

# Peritonitis Management through Appendicular Perforation in the Department of Surgery Bougouni Hospital (Mali)

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## Abstract

**Introduction:** Appendicular peritonitis is a complication of acute appendicitis characterized by the spread of the infectious process in the peritoneal cavity thus achieving wide spread or localized purulent peritonitis; it's a medico-surgical emergency. Our objectives are to determine the frequency, describe the clinical, therapeutic and prognostic aspects of peritonitis by appendicular perforations. **Patients-Method:** This was a 24-month retro, prospective, descriptive study from January 1, 2018 to December 31, 2019; conducted in the Bougouni Reference Health Center Surgery Unit. All patients of appendicular peritonitis at the Bougouni Reference Health Centre were included. **Results:** During the study period, 68 cases of generalized acute peritonitis including 30 appendicular peritonitis cases were collected. Appendicular peritonitis accounted for 44.1% of surgical procedures. Males accounted for 71.0% with a sex ratio of 1.2 at risk of men, the average age was 26.07 years. Abdominal pain and vomiting were the reasons for consultation in 86.7% and 76.7% of cases. Physical examination was used in most cases to make the diagnosis. X-ray of the abdomen without preparation, and abdominal ultrasound were performed systematically. Surgical treatment consisted of an appendectomy with peritoneal toilet followed by drainage. The average length of hospitalization was 8.8 days with extremes of 1 - 44 days. Hospital mortality was 3.3%; morbidity and high mortality were related to delayed consultation. **Conclusion:** Appendicular generalized acute peritonitis is a medical-surgical emergency with a high mortality rate associated with delayed management.

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## Keywords

Appendicular, Peritonitis, Surgical Emergencies, Appendectomy

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## 1. Introduction

Appendicular peritonitis is complications of acute appendicitis which is characterized by the spread of the infectious process into the peritoneal cavity, thus producing generalized or localized purulent peritonitis. It can appear immediately or follow the stage of appendicular abscess. Perforation is the rupture of the wall of the appendix putting its septic contents in communication with the peritoneal cavity. Peritonitis is a medical-surgical emergency and the prognosis can be serious.

Despite effective health coverage in the West, the incidence of appendicular peritonitis is not decreasing (20/100,000/year) [1]. Many studies carried out on peritonitis caused by digestive perforations have shown the predominance of appendicular perforations [2] [3] [4] [5] [6]. Flum. DR *et al.* [7] in the USA in a retrospective study of 63,707 appendectomies, found 25.85% of peritonitis by appendicular perforation. In Europe, Kraemer M. [8] 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 perforation. In Africa, Chavda SK [9] in Kenya in 2005 in a retrospective and descriptive study on 289 patients operated on for appendicitis found 29.7% of cases of appendicular perforations with a morbidity of 19.4% and a mortality of zero. In Mali, numerous studies have shown the predominance of appendicular perforations in digestive perforations. SOGOBA G. [4] in a prospective study on non-traumatic digestive perforations obtained a frequency of 60% of appendicular perforations. DARRA MO [5] in a prospective and descriptive study, found 59 cases of acute generalized peritonitis, 84.3% of which were appendicular perforations.

In Bougouni, no study has so far been performed on appendicular peritonitis despite its high frequency. The lack of data on this pathology motivated us to do this work.

## 2. Patients and Method

### **Type and study period:**

This was a 24-month retro prospective and descriptive retro study from January 1, 2018 to December 31, 2019.

### **Study framework:**

The study took place in the general surgery unit of the Bougouni Reference Health Centre

### **Study population:**

All of our patients were recruited from the general surgery unit of the Bougouni Reference Health Centre and operated on for appendicular peritonitis. A

pre-established factsheet collected all the information for each patient.

**Inclusion criteria:**

All patients operated on for peritonitis whose origin was appendicular per operative.

**Non-inclusion criteria:**

Not included in the study were non-appendicular peritonitis, out-of-service surgery patients, and unusable records.

**Data extraction:** was done from texts and possibly tables and figures.

**Parameters studied:** The following parameters were analyzed: patient demographic characteristics (age, gender), clinical presentation, diagnostic confirmation, methods and therapeutic results.

**Statistical method:** The data collected was put together in a database in the form of an Excel<sup>®</sup> table. Variables are expressed as mean or median with extremes. Data analysis was performed using Epi Info 7TM software.

### 3. Results

During the study period we performed 400 surgical procedures, 68 cases of acute peritonitis including 30 cases of appendicular peritonitis. The majority of our patients were between 15 and 30 years old, or 40%. The average age was 26.07 years with extremes of 4 years and 70 years. Males accounted for 60% of cases with a sex ratio of 1.50 in favour of men. 90% of our patients came to the clinic 72 hours after the start of symptomatology, the average consultation time was 4 days. Abdominal pain was the most common reason for consultation with 26 cases or 86.7%, it was accompanied by vomiting in 23 cases or 76.7%; fever in 21 cases or 70%; pulse acceleration of more than 100 pulses per minute in 22 patients or 73.3%; hypotension in 17 patients or 56.7% and polypnea in 22 cases or 73.3%. Pain was diffuse in 25 cases or 83.3%; type of sting and burn in all patients; the onset was gradual in 17 cases or 56.7%; its intensity was average in 15 cases or 50%; 23 cases or 76.7%; spontaneous in 17 cases or 56.7%; it was calmed by painkillers in 17 cases or 56.7%. The clinical examination had found the classic abdominal contracture in all patients. The abdominal ultrasound was performed in all our patients and had found a liquid effusion in 21 patients or 70%. X-ray of the abdomen without preparation was performed in 21 patients, or 70%, and resulted in diffuse blurred greyness and hydro-aeric levels in all patients. All of our patients received preoperative care. It consisted of the installation of a nasogastric probe, a urinary probe, and electrolytic hydro-resuscitation. The type of anesthesia was a general anesthesia with orotracheal intubation. Xi-pho-pubal median laparotomy was performed in all of our patients. Surgical procedures performed were appendectomy, suction of suppuration and drainage of the peritoneal cavity by multi-perforated tubulated drains. The amount of intra-peritoneal effusion was less than 500 ml in 26 cases or 86.7%, the fluid was purulent in all patients. The appendix was punctured at its base in 5 cases or 16.7% and perforated at the top in 25 cases or 83.3%. Immediate surgical fol-

low-ups were simple in 93.3% of our patients or 28 cases. The morbidity rate was 1 case of parietal suppuration or 3.3%. The mortality rate was 3.3%, one case.

#### 4. Discussion

We conducted a 24-month retrospective and descriptive study from January 1, 2018 to December 31, 2019, including 30 patients operated on for appendicular peritonitis. The clearance was based on hospital records and operational reporting records. Difficulties in archiving files, the inadequacy of the technical platform made it impossible to carry out some additional examinations in an emergency, the low purchasing capability of patients made it difficult for some patients to take care of quickly. Despite advances in the management of appendicitis, the frequency of appendicular peritonitis remains high [5] [9] [10] [11]. Appendicular peritonitis accounted for 44.1% of acute peritonitis (68 cases) and 7.5% of all surgical procedures. Sex is not a risk factor for appendicular peritonitis, however the observed male predominance is consistent with the other series [6] [12] [13]. The average age of 26.07 is explained by the youth of the African population [13] [14] [15], on the other hand it is 39.8 years in France [13]. The average consultation time of 4 days is comparable to the African series [5] [12] [15], but lower than in Europe, which is 1 day [2] [13]. This delay in consultation is said to be related to the use of self-medication, traditional first-line treatment, lack of financial means and the absence of a health insurance system. Diffuse abdominal pain remains the dominant functional sign according to several authors [5] [6] [12] [15] [16]. Pain is accompanied by vomiting, stopping materials and gas [14] [17]. The rapidity of installation of general signs is correlated with the severity of peritoneal contamination [2]. Fever is usually high from the onset of the disease. Appendicular peritonitis produces an acute peritonitis picture that is essentially clinically diagnosed. Abdominal contracture is the major physical sign [18] [19]. If the examination is early it can be localized or limited to a simple generalized defense which is the semiological significance [15]. The stillness of the abdomen reflects the peritoneal attack, it is a symptom frequently encountered [2] [5] [20], it was found in 73.3% of our patients. Pain in Douglas' cul-de-sac is of diagnostic interest in peritoneal syndrome and testifies to peritoneal irritation [2] [5]. Abdominal ultrasound has become a routine examination as long as the clinical diagnosis is not typical or to eliminate certain differential diagnoses [20]. Positive signs are a tubular structure more than 6 mm in diameter with sometimes an intra-luminal appendicolith not visible on the abdomen radiography without preparation. It is also possible to see an effusion in the peritoneal cavity perioperative (abscess) or diffuse (peritonitis) knowing that the absence of effusion does not eliminate peritonitis [20]. Undated abdomen x-ray was requested in 30% of our patients because the diagnosis was already done with ultrasound. It allowed for the objective of a diffuse fuzzy greyness in 4 patients (13.3%) and this greyness was associated with hydro-aeric levels in 2 patients or 6.7%. Pneumoperitoneum was not found in our study, its absence in

appendicular perforation appears as a very important distinguishing sign [2] [21]. We did not perform an abdominal scan because of its unavailability. The goal of the treatment of appendicular peritonitis is to eradicate the infectious focus, fight infection and ensure hydro-electrolytic balance. Resuscitation is the first essential time, it combines: the hydro-electrolytic rebalancing by the infusion of solutes through a central venous pathway that allows the repeated measurement of the central venous pressure; the nasogastric tube needed to suck up gastric stasis fluids and quantify water losses; urinary tube for monitoring hourly diuresis and kidney function. All of our patients received resuscitation, this resuscitation was brief in the preoperative period and continued in post-operative. Antibiotic therapy is intended to prevent the spread of the infectious process by combating bacteremia [2]. The products used must be active on aerobic and anaerobic germs, most commonly encountered and have good intra-peritoneal penetration. The combination of aminosides, imidazoles and betalactamines corresponds to this pattern [2]. We used the combination of ciprofloxacin, gentamicin and metronidazole. This association was used by several authors [22] [23] and was in accordance with the recommendations of the French Society of Anesthesia and Resuscitation [24]. Surgical management of appendicular peritonitis accounts for the bulk of therapy. It should be as early as possible. In the face of an appendicular lesion, appendectomy is the rule. The first preferred route was median laparotomy [12] [13]. In France in the series of MARIAGE M. [13] 96.6% of patients were operated on laparoscopy. Appendectomy associated with an abundant peritoneal toilet with physiological salt serum, suction and systematic drainage of the parieto-colic gutters and Douglas cul de sac were performed in all of our patients.

The morbidity rate of 3.3% differs statistically from that of African authors [10] [17], because of our smaller sample size. This was a parietal suppuration in a patient. Mortality from appendicular peritonitis ranges from 1% to 17% in Africa [10] [13] [17] compared to 1.1% in France [13]. The European literature estimates this mortality to be less than 10% [2]. In our series we had one death or 3.3%. The prognostic factors reported in the African series are essentially: the delay in consultation related to certain traditional practices, and the absence of a technical plateau [11] [12]. The causes of death reported in the African series are: septic shock, hypovolemia, digestive fistula and multivisceral failures [5] [12] [13].

## 5. Conclusion

Appendicular peritonitis is one of the most common etiological features. They are characterized by a delay in consultation. Diagnosis is mostly clinical and management is medical-surgical. Although they have a good prognosis; mortality and morbidity are not negligible in developing countries. Improved technical plateau, adequate health coverage and health education could reduce mortality and morbidity.

## Consent

Informed patient consent, from a file pre-established in this context has been obtained. All patients have been informed and have given their consent.

The informed consent: The informed consent form was submitted and explained to all patients. They accepted and signed the form.

## Conflicts of Interest

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

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