



# The Problem of Early Surgical Revisions After Abdominal Surgery, Study About 83 Cases Recorded in Bangui, Central African Republic

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**Abstract:** Objectives: To describe the characteristic of reoperated patients, the predictive factors of morbidity and mortality as well as the evolution after early reoperations. Materials and method: The study included a retrospective and prospective series. The files of patients reoperated after abdominal surgery from January 2014 to December 2019 at the general surgery department of Sino-Central African Friendship University Hospital in Bangui were analyzed. Results: Out of 1249 patients operated on and hospitalized in the surgical department and, 83 (6.6%) patients were reoperated. They were 53% male subjects. The average age was 38.4 years old. An initial intervention was carried out urgently by unqualified operators (71.1%). Postoperative peritonitis (42.2%) was the main reasons for reoperation. Time to reoperation was 8.4 days on average. The founding during reoperation was anastomotic disunity (39.8%). A bypass stoma (33.7%) associated with washing and drainage of the peritoneal cavity was performed. In 19.2% of cases, patients underwent iterative reoperation. The rate of death was 24%. Predictive factors of poor prognosis were, initial surgery for acute peritonitis, dirty surgery, patient with ASA score II and III, NISS 2 and 3, unqualified operators, iterative reoperations and digestive fistula. Conclusion: Early re-operations occurred after emergency surgery performed by an unqualified surgeon. They dependent on high mortality. To reduce rate of early reoperations and improve the prognosis, qualified surgical personnel are needed. Unqualified surgeons must be regularly retrained in essential surgical care with particular emphasis on respecting the basic principles of emergency surgery.

**Keywords:** Surgical Reoperation, Abdominal Surgery, Surgical Emergencies

## 1. Introduction

Reoperation is a new intervention necessary to improve the situation of an operated patient and to avoid a fatal outcome secondary to a complication that arose after the initial operation [1]. Addressing the problems of reoperation comes down to questioning how the initial intervention was carried out [1-3]. In abdominal surgery, postoperative complications can lead to reoperation. But these early reoperations are often

dependent on high postoperative morbidity and mortality due to the complexity of the patient's conditions [2, 3].

In the West Country [1, 4, 5], the frequency of early reoperation varies between 1.1 to 7%. In contrast, in some African regions [2, 3] incidence rates ranging from 3.1 to 22.37% have been reported. In the Central African Republic, given the insufficiency of specialists in the field of surgery, surgical interventions are often carried out by resident surgical doctors, general practitioners, medical students at the end of their cycle and certain non-specialized paramedical personnel.

These categories of unqualified staff work full or part time in national, regional and district hospitals in Bangui as well as in rural areas. When a postoperative complication occurs, patients are generally transferred to the general surgery department for treatment. To date, there is no study on early re-intervention in abdominal surgery in the Central African Republic. Thus, we proposed to conduct this study, the objectives of which follow. The main purpose was to describe the profile of reoperated patients, to determine the reasons for reoperation, the morbidity and mortality factors in patients reoperated early after abdominal surgery.

## 2. Materials and Method

The study was carried out at the general surgery department of the Sino-Central African Friendship University Hospital in Bangui. This was a retrospective study from January 1, 2014 to December 31, 2018 supplemented by a continuous series from January 1 to December 31, 2019. The study population consisted of patients who had undergone abdominal surgery. The target population was represented by patients reoperated early after an initial surgery on the abdominal wall or viscera. The patients included were 16 years old and over hospitalized in the department and reoperated one or more times in the 30 days following a first intervention. Patients reoperated for a complication that occurred more than 30 days after the initial operation and those with an early complication who were not reoperated not included. The sources of data collected were medical records, results of laboratory and imaging examinations, anesthesia records, surgical and hospital reports. For each patient included, a pre-established sheet made it possible to collect data and included the epidemiological variables, the causes of reoperation and the prognostic factors were analyzed. The data collected was analyzed with Epi Info version 7.1 software. The Chi2 statistical test was used to

compare the proportions for a p-value < 0.05 with a 95% confidence interval. The sample size was determined by the number of cases meeting the inclusion criteria. From an ethical standpoint, the data collected was in strict compliance with patient confidentiality. The collection sheets were anonymous and the information provided was used only for the purpose of the study and kept secret.

## 3. Results

### 3.1. The Epidemiological Aspects

During the study period 1,249 patients underwent abdominal surgery, 83 of whom (6.6%) required reoperation. The annual incidence of early reoperation was on average 13.8 cases (Extreme: 12 and 17 cases). The series included 44 male patients (53%) and 39 female patients (47%) (Sex ratio=1.1).

The average age of those who had been operated on was 38.4 years old (Extreme: 16 years old and 90 years old). The proportion of subjects aged 21 to 30 was 27.7%, that of 31 to 40 years, 22.9% and that of 41 to 50 years (16.9%). Over the age of 50, reoperated cases represented 21.6% of the total.

### 3.2. The Study of Initial Operations

Most of the initial operations (72.3%) took place in the general surgery department of the Sino-Central African Friendship University Hospital. The other cases came from provincial hospitals (14.5%), the Bangui Community University Hospital (6%), the Maman Elisabeth Domitien University Hospital in Bimbo (3.6%) and the Beaver Hospital (3.6%). These interventions were performed urgently in 71 patients (85.5%). The other 12 (14.5%) were operated as regulated surgery. They were conducted by non-surgeon operators in 71.1% of cases. Incumbent surgeons only operated in 28.9% of cases. The indications for initial interventions are reported in Table 1.

**Table 1.** Distribution of cases according to the circumstances and the reasons of first intervention.

reasons	interventions circumstances		Total	%
	emergency	Resolved surgery		
Acute generalized peritonitis	24	00	24	28,9
acute appendicitis	16	00	16	19,3
acute bowel obstruction	12	00	12	14,5
Intra-abdominal malignancy tumor	00	07	07	08,4
strangulated hernia	05	00	05	06,0
hemoperitoneum	03	00	03	03,6
acute cholecystitis	00	04	04	04,8
obstetric emergency	07	00	07	08,4
uterine fibroid	00	03	03	03,6
ovarian cyst	00	02	02	02,5
Total	66	17	83	100

The surgical procedures performed during the first operation are reported in Table 2.

**Table 2.** Distribution of reoperated patients according to the procedures performed during the first operation.

surgical procedures	Number	%
appendectomy	21	25,3
peptic ulcer suture	12	14,5
liver suture	02	02,4
intestinal anastomosis	13	15,7
stoma	06	07,2

surgical procedures	Number	%
parietal flange section and adhesiolysis	08	09,6
cholecystectomy	04	04,9
splenectomy	02	02,4
strangulated hernia treatment	05	06,0
uterine suture	07	08,4
myomectomy	03	03,6

### 3.3. The Study of Reoperations

The main reasons that required reoperation are reported in Table 3.

**Table 3.** Distribution of reoperated patients according to surgical indications.

reoperation indications	Number	Percentage
post -operatives peritonitis	35	42,2
enterocutaneous fistula	26	31,3
Post-operative bowel obstruction	11	13,3
hemoperitoneum	03	03,6
surgical site infections	04	04,8
evisceration	04	04,8
TOTAL	83	100,0

The mean time to reoperation was 8.4 days (Extreme 1 and 28 days). In 56.6% of cases, reoperation was performed between the 8th and 14th days after the initial operation.

The lesions found during reoperation were anastomotic disunity (39.8%), digestive fistulas (31.3%), peritoneal collections (10.8%), intestinal necrosis (6%), abdominal wall (3.6%), evisceration (3.6%) and surgical site infections (4.9%).

The surgical procedures performed were stoma (33.7%) digestive anastomoses (19.3%), repair of fistulas (16.9%), section of flanges release of adhesions (16.9%) and repairs parietal (10.8%). A subtotal hysterectomy was performed in two patients (2.4%) operated on initially for post abortion uterine perforation. All these procedures were associated with peritoneal lavage with physiological serum and drainage of the sub phrenic compartments.

### 3.4. The study of Morbidity and Mortality Scores Factors

Many factors of morbidity and mortality were found and reported in table 4.

**Table 4.** Distribution of patients according to Atteimer class contamination, the American Society of Anesthesiologists (ASA) and the National Nosocomial Infection Surveillance (NNIS) scores.

Variables	Number (n=83)	%
Atteimer class contamination		
Clean surgery	14	16,9
clean contaminated surgery	24	28,9
contaminated surgery	17	20,5
dirty surgery	28	33,7
ASA score		
ASA I	28	33,7
ASA II	53	63,9
ASA III	02	02,4
NNIS score		
low risk (1% or score0)	15	18,8
Medium risk (3% or score1)	37	46,2
High risk (7% or score2)	27	33,8
Very high risk (5% or score3)	04	01,2

After the reoperation, 20 patients had died (24.1%). The proportion of deaths among reoperated patients following emergency surgery (90%) was higher than when patients undergoing reoperations following completed procedures (10%). According to the lesions found during reoperation, the death rate was higher after postoperative fistulas and peritonitis

**Table 5.** Distribution of deaths after reoperation according to the intraoperative diagnosis.

Intraoperative diagnosis	Number	death	Percentage
Postoperative fistula	59	11	13,3
post-operative peritonitis	09	05	06,0
intestinal necrosis	05	03	03,6
loose sutures	03	01	01,2
evisceration	03	00	00,0
surgical site infections	04	00	00,0
Total	83	20	24,0

Twenty-three (23) of the re-operated patients (27.7%) presented secondary complications consisting of recurrent fistula (9 cases), secondary peritonitis (3 cases), extensive abdominal wall necrosis (5 cases) and infection of the surgical site (6 cases).

Sixteen (16) reoperated patients (19.2%) underwent iterative reoperation including six (6) twice in a row, four (4) three times in a row and the other six (6) four times in a row.

## 4. Discussion

This study made it possible to determine the frequency of early reoperations after abdominal surgery, which is of the order of 6.6%. This frequency is higher than those reported in the western series [1, 4, 5]. In sub-Saharan Africa, the frequency of early reoperation varies from country to country [2, 4]. On the other hand, our frequency is comparable to that reported by SALEH C et al in Lubumbashi (DRC) where it reaches 22.37% [5]. Indeed, the frequency of reoperation depends on the working conditions of the countries. According to data from the literature [6-9]. The incidence of reoperation is generally very high in developing countries and in sub-Saharan Africa, and is accompanied by a mortality approaching 100% when three visceral failures are associated or when treatment is late as reported in the study by SALEH C and Al [5], the high frequency of reoperation in us is due to the delay in diagnosing the operative complications that arise in the context of abdominal surgery. In addition, this frequency can also be linked to the fact that the initial interventions are performed in an emergency context performed by non-surgeons. These are the circumstances that make the bed of the complication of the operated on due to the general

condition of the operated, the experience of the surgeon and the technical difficulties.

Early reoperations in abdominal surgery are not gender-related, although there is a slight predominance of men [1, 2, 4, 5]. The same is true for age. In general, reoperations in abdominal surgery concern all ages, however in our study the age groups of 21 to 30 years and 31 to 40 years were the most affected.

In our series, emergency surgery accounted for 83.1% of cases. Peritonitis was the main cause (28.9%). They were followed by acute appendicitis and intestinal obstruction respectively in 19.3% and 14.5% of cases. In Yaoundé, reoperations occur after emergency surgery [2] and peritonitis represented 34.5%, followed by intestinal obstruction (26.05%). In Benin, ASSOUTO P and al [10] also reported that acute peritonitis represented the main cause (52.8%) of interventions on the digestive tract". In Europe, some authors [1, 7] have also noted the predominance of diffuse or localized intraperitoneal infections in the indications for digestive surgery. This would increase the risk of developing postoperative infections if aseptic conditions are not rigorous.

The experience and qualification of the surgeon are also determining factors to take into account for the prognosis during surgery [5]. During the period of our study, incumbent surgeons did not operate much (28.9%). The conduct of surgical interventions, especially in emergencies, by unqualified people (71.1%) are probably the cause of inappropriate actions leading to postoperative complications. Our observations are in line with those reported by SALEH C et al in Lubumbashi [5], who reported that 60.7% of interventions were carried out by unqualified operators. Thus, the majority of initial laparotomies (61%) performed by these unqualified operators were complicated and required revision surgery [4]. LAU W et al [11], evaluating the experience of operators on the occurrence of postoperative infections, noted a higher incidence of postoperative infectious complications for appendectomies performed by junior operators than among senior surgeons.

#### Morbidity and mortality factors

The speed of diagnosis and the methods of surgical treatment are two major prognostic factors [5, 12]. When there are warning signs, reoperation should be started as soon as possible [1, 4, 5, 6, 8]. The Beninese series on reoperations in abdominal surgery noted the importance attached to clinical criteria on the decision to reopen [3]. Indeed, the decision to reopen is often subjective and based on the experience of each team [5]. In western countries, the preoperative evaluation of patients proposed for reoperation is based on clinical criteria, imaging, the use of clinical scores, and even the use of laparoscopy [2, 5, 7]. On the other hand, in African countries the detection of signs that may lead to early reoperation varies according to the available means of para-clinical investigations likely to supplement the clinic [2-4]. In our series, the mean time to reoperation was 8.4 days. This period could take 28 days. This delay in care is partly linked to the lack of an emergency management mechanism at the level of

the emergency services. Before operating on an emergency patient, it is the parents of the patients who provide the consumables, which is a factor in the delay in the management of these emergency cases. Because of these difficulties, the surgeon is obliged to perform at the same time of the operation procedures such as sutures or intestinal anastomosis resections sometimes under difficult conditions at the risk of anastomotic disunity.

The nature of the postoperative complications leading to reoperation is also a determining factor in the prognosis. In our study, the causes of reoperation were similar to those often reported by other authors [2-4]. But in our series, we have found out that the number of intestinal anastomosis resections performed in emergency was higher. These procedures carried out in a septic environment are risk factors liable to lead to postoperative complications such as fistulas and disunions, especially since patients received urgently are often operated on late. The lack of surgeons in the general surgery department means that on-call services are run by surgical residents, interns. In the provinces, it is general practitioners and certain nurses who carry out surgical procedures. This situation may explain the high number of postoperative complications requiring reoperation noted during our study.

During the surgical recovery, the nature of the actions performed also determines the postoperative course. It will be a question of limiting the duration of the intervention by proceeding with simple, atraumatic and rapid gestures to save the patient. Generally, digestive diversions should be favored over anastomotic sutures associated with abundant lavage followed by wide drainage of the peritoneal cavity. For our study, most of the reoperations were performed by the incumbent surgeons. Apart from bypass stomas (33.7%), repair sutures for digestive fistulas (16.9%) were also frequently performed. These procedures were accompanied by peritoneal lavage, drainage and delayed or loose skin closure are more or less the strategies described in the literature [12-14].

Among the re-operated cases, the death rate was 24.1%. This rate appears to be slightly higher than those reported in studies in Cameroon (18.1%), Congo (17.65%) and Benin (16.2%) for similar indications [1-6]. In other studies the mortality rate varied between 28 and 50% [1, 5, 6]. Mortality is actually a function of the causes that required recovery and also of the context of their occurrence. This is how we observed that there were more deaths when the indication for the initial intervention was peritonitis, acute appendicitis or cancer ( $\chi^2=0.29$ ;  $p < 0.023$ ). In addition, mortality was also high when the complication which motivated the surgical revision was digestive fistula, postoperative peritonitis or intestinal necrosis ( $\chi^2=0.12$ ;  $p < 0.005$ ). These results were predictable insofar as according to the predictive factors of morbidities and mortality recorded, more than half of the cases operated on initially with dirty surgery and only 18; 8% of patients had a low risk of developing a postoperative infectious complication.

Moreover, it is recognized that in the event of septic abdominal surgery, washing the abdominal cavity alone

cannot lead to a good result in the absence of an antibiotic therapy adapted to the targeted germs. Indeed, CARLET J et al [15] reported that the mortality was low (6%) when an adapted antibiotic therapy was associated with a correct surgical treatment whereas this mortality could reach 71% in the event of inappropriate antibiotic therapy even with a correct surgery. Antibiotic therapy is an essential therapeutic method alongside surgery for improving the prognosis. In principle, patients should benefit from multidisciplinary care including the intervention of a resuscitator. It was not the case in this study where the surgeon was alone with the patients. There are no resuscitators or anesthetists in the Central African Republic. Apart from the mortality which is high in our series, the morbidity was characterized by iterative reoperation, leading to long hospital stays. This morbidity reflects the difficulties encountered during early reoperation in our context.

## 5. Conclusion

Early re-operations occurred after emergency surgery performed by an unqualified surgeon. They dependent on high mortality. To reduce rate of early reoperations and improve the prognosis, qualified surgical personnel are needed. Unqualified surgeons must be regularly retrained in essential surgical care with particular emphasis on respecting the basic principles of emergency surgery. This work is a starting point for other future work on the subject. We suggest that future work focus mainly on surgical site infections and their factors based much more on predictive scores. Progress will be assessed against the decline in early reoperation rates as risk factors.

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