SAS Journal of Surgery
Abbreviated Key Title: SAS J Surg
ISSN 2454-5104
Journal homepage: https://www.saspublishers.com

OPEN ACCESS

Surgery

Ileal Perforations of Typhic Origin in Children in the Sominé Dolo Hospital Surgery Service

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DOI: 10.36347/sasjs.2024.v10i06.017 | **Received:** 09.05.2024 | **Accepted:** 14.06.2024 | **Published:** 21.06.2024

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Abstract **Original Research Article**

***Objective*:** Study peritonitis by ileal perforation of typhic origin in children in the general surgery service of the Sominé Dolo hospital in Mopti. ***Method*:** It was a prospective study on children aged 0 to 15 having been operated for peritonitis by ileal perforation of typhic origin produced at Sominé Dolo Hospital in Mopti over a period of 12 months going from January to December 2018. ***Results*:** We have identified 35 cases of ileal perforation of typhic origin which represented 22.3 % of all peritonitis (n = 157). The average age was 8.7 ± 3.5 years (extremes : 1 and 15 years). The sex ratio was 1.3. Most patients came from rural areas represented (74.3 %). The abdominal pain of progressive occurrence in 71.4 % of patients and generalized in 68.6 %. The average admission time was 10.7 ± 7.1 days (extremes: 2 and 30 days). Abdominal defense and abdominal contracture was found in 94.3 %. A pneumoperitoneum (31%), and a dislocated fluid effusion were found in 49% of patients. Excision-subsion in 54.3 % and ileostomy in 40 % were carried out. We have observed a morbidity rate at 48.6 % and 11 cases of death. ***Conclusion*:** Peritonitis by ileal perforation of typhic origin are frequent in our structure. The prognosis depends on the precocity of care despite mortality raised in developing countries.

Keywords: Peritonitis, Perforation, Ileon, Typhoid, Child, Mopti.

INTRODUCTION

Typhoid or enteric fever is a generalized toxi-infection with endotoxlemia with a mesenteric lymphatic starting point. It is due to Salmonella Enterica, Sérovar Typhi (Bacille d'Eberth) or Paratyphi A, B and C [1, 3].

She is a patient of fecal danger and poses a major public health problem in low -income countries. Its prevalence is estimated between 11 and 21 million worldwide with an annual death rate between 128,000 to 161,000. It is mainly raging on the Asian continent and in sub -Saharan Africa [2, 3].

The risk is linked to the occurrence of complications dominated by ileal perforation peritonitis in countries with limited resources. Peritonitis by typhic perforation is the pathological opening of the small intestine in the peritoneal cavity due to Salmonella Typhi. They often constitute the first cause of peritonitis in endemic areas and especially in children [1, 4, 5].

The diagnosis of typhic peritonitis is based on the clinical picture and the appearance of the intestinal lesions in peroperative.

It is a medico-surgical emergency and surgical management with resuscitation must be carried out as soon as possible.

However, ileal perforation of typhic origin remains a serious pathology with high morbidity and a mortality rate reaching 20 to 30 % [6-8].

The incidence of ileal perforation peritonitis in typhoid fever was estimated at 2.48 % in France [9] and between 0.8 and 18 % in India [10].

In Africa several works were carried out on ileal perforation during typhoid fever by Ayite [11] in Togo and Benin and Ouangre [12] in Burkina Faso.

In Mali, Dieffaga [13] in the general and pediatric surgery service of the Gabriel Touré CHU in 2005;

Coulibaly [14] in the pediatric surgery service of the Gabriel Touré CHU in 2011 and Sanogo [15].

Given the high frequency of peritonitis and the lack of specific study in children at Sominé Dolo Hospital in Mopti, we initiated this study with as:

Specific Objectives

- Determine the frequency of peritonitis by ileal perforation of typhic origin in children;
- Describe clinical and paraclinical signs
- Describe the therapeutic aspects
- Analyze operating follow -up.

METHODOLOGY

It was a descriptive study over 12 months (January to December 2018) in the Sominé Dolo Hospital of Mopti.

The MOPTI HSD is a second reference public hospital establishment (EPH). It is located in the administrative zone of Sévaré by the national road 16 (RN 16), built on a total area of six hectares and on two levels:

- The administrative service on the 2nd floor;
- The Offices of Medical Consultant Staff (PC) on the 1st floor;
- Technical services on the ground floor.

The surgery service brings together all surgical specialties: general surgery, pediatric surgery, urology, trauma-trauma, ot-rhino-laryngology and maxillofacial.

This service is composed :

- an office for the department head;
- An office for the service supervisor, which serves as a staff room;
- A guard room for surgeons;
- A treatment room, a store, a locker room for paramedical staff;
- Sixteen (16) hospitalization rooms and patients for patients.

The service is made up of three (3) generalist surgeons and two (2) pediatric surgeons with a capacity of 59 distributed beds. There are other surgical specialties.

The activities carried out in the service are essentially the management of surgical and programmed emergencies.

Inclusion Criteria

All children aged 0 to 15 operated for peritonitis by ileal perforation of typhic origin in the service during our study period. The diagnosis of typhic perforation was made on the basis of clinical arguments, the appearance of peroperative lesions and the positivity of the Widal and Félix serodiagnosis.

Non-Inclusion Criteria

All other causes of operated peritonitis and/or patients who died before surgery.

Data analysis was done by Excel 2010 software and SPSS Statistics 20.

RESULTS

During our study period, we identified 35 cases of peritonitis by ileal perforation of typhic origin which represented:

- 4.9 % of visceral surgical emergencies (35/710)
- 22.3 % of all peritonitis (35/157)
- 60.3 % of peritonitis by typhic perforation (35/58)

➢ **Age:**

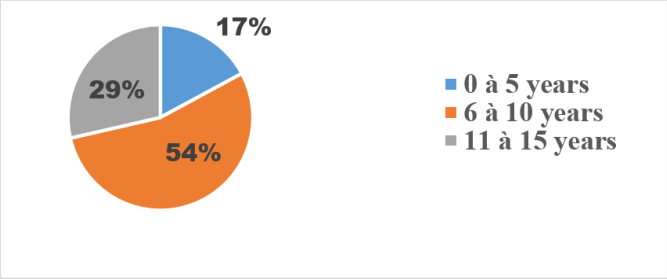

Fig 1: According to Age

The average age was 8.7 ± 3.5 years (extreme : 1 and 15 years).

➢ **Sex:**

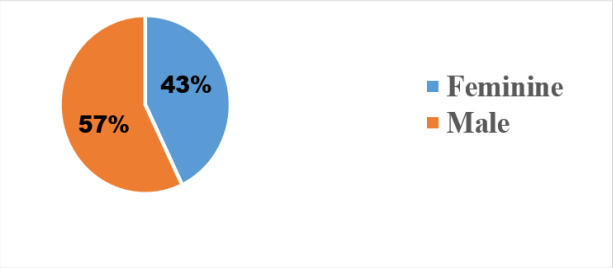

Fig. 2: Accordin to Sex

The sex ratio was 1.3.

➢ **Origin :**

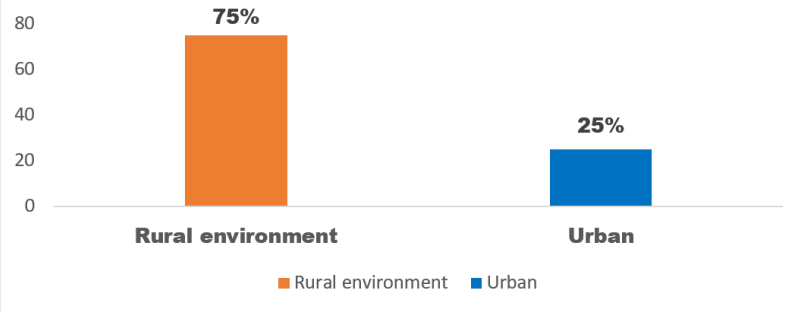

Fig. 4: According to Origin

➢ **Recruitment mode :**

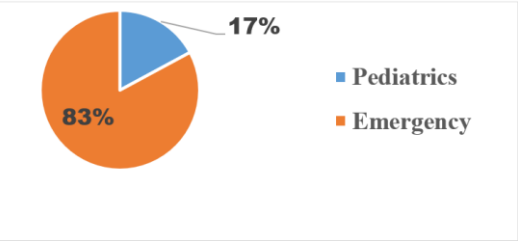

Fig 5: Selon le Mode d'admision

- **Reason for Consultation**

Table 1: Depending on the reason for consultation

Reason for consultation	Effective	%
Abdominale Pain	**35**	**100**
Fever	20	57.1
Start of matter and gas	13	37.2
Diarrhea	2	5.7

- **Perforation Time**

Table 2: Depending on the perforation time

Perforation time	Effective	%
≤ 7 jours	**18**	**51.4**
8-15 jours	12	34.3
> 15 jours	5	14.3
Total	**35**	**100**

The average period of perforation was 10.7 ± 7.1 days (extremes: 2 and 30 days).

- **Examination of the Abdomen and Rectal Touch**

Table 3: According to physical signs

Physical signs	Effective	%
Abdominal distension	26	74,3
Abdominal breathing abolished	30	85,7
Abdominal defense	35	**100**
Abdominal contracture	33	**94,3**
Cry of umbilicus	34	**97,1**
Percussion matite	21	60
Percussion tympanism	14	40
Abdominal silence to auscultation	27	77,1
Pain with rectal touch	**35**	**100**

- **ASP :**

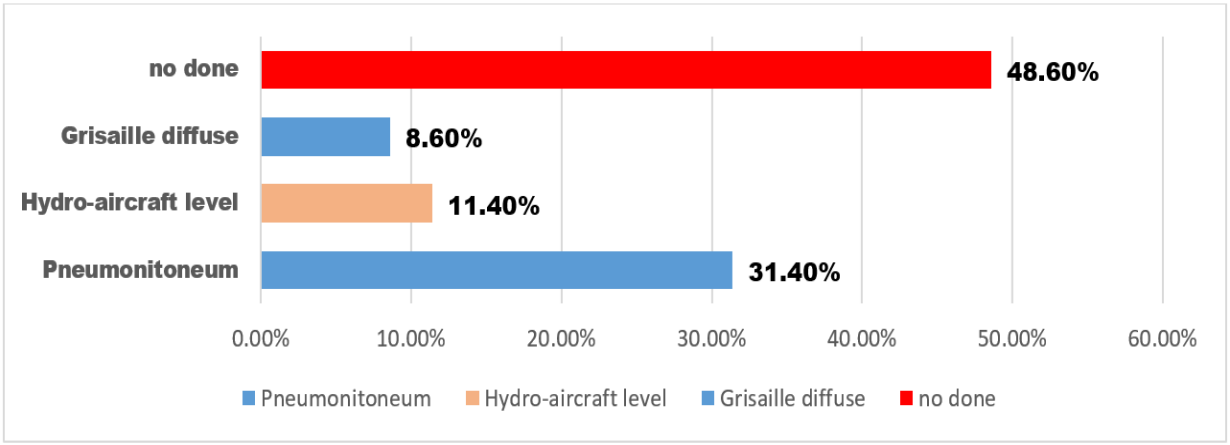

Fig. 6: Depending on the result of the ASP

- **Abdominal Ultrasound :**

Table 4: Depending on the result of abdominal ultrasound

Abdominal ultrasound	Effective	%
Troubled liquid	**17**	**48,6**
No Done	18	51,4
Total	**35**	**100**

- **Widal and Felix Serodiagnostics**

Table 5: According to the results of the Widal and Félix serodiagnosis

Widal and Felix serodiagnostics	Effective	%
Positive	**29**	**82,9**
Négative	1	2,9
No Done	5	14,2
Total	**35**	**100**

- **Coproculture**

Table 6: According to the results of the coproculture

Coproculture	Effectifs	%
Candida	01	2,9
Escherichia	01	2,9
Salmonella	01	2,9
Not made	**32**	**91,3**
Total	**35**	**100**

- **The Number of Intestinal Perforation**

Table 7: Depending on the number of intestinal perforation

The number of intestinal perforation	Effective	%
1	**24**	**68,5**
2	5	14,3
3	3	8,6
> 3	3	8,6
Total	**35**	**100**

- **Siege of perforation**

Table 8: Depending on the siege of the perforation as a function of the ileo-caecal valve

Siege of the perforation according to the ileo-Caecal valve	Effective	%
0 – 10 cm	**13**	**37,1**
11 – 20 cm	11	31,4
21 – 50 cm	10	28,6
> 50 cm	1	2,9
Total	**35**	**100**

- **Surgical treatment**

Table 9: According to the operating technique

Operating technique	Effective	%
Revive - Suture	**19**	**54,3**
Resection - anastomosis	2	5,7
Ileostomy	14	40
Total	**35**	**100**

- **Postoperative antibiotic therapy**

Table 10: According to the antibiotic used in postoperative

Antibiotic therapy	Effective	%
Ceftriaxone + Metronidazole	**25**	**71,4**
Ceftriaxone + Metronidazole + Gentamicin	7	20,0
Ciprofloxacin + Metronidazole	3	8,6
Total	**35**	**100**

- **Postoperative hospitalization duration**

Table 11: Depending on the duration of hospitalization in postoperative

Postoperative hospitalization duration	Effective	%
≤ 7 jours	11	31.4
8-15 jours	7	20
> 15 jours	**17**	**48.6**
Total	**35**	**100**

The average duration hospitalization in postoperatively was 16.43 ± 13.6 days (extremes: 1 and 50 days).

- **Operatory suite**

Table 12: According to early operating follow -up (0 to 30 days)

Early early operations of D0 at D30	Effectifs	%
Simples	**7**	**20,0**
Mortality (septic shock, multi -visceral failure)	11	31,4
Morbidity	**17**	**48,6**
Total	**35**	**100**

Table 13: Depending on the causes of morbidity

Causes of early morbidity	Effectifs	%
Parietal suppuration	**11**	**31,4**
Digestive fistulas	3	8,6
Evisceration	2	5,7
Undernutrition	1	2,9

- **Duration of evolution and early morbidity**

Table 14: Depending on the duration of the disease and the occurrence of morbidity

Duration of evolution	Morbidity				Total
	SUPPURATION Parietal	Digestive Fistulas Destrition	Dénutrition	Evisceration	
0 - 7 jours	**8 (72,7 %)**	-	-	-	8 (47,1 %)
8 - 15 jours	2 (18,2 %)	**2 (66,7 %)**	**1 (100 %)**	-	5 (29,4 %)
16 - 30 jours	1 (9,1 %)	1 (33, 3 %)	-	**2 (100 %)**	4 (23,5 %)
Total	**11 (31,4 %)**	**3 (8,6 %)**	**1 (5,7 %)**	**2 (2,9 %)**	**17 (100 %)**

Table 15: Depending on the duration of the disease and the occurrence of death

Duration of evolution	death	
	Effective	%
0 – 7 jours	**8**	**72,7**
8 – 15 jours	2	18,2
16 – 30 jours	1	9,1
Total	**11**	**100**

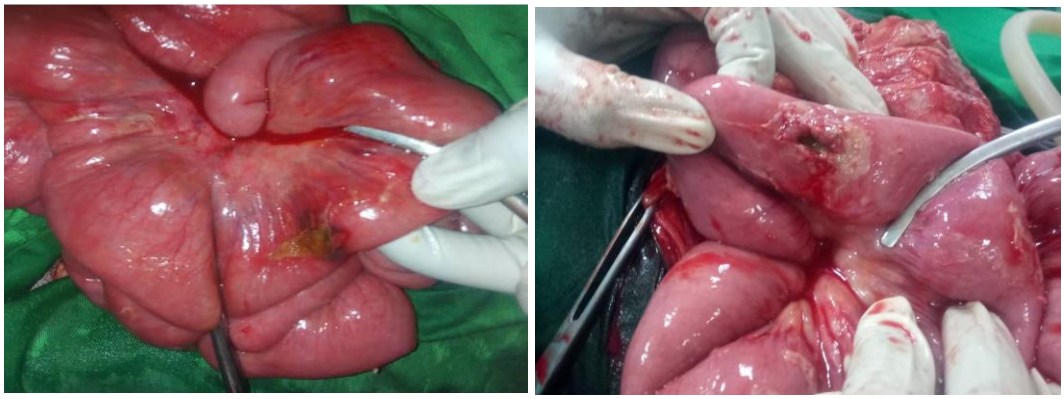

Fig. 7: Aspect of an ileal perforation

Table 16: Average monthly frequency of peritonitis by ileal perforation

Authors	Sample	Saves Duration (month)	frequency	Ville, countries
Coulibaly **[14]**	105	60	1,8	Bamako, Mali
Kouamé **[6]**	8	96	0,5	Abidjan, RCI
Our study	**35**	**12**	**2,9**	**Mopti, Mali**

DISCUSSIONS

In the court of our study, we observed certain limits due to the size of the sample which was not exhaustive and to the weakness of the technical platform which did not allow the realization of certain analyzes such as coproculture to confirm the typhic origin of perforation. However, it seems to us as a draft to study peritonitis by ileal perforations of typhic origin, particularly in children in the region of Mopti.

We have encountered some difficulties, in particular the lack of financial means of patients to ensure the emergency management of children as well as the performance of certain additional examinations.

The average monthly frequency of peritonitis by typhic perforation is raised in our study compared to those of Bamako and Abidjan. It would be due to the geographical location of our structure in the region where the majority of our patients come from the rural environment disadvantaged by poor hygiene conditions and the lack of drinking water.

Vaccination, food hygiene and antibiotic therapy have reduced the frequency and severity of peritonitis by ileal perforations of typhic origin in developed countries [1].

Our average age is similar to those reported by Coulibaly [14] and Kouamé [6] who found 9.82 ± 2.84 years respectively. This testifies to the high frequency of ileal perforation of typhic origin in the big child.

Male sex predominant in our study and in the literature [6, 13, 14, 16] has not showed a particular correlation with ileal perforation. It would be linked to a high representativeness of the population of the study area.

In our study, more than 60% of patients resided in rural areas, this could be explained by promiscuity, precarious hygiene, lack of drinking water, delay in consultation.

The delay in adequate care of diseases in general and typhoid fever in particular, the limitation of financial means and sometimes traditional beliefs would be the cause of the high frequency of self -medication, and therefore could favored the occurrence Complications such as peritonitis by perforation the ileal.

Abdominal pain is the most common clinical manifestation of ileal perforation. It is found in all our patients as in other series [4, 8, 17, 18]. This pain is often located in the right iliac pit at first and then diffuses in the abdomen. It is brutal, intense or without adjuvant cause (H Mondor).

Pain in ileal perforation peritonitis is due to peritoneal contamination by the content of the digestive tract that causes irritation of the peritoneal serous rich in nerve endings.

The abdominal pain associated with fever (57.1 %) is confirmed in the literature [18, 19, 16]. It is secondary to infectious syndrome which often accompanies peritonitis.

The period of perforation is the time between the start of the disease and the appearance of the first signs of perforation. Our deadline was located in the second week of evolution which is theoretically between the 7th and 14th day as in most African series [9, 13, 16, 20]. The delay in consultation and adequate management of typhoid fever would be the cause of the occurrence of complications (hail perforation, peritonitis, anemia).

Abdominal defense, abdominal contracture, the cry of umbilicus and the rectal touch pain are the major signs found in more than 90% of our patients similar to the Malian series [15, 16, 18, 20] and World [5, 8, 10, 21]. These symptoms are due to liquid effusion present in the peritoneal cavity resulting in irritation of the peritoneal serous and the involuntary contraction of the muscles of the abdominal wall.

ASP x -ray is carried out in more than half of our patients. The same radiographic aspects have been frequently reported in other studies [16, 18, 20, 22, 23]. It would be due to the fact that hollow organ perforations achieve pneumoperitoneum between the liver and the diaphragm visible on a radiographic cliché of the abdomen without preparation in a standing patient from the front taking the two diaphragmatic domes.

The abdominal ultrasound which allows the rapid diagnosis of peritonitis was not carried out in all our patients due to the difficulties linked to its emergency realization in our structure.

In our study, Widal and Félix serodiagnosis was positive in more than 80%; This agrees with the study by Kouamé and Coulibaly [4, 17] which found 85 % HIV positive and 81 % respectively without statistically significant difference. P> 0.05. Although controversial, Widal and Felix serodiagnosis remains the most carried

out biological examination for the diagnosis of typhoid fever in Mali [18, 16, 20].

The management of typhic hail perforations is multidisciplinary. It must fight the origin which is typhoid fever and its consequences which are peritonitis and hydro electrolytic disorders.

A preoperative resuscitation which is the fundamental pillar of the success of treatment has been carried out in all our patients.

A lenticular perforation on the anti -mesenteric edge of the last fifty cm of the hail is so pathognomonic of the typhic perforation that the diagnosis can be affirmed in peroperative [24]. This observation made in our study, finding most ileal perforations 50 cm or less from the ileocecal valve in our study, was comparable to that of Coulibaly (98.1%) [14] without statistical difference. P > 0.05.

Various techniques for repairing typhus perforations of the small intestine have been described without any being unanimously agreed upon, taking into account several criteria such as the general condition of the patient (according to the ASA 1 score), the severity or the length of time of the peritonitis, the number of perforations or even the condition of the intestinal wall [9, 25].

In our study, suture excision was the most used surgical technique followed by ileostomy as in Coulibaly's study [14]; unlike Kouamé [6] who essentially performed an anastomosis resection (93.17%) and an ileostomy (6.81%).

The average duration of postoperative hospitalization was statistically higher than other series [18, 13, 16, 20] varying between 12.37 and 15.8 days without statistically significant difference. P>0.05.

This duration of hospitalization was influenced by the general condition of the patients before the operation and the complications that occurred postoperatively.

Our postoperative morbidity rate was statistically higher than that of Kouamé and Coulibaly [6, 14] who found 34.28% and 25% respectively. P<0.05. This difference could be explained by the majority of our patients coming from a rural area where hygiene conditions are precarious.

They are dominated by parietal suppurations in our study which would be due to contamination of the operating wound by intestinal or peritoneal fluid intraoperatively and by the stoma postoperatively. They could be favored by the precarious state of our patients upon admission or the poor hygienic conditions in the operating theater and in the hospitalization rooms.

Morbidity still remains high in other series [13, 18, 16]. It constitutes the main cause of increased treatment costs as well as the reason for a long stay of patients in hospital.

Our mortality rate was high when an anastomosis resection was performed unlike Kouamé [6].

Advances in intraoperative resuscitation and the use of antibiotics have improved the prognosis of peritonitis due to typhoid perforations. However, our high mortality rate is due to certain factors such as the delay in treatment, the degree of contamination of the peritoneum and the poor general condition of our patients.

CONCLUSION

Peritonitis by ileal perforation of typhic origin is frequent in children in our structure. It affects young children who are mainly received in an emergency table. The operating follow -ups are dominated by complications such as parietal suppurations and mortality remains high in developing countries.

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