Appendicitis in the premature newborn

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Abstract

Objective: to present a case of acute appendicitis in a premature baby.

Methods: retrospective review of medical references using the MEDLINE and LILACS databases, and necropsy reports.

Clinical report: a white male preterm infant was born at 34 weeks of gestation weighing 1,750 g to a primiparous mother. Apgar score was 4 and 8 at the 1st and 5th minutes, respectively. Physical examination was normal until the 9th day of life when the child developed signs suggesting acute abdomen, possibly due to necrotizing enterocolitis with perforation. He was submitted to exploratory laparotomy, which established the diagnosis of acute appendicitis.

Conclusion: acute appendicitis must be ruled out on differential diagnosis when there is a suspicion of necrotizing enterocolitis with perforation, especially in the absence of when risk factors.


Introduction

Acute appendicitis is a rare disease in newborns. The associated mortality rate is high,1 varying from 41% to 61% respectively, depending on the presence or not perforation, especially on an intra-abdominal location. In cases in which the inflamed appendix is located in the interior of a hernial sac, prognosis is significantly improved.2-4

In this paper, we report a case of appendicitis in a 9-day old premature newborn.

Case report

We describe the case of a male baby, born from a primiparous mother (weight = 1,750 g; length = 41 cm long.). A cesarian delivery was performed due to placenta previa. Amniotic liquid was normal. Apgar score was 4 and 8 at the 1st and 5th minutes, respectively; Capurro index was 34 weeks. In the delivery room, the child was submitted to aspiration of the upper airways and administration of oxygen with a mask. He was transferred to the intensive care unit (ICU), and started on glucose venous infusion and calcium gluconate at 10%. Physical examination was normal in the 6th hour of life.

After 36 hours, he was transferred to an intermediate unit. Venous hydration was maintained, and breastfeeding was initiated. On the 4th day of life he presented physiologic jaundice. He started receiving phototherapy, interrupted 2 days later. Seric hemograms were normal. During this...
period, we continued with breastfeeding. The child was doing well until the morning of the 9th day, when he became hypoactive, hypothermic, with acrocyanosis; he also presented mild jaundice. On the same night, despite the presence of vital signs, his general state was poor. Abdomen was tense, algesic, with the presence of hyperemia in the flanks and supraumbilical region. Laboratory tests presented the following results: Hemogram - leukopenia, and deviation to the left; arterial gasometry - hypocapnia; abdominal X-rays - irregular distribution of gas. The boy was started on Claraforan + Oxacillin+ Clindamycin in the usual doses. Twenty-four hours later (10th day), another abdominal X-ray showed the presence of pneumoperitoneum, and a pre-operative diagnosis of necrotizing enterocolitis was made.

At the surgical center, the child was submitted to exploratory laparotomy. We found a perforated vermiform appendix, blocked by the ileum, with seropurulent peritoneal secretion. The surgical specimen was sent to the laboratory for analysis.

Evolution was unfavorable during the immediate postoperative period, with hemodynamic and ventilatory instabilities. He remained on mechanical ventilation on the following days, and his status deteriorated until he died on the 14th day of life.

**Pathological analysis results**

Macroscopy revealed vermiform appendix measuring 2.3 X 0.3 cm, covered by shiny, smooth and translucent serosa, through which a grayish surface was visible, except in the distal extremity, where it was brown-reddish. Sections revealed a virtual lumen and a mucosa presenting a light brown color. The conclusion resulting from microscopic examination was acute appendicitis (Figure 1).

Necropsy confirmed a disseminated bacterial infection as causa mortis. Intestinal malformations or sequelae resulting from local infection were not observed.

**Discussion**

Pre-operative diagnosis of acute appendicitis during the neonatal period (AAN) is difficult, and we were not able to find any reports in the literature. The clinical course of this disease may be fast, with death within the first 24 hours after the beginning of the symptoms.\(^5\) Since symptomatology and routine examinations are unspecific and common to several disorders, such as sepsis and necrotizing enterocolitis, among others, the delay in diagnosis contributes to the high incidence of perforation and high mortality rate.\(^6\)

In the present case, except for hypoactivity, pain on abdominal palpation, abdominal distension, and lateral and supraumbilical hyperemia, other signs were not observed. Anorexia, vomiting, and abdominal distension are described as the most common symptoms,\(^7\) lasting from 7 hours to 9 days. The least frequent symptoms are irritability, lethargy, constipation, diarrhea, and fever. Occasionally, abdominal defense, palpable mass, abdominal silence, and respiratory effort may be present.

The similarity between the development of AAN and that of necrotizing enterocolitis (NE) is evident.\(^10\) However, the frequency of NE cases is significantly higher than that of AAN cases. The rarity of the vermiform appendix inflammatory process in the neonatal period is attributed to the fact that the appendix, in this period, has a conical shape with a large basis and therefore it does not tend to obstruction.\(^11\) Therefore, the initial diagnosis is usually of NE. However, it has been suggested that AAN may be a complication form of necrotizing enterocolitis.\(^10\)

The presence of the lateral and supraumbilical hyperemia, which we observed in this case, is a frequent finding in AAN cases.\(^7,12\) Although we did not observe any edema on the abdominal wall, this seems to be an important sign when located on the right flank. It is assumed that these cutaneous signs result from an intra-abdominal cellulitis secondary to inflammation, particularly of retrocecal location,\(^13\) especially when combined with hematuria and proteinuria.\(^14\) When these findings are present, immediate surgical exploration must be considered.\(^14\) However, these signs are specific to AAN. In NE, particularly when associated with Hirschsprung's disease, abdominal wall erythema has been reported.\(^15\)

The alterations observed in the hemogram, arterial gasometry, and those observed on abdominal X-rays, at the beginning of the case, were also insufficient to suggest a hypothesis of AAN, because they are not specific. Only after the presence of pneumoperitoneum was observed, when the radiological examination was repeated, were we able to establish a diagnosis of acute abdomen with visceral rupture.
Despite being labeled as NE, due to the frequency with which these cases occur, some details called our attention in this case, among which the fact that the baby was never fed with formulas, asphyxia was mild (it does not seem sufficient to cause an important re-distribution of blood flow), and colonization did not occur due to the use of broad-spectrum antimicrobials. The absence of these and other factors (serious post-natal asphyxia, mechanical ventilation, etc.) does not support a different reasoning (even if it is because the genesis of NE is not clear). In addition, the severity of the child’s status on physical examination often precludes initial diagnostic differentiation, especially when signs of sepsis are present. The need for evaluation and immediate and strict management of the parallel hemodynamic alterations considerably delay diagnosis and cause death.

Although the differential diagnosis usually considers NE, AAN may reflect underlying diseases such as Hirschsprung’s disease and cystic fibrosis. What draws attention in the differential diagnosis with Hirschsprung’s disease is that these cases present periappendicitis without transmural inflammation. Cystic fibrosis-associated complications include neonatal meconium ileus and neonatal peritonitis, which may be taken for AAN and make diagnosis difficult.

Conclusions

1 - The presence of abdominal distension, poor general state with signs such as hypoactivity, hypothermia, and acrocyanosis, together with cutaneous signs such as erythema and abdominal wall edema, with fast evolution, may indicate the need for immediate surgical intervention.

2 - The diagnosis of acute appendicitis must considered in the differential diagnosis of acute abdomen in newborns, mainly when there is suspicion of necrotizing enterocolitis with perforation in the absence of risk factors.

References

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