



Epidemioclinical Profile, Therapeutics and Outcome of Patients with Post-Perforation Typhic Peritonitis in DRC in Lomami Province, Luputa Rural Health Zone: 5-Year Retrospective Study at Lusuku Rural Hospital Center

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Abstract

Introduction: Perforations of the small intestine are a common cause of generalized peritonitis, a common condition in surgical practice. It has high morbidity and mortality, and postoperative complications are common. Various techniques have been described for their treatment, without any real consensus on performance. The magnitude of the problem is not fully appreciated, especially in rural areas. The objective of this study is to determine the epidemioclinical character and management of peritonitis secondary to typhoid perforation in a rural setting. **Materials and Methods:** The Observational Study Retrospective Cross-Section Description from April 2018 to April 2023 included 72 records of patients operated for peritonitis on typhoid perforation at the Lusuku Rural Hospital Center in the province of LOMAMI in the DRC. Clinical and paraclinical data (age, sex, Widal), surgical data (surgical technique: excision, suture for perforation repair, resection, anastomosis, postoperative complications, wound evolution, release of digestive sutures) and vital outcome (survivor, death) were considered. **Results:** The frequency of peritonitis due to typhoid perforation has been estimated at 85% of cases of all generalized peritonitis, and 28% of all surgical pathologies. Males were more affected with 57% and the mean age was 22 years. The surgical techniques used for the perforations essentially included: - Excision and simple suturing was

used in 49 patients, whose course was marked by parietal suppuration at 61.2%, and postoperative peritonitis at 10.2%. For this technique, the cure rate is high in patients who have had 1 to 2 perforations with 88%; - Immediate resection and anastomosis was used in 11 patients who had more than 3 distant perforations, among which more than 30% manifested as complications parietal suppuration, more than 20% postoperative peritonitis, about 20% evisceration and 18% digestive fistulas, the mortality rate is 80% in this technique. - Deferred resection and anastomosis preceded by an enterostomy was used in 12 patients with more than 3 perforations, 25% had parietal suppurations as a complication, 8% eviscerations as complications, 17% mortality rate in this technique. **Conclusion:** First-line excision-suture and delayed resection and anastomosis seem to give a better result compared to immediate resection-anastomosis as a surgical technique for peritonitis on typhoid perforation.

Subject Areas

Internal Medicine

Keywords

Profile, Clinical Epidemio, Perforation, Peritonitis, Typhic

1. Introduction

Peritonitis is inflammation of the peritoneum by septic inoculation, most often from an intraperitoneal organ (secondary peritonitis), and more rarely after systemic or haematogenous contamination (primary peritonitis) [1].

It can be either generalized in the large peritoneal cavity, or localized in the subphrenic compartments, parieto-colic gutters and the Douglas fir cul-de-sac. Acute peritonitis is a very common pathology and occupies the second place of surgical acute abdomens after acute appendicitis in rural areas [2] [3] [4].

It is a serious condition that quickly calls into question the integrity of most of the major vital functions, it requires, apart from the indicated surgical procedures and the execution on time, the intensive use of resuscitation resources. The severity of peritonitis varies depending on the country, the duration of the course before treatment, the etiology, the terrain and age of the patients in whom it occurs, the treatment and the techniques used, in addition to the experience of the surgeon. Morbidity and mortality are still very high, especially in developing countries such as ours, where it is a real public health problem, and even more so in rural areas [1] [5] [6] [7].

Typhoid ileal perforations are often the leading cause of peritonitis in endemic areas, especially in children. The management of these patients with acute peritonitis of typhoid origin by ileal perforation continues to remain complex in rural areas and even in many general referral hospitals in peripheral settings, this inspired us to conduct a study on 72 cases of acute peritonitis secondary to

ileal perforations of typhoid origin, operated on over the last 5 years [8] [9] [10] [11].

2. Material and Methods

This is a retrospective cross-sectional descriptive observational study ranging from April 2018 to March 2023 on 72 patients admitted and operated on at the Lusuku Rural Hospital Center for acute peritonitis secondary to ileal perforations of typhoid origin, exhaustively selected. Data collection was done through patient files, patient register, operating room register and the operating protocol of each patient.

Intraoperative data included the number of perforations found, the distance between the perforation and the type of surgical technique of intestinal perforation (a trimmed excision followed by a suture, immediate terminoterminal resection and anastomosis; delayed terminoterminal resection and anastomosis preceded by enterostomy).

The choice of surgical technique depended on the number of perforations, the size of the perforation and the existence of the pre-perforative zones. There are cases that have been repeated more than once, for some we have had to use the same technique and these cases are retained for the same technique applied. The other techniques applied to the takeover case are retained as the case of the last technique applied.

2.1. Inclusion Criteria

Only patients with acute peritonitis due to intestinal perforation of typhoid origin who had a positive, clinically diagnosed, intraoperatively confirmed WIDAL result were selected.

2.2. Exclusion Criteria

All patients who did not meet the inclusion criteria were excluded.

Data were collected manually and entered into Excel (Microsoft USA, 2010) and exported for analysis to Epi info TM software version 7.2.2.6 (CDC, 2018). Excel was also used for the presentation of numbers (for qualitative variables) and tables including observed numbers, frequencies and proportions.

3. Results

The frequency of peritonitis due to typhoid perforation has been estimated at 85% of cases of all generalized peritonitis, and 28% of all surgical pathologies.

Intestinal perforation of typhoid origin affects both sexes, *i.e.* 1:1 ratio with a slight predominance of the male sex, affects more children aged 10 to 20 years (38.8%), the average age was 22 years.

Of the 72 cases of acute peritonitis collected in our study, 49 benefited from the simple technique or simple excision and suture, 11 patients from resection followed immediately by the immediate terminoterminal suture and 12 patients

from resection with the delayed termino-terminal suture preceded by an enterostomy (See **Table 1**).

With regard to the techniques used, it appears that:

- Simple excision and suturing was used in 49 patients, whose course was marked by parietal suppuration at 61.2%, and postoperative peritonitis at 10.2%. But despite these complications, the cure rate was 38/49 cases, or 77.6%, compared to 11/49 cases, or 22.4% mortality rate (**Tables 2-4**).

In addition, the cure rate increases when the number of perforations decreases, as is the case of 35 patients who presented 1 to 2 perforations and who benefited from this technique, it appears that 31 out of 35 cases or 88.6% survived against 4 out of 35 cases or 11.4% who died (**Table 4**).

Table 1. Distribution of cases by age group.

Age Range	Number	%
≤10 Years	17	29.6
11 - 20 Years	28	38.8
21 - 30 Years	8	11.1
31 - 40 Years	7	9.7
41 - 50 Years	9	12.5
51 - 60 Years	1	1.3
≥61 Years	2	2.7
Total	72	100

Table 2. Distribution of cases by technique and evolution.

Technical	Excision and simple suturing		Immediate resection and anastomosis		Resection and delayed anastomosis	
	Number of cases	49		11		12
Healed/Deceased	38	11	3	8	10	2
%	77.6	22.4	27.3	72.7	83.3	16.7

Table 3. Distribution of cases by technique and complication.

Technical Complications	Simple excision and suturing		Resection and immediate anastomosis		Ileostomy and delayed anastomosis	
	49 Case	%	11 Case	%	12 Case	%
Parietal suppurations	30	61.2	4	36.4	3	25
Peritonitis	5	10.2	3	27.2	0	0
Evisceration	3	6.1	2	18.2	1	8.3
Fistula	2	4.1	2	18.2	0	0
Uncomplicated	9	20	0	0	8	66
Total	40/49	81.6	11/11	100	4/12	33.3

Table 4. Distribution of cases by number of holes, techniques and outcomes.

	1 to 2 Holes	3 Holes	≥4 Holes	Total
Simple Excision And Suturing	35 cases	14 cases	0 case	49 cases
Healed	31	7	0	38
%	88.6	50	0	77.5
Deceased	4	7	0	11
%	11.4%	50	0	22.4
Immediate Resection And Anastomosis	0 case	7 cases	4 cases	11 cases
Healed	0	2	1	3
%	0	28.6	25	27.3
Deceased	0	5	3	8
%	0	71.4	75	72.7
Resection and delayed anastomosis	0 case	5 cases	7 cases	12 cases
Healed	0	4	6	10
%	0	80	85.7	83.3
Deceased	0	1	1	2
%	0	20	14.3	16.7

▪ Immediate resection and anastomosis was used in 11 patients with a perforation count of at least 3. The course was generally marked by complications 4 out of 11 cases or 36.4% parietal suppuration, 3 out of 11 cases or 27.2% post-operative peritonitis, 2 out of 11 cases or 18.2% evisceration and 2 out of 11 cases or 18.2% digestive fistulas (**Table 4**).

In the same vein, the mortality rate is higher with this technique, 8 out of 11 cases or 79.7% of patients died compared to 3 out of 11 cases or 27.3% of patients who survived (**Table 2**).

▪ Delayed resection and anastomosis preceded by enterostomy was used in 12 patients with at least 3 perforations. And the evolution was marked by good postoperative outcomes with 3 out of 12 cases, *i.e.* 25% parietal suppuration, and 1 out of 12 cases, *i.e.* 8.3% evisceration as complications. This technique gave very good results with 10 out of 12 cases, *i.e.* 83.3% cure rate, compared to 2 out of 12 cases, 16.7% of operated patients whose nutritional status was already deteriorated who died (**Tables 2-4**).

On this table, the most affected age group is 11 to 20 years old with 28 out of 72 cases or 38.8%, followed by 0 to 10 years old with 17 out of 72 cases or 29.6%.

On this table, we see 38 out of 49 cases or 77.6% of patients cured with the simple technique, 10 out of 12 cases or 83.3% with resection and delayed anastomosis against 8 out of 11 cases or 72.7% of patients who died with immediate resection and anastomosis.

It is noted on this table that suppuration was the complication found in all the techniques used but more found in the excision and simple suturing technique

with more than 60%. However, for the excision and simple suturing technique, 2 out of 10 patients had no complications. For the ileostomy and delayed anastomosis technique, more than 60% of patients did not manifest a complication, but all patients who underwent resection and immediate anastomosis manifested a complication.

On this table, we have a healing rate of 88.6% with the technique of excision and simple suturing on one to 2 ileal perforations.

It is found in **Table 5** that the postoperative mortality of peritonitis due to intestinal perforation was 29% overall.

4. Discussion

Related to epidemiology

➤ The frequency of peritonitis due to typhoid perforation has been estimated at 85% of all cases of all generalized peritonitis, and 28% of all operated pathologies.

This frequency is much higher than that of Harouna, who found 35% of peritonitis by typhoid perforation in all generalized peritonitis, and that of Coulibaly, who estimated it at 32.5% [12] [13].

In relation to other surgical pathologies, our frequency of 28% is within the limits drawn by Akgun Y, between 0.5% and 78.6% [13] [14] [15] [16]. But it is higher than that estimated by Bouzidi at 2.8% and that estimated at 3.13% by Yao [15] [17] [18].

Unlike these studies conducted in large urban centres, ours was conducted in rural areas where sanitary conditions are precarious and where, in the culture of most patients dominated by poverty, prefer traditional care at a lower cost and only go to the appropriate (hospital) health facilities after the episode of complications of the disease. This increases the frequency of complications, in this case typhoid fever, including intestinal perforation that causes peritonitis [11] [19] [20].

➤ Age; all are affected, but the juvenile population is the most affected by this pathology. We noted 38% of patients whose age ranged from 11 to 20 years, 29% whose age was less than or equal to 10 years. The average age is estimated to be 22 years with extremes 3 and 65 years [21].

Our average age found is slightly lower than that found by Manix Ilunga Banza of 23.3 years with extremes 6 and 71 years [22], 34 years old with extremes 5 and 63 years old by Kouame [23].

Table 5. The postoperative case fatality rate of peritonitis.

Evolution	Actual	Percentage
healing	51	70.9
death	21	29.1
Total	72	

But it is slightly higher than that found by Harouna of 20 years with extremes of 4 and 60 years [24]. Nguyen in Vietnam had found that 72.2% of the patients were under the age of 30 [25]. This proves that this pathology affects young people more than old people.

► Related to the therapeutic aspect and patient outcome.

All patients with peritonitis due to typhoid perforation had benefited from pre-, per- and post-operative resuscitation treatment, including the essential gestures, the urinary catheter to qualify the diuresis, and the venous line to combat shock.

Pre- and post-operative antibiotic therapy consisting of ciprofloxacin combined with metronidazole in an almost systematic manner to reduce the degree of sepsis.

For this study we used 3 surgical techniques, all preceded by cleansing, emptying of the perforated intestinal portions and abundant rinsing with lukewarm saline.

The placement of drains is systematic for all techniques, while the placement of the nasogastric tube post-operatively and fasting to be observed up to a minimum of 7 days post-operatively depend on the technique used.

The simple technique of excision and suturing of the breach in separate points was applied in 49 patients or 68% of patients, including 35 cases with 1 to 2 perforations and 14 cases with 3 perforations.

During their evolution, we noted the morbidity of 61.2% related to parietal suppuration, 10.2% related to recurrence of peritonitis, 6.1% related to evisceration and 4.1% to digestive fistula. All complications represent a morbidity rate of 81.6% and an estimated mortality rate of 22.4% for all cases passed by this technique. This mortality rate decreases to 11.4% for patients with at most two perforations and rises to 50% for patients with at least 3 perforations.

Using the same technique, excision and suturing

► Abdoulaye Niangaly in Bamako, found morbidity at 50% dominated by wall suppuration at 35.3%, digestive fistula at 8.8% and evisceration at 5.9% with an estimated mortality rate of 20.59% [26]. This mortality rate swims within the same limits as our study. The only morbidity in our study remains high and this seems to be related to the delay in patient consultation and the level of the technical platform adapted to the rural environment.

► According to Harouna, which also cites several authors, morbidity varies between 25 and 81% and mortality between 3 and 72%, studies conducted in Africa [24] [26].

Using the technique of immediate termino-terminal resection and anastomosis, we found a 100% morbidity dominated by parietal suppurations at 36.4%, peritonitis at 27.2%, evisceration at 18.2% and fistula at 18.2%, this technique resulted in a failure creating with a mortality rate of 72.7%.

► Abdoulaye Niangaly found morbidity of 99.9% including 33.3% parietal abscess, 33.3% digestive abscess and 33.3% hypovolemic shock and a mortality rate of 66.6%, these results are close to our study [26] [27].

► On the other hand, Manix Ilunga Banza in his series has just modified the technique by applying latero-transverse resection and anastomosis. It reports a huge success, a morbidity rate of 31% dominated by parietal infection at 14.5%, stercoral fistula at 9% and 1.8% evisceration and a mortality rate of 5.4% [23] [28].

This high morbidity and mortality in our series seems to be due to the difficulty of resistance of the large sutures in a cavity that is still septic although flushed. And the low vascularization of the terminal ileum compared to other portions (Manix Ilunga Banza) [23].

Ileostomy and delayed anastomosis, using this technique, we found a morbidity rate of 33.3% dominated by parietal suppurations at 25% and evisceration at 8.3%. Mortality was estimated at 16.7%.

► Abdoulaye Niangaly with this technique reports morbidity of 52.3% dominated by wall abscesses 38.1%, evisceration 4.8% and hypovolemic shock at 9.5% and a mortality rate of 38.09% [26].

► Ousseini Adakal speaks of a mortality rate in sub-Saharan Africa and Asia ranging from 4.6% to 75%, while the mortality rate of his study was estimated at 11%. With this technique, the results are within the limits of several studies conducted in sub-Saharan Africa [29].

In all techniques, we noted an estimated overall morbidity of 76.4% and an estimated mortality of 29.2%. These rates are within the range of other studies conducted in Africa estimating the mortality rate of 3% to 72%, these are Abantanga FA, Akgunyi, Ayite AE Yao JG [2] [4] [5] [30].

These rates are (approximate) to the morbidity rate estimated at 51.5% and mortality rate at 29.3% by Abdoulaye Niangaly. This mortality rate is higher than the 13.8% estimated by Sow ML, [26] [31].

These high morbidity and mortality figures in our study are attributable to patients' ignorance, poor sanitary conditions, and delay in presenting to hospital for treatment. But it also depends on several factors such as the level of the technical platform, the characteristics of the germ and the patient himself.

5. Conclusions

Peritonitis due to typhoid perforation is a common and endemic pathology in our area, accounting for 85% of all cases of all generalized peritonitis and 28% of all surgical pathologies admitted and operated on in our facility.

The therapeutic approach outside the medical aspect, consists of a good resuscitation of the patient, pre, per and post-operatively. The surgical component still seems to be codified with several techniques and several studies proving the effectiveness of these techniques. However, in the context of our study, excision and suturing remain the first-line technique in patients with a perforation number not exceeding 2.

And ileostomy and delayed anastomosis resection for patients with intestinal perforations from 3 years of age give good results.

Conflicts of Interest

The authors declare no conflicts of interest.

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