Research Article
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Non-traumatic perforations of the small bowel in pediatric surgery department of the National hospital Donka in Conakry Guinea

Abstract

Introduction: Non-traumatic perforations of the small intestine are conditions with a serious prognosis in the absence of early and effective management. In Guinea, very few studies have been carried out on this subject. The aim of this study was to describe the epidemiological, diagnostic and therapeutic aspects of this condition.

Methodology: This was a retrospective descriptive study. All patients aged less than or equal to 16 years operated on for intra-operatively confirmed non-traumatic perforations of the small bowel between January 1, 2004 and December 31, 2009 were included. Epi-info version 6 FR software was used for data entry and analysis.

Results: A total of 92 patients were registered. Males accounted for 67.0% and the mean age was 9.37 ±1.13 years.

Typhoid perforation was the predominant cause (92.4%). Postoperative outcome was uncomplicated in 32.6% of cases. Parietal suppuration (42.39%), fistula (12%) and peritonitis (5.4%) were the major complications. Mortality due to peritonitis was 23.9%. Mortality from non-traumatic bowel perforation was statistically associated with deterioration in the patient's clinical condition (malnutrition, important weight loss, hemodynamic disorders) ($p < 0.04$); with a delay in management of more than 72 hours ($p < 0.01$); hospital stay ($p < 0.001$); with the number of multiple perforations ($p < 0.0001$); and with a complicated post-operative course ($p < 0.0001$).

Conclusion: Non-traumatic perforations of the small intestine in children were relatively frequent. The vast majority was due to typhoid, and mortality was fairly high.

Keywords: non-traumatic small bowel perforation, pediatric surgery, Donka Hospital, Guinea

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Abbreviations: M± SD, Mean ± standard deviation

Introduction

Non-traumatic perforations of the small intestine is a common complication of typhoid fever and the incidence of which is approximately 100 cases/100.000 habitants in worldwide.[1] They include all spontaneous perforations, as opposed to traumatic perforations secondary to an abdominal wound or contusion.[2] These are conditions with a serious prognosis in the absence of medico-surgical means for early and effective management, as they rapidly compromise the integrity of most major vital functions.[3] These perforations can be distinguished by the diversity of their etiologies, but they share a common therapeutic urgency.[4] The treatment of peritonitis is always based on clinical examination data, which must be supplemented by biological and medical imaging data, which are frequently inadequate in Third World hospitals, making their management difficult and contributing significantly to their morbidity and mortality.[5]

Over the last hundred years, the literature reports that in developed countries, the frequency of spontaneous digestive perforation has decreased, thanks to rising living standards. Conversely, the incidence remains high in developing countries.

Very few studies of non-traumatic perforation of the small intestine in children have been carried out in Guinea

The aim of this work was to describe the epidemiological, diagnostic and therapeutic aspects of non-traumatic small bowel perforation in children in the Pediatric Surgery Department of the Donka National Hospital.

Methodology

Type of study

This was a retrospective, descriptive study aimed at describing the epidemiological, diagnostic and therapeutic aspects of non-traumatic perforated bowel in children.

Study site and population

The study took place in the pediatric surgery department of the CHU de Donka in Guinea Conakry.

Patients were collected over a 5-year period from January 1, 2004 to December 31, 2009. Patients aged 0 to 16 years with intraoperatively confirmed non-traumatic perforations of the small bowel were included in the study. Patients whose records could not

be retrieved and those who did not meet the inclusion criteria were excluded from the study.

Data source and means of collection

Data were collected using a standardized questionnaire. The main sources of data were the medical-surgical records, operative report registers and hospitalization registers.

Variables collected

Information was collected on:

- Patients' socio-demographic characteristics, such as age, gender and place of residence.
- Clinical and paraclinical data.

Statistical analysis plan

The information gathered was entered and analyzed using EPI-info version 7 software. The analysis was carried out in two stages.

- A descriptive analysis, consisting of a description of the study sample. Quantitative variables were presented as means with their standard deviation, and qualitative variables as percentages.
- A univariate analysis was carried out to determine the association between mortality due to perforation and certain explanatory variables, such as age, general condition of the patient on admission, time to treatment, length of hospital stay, number of perforations and postoperative course.

The Chi2 test was used to compare percentages. The significance level was set at 5%.

Ethical aspects

This study was approved by the Faculty of Medicine and Pharmacy of Conakry.

Results

I. Socio-demographic characteristics and mode of admission of patients

A total of 92 patients less than or equal to 16 years with non-traumatic perforated bowel were registered over a 5-year period in the pediatric surgery department of Tonka University Hospital, representing an admission frequency of 18.4 patients per year. The mean age was 9.37 ±1.13 years. Patients were 67.0% male, 81.5% urban and 54.3% were evacuated from a peripheral health center (Table 1).

II. Clinical data and time to patient management

On admission, 80.4% of patients presented with fever and 15.2% with an altered general condition. Questioning revealed abdominal pain in almost all patients (96.7%), nausea and vomiting in over half (52.2%), and bloody diarrhea in 10.2%.

The predominant physical signs were respectively pain in the Douglas with 92.2%; abdominal contracture in 71.7% and tympany in 58.7%. The average consultation time was 2.75±0.35 days (Table 2).

III. Distribution of patients by etiology

Nearly all observed perforations were of typhoid origin (92.4%). In 3.3% of cases, they were linked to diverticular perforation (Figure 1).

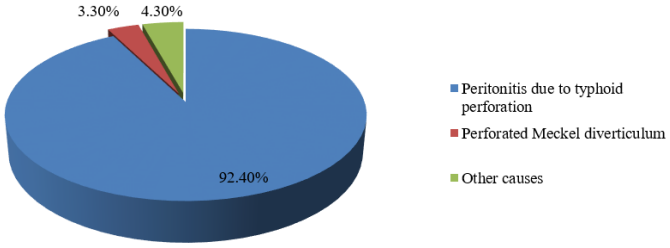

Figure 1 Patient distribution by etiology.

IV. Complementary examinations requested

The unprepared abdominal X-ray showed pneumoperitoneum in 32.2% of patients, diffuse opacity in 32.2% and hydroaerosal levels in 26.7%. Widal serology was positive in 53.7% of patients (Table 3).

V. Distribution of patients according to treatment and post-operative follow-up

Treatment was surgical, with suture excision performed in 81.5% of patients, resection with end-to-end anastomosis in 14.1%, and resection with transitional stoma in 3.3%. The surgical technique was not recorded in 1.1%.

Post-operative complications were straightforward in 32.6%, with parietal infections in 42.39%, fistula (12%), peritonitis (5.4%), evisceration (4.3%), ventration and haemorrhage in 1.1% each. Other complications such as cardiac, respiratory and infectious damage were observed in 22 patients (23.9%). Hospital stay was less than or equal to 30 days in 85.9% of cases (Table 4).

VI. Factors associated with mortality from non-traumatic bowel perforation in children

On univariate analysis, the variables statistically associated with mortality from non-traumatic bowel perforation were deterioration in the patient's general condition ($p < 0.04$); time to care exceeding 72 h ($p < 0.01$); hospital stay exceeding 10 days ($p < 0.001$); number of multiple perforations ($p < 0.0001$); and complicated postoperative course ($p < 0.0001$) (Table 5).

Table 1 Patient distribution by socio-demographic characteristics and mode of admission

Variables	Number (N)	Percentage (%)	Mean± Standard Deviation
Age (years)			9,37±1,13
Sex			
Male	62	67,0	
Female	30	33,0	
Residence			
Urban	75	81,5	
Rural	17	18,5	
Mode of admission			
Came by themselves	7	7,6	
Transferred from another CHU department	35	38,0	
Referred from another health center	50	54,3	

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Table 2 Distribution of patients according to clinical data and time taken to manage them

Variables	N	%	M ± SD
Consultation time (days)			2,75±0,35
≤ 2	71	77,2	
> 2	21	22,8	
General symptoms			
Clinical condition (malnutrition, important weight loss, hemodynamic disorders)	14	15,2	
Fever	74	80,4	
Functional signs on clinical examination			
Abdominal pain	89	96,7	
Vomiting/nausea	48	52,2	
Bloody diarrhea	10	10,8	
Material and gas shut-off	1	1,1	
Physical signs			
Abdominal defense	66	71,7	
Meteorism	44	47,8	
Umbilical cry	74	80,4	
Abdominal contractures	12	13,0	
Abdominal mass	1	1,1	
Percussion tympanism	54	58,7	
Douglas convex and sensitive to rectal touch	83	90,2	

Table 3 Distribution of patients according to additional tests performed and their results

Complementary examinations	N	%	Results
	29	32,2	pneumoperitoneum
	24	26,7	Hydro-aeric level
Unprepared abdominal x-ray (n=90)	11	12,2	Diffuse greyness
	29	32,2	Diffused opacity
	21	23,3	X ray not found
Ultrasound (n=92)	92	100	Fluid effusion
Widal et Félix serology (n=13)	7	53,9	positive
Stool culture (n=2)	2	100	Positive for salmonella
Anatomy pathology (n=1)	1	100	Peritoneal-intestinal granuloma of the ileum

Table 4 Distribution of patients by surgical technique, postoperative course and length of hospital stay

Surgical techniques	N	%	M ± SD
Excision suture	75	81,5	
End-to-end anastomosis resection	13	14,1	
Transient stoma resection	3	3,3	
Not recorded	1	1,1	
Post- operative care			
Simples	30	32,6	
Parietal suppuration	39	42,3	
Evisceration	4	4,3	
Eventration	1	1,1	
Fistula	11	12,0	
Hemorrhage	1	1,1	
Peritonitis	5	5,4	
Other (infectious/cardiac/respiratory)	22	23,9	
Length of hospital stay (Days)			18 ±13,81
≤ 30	79	85,9	
>30	13	14,1	

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Table 5 Factors associated with mortality from non-traumatic bowel perforation in children

Variables	Patient's condition at discharge				Chi2 test	p-value
	Deceased (n=22)		Living (n=70)			
	n	%	n	%		
Age (years) n=92						
≤ 9	13	28,3	33	71,7		0,91
> 9	10	21,7	36	78,3		
General condition on admittance (n=91)						
Altered (Malnourished, weight loss, hemodynamic disorders)	5	35,7	9	64,3		< 0,04
Good	17	22,1	60	77,9		
TREATMENT TIME (HOURS)						
≤ 3	17	20,9	64	79,0		
>3	5	45,5	6	54,6		< 0,01
Length of hospital stay (days)						
≤10	15	0,6	10	0,4		
>10	7	10,6	59	89,4		<0,001
Number of perforations (n=51)						
Unique	10	15,2	56	84,8		
Two or more	12	48,0	13	52,0		0,0001
Operative follow-up (n=91)						
Simple	0	0,0	30	100		
Complicated	22	36,1	39	63,9		0,0001

Discussion

Spontaneous bowel perforations have increased considerably in recent years in the pediatric surgery department of the Donka National Hospital. During the course of our study, a frequency of admission of 18.4 patients per year was observed. The average age of the patients was 9.37 ±1.13 years, and the male sex predominated at 67.0%.This same trend was observed in studies by Dieffaga M in 2005 in Mali and Bobossi G in 2002 in the Central African Republic.[6,7]

In terms of time to admission, 77.2% of patients had consulted within 48 h (≤ 2 days) of the onset of symptoms, with an average delay of 2.75±0.35 days. This relatively high delay could be explained in our series by the delay in patient referrals. However, it was much lower than that reported by Bobossi G. Serengbé et al, but similar to that observed in the study by Harouna Y et al, which was 6.2 days and 3 days respectively.[7,8]

Clinically, 15.2% of patients had an altered general condition on admission. This result was markedly different from that of Sako AS, et al[9]. The predominant functional signs were abdominal pain, nausea and vomiting, which corroborated the authors' data.[7–10] On physical examination, the most common signs were pain in the douglas on rectal examination, abdominal contracture and defensiveness, and tympany. A similar pattern has been reported by Dieffaga M et al,[6] and Bobossi Serengbe G, et al[7].

The absence of a technical platform was a handicap for the urgent performance of certain complementary examinations. Abdominal ultrasound and an unprepared abdominal X-ray (APS) were requested almost systematically. On APS, the images most typical of peritonitis due to perforation of the cecum were pneumoperitoneum in 32.2% and hydroaerosal levels in 26.7%. These rates differ little from those observed in the M Dieffaga study in Mali[6] and the Y Harouna study in Niger.[8] In our study, almost all peritonitis due to perforated bowel was of typhoid origin, and Widal serology should therefore be a systematic examination. However, due to financial constraints and the impossibility of carrying out this examination on an emergency basis at Donka Hospital, 13 patients (14.13%) were able to undergo it, and 53.9% of the results were positive. The rate of completion of Widal serology in our study was significantly lower than those reported by Dieffaga M in Mali in 2005, Bobossi G Serengbe in the Central African Republic and Kouamé BD in Côte d'Ivoire, with completion rates of 100%, 53.3% and 54.54 respectively.[6,7,10] This difference in results could be partly explained by the fact that this examination is not available as an emergency procedure in our series, and by the low socio-economic level of our study sample.

Currently, the most recommended therapeutic strategy is a combination of medical and surgical treatment. This has led to a reduction in morbidity of between 1% and 10% in developing countries.[6]

Evolution was uncomplicated in 32.6% of cases, with parietal infection in 42.39%. This finding corroborates that of Sako AS and YD Harouna[9–11]. Mortality was 23.9%. This rate far exceeds the 9.1% reported by Dieng M, et al[12].

Our high mortality rate could be explained by relatively long admission times, delays in referrals/evacuations, poverty and nosocomial infections.

The average length of hospital stay was 18±13.81 days. This is well below the 25 days reported by G Bikandou, et al[13]. In our study, the average hospital stay was 18 days (1-70) with a standard deviation 13,816; the causes of the delay in admission were linked to a diagnostic delay; self-medication as first intention of parents and the use of traditional therapy.

A statistically significant association was found between mortality due to peritonitis and patients' altered general condition at amission ($p < 0.04$); delay in management beyond 72h ($p < 0.01$); length of hospitalization ($p < 0.001$); number of multiple perforations ($p < 0.0001$) and postoperative complications ($p < 0.0001$) (Table 4).

Conclusion

Our study showed that non-traumatic perforation of the small intestine in children was a relatively frequent condition in the pediatric surgery department of the Donka National Hospital. The vast majority were of typhoid origin. The technical platform was a major handicap for the performance of certain complementary examinations. Infant mortality due to peritonitis was quite high. Information, education and communication campaigns on hygiene and sanitary are essential.

Acknowledgments

None.

Conflicts of interest

The authors declare there is no conflict of interest.

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