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Case Report Open Access

Neonatal Perforation of Meckel Diverticulum: About Two Cases

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Abstract

Two cases of neonatal perforation of Meckel's diverticulum (MD) are reported. The clinical course showed the appearance of pneumoperitoneum successively at 20 h and the 7th day of life. Laparotomy revealed Meckel's perforation, which was associated with meconium peritonitis in the second case.

Although rare, MD should be kept in mind as one cause of gastrointestinal perforation in neonate.

Keywords: Newborn; Meckel's diverticulum; Intestinal perforation; Pneumoperitoneum; Premature

Introduction

Gastrointestinal perforation is a common situation in neonatology which complicated most often the evolution of necrotizing enterocolitis in premature with a low weight of birth. In other cases, gastrointestinal perforation can be iatrogenic or occurring spontaneously without signs of enterocolitis. We report two cases of intestinal perforation of MD in the first days of life.

Case 1

A male baby, 28 week gestation weighing 1400 g was born by urgent cesarean section for chorioamniotitis. He was born to a 31 year old primipara mother with no medical history. The Apgar score was 8 at 1 min and 9 at 5 min, the infant was transferred to our neonatal intensive care unit with a mild respiratory distress. Routine thoraco abdominal radiograph taken 10 h after birth showed none expanded stomach and a dilated intestinal loop beneath the liver edge. Therefore, he was treated in nil-by-mouth status and was supplied with intravenous fluid [1-5]. Clinically the abdomen was progressively distended but palpated softly without tenderness. An abdominal X-ray was performed again at 20 h of age and showed pneumoperitoneum. All vital signs were stable except mild tachypnea. An emergency operation was performed 24 h after birth under a suspected diagnosis of gastrointestinal perforation. Before the operation, no meconium was passed. At laparotomy, a wide- based Meckel's diverticulum was found located 12 cm above the ileocecal valve with several thin-walled irregular bulges in the antimesenteric side. A tiny perforation was found over one bulge. The perforation was a blowout-like lesion and the appearance of the surrounding bowel was healthy without any inflammatory reaction. A wedge resection of the intestine with end-to-end anastomosis was performed. The postoperative course was uneventful [6-10].

Case 2

A 750 g boy was born by a normal vaginal delivery at 26 weeks' gestation. He was born of a 38 year old multigravida nulliparous mother who was followed for an incompetent cervix [11]. The Apgar score was 8 at 1 min, 9 at 5 min. Severe respiratory distress was noted immediately after birth necessitating his rapid transfer to our intensive care unit. On admission, he had cyanosis and severe respiratory distress [12-14]. The diagnosis of hyaline membrane disease was confirmed by the chest radiograph. Clinical outcome was favorable after surfactant administration. The infant presented at the 7th day of life severe apnea requiring mechanical ventilation with oxygen requirement of 21% [15]. The chest radiograph was normal but the abdomen radiograph showed a pneumoperitoneum. The infant had a soft and no distending abdomen. An emergency laparotomy was performed on suspicion of a gut perforation. At laparotomy, a perforated MD was found 10 cm before the ileocecal valve, with meconium peritonitis. The appearance of the surrounding bowel was healthy. A segmental resection of the intestine with a stoma was performed. No aerobic or anaerobic organisms were cultured in the effusion taken from the peritoneal cavity [16-19]. Our patient recovered well from surgery. He required a prolonged total parenteral nutrition via a central venous catheter.

Discussion

MD is a vestigial remnant of the omphalomesnteric duct which is caused by an incomplete obliteration of the vitelline duct. Tt is the most common malformation of the gastrointestinal tract and is present in approximately 2% of the population [1]. Most of these are asymptomatic and occur during childhood in the first two years of life, with a male-to-female ratio of 2:1 [2]. The most common symptoms are gastrointestinal bleeding, bowel obstruction and diverticulitis [20].

Symptomatic MD in neonates is rare. The most common presenting symptoms is bowel obstruction [3], gastrointestinal bleeding was reported in one case [4]. Perforation of MD in neonates is rare, a review of the literature revealed only 22 cases from 1953 to 2016 with a sex ratio equal to 4.6 (M/F: 14/3) and a gestational age ranging from 28 to 41 weeks (Table 1). The onset of symptoms was between 1 day of life and 17 [21,22]. Our patients were very preterm babies born at 28 and 26 week gestation, the pneumoperitoneum was discovered during abdomen distension in the first case, incidentally on the thoraco-abdominal x-ray in the other patient. There are risk factors predisposing to MD perforation such us antenatal and postnatal steroid therapy, hypoxia, and poor intrauterine blood flow, congenital absence of the muscles in the gastrointestinal wall and exchange transfusion for hemolytic disease [5,23]. Our two babies actually received antenatal steroid therapy [24].

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Authors	Sex	Week gestation	Weight (g)	Age at presentation (d)	Clinical picture	Heterotopic tissue	Histology
Abramson [6]	Female	?	3742	5	Peritonitis	None	Inflammation
Coppes et al. [7]	Male	32	1780	3	Pneumoperitoneum	None	Inflammation and necrosis
Rogers [8]	Male	?	2300	Birth	Perforated viscus	None	Inflammation
Lin et al. [9]	Male	36	2450	4	Perforated viscus	None	Inflammation
Mc Manus et al. [10]	Male	?	2268	8 H	Peritonitis	None	Inflammation
Yeh et al. [11]	Male	?	?	5	Intestinal	None	Inflammation
Canty et al. [12]	Male	?	4500	8	Necrotizing enterocolitis	Pancreatic mucosa	Ectopic mucosa
Zahraa et al. [13]	Male	Full term	2070	3	Necrotizing peritonitis	None	Inflammation
Wright and Bhagwandeen [14]	Male	Full term	3515	Birth	Strangulated inguinal hernia	Gastric mucosa	Inflammation
Rosza and Gross [15]	Female	?	?	Died at 9 H	Meconium peritonitis	None	Inflammation
Chang et al. [3]	Male	33	2040	13 H	Pneumoperitoneum	None	Inflammation
Ford and Wooley [16]	?	37	1900	1	Pneumoperitoneum	Pancreatic mucosa	Inflammation and necrosis
Gandy et al. [17]	Male	Full term	4500	8	Bowel obstruction	Pancreatic mucosa	Inflammation
Kumar et al. [18]	Male	?	2300	5	Bowel obstruction	None	Inflammation
Sy et al. [19]	Female	40	3200	3	Pneumoperitoneum	None	Inflammation
Chang et al. [3]	Male	33	2040	1	Pneumoperitoneum	None	Focal muscular defect
Oyachi et al. [20]	Male	Full term	3060	17	Bowel obstruction	None	Inflammation
Aguayo et al. [21]	?	28	810	6	Pneumoperitoneum	None	Inflammation
Alkan et al. [22]	Female	38	2800	1	Pneumoperitoneum	None	Inflammation
Bertozzi et al. [1]	Male	34	2500	5	Pneumoperitoneum	None	No inflammation
Borgi et al. [23]	Male	29	1400	3 H	Gut perforation	None	Inflammation
Smolkin et al. [24]	Male	28	1200	4	Pneumoperitoneum	None	No inflammation

Table 1: Reported cases of neonatal Meckel's diverticulum in the literature.

Conclusion

Because perforation of MD is the newborn is very rare, early recognition and prompt management with surgical intervention is essential for a positive outcome.

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