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Intestinal Intussusception Due to Meckel's Diverticulum

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1. Abstract

Meckel's diverticulum (MD) is the most common congenital anomaly of the gastrointestinal tract and affects 1% - 4% of the general population. Most patients are asymptomatic throughout their lives, but it is estimated that 4% - 6% will have some symptoms, which usually occur due to abdominal complications. This study aimed to report a rare case of Meckel's diverticulum complicated by intestinal intussusception.

2. Keywords: Acute abdomen; Intussusception; Meckel's diverticulum

3. Introduction

Meckel's diverticulum (MD) is a congenital anomaly of about 5 cm in length and lies at the ileum, approximately 60 cm from the ileocecal junction. This condition occurs due to failed obliteration of the proximal portion of the vitello-intestinal duct from the 5th to the 7th week of intra-uterine fetal life [1]. Although the majority of people who present with MD are asymptomatic throughout their lives, it is estimated that 4% - 6% of them will have some type of symptom [2]. Once the symptoms start, it is usually due to complications such as digestive hemorrhage, more common in children, in addition to obstructive, inflammatory, or neoplastic acute abdomen, more common in adults [3].

Approximately 4% - 14% of MD complications may occur due to intussusception. In adults, about 90% of the cases of intussusception are secondary to polyps, MD, colonic diverticulum, stenosis, carcinoma, or benign neoplasias. Among these causes, MD is considered rare [4-7].

Therefore, this study aimed to report a case of a patient with a typical clinical condition of obstructive acute abdomen, confirmed by imaging exams.

4. Case Presentation

A 49-year-old male patient was admitted to the emergency room complaining of colic-like abdominal pain in the epigastric region 3 days after alcoholic libation. He reported a progressive worsening pain associated with nausea, vomiting and asthenia. The patient affirmed that he was a former smoker, had been a chronic alcoholic for 30 years (one liter of distillate per day) and had a history of irregularly treated systemic arterial hypertension and alcoholic liver disease. He had no history of fever, urinary, or intestinal disorders on the previous few days.

Physical examination demonstrated that the patient was in good general condition, with no cardiopulmonary alterations, no palpable visceromegalies/masses, no signs of peritonitis and normoactive airborne noises, although presenting with globous abdomen and diffusely painful superficial palpation.

Laboratory exams at admission showed C-reactive protein 13.2, 4,400 leukocytes without deviation,

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gamma-glutamyl transferase (GGT) 92, creatinine 1.6 and urea 64. In addition, the acute abdomen X-ray revealed the presence of diffuse hydroaerial level with significant distension of the small intestine.

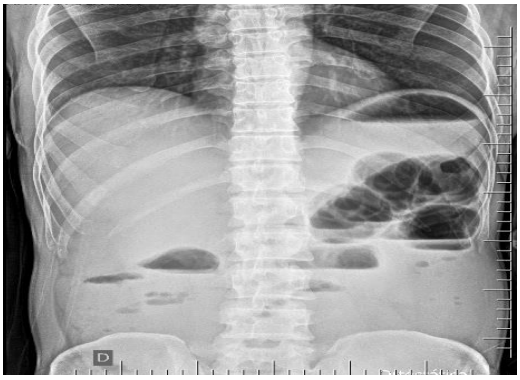

Figure 1: Radiograph of acute obstructive abdomen.

The patient was hospitalized and computed tomography of the abdomen was requested, showing distension of the small bowel loops to the terminal ileum with a point of obstruction.

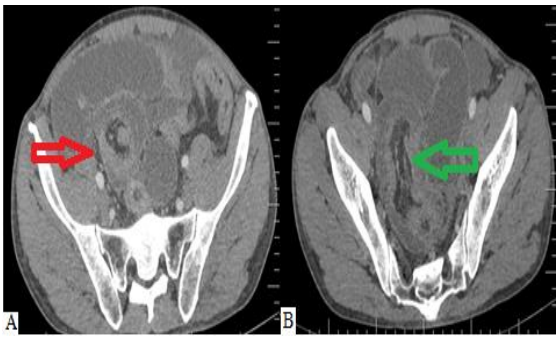

Figure 2: Computed tomography showing: **A.** "On target" signal (red arrow); **B.** Small bowel loop intussusception (green arrow).

The diagnostic hypotheses of volvulus, internal hernia, or phytobezoar were taken into consideration. The patient underwent an exploratory laparotomy and the intraoperative findings were large distension of small bowel loops and an intussusception 30 cm from the ileocecal valve with MD.

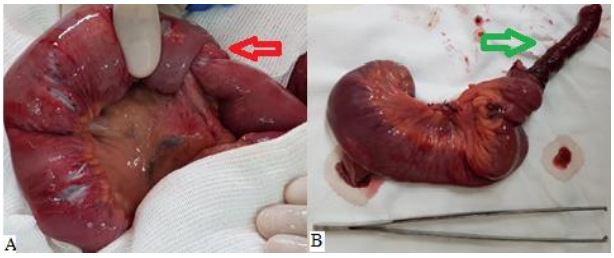

Figure 3A: Small bowel intussusception (red arrow); **B.** Segmental enterectomy with Meckel's diverticulum (green arrow).

It was necessary to perform a 25-cm segmental enterectomy of the small bowel loop at 30 cm of the ileocecal valve and a side-to-side enteroanastomosis with an 80-mm linear stapler.

On the first postoperative day, the patient developed delirium tremens due to alcohol withdrawal, requiring the use of lorazepam and restraint in bed because of agitation. Albumin and thiamine were also introduced due to liver dysfunction. During hospitalization, the patient had a good evolution and was discharged on the fifth day after surgery. He was advised to follow up at the general surgery outpatient clinic.

5. Discussion

MD, firstly described by the German anatomist Johann Friedrich Meckel in 1809, is a true diverticulum containing all layers of the small intestine wall. Arising from the antimesenteric surface of the mid-distal ileum, they represent a persistent remnant of the omphalomesenteric canal, which connects the midgut to the vitelline sac in the fetus, normally between the 5th and the 7th week of gestation, when the bowel settles in its permanent position. The most common form is a diverticulum with no additional connection, irrigated by the vitelline artery, a branch of the superior mesenteric artery [8]. In addition to the native mucosa, MD has a heterotopic mucosa that is most commonly gastric, although pancreatic or colonic mucosas have already been reported [9].

It is known that MD is the most common gastrointestinal anomaly, with a prevalence of 1% - 4% in the general population, in a 2:1 male:female ratio and often located 60 cm from the ileocecal valve [2,10,11]. It may be identified occasionally on imaging exams, but it is most commonly diagnosed during abdominal exploration for unrelated pathologies [6,12].

Patients under 50 years, male, presenting with diverticulum length >2 cm and histologically abnormal tissue, have an increased risk of developing symptoms [6], similarly to the patient of this report. In cases of obstruction, clinical manifestations include

abdominal pain, vomiting and constipation, the symptoms reported by our patient. In the presence of intussusception, the patient usually has a characteristic abdominal palpation and "raspberry jam" stools, which are important clues to help diagnosis. Obstructions that are not surgically approached may progress to necrosis and peritonitis [13].

The probability of MD patients to develop complications is 4%. Most of these cases occur before the age of two, only 1% near the age of 40, decreasing to near zero at the age of 70 [14].

MD poses difficulty for diagnosis and remains a challenge in medical practice. It should be suspected in children with low gastrointestinal bleeding and/or with recurrent or atypical intussusception, patients with suspected acute appendicitis when the appendix has already been removed and in adults with unidentified gastrointestinal bleeding at upper digestive endoscopy or colonoscopy. Diagnosis is usually made in one of three ways: technetium-99 m pertechnetate scintigraphy (known as Meckel scan), mesenteric arteriography, or abdominal exploration. Some studies have reported that the diagnosis can also be made with wireless capsule endoscopy and double balloon enteroscopy [15-19].

The progression of MD to intestinal obstruction is most commonly caused by volvulus and intussusception in children, whereas in adults it is uncommon [5,6,20]. Ultrasound is a good method for the diagnosis of MD complications, especially intestinal intussusception and inflammatory processes [11]. In cases of intussusception, a double intussusception image is seen, i.e. of the diverticulum in the ileum and of the ileum in the neck through the ileocecal valve. Additionally, a distended tubular structure, containing liquid, connected to the umbilical scar, is observed [21,22].

In cases MD is the source of symptoms, it should be surgically resected. In patients that are asymptomatic and MD is discovered by chance, resection remains controversial. Based on clinical experience, evidence and systematic reviews, asymptomatic MD should be resected in cases of identification during exploratory surgical procedures in children, in young individuals and/or in patients under 50 years whenever a palpable mass or a diverticulum >2 cm are found. However, it should not be resected in patients over 50 years, in children, or in young adults when incidentally discovered by imaging [5,6,23-25].

6. Conclusion

Clinical presentation of MD is usually related to complications and it is commonly confused with other pathologies. Therefore, it is worth to stress the importance of a diagnostic suspicion of MD in individuals with vague abdominal pain. The treatment should always be surgical, especially in cases of intestinal intussusception.

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