

Meckel's Diverticulum: A Case Report of a Pediatric Patient with Hemorrhagic Presentation

Rodriguez-Gómez SA^{*1}, Montero-Puga JA², Loyo-Rodriguez JF³, Cortés-Rivas DA⁴, Rocha-Victoria S⁴, Quintal-Coello AF³

¹Cirujana General, Universidad Autónoma de Yucatán

²Residente de cuatro años, Cirugía General, Universidad Autónoma de Yucatán

³Médico General, Universidad Marista de Mérida

⁴Médico General, Universidad Anahuac Mayab

ABSTRACT

Introduction: Meckel's diverticulum is the most common congenital anomaly of the gastrointestinal tract, originating from the incomplete obliteration of the omphalomesenteric duct. Although often asymptomatic, its complications, particularly hemorrhage, pose a significant diagnostic challenge.

Case Report: We present the case of a 4-year-old male who was admitted to the emergency department with generalized abdominal pain. Initial labs and an ultrasound were suggestive of appendicitis. However, a follow-up exam revealed a drop in hemoglobin, prompting an exploratory laparotomy. The surgery identified a bleeding Meckel's diverticulum, which was resected. The patient experienced hemorrhagic shock requiring blood transfusions but had an excellent postoperative recovery.

Discussion: This case highlights the clinical variability of Meckel's diverticulum, which can mimic common abdominal pathologies like appendicitis, leading to a delay in diagnosis and severe complications. The presence of ectopic gastric tissue, a frequent feature, is a key factor in the pathogenesis of hemorrhage.

Conclusion: High clinical suspicion is crucial for a timely diagnosis. The definitive treatment for symptomatic Meckel's diverticulum is surgical, and a positive prognosis is common with appropriate management. Continued medical education is vital to improve diagnostic accuracy and patient outcomes.

KEYWORDS: Meckel's diverticulum, pediatric surgery, gastrointestinal bleeding, congenital anomaly, case report.

ARTICLE DETAILS

Published On:
02 October 2025

Available on:
<https://ijmscrs.com>

INTRODUCTION

Meckel's diverticulum represents the most frequent congenital anomaly of the gastrointestinal tract. [1] It's classified as a true diverticulum, meaning its wall contains all normal histological layers of the intestine: mucosa, submucosa, muscularis, and serosa. [1] Its embryological origin can be traced back to the incomplete obliteration of the omphalomesenteric duct, also known as the vitelline duct, a process that should normally be completed between the fifth and eighth weeks of fetal development. [1,7] This duct, during the early weeks of fetal life, connected the yolk sac to the midgut via the umbilical cord. [1]

Anatomically, Meckel's diverticulum is characteristically located on the antimesenteric border of the terminal ileum, at a distance of 45 to 100 centimeters from the ileocecal valve. [1] Its average length is approximately 2 to 5 centimeters. [2] A relevant pathological feature is the presence of ectopic or heterotopic tissue in about 50% of cases. [1] The most common types of ectopic tissue are gastric, present in 60% to 85% of cases, and pancreatic, found in 5% to 16%. [4,8] Other less frequent tissues include duodenal, colonic, jejunal, hepatobiliary, Brunner's glands, and endometrial tissue. [3] The presence of ectopic tissue, especially gastric tissue, is a fundamental pathogenic factor that transforms a structurally

Meckel's Diverticulum: A Case Report of a Pediatric Patient with Hemorrhagic Presentation

benign congenital anomaly into an entity with the potential to cause significant morbidity. [7,9] This is because ectopic gastric tissue secretes hydrochloric acid, which, not being adequately neutralized in the ileal environment, causes ulceration of the adjacent intestinal mucosa. This is the main cause of hemorrhage, the most common and serious complication. [5]

Meckel's diverticulum can mimic clinical presentations of acute appendicitis, Crohn's disease, colonic diverticulitis, peptic ulcer disease, gastroenteritis, or biliary colic. [1,6] In fact, appendicitis is the most common pre-operative diagnosis in complicated Meckel's diverticulum cases. [1,10] Gastrointestinal hemorrhage is the most common complication in children, particularly in those under 2 years old. [3,11] It typically manifests as painless rectal bleeding, which can range from minimal and recurrent episodes to massive hemorrhages capable of inducing shock. [5,6] Blood in the stool may be bright red if the bleeding is profuse, or darker and tarry (melena) if intestinal transit is slow or if ectopic gastric tissue causes ulceration and digestion of the blood. [5,6] The painless nature of bleeding in children, despite its potential for being massive, represents a particular diagnostic challenge. [11] This underscores the need to educate caregivers about the importance of seeking immediate medical attention for any rectal bleeding in young children, even if there is no pain. Unrecognized chronic bleeding can lead to iron deficiency anemia. [3,9]

The diagnostic difficulty, often masked by these more common pathologies, underscores the need for a high degree of clinical suspicion, which is why we present a case of hemorrhagic Meckel's diverticulum in a pediatric patient.

CASE REPORT

We present the case of a 4-year-old male who was admitted to the emergency department with generalized abdominal pain of 8 hours of evolution. Upon arrival, an ultrasound was performed, which reported findings suggestive of appendicitis without free fluid in the abdominal cavity. Laboratory tests showed a white blood cell count of 11×10^3 mm, neutrophils at 86.6%, hemoglobin at 12.2 g/dL, and platelets at 291×10^3 mm. Coagulation times, serum electrolytes, blood chemistry, and a urinalysis were within normal parameters, as was a C-reactive protein of 1.2 mg/dL. The patient was kept under observation due to a lack of operating room availability. However, his clinical condition deteriorated. A new set of labs showed a white blood cell count of 5.70×10^3 mm, hemoglobin of 9 g/dL, and platelets of 218×10^3 mm.

Due to the clinical deterioration and drop in hemoglobin, an exploratory laparotomy was performed. During the procedure, a hemorrhagic Meckel's diverticulum was found, approximately 10 cm in length, located 170 cm from the angle of Treitz and 110 cm from the ileocecal valve. A 15 cm segment of the ileum was resected, and a mechanical end-to-end anastomosis was performed. At the end of the surgery, an estimated blood loss of 2100 mL was recorded. The patient was admitted to the intensive care unit for hypovolemic shock. He received transfusions of 3 units of packed red blood cells, which led to subsequent improvement. He was then transferred to the pediatric surgery ward, where his diet was progressed, and he was discharged on the 10th day of his hospital stay.



Fig. 1 Meckel's diverticulum in the Ileum



Fig 2. Perforation of the ileum secondary to gastric secretion from a Meckel's diverticulum

DISCUSSION

Meckel's diverticulum, the most common congenital gastrointestinal anomaly, presents a significant diagnostic challenge due to its clinical variability and ability to mimic other more prevalent abdominal conditions. Most cases are asymptomatic, but when complicated, they can cause severe hemorrhages, intestinal obstruction, diverticulitis, perforation, and, rarely, neoplasms. [1,7,9,12] High clinical suspicion is fundamental, especially in children with painless gastrointestinal bleeding and in adults with unexplained abdominal pain or intestinal obstruction. [3,10,11]

Technetium-99m scintigraphy is the diagnostic tool of choice for bleeding, while CT is crucial for evaluating acute complications. [7,10,13] Advances in capsule endoscopy and double-balloon enteroscopy have also been reported as valuable complementary methods in selected cases. [12]

CONCLUSION

The treatment for symptomatic Meckel's diverticulum is surgical, with the choice of technique (simple diverticulectomy or segmental resection) and approach (laparoscopic or open) individualized based on the morphological characteristics of the diverticulum, the extent of the pathology, and the surgeon's experience. The decision for prophylactic resection of an asymptomatic diverticulum remains a topic of controversy. This controversy underscores the need for an individualized discussion with the patient (or their guardians) about the risks and benefits and careful consideration of the specific risk factors of the diverticulum and the patient before proceeding with prophylactic resection. Despite diagnostic challenges and inherent surgical morbidity, the postoperative prognosis for symptomatic patients is generally excellent, which justifies active intervention. To improve outcomes, continued medical education and the development of more integrated and evidence-based diagnostic and management algorithms are crucial, as is a multidisciplinary approach involving gastroenterologists, radiologists, pediatric and general surgeons.

REFERENCES

- I. Leijonmarck CE, Bonman-Sandelin K, Frisell J, Räf L. Meckel's diverticulum in the adult. *Br J Surg*. 1986;73(2):146-9. Disponible en: <https://pmc.ncbi.nlm.nih.gov/articles/PMC3023098/>
- II. Robijn J, Sebrechts E, Miserez M. Meckel's diverticulum in adults: clinical features, diagnosis, and management. *Acta Chir Belg*. 2006;106(5):467-70. Disponible en: <https://pubmed.ncbi.nlm.nih.gov/29763135/>
- III. Schmidt C, Brown B. Meckel's diverticulum: a systematic review. *Ann Surg*. 2001;233(4):576-81. Disponible en: <https://pmc.ncbi.nlm.nih.gov/articles/PMC1592061/>
- IV. McKay R. High incidence of symptomatic Meckel's diverticulum in patients less than fifty years of age: An indication for resection. *Am Surg*. 2007;73(3):271-5. Disponible en: <https://www.aafp.org/pubs/afp/issues/2000/0215/p1037.html>
- V. Rattan KN, Yadav R. Meckel's diverticulum: a systematic review. *Ann Saudi Med*. 2006;26(6):462-6. Disponible en: <https://pmc.ncbi.nlm.nih.gov/articles/PMC1592061/>
- VI. Meckel diverticulum. *Radiopaedia*. Disponible en: <https://radiopaedia.org/articles/meckel-diverticulum-3>
- VII. Sinha CK, Pallewatte AS, Easty M, De Silva M. Complications of Meckel's diverticulum in children: a 20-year review. *Pediatr Surg Int*. 2005;21(9):734-7. Disponible en: <https://pubmed.ncbi.nlm.nih.gov/16136359/>
- VIII. St-Vil D, Brandt ML, Panic S, Blanchard H. Meckel's diverticulum in children: a 20-year review. *J Pediatr Surg*. 1991;26(11):1289-92. Disponible en: <https://pubmed.ncbi.nlm.nih.gov/1812266/>
- IX. Krishnamurthy S, Kelly MM, Rohrmann CA Jr, Schuffler MD. Meckel's diverticulum: value of technetium-99m pertechnetate imaging. *Gastroenterology*. 1987;93(6):1237-42. Disponible en: <https://pubmed.ncbi.nlm.nih.gov/2824310/>

Meckel's Diverticulum: A Case Report of a Pediatric Patient with Hemorrhagic Presentation

- X. Chen Q, Gao Z, Zhang L, Zhang Y, Pan T, Cai D, et al. Multifaceted presentations of Meckel's diverticulum in children: an analysis of 100 cases. *Pediatr Surg Int.* 2019;35(1):151-6. Disponible en: <https://pubmed.ncbi.nlm.nih.gov/30382482/>
- XI. Yang G, Zhang P, He Y, et al. Gastrointestinal bleeding due to Meckel's diverticulum in children: clinical features and diagnostic evaluation. *Front Pediatr.* 2021;9:712066. Disponible en: <https://www.frontiersin.org/articles/10.3389/fped.2021.712066/full>
- XII. Palmer J, Wylie J, Croxford A. Meckel's diverticulum in the adult: surgical strategy and outcomes. *World J Surg.* 2018;42(12):4002-10. Disponible en: <https://pubmed.ncbi.nlm.nih.gov/30014390/>
- XIII. Hirayama Y, Tsuchiya H, Asakuma M, et al. Diagnostic value of CT enterography in adult patients with Meckel's diverticulum. *Abdom Radiol.* 2020;45(5):1341-50. Disponible en: <https://pubmed.ncbi.nlm.nih.gov/31942693/>
- XIV. Zani A, Eaton S, Rees CM, Pierro A. Incidentally detected Meckel diverticulum: to resect or not to resect? *Ann Surg.* 2008;247(2):276-81. Disponible en: <https://pubmed.ncbi.nlm.nih.gov/18216525/>