

Inverted Meckel's Diverticulum in Adult Presented with Iron Deficiency Anemia and Caused Intussusception But Not Obstruction: Case Report

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ABSTRACT Meckel's diverticulum (MD) is the most common congenital anomaly of the gastrointestinal tract that seen in the 1-2% of the population. However it is often asymptomatic it may present with hemorrhage, intestinal obstruction, intussusceptions or inflammation. Inverted MD, where MD literally inverts on itself, is an uncommon condition underlying pathophysiology has not been explained fully. It may cause obstruction or occult bleeding due to the intussusception. We presented a case of 52-year-old male which inverted MD causing ileoileal intussusception without any symptoms of obstruction or abdominal pain detected while investigating the etiology of iron deficiency anemia. Inverted Meckel's diverticulum should be suspected in adult patients with iron deficiency anemia even if abdominal symptoms does not accompany.

Key Words: Intussusception; anemia, iron-deficiency; meckel diverticulum; occult blood

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Meckel's diverticulum (MD) is the most common congenital anomaly of the gastrointestinal tract that seen in the 1-2% of the population.¹ Bleeding, infection, intussusception, and neoplasms are the main possible complications of MD and lifetime prevalence of these complication is reported as 5%.² Inverted MD is well-defined, potentially life-threatening, rare condition which is mostly presented with abdominal pain and signs of obstruction due to ileoileal or ileocolic intussusception that inverted MD starring as leading point.³ Presentation with iron deficiency anemia has a very limited number of cases.⁴⁻⁸ We encountered only two case reports that inverted MD causing intussusception but not obstruction symptoms or significant abdominal pain with recurrent lower gastrointestinal bleeding episodes.^{9,10}

In this article, we aim to present a case of ileoileal intussusception due to inverted MD which presented with iron deficiency anemia without any compliant and diagnosed as intussusception in computed tomography (CT) examination.

CASE REPORT

52-year-old male patient with iron deficiency anemia was assessed during routine checks (Hb 8.2 g/dl, MCV: 67.1, MCH: 20.3, Ferritin: 12 ng/ml) and admitted to our hospital for further evaluation. The patients has no com-

plaints and physical examination findings were normal. Endoscopy and colonoscopy did not coincide with the pathological findings. CT showed tubular structure with necrotic-hemorrhagic content in the terminal ileum lumen which is in low density and invaginated to lumen (Figure 1). Diagnostic laparotomy was performed with the pre-diagnosis of invaginated Meckel's diverticulum. Within the proximal 80 cm. from the terminal ileum, invaginated intestinal segment was observed. After a 10 cm long ileal segments with-

drawn and intussusception opened inverted Meckel's diverticulum was seen in the lumen (Figure 2a, 2b). Segmental intestinal resection and primary anastomosis was performed (Figure 2c). At pathological examination 4.5 cm in length and 2 cm in width diverticulum was observed. Microscopic examination revealed a mucosa lined by simple columnar epithelium with no oxyntic types of cells or pancreatic tissue. An ulcerated area was noted (Figure 3). Patient was discharged on post-operative day 4 without complications.

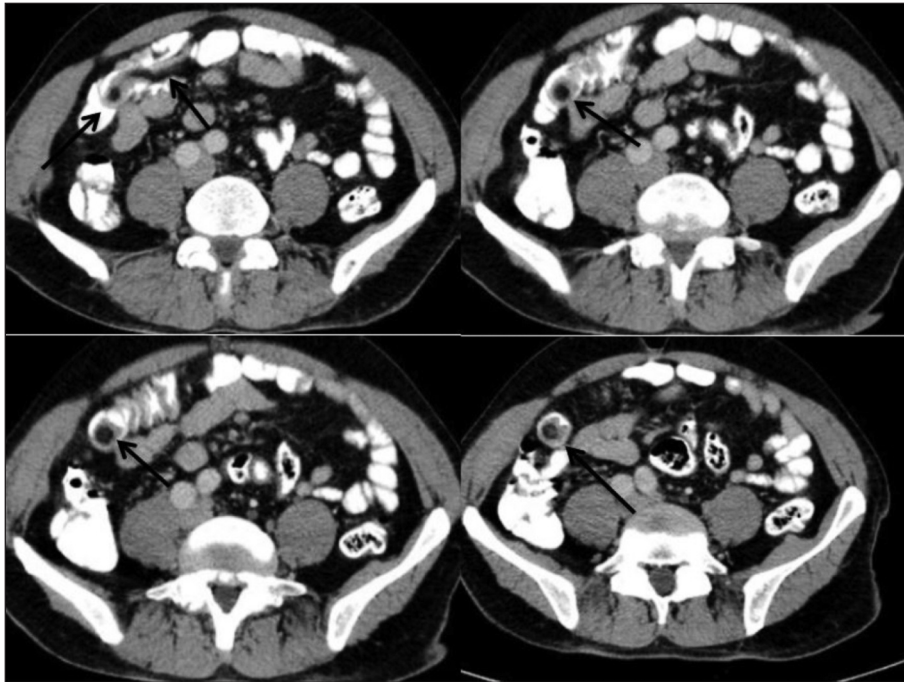


FIGURE 1: Oral and IV contrast-enhanced axial CT scan; the black arrow marks the appearance tubular structure invaginated to terminal ileum lumen.

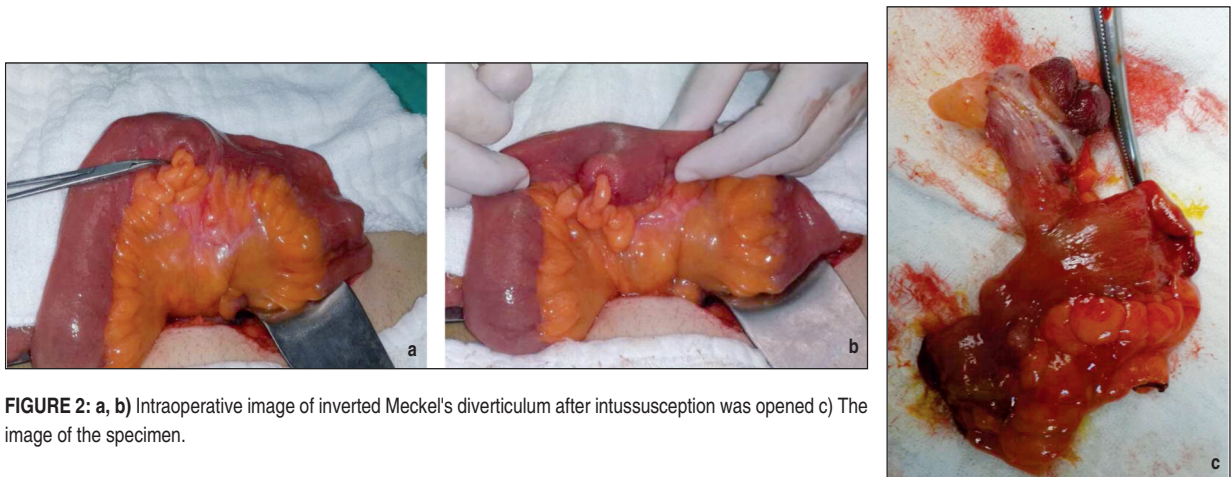


FIGURE 2: a, b) Intraoperative image of inverted Meckel's diverticulum after intussusception was opened c) The image of the specimen.

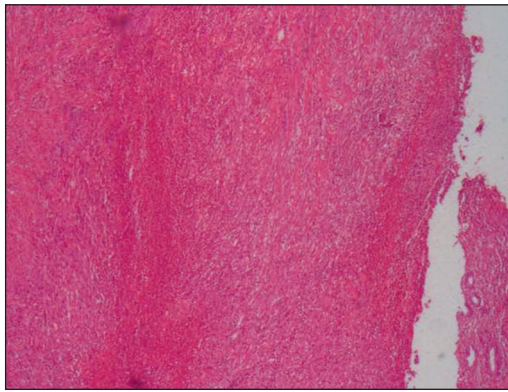


FIGURE 3: Ulcer and severe inflammation (HE, x20).

DISCUSSION

During 5th and 7th weeks of pregnancy if the umbilicus-mesenteric canal does not get closed MD forms. It was embryologically defined and named by German anatomist Johann Friedrich Meckel in 1809 as the first time.¹¹ Although the location vary conventionally, MD is located on the antimesenteric surface of ileum within 100 cm of the ileocecal valve.¹²

MD is usually asymptomatic. Usually encountered in barium studies or in laparotomies by chance.⁸ It becomes symptomatic when complications develop and it may be presented with hemorrhage, intestinal obstruction, intussusceptions or inflammation.⁷ Bleeding is the clinical finding of symptomatic MD mostly in children and it depends on ectopic gastric and/or pancreatic mucosa. It is generally painless.¹³ The obstruction connected to the MD usually occurs in adults and especially the intussusception, Littre hernia, mesodivertikuler band, Meckel's diverticulum lithiasis, volvulus and axial torsion of MD are the reasons that led to obstruction.¹³ Meckel's diverticulitis is mostly common in the elderly and is often misdiagnosed as appendicitis.¹³

Inverted MD, where I literally inverts the MD on itself, is the uncommon condition which underlying pathophysiology has not been explained fully.⁷ It may cause obstruction by direct luminal obliteration or acting as a lead-point for intussusception and on the other hand it may cause hem-

orrhage due to ulceration of the tip of the diverticulum, ectopic gastric mucosa, trauma or localized ischemia.^{3,12} Complicated and confusing clinical presentation of disease consisting repetitive obstructive symptoms, chronic abdominal pain and lower gastrointestinal bleeding often causes delays in diagnosis.¹² In a review of Rashid et al consisting of 59 patients with inverted MD, 49 (80%) patient admitted with lower gastrointestinal bleeding while 41 patients (69%) admitted with abdominal pain.⁷ The same review, it has been reported that 23 patients (39%) has active intussusception at the time of operation.⁷ Application just with iron deficiency anemia as in our patient is a rare presentation of this entity available on a limited number of case reports.⁴⁻⁸ It is a rare clinical presentation that there is no abdominal pain or any symptoms of obstruction in spite of the presence of intussusception. In the literature presentation with lower gastrointestinal bleeding without any abdominal symptoms has been mentioned in two cases.^{9,10}

Despite the wide use and availability of modern imaging methods, specific preoperative diagnosis of MD is rare because of the lack of pathognomonic symptoms and uncertainty of symptoms of its complications.¹⁰ Preoperative diagnosis of adult intussusception depending on MD is quite challenging since classic triad of childhood intussusception seen only in 15-20% of cases.¹⁴ In case of development of MD complications, it may be recognizable by Ultrasound (US) imaging. In the case of an obstructed MD umbilicus associated with tubular, fluid densities were observed while in case of inverted MD and related intussusception target-like mass, the central focus of increased echogenicity might represent.⁸ CT is more specific in the case of intussusception; it observed as an intraluminal mass composed of a central lesion with the attenuation of fat surrounded by a collar of soft-tissue attenuation.⁸ In our patient, any bleeding site could not be monitored by endoscopy and colonoscopy so afterward CT applied and showed a low-density tubular structure with necrotic-hemorrhagic content invaginated to the lumen.

There are case reports in the literature which states the diagnosis with enteroclysis and capsule endoscopy method for patients presenting with similar clinical features, but we started with CT evaluation for lack of these facilities at our clinic.^{5,6}

Surgery is the preferred treatment for symptomatic MD.⁷ When inverted MD detected preoperatively or intraoperative as the surgical procedure is to be performed segmental resection and anastomosis.⁷ There are some published reports advocates that laparoscopic operation can be preformed safely.¹⁵

The case presentation emphasizes the accuracy of the saying "There are no diseases; there are patients only". That is quite interesting that the patients have no abdominal pain or obstruction symptoms in spite of the presence intussusception and admitted to clinic for the further evaluation of

detected iron deficiency anemia. That shows that we may encounter with MD with different clinical presentations in practice. Therefore; to keep in mind this entity in case of unexplained recurrent abdominal pain, nausea, vomiting or lower gastrointestinal bleeding prevents the possible delays in the diagnosis and treatment of this curable disease.

Conflict of Interest

Authors declared no conflict of interest or financial support..

Authorship Contributions

Conception or design of the work: Mani Habibi, Rojbin Karakoyun; **Data collection:** Rojbin Karakoyun, Arsenal Sezgin Alikanoğlu, Erkan Demirci; **Data analysis and interpretation:** Mani Habibi, Erkan Demirci; **Drafting the article:** Mani Habibi; **Critical revision of the article:** Rojbin Karakoyun; **Final approval of the version to be published:** Mani Habibi, Rojbin Karakoyun, Arsenal Sezgin Alikanoğlu, Erkan Demirci.

REFERENCES

1. Yigiter M, Kiyici H, Yucesan S, Hicsonmez A. An unusual cause of acute abdominal pain in a child: an inverted Meckel diverticulum: report of a case. *J Clin Ultrasound* 2010; 38(6):314-6.
2. Leijonmarck CE, Bonman-Sandelin K, Frisell J, Räf L. Meckel's diverticulum in the adult. *Br J Surg* 1986;73(2):146-9.
3. Turkington JR, Devlin PB, Dace S, Madden M. An unusual cause of intermittent abdominal pain (2006: 5b). Inverted Meckel's diverticulum. *Eur Radiol* 2006;16(8):1862-4.
4. Heider R, Warshauer DM, Behrns KE. Inverted Meckel's diverticulum as a source of chronic gastrointestinal blood loss. *Surgery* 2000;128(1):107-8.
5. Puligandla PS, Becker L, Driman D, Prokopiw I, Taves D, Davies ET. Inverted Meckel's diverticulum presenting as chronic anemia: case report and literature review. *Can J Surg* 2001;44(6):458-9.
6. Shelton JH, Newsome TW, Ford Iii KL, Hamilton JK. Inverted Meckel's diverticulum presenting as iron deficiency anemia. *Endoscopy* 2006;38 Suppl 2:E93-4.
7. Rashid OM, Ku JK, Nagahashi M, Yamada A, Takabe K. Inverted Meckel's diverticulum as a cause of occult lower gastrointestinal hemorrhage. *World J Gastroenterol* 2012;18(42): 6155-9.
8. Giusti S, Iacconi C, Giusti P, Minuto M, Caramella D, Bartolozzi C. Ileal invaginated Meckel's diverticulum: imaging diagnosis (2004:9b). *Eur Radiol* 2004;14(12):2368-71.
9. Lu CL, Chen CY, Chiu ST, Chang FY, Lee SD. Adult intussuscepted Meckel's diverticulum presenting mainly lower gastrointestinal bleeding. *J Gastroenterol Hepatol* 2001;16(4):478-80.
10. Dujardin M, de Beeck BO, Osteaux M. Inverted Meckel's diverticulum as a leading point for ileoileal intussusception in an adult: case report. *Abdom Imaging* 2002;27(5):563-5.
11. Erol V, Yoldaş T, Cin S, Çalışkan C, Akgün E, Korkut M. Complicated Meckel's diverticulum and therapeutic management. *Ulusal Cerrahi Derg* 2013;29(2):63-6.
12. Karadeniz Cakmak G, Emre AU, Tascilar O, Bektaş S, Uçan BH, Irkorucu O, et al. Lipoma within inverted Meckel's diverticulum as a cause of recurrent partial intestinal obstruction and hemorrhage: a case report and review of literature. *World J Gastroenterol* 2007;13(7): 1141-3.
13. Uppal K, Tubbs RS, Matusz P, Shaffer K, Loukas M. Meckel's diverticulum: a review. *Clin Anat* 2011;24(4):416-22.
14. Karahasanoglu T, Memisoglu K, Korman U, Tunckale A, Curgunlu A, Karter Y. Adult intussusception due to inverted Meckel's diverticulum: laparoscopic approach. *Surg Laparosc Endosc Percutan Tech* 2003;13(1):39-41.
15. Yalamarthi S, Smith RC. Adult intussusception: case reports and review of literature. *Postgrad Med J* 2005;81(953):174-7.