Texila International Journal of Public Health
ISSN: 2520-3134
DOI: 10.21522/TIJPH.2013.13.03.Art017

A Case of Meckel's Diverticulum with Perforation

Sushmitha S.*, J. Thanka, Srismitha, Sivaranjani, A.
Department of Pathology, Sree Balaji Medical College and Hospital, Chennai, Tamil Nadu, India

Abstract

Meckel's diverticulum is the most common congenital abnormality of the small intestine, resulting from incomplete closure of the vitelline (omphalomesenteric) duct. It is a true diverticulum located approximately 2 feet from the ileocecal valve, usually on the anti-mesenteric border of the ileum. While it is generally asymptomatic, complications such as inflammation, haemorrhage, intestinal obstruction, and Littre's hernia can occur but rarely presents with perforation in adults, especially in females. We present a case of Meckel's diverticulitis with perforation, highlighting the histopathological features and associated complications and considering differential diagnosis in female patient with symptoms of acute abdomen pain. In our case a 48-year-old female presented with symptoms of intestinal perforation. Laparotomy revealed Meckel's diverticulum with perforation. On histology shows a true diverticulum containing all the layers of the intestine with transmural inflammation and perforation.

Keywords: *Acute Abdomen, Diverticulitis, Enterolith, Meckel's Diverticulum, Perforation.*

Introduction

Meckel's diverticulum, first described by Fabricius Hidanus in 1598 and later named after Johann Friedrich Meckel the Younger, results from incomplete obliteration of the vitelline duct [1]. It is a true diverticulum comprising all bowel wall layers, usually found on the anti-mesenteric border of the ileum within 100 cm of the ileocecal valve [4].

While often asymptomatic, Meckel's diverticulum may harbor heterotopic mucosa (gastric and pancreatic), which can lead to complications such as ulceration, bleeding, inflammation, and perforation [5]. Gastric mucosa is the most common ectopic tissue and may lead to acid-induced ulceration, particularly at the junction with normal ileal mucosa [6].

Case Report

A 48-year-old female presented with abdominal distension for three days, constipation for four days, and five episodes of vomiting over four days on clinical examination showed features of intestinal perforation. Laparotomy showed meckel's diverticulum with features of perforation. We received resected part of ileum with Meckel's diverticulum specimen in histopathology laboratory. On gross Examination a resected part of ileum with Meckel's diverticulum the resected ileal segment measured 20 cm in length (Figure 1). On cut section, a diverticulum measuring 5 × 4 × 3 cm with thinned-out mucosa and ulceration was identified. The diverticulum was 5.5 cm from the proximal end and 9 cm from the distal end. The remaining ileal mucosa appeared unremarkable. On microscopic examination Meckel's diverticulitis showing lining of ileal mucosa (Figure.2). Also shows acute inflammation which is transmural and serosal with areas of perforation (Figure 3). There is also an enterolith seen in Meckel's diverticulum (Figure 4).

Received: 28.04.2025 ***Accepted: 11.06.2025*** ***Published on: 03.10.2025***
****Corresponding Author: sushmitharathod4@gmail.com***

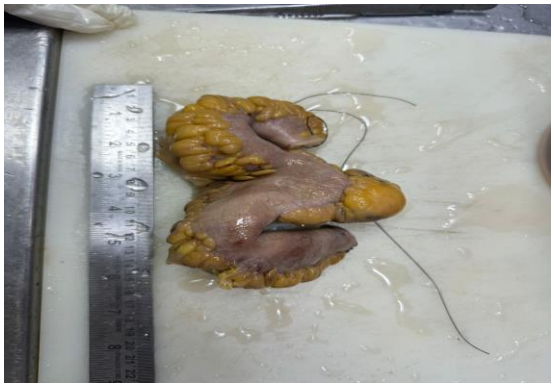

Figure 1. Resected Part of Ileum with Meckel's Diverticulum

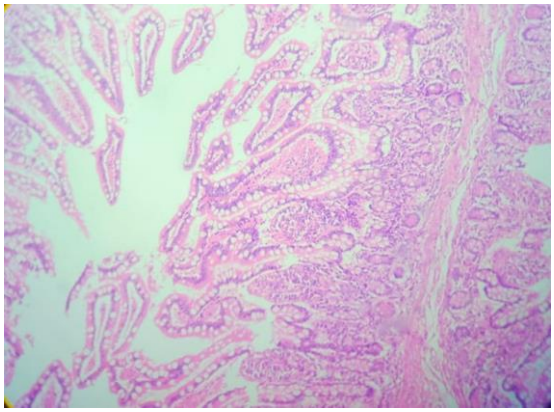

Figure 2. Meckel's Diverticulitis Showing Lining of Ileal Mucosa

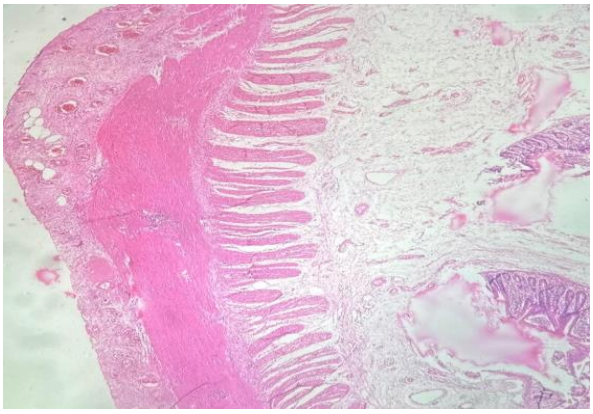

Figure 3. Transmural and Serosal Inflammation and Perforation

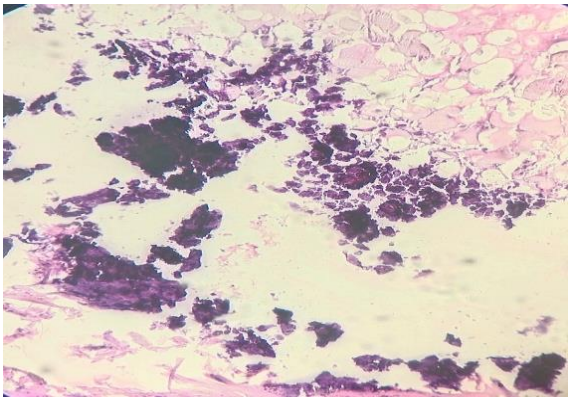

Figure 4. Enterolith in the Meckel's Diverticulum

Discussion

Meckel's diverticulitis with perforation is a pathological condition characterized by inflammation of Meckel's diverticulum, a congenital outpouching of the small intestine resulting from the incomplete closure of the vitelline duct during embryonic development. This inflammatory process can escalate, leading to rupture and perforation of the intestinal wall, thereby initiating a cascade of complications. The location of Meckel's diverticulum, typically situated near the ileocecal valve, plays a crucial role in the development of complications. Complications arising from perforation and enteroliths in Meckel's diverticulum can have significant clinical implications -Peritonitis. It is characterized by abdominal pain, tenderness, guarding, rebound tenderness and Sepsis. The inflammatory response triggered by perforation can result in the systemic spread of bacteria, leading to sepsis. Sepsis may manifest with fever, increased heart rate, rapid breathing, and other signs of systemic infection that can lead to widespread inflammation, organ dysfunction, and, if not promptly treated, can be life-threatening. Perforation and the subsequent inflammatory process may lead to the formation of abscesses in the vicinity of Meckel's diverticulum. Abscesses can cause localized symptoms and may require drainage in addition to addressing the underlying cause. Enteroliths can contribute to luminal obstruction within Meckel's diverticulum or the adjacent small intestine. Obstruction can result in abdominal pain, distension, nausea, vomiting, and constipation. Larger enteroliths may exert pressure on blood vessels, compromising blood flow to the surrounding tissues. Ischemia can contribute to tissue damage, necrosis, and an increased risk of perforation. Enteroliths may act as a lead point for intussusception, a condition where one segment of the intestine telescopes into another. Intussusception can lead to bowel obstruction and compromise blood flow, potentially resulting in ischemia. Secondary Infection: Perforation and the presence of enteroliths create an environment conducive to secondary infections. Infections may exacerbate inflammation, leading to a more complex clinical scenario. [7-9].

Several other factors can contribute to the initiation of the inflammatory process in Meckel's diverticulum. Infection is a common trigger, and the diverticulum's aberrant tissue, often containing gastric mucosa, may be more susceptible to infectious agents. Fecalith formation, the accumulation of hardened fecal material within the diverticulum, can also lead to irritation, inflammation, and ultimately perforation. Ischemia, resulting from compromised blood supply to the diverticulum, is another potential instigator of inflammation. Prompt medical attention is crucial in cases of Meckel's diverticulitis with perforation due to the risk of complications and the potential for rapid deterioration of the patient's condition. Diagnosis often involves a combination of clinical evaluation, laboratory tests, and imaging studies. Abdominal pain, tenderness, fever, and signs of peritonitis are essential clinical indicators, while laboratory tests may reveal an elevated white blood cell count and signs of systemic inflammation. Imaging modalities, such as abdominal computed tomography (CT) scans, can provide valuable insights into the extent of perforation and associated complications. Surgical options may include the resection of the affected segment of the small intestine, which includes the Meckel's diverticulum, and primary anastomosis. The choice of surgical procedure may depend on the severity of inflammation, the presence of complications, and the overall clinical condition of the patient. Minimally invasive techniques, such as laparoscopy, may be employed when feasible, offering potential benefits such as reduced postoperative pain and faster recovery. [20].

Conclusion

Meckel's diverticulum is the most common congenital anomaly of the gastrointestinal tract, with complications arising due to its abnormal embryological persistence. Meckel's diverticulitis with perforation is a rare but serious condition requiring prompt diagnosis and intervention. The presence of enteroliths adds to the complexity, increasing the risk of obstruction, ischemia, and perforation. A thorough understanding of its embryology, pathology, clinical features, and histopathology is essential for accurate diagnosis and optimal management.

Acknowledgement

The author wishes to express sincere gratitude to Dr. Sivaranjani, Department of Pathology, Sree Balaji Medical College and Hospital, for her invaluable guidance and support.

Funding

None.

Conflict of Interest

The authors declare no conflict of interest.

Reference

[1]. Coran, A. G., Caldamone, A., Adzick, N. S., Krummel, T. M., Laberge, J.-M., Shamberger, R., 2012, *Pediatric Surgery, 7th Edition. Elsevier.*

[2]. Downard, C. D., Ziegler, M. M., 2004, *Encyclopedia of Gastroenterology*.

[3]. Stone, P. A., Hofeldt, M. J., Lohan, J. A., Kessel, J. W., Flaherty, S. K., 2004, Massive gastrointestinal hemorrhage from Meckel's diverticulum in a 53-year-old man. *Am. Surg.*, 70(8):738–741.

[4]. Kumar, V., Abbas, A. K., Fausto, N., Aster, J. C., 2010, Robbins and Cotran Pathologic Basis of Disease, 8th Edition. *Saunders Elsevier*.

[5]. WHO Classification of Tumours Editorial Board, 2019, *WHO Classification of Tumours: Digestive System Tumours, 5th Edition*. *IARC.*

[6]. Farah, R. H., Avala, P., Khaiz, D., et al., 2020, Spontaneous perforation of Meckel's diverticulum: A case report and literature review. *Int. J. Surg. Case Rep.*, 71:239–242.

[7]. Dumper, J., Mackenzie, S., Mitchell, P., Sutherland, F., Quan, M. L., Mew, D., 2006, Complications of Meckel's diverticula in adults. *Can. J. Surg.*, 49(5):353–357.

[8]. Hansen, C. C., Søreide, K., 2018, Systematic review of epidemiology, presentation, and management of Meckel's diverticulum in the 21st century. *Medicine (Baltimore).*, 97(35):e12154.

[9]. Choi, S. Y., Hong, S. S., Park, H. J., et al., 2017, The many faces of Meckel's diverticulum and its complications. *J. Med. Imaging Radiat. Oncol.*, 61(2):225–231.

[10]. Palanivelu, C., Rangarajan, M., Senthilkumar, R., Madankumar, M. V., 2008, Laparoscopic management of symptomatic Meckel's diverticula: A simple tangential stapler excision. *JSLS.*, 12(1):66–70.

[11]. Kusumoto, H., Yoshida, M., Takahashi, I., et al., 1996, Complications and diagnosis of Meckel's diverticulum in 776 pediatric patients. *Surg. Today.*, 26(9):795–800.

[12]. Park, H. C., Kim, B. S., Kim, H. J., 2011, Surgical treatment of Meckel's diverticulum in adults: Comparison of diverticulectomy and segmental resection. *J. Korean Surg. Soc.*, 81(1):25–29.

[13]. Sagar, J., Kumar, V., Shah, D. K., 2006, Meckel's diverticulum: A systematic review. *J. R. Soc. Med.*, 99(10):501–505.

[14]. Arnold, J. F., Pellicane, J. V., 1997, Meckel's diverticulum: A ten-year experience. *Am. Surg.*, 63(4):354–355.

[15]. Yahchouchy, E. K., Marano, A. F., Etienne, J. C., Fingerhut, A. L., 2001, Meckel's diverticulum. *J. Am. Coll. Surg.*, 192(5):658–662.

[16]. De Silva, W. S., Lakmal, K. C., 2020, A rare case of Meckel's diverticulum with enterolith

formation causing small bowel obstruction. *BMC Gastroenterol.*, 20(1):194.

[17]. Zarzavadjian Le Bian, A., Gaujoux, S., De'Angelis, N., et al., 2018, Laparoscopic management of complicated Meckel's diverticulum in adults: A systematic review. *World J. Surg.*, 42(5):1436–1443.

[18]. Sfakianakis, G. N., Conway, J. J., 1981, Detection of ectopic gastric mucosa in Meckel's diverticulum and Barrett's esophagus by scintigraphy: II. *J. Nucl. Med.*, 22(8):721–724.

[19]. Kamada, T., Tsuchiya, Y., Tanaka, A., et al., 2006, Unusual clinical presentation of perforated Meckel's diverticulum: A case report. *World J. Gastroenterol.*, 12(41):6699–6701.

[20]. Palanivelu, C., Rangarajan, M., Senthilkumar, R., Madankumar, M. V., 2008, Laparoscopic management of symptomatic Meckel's diverticula: A simple tangential stapler excision. *JSLS.*, 12(1):66–70.