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Small Bowel Obstruction Due to a Meckel's Diverticulum: A Case Report

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Authors' contributions

This work was carried out in collaboration among all authors. Written informed consent was obtained from the patient for publication in this case report and accompanying images. A copy of the written consent is available for review by the Editor in chief of this journal on request. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Introduction: Meckel's diverticulum is due to the partial persistence of the omphalo mesenteric duct. It is a rare condition, affecting about 2% of the population. It is usually asymptomatic, but can also be responsible for complications which constitute as many circumstances of diagnosis.
Observation: We report the observation of an 18-year-old patient, admitted for an occlusive syndrome. The abdominopelvic CT scan showed bowel obstruction with possible volvulus of an ileal loop on flange. An exploratory laparotomy was performed and found an occlusion on an ileal loop volvulus related to a Meckel's diverticulum, connected to the umbilicus by a fibrous flange, with the demonstration of a Meckel's diverticulum with 10 cm in long and 4 cm in diameter, located on the antimesenteric border at 70 cm from Bauhin's valve. The surgical procedure consisted of a resection of the bowel, including the Meckel diverticulum with terminal anastomosis. The postoperative course was simple and the patient was discharged on the sixth postoperative day.
Conclusion: Complications of Meckel's diverticulum are rare. The clinical signs are atypical and may lead to misdiagnosis. When faced with an acute intestinal obstruction, any clinician must think of complications of Meckel's diverticulum.

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Keywords: Meckel's diverticulum; omphalodiverticular adhesion; small bowel obstruction.

1. INTRODUCTION

Meckel's diverticulum (MD) is a congenital anomaly of the gastrointestinal tract due to the partial persistence of the omphalo mesenteric duct. During intrauterine life, the omphalo mesenteric duct connects the primitive intestine with the umbilical vesicle before disappearing completely from the fifth week of gestation [1]. It is a rare condition, affecting about 2% of the general population with a slight male predominance [2]. DM is usually asymptomatic, but can also be responsible for various complications that constitute as many diagnostic circumstances: digestive hemorrhage, intestinal obstruction, intestinal intussusception, Meckel's diverticulitis, perforation, umbilical fistula and tumor degeneration [3]. These complications are unusual in adults; however, they are common in children [4]. The objective of this article was to describe the clinical case and management of small bowel volvulus on Meckel's diverticulum in an 18-year-old adult.

2. OBSERVATION

The patient was an 18-year-old man, without any particular pathological history, who presented with abdominal pain, evolving for 6 hours before his admission, associated with food vomiting and cessation of matter and gas, all evolving in a context of apyrexia and alteration of the general state. The physical examination revealed a conscious patient, stable on the hemodynamic and respiratory level, the abdomen was slightly distended, tympanic on percussion with generalized abdominal tenderness. The abdominal X-ray showed air-fluid levels in the bowel (Fig. 1). Abdominopelvic computed tomography (CT) showed a bowel obstruction with possible volvulus of an ileal loop on a flange (Fig. 2). After a blood test and preoperative resuscitation, an exploratory laparotomy was performed. The surgical exploration had found a small amount of intestinal distress fluid that was evacuated and removed, the presence of an occlusion on a volvulus of an ileal loop related to a Meckel's diverticulum, connected to the umbilicus by a fibrous flange, with the demonstration of a Meckel's diverticulum with 10 cm in long and 3 cm in diameter, located on the antimesenteric border 70 cm from Bauhin's valve (Fig. 3 and 4). The volvular loop was necrotic (Fig. 4). The operation consisted of a resection of the cecal tube, removing the necrotic loop and the Meckel's diverticulum with a terminal-terminal hail-hail anastomosis. The postoperative course was simple and the patient was discharged on the sixth postoperative day. The histopathological examination of the diverticulum showed a fibrous tissue, seat of an important inflammatory reaction, the mucosa was similar to the gastric mucosa.

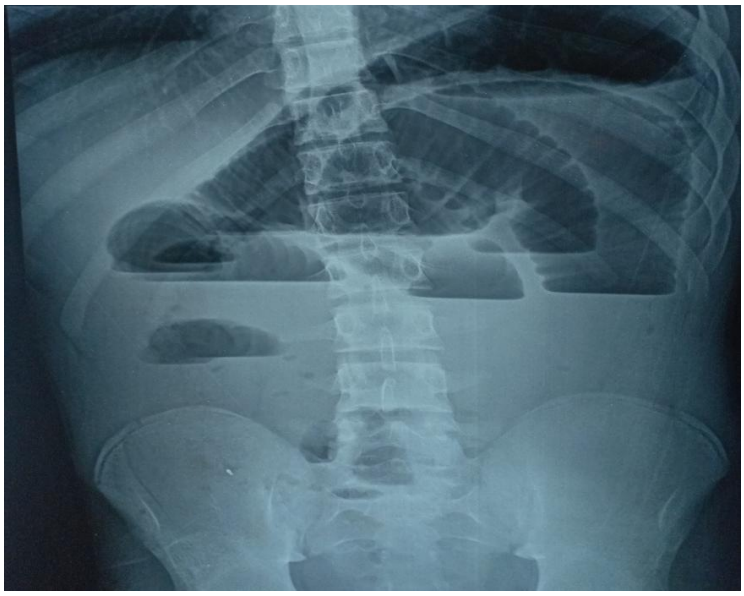

Fig. 1. Abdominal X-ray showing air-fluid levels

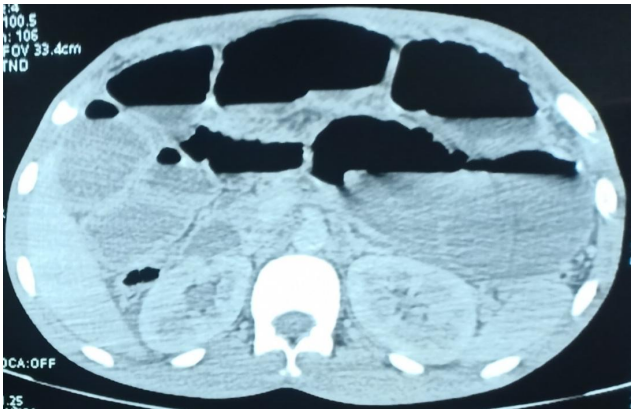

Fig. 2. CT image in axial section, showing intestinal bowel obstruction with possible volvulus of an ileal loop on flange

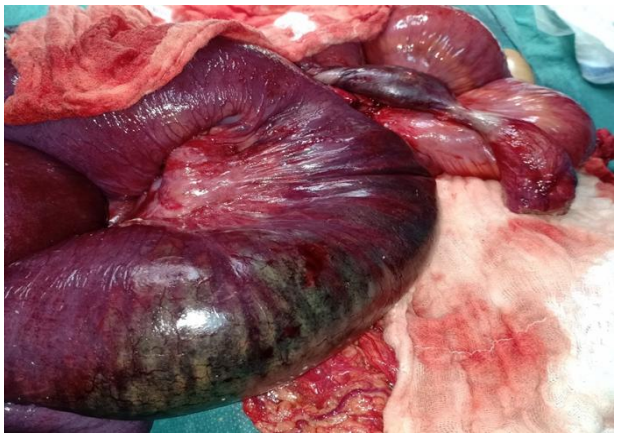

Fig. 3. Intraoperative image showing the distended and necrotic volvular loop with a 10 cm long Meckel Diverticulum, seat of stricture zones

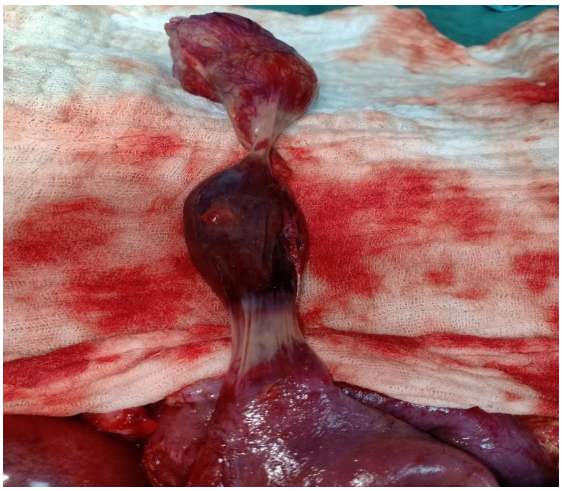

Fig. 4. Intraoperative image showing the Meckel Diverticulum which is the site of two stricture zones, measuring 10 cm in length and 4 cm in diameter

3. DISCUSSION

Meckel's diverticulum is described as a true diverticulum present on the antimesenteric border of the terminal part of the ileum, within 90 cm of the ileo-coecal valve in more than 90% of cases [5]. It represents the persistence of the proximal part of the congenital ductus vitello-intestinal which usually obliterates between the fifth and tenth week of intrauterine life. Johann Friedrich Meckel established its embryonic origin in 1809 [6]. It is the most frequent congenital pathology of the gastrointestinal tract with a slight male predominance. However, it is encountered only rarely, between 2 and 4% of the population [7]. Its dimensions are on average 2 cm in diameter and 5 cm in length [7], with 90% of diverticula measuring between one and ten centimeters. They are therefore usually short and stubby. The DM may be the site of mucosal heterotopia, which may often be of gastric origin (in 85% of cases), or pancreatic type which is identified in about 5% of diverticula; less often they may include colonic or duodenal mucosa, and appears to be a risk factor for diverticulum-related complications [8]. In our study, Meckel's diverticulum was located 70 cm from Bauhin's valve and measured 4 cm in diameter and 10 cm in length with gastric-type mucosa. Meckel's diverticulum is often asymptomatic and is only diagnosed incidentally intraoperatively, during morphological imaging of the bowel or during the occurrence of complications [9]. Mechanical bowel obstruction is the most frequent complication in adults, accounting for 24 to 53%. Most often it is an occlusion with a variable mechanism: volvulus, invagination, fixation of diverticulum at the umbilicus or at any other point of the abdomen. The frequency of complications is slightly higher in men [2]. Volvulus is considered to be the primary mechanism in terms of frequency, and can be spontaneous or flanged. Spontaneous volvulus most often involves the loop carrying Meckel's diverticulum. the diverticulum acts as a factor favoring volvulus. Volvulus on flanges are the most frequent. A distinction must be made between congenital and acquired flanges. Of the former, omphalodiverticular flanges result from the persistence of the omphalomesenteric duct which gives Meckel's diverticulum connected by a fibrous element to the umbilicus. The small intestine can then wrap around this fibrous cord [10;11], and this was the case for our patient. Mesodiverticular flanges result from the persistence of the left branch of the vitelline artery which should normally involute around the tenth week of intrauterine life but persists because of the presence of Meckel's diverticulum. These flanges are therefore stretched between the mesentery and the tip of the diverticulum. Acquired flanges are mainly due to diverticulitis; they are fibro-inflammatory adhesions. Another occlusive mechanism related to flanges is represented by internal hernias. Indeed, the flange creates a hiatus into which a small loop can enter [8]. The diagnosis of asymptomatic forms of DM is difficult. This abnormality must be looked for each time a laparotomy is performed. Similarly, in case of unexplained abdominal pain, nausea, vomiting and especially in front of an intestinal obstruction or digestive hemorrhage in children, the diagnosis of DM must be in mind [2]. Today, several imaging modalities are used, including radiography, ultrasonography, computed tomography (CT) and magnetic resonance imaging, but they have been shown to be of limited diagnostic value [12]. Superior mesenteric artery angiography is crucial to detect the site and cause of hemorrhage in complicated cases of DM. Technetium-99m scintigraphy also provides a great diagnostic clue for DM [13]. The mainstay of treatment for symptomatic DM remains surgical resection of a short segment of small bowel on both sides of the base of implantation of the diverticulum after vascular control followed by terminal-terminal ielo-ileal anastomosis. In complicated forms of peritonitis, the restoration of continuity must be postponed for a few weeks. Diamond resection is another alternative that resects the diverticulum leaving its base of implantation on the small intestine in place. The bowel is then closed with separate stitches. This simpler and faster technique has the advantage of not breaking the continuity of the bowel and therefore simpler aftercare [14]. If it is accepted that the pathological DM must be resected, certain questions still remain: should the DM be systematically sought during an abdominal operation, should a diverticulum encountered by chance be systematically removed? Depending on the context, the diverticulum can either be deliberately left in place, taking care to inform the patient or his parents if he is a child, or it can be removed immediately. Many teams have recommended for several years that only Meckel's diverticulum found in young patients should be resected prophylactically, as the risk of complications is still high [8]. The diagnosis of Meckel's diverticulum should be considered within the large group of intestinal obstructions, especially in young patients without a previous history of

surgery, because Meckel's diverticulum is difficult to identify despite the progress of cross-sectional imaging [15].

4. CONCLUSION

Complications of Meckel's diverticulum are rare. The clinical signs are atypical, which can lead to misdiagnosis. When faced with an acute intestinal obstruction, any treating clinician must think of complications of Meckel's diverticulum [16].

CONSENT

It's not applicable.

ETHICAL APPROVAL

It's not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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