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Second-Look Surgery in Intestinal Volvulus Caused by Meckel's Diverticulum: A Case Report

Abordagem *Second-Look* em Volvo Intestinal por Divertículo de Meckel: Um Caso Clínico

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Abstract

Meckel's diverticulum is the most common manifestation of yolk duct anomalies. The most common forms of presentation are painless gastrointestinal bleeding, intestinal obstruction, and diverticulitis. A previously healthy 19-month-old boy was admitted on the emergency department due to septic and hypovolemic shock. The patient underwent exploratory laparotomy which revealed a Meckel's diverticulum anchored to the mesentery by a fibrous band, causing a volvulus and ischemia. A second-look approach was chosen. He underwent relaparotomy on postoperative day 7, which revealed an improvement of intestinal perfusion. Segmental ileal resection containing Meckel's diverticulum and ileostomy were performed. Few cases are described in the literature for intestinal ischemia secondary to volvulus and, those that do exist, are in the context of intestinal malrotation and not in the presence of a Meckel's diverticulum. With this approach, we were able to preserve a significant amount of bowel, without increasing the risk of short intestine syndrome.

Resumo

O divertículo de Meckel é a manifestação mais comum das anomalias do ducto vitelino. As formas mais comuns de apresentação são hemorragia gastrointestinal indolor, oclusão intestinal e diverticulite. Descrevemos o caso de uma criança de 19 meses, sexo masculino, saudável, admitida na sala de emergência por choque séptico e hipovolémico. Foi submetida a laparotomia exploradora com identificação de divertículo de Meckel ancorado ao mesentério por cordão fibroso, condicionando volvo do intestino médio e isquemia, pelo que se optou por uma cirurgia *second-look*. Foi submetido a relaparotomia ao sétimo dia de pós-operatório, constatando-se melhoria da perfusão intestinal. Realizou-se resseção ileal segmentar contendo o divertículo de Meckel e ileostomia. Existem poucos casos descritos na literatura de isquemia intestinal secundária a volvo e, os que existem, são no contexto de malrotação intestinal e não na presença de divertículo de Meckel. Com esta abordagem, conseguimos preservar uma quantidade significativa de intestino, sem aumentar o risco de síndrome do intestino curto.

Keywords: Child; Intestinal Volvulus/surgery; Ischemia/surgery; Meckel Diverticulum/surgery; Second-Look Surgery

Palavras-chave: Cirurgia Second-Look; Criança; Divertículo de Meckel/cirurgia; Isquémia/cirurgia; Volvo Intestinal/cirurgia

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Introduction

Meckel's diverticulum is the most common manifestation of yolk duct anomalies, located close to the ileocecal valve.[1-3] The incidence is 0.3%-3% in the population, being more common in males under 2 years of age.[1-5] The first records date back to 1650, by Fabricus Heldanus.[1,2] However, the entity's name was given in honor of Johann Friedrich Meckel, in 1809, the first to recognize the embryologic origin.[6]

Etiology is due to incomplete obliteration of the yolk duct, during the fith-sixth weeks of embryonic development, forming a true diverticulum.[1,4] It is located at the antimesenteric edge of the small intestine, approximately 60 cm from the ileocecal valve and has approximately 2 cm long.[5] It may contain heterotopic mucosa, with gastric and pancreatic being the most common.[4]

Diagnosis is a challenge. Most cases are asymptomatic and the diagnosis may be incidental, by imaging or surgical exploration for other causes.[1,2] Risk factors for developing symptoms include: age younger than 50, male gender, diverticulum greater than 2 cm in length, presence of ectopic tissue, broad-based diverticulum, and fibrous bands attached to the diverticulum.[5-9] The most common forms of presentation are painless gastrointestinal bleeding, intestinal obstruction, and diverticulitis.[1-2,10]

Symptomatic Meckel's diverticulum requires surgery; however, the management of its incidental discovery remains controversial. More recent evidence suggests that it should only be removed surgically if the risk of developing complications in the future is increased.[1,3,7]

Second-look surgery in intestinal ischemia argues that it is possible to reevaluate intestinal reperfusion later in time and reduce the extension of the resected bowel, reducing the risk of short bowel syndrome.[11,12]

In this article, we present a case of intestinal ischemia due to volvulus, associated with the presence of remnants of the omphalomesenteric band, in which the second-look approach successfully avoided a large intestinal resection.

Case Report

A previously healthy 19-month-old boy was admitted on the emergency department due to septic and hypovolemic shock. After volemic resuscitation in the Pediatric Intensive Care Unit, an abdominal ultrasound was performed which showed intestinal volvulus. The patient underwent exploratory laparotomy which revealed a Meckel's diverticulum anchored to the mesentery by a fibrous band, causing midgut volvulus and ischemia (Figs. 1 and 2).

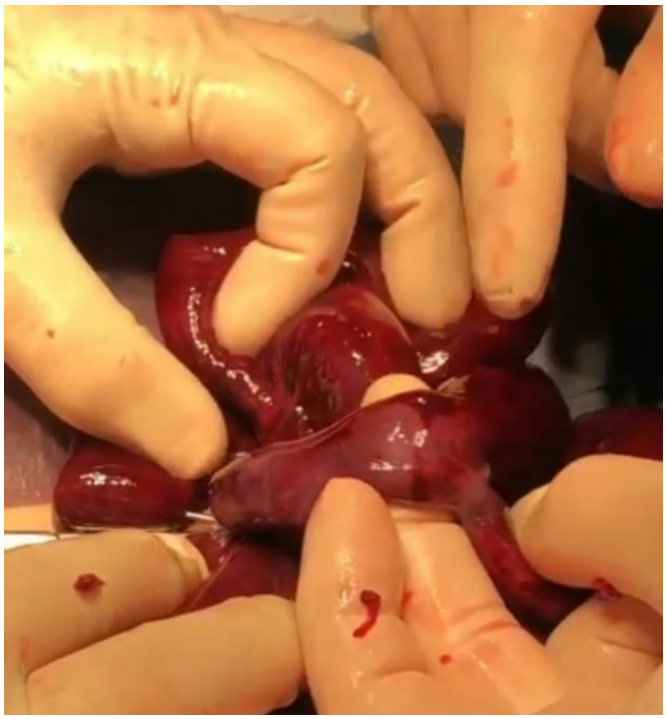

Figure 1. Meckel's diverticulum

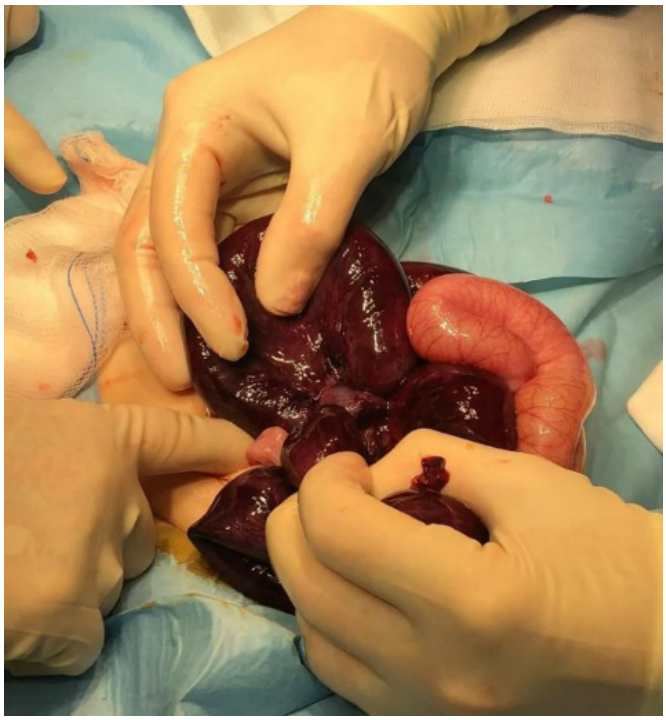

Figure 2. Midgut volvulus causing ischemia.

The fibrous band was sectioned, and the volvulus was untwisted with improvement of some ischemic areas (Fig. 3). Given the risk of short intestine syndrome, a second-look approach was chosen.

On postoperative day 7, he underwent relaparotomy and a significant improvement in intestinal perfusion was noted. Segmental ileal resection, containing Meckel's diverticulum and ileostomy 30 cm from the ileocecal valve were performed (Fig. 4).

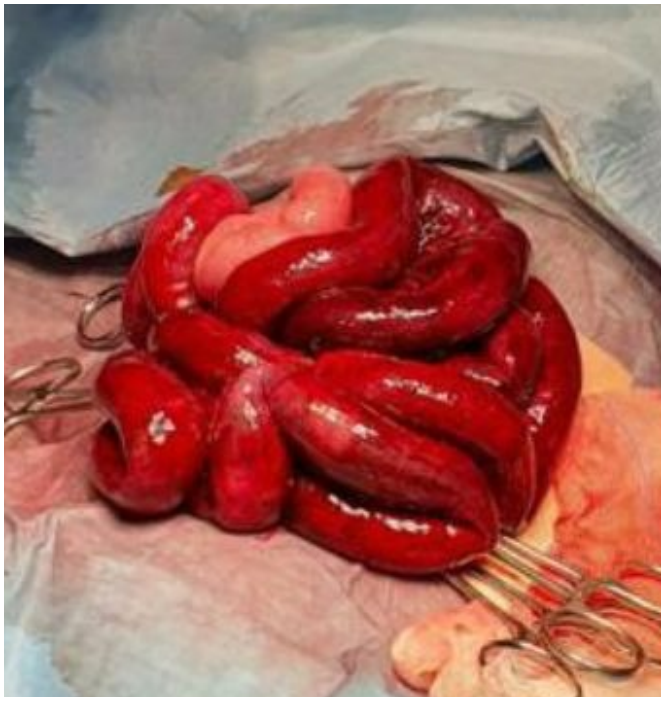

Figure 3. Improvement of ischemia after fibrous band section and volvulus detorsion.

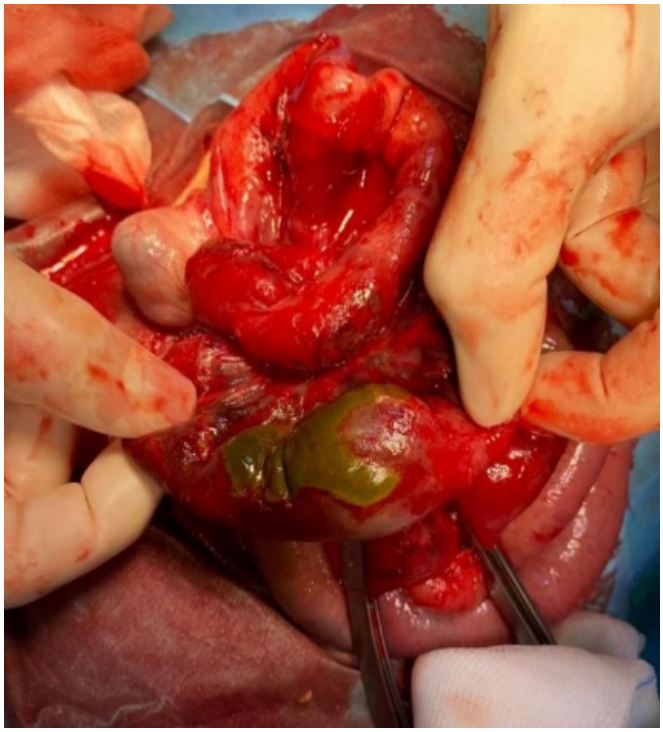

Figure 4. Second-look approach: significant improvement in intestinal perfusion but with the need of segmental ileal resection containing Meckel's diverticulum.

The patient had a functioning ileostomy on postoperative day 1 and started enteral feeding on day 4. The postoperative period was complicated by intestinal obstruction requiring relaparotomy. He was discharged on the 25th day of hospitalization and remains without complications. He underwent intestinal reconstruction 5 months after the second intervention.

Discussion

Meckel's diverticulum is a rare disease, generally asymptomatic. However, if becomes symptomatic, it is mainly due to obstruction, bleeding or diverticulitis.[1-2,10]

In our case, male sex, age < 2 years old and the presence of a fibrous band are risk factors for the development of complications such as obstruction, according to the literature.[9] Obstruction may occur due to volvulus, intussusception, internal hernia, or incarcerated inguinal hernia.[2,5,10] Volvulus usually occurs around the remnants of the yolk duct.

The diagnosis of Meckel's diverticulum was made intraoperatively, and this structure must be resected in all symptomatic patients.[3,7] Segmental enterectomy was performed, containing Meckel's diverticulum, as described in the literature.

The second-look surgical approach in cases of intestinal ischemia is used with the aim of avoiding the resection of large bowel segments. This technique is not new and has been applied in cases of necrotizing enterocolitis with some success.[11-13] With this approach, we were able to preserve a significant amount of bowel loops, rather than going aggressively in the first surgery, where most of the bowel would have been resected.

Meckel's diverticulum presents a diagnostic and clinical challenge to the pediatric surgeon. In a sudden-onset acute abdomen, associated with hypovolemic/septic shock, it is always necessary to exclude mesenteric ischemia, particularly intestinal volvulus, the most common complication in pediatrics.[8] A second-look approach to confirm or not the bowel viability could mean fewer comorbidities for the patient, namely the risk of short bowel syndrome.[9]

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IM: Concept and case design. Collection, analysis and interpretation. Manuscript writing.
CP: Concept and case design. Collection, analysis and interpretation. Case surgeon. Supervision.
ES: Concept and case design. Scientific review. Supervision.
FF: Concept and case design. Supervision.
FA: Concept and case design. Case surgeon. Supervision.
All authors approved the final version.

Declaração de Contribuição

IM: Conceito e desenho do caso. Colheita, análise e interpretação. Redação do manuscrito.
CP: Conceito e desenho do caso. Colheita, análise e interpretação. Cirurgiã do caso. Supervisão.
ES: Conceito e desenho do caso. Revisão Científica. Supervisão.
FF: Conceito e desenho do caso. Supervisão.
FA: Conceito e desenho do caso. Cirurgiã do caso. Supervisão.
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