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# Meckel's Diverticulum in Its Occlusive Form

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**Abstract** **Case Report**

Meckel's diverticulum is a remnant of the omphalomesenteric duct. This diverticulum can lead to complications such as perforation, inflammation, or intestinal obstruction. We report the case of an 18-year-old female who presented with a febrile subocclusive condition lasting more than 48 hours. She was urgently admitted to the operating room due to worsening clinical and laboratory findings that were unresponsive to standard resuscitation measures. Imaging indicated a small bowel obstruction without signs of bowel ischemia, with prominent air-fluid levels upstream of a non-specific inflammatory disparity zone. During surgery, after meticulous dissection focused on the previously identified disparity zone on imaging, it was concluded that the obstruction occurred upstream of a Meckel's diverticulitis. The surgical procedure involved resection and ileoileal anastomosis. Postoperative recovery was uneventful, with the resumption of liquid diet and bowel movements on the third day. This case will be presented, labeled, and discussed in relation to the existing literature.

**Keywords:** Meckel's diverticulum, intestinal obstruction, jejunal volvulus, jejunal resection, omphalomesenteric duct.



## INTRODUCTION

During the early weeks of embryonic development, specifically between the second and fourth week after conception, the embryo consists of three embryonic layers: mesoderm, endoderm, and ectoderm [1]. During this period, these layers converge towards the umbilicus simultaneously. The vitelline duct, also known as the omphalomesenteric duct, connects the midgut to the umbilicus and disappears by the tenth week of embryonic development when the intestinal loops reenter the abdomen [1, 2]. However, in some individuals, a portion of this duct persists, forming what is known as Meckel's diverticulum. This congenital anomaly is the most common gastrointestinal abnormality, with a slight male predominance [3, 4]. Although rare, it affects approximately 2 to 4% of the population [3]. In most cases, Meckel's diverticulum remains asymptomatic and is only diagnosed incidentally or in the presence of complications such as gastrointestinal bleeding, intestinal obstruction, intestinal intussusception, Meckel's diverticulitis, perforation, umbilical fistula, or tumor degeneration [3, 5-8]. It should be noted that these complications are more common in children, especially young children, and less frequent in adults [9]. In this article, we describe the case of a young girl hospitalized for empirical management of her obstructive presentation in our Department of General Surgery at the Military Hospital Moulay Ismail in Meknes, Morocco. This case will be presented, labeled, and analyzed in relation to the existing literature.

## PATIENT AND OBSERVATION

An 18-year-old girl with no notable medical history was admitted to the surgical emergency department of the Military Hospital Moulay Ismail. The patient complained of cessation of bowel movements and vomiting lasting for more than 2 days, accompanied by moderate abdominal distension. Laboratory tests revealed non-specific findings, with a leukocytosis of 12,000 cells/mm3 and a C-reactive protein level of 34. Abdominopelvic contrast-enhanced computed tomography (CT) confirmed the diagnosis of jejunal obstruction without direct or indirect signs of bowel ischemia, showing the presence of air-fluid levels upstream of an inflammatory zone with a disparity in caliber (Figure A and B).

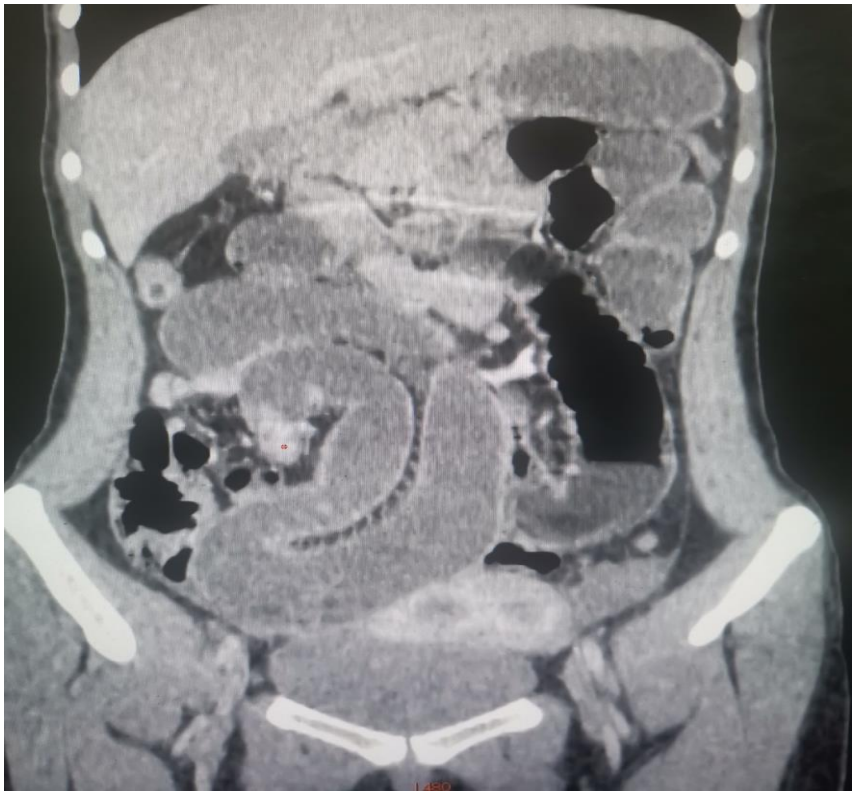

**Figure A: Mechanical jejunal obstruction upstream of an inflammatory zone with a disparity in caliber**

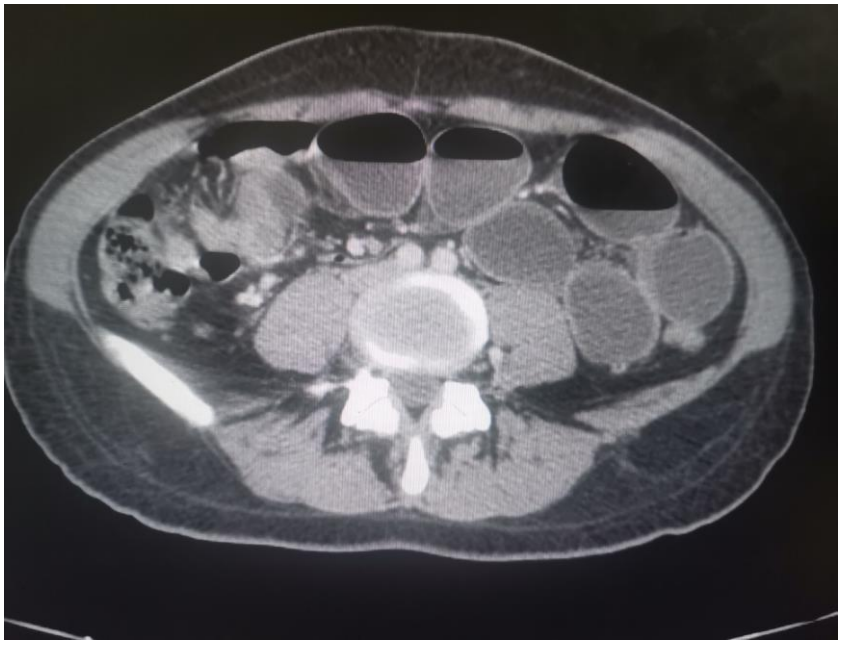

**Figure B: Mechanical jejunal obstruction upstream of an inflammatory zone with a disparity in caliber**

The suggested diagnosis by our radiologists indicated either Meckel's diverticulum or an exacerbation of inflammatory bowel disease (IBD).

Despite unsuccessful resuscitation measures due to the patient's worsening clinical and laboratory condition, the decision was made to proceed with radical surgery performed by our team. The surgical procedure involved meticulous dissection and a jejuno-jejunal termino-terminal resection-anastomosis focused on the diverticulum (Figure C and D).

The postoperative period was uneventful, and the patient was discharged on the 5th day. Histopathological examination of the diverticulum revealed fibrous tissue with a significant inflammatory reaction, along with mucosa resembling gastric mucosa.

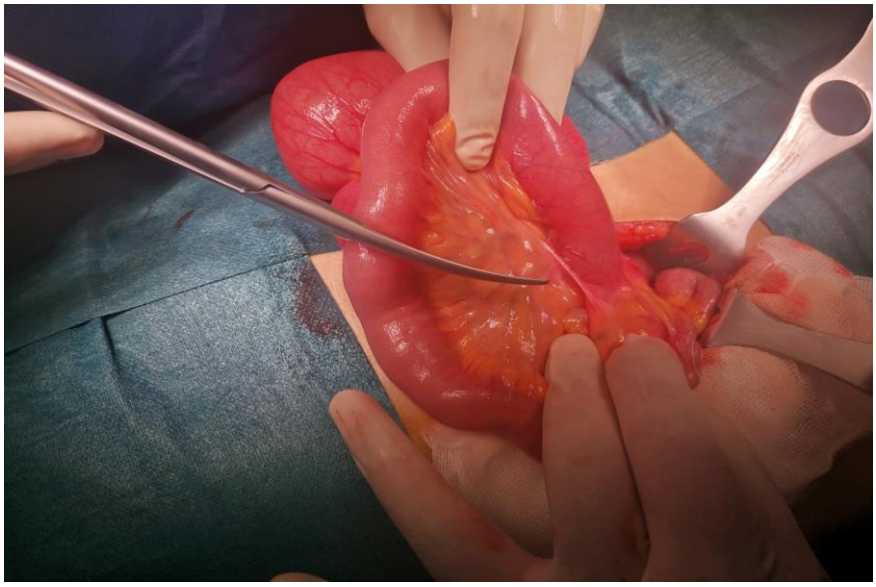

**Figure C: Jejunal obstruction: Small bowel volvulus over Meckel's diverticulum**

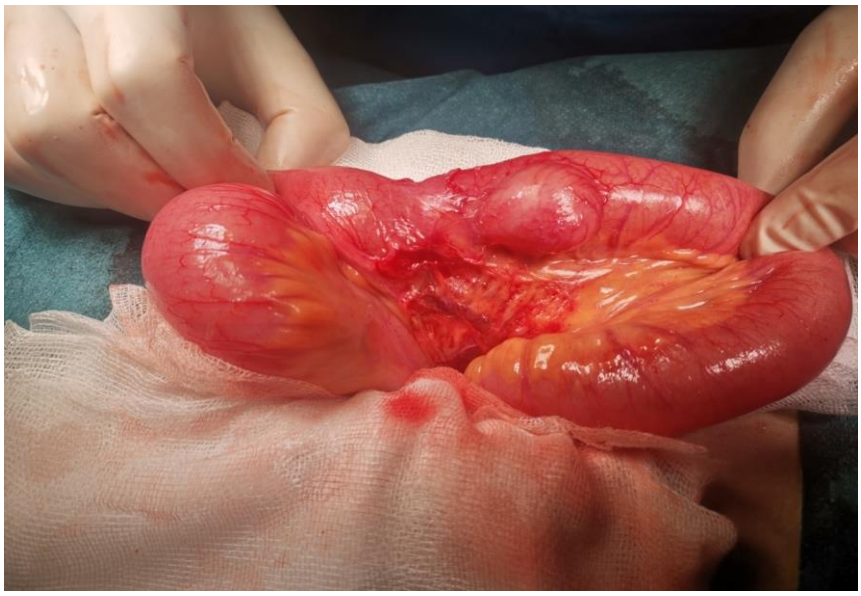

**Figure D: Jejunal obstruction: Small bowel volvulus over Meckel's diverticulum**

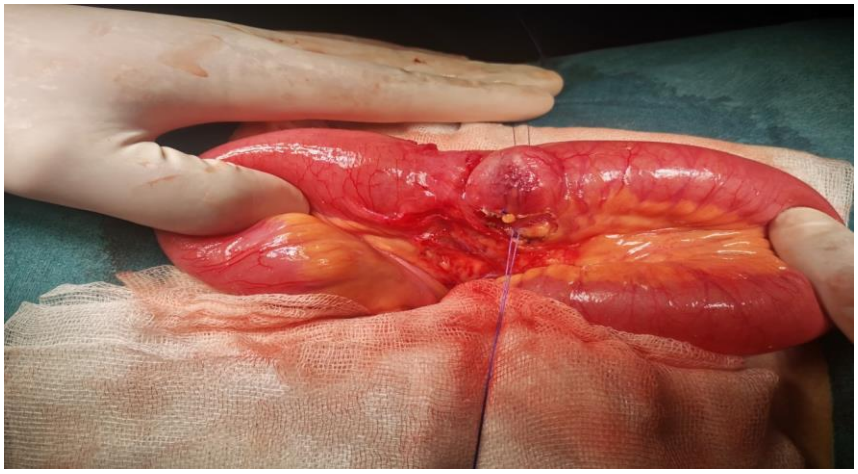

**Figure E: Jejuno-jejunal termino-terminal resection-anastomosis**

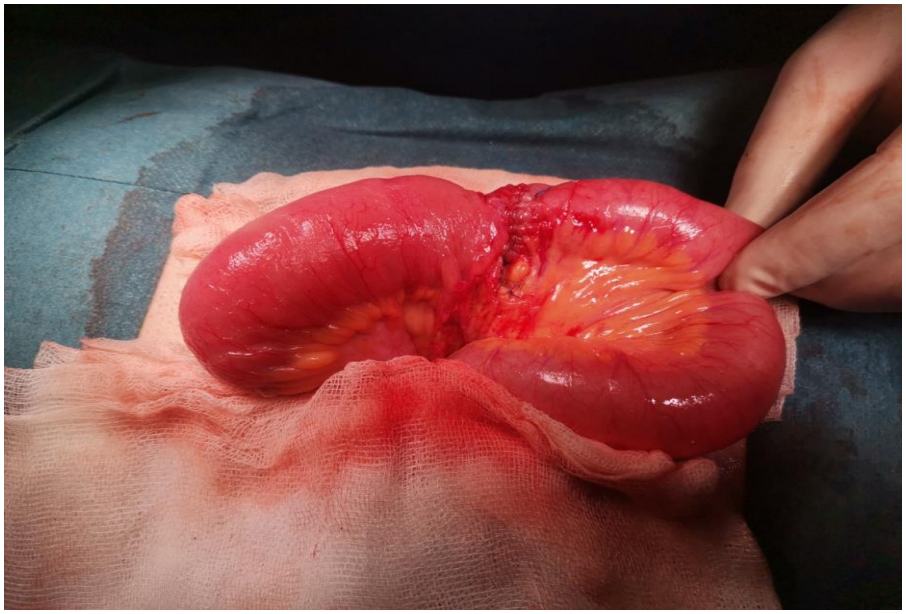

**Figure F: Jejuno-jejunal termino-terminal resection-anastomosis**

## DISCUSSION

Meckel's diverticulum is a common congenital anomaly of the gastrointestinal tract, resulting from the partial persistence of the omphalomesenteric duct. There is a slight male predominance [3, 4]. Its prevalence is rare, affecting approximately 2 to 4% of the population [2, 3]. Typically asymptomatic, Meckel's diverticulum is often diagnosed incidentally or when complications arise, although these are less common in adults [5-7].

The diagnosis of intestinal obstruction caused by Meckel's diverticulum can be considered preoperatively using imaging techniques such as abdominal ultrasound, technetium-99m scintigraphy, abdominal computed tomography, or magnetic resonance imaging (MRI) [7]. Mechanical obstruction is the most common complication in adults, accounting for 24% to 53% of cases. It can have various mechanisms such as volvulus, intussusception, diverticulum fixation at the umbilicus, or elsewhere in the abdomen [5, 6, 9]. Complications are slightly more frequent in males [3, 4]. In the presented case, a girl developed jejunal volvulus due to diverticulitis intimately adherent to the mesentery.

The location of Meckel's diverticulum typically varies between 10 and 100 cm downstream from the ileocecal valve. It has an average size of approximately 2 cm in diameter and 5 cm in length [4]. The diverticula are composed of heterotopic mucosa, often gastric in type (23% to 60% of cases), but occasionally pancreatic in type as well. In this study, the Meckel's diverticulum was located 60 cm from the ileocecal valve, measuring 5 cm in diameter and 8 cm in length, and had gastric-type mucosa.

A study conducted by Edgar Ouangré *et al*., included 11 cases of Meckel's diverticulum. The average age of the patients was 29.8 years, and eight cases of intestinal obstruction required segmental resection of the ileum, including the Meckel's diverticulum, with restoration of digestive continuity. In the presented case, intestinal resection was performed, resulting in the removal of the Meckel's diverticulum and restoration of intestinal continuity.

It is important to consider Meckel's diverticulum among the many causes of acute or subacute intestinal obstructions, especially in young individuals without surgical history, as its identification remains challenging despite advances in medical imaging [3]. It is crucial to consider it in the diagnosis of acute abdominal pain to guide optimal surgical management.

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