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A Perforated Meckel's Diverticulum Simulating Appendicular Peritonitis in a Case Report

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Meckel's diverticulum is the partial persistence of the omphalo mesenteric duct. Its complications are rare. The diagnosis is most often per operative. We report the case of a 54-year-old patient admitted to the emergency room for a peritonitis picture. The clinical examination showed a generalized abdominal tenderness, the abdominal scan showed a tumified appendix in a retro caecal position measuring 12 mm in maximum thickness with a small amount of effusion.
During the operation we found a perforated Meckel's diverticulum which is responsible for peritonitis, the patient benefited from a segmental bowel resectionwith an ileostomy.The Post-operative follow-up was normal and the patient was discharged on day 3 postop. The anatomopathological examination of the surgical specimen showed an inflammatory aspect without signs of malignancy, one month after the operation the patient benefited from a restoration of the ileal continuity.

Keywords: Meckel's diverticulum; small bowel; T-resection.

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1. 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].

2. CASE REPORT

This is a 54-year-old patient, chronic smoker with 45 pack-year presented three days agogeneralized abdominal pain associated with food vomiting, without transit disorder or externalized digestive hemorrhage, all evolving in a context of apyrexia and conservation of the general state. The clinical examination showed a generalized abdominal tenderness. The rest of the clinical examination was without particularities.

Abdominal and pelvic ultrasound showed an oval pelvic formation with regular contours, not vascularized by Doppler and no peritoneal effusion.

the abdominal scan showed a tumified appendix in a retro caecal position measuring 12 mm in maximum thickness with a small amount 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.

On exploration we found a purulent peritoneal effusion which we removed and evacuated. Presence of a catarrhal appendix in retro caecal position and under serosa Presence of a perforated Meckel's diverticulitis located at 70 cm from the ileo caecal junction.

The postoperative follow-up was normal, and the patient was declared discharged on day 3 postoperatively.

The Pathological examination of the surgical specimen showed inflammation without signs of malignancy, one month after the operation the patient benefited from a restoration of the ileal continuity.

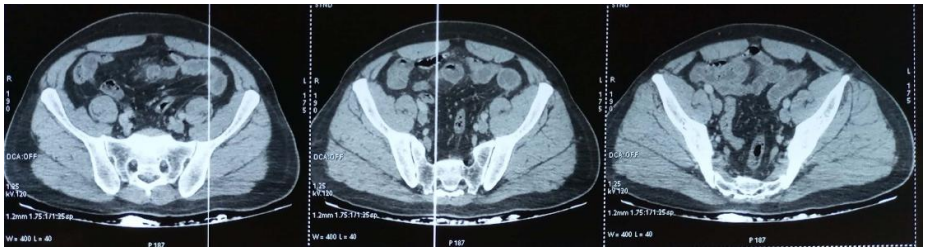

Fig. 1. Cross-sectional abdominal CT scan showing the appendix in retro caecal position the biological check-up showed a Hb :14.9g/dl, WBC :19540/mm3, Plq : 247000/mm3

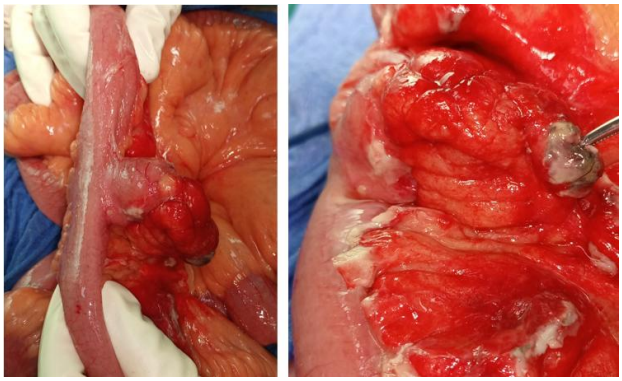

Fig. 2. intraoperative image showing the perforated Meckel's diverticulum

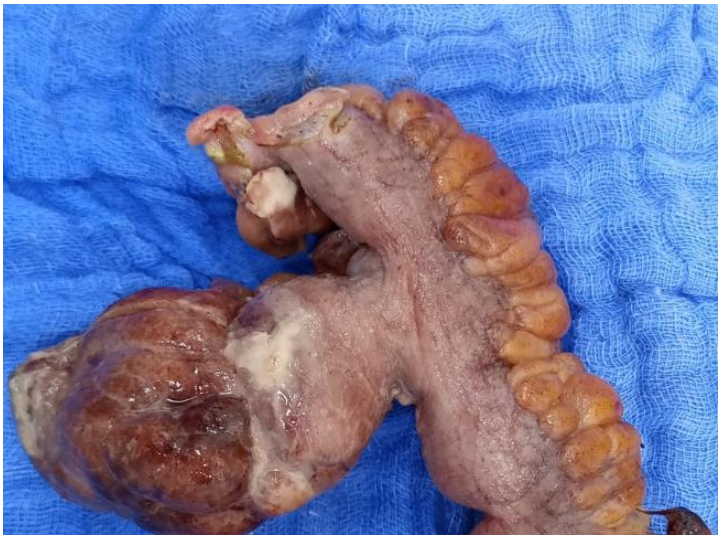

Fig. 3. Surgical specimen image showing T-shaped small bowel resection

3. DISCUSSION

Meckel's diverticulum 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 omphalo mesenteric 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 fiberous band, the omphalo mesenteric 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 anti-mesenteric 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 omphalo mesenteric 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 non-specific 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].

Complications occur in 4.1-16% of Meckel's diverticula. Several factors are associated with these complications [8]. These are young age less than 50 years, male gender, diverticular base diameter less than 2 cm and presence of ectopic tissue [3].

Intestinal obstruction and peritoneal irritation are the 2 main circumstances of discovery. They represent 26.2 and 55% of complications according to the Mendelson study [3].

The mechanisms of occlusion are multiple by flange, inflammation, invagination or tumor. Those of peritonitis are necrosis, perforation and diffusion of diverticulitis, then there is hemorrhage, diverticulitis, perforation, tumor degeneration.

The 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]. Enteroscan 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.

4. CONCLUSION

Complications of Meckel's diverticulum are rare. The clinical signs are atypical and are a source of diagnostic problems. The progress made in medical imaging has allowed in several studies a better approach of the diagnosis. When faced with an acute intestinal obstruction, one must think about the complications of Meckel's diverticulum. The development of laparoscopy will make it possible not only to make the diagnosis, but also to treat the complication during the same operation.

DISCLAIMER REGARDING CONSENT AND ETHICAL APPROVAL

As per university standard guideline, participant consent and ethical approval have been collected and preserved by the authors

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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