

Perforation of the cecal appendix in the neonatal period[☆]



Perfuração do apêndice cecal no período neonatal

Dear Editor,

In response to our colleague Aduino D.M. Barbosa,¹ I would like to thank him for the interest in our article, and I have the following statements about his questions:

1. In our study, we did not mention the involvement of either the ileocecal valve or the appendix alone. I reviewed the surgical descriptions of the study patients who, in addition to the affected cecal appendix, presented the involvement of the terminal portion of the ileum or cecum together.

Concurrently with the study, there was a patient born at term with a perforation of the appendicular base that was considered neonatal appendicitis and not accounted for in our sample, as necrotizing enterocolitis (NEC) was ruled out due to the surgical and anatomopathological findings. I have the record and the medical history, as we intended to publish it as a case report. A 38-week neonate developed abdominal distension, refusal to eat, and vomiting. Imaging tests disclosed ascites and septal collections. Paracentesis showed the presence of Gram-negative bacilli, which together with progressive clinical worsening justified the laparotomy indication. On the 13th postoperative day and after a new surgical procedure to wash the cavity, the child died.

2. Is it important to describe the status of the cecal appendix in NEC studies? Would acute appendicitis in the newborn be a mere finding or could it be NEC?

In the article by Raveenthiran² published in 2015, we found it as a question that remains unanswered whether the involvement of the appendix alone could be a manifestation of NEC or just primary appendicitis. There are three theories that could explain "neonatal appendicitis": appendiceal obstruction caused by Hirschsprung's disease (Martin and Perrin's theory); the limited form of NEC with appendix involvement alone (Bax's theory); or luminal obstruction by thickened stools in cases of meconium ileus or cystic fibrosis (Wangenstein's theory). None of them have ever been scientifically proven.

It is known that, in most cases, clinical pictures of "neonatal appendicitis" are initially diagnosed as NEC due to the similarity of symptoms and have a mortality rate that can range from 28% to 80% according to current studies.³ Nonspecific symptoms suggestive of NEC initially lead to a conservative treatment, with delayed surgical procedure; appendicular perforation usually occurs earlier

in this age range, with infection being prone to a more rapid dissemination (due to the newborn's immunosuppression and lack of the appendicular perforation blocking by the epiploon). The presence of pneumoperitoneum in the abdominal radiography leads to an earlier laparotomy, with a chance of a definitive diagnosis, more adequate treatment with appendectomy and the improvement of the chances of survival.

Some risk factors for NEC, such as hypoxemia or ischemia, also seem to be associated with "neonatal appendicitis", combined with the fact that 50% of infants with isolated appendicitis are preterm. These factors strongly suggest that this could be a NEC picture restricted to the appendix.⁴

There is no histological distinction between primary appendicitis and isolated NEC in the appendix, and the anatomopathological examination of the surgical specimen may not be conclusive for either disease.⁵ It must also be considered that instead of a case of NEC it could be a single perforation related to the prematurity, affecting only the cecal appendix.

Schwartz et al.⁶ have suggested an algorithm to investigate cases of abdominal sepsis initially suspected to be NEC, without clinical improvement, due to the rarity of cases of "neonatal appendicitis", which has an incidence of 0.04%.³

I think studies could be carried out to better evaluate the etiology of appendiceal disease in newborns, as it is not possible to affirm that these are cases of isolated NEC. I also agree that the involvement of either the ileocecal valve or the appendix alone could be evaluated in large NEC series.

While definitive answers cannot be attained, it is worth remembering the following quote: "The eye does not see what the mind does not know."

Conflicts of interest

The authors declare no conflicts of interest.

References

1. Barbosa AD. Necrotizing enterocolitis and appendicitis in preterm infants. *J Pediatr (Rio J)*. 2018;94:566.
2. Raveenthiran V. Neonatal appendicitis (Part 1): a review of 52 cases with abdominal manifestation. *J Neonatal Surg*. 2015;4:4.
3. Karaman A, Cavusoglu YH, Karaman I, Cakmak O. Seven cases of neonatal appendicitis with a review of the English language literature of the last century. *Pediatr Surg Int*. 2003;19:707-9.
4. Haider F, Ayoub B, Al Kooheji M, Al Juffairi M, Al-Shaikh S. Perforated acute appendicitis with no peritonitis in a premature baby: a case report. *J Med Case Rep*. 2017;11:125.
5. Bengtsson BOS, van Houten JP. Neonatal vermiform appendicopathy. *Am J Perinatol*. 2015;32:683-8.
6. Schwartz KL, Gilad E, Sigalet D, Yu W, Wong AL. Neonatal acute appendicitis: a proposed algorithm for timely diagnosis. *J Pediatr Surg*. 2011;46:2060-4.

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