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### RESEARCH ARTICLE

#### SMALL BOWEL OBSTRUCTION DUE TO MECKEL'S DIVERTICULUM IN ADULTS: CASE REPORT

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#### Abstract

Meckel's diverticulum is the partial persistence of the omphalomesenteric duct during the seventh week of gestation [1]. It is the most common congenital anomaly of the gastrointestinal tract with a slight male predominance [1]. It is rare and is encountered in 2 to 4% of the population [2]. Meckel's diverticulum is usually, but it can be revealed by complications such as: intestinal obstruction, perforation, fistula and tumor degeneration [3]. We report in this work the clinical case and management of small bowel volvulus on Meckel's diverticulum, observed in the University Hospital center of Marrakech in a 19-year-old adult in March 2023, this is a patient without medical history admitted to the emergency with acute abdomen made up of abdominal pain, vomiting and fever. The physical examination aimed abdominal bloating and generalized defense. Biology shows an inflammatory syndrome. Abdominal Computed tomography scan in the emergency shows a distension of the small bowel measuring 36mm, with hydroaeric levels, no disparity in caliber, associated with moderate peritoneal effusion. The patient was operated by median laparotomy. Surgical exploration revealed distension of the bowel upstream of a flange taking up an inflamed Meckel's diverticulum, 6cm long and 2cm in diameter, situated on the anti-mesenteric edge, 2.30 meters from the Treitz angle and 70cm from the ileo-caecal junction, adhering to the root of the mesentery. It was around this diverticulum that the small intestine had volvulated but was viable. The appendix was normal size. The surgical procedure consisted of a losangic diverticulectomy preserving the supporting loop of bowel and transverse suture of the loop of bowel using separate stitches. Postoperative recovery was straightforward. Discharge was authorized on the 6th day. Histopathological examination showed fibrous tissue with a dense, diffuse inflammatory infiltrate, compatible with a lesion of non-specific gastric diverticulitis. It is important to be aware of the complications of Meckel's diverticulum in the presence of acute abdominal pain, to guide surgical management as effectively as possible.

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**Introduction:-**

Meckel's diverticulum (MD) is an embryological vestige secondary to incomplete obliteration of the omphalo mesenteric duct or vitelline at the seventh week of gestation[4]. This is the anomaly the most common congenital disorder of the gastrointestinal tract with a slight male predominance[1]. It is rare and is found in 2 to 4% of the population [2]. Meckel's diverticulum most often remains asymptomatic[1], its diagnosis is fortuitous, nevertheless, complications can reveal it such as: intestinal obstruction, digestive hemorrhage intussusception, Meckel's diverticulitis, perforation, umbilical fistula and tumor degeneration, the treatment of choice is segmental resection of the small intestine removing the Meckel's diverticulum with end-to-end small intestine anastomosis or diverticulectomy retaining the carrying handle. We report in this clinical case work and the management of small intestine volvulus on diverticulum of Meckel, treated by losangic resection at the foot of the diverticulum, observed in the hospital center academic Mohamed VI of Marrakech in an adult aged 19 in March 2023.

**Patient and Observation:-**

It involved a 19-year-old man admitted to the emergencies of the university hospital center in Marrakech, for diffuse abdominal pain maximal in the right iliac fossa for 6 days with accentuation for 24 hours, vomiting accompanied by fever. The patient is without any significant pathological history. The physical examination revealed abdominal distension, generalized defense more accentuated at the level of the right iliac fossa, dullness at the pelvic floor, the hernial orifices were free and rectal examination revealed a pouch of Douglas which was not bulging but sensitive. Biology shows an inflammatory syndrome with a C-Reactive Protein (CRP) at 106 mg/L and hyperleukocytosis at 30,640/ml with 80% neutrophils at 24,000/ml, a hemoglobin at 17.1 g/dl.

The X-ray of the abdomen without preparation had not been carried out. The abdominal ultrasound pelvic emergencies showed distension with frozen appearance of the small bowel loops (33mm) associated with mesenteric lymphadenopathy in the right iliac fossa, medium-sized peritoneal effusion abundance finely echogenic and absence of appendix image (Figure 1).

Abdominal Computed Tomography (CT)scan showed a distension of the small loops measuring 36mm seat of hydro-aerial levels, without image of caliber disparity associated with mesenteric lymphadenopathy of the right iliac fossa and peritoneal effusion of medium abundance (Figure 2).

Faced with this picture, the diagnosis of acute intestinal obstruction was made. And after the blood test and preoperative resuscitation, an exploratory laparotomy was performed. The lesion inventory revealed the following:

1-purulent effusion of medium abundance at the level of the pouch of Douglas with the presence of some false membranes

2-distension of the small loops upstream of a bridge taking an inflamed Meckel diverticulum, of 6cm long and 2cm in diameter, located on the antimesenteric edge, 2 meters 30 from the angle of Treitz and 70cm from the ileo-caecal junction, adhering to the root of the mesentery. It is around this diverticulum that the small had volvulus, but viable. The appendix is normal size (Figure 3-4).

The surgical procedure consisted of a diamond diverticulectomy preserving the carrying small bowel loop and transverse suture of the small intestine by separate stitches (Figure 5), with washing and drainage of the pouch of Douglas. The postoperative aftermath was simple. The release was authorized on the 6th day.

The histopathological examination showed fibrous tissue with a dense and diffuse inflammatory infiltrate, compatible with a nonspecific small bowel diverticulitis lesion (Figure 5).

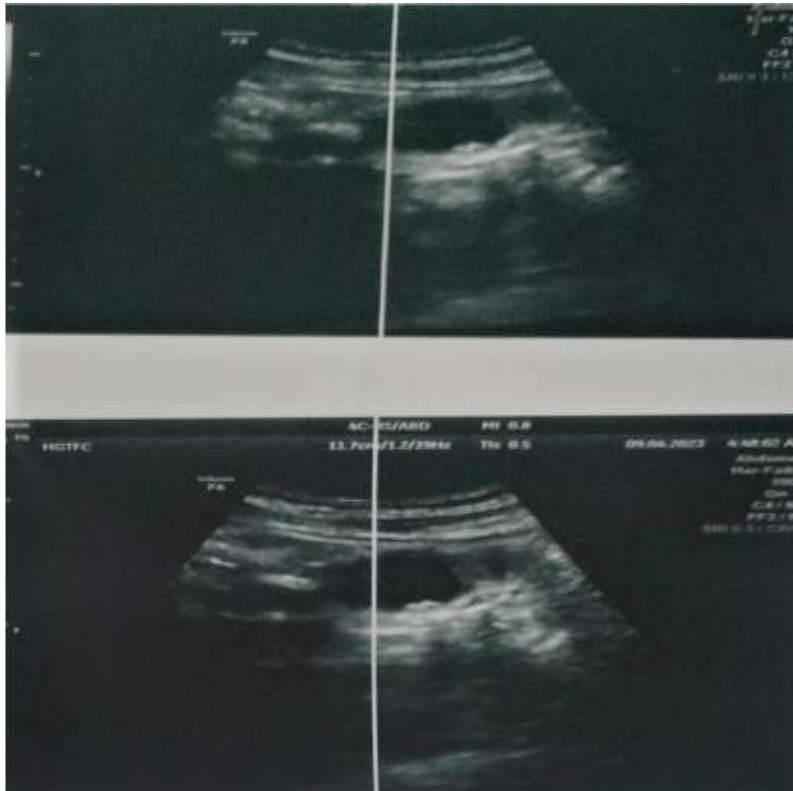
**Discussion:-**

Meckel's diverticulum (MD) is the partial persistence of the omphalomesenteric canal. It is the most common congenital anomaly of the gastrointestinal tract with a slight predominance masculine [5]. It is rare and encountered between 2 to 4% of the population [6]. Meckel's diverticulum most often remains asymptomatic, its clinical manifestations in adults are rare, and can give rise to peritoneal and occlusive surgical complications, rarely hemorrhagic, in 17 to 40% of cases[1,7,8].

In this work, we report the case of small intestine obstruction secondary to Meckel's diverticulum. symptomatic, by a volvulus of the small intestine around an inflamed MD and attached by a relief fibrous at the root of the mesentery.

Preoperative diagnosis of occlusion due to Meckel's diverticulum is difficult. A high degree of clinical suspicion and specific additional examinations are necessary. Currently, scintigraphy Technetium-99m-pertechnetate ( $^{99}\text{Tcm-p}$ ) is the imaging of choice for highlighting of an ectopic gastric mucosa. Classically, in an emergency, abdominal CT is useful for diagnosis [9,10]. Most often it is an occlusion with variable mechanism: volvulus, intussusception, fixation of diverticulum at the umbilicus or any other point in the abdomen. The location of Meckel's diverticulum varies between 10 and 100 cm in relation to Bauhin's valve in 50% of cases, its dimensions are on average 2cm in diameter, 5cm in length, the diverticula are consisting of a mucosal heterotopia, gastric heterotopia is the most frequently observed, but other types can be found: pancreatic, duodenal and colic.

In the case presented, Meckel's diverticulum was located 70cm from Bauhin's valve with 2cm diameter and 6cm long with an inflamed intestinal type mucosa. Surgical excision is the mainstay of therapeutic management of symptomatic Meckel's diverticulum in the adult. As described by other authors [11], segmental resection of the weight-bearing loop of the Meckel's diverticulum with end-to-end anastomosis remains the most used technique [12]. In the case presented, there was a diverticulectomy, losangic resection at the foot of the diverticulum with transverse suture of the small intestine. minimally invasive surgery and excellent abdominal exploration reduce related morbidity and mortality to diagnostic delay. It is necessary to know how to discuss the diagnosis of Meckel's diverticulum within the vast group of occlusions acute or subacute intestinal problems, particularly in young subjects without a surgical history, because the Meckel's diverticulum is difficult to identify despite advances in cross-sectional imaging [1]. You have to know the recognize in the diagnosis of acute abdominal pain in order to best guide the management surgical load [13,14,15].



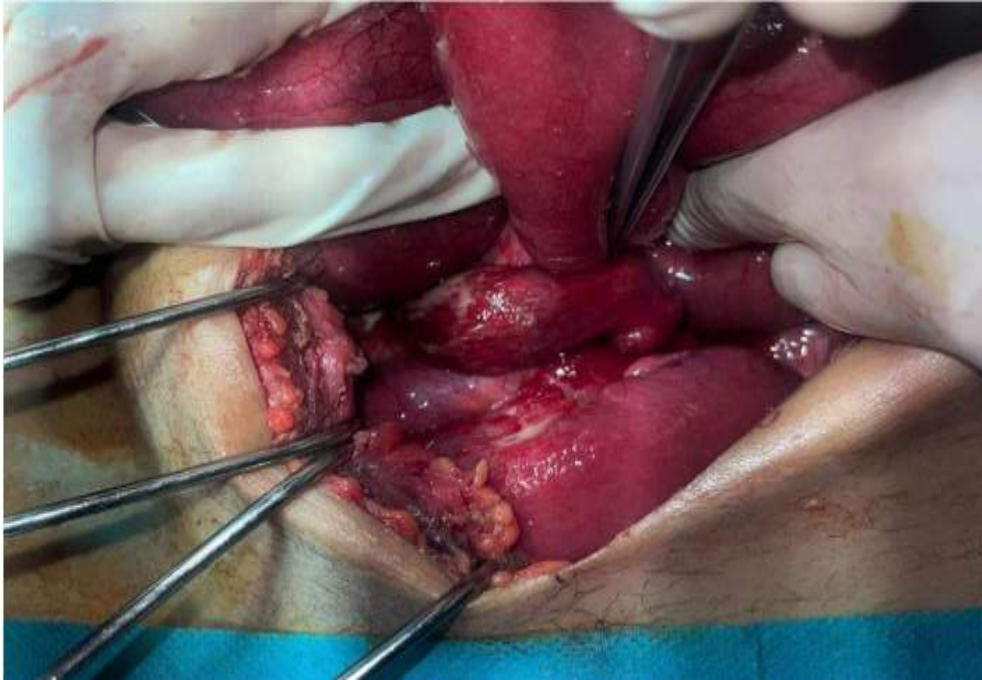
**Figure 1:-** Ultrasound showing distension of the small bowel loops associated with peritoneal effusion of average abundance.



**Figure 2:-** Abdominal CT scan showing distension of the distended small bowel loops, site of hydro-levels aeric, and effusion peritoneal of medium abundance.



**Figure 3:-**Per-operativeimage, distension of the small bowel loops upstream of a flange taking a inflamed Meckel's diverticulum.



**Figure 4:-** Per-operative image, appearance of the inflamed Meckel diverticulum.



**Figure5:-** Diverticulectomy piece for anatomico-pathological examination.

**Conclusion:-**

We report the case of small intestinal obstruction linked to MD. Meckel's diverticulum is the partial persistence of the omphalomesenteric canal. It is rare and encountered between 2 to 4% of the population. It most often remains asymptomatic and is not diagnosed only accidentally or when complications arise [1]. However, they are not usual among adults. It is necessary to know how to recognize the diagnosis in the face of acute abdominal pain to best guide surgical management [1]. The evolution depends on the precocity of the diagnosis.

**Conflicts of interest**

The authors declare no conflicts of interest.

**Authors' contributions**

All authors contributed to the conduct of this work. All authors also declare that they have read and approved the final version of the manuscript.

**Tables and figures**

Figure 1: Ultrasound showing distension of the small bowel loops associated with peritoneal effusion of average abundance.

Figure 2: Abdominal CT scan showing the distended small bowel loops, site of hydro-levels aericand effusion peritoneal of medium abundance.

Figure 3: Per-operative image, distension of the small bowel loops upstream of a flange taking a inflamed Meckel's diverticulum

Figure 4: Per-operative image, appearance of the inflamed Meckel diverticulum

Figure 5: Diverticulectomy piece for anatomo-pathological examination

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