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Perforated Meckel's Diverticulum with Intestinal Obstruction in a Newborn

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Abstract

Intestinal obstruction is one of the most common life-threatening causes of neonatal surgical emergencies. Meckel's diverticulum is true diverticulum of the intestine which usually remains silent during neonatal period. Rarely, it can present in neonates as bleeding, obstruction and perforation.

Keywords: Neonate; Laparotomy; Pneumoperitoneum; Surgery

Key-messages: Meckel's Diverticulum should be considered as one of the possible cause of pneumoperitoneum in full term newborn without risk factors. Laparotomy should be considered in such case and end to end anastomosis was successful.

Case report: Perforated Meckel's Diverticulum with Intestinal Obstruction in a Newborn

Introduction

Meckel's diverticulum (MD) is one of the commonest congenital malformations of the gastrointestinal tract. First possible differential diagnosis of bleeding per rectum in children is MD. It is a true diverticulum and has all three layers of wall of intestine with separate blood supply from vitelline artery. MD occurs due to persistence of the proximal part of the vitello-intestinal duct present on the anti-mesenteric border. Though many anatomical variations are possible, it is commonly known by the rule of two: present in 2% population, located at two feet from the ileo-caecal junction and two inches long[1]. When symptomatic, it may present with bleeding per rectum, obstruction and perforation and rarely gets manifested in neonates[2]. We report a case of nine days old neonate, who presented with intestinal obstruction having perforated MD.

Case

A male neonate was born at 36.5wks gestation via Caesarean Section due to non-progression of labour to a 24y old primi-gravida mother. Antenatal period was uneventful. His birth weight was 2740g. On examination,

there were no gross anomalies and breast feeding was started early. First meconium passed at eighth hour of life. Baby was discharged on fifth day of life. On ninth day of life, he was admitted with complaints of abdominal distension, not passing stool and two episodes of vomiting in previous 12 hours. On examination, he was stable hemodynamically but irritable. The abdomen was tense, bowel sounds were present, with no organomegaly and no palpable mass. Infant feeding tube was inserted and five ml bilious fluid was aspirated. Per anal examination was normal. Baby passed yellow stool at the time of examination. Standing X-ray of chest and abdomen revealed markedly distended bowel loops with gas under diaphragm (Figure 1). On exploratory laparotomy, at approximately 30 cm proximal to ileocecal junction, the fundus of MD was adhered to the cecum creating a band through which multiple loops of ileum were passing resulting in stretching and twisting of MD at stalk leading to venous congestion and impairment in arterial circulation causing necrosis and perforation at fundus. Surrounding ileum at the stalk, omentum and cecum were inflamed and edematous (Figure 2). Pyo-peritoneum drainage was done & pus was sent for culture. Total 10cm segment of ileum (5cm proximal and 5cm distal from MD) was resected and sent for histopathological examination. End to end anastomosis done and peritoneal drain was kept. Post-operatively, he was kept on conventional invasive ventilation with minimal support. Total parenteral nutrition and other supportive care was given. On post-operative day two, baby was extubated and naso-gastric feeds of mother's milk started on postoperative day five. Peritoneal drain was removed on seventh day of admission. He tolerated feeds well and was on full feeds on eighth day of admission. Blood culture was negative, peritoneal pus culture showed E. Coli and sensitive antibiotics were given for 14 days. He was discharged on exclusive breast feeding with adequate weight gain. At follow up after one week, baby gained 40g weight per day, passed stool daily and his abdomen was soft.

Discussion

MD is one of the commonest gastro-intestinal anomalies. However, it rarely presents in neonatal period. Most of the symptomatic MD presents by the age of 2y and male:female ratio is 2:1. Orelaru FO et. al. reviewed data of 22 published cases of MD in neonates, and found 19 out of 22 as male and term:preterm ratio of 1:1[2]. In older children, the most common presenting symptom is painless bleeding per rectum, followed by bowel obstruction, diverticulitis, and umbilical discharge, in contrast, the most common presenting symptom in neonates is bowel obstruction[3-6]. In a review from Bertozzi M et. al. among the 18 neonatal Meckel's, 58.3 % presented as obstruction, and 33.3% presented with pneumoperitoneum[7]. However, findings were reverse in the review of Orelaru FO et. al. in which 62% had pneumoperitoneum and 32% had obstruction[2]. In our case, the neonate had intestinal obstruction due to adhered MD with the cecum with perforation of MD at its fundus casing pneumoperitoneum. There was no bleeding per rectum. Perforation of Meckel's may occur due to variety of reasons. It can be secondary to ulcer perforation from ectopic gastric mucosa in the Meckel's, separation of vitelline remnants from the abdominal wall or perforation from diverticulitis[2]. Meckel's may have different ectopic tissues such as gastric, pancreatic, colonic, duodenal or endometrial in about 30% to 50% of patients[8,9]. In our case, on histopathological examination, no ectopic mucosa was seen however, neutrophilic infiltration was present on serosal surface, which was suggested acute inflammation because of venous congestion.

Perforation of the gastrointestinal tract in neonates is commonly due to spontaneous intestinal perforation, necrotising enterocolitis (NEC); mechanical causes like intestinal atresia / stenosis, meconium ileus and trauma due to gavage tube or rectal thermometer. Various risk factors of spontaneous perforations are perinatal asphyxia, shock, premature rupture of membranes and low birth weight[10]. None of these risk factors were present in our case. Perforated MD was rare possibility. Exploratory laparotomy helped to find the primary cause and primary anastomosis after resection of the perforated MD was safe. Felix et al also reported 22 neonates with MD and out of them 14 had undergone primary anastomosis as the surgical intervention, however in five neonates, surgical intervention was not reported[2]. This can prevent complications of a second operation and anesthesia.

Conclusion

Though symptomatic presentation of MD is rare in neonates, it should be kept as one of the possibilities of intestinal perforation/obstruction and resection anastomosis can be performed as a primary treatment modality.

Figure Legends:

Figure 1: Erect x-ray chest and abdomen showing dilated bowel loops and gas under the right dome of diaphragm (arrow)

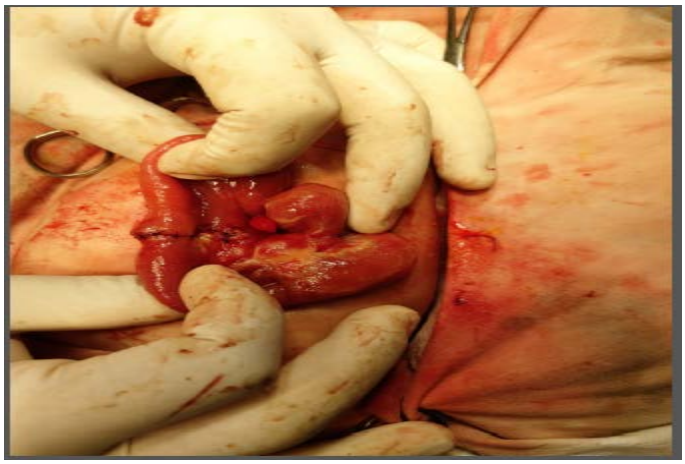
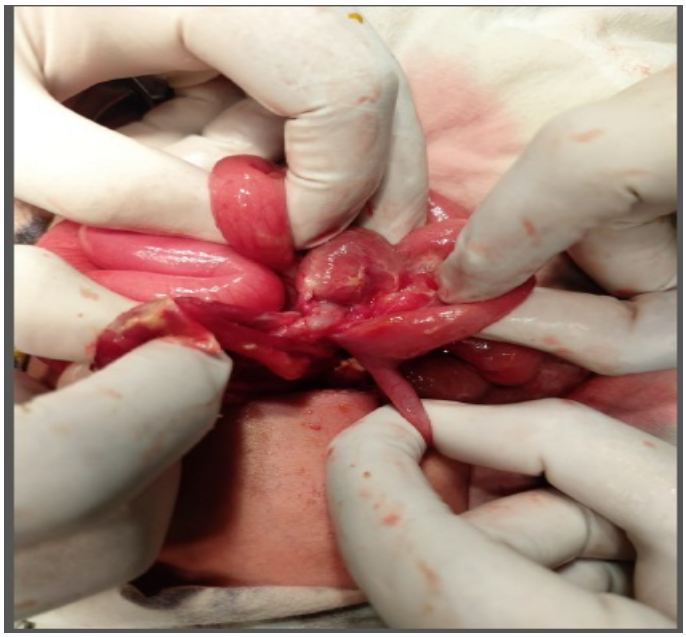


Figure 2: Gross and Histopathological Findings



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