

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/radcr

Case Report

Spontaneous gastric perforation in a newborn: About a case [☆]

Lamya Diouri, MD^{a,*}, Widad Abbou, MD^a, Oussama El Abassi, MD^a, Yassine Amane, MD^a,
Imane Guerrouj, MD^a, Abdelouhab Ammor, MD^b, Narjisse Aichouni, MD^a,
Siham Nasri, MD^a, Imane Kamaoui, MD^a, Imane Skiker, MD^a

^a Department of Radiology, Mohammed VI University Hospital, Faculty of Medicine, University Mohammed First, BP 4806, Oujda 60049, Morocco

^b Department of Pediatric Surgery, Mohammed VI University Hospital, Faculty of Medicine, University Mohammed First, Oujda, Morocco

ARTICLE INFO

Article history:

Received 25 December 2022

Revised 25 March 2023

Accepted 29 March 2023

Keywords:

Newborn

Abdominal distress

CT scan

Spontaneous gastric perforation

ABSTRACT

Spontaneous neonatal gastric perforation is rare. We report a case of a newborn from a pregnancy and birth with no complications, who presented on day 5 of life with sudden severe abdominal distension, and subsequently bilious vomiting. The radiography of the abdomen without preparation showed a massive pneumoperitoneum. The CT scan showed a pneumoperitoneum more accentuated at the supra-mesocolic level with a defect in the anterior wall of the stomach. The laparotomy found a perforation in the anterior gastric wall, which was sutured in one plane. The postoperative course was simple. The evolution of spontaneous gastric perforations in newborns is usually favorable. The key to avoiding complications is obviously to make a good diagnosis and perform the correct surgical treatment as soon as possible.

© 2023 Published by Elsevier Inc. on behalf of University of Washington.

This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>)

Introduction

Spontaneous gastric perforation is rare in term newborns and accounts for 10%–16% of neonatal gastrointestinal perforations. Different mechanisms have been proposed for the cause of the perforation. The high mortality rate in these patients can be improved by early diagnosis and prompt resuscitation which requires surgical treatment. We report here a case of idiopathic gastric perforation in a term neonate.

Observation

A 7-day-old female newborn was admitted urgently for severe abdominal distension with respiratory distress. This child was born at term, cesarean delivery, following a normal pregnancy, with a birth weight of 2.6 kg. No resuscitative measures were required during delivery. The placenta and umbilical cord were normal and the amniotic fluid was clear. Breast-feeding was started immediately after birth and meconium

[☆] Competing Interests: The authors do not have any conflict of interest.

* Corresponding author.

E-mail address: diouri.lamya@gmail.com (L. Diouri).

<https://doi.org/10.1016/j.radcr.2023.03.051>

1930-0433/© 2023 Published by Elsevier Inc. on behalf of University of Washington. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>)

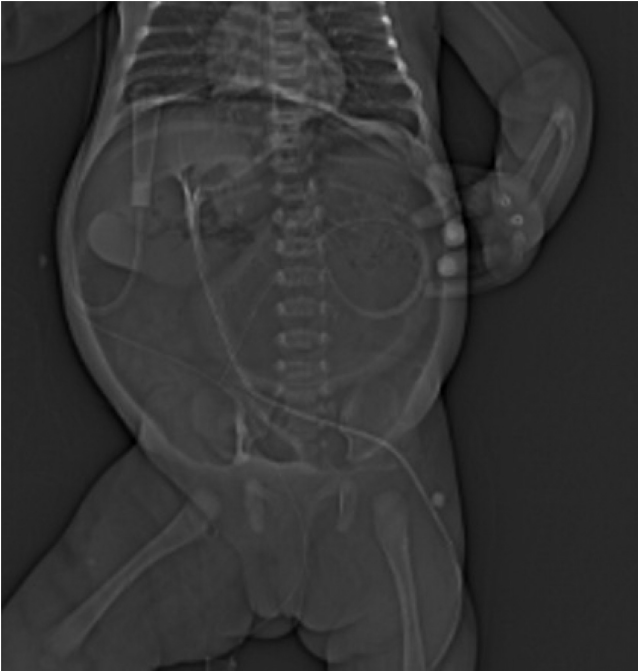


Fig. 1 – X-ray abdomen film showing a massive pneumoperitoneum.

emission occurred within the first 24 hours. At 5 days old, abdominal distension appeared, which became massive in a few hours and was accompanied by bilious vomiting. These digestive signs were associated with respiratory signs with tachypnea at 50 c/min, intercostal and suprasternal draught, fluttering of the wings of the nose and moderate cyanosis of the extremities. The heart rate was 150 c/min and peripheral pulses were barely perceptible. This neonate was prostrate, apathetic with a very distended abdomen, with no hydroaerobic sounds on abdominal auscultation, and had respiratory distress with signs of bronchial congestion on pulmonary auscultation. An unprepared abdominal X-ray showed a massive pneumoperitoneum strongly suggestive of perforation of a hollow viscera (Fig. 1). The CT scan showed a pneumoperitoneum more accentuated at the supra-mesocolic level (Fig. 2) with a defect in the anterior wall of the stomach (Fig. 3). Oxygen therapy with a simple nasal tube, placement of a nasogastric tube, hydro-electrolyte rebalancing and antibiotic therapy combining ceftriaxone, ampicillin, and gentamycin were prescribed and gave the child slight relief. An exploratory laparotomy was indicated, finding a gastric perforation opposite the greater curvature (Fig. 4), which was sutured in one plane. The postoperative course was simple. The evolution of spontaneous gastric perforations in newborns is usually favorable if diagnosed and managed early.

Discussion

Spontaneous gastric perforation is rare in term newborns and accounts for 10%-16% of neonatal gastrointestinal perforations [1]. Since the first description by Siebold in 1825, more than 300 cases have been reported in the literature. It affects

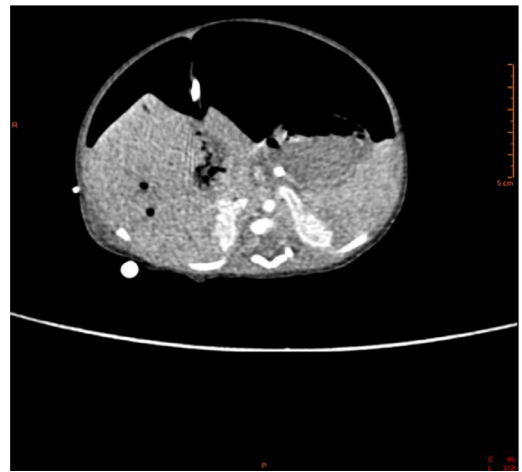
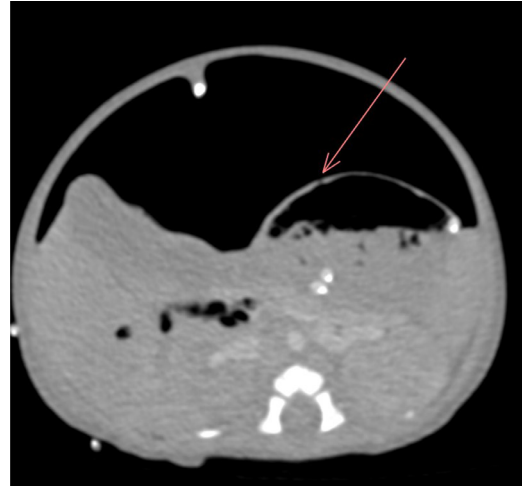


Fig. 2 – Axial slices of a CT scan showing a pneumoperitoneum with a defect in the anterior wall of the stomach.

1/29,000 live births [2]. Several risk factors are associated with the condition: prematurity, low birth weight, exchange transfusion, premature rupture of membranes, pregnancy toxemia, breech birth, maternal diabetes, placenta previa, amniotic infection, or caesarean section. The usual age of onset is between 2 and 7 days and there is a predilection for black race and male. In addition, several mechanisms are put forward in the genesis of perforation with particular anatomopathological aspects depending on the etiology.

Thus, congenital perforations by agenesis of the gastric musculature causing lesions in the form of linear tears at the level of the greater curvature have been reported; then ischemic (neonatal suffering, septic emboli), mechanical (gastric distension after a mask ventilation, gastric tube perforating the stomach), drug-induced (corticosteroids, indomethacin in atrial septal defect), or even a functional perforation (neurological disease, gastric atony, pyloric spasm in case of neonatal stress), leading to punctiform perforations of the anterior or posterior gastric wall [3,4]. None of these mechanisms or risk factors seem to be involved in our observation and the origin remains undetermined. In our case,



Fig. 3 – Sagittal slice of a CT scan showed the defect in the anterior wall of the stomach.



Fig. 4 – Photograph per op showing gastric perforation.

the first clinical manifestations appeared at day 5 of life. The clinical picture of neonatal gastric perforation is quite characteristic. Indeed, during the first days, while feeding and meconium emission are normal, abdominal distension, vomiting and respiratory disorders occur suddenly and evolve to respiratory distress [5]. In our case, the main symptom was abdominal distension followed by respiratory distress due to diaphragmatic compression. The radiograph of the abdomen without preparation shows a massive pneumoperitoneum (Fig. 1). The CT scan showed a pneumoperitoneum more accentuated at the supra-mesocolic level with a defect in the anterior wall of the stomach (Fig. 2).

The treatment of spontaneous gastric rupture is surgical repair. The acute respiratory distress due to massive pneumoperitoneum should be relieved temporarily by needle aspiration of the air from the peritoneal cavity. Debridement of the edges with 2-layer closure of the defect is adequate treatment. The debridement should be carried far enough to get healthy tissue to put the sutures. Some cases with extensive necrosis of the stomach wall may require partial gastrectomy. Graivier et al. [6] have recorded a survival after a 95% gastrectomy for spontaneous gastric rupture. Gastrostomy is not needed in all cases, and its need should be individualized. A thorough examination of the stomach for a second perforation and the entire gastrointestinal tract for other unsuspected perforations or abnormalities should be carried out.

Conclusion

Gastric perforation in neonates is extremely rare but a serious surgical emergency. Classical risk factors are not always found. The evolution of perforations can be favorable if the diagnosis and surgical management are done early.

Patient consent

The patient's parents agreed with a written informed consent to anonymously publish their boy's medical information.

REFERENCES

- [1] Rosser SB, Clark CH, Elechi EN. Spontaneous neonatal gastric perforation. *J Pediatr Surg* 1982;17(4):390–4.
- [2] Shaw A, Blanc WA, Santulli TV, Kaiser G. Spontaneous rupture of the stomach in the newborn: a clinical and experimental study. *J PED Surg* 1998;58(3):561–71.
- [3] Gharehbahgy MM, Rafeey M. Acute gastric perforation in neonatal period. *Med J Islam Acad Sci* 2001;14(2):67–9.
- [4] Terui K, Iwai J, Yamada S, Takenouchi A, Nakata M, Komatsu S, et al. Etiology of neonatal gastric perforation: a review of 20 years' experience. *Pediatr Surg Int* 2012;28(1):9–14.
- [5] Jawed AJ, Al-Rabie A, Hadi A, Al-Sowailem A, Al-Rawaf A, Abu-Touk B, et al. Spontaneous neonatal gastric perforation. *Pediatr Surg Int* 2002;18(5-6):396–9.
- [6] Graivier L, Rundell K, McWilliams N, Carruth D. Neonatal Gastric Perforation and Necrosis: Ninety-five Per Cent Gastrectomy and Colonic Interposition, with Survival. *Annals of Surgery* 1973;177:428–31.