Neonate with Jejunal Atresia with Distal Ileal Volvulus Caused by Meckel’s Diverticulum

Abstract: Jejuno-ileal atresia (JIA) is the commonest type of intestinal atresia and accounts for around 1 in 5000 to 1 in 14,000 live births. Meckel’s diverticulum (MD) is an outpouching or bulge of the small intestine. MD has also been found along with JIA as a result of intrauterine vascular accident. This case report presents a 3-day-old neonate who was then diagnosed with jejunal atresia with distal ileal volvulus caused by Meckel’s diverticulum. Presented with bloated abdomen, vomited clear yellowish fluid and did not defecated after meconium passage within 24 hours. The diagnosis was supported with specific characteristic on physical examination, laboratories and imaging results. Patient underwent explorative laparotomy to be found that the proximal ileum had jejunal atresia where the distal part had adhesion. Adhesiolysis, resection and anastomosis of the bowel surgery was done, after confirmed the passage was clear and viable. Intestinal atresia is one of the main causes of intestinal obstruction, as in our patient was found MD during surgery for JIA with volvulus. MD can cause vascular accident and necrotic bowel with volvulus as its clinical manifestation. Such patients are treated with resection of the atresia and anastomosis. However, when jejunal atresia and volvulus present together, the anastomotic leakage and mortality rate are significantly higher.

Keywords: Jejuno-ileal atresia, Volvulus, Meckel’s Diverticulum.

INTRODUCTION

Jejuno-ileal atresia (JIA) is the commonest type of intestinal atresia and accounts for around 1 in 5000 to 1 in 14,000 live births (Adams, S. D., & Stanton, M. P. 2014). Destructive events such as volvulus, hematoma, constriction, and intussusception have been observed during surgery in patients with JIA (Ciftci, I. 2012). Meckel’s diverticulum (MD) is an outpouching or bulge of the small intestine. MD has also been found along with JIA as a result of intrauterine vascular accident (Huang, C. C. et al., 2014).

CASE REPORT

A 3-day-old male neonate was admitted to our hospital with bloated abdomen. The previous day, the patient vomited five times, with clear yellowish fluid as the last product. Passage of meconium was identified within 24 hours after being born. However, the patient had not defecated since then. His last urination was 4 hours before admission. According to the mother, the antenatal period was uneventful.

During physical examination, we found abdominal distention, weak bowel sounds, decreased turgor, and hypertimpanic percussion (Figure 1). His blood draw showed a thrombocytopenia of 16,000/ul (N: 150,000-450,000/ul). The urine examination revealed leucocytosis, proteinuria, and was positive for red blood cells. The patient was then admitted to undergo babygram examination. The result showed that air distribution did not reach the distal part of the bowel, the preperitoneal fat line was hardly identified, and haziness was found in the lower to upper right abdomen. There was also dilated cisterns with multiple bubble sign, indicating jejunal atresia (Figure 2).
After administration of fluid and antibiotics, the patient was planned for explorative laparotomy. During the surgery, we found that the proximal ileum had jejunal atresia where the distal part had adhesion. The atresia was located 70 cm from the Treitz ligament. We also found a volvulus found in the distal part of the atresia which was caused by Meckel's diverticulum located 30 cm from the ileocaecal junction (Figure 3).

First, we did adhesiolysis for the adhesion. Secondly, we plicated the part proximal to the atresia. For the atresia, we did a resection and we tested the passage with NaCl 0.9% from the microcolon and the microileum. The passage was clear and the bowel was viable. Lastly, we did anastomosis on the bowel.
DISCUSSION

This case report presents a neonate with the main complaint of a bloated abdomen and vomiting with abdominal distention and radiologic examination indicating jejunal atresia. The symptoms of this patient corresponded with the clinical presentations of intestinal atresia found in a study by Burjonrappa et al., (2010) which were abdominal distention, vomiting, failure to gain weight, aspiration, and delayed passage of meconium (Burjonrappa, S. et al., 2011). The working diagnosis of this patient was jejunal atresia with sigmoid volvulus and the patient was immediately planned for surgery. During the surgery, we found that the proximal ileum had a type III jejunal atresia and adhesion. Interestingly, we also found a volvulus found in the distal part of the atresia caused by Meckel’s diverticulum.

Intestinal atresia can occur in any location on the small bowel as a solitary or even multiple lesions. Jejunum and ileum account for 39% of intestinal atresias (Osuchukwu, O.O., & Rentea, R.M. 2021). Our patient was not diagnosed with jejunal atresia alone, but with sigmoid volvulus. Volvulus of the small intestine is commonly associated with abnormality of intestinal rotation and fixation. Destructive events such as volvulus, hemiation, constriction, and intussusception have been observed during surgery in patients with JIA (Ciftci, I. 2012).

Volvulus occurring early in intrauterine life results in intestinal atresia with complete resorption of the involved bowel segment (Osifo, O. D., & Oriaifo, I. A. 2008). The two major theories regarding the pathogenetic mechanisms of intestinal atresia are Tandler’s concept of a lack of revacuolization of the solid cord stage of intestinal development and the classic study by Louw and Bamard, suggesting that a late intrauterine mesenteric vascular accident is the cause of most intestinal atresias (Sinha, S., & Sarin, Y. K. 2012).

Meckel’s diverticulum (MD) is an outpouching or bulge of the small intestine (Huang, C. C. et al., 2014). MD in neonates is usually incidentally found during pediatric digestive surgeries, as in this case it was found during surgery for jejunal atresia with sigmoid volvulus (Kuru, S., & Kismet, K. 2018). Neonates with both JIA and Meckel’s diverticulum usually present early after birth which also occurred in our case with a 3-day-old presentation Volvulus has (Singh, V., & Pathak, M. 2016). been mentioned as a clinical manifestation of MD which also became one of the mechanisms of intestinal obstruction in MD (Kuru, S., & Kismet, K. 2018; & Fu, T. et al., 2021). Disruption of mesenteric blood flow in utero leading to jejunoileal atresia (JIA) was associated with volvulus in 34 neonates (27%), malrotation in 24 (19%), gastrochisis in 21 (16%), omphalocele in 2 (1.6%), Meckel’s diverticulum (without intussusception) in 3 (2.4%), and intussusception in 2 neonates (1.6%) among 128 neonates in one study (Huebner, B. R. et al., 2013).

Patients who present with jejunoileal atresia and intraoperative finding of Meckel’s diverticulum are usually treated with resection of the atresia with primary bowel anastomosis (Huebner, B. R. et al., 2013). As in this case, we did resection and anastomosis to our patient. However, in one case report, the mortality (90.1% vs 31.5%) and morbidity (71.4% vs 22.4%) was significantly higher when JIA presented together with volvulus compared to JIA alone. Both the anastomotic leakage and mortality rate were significantly higher in patients of JIA associated with intraoperative findings of small bowel volvulus (Sinha, S., & Sarin, Y. K. 2012).

CONCLUSION

Intestinal atresia is one of the main causes of intestinal obstruction. Several mechanisms including disturbance in intrauterine intestinal revacuolization, vascular accident, and necrosis have been hypothesized for the association of JIA and volvulus, as seen in our patient in which these two conditions present together. Meckel’s diverticulum usually presents as an incidental intraoperative finding in surgeries for other indications, as in our patient was found during surgery for JIA with volvulus. MD can cause vascular accident and necrotic bowel with volvulus as its clinical manifestation. The resorption of this necrotic bowel finally results in intestinal atresia. Such patients are treated with resection of the atresia and anastomosis. However, when intestinal atresia and volvulus present together, the anastomotic leakage and mortality rate are significantly higher.

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Conflict of Interest:
No potential conflict of interest relevant to this study was reported.

REFERENCES


