

## Original Research Article

# Non-traumatic intestinal perforation in the regional hospital Borgou of Benin: epidemiological and therapeutic characteristics

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**Received:** 06 February 2017

**Accepted:** 02 March 2017

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## ABSTRACT

**Background:** Non-traumatic small bowel perforation is common condition in our income countries. This study aims to determine the pattern of non-traumatic intestinal perforation in our environment.

**Methods:** The demographics, clinical features, relevant investigations, surgery performed and outcome of all the patients confirmed at surgery with intestinal perforation were collected for five years and the data analyzed using version 3.5.1 of Epi Info.

**Results:** Out of the 69 cases involved in this study, there were 46 (66.7%) males and 23 (33.3%) females with a male/female ratio of 2; their mean age was 22.5±13.7 years (range 2 - 68 years). Young people in school constituted 23 (33,34%) of the cases and typhoid intestinal perforation was responsible for 64 (92.8%) cases while ischemic perforation as a result of postoperative flange, strangulated hernia and acute intussusception was responsible in 5 (7.2%) cases. The average duration before presentation in the hospital was 3 days while the average duration between presentation at the hospital and surgery was 2 days. The surgery offered was simple closure after freshening the edges in 35 (50.7%) cases, resection and anastomosis in 28 (40.5%) cases and resection with ileostomy in 6 (8.8 %) cases. The immediate postoperative course was uneventful in 64 (92.8%) case while the mortality was 10 (14.5%). The cause of death was not identified in 3 cases. The average hospital stay was 14.5±12.8 days with extremes of 7 and 55 days.

**Conclusions:** NTIP is relatively common among the causes of widespread acute peritonitis in sub-Saharan Africa and its management remains difficult with high mortality.

**Keywords:** Acute peritonitis, Non-traumatic perforation, Prognosis, Treatment

## INTRODUCTION

The non-traumatic ileal perforation (NTIP) is a common etiology of peritonitis in sub-Saharan Africa.<sup>1,2</sup> It carries an emergency whose surgical treatment remains controversial.<sup>3</sup> Its prognosis is guarded because of the occurrence of frequent and severe postoperative complications. This study aims to determine the pattern

of non-traumatic intestinal perforation in our environment.

## METHODS

It is a retrospective descriptive study performed in the teaching hospital of Parakou (Republic of Benin) over a period of 5 years from 1 January 2010 to 31 December

2014. Were included all patient records in whom the diagnosis of widespread acute peritonitis by NTIP was evoked after clinical examination and confirmed intraoperatively. Each file should include an admission card, a medical observation, an operative report and an anesthesia and resuscitation record sheet. The variables were related to epidemiological data, clinical aspects, results of laboratory tests and macroscopic intraoperative observations.

Were excluded from the study, patient records in whom the diagnosis of ileal perforation was not confirmed intraoperatively and those whose medical records did not contain all the required variables.

Data processing was performed using version 3.5.1 of Epi Info. Any p-value less than or equal to 0.05 was considered statistically significant.

## RESULTS

### *Epidemiological characteristics*

During the study period, 184 patients were operated on for widespread acute peritonitis. The NTIP was the first etiology observed with 77 cases (41.8%). We eliminated 8 cases (10.4%) who did not meet the inclusion criteria. The study therefore focused on 69 cases.

The average age of patients was  $22.5 \pm 13.7$  years, ranging from 2 years to 68 years. The most affected age group was that of adolescents and young adults with 62.3% of cases. The male was predominant with 46 patients against 23 female patients (sex-ratio=2). The young educated people (schoolchildren, pupils and students) represented a third of the sample.

### *Etiological aspects*

Two occurred mechanisms of widespread acute peritonitis were found: infection (64 cases; 92.8%) and ischemia (5 cases; 7.2%). Infectious perforation was probably due to salmonella: in fact, in 64 cases, abdominal pain had occurred with the waning of an infectious syndrome lasting for two to three weeks; stool culture was positive for *Salmonella typhi* for the 4 patients in whom it was performed and blood cultures, done in 10 patients, had also objectified 100% infection with *Salmonella typhi*. Widal test measuring agglutinating antibody titres against *S. typhi* in serum was positive for 50 of 61 patients (81.96%).

Ischemic lesions etiologies were postoperative flange (2 cases), strangulated hernia (2 cases) and acute intussusception (1 case).

### *Therapeutic data*

All patients had received preoperative resuscitation which was continued during and after the operation. It consisted

of a fluid and electrolyte restoration, an emptying of the stomach by nasogastric tube and empirical antibiotic therapy combining 3 different molecules in most cases (Table 1). A urinary catheter was systematically implemented and left permanently for urine output monitoring. A blood transfusion was performed in 5 patients (7.2%). All patients were operated on under general anesthesia.

**Table 1: Distribution of patients by antibiotics.**

	N	%
Triple antibiotic therapy (Beta- lactam, imidazole and aminoglycoside or quinolone)	59	85.5
Bi-antibiotic therapy (Beta- lactam antibiotic and imidazole)	10	14.5
<b>Total</b>	<b>69</b>	<b>100</b>

For 32 patients (46.4%), surgery took place during the first 24 hours. For the remaining 37 (53.6%), it took place more than 24 hours after admission. The average duration before presentation in the hospital was  $3 \pm 2.3$  days while the average duration between presentation at the hospital and surgery was  $2 \pm 1.4$  days. The incision was the midline laparotomy straddling the umbilicus.

Infectious perforations were located on the last 70 cm of the anti-mesenteric side of the ileum. We had counted 95 holes. The perforation was unique for 45 patients and there was no pre-perforative area identified on the ileum for 35 of them. More than one perforation (2-5) was observed in the remaining 24 patients.

The 35 perforations that were unique on the ileum without pre-perforative area had been treated by simple closure after freshening the edges (50.7%). A resection with anastomosis was performed in 28 patients (40.5%) because of the existence of multiple perforations and pre-perforative areas. The one-time procedure involved thus 63 patients (91.2%). Resection with ileostomy was performed in 6 patients (8.8%) because of the importance of sepsis in the peritoneal cavity. It was followed by the restoration of digestive continuity after 3 months.

The immediate postoperative course was uneventful in 64 (92.8%) cases. It was marked by shock of 5 patients (7.2%) and by the death of 4 of them (5.8%). Secondly, complications occurred in 30 cases (43.5%): 20 cases of parietal suppuration (29%), 4 cases of electrolyte disturbances (5.8%), 3 cases of enterocutaneous fistula (4.3%), 2 cases of septic shock (2.9%) and 6 other deaths (2.9%). Total postoperative deaths thus reached 10, an overall mortality of 14.5%. The other causes of these deaths were electrolyte disturbances in 3 patients and were not identified in 3 cases. The deaths were all occurred at the waning of the one-time procedure of the NTIP but the difference was not statistically significant (Table 2). The average

hospital stay was  $14.5 \pm 12.8$  days ranging from 7 to 55 days.

**Table 2: Distribution of NTIP according to the method of treatment.**

	Death	Healing	Total
One-time procedure (excision-suture or sleeve resection)	10	50	60
Two stages procedure (resection with ileostomy + continuity restoration after 3 months)	0	4	4
<b>Total</b>	<b>10</b>	<b>54</b>	<b>64</b>

## DISCUSSION

### *Epidemiological aspects*

According to the authors, the NTIP is a frequent mechanism of widespread acute peritonitis in sub-Saharan Africa: 19.6% for Mèhinto et al at Cotonou, Benin and 21.5% for Eid et al at Al-Ain in the United Arab Emirates, that means about 1 out of 5. On the contrary, they account 4 out of 5 cases (82.2%) according Adegne et al in the region of Sikasso in Mali.<sup>4-6</sup> This could translate the difference in level of food hygiene in these areas.

NTIP is frequent in young males.<sup>3,4,7</sup> They generally feed in the little restaurants and other dubious hygienic eating places.

### *Etiological aspects*

NTIP have many etiologies that vary by region of the world.<sup>5</sup> Typhoid and intestinal tuberculosis are the most common causes in developing countries while in Western countries, Crohn's disease and tumors are at the forefront.<sup>7-12</sup> Other etiologies are found: non-specific acute ileitis, diastatic perforation, radiation enteritis and necrotizing enteritis.<sup>4,13</sup>

### *Therapeutic aspects*

Unanimity is made on the surgical nature of the treatment of the perforation. Likewise, the importance and place of a preoperative, intraoperative and postoperative resuscitation are no longer to talk as long as it does not delay the surgery. According to Pierre, it is the fundamental pillar of successful treatment. Antibiotic therapy should be tailored to the results of the cytobacteriological examination of peritoneal sampling<sup>14,15</sup> In our work context, there is a weak performance of laboratories and lack of financial means of the patients that oblige us to use probabilistic broad-spectrum antibiotics upon the duration of treatment.

According to the French Society of Anesthesia and Resuscitation, surgery should not be delayed for more than a few hours, even if shock persists despite intensive resuscitation.<sup>16</sup> This delay in the surgical management promotes the extension of the peritonitis, blood diffusion of the peritoneal contamination and dropping digestive sutures. Various surgical methods are controversial in the literature.<sup>17,18</sup> The one-time treatment is favored by authors even though both techniques usually employed, sleeve resection and excision-suture, are those which cause digestive complications such as enterocutaneous fistulae.<sup>3,4</sup> Although resection with ileostomy is adapted to these patients, it fraught with problems of availability of colostomy bags in sub-Saharan Africa, their management, their care and the tolerance of ileostomy by patients. Our 48.4% morbidity rate is in the range of 21.2% and 92.2% reported by Udai et al and Oheneh et al.<sup>19,20</sup> These complications lengthen the hospital stay and increase the cost of care.

## CONCLUSION

NTIP is relatively common among the causes of widespread acute peritonitis in sub-Saharan Africa. Its management is difficult and often linked to the long waiting time for surgical treatment. The development of universal health insurance (social security) for sub-Saharan populations in Africa and organization of mutual health insurance could help to reduce the delay and improve care.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was allowed by the authorities of the hospital*

## REFERENCES

1. Kouassi JC, Diane B, Lebeau R, Yénon K, Kouakou B. Traitement chirurgical des perforations de l'intestin grêle d'origine typhique au CHU de Bouaké. *Rev Int Sc Méd.* 2006;8(1):10-3.
2. Sissoko F, Ongoïba N, Béréte S, Diarra S, Coulibaly Y, Doumbia D, et al. Les péritonites par perforation iléale en chirurgie « B » de l'Hôpital du Point « G ». *Mali Med.* 2003;18(1 et 2):22-4.
3. Ayité AE, Tékou HA, Olory-Togbé J-L, James KD, Padonou N. Les perforations non traumatiques du grêle. Une étude multicentrique menée au Bénin et au Togo. A propos de 206 cas. *J afr Chir Digest.* 2001;1(0):37-44.
4. Mèhinto D, Gandaho I, Adoukonou O, Bagnan OK, Padonou N. Aspects épidémiologiques, diagnostiques et thérapeutiques des perforations du grêle d'origine typhique en chirurgie viscérale du Centre National Hospitalier et Universitaire-Hubert Koutoucou Maga de Cotonou. *Med Afr Noire.* 2010;57(11):535-40.

5. Eid HO, Hefny AF, Joshi S, Abu-Zidan FM. Non traumatic perforation of the small bowel. *African Health Sciences.* 2008;8(1):36-9.
6. Adegne N, Seydou D, Nianguiry K, Coulibaly S, Dembélé K, Mamadou D. Les péritonites par perforation intestinale dans la région de Sikasso. Rapport final de l'Institut National de Recherche en Santé Publique (INRSP). Mali, 2009:104p.
7. Bhupendra KJ, Himanshu A, Upendra KS, Debajyoti M, Pankaj KG. Insight into the management of non-traumatic perforation of the small intestine. *J Infect Dev Ctries.* 2010;4(10):650-4.
8. Tade AO, Olateju SO, Osinupebi OA, Salami BA. Typhoid Intestinal Perforations in a Tropical Tertiary Health Facility: A Prospective Study. *East and Central African J Surgery* 2011;16(2):131-7.
9. Lebeau R, Diane B, Brouh Y, Kouamé EK, Boua N. Péritonites aiguës diffuses secondaires non traumatiques: Etiologies et évolution après traitement au CHU de Bouaké (RCI). *J Magh A Rea Med Urg* 2010;17:200p.
10. Sharma MP, Bhatia V. Abdominal tuberculosis. *Indian J Med Res.* 2004;120:305-15.
11. Hu JP. Difficulties in diagnosis and treatment of Cronh disease: *Zhonghua Wei Chang Wai Ke Za Zi.* 2013;16(4):301-3.
12. Kimchi NA, Broide E, Shapiro M, Scapa E. Non-traumatic perforation of the small intestine. Report of 13 cases and review of the literature. *Hepatogastroenterology.* 2002;49(46):1017-22.
13. Wani RA, Fazl QP, Nadeem AB, Wani MA, Tasaduq HB, Fowzia F. Non-traumatic terminal ileal perforation. *World J Emergency Surgery.* 2006;(1):4p.
14. Pierre LE. Péritonites typhiques. *Rencontres chirurgicales des Médecins du Monde.* Deuxième édition 25 Mars. 2006;6:37-40.
15. Purice GI, Andriescu L, Danila R, Radulescu C, Patrascanu E, Dragomir C. The assessment of empiric antibiotherapy in acute secondary peritonitis. *Rev Med Chir Soc Med Nat Iasi.* 2006;110(4):874-8.
16. SFAR. Prise en Charge des Péritonites Communautaires. *Ann Fr Anesth Reanim.* 2001;20:149-54.
17. Zida M, Ouédraogo T, Bandré E, Bonkougou GP, Sanou A, Traoré SS. Iléostomie première des perforations iléales d'origine typhique: 62 cas à Ouagadougou (Burkina Faso). *Med Trop.* 2010;70:267-8.
18. Chalya PL1, Mabula JB, Koy M, Kataraihya JB, Jaka H, Mshana SE. Typhoid intestinal perforations at a University teaching hospital in Northwestern Tanzania: A surgical experience of 104 cases in a resource-limited setting. *World J Emerg Surg.* 2012;7:4.
19. Udai SB, Dinesh J, Jagdish S, Sumita J, Ghan S. Comparative study of operative procedures in typhoid perforation. *Indian J Surgery.* 2003;65(2):172-7.
20. Oheneh-Yeboah M. Postoperative complications after surgery for typhoid ileal perforation in adults in Kumasi. *West Afr J Med.* 2007;26(1):32-6.

**Cite this article as:** Allode AS, Dossou FM, Hodonou AM, Séto M, Gbessi GD, Sambo BT, et al. Non-traumatic intestinal perforation in the regional hospital Borgou of Benin: epidemiological and therapeutic characteristics. *Int Surg J* 2017;4:1376-9.