infectious process to the peritoneal cavity, thus producing generalized or localized purulent peritonitis. It can appear immediately or follow the stage of appendicular abscess [1].

Perforation is the rupture of the wall of the appendix putting its septic contents in communication with the peritoneal cavity [2].

Peritonitis is a medical-surgical emergency because the prognosis can be serious (depends on the patient's age, his general condition and associated defects, the etiology and the delay in surgical management).

Despite effective health coverage in the West, the incidence of appendicular peritonitis does not decrease (20/100,000/year) [3].

Numerous studies carried out on peritonitis caused by digestive perforations [4] [5] [6] [7] have shown the predominance of appendicular perforations.

Flum D.R. *et al.* [8] in the USA in 2001 in a retrospective study on 63,707 appendectomies, found 25.85% of peritonitis by appendicular perforation.

In Europe: Kraemer, M. [9] in 2003 in a prospective multicenter study in 11 surgical departments in Germany and Austria on 519 cases of appendicitis, found 17.7% of peritonitis by appendicular perforations.

In Africa: Chavda S.K. [10] in Kenya in 2005 in a retrospective and descriptive study of 289 patients managed for suspected appendicitis found 29.7% of cases of appendicular perforation with morbidity of 19.4% and zero mortality.

In Mali: Numerous studies have shown the predominance of appendicular perforations in digestive perforations.

Camara B. [4] in 2008 in a retrospective study at the CHU Gabriel Touré found 137 cases of appendicular peritonitis constituting 33.25% of acute generalized peritonitis with 15.3% of complications and a mortality rate of 0.7%.

2. Goals

Describe the epidemiological, therapeutic and evolutionary aspects, identify the main germs and their sensitivity to antibiotics.

3. Methodology

This was a 12-month prospective and descriptive study from January 1, 2016 to December 31, 2016, in the general surgery department of Gabriel TOURE CHU.

All patients operated on for peritonitis whose etiology was appendicular intraoperatively.

All non-appendicular peritonitis and all patients operated outside the ward were not included in the study.

4. Results

During the study period we collected 31 files of appendicular peritonitis which represented 4.36% of surgical interventions, 2.99% of hospitalizations, 19.25% of

emergency surgical interventions, 52.54% of acute peritonitis generalized. The mean age of the patients was 20.42 years with extremes of 4 years and 58 years and a standard deviation of 12.99. The sex ratio was 2.44. Abdominal pain was the main reason for consultation in all of our patients. The average consultation time is 5.7 days, with extremes of 1 and 12 days. Treatment (traditional + medical) was carried out by 17 patients (54.8%). The most common physical signs are summarized in Table 1.

We performed 28 ultrasounds which demonstrated 16 times a cloudy effusion (51.6%), 5 times a thickening of the appendix (16.1%), a cloudy effusion plus a lesion of the appendix in 6 cases, *i.e.* 19, 4% and in one case the appendix was normal (3.2%). Of the 16 unprepared abdomen images taken, we had 6 times hydro-aeric levels (19.4%) and 10 times diffuse grayness (34.2%). Preoperatively, the diagnosis of appendicular peritonitis was made 23 times (74.2%), appendicular abscess 7 times (22.6%) and the diagnosis of occlusion once. The midline supra and subumbilical laparotomy was the most common route in 24 cases (77.4%). In 7 cases the incision at Mac Burney's point was subsequently widened. An appendectomy plus washing and drainage were performed.

The pus collected and the operative parts were sent for anatomy pathology. The germs encountered were: Escherichiacoli5 cases (33.3%), Serratiae 1 case (6.7%) and Staphylococcus aureus 1 case (6.7%) In 8 cases (53.3%) the culture was sterile. The antibiograms performed showed 100% sensitivity of *Escherichia coli*, Seratiae and *Staphylococcus aureus* to cephalosporins and macrolides, 100% resistance to amoxicillin and to ampicillin at what percentage.

The consequences were simple in 23 cases or 74.2%, 5 cases of morbidity or 16.1% (4 superficial wall suppurations, and one digestive fistula), and 3 cases of death or 9.7%.

5. Comments

The frequency of appendicular peritonitis was 19.25% in our study. It does not differ statistically from that found in the African series by Chavda [9] in Kenya, Koumaré [11] in Mali and Flum [7] in the USA, Marudanayaagam [12], despite the delay in consultation and insufficient health coverage (Table 2). Our consultation time of 5.7 days does not differ from that observed in the African series

Table 1. The most common physical signs.

Decreased abdominal breathing	6	19.3
Localizeddefense	6	19.4
Contracture	25	80.6
Abdominal dullness	19	61.3
Abdominal silence	20	64.5
Bulging and painful douglas	14	45.2
Painful Douglas	17	54.8

Table 2. The rate of peritonitis according to the authors (authors too old).

	Chavda Kenya 2005 [9]	Flum USA 2001 [7]	Koumaré Mali 1995 [11]	Marudanay Angleterre 2006 [12]	Nous 2017
Appendicitis	189	63,707	109	1718	112
Appendicular peritonitis %					
Statistical test	29.7 P = 0.6760	25.85 P = 0.6587	28.5 P = 0.8997	13.9 P = 0.00003	27.67

Table 3. Germs according to the authors.

	Jasme K Togo 1990 [1]	Dembélé B Mali 2005 [13]	Nous 2017
E. coli	1er	1er	1er
Klebsiela	2e	2e	3e
Enterobacter	3e	-	-
Streptococus	-	-	-
P aeruginosa	-	3e	2e

of Harouna in Niger [14] and Dembélé of Mali [13] which was on average between 4.5 and 7 days against one day in the series. Faniez French [15] with a p = 0.038. This statistically significant difference could be explained by the practice of self-medication and the traditional treatments received before admission. We found germs at different rates depending on the study. These are the germs known in surgery (**Table 3**). The two cases of sterile pus could correspond to perforations following a parasitic appendicitis, since we did not look for these germs. Although rare, some authors have described bilharzian appendicitis in South Saharan Africa [14].

The therapeutic management was resuscitation for 1 to 2 hours before the operation and continued postoperatively. It was based on electrolyte rebalancing plus a triple antibiotic therapy combining a betalactamine, an aminoglycoside and an imidazole. We had to modify this treatment depending on the results of the antibiogram and the clinical course. Most of the germs isolated in our department were sensitive to these molecules. Median laparotomy was the most common route performed in 91.3% of cases as in other studies [16] [17].

The mesocoeliac position, which is not reported by many authors, was found in 7.4% of cases. This position was responsible for the occlusive forms in our study. This is confirmed in the literature [18]. The preferred area for perforation was the top (distal part) of the appendix in 125 cases, *i.e.* 91.24% against 4 times (2.92%) the middle part and twice (1.46%) at the level from the base. We observed 6 cases of appendicular necrosis, *i.e.* 4.38%. Harouna in Niger [10] reported 4%. So the question arises, if the perforation has no other causes than the vascularization.

All the authors are unanimous on the eradication of the infectious focus, the fight against infection and the assurance of fluid and electrolyte balance [15] [16].

The operative technique was based on appendectomy, toilet and peritoneal

drainage. This drainage is questionable for certain European authors [15] [16]. The consequences were simple in the majority of cases, but we had 15.3% of morbidity which does not differ statistically from those of other African and European authors [10] [13] [19]. The mortality from acute peritonitis varies according to the aetiology. In the African series it varied between 0.7% and 17.9%, against 0% in Belgium [19]. This could be explained by the elevation of the Mannheim peritonitis index score in African studies [13] [20] and the low use of laparoscopic surgery.

6. Conclusion

Appendicular peritonitis is a complication of acute appendicitis. It is frequent and morbid. Mortality remains high despite advances in medicine. The introduction of laparoscopic surgery would improve morbidity in African countries.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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