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Meckel Diverticulum Diagnosed As Appendicitis

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Introduction

Meckel's diverticulum (MD) is the most common congenital malformation of the gastrointestinal tract involving 97% of omphalomesenteric duct malformations. It was first described in 1809 by the German anatomist Johann Meckel[1] It is the most common congenital anomaly of the gastrointestinal tract in children, with an incidence of about 2 % in the general population. In the majority of patients, the MD is asymptomatic.[2] the purpose of this study is to describe a case of meckel's diverticulum presenting with a clinical picture resembling appendicular peritonitis.

Case report

This report concerns a 25-year-old patient with no significant medical history, who presented with pain in the right iliac fossa and hypogastric region, accompanied by vomiting, without any external signs of gastrointestinal bleeding or transit disorders. These symptoms evolved in the context of apyrexia and stable general condition.

Clinical examination revealed a conscious patient who was stable hemodynamically and respiratorily. Abdominal examination showed guarding in the right iliac fossa and hypogastric area, with a rectal examination yielding no abnormalities.

Biological tests indicated abnormalities, with white blood cell count elevated at 22,000 and C-reactive protein (CRP) at 157. An ultrasound was performed, revealing an inflamed, edematous appendix with infiltration of the peritoneal fat, associated with fluid accumulation in the Douglas pouch.

Surgical intervention was conducted through a median incision above and below the umbilicus. Exploration revealed a moderate amount of peritoneal fluid, consisting of purulent fluid, alongside the presence of an inflamed, gangrenous, and perforated Meckel's diverticulum(figure 1) with normal appendix (figure 2). The surgical procedure involved segmental resection of the ileum, excising the Meckel's diverticulum, and creation of a double -barrel ileostomy with drainage of the Douglas pouch using a Salem sump tube.

Postoperative recovery was uncomplicated, and the patient was discharged on postoperative day 3 after

removal of the drain, with a functioning ileostomy and clean dressings.

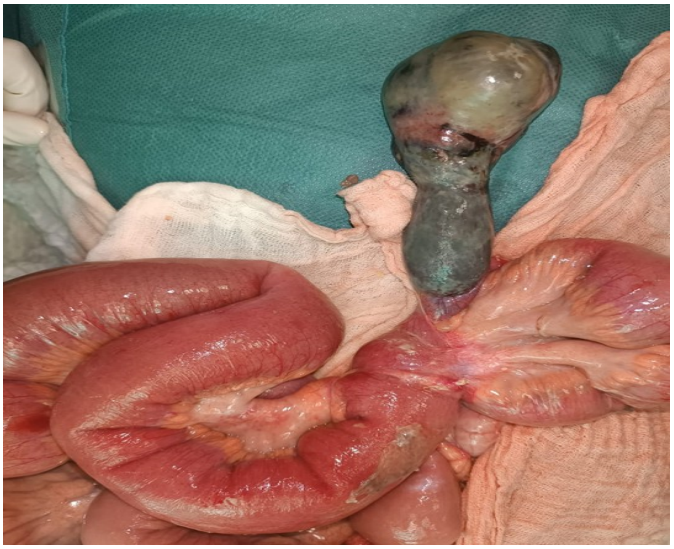

Figure 1: perforated meckel diverticulm

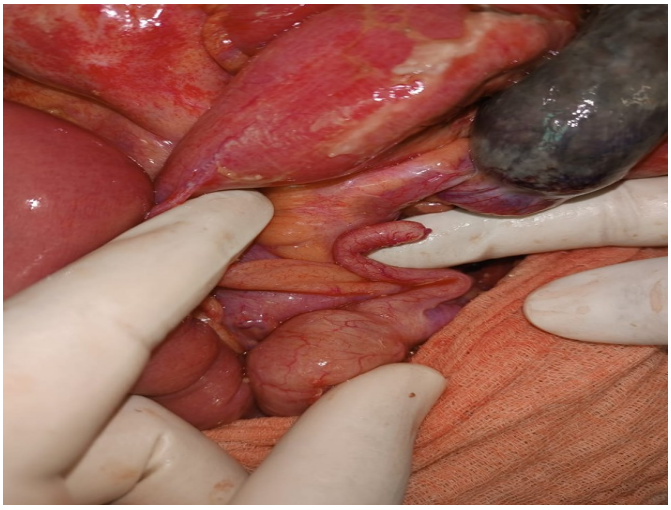

Figure 2: normal appendix

Discussion

Meckel's diverticulum (MD) is the most common congenital malformation in the gastrointestinal tract [3] The condition is named after German anatomist Johann Friedrich Meckel, who first described the condition in 1809. Meckel described it as an omphalomesenteric duct remnant. In 1598 Fabricius Hildanmas also described the abnormality, as did Lavater in 1671; however, Meckel is given credit as he was the first to recognize the embryologic origin.[4]

Meckel's diverticulum (MD) is defined as a congenital anomaly that ensues in the wake of partial closure and persistence of the vitelline, or the omphalomesenteric, duct during embryogenesis. This usually occurs in the fifth week of developmentand causes a true outpouching of the small intestine, located approximately two feet from the ileocecal valve. It is the most common congenital abnormality afflicting the gastrointestinal tract and has been reported in up to 1 –3% of patients[5]

MD is a true diverticulum involving all layers of the intestinal wall. Typically occurs within 100 cm proximal to the ileocecal valve on the antimesenteric border. Its blood supply is derived from the right vitelline artery which subsequently becomes the superior mesenteric artery; a mesodiverticulum may be present or not. It may have a persistent connection to the umbilicus via a fibrous band, but most often it is free and isolated[1]

Meckel's diverticulum is described by the ''Rule of Twos,'' which states:

- It occurs in 2% of the population.
- The symptoms usually appear before the age of two or within the first two decades of life.
- There are two types of ectopic tissue (gastric and pancreatic).
- It is usually located within 2 ft of the small and large intestine junction (ileocecal valve).
- It is approximately 2 in (5 cm) long.
- It is two times more likely to be symptomatic in males than females, and
- 2% become symptomatic (however, most Meckel's diverticula are clinically silent).[4]

The lifetime probability of onset of complications is evaluated at 4%, maximal before two years of age, approximately 1% near 40 years old, and progressively decreasing to nearly nil after 70. Mean age at

the onset of complications is 2.8 years. MD is more often symptomatic in men than in women (sex ratio = 2.8). Complications can be hemorrhagic, mechanical, infectious or tumoral[6]

Inflammation of MD mimics acute appendicitis and should be considered in the differential diagnosis of a patient with right lower quadrant pain. It is generally asymptomatic and is usually discovered incidentally during surgical exploration of other diseases or less commonly through diagnostic imaging. Symptoms of Meckel's diverticulum include gastrointestinal bleeding, cramping, tenderness near the navel, intestinal obstruction causing pain, bloating, diarrhea, constipation, vomiting, and diverticulitis.[4]

Meckel's can be diagnosed by using imaging modalities like ultrasound, X-ray, angiography, CT, and magnetic resonance imaging, but the sensitivity and specificity is low. They are not without value, though, as they can show small-bowel obstruction and intussusception and lead to correct surgical interventions, and finding a normal appendix on such tests can encourage the radiologist to consider differential diagnoses like symptomatic Meckel's[7]

Despite all the improvements, the most significant challenge is still the preoperative diagnosis of Meckel's diverticulum. The diverticulum is occasionally identified incidentally on imaging studies and may be found during the course of a laparotomy performed for other reasons.[8]

However, hemorrhagic, inflammatory, and obstructive complications can arise[5] It presents only when some complication arises. In order of frequency, the complications are:[9]

Hemorrhage: It occurs due to peptic ulceration and is the most common cause for painless major lower gastrointestinal bleeding in children aged less than 2 years. This complication has been reported in about 50% of patients with symptoms associated with the diverticulum. Blood is usually maroon in color.

Intestinal obstruction: This is another common complication seen in young children. It can occur due to a number of reasons. Common causes include volvulus of the small gut around a diverticulum that is attached to the anterior abdominal wall, intussusception or incarceration of the diverticulum in a hernia (Littre's Hernia) and enterolith formation in diverticulum. Single or multiple enteroliths may develop within the lumen of the diverticulum in as many as 10% patients. Most enteroliths show peripheral calcification. Other reasons include internal herniation by a band attached to another viscus, herniation of small gut beneath a mesodiverticular band or volvulus, direct ileal compression by mesodiverticular band, formation of a knot in a long diverticulum involving another viscus and rarely an axial volvulus of the diverticulum causing infarction.

Meckelian diverticulitis: It accounts for 10%-20% of complication and is more common in older patients. It usually presents as acute appendicitis except for the location of the pain and may or may not be associated with enteroliths, fecoliths or foreign bodies within the diverticulum. Failure to establish the diagnosis may lead to perforation, peritonitis and death. Tuberculosis and Crohn's disease in the diverticulum have been seen.

Tumors: Recent article about a Meckel's diverticulum has reported an unusual occurrence of a neo-

plasm in the diverticulum. The common benign neoplasm include lipoma, leiomyoma, neurofibroma and angioma, while as malignant tumors include leiomyosarcoma and carcinoid,which represent about 80% of such lesions while adenocarcinoma and metastatic lesions constitute the remainder.

Chronic peptic ulceration: The diverticulum being part of the midgut, the pain, though related to meals, is felt around the umbilicus.

In usual surgical practice, owing to difficult preoperative diagnosis, patients are subjected to surgery for appendicitis and finding a normal appendix needs examination of 180 cm of terminal ileum for location of a diverticulum. Both pathologies being present, is very rare, and therefore little is to be gained by searching for a diverticulum where acute appendicitis is present and dealt with. However, some recommended that Meckel's diverticulum should be looked for in all cases of appendicitis and if found, it should be removed. The guidelines for management can be summarized as follows[9]:

1. Operating definite acute appendicitis does not need any search for the diverticulum.
2. In children or young adults, a diverticulum if found during a nonacute operation, should be removed especially if it bears a narrow neck, provided the patient's general condition and nature of primary operation is appropriate.
3. An incidental nonadherent Meckel's diverticulum in a patient aged over 40 years should be left alone.
4. Operating for abdominal pain and finding a normal appendix needs removal of appendix as well as the diverticulum.
5. During a routine laparotomy, if a band is found attached to umbilicus at any age, it needs division of band between ligature and resection of diverticulum, if feasible.

Conclusion

Although Meckel's diverticulum is the most prevalent congenital anomaly of the gastrointestinal tract, it continues to be commonly misdiagnosed. Symptomatic Meckel's is managed by surgical resection, but the issue of prophylactic resection remains controversial and unresolved.

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