



Clinical case

Perforation peritonitis gastroduodenal in children: about three cases

Péritonite par perforation gastroduodénale de l'enfant : à propos de trois cas

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Résumé

La péritonite par perforation gastroduodénale chez l'enfant est une entité pathologique rare mais très redoutable du fait de son mauvais pronostic. Le traitement repose sur une réparation chirurgicale de la perforation en réalisant une laparotomie exploratrice qui est à visée diagnostique et thérapeutique. Les auteurs rapportent trois cas de péritonite par perforation gastroduodénale chez l'enfant pris en charge au service de chirurgie pédiatrique de l'Hôpital National Amirou Boubacar Diallo de Niamey.

Mots-clés : péritonite, perforation gastroduodénale, enfant, Niamey.

Abstract

Peritonitis due to gastroduodenal perforation in children is a rare pathological entity, but a very formidable one due to its poor prognosis. Treatment is based on surgical repair of the perforation by exploratory laparotomy, for both diagnostic and therapeutic purposes. The authors report three cases of gastroduodenal perforation peritonitis in children treated in the pediatric surgery department of the

Hôpital National Amirou Boubacar Diallo, Niamey.

Keywords: peritonitis, gastroduodenal perforation, child, Niamey.

Introduction

Peritonitis is an acute generalized inflammation of the peritoneal serosa caused by bacterial infection. Etiologies vary. Peritonitis due to gastric perforation is a rare pathological entity in children [1, 2].

Peptic ulcer disease is considered relatively uncommon and life-threatening in children [3]. In Niger, there are no studies of ulcer complications in children.

We report three cases of gastroduodenal perforation peritonitis in children treated at the Pediatric Surgery Department of the Amirou Boubacar Diallo National Hospital in Niamey, before discussing the different aspects specifically in children described in the literature.

Clinical cases

Case n°1

A 3-year-old female patient with no known pathological history was admitted to the surgical emergency department of the Hôpital National Amirou Boubacar Diallo, Niamey, with abdominal pain, fever of 38.8°C and vomiting of food, then bilious vomiting, which had been progressing for 3 days. Clinical examination revealed a prostrate, febrile child with moderate dehydration and pale skin. A two-day cessation of bowel movements and gas, abdominal bloating and a cry from the umbilicus. Hemogram showed hyperleukocytosis (WBC=23,000), (Hb 5.6 g/dl), platelets (platelets = 158,000). An unprepared radiograph of the abdomen revealed a pneumoperitoneum (figure 1).

An exploratory xypho pubic laparotomy was indicated after preoperative resuscitation, and had revealed a perforation in the anterior aspect of the gastric antrum (figure 2) and pus of around 1200 CC. No lesions were found in the other viscera. Intraoperative transfusion (20 mg/kg of whole blood), edge biopsy for anatomopathological examination, pus collection for cytobacteriological examination, peritoneal cavity cleansing, vicryl 2/0 suture after aviviation of the necrotic edges of an epiplooplasty, and drainage of the abdominal cavity were performed.

Antibiotic therapy with Ceftriaxone (100 mg/kg/d) and metronidazole (40 mg/kg/d) was initiated.

Bacteriological examination of the peritoneal fluid revealed the presence of *E. coli*. Pathological examination of the biopsy specimen showed gastric perforation with *Helicobacter pylori* and no malignant cells. Antiulcer treatment with omeprazole (20mg x2/d) for 4 weeks was initiated to eradicate *Helicobacter pylori*. The patient died 48 hours after the operation, suffering from anemia and respiratory distress.

Case n°2

A 5-year-old patient with no known pathological history was admitted to the surgical emergency

department of the Hôpital National Amirou Boubacar Diallo, Niamey, for abdominal pain and vomiting of food, which had been present for 2 days. Clinical examination revealed a febrile child at 39.7° C, altered general condition, abdominal bloating, umbilical crying, and a one-day cessation of feces and gas. Hemogram showed hyperleukocytosis (WBC=29,000), (Hb 8.9 g/dl), platelets (platelets = 209,000). An unprepared radiograph of the abdomen revealed a pneumoperitoneum (figure 3).

A xypho pubic laparotomy was indicated after preoperative resuscitation, and had revealed a gastric perforation at the posterior aspect of the greater curvature (figure 4) and pus of approximately 650 CC. We proceeded to biopsy the margins for anatomopathological examination, collect the pus for cytobacteriological examination, aspirate the pus, clean the peritoneal cavity, suture with 2/0 vicryl after aviviation of the necrotic margins, and drain the abdominal cavity.

Antibiotic therapy with ceftriaxone (100 mg/kg/d) and metronidazole (40 mg/kg/d), as well as transfusion (20 mg/kg/ whole blood), were instituted.

Bacteriological examination of the peritoneal fluid showed a polybial flora. Anatomopathological examination of the biopsy specimen was in favour of gastric perforation, with absence of *Helicobacter pylori* and malignant cells. Antiulcer treatment with omeprazole (20 mgx2/d) for 4 weeks was administered to eradicate *Helicobacter pylori*.

The patient died 4 days after the operation in septic shock.

Case n°3

A 7-year-old patient with no known pathological history was admitted to the surgical emergency department of the Hôpital National Amirou Boubacar Diallo, Niamey, for abdominal pain and vomiting that had been evolving for 2 days. Clinical examination revealed a febrile child at 39.3° C, altered general condition, dehydrated, bloated abdomen, umbilical cry and cessation of feces and gas for two days. Hemogram showed hyperleukocytosis (WBC=16,400), (Hb 9.4

g/dl), platelets (platelets = 304,000).

An unprepared abdominal x-ray revealed a pneumoperitoneum.

A xypho pubic laparotomy was indicated after preoperative resuscitation, and had revealed a duodenal perforation and pus of approximately 700 CC. We proceeded to biopsy the margins for anatomopathological examination, collect the pus for cytobacteriological examination, aspirate the pus, clean the peritoneal cavity, suture with 2/0 vicryl after avivement of the necrotic margins, and drain the abdominal cavity.

Antibiotic therapy with ceftriaxone (100 mg/kg/d) and

metronidazole (40 mg/kg/d), as well as transfusion (20 mg/kg/d of whole blood), had been initiated. Bacteriological examination of the peritoneal fluid showed a polybial flora. Anatomopathological examination of the biopsy specimen was in favour of gastro-duodenal perforation, with absence of *Helicobacter pylori* and malignant cells. Antiulcer treatment with omeprazole (20 mg 2/d) for 4 weeks was administered to eradicate *Helicobacter pylori*. The post-operative course was straightforward, and the patient was discharged 10 days after the operation, with a follow-up fibroscopy at one month.

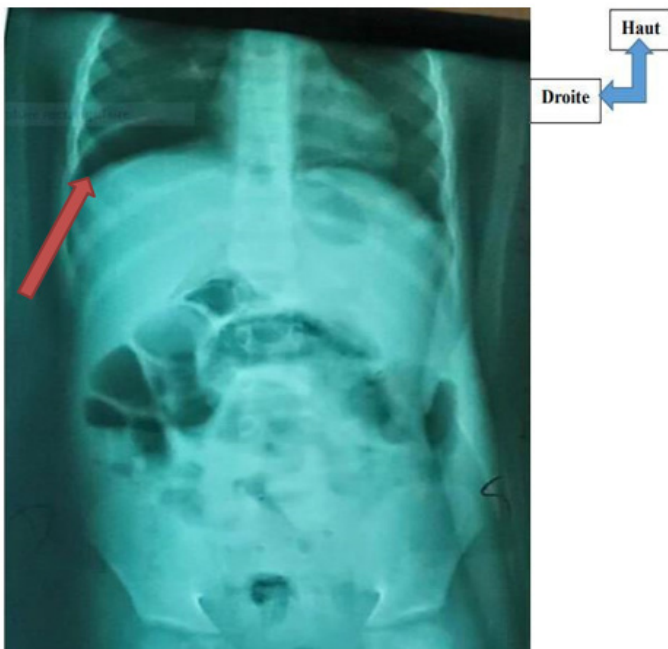


Figure 1: Right pneumoperitoneum in a 5-year-old girl

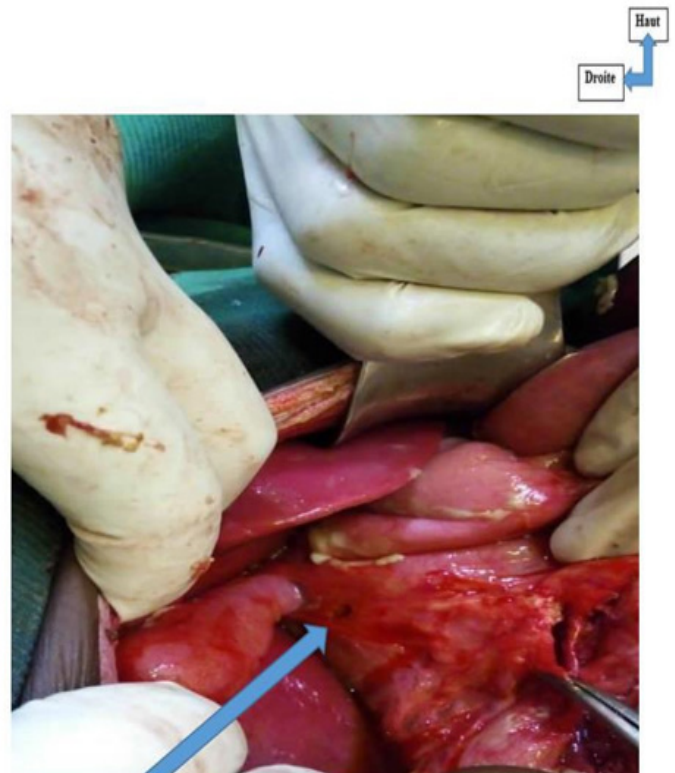


Figure 2: intraoperative image showing the perforation in the gastric antrum blue arrow

Discussion

Gastroduodenal perforation peritonitis in children is a rare pathological entity. However, its incidence is increasing in industrialized countries. Indeed, since Siebold's first description in 1825, over 300 cases have been reported in the literature [4, 5]. *Helicobacter pylori* is the main germ found, with early acquisition occurring in childhood and adolescence, particularly in developing countries [2]. In our study, we report 3 cases of perforation in 12 years (2010 to 2022), which is in line with the findings of some authors on the rarity of gastroduodenal perforations [6,7,8]. In this series, gastric ulcers were found in small children (age < 5 years), unlike duodenal ulcers [9,10].

The patients were aged 3, 5 and 7 years, including 2 girls and 1 boy. In the literature, the usual age of onset is between two and seven days, with a predilection for blacks and males [11].

Gastric perforation remains a rare pathology, the pathophysiology of which has yet to be elucidated. Several risk factors are associated with the condition, such as prematurity, exchange transfusion, premature rupture of membranes, pregnancy toxemia, breech delivery, maternal diabetes, amniotic infection and caesarean section [12, 13, 14].

In our study, abdominal distension was present in all patients. According to some authors, abdominal distension is almost constant and represents the main symptom in gastric perforation peritonitis, particularly if associated with food refusal, vomiting or respiratory distress [4, 15, 16]. In this series, the primary diagnosis of gastro-duodenal perforation was not considered, due to its rarity. In this context, abdominal bloating and disturbed transit were constant, in line with the literature [10].

The perforation is usually located in the anterior wall of the greater curvature. In the series by Jawad et al. perforation was always in the greater curvature, often with a single perforation or sometimes multiple perforations [4]. In the series by Leone et al. the perforation was located at the greater curvature in 57.14% of cases, and at the lesser curvature in 28.57%

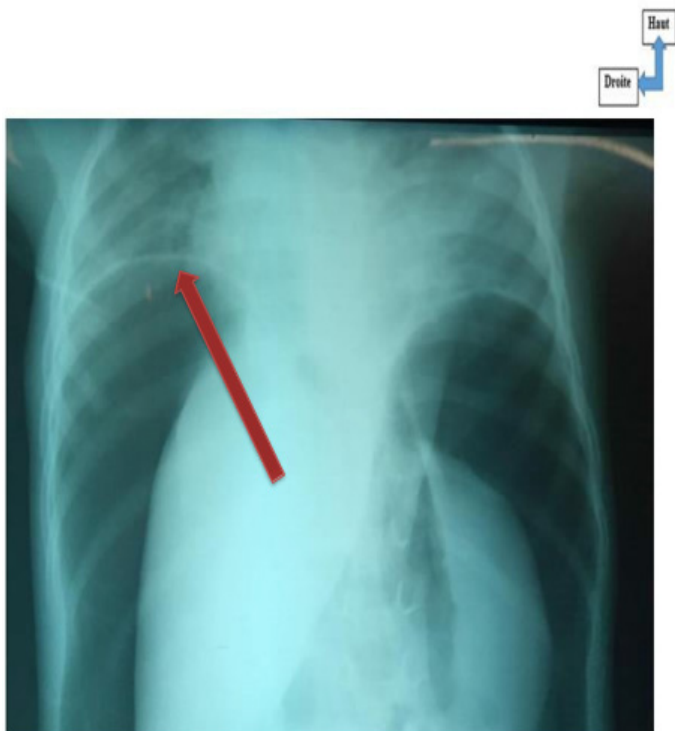


Figure 3: Right pneumoperitoneum in a 3-year-old girl



Figure 4: intraoperative image showing the perforation on the posterior surface of the greater curvature of the stomach blue arrow

[17].

The principle of perforation treatment is based on double antibiotic therapy with ceftriaxone (50mg to 100mg/kg/d), metronidazole (30mg to 40mg/kg/d) combined with a PPI (20mg x2/d) and simple suturing after debridement of the necrotic edges with or without omental reinforcement [18].

We recorded 2 deaths out of the 3 patients, i.e. 66.66% (n=2) postoperatively. Our result is contrary to that of Jawad et al, who recorded 100% survival in a series of 5 cases.

Vital prognosis depends on early treatment, which in turn depends on pre-, intra- and postoperative resuscitation [2, 4]. The prognosis is generally very poor, especially when an infectious complication occurs postoperatively.

Conclusion

Peritonitis due to gastric perforation in children is a rare but extremely serious condition, due to its poor prognosis. Diagnosis is based on clinical examination and radiological findings, but is confirmed by histological examination.

However, resuscitation remains essential, as it improves vital prognosis.

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Conflict interest : None

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