



Management of Postoperative Peritonitis (POP) in a Disadvantaged Environment

Fode Baba Toure^{1, 2, *}, Fode Ibrahima Kourala Keita¹, Mamadouba Camara¹

¹Faculty of Health Sciences and Techniques, University of Gamal Abdel Nasser, Conakry, Guinea

²Ignace Deen University Hospital, Conakry, Guinea

Email address:

babafode@gmail.com (Fode Baba Toure), kourala87@gmail.com (Fode Ibrahima Kourala Keita),

drmcamara28@gmail.com (Mamadouba Camara)

*Corresponding author

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Abstract: The aim of this work was to describe the management of POP in a precarious environment. It was a retrospective study of descriptive type from January 2007 to December 2012 on the records of patients with POP. Gender, age, qualification of the operating physician, time to management, initial diagnosis, type of initial surgery, treatment, prognosis were the parameters studied. We noted 32 cases of POP out of 4656 laparotomies, i.e. a frequency of 0.7%. The mean age of our patients was 37.7 years. The sex ratio was 1.3 in favor of the male sex. The majority of our patients were referred from other centers with a rate of 78%. Emergencies accounted for 84% of the initial surgical procedures. Initial diagnoses were dominated by acute appendicitis with a rate of 37.5%. Clinical signs were dominated by abdominal pain 87.5%; vomiting 53.1%; tachycardia 68.7% and fever 75%. The main causes were the release of digestive sutures. The management was multidisciplinary. We noted 41% of favorable follow-up; 9% of morbidity and 50% of death. The delay of the operative recovery, the number of visceral failures, the number of iterative and close reoperations were factors that influenced the prognosis. Post-operative peritonitis rapidly challenges the integrity of most major vital functions. Early diagnosis is the key to improving prognosis.

Keywords: Complications, Postoperative, Reintervention, Surgery

1. Introduction

Postoperative peritonitis (POP) is a secondary and tertiary inflammation of the peritoneal serosa occurring in the immediate or close aftermath of surgical procedures [1]. They are serious complications of abdominopelvic surgery marked by the presence of an intraperitoneal septic focus. These conditions cause the double problem of their recognition and treatment [2].

The frequency of postoperative peritonitis remains low and varies from region to region [3].

The prognosis of this pathology remains serious, despite the technical and human means deployed within the medical-surgical teams. According to Mariette C [4], this seriousness results from the association of three attacks: The initial pathology, the first surgery and the intraabdominal

infectious complication. The addition of these aggravating circumstances is probably responsible for the high mortality reported by articles on postoperative peritonitis: 30 to 50% depending on the series [5, 6]. Of various etiologies, the diagnosis of postoperative peritonitis remains difficult because of the latent character of the local symptoms which contrasts with the intensity and variety of the general manifestations [1, 7].

Because of the length of hospitalization and the cost of care, reoperations for postoperative peritonitis are a drain on the budgets of patients and parents.

The aim of this work was to describe the management of this condition in a precarious environment.

2. Methods

This was a retrospective descriptive study covering a period of six (6) years from January 2007 to December 2012. The general surgery department of the Ignace DEEN University Hospital in the Republic of Guinea served as the setting for this study.

The Republic of Guinea is a country with only two university hospitals (UH) for a population of about ten million in 2011. Access to health care is difficult, and the illegal practice of medicine is commonplace.

All complete records of patients with a diagnosis of postoperative peritonitis managed in the department were included in our study.

Patients who did not receive surgical management were not included.

The parameters studied were: gender, age, qualification of the operating physician, time to management, initial diagnosis, type of initial intervention, treatment, prognosis.

3. Results

We noted 32 cases of POP out of 4656 laparotomies, i.e. a frequency of 0.7%.

The mean age of the patients was 37.7 years with extremes of 9 and 70 years.

We recorded 14 women (44%) and 18 men (56%) with a sex ratio of 1.3.

Twenty-seven patients (71.8%) were initially operated on by general practitioners, eight patients (25%) by surgical interns and only one case (3.1%) by a senior surgeon.

Five patients (16%) had undergone planned surgery and 27 (84%) had undergone emergency surgery during their first procedure.

Acute appendicitis and ileal perforation peritonitis were the main initial diagnoses. Appendectomy and anastomotic resection were the most common procedures performed (see Table 1).

Table 1. Distribution of patients according to the initial diagnosis and the procedure performed.

Initial diagnosis	Number of cases	Gesture performed
Appendicitis	12	Appendectomy
Gastric tumor	2	Gastrectomy-anastomosis
Appendicular peritonitis	2	Toilet-Appendectomy
Peritonitis by ileal perforation	8	Resection-anastomosis
Acute intestinal occlusion	3	Resection-anastomosis
Peptic ulcer perforation	4	Toilet-Excision-Suture
Inguino-scrotal hernia with necrosis	1	Resection-anastomosis
Total	32	

Clinical signs were dominated by abdominal pain 87.5%; Vomiting 53.1% (see Table 2).

Table 2. Distribution of patients according to clinical signs.

Clinical signs	Number of cases
Abdominal pain	28
Vomiting	17
Diarrhea	2
Hoquet	5
Constipation or inability to pass gas	11
Localized defense	7
Umbilical cry	4
Abnormal flow	12
Bulging and painful Douglas	14
Fever	24
Alteration of consciousness	4
Tachycardia	22
Pallor	9
Oliguria	5

The blood count and the blood formula were carried out in 24 patients, they have showed neutrophilic leukocytosis in 58.3% of cases and anemia in 41.6% of cases.

The radiography of the abdomen without preparation (ASP) was carried out in 10 patients (30%). It revealed 6 cases of inter-hepato-diaphragmatic gas crescent; 2 cases of distension of the digestive tract and 2 cases of hydroaerobic level. Abdominal ultrasound was performed in 3 cases (10%) and showed peritoneal effusion. Chest X-ray was performed in 4

cases (12.5%). One patient had a small amount of pleurisy.

The surgical procedure was supervised by resuscitation. Thirteen patients with anemia and a hemoglobin level below 7g/dl were transfused with iso-group, iso-rhesus blood, i.e. 40.6%.

The combination of imidazole, aminoglycoside was performed in (13cases) and Cephalosporin of 3e generation, imidazole, fluoroquinolone in (19cas). No antibiogram was performed.

In this study, appendicular stump release and anastomotic disunion were the most frequent intraoperative findings, 33% each; followed by digestive suture release, 29% and iatrogenic perforation 5%.

All our patients benefited from a median laparotomy above and below the umbilical. A cleansing of the abdominal cavity followed by a drainage in addition to the gesture on the cause of the peritonitis was performed for all patients.

Resection-anastomosis and closure of the appendicular stump were the dominant procedures, respectively 53% and 28%, followed by suture excision 13% and stoma 6%.

The evolution was favorable in 41% of patients. We noted 9% of morbidities and 50% of deaths.

Twelve (12) patients presented a single visceral failure, five (5) of them died, i.e. a rate of 41.6% and two (2) presented two failures at the same time and all died, i.e. a death rate of 100%.

The mortality rate in our study increased with the delay in

management: from 25% for patients operated on in less than 24 hours to 100% for those operated on after 16 days (see Table 3).

A re-intervention was performed in twenty-seven (27) cases with seventeen (17) deaths, i.e. a death rate of 62.9%; two

re-interventions were performed in four (4) patients with three (3) deaths, i.e. a rate of 75%, and three (3) reinterventions in a patient who died, i.e. a death rate of 100%.

The average length of hospital stay was 35.2 days with extremes of 2 and 80 days.

Table 3. Distribution of patients by mortality according to time to recovery.

Deadline	Number of cases	Number of deaths	Mortality in%
<24hours	8	2	25
24 to 48 hours	6	2	33.3
48 to 72 hours	5	2	40
72hours to 7 days	4	2	50
7 to 16 days	8	7	85.7
>16 days	1	1	100
Total	32	12	

4. Discussion

The frequency of POPs was low in this work. The frequency of POPs remains low and varies by country [8, 9]. For us, the reluctance of surgeons to refer patients in time with the high risk of death before patients are admitted to our department would support this low frequency.

In Africa, POP occurs in young patients, unlike in Europe where the average age of onset is 60 years [10, 11]. The mean age of onset in our series is similar to that of Cissé M et al [12] in Senegal who reported a mean age of 38.2 years.

Most authors agree on a male predominance. Mohd. Salman et al [13] noted 47 men for 13 women; Cissé M et al [12] found a sex ratio of 4 M/F.

This male predominance in our study would be related to the high frequency of males among patients admitted for abdominal surgical conditions in the department.

POPs were found after surgical procedures performed by both specialist surgeons and surgeons-in-training and general practitioners.

General practitioners, with no surgical skills and practicing surgery illegally, were the initial operators for most patients.

The lack of specialist surgeons in the country would explain this phenomenon.

Emergency surgery was the biggest source of POP in our study. The urgent nature of the operation in a patient who is not well prepared and operated under often difficult conditions would be in favor of this predominance. The responsibility of the initial cold or emergency intervention in triggering early surgical complications appears to be the most important factor [14].

In this study, POPs were due to acute generalized peritonitis of appendicular origin, by ileal perforation or peptic ulcer; but also to acute operated appendicitis without complications.

In contrast to the study by Cissé M et al [12] where POPs were secondary to flange occlusions with or without necrosis, appendicular peritonitis and post-traumatic ileal wounds.

This fact can be explained by the frequency of these conditions in our country and the supposed triviality of appendectomy by young surgeons.

The clinical data of this work are not different from those reported by other authors. In Dakar, Cissé M et al [12] reported 73.3% abdominal pain; 66.7% fever; 46.7% tachycardia; 40% vomiting; 26.7% abdominal distension; 33.3% abnormal discharge. In Ivory Coast, Mignonsin D et al [15] reported 65.99% abdominal pain; 77.27% fever; 2.72% vomiting; 31.81% functional ileus; 63.63% abdominal distension. In Morocco, Hssaida R et al [16] reported 75% abdominal pain; 68.7% fever; 50% tachycardia; 12.5% abdominal distension.

These signs are difficult to interpret in the postoperative period, which explains the difficulty of diagnosis [17].

Hyperleukocytosis and anemia were the paraclinical signs most found in this work. Anemia was severe and secondary to infection. She required a blood transfusion. Several authors report this finding [12, 16]. The other biological tests do not help to orient the diagnosis before the visceral failure phase [16].

An unprepared abdominal X-ray was not systematically performed; it showed hydro-aerosic levels, gas crescents and distension of the digestive tract.

Abdominal ultrasonography, although poorly performed in our practice, has been used to demonstrate peritoneal effusions. In Morocco, HSSAIDA R et al [16] reported that ultrasound contributed to the diagnosis of POP in 70% of cases.

Abdominal CT scan was not performed in our patients. Abdominal CT is very accurate in the diagnosis of intra-abdominal abscesses and fluid collections. Its sensitivity is about 98% and its specificity 62% [18].

The almost total absence and the difficulties of access to paraclinical examinations in general and imaging in particular in our practice would explain our low rate of realization of the ultrasound and the absence of realization of CT scan.

Release of digestive sutures was the main cause of postoperative peritonitis. Our results are similar to those of Cissé M et al [12] who reported 80% of these etiologies.

These suture releases were due to the emergency context of the pathologies, the contamination of the peritoneal cavity and the operative difficulties.

We also noted iatrogenic lesions related to adhesiolysis.

The understanding of these factors leads to the prophylaxis

of POP; the presence of a soiled abdominal cavity in an emergency context should lead to a preference for stomas over anastomoses. Similarly, adhesiolysis must be prudent and in the case of iatrogenic breaches, stomas should be preferred when the local and general conditions are not suitable for suturing [10].

Surgical treatment had been performed with resections-anastomoses in most cases.

The stoma rate in our study is lower than that reported by Cissé M et al [12] who performed 80% of stomas. In our practice, socio-cultural considerations mean that we perform fewer ostomies.

A peritoneal cavity cleansing followed by drainage was performed in all our operated patients.

Less than half of our patients had a favourable evolution in the immediate postoperative period. The absence of associated defects in our patients meant that our morbidity rate was lower than that reported by Cissé M et al [12] where the morbidity was 33.3%.

The overall mortality of POP remains high and variable from one series to another. The mortality rate in this study is lower than that reported by Mignonsin D et al [15] who found 73.52% deaths and higher than those reported by Toure AO et al [8] and Cissé M [11] in Senegal who noted respectively 24.5 and 33.3% deaths.

This study allowed us to observe a direct relationship between the operating time and mortality. The same finding was reported by Hssaida R et al [16] who revealed that: the mortality which was 50% for patients operated on within 24 hours increased to 75% when the reoperation was performed after 48 hours and the late reoperations beyond 72 hours had a fatal outcome.

The occurrence of visceral failure is frequent during POP. Its impact on the prognosis is mentioned by many authors. Thus Hssaida R et al [16] report that: mortality, which was 25% in the presence of a single failure, rose to 62.5% for two failures and to 100% for more than three failures. This impact of visceral failures is evident in this work. The occurrence of a second failure doubled the mortality rate in the study.

The number of repeat operations also influences the prognosis. Hssaida R et al [16] reported that the mortality rate which was 50% for a single laparotomy increased to 74% for the reoperation and 100% for the third reoperation. This study revealed the same findings with a mortality rate that doubled from the first to the third reintervention.

5. Conclusion

The rate of postoperative peritonitis is low in our context. Digestive suture loosening and anastomotic disunions were the most incriminating causes. They rapidly compromise the integrity of most of the major vital functions. Consequently, it is essential to know the clinical and biological elements and the factors of gravity that require early intervention. Their management remains difficult in a context of poverty and lack of hospital structures with adequate equipment. Mortality

remains high. This mortality could be reduced by an early diagnosis and an adequate management which must be multidisciplinary.

References

- [1] Lefèvre J. H, Parc Y. Postoperative peritonitis *Encycl. Med Chir Gastroenterology* 2012; 9045 A10: Xiongshuang Su, Cheng Chen, Jia Li, Shun Lu & Guihua Xu. (2022). Effect of Polypropylene Microplastics Concentration on Wastewater Denitrification. *Science Journal of Chemistry* (3). doi: 10.11648/J.SJC.20221003.11.
- [2] Hinsdale JG, Jaffe BM. Re-operation for intra-abdominal sepsis: indications and results in modern critical care setting. *Ann surg* 1984; 199: 31-6.
- [3] Montravers P, Iepers S, Popesco D. Postoperative management. Resuscitation of intra-abdominal sepsis after surgery. *Presse Med* 1999; 28: 196-202.
- [4] Mariette C. Principles of surgical management of postoperative peritonitis: *J. Chir, Masson (Paris)*, 2006, 148 (2): 84-87.
- [5] Butler JA, Huang J, Wilson SE. Repeated laparotomy for postoperative intra-abdominal sepsis: an analysis of outcome predictors. *Arch Surg* 1987; 22: 702-6.
- [6] Pacelli F, Doglietto GB, Alfieri S, Piccioni E, Sgadari A, Gui D et al. Prognosis in intra-abdominal infections: multivariate analysis on 604 patients. *Arch Surg* 1996; 131: 641-5.
- [7] Sartelli M1, Griffiths EA2, Nestori M3. The challenge of post-operative peritonitis after gastrointestinal surgery. *Updates Surg.* 2015; 67 (4): 373-81. doi: 10.1007/s13304-015-0324-1. Epub 2015 Aug 12.
- [8] Touré AO, Cissé M, Ka I, Dieng M, Konaté I, Ka O et al. Diffuse post-operative intra-abdominal sepsis: epidemiological, diagnostic and therapeutic aspects at the General Surgery Service of the University Hospital Aristide Le Dantec in Dakar. *Pan Afr Med J.* 2014 Mar 15; 17: 204. doi: 10.11604/pamj.2014.17.204.311.
- [9] Coulibaly B, Togola B, Traoré D, Coulibaly M, Diallo S et al. Postoperative peritonitis in department of surgery B at hospital du Point G. *Mali medical* 2013 tome XXVIII N°3.
- [10] Bader FG, Schröder M, Kujath P, Muhl E, Bruch HP, Eckmann C. Diffuse postoperative peritonitis -- value of diagnostic parameters and impact of early indication for relaparotomy. *Eur J Med Res.* 2009 Nov 3; 14 (11): 491-6. doi: 10.1186/2047-783x-14-11-491. PMID: 19948445; PMCID: PMC3352290.
- [11] Marzougui Y, Missaoui K, Hannachi Z, Dhibi Y, Kouka J, Dziri C et al. Postoperative peritonitis: pronostic factors of mortality. *Arch Inst Pasteur Tunis.* 2014; 91 (1-4): 67-76. French. PMID: 26485772.
- [12] Cissé M, Touré FB, Konaté I, Ka O, Dieng M, Dia A et al. Management of postoperative peritonitis in the Surgical Clinic of Aristide le Dantec Hospital, about 15 cases. *Dakar Médical* 2008; 53: 260-6.
- [13] Mohd. Salman Aquib, Ganesh Ashok Swami. Study of abdominal sepsis in post-operative period after emergency abdominal surgery. *MedPulse International Journal of Medicine.* May 2021; 18 (2): 54-58. <https://www.medpulse.in/Medicine/>

- [14] Tonye TA, Essi MJ, Handy E D, Ankouane A, Minka Ngom E, Ngo Nonga B et al. Early post-operative complications in Yaounde district hospitals: Epidemiological and clinical features. *Health Sci. Dis*: Vol 16 (1) January – February - March 2015.
- [15] Mignonsin. D, Kane. M, Coffi. S, Bondurand. A, N'goui. N. Postoperative peritonitis: diagnosis, treatment, and prognosis about 68 cases. *Médecine d'Afrique Noire* 1990, 37 (7): 397-401.
- [16] Hssaida R, Daali M, Seddiki R, Zoubir M, Elguelaa K, Boughalem M. Postoperative peritonitis in the elderly. *Médecine du Maghreb* 2000; 81: 20-2.
- [17] Hecker, A., Reichert, M., Reuß, C. J. et al. Intra-abdominal sepsis: new definitions and current clinical standards. *Langenbecks Arch Surg* 404, 257–271 (2019). <https://doi.org/10.1007/s00423-019-01752-7>.
- [18] Alzerwi, Nasser A N. "Diagnostic challenges in postoperative intra-abdominal sepsis in critically ill patients: When to reoperate?" *Postępy Higieny i Medycyny Doświadczalnej*, vol. 76, no. 1, 2022, pp. 420-430. <https://doi.org/10.2478/ahem-2022-0032>