Gastric perforation in neonate: A rare complication of birth trauma

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A B S T R A C T

We report the case of a neonate, born at 36 + 5 weeks of gestation, with shoulder dystocia requiring a pair of forceps. The Apgar score was 3/7 at 1 and 5 min requiring resuscitation. He was transferred at 21 h of life (H21) in intensive care unit for an acute abdomen and an oedematous ecchymotic left testis. Biochemical investigation showed severe renal and hepatic failure and disseminated intravascular coagulation. X-Ray examination showed a large pneumoperitoneum with left scrotal pneumatocele. Surgery exploration disclosed hematoma of the 2 adrenal gland, part of the liver and 2 gastric perforations of the anterior part of the large gastric tuberosity, which were sutured; the inguino-scrotal hernia was repaired. In this case report, we discuss the different etiology of neonatal gastric perforation. The two major particularities were the early presentation in life and the suspected mechanism of perforation. Indeed, most of the non idiopathic etiology of neonatal gastric perforation were eliminated and the major birth trauma was the mechanism the most suitable to explain the gastric perforation, possibly by a mechanism of barotrauma. In a context of difficult extraction, an acute abdomen or a scrotal hernia should lead to X-Ray examination; a pneumoperitoneum should lead to surgical examination looking for a gastric perforation.

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We report a case of neonatal gastric perforation, presumably due to a major birth trauma, revealed in the first 24 h of life by an unilateral scrotal pneumatocele. We discuss the two major points of interest of this case: the early presentation in life and the suspected mechanism of perforation in comparison with the literature.

1. Case report

This boy, first child of a non consanguineous couple, was born at 36 weeks of gestation + 5 days, after an uneventful pregnancy. The rupture of membranes lasted more than 12 h and his mother received an antibioprophylaxis. The vaginal delivery was difficult because of shoulder dystocya requiring a pair of forceps. Birth weight was 3090 g. The Apgar score was 3, 7 and 9 at 1, 5 and 10 min respectively, requiring usual positive pressure ventilation and external cardiac massage. He recovered rapidly, but with a persistent hypotonia and was admitted in neonatal care unit because of the risk of maternal

fetal infection. At admission, this boy presented a cephalhematoma and multiple ecchymosis of the legs and the head. Formula-feeding was started at H2 and an antibiotic therapy by amoxicillin, cefotaxime and gentamicin was initiated. At H21, he was transferred in intensive care unit for an oedematous ecchymotic left scrotum and an acute abdomen with abdominal distention. Abdominal X-Ray examination showed a large pneumoperitoneum with left scrotal pneumatocele (Figs. 1 and 2). Biochemical investigation showed severe renal and hepatic failure (creatinine = 182 μmol/L (30–90); aspartate aminotransferase (AST) = 834 IU/L (International Unit per Liter) (25–75); alanine aminotransferase (ALT) = 296 IU/L (10–45); gammaglutamyl transferase (γGT) = 172 IU/L (10–130); prothrombin time (PTT) = 24% (30–100); Fact II = 18% (25–70); Fact V = 28% (35–110)) myolysis (creatinine phosphokinase (CPK) = 12551 IU/L (<170)) and disseminated intravascular coagulation (thrombopenia = 71 Giga per Liter G/L (150–400)). An exploratory laparotomy was performed in emergency. Surgery exploration disclosed 2 gastric perforations of the anterior wall on the greater curvature of the fundus, which were sutured. The inguino-scrotal hernia was also repaired. The stomach did not show any sign of ischemia, but the surgeon found an hematoma of the two adenal gland and multiple liver contusions, notably in the 5th and 6th segments. The patient progressively recovered, but with recurrence of pneumoperitoneum at day 6. He underwent a new surgery exploration discovering an additional gastric perforation.

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on the posterior wall on the greater curvature of the fundus was also reported in only few cases, sometime mimicking testicular torsion also unusual, and pneumatocele as revealing symptom has been described, such as prematurity, tracheoesophageal fistula, duodenal atresia or obstruction as meconium plug, necrotizing enterocolitis, respiratory distress syndrome, and neonatal asphyxia. Iatrogenic perforation related to increased gastric pressure has also been described, for example in context of nasal continuous airway pressure or enteral feeding. Finally, really true spontaneous gastric perforations are less common than in the past. In our case, none of the previous risk factors was present and a barotrauma remained the most reliable hypothesis. Positive pressure ventilation was used at birth, but with a maximum controlled pressure as recommended and for a short time until Apgar score were 9 at 5 min. An ischemic lesion of the stomach could be discussed in this context of neonatal asphyxia but no sign of stomach ischemia was retrieved during the surgery exploration. Likewise, no gastritis was found, which could explain the perforation by a high gastric acidity level. A mechanic lesion could also be discussed because of the feeding tube, but two perforations would not be very probable. Finally, this case took place in a context of major birth trauma with perinatal asphyxia, suggesting that the gastric perforation could be due to a mechanical rupture during the difficult extraction, according to the other major cutaneous, visceral and cranial injuries. Instrumental vaginal delivery is widely used among obstetrical practices and leads to a decrease in fetal morbidity and mortality; however it can also lead to neonatal severe damage. The most common injuries have been recently summarized by Parker [10,11]. Most of them are orthopedic trauma, including nerves paralysis and skeletal fractures, which are associated with a favorable outcome most of the time. Intra and extra cranial hemorrhages are also frequent, with most of the time good prognosis. The worst prognosis is when perinatal asphyxia occurs, with anoxo-ischemia cerebral lesions and neurological sequela. In 2008, Baud reviewed four large studies about neonatal outcomes after instrumental vaginal delivery and reported frequent seizures, cephalhematoma, intracranial hemorrhage, facial nerve paralysis or brachial plexus injuries [12]. In all these previous studies, gastric perforation has not been reported as a potential complication of birth trauma. In our knowledge, only one other case of neonatal gastric perforation associated with birth trauma has been previously reported, but was also associated with a treatment by dexamethasone and prolonged mechanical ventilation [13].

The second hallmark of this case report is the early presentation, in the first 24 h of life, possibly related to the underlying mechanism. In the previous case reports, the first symptoms of perforation appear since day 2, suggesting that perforation was not present at birth and occurred in the first days of life. Clinical symptoms were also unusual, and pneumatocele as revealing symptom has been reported in only few cases, sometime mimicking testicular torsion [14,15]. Moreover, the localization of the third gastric perforation on the posterior wall on the greater curvature of the fundus was also uncommon, compared to the previous reported cases [13,16].

3. Conclusion

To summarize, spontaneous gastric perforation may occur in a context of severe birth trauma, presumably due to an increased gastric pressure related to instrumental vaginal delivery. In this
later situation, perforation symptoms appear earlier and localization of gastric perforation may be unusual.

Conflict of interest
The authors have no conflict of interest to declare.

References