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A Perforated Meckel's Diverticulum Simulating Appendicular Peritonitis : Case report

BACHAR Amine, EL HAYAL Anas, JAMALEDDINE Khalid, Bouali Mounir, Elbakouri Abdelilah, Elhattabi Khalid, Bensardi Fatimazahara, Fadil Abdelaziz

Department of general surgery, IBN ROCHD University hospital of Casablanca, Casablanca, Morocco

*Correspondence: JAMALEDDINE Khalid

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Abstract

Meckel's diverticulum results from the partial persistence of the omphalomesenteric duct and its complications are rare. Diagnosis is often made intraoperatively.

We present the case of a 46-year-old patient admitted to the emergency ward with symptoms suggestive of peritonitis. Clinical examination revealed tenderness in the right iliac fossa. Abdominal and pelvic ultrasound revealed a swollen appendix located laterocecally, measuring 9.2 mm in maximum thickness, with an associated oval collection containing finely echogenic contents measuring 32 × 14 mm, without evidence of effusion.During surgery, a perforated Meckel's diverticulum was discovered as the cause of the peritonitis. The patient underwent segmental bowel resection with ileostomy formation. Postoperative recovery was uneventful, and the patient was discharged on the third postoperative day. Anatomopathological examination of the surgical specimen showed inflammatory changes without signs of malignancy. One month after the operation, the patient underwent ileal continuity restoration.

Key Words: Meckel's diverticulum, Perforated Meckel's diverticulum, Appendicitis.

INTRODUCTION

Meckel's diverticulum (MD) is a persistent omphalo mesenteric duct first described in 1598[1].

It is the most common congenital malformation of the digestive tract. Its incidence is between 1 and 4% of the general population [2].

Generally benign and asymptomatic, MD is a pathology of the child but can manifest itself in adulthood. Complicated forms account for 4 to 16% of MD and are often their circumstances of discovery [3].

PRESENTATION OF CASE

The patient, a 46-year-old individual with no significant medical history, presented 15 days ago with tenderness in the right iliac fossa accompanied

by food vomiting. There were no reported transit disorders or external digestive hemorrhage, and the patient experienced fever while maintaining a stable general condition.

During the physical examination, the patient was comfortable when seated but reported exacerbation of pain when lying supine. Vital signs recorded were blood pressure 110/60 mmHg, heart rate 101 beats per minute, respiratory rate 18 breaths per minute, and a temperature of 37.1°C. Tenderness was noted in the right iliac fossa, while the rest of the examination revealed no abnormalities.

Laboratory investigations revealed a white blood cell count of 23.6 with 83.2% neutrophils, a hemoglobin level of 13g/dl, and a platelet count of 394000/mm³. The Alvarado score was 8.

Abdominal and pelvic ultrasound revealed a swollen appendix laterocecal measuring 9.2 mm in maximum thickness, accompanied by an oval collection containing finely echogenic contents measuring 32 × 14 mm, with no evidence of effusion.

The patient underwent a 10 cm T-segmental resection of the small bowel, including the perforated Meckel's diverticulum, a double gunshot ileostomy, and a retrograde appendectomy. Intraoperatively, purulent peritoneal effusion was observed and removed. Additionally, a catarrhal appendix was identified in a retrocecal position, along with a perforated Meckel's diverticulum located 70 cm from the ileocecal junction. (Figure 1,2 and 3)

Postoperative recovery was uneventful, and the patient was discharged on the third day postoperatively. Pathological examination of the surgical specimen showed inflammation without signs of malignancy. One month after the operation, the patient underwent restoration of ileal continuity.

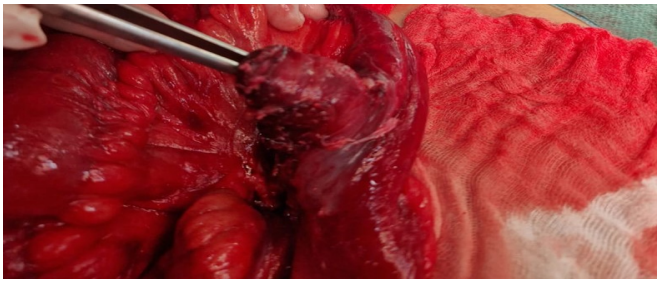

Figure 1: Peroperative image of the perforated Meckel's diverticulum

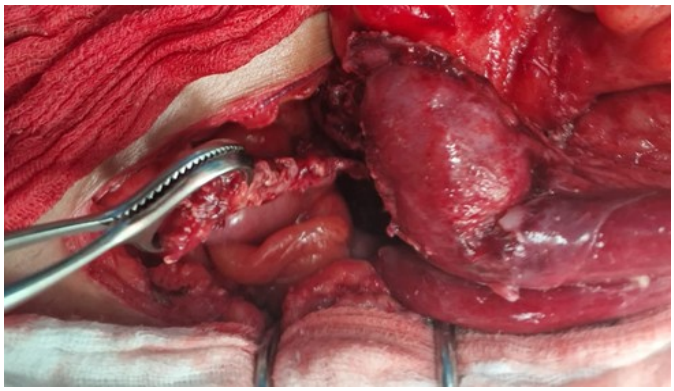

Figure 2:Peroperative image of the vermiform appendix

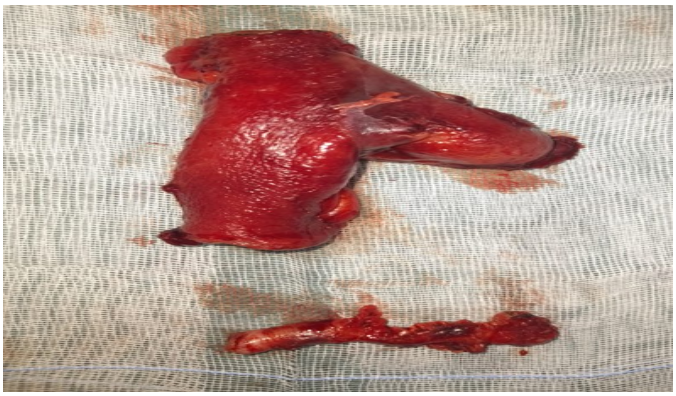

Figure 3: Operative specimens of the Meckel's diverticulum and the vermiform appendix

DISCUSSION:

Meckel's diverticulum (MD) was described by Johan Frederich Meckel, who published a detailed description of it in 1809, qualifying it for the first time as an embryonic remnant [4]. In the embryo, the omphalomesenteric duct (or yolk duct) provides communication between the yolk sac and the developing intestine. Between the 6th and 10th week,

this duct closes and becomes a fibrous band, the omphalomesenteric ligament, which then completely resolves. Meckel's diverticulum corresponds to the involutional defect of this primitive yolk loop. It appears as a single blind recess at the antimesenteric border of the ileum, at the level of the termination of the superior mesenteric artery. It is found on average 60 cm from the ileocaecal valve, with extremes of 15 to 120 cm, and this distance is shorter in children [5]. Anatomically, it is a true diverticulum with all tunics of the intestinal wall. Its average size is 3 cm, but several anatomical forms have been described, from the "a minima" diverticulum that appears as a small nipple on the wall of the small intestine, to the giant diverticulum that can measure up to 1 meter [4].

In 15% of cases, the omphalomesenteric ligament, which connects Meckel's diverticulum to the umbilicus, also persists. In most cases, it contains typical ileal mucosa, but it may also contain various tissues of ectopic location. Gastric, duodenal, colonic, pancreatic, and endometrial mucosa can be found, as well as hepato-biliary tissue [6]. Meckel's diverticulum is most often asymptomatic, discovered incidentally during surgery or imaging, but may be revealed in 4-7% of cases by a complication [7]. Nicknamed "the great simulator," the diverticulum may be responsible for a range of nonspecific symptoms. Recurrent periumbilical abdominal pain should prompt a search for unusual umbilical pathology in childhood (leaking umbilicus, recalcitrant umbilical bud) and raise the diagnosis [4].

Only about 4–16% of cases will lead to complications [8], which include hemorrhage, intussusception, inflammation, and, occasionally, perforation, which occurred in our patient. Complications are much more common in males, and the incidence of complications decreases with age, with the majority occurring in the pediatric population.

Paraclinical examinations are often of little help, especially if the diverticulum is uncomplicated. Ultrasound is of limited value in adults. The diverticulum appears as a blind tubular structure arising from an ileal loop [9]. CT scan with injection of contrast medium can easily misidentify a Meckel's diverticulum, which is mistaken for a small bowel loop, in the absence of complications [10]. Enteroscopy with enteroclysis facilitates visualization of the diverticulum and improves the sensitivity of the CT scan for diagnosis [11]. In case of complications, CT remains the most performing test [4]. MRI currently has no established place in the diagnosis of Meckel's diverticulum, complicated or not [12].

Treatment is primarily surgical, three procedures have been described: intestinal resection with anastomosis, wedge resection, and tangential stapling [13,14]. The last two options are difficult to consider in cases of perforation, inflammation, or bleeding ulcer that make segmental resection of the small bowel preferable. In case of visible macroscopic abnormality at the base of the diverticulum, segmental ("T-shaped") resection with intracorporeal anastomosis is also the only feasible procedure if the laparoscopic approach is to be preferred [15].

In other cases, linear stapling of the diverticulum [14] or wedge-shaped resection [10,13] seems to be acceptable, even if there is a risk of leaving heterotopic residues in place, which are often neither visible nor palpable [16]. In this case, opening the specimen to ensure that all macroscopically detectable ectopic mucosa is removed seems essential [15]. In case of incidental findings, the decision of

surgical management and type of resection should be made on a case-by-case basis and can be helped by looking for risk factors for complications: male sex, age < 40 years, size > 2 cm, and macroscopically visible mucosal heterotopia.

CONCLUSION:

Complications of Meckel's diverticulum are rare. The clinical signs are atypical and can pose diagnostic challenges. Advances in medical imaging have improved diagnostic approaches in several studies. In cases of acute intestinal obstruction, consideration should be given to complications of Meckel's diverticulum. The advent of laparoscopy enables not only diagnosis but also treatment of the complication during the same operation.

PROVENANCE AND PEER REVIEW:

Not commissioned, externally peer reviewed.

CONSENT

As per international standard or university standard, patient(s) written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

CONFLICTS INTERESTS

Authors have declared that no competing interests exist.

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