

## Right Lower Quadrant Pain: Don't Forget Meckel Diverticulitis

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### Abstract

### Case Report

Meckel's diverticulum is one of the most common congenital abnormalities of the gastrointestinal tract. It can present a wide spectrum of clinical manifestations but is often found unexpectedly. In the rare situation that symptoms do arise, these diverticula can lead to serious complications, especially infection that pose a life-threatening risk. In this case study, we discuss a 26-year-old male patient who presented pain in the right iliac fossa and emphasize how imaging played a crucial role in the diagnosis of this complication mimicking symptoms of acute appendicitis.

**Keywords:** Meckel's diverticulum, Meckel diverticulitis; Appendicitis; Right lower quadrant pain.

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## INTRODUCTION

Meckel's diverticulum (MD) is a frequently occurring congenital abnormality of the gastrointestinal tract, found in approximately 2% of the population [1]. It affects both genders equally, but symptoms typically manifest in male patients [2]. This condition involves a true diverticulum that includes all layers of the small bowel wall and lined by small intestinal mucosa. It was first extensively described by Johann Meckel, a German anatomist, in the year 1809 [3]. The formation of this diverticulum is attributed to the incomplete closure of the omphalomesenteric (vitelline) duct [3]. Meckel diverticula present a wide spectrum of clinical presentation but are mostly discovered incidentally [4]. Rarely, these diverticula become symptomatic, and can quickly become life-threatening due to severe complications [5]. In young adults, acute inflammation may spread along the omphalomesenteric canal, leading to Meckel's diverticulitis. These diverticula can present clinically in a picture of acute febrile pain in the right iliac fossa simulating acute appendicitis [2]. This entity must be considered in the differential diagnosis of patients presenting with abdominal pain at the right lower quadrant, and complex structures adjacent to the cecum and terminal ileum at ultrasonography and especially CT imaging [6]. It was in 1934 the first report of preoperative diagnosis of this condition by roentgen ray appeared in a patient with a clinical picture suggestive of appendicitis [7]. In this work, we report the case of MD in a 26-year-old male patient, mistakenly

diagnosed as appendicular syndrome; and the role of imaging in correcting the diagnosis.

## CASE REPORT

A 26-year-old male patient reported an 8-day history of crampy, non-radiating abdominal pain located in the lower quadrants. The pain worsened over 2–3 days, accompanied by fever, with obstipation, and without other associated digestive or urinary symptoms. Physical examination revealed an ill-looking patient, hemodynamically stable. On abdominal examination, his abdomen was non-distended, and he was tender in the right iliac fossa. Laboratory work-up revealed a leukocytosis (white blood cell 17,000/mm<sup>3</sup>) and a slightly elevated C reactive protein of 88.7 mg dl<sup>-1</sup>. All others blood tests including electrolytes, glucose and serum creatinine were within normal limits. A clinical diagnosis of acute appendicitis was made. Contrast material-enhanced computed tomography (CT) of the abdomen and pelvis was performed. It revealed a normal-caliber appendix in the right lower (Fig 1). A blind-ending tubular structure (15 mm of diameter, 32 mm length) emanating from the anti-mesenteric border of distal ileum (Fig 2); surrounded by inflammatory fat with fluid effusion associated to regional lymphadenopathy (Fig 3). The diagnosis of Meckel diverticulitis was suspected. Under General Anesthesia, the laparotomy confirmed the diagnostic (Fig 4). A resection of the diverticulum and its ileal attachment with ileo-ileal anastomosis were performed. The patient made

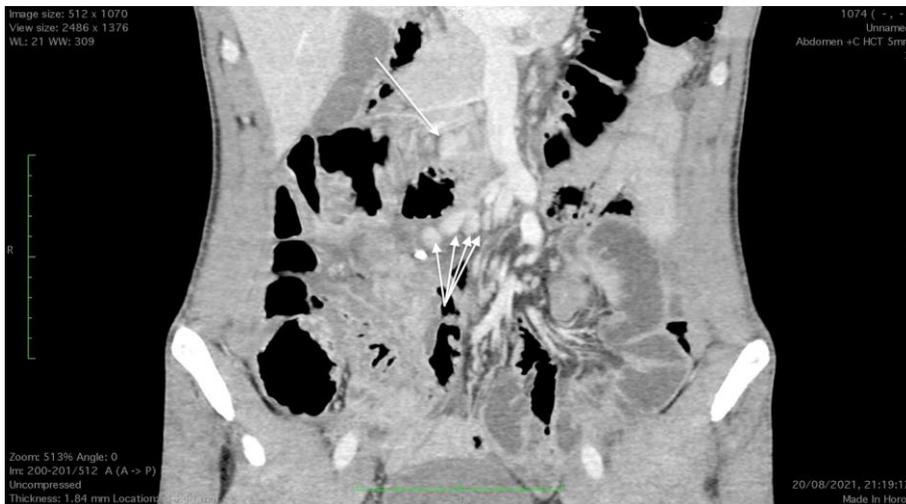
an uneventful recovery postoperatively. The histopathological revealed MD with acute and chronic inflammation without evidence of any malignancy.



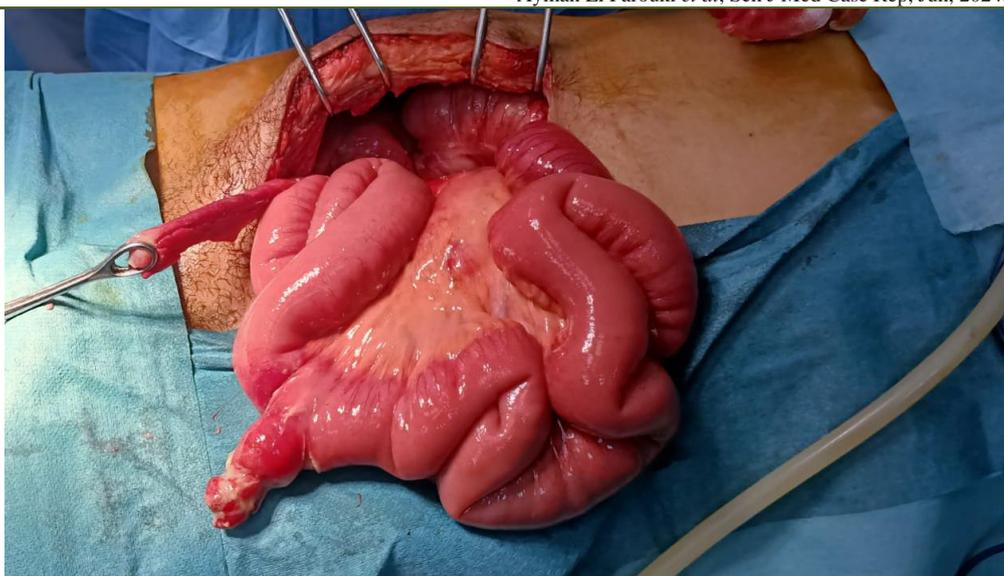
**Figure 1: Coronal CT scan with normal appendix**



**Figure 2: A blind-ending tubular structure (Arrow) emanating from the anti-mesenteric border of distal ileum**



**Figure 3: inflammatory surrounding fat associated to regional lymphadenopathy (Arrows)**



**Figure 4: Meckel's diverticulum and normal appendix**

## DISCUSSION

MD is the most common congenital abnormality of the intestinal tract, that results from a fragmentary vitelline canal [2]. During embryonic development, the omphalo-mesenteric canal, also known as the vitelline duct, serves as a connection between the yolk sac and the midgut of the developing fetus. Typically, this canal closes off and transforms into a fibrous structure known as the omphalo-mesenteric ligament between the 6th and 10th week of gestation. This ligament naturally disappears over time. However, MD arises from incomplete resolution of this primitive vitelline loop. It manifests as a distinct, blind pouch on the anti-mesenteric side of the ileum, opposite the end branches of the superior mesenteric artery. Positioned around 60 cm away from the ileocecal junction on average (ranging from 15 to 120 cm), this distance may vary slightly depending on the individual's age [8].

It is unusual for MD to cause symptoms in adults and usually discovered fortuitously during an operation or an imaging investigation [9]. The estimated incidence of complications associated to MD ranges from 4 % to 9 % [10]. Complications can be hemorrhagic, mechanical, infectious or tumoral [9]. The most common pediatric complication is painless enteric hemorrhage from peptic ulceration of ectopic gastric mucosa [11]. In adult, Meckel's diverticulitis is the most frequent complication, complicating up to 58% of symptomatic MD [9]. Clinically, patients with Meckel diverticulitis often present with symptoms of appendicitis [3]. Early detection plays a crucial role in averting severe complications like diverticulum perforation leading to peritonitis. Due to its infrequent occurrence and diverse clinical presentations, accurately diagnosing MD can be notably challenging [5]. Diagnosis is tricky and infrequently made, and imaging, especially in a complicated case is frequently not helpful, still diagnostic laparoscopy has an important role [2].

Ultrasonography holds limited usefulness in adult cases. In adults, a MD is visualized as a blind tubular structure stemming from an ileal loop [12]. Although sonography is not generally utilized extensively in adult cases, its role remains significant in pediatrics. This is due to its radiation-free nature and increased sensitivity, particularly in identifying complications related to MD in children [9]. On CT scan can typically visualize MD as a tubular structure that ends blindly, emerging from the antimesenteric border of the end part of the ileum. Nonetheless, in cases without complications, this diverticulum is frequently misinterpreted as a regular segment of small bowel, leading to challenges in its identification [12]. In our case, the CT scan play an important role in the diagnosis, it showed a normal appendix with a lengthy tubular structure originating from the end of the ileum. Additionally, there was inflammation in the nearby fat tissue, suggesting Meckel diverticulitis as the probable diagnosis. This diagnosis was later verified through pathological examination.

Three surgical approaches have been outlined: segmental resection with anastomosis, wedge resection, and tangential stapling. The last two methods may be difficult to consider in scenarios involving perforation, inflammation, or hemorrhagic ulceration, all of which typically necessitate intestinal resection [13]. When visible base involvement of the diverticulum is observed, a "T"-shaped segmental resection with intra-abdominal anastomosis stands as the sole feasible laparoscopic solution [14]. In our patient, laparotomy with resection and anastomosis was the therapeutic approach performed, given the emergency context and the inflammatory adhesions hindering proper exposure of the surgical field. But in our opinion, the laparoscopic approach offers undeniable advantages, such as a better postoperative recovery, a lower surgical wound infection rate or a lower incisional hernia rate [5].

## CONCLUSION

Even if MD is a rare entity, its knowledge is important. Its infection is the most common and feared complication in adults. Its ignorance can be fatal, particularly when faced with a picture of pain in the right iliac fossa with a falsely reassuring normal appendix.

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