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Clinical Image

Pneumatosis Intestinalis in Necrotizing Enterocolitis

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Clinical Image

A 14-day-old full-term girl was transferred to our hospital with hematochezia, fever, and poor feeding. Physical examination revealed abdominal tenderness and hypoactive bowel sounds. Abdominal radiography showed extensive pneumatosis intestinalis in the colon (Figure 1A). Emergency laparotomy was performed, and surgeon found yellow-coloured, turbid ascites which was not detected on preoperative ultrasound. Extensive subserosal gas was observed in the ascending and transverse colon (Figure 1B). A double-cavity stoma was created 15 cm proximal to the ileocecal region. Consequently, necrotizing enterocolitis (NEC stage IIIA) was diagnosed which might be underestimated before surgery. Empirical antibiotic therapy was adjusted based on Metagenomic Next-Generation Sequencing (mNGS) results. The blood culture test was negative. Interestingly, mNGS of blood and ascitic fluid identified the same pathogens: Clostridium neonatorum, Citrobacter crui, Enterococcus avium, Enterococcus faecalis, and Clostridium difficile. In addition, the pathogen-specific reads count was higher in ascites compared to blood. These findings indicated dysbiotic enteric microbes could induce the disruption of the intestinal mucosal barrier, followed by bacterial translocation which can result in sepsis. Following optimized antibiotic therapy, C-reactive protein (maximum 178.2 mg/L) normalized within 9 days. On postoperative day 2, the infant received low-molecular-weight heparin because thrombin-antithrombin complex and thrombomodulin levels were elevated. Trophic feeding was initiated on postoperative day 4, and the patient was discharged 30 days later.

Aggressive surgery might avoid the severe septic peritonitis due to bowel perforation. mNGS is more sensitive than traditional culture, enabling targeted antibiotics administration, and reducing unnecessary antibiotic exposure. In addition, monitoring of coagulation function could result in earlier anticoagulation and improved microcirculatory perfusion. Novel systemic treatment strategies for NEC may help achieve a favourable prognosis.

Keywords: Pneumatosis; Clostridium neonatorum; Enterococcus avium

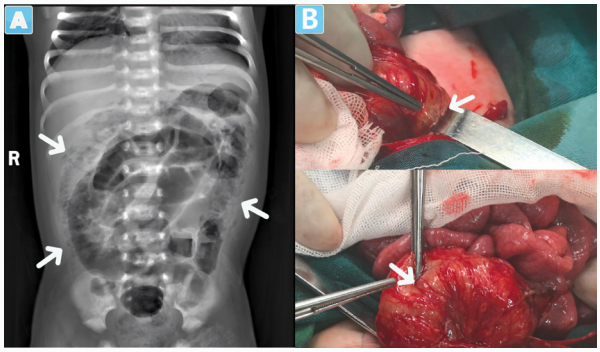

Figure 1: Abdominal imaging and during the surgery, extensive pneumatosis intestinalis was observed within the colon (indicated by the arrows).

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