Perforated Meckel's Diverticulum in a Neonate Mimicking Necrotizing Enterocolitis

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Key Words: neonate, Meckel's diverticulum, perforation of, abdominal wall inflammation

Meckel's diverticulum is normally present in about 2% of general population.[1] Only 3% to 4% of them become symptomatic and develops complications and these mostly occur in children.[2–4] Perforation occurs only in 10% of symptomatic cases.[5] This rarely happens in neonates. The clinical presentation of perforated bowel is variable in neonates and could be difficult to differentiate from necrotizing enterocolitis, which is more common entity at this age group.

We are presenting a case of perforated Meckel's diverticulum in a 3-day-old neonate that expressed itself with systemic manifestation and localized abdominal wall inflammation. The preoperative diagnosis in this case was challenging.

CASE

A 2.07-kg full-term baby was delivered in our hospital via spontaneous vaginal delivery to a 27-year-old Saudi female, primigravida. Antenatal course was complicated by mild bronchial asthma managed with salbutamol inhaler, and urinary tract infection treated adequately with oral antibiotics. Upon delivery of the baby Apgar score was 8 at 1 minute and 9 at 5 minutes. The baby was discharged home on the second day of life in good condition on formula feeding. On the third day of his life, his parents took him to a private clinic as he developed jaundice, poor activity, and decreased feeding. Hospitalization was advised. Upon admission, the patient appeared ill, lethargic, and exhibited grunting respirations. He had tense, tender, distended abdomen with sluggish bowel sounds, and remarkable redness in the right abdominal wall. He was electively intubated, and received sodium bicarbonate to correct the metabolic acidosis and fluid boluses and inotropes to support hemodynamics.

CBCs initially showed leukopenia and thrombocytopenia, and blood culture yielded *E. coli* on the second day of incubation. The treatment with ampicilline, gentamicin, and metronidazole controlled the sepsis and clinically we were able to wean inotropic support and CBCs showed signs of recovery. Although the redness of the abdominal wall disappeared, the edema and the tenderness in that area persist. Serial x-ray films of the abdomen showed paucity of gas bowel suggesting ascites but no clear evidence of intestinal obstruction or pneumoperitonium or pneumatosis intestinalis. Abdominal ultrasound confirmed the presence of mild ascites with no localized fluid collection.

The decision was made by the pediatric surgeon to do exploratory laparotomy, based on the focal abnormality on the abdominal examination, suspecting necrotizing enterocolitis.

Intraoperatively, the patient was found to have perforated Meckel's diverticulum which was adherent to the right abdominal wall. This finding was confirmed by histopathology that described features consistent with inflamed Meckel's diverticulum with no evidence of abnormal mucosa. After the resection of the diverticulum, the patient improved gradually and extubated the next day. Feeding was started after 5 days without difficulties, and patient was discharged home after finishing the intravenous antibiotic course.

DISCUSSION

Meckel's diverticulum is a remnant of the vitello-mesentric duct, which usually regresses by about the 5th week of intrauterine life.[6] Persistence has been estimated to occur in about 2% of general population and usually asymptomatic. Gastrointestinal hemorrhage and obstruction are the most common presentations of Meckel's diverticulum in infants.[7]

Gastrointestinal tract perforation in neonates is commonly due to necrotizing enterocolitis or to some mechanical obstruction such as atresia, stenosis, meconium ileus, or Hirschprung disease.[2,5] Many factors have been implicated as possible causes of spontaneous perforation in neonates. These include perinatal asphyxia,[8] trauma due to nasogastric feeding tube,[9] congenital absence of muscle in gastrointestinal wall,[10] maternal use of corticosteroids or cocaine,[11] and exchange transfusion.[12] Perforation of Meckel's diverticulum is commonly due to underlying pathology such diverticulitis or heterotopic gastric mucosa,[13] but it may occur spontaneously. Our baby was full term, healthy at birth, and there was no history of predisposing factors like asphyxia. His clinical presentation was similar to necrotizing enterocolitis. Review of the literature yielded only 2 cases with similar presentation,

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ISSN: 0749-5161/03/1906-0418

one described by Gandy et al,[14] and the second reported by Kumar et al.[15] The pathological exam of Meckel's diverticulum in first case showed acute inflammation with heterotopic pancreatic tissue, but failed to reveal any ectopic gastric or pancreatic mucosa in the second case. The pathology in our case showed only features of acute inflammation and no ectopic tissue.

In a retrospective study of their 50 years experience with Meckel's diverticulum, Mackey and Dineen[16] found at autopsy only 1 newborn with a perforated Meckel's diverticulum and peritonitis. From that, we can conclude that the spontaneous perforation of Meckel's diverticulum in neonate is very rare but serious entity. Our case is the third reported in the literature. The course was rapid and progressed to full septicemia with gram-negative organism. Although the patient condition improved with supportive care, the persistence of the local findings on abdominal examination was the main reason to explore the abdomen. So despite its varied presentation, Meckel's diverticulum should be kept in mind as one of the differential diagnosis of necrotizing enterocolitis or a cause of an acute abdomen in neonates.

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