

## Abdominal pain in a young lady with inverted Meckel's diverticulum: a case report

Seyed Mohammad Reza Nejatollahi<sup>1</sup>, Keihan Mostafavi<sup>2</sup>, Fariba Ghorbani<sup>3</sup>

<sup>1</sup>Hepato-Pancreato-Biliary and Transplant Surgery, Masih Daneshvari Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran

<sup>2</sup>Lung Transplantation Research Center, National Research Institute of Tuberculosis and Lung Diseases, Shaheed Beheshti University of Medical Sciences, Tehran, Iran

<sup>3</sup>Tracheal Diseases Research Center, National Research Institute of Tuberculosis and Lung Diseases, Shaheed Beheshti University of Medical Sciences, Tehran, Iran

### ABSTRACT

Meckel diverticulum is the most common congenital anomaly of the gastrointestinal tract which is located in small bowel within 2 feet of the ileocecal valve. Nevertheless, an inverted Meckel's diverticulum is an uncommon condition believed to result from aberrant peristalsis in that specific area. This article showed signs, symptoms, and possible clinical presentations using CARE guidelines in a case of inverted Meckel's diverticulum and reviews other possible features lastly, definitive treatment, results, and case follow-up were shown to refresh, and raise surgeons' awareness of this rare disorder.

**Keywords:** Inverted Meckel's diverticulum, Case report, Surgery, Care guideline.

(Please cite as: **Nejatollahi SMR, Mostafavi K, Ghorbani F. Abdominal pain in a young lady with inverted Meckel's diverticulum: a case report. Gastroenterol Hepatol Bed Bench 2024;17(1):100-103. <https://doi.org/10.22037/ghfbb.v17i1.2815>**).

### Introduction

Meckel's diverticulum is a common congenital gastrointestinal tract abnormality, which is rarely accompanied by symptoms. The symptoms of Meckel's diverticulum present with intestinal obstruction, intussusception, gastrointestinal hemorrhage, and inflammation, diagnosis is difficult in terms of its similarity to other diseases (1) Additionally, it may manifest as an inverted diverticulum, resulting from the diverticulum folding inward on itself. Inverted Meckel's diverticulum is an exceptionally uncommon condition that may result in lower gastrointestinal hemorrhage. The recommended course of action for therapy is surgical resection. This study aimed to inform physicians about the possibility of symptoms

caused by inverted Meckel's diverticulum, which can suggest the diagnosis of this abnormality.

### Case report

The patient was a 19-year-old Iranian female who presented with abdominal colicky pain for 2 weeks, with intermittent vomiting, anorexia, and loose stool. On physical examination, she had a 100/min pulse rate, blood pressure was 130/80 mmHg, and O<sub>2</sub>sat was 99% with a respiratory rate of 12 breaths/min at room air. Moreover, abdominal examination indicated a soft abdomen with generalized tenderness, especially in the suprapubic and periumbilical region with rebound tenderness in the periumbilical area. The rectal was bulging in Rt. Sided of the pelvis and bowel sounds were hyperactive.

Laboratory tests were normal except for liver function tests, which were slightly increased (AST=48, ALT=77 IU/Lit).

Regarding imaging findings, abdominal sonography showed ileoileal intussusception and a fluid level in the

Received: 06 May 2023 Accepted: 10 July 2023

**Reprint or Correspondence:** Seyed Mohammad Reza Nejatollahi, Hepato-Pancreato-Biliary and Transplant Surgery, Masih Daneshvari Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

**E-mail:** Nejatollahi.smr@sbm.ac.ir

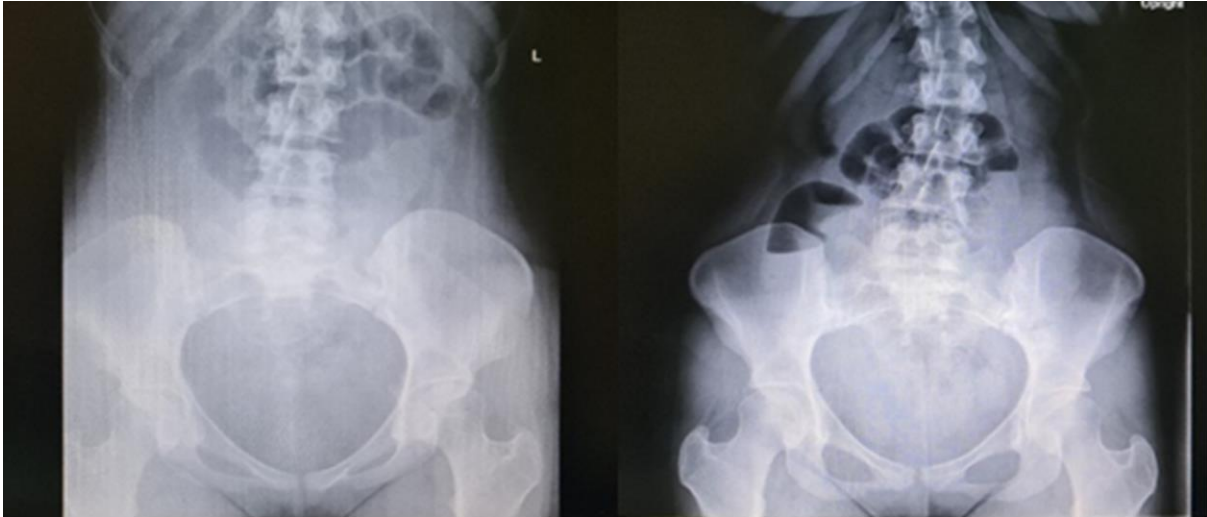
**ORCID ID:** 0000-0003-0597-0703

small bowel, and the abdomen X-ray was indicative of distended jejunal and ileal loops (Figure 1).

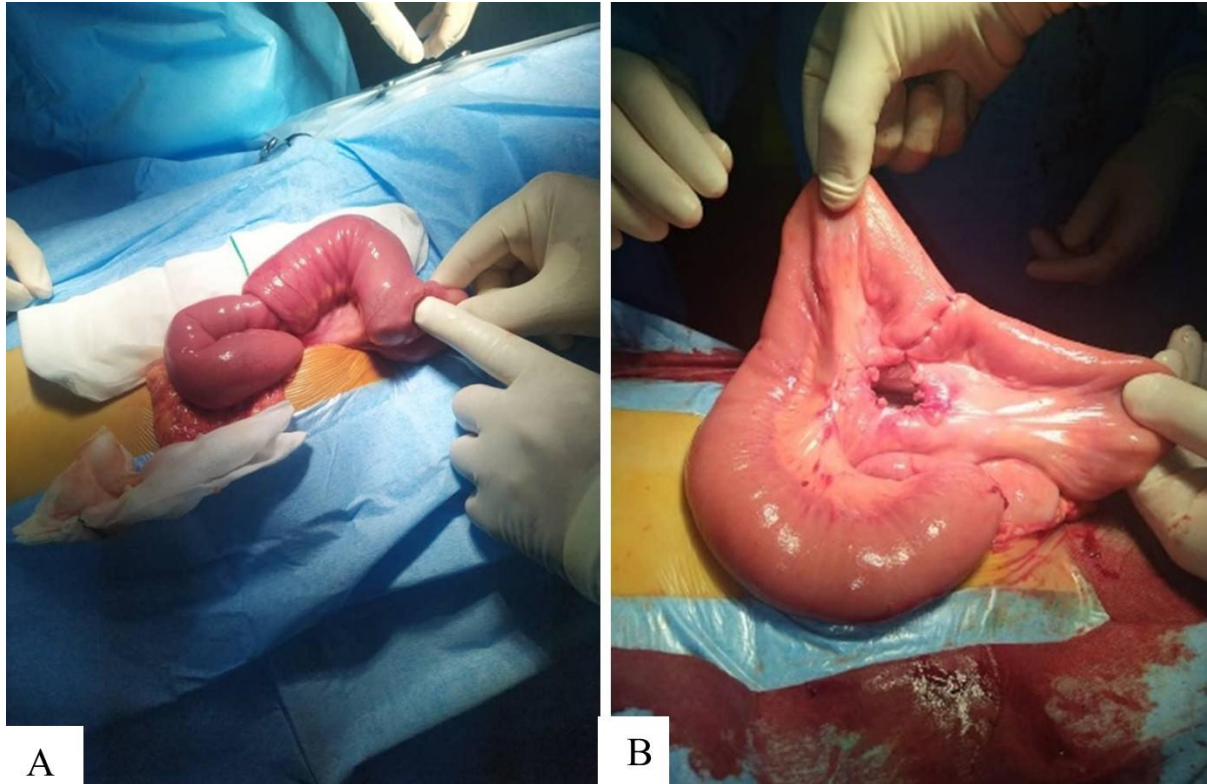
Based on the results of the physical examination and imaging, a laparotomy surgery was carried out by making a small incision in the middle of the abdomen. The intraoperative findings revealed an ileoileal intussusception measuring 21 cm in length, about 80 cm

proximal to the ileocecal valve, along with edematous and distended proximal bowel. The involved segment was resected (Figure 2), and an end-to-end anastomosis was performed, also appendectomy was done.

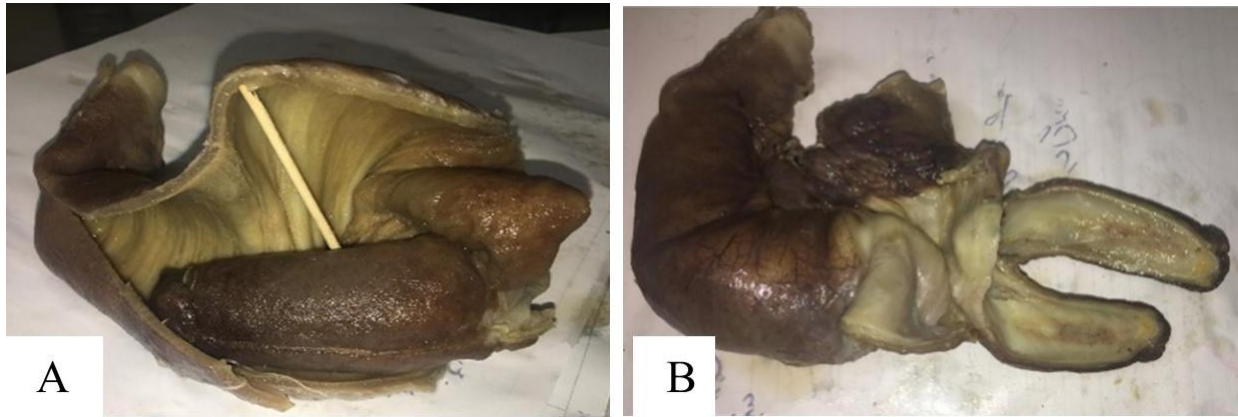
After opening the specimen, there was an intraluminal enlarged elliptical mass associated with intussusception. Histopathology investigations showed



**Figure 1.** Abdomen X-ray showed a fluid level in the small bowel and distended jejunal and ileal loops.



**Figure 2.** Operation Room and surgical findings; A: Intussuscepted mass, B: End-to-end anastomosis after resection of intussuscepted segment.



**Figure 3.** The resected mass, A: inverted diverticulum in the ileum; B: Ectopic tissue at the bottom of inverted diverticulum.

an edematous and congested serosal surface of a portion of the ileum. The microscopic examination revealed an inverted diverticula consisting of all layers of the normal intestinal wall, showing ileal mucosa as well as heterotopias such as gastric and pancreatic mucosa. Also, extensive areas of fibrosis, hyalinization, and vascular proliferation were seen. No malignancy was reported in this specimen (Figure 3).

In five days, the patient uneventfully recovered which was discharged. The patient was in good health at 1-year follow-up.

## Discussion

Meckel's diverticulum with an incidence of 1-3% is one of the most common gastrointestinal malformations (2). This diverticulum is the remnant of vitelline duct, which is the duct between the intestinal tract, and the yolk sac during the embryonic period (3). The complications include intestinal obstruction, hemorrhage, diverticulitis, intussusception, and rarely fistulae, hernia, and tumors. Symptoms often consist of a complex set of recurrent symptoms consistent with obstruction, which is often preoperatively misdiagnosed because of its rarity (4).

Reversed Meckel's diverticulum arises when the diverticulum undergoes invagination. The underlying cause of this unusual condition is uncertain. One hypothesis is that irregular movement of the intestines near Meckel's diverticulum leads to the turning inside out of the diverticulum (5). This inverted diverticulum acts as the initial point of intussusception in these patients. Consequently, hindering the normal function of intestine which leads to obstruction, pain,

intussusception, disruption of blood flow, and then gastrointestinal bleeding. Inverted Meckel's diverticulum has only been reported in less than 60 cases, making it a rare finding, and very few cases were detected before surgery (2).

The diagnostic methods available to the physicians are numerous. One of the radiographic methods is Meckel's scan, a radionucleotide scan that detects gastric mucosa, which is a useful diagnostic tool, especially in the pediatric population, which has high sensitivity, but low specificity (6). Ultrasound is one of the other radiographic methods whose findings are often non-specific, such as "eggplant shaped mass within the bowel", fluid-filled target, and distended loops of bowel with free fluid (7). In the patients with massive gastrointestinal bleeding, angiography can be helpful (8).

CT scans of the patients with Meckel's diverticulum may reveal a blind-ending pouch filled with air or fluid from the distal ileum's antimesenteric surface. An intraluminal mass surrounded by augmenting soft tissue presents as an intraluminal mass encircled by a thick collar of enhancing soft tissue due to imprisoned peri enteric fatty tissue inside the inverted serosal side of the diverticulum. In addition to helping the treating physician confirm a diagnosis, a CT scan can help detect any other concomitant pathology occurring in the bowel wall associated with intussusception (9). Using double-balloon enteroscopy is increasing for diagnosis because it permits a biopsy of the intestine, but it is a challenging procedure (9, 10). There are other modalities that have proven beneficial, including barium series for the small intestines, capsule endoscopy, however, CT scans have now replaced as

the first investigation of choice since CT can detect both intra- and extra-luminal pathologies upon examining the whole abdomen (11).

The mainstay of treatment for adult intussusception is surgery, as segmental resection and primary anastomosis are the preferred surgical procedures (12). Occasionally even if open laparotomy fails to localize the lesion, intra-operative endoscopy can be used to localize the lesion and guide resection of inverted Meckel's diverticulum has been used successfully (13). In our case, the lesion was laparotomically localized, resected, and anastomosed.

### Conclusion

Meckel's diverticulum is a common asymptomatic congenital abnormality of gastrointestinal tract; however, inverted Meckel's diverticulum is a rare disorder that seems to be caused by abnormal peristalsis around Meckel's diverticulum. We hope that by sharing this case report, surgeons will become more knowledgeable about this uncommon illness and its potential clinical signs. Preoperative diagnosis of inverted Meckel's diverticulum is challenging because of the overlap of radiographic characteristics, clinical indicators, and symptoms. Definitive and preferred treatment, whether diagnosed preoperatively or intraoperatively, includes segmental resection and anastomosis. Indeed, in the cases of intussusception in young adults, the primary treatment is surgery and en-bloc resection rather than reduction. It is recommended to consider Meckel's diverticulum in any patient with partial obstruction or chronic abdominal pain.

### Acknowledgement

We would like to gratefully thank all medical staff who were involved in this case.

### Conflict of interests

Authors have no potential conflicts of interest to disclose.

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