Lipoma With Inverted Meckel's Diverticulum Causing Intestinal Intussusception and Anemia: Report of a Case

Ann. Ital. Chir., 2025 96, 9: 1155–1158
https://doi.org/10.62713/aic.4063

Gabriele D'Amata[1], Luca Musmeci[1], Gaetano Florio[1], Daniela Caporilli[1], Annalisa Romina Di Filippo[1], Martino Demoro[1], Fabio Antonellis[1], Isabella Palmieri[2], Maria Grazia Mastrogiulio[1]

[1]Department of Surgery, Ospedale di Colleferro "Parodi Delfino", ASL Roma 5, 00034 Colleferro, Italy
[2]Department of Surgery, Ospedale Civile di Velletri "Paolo Colombo", ASL Roma 6, 00049 Velletri, Italy

Meckel's diverticulum (M.D.) is the most frequent congenital anomaly of the gastrointestinal tract. Inverted Meckel's diverticulum is a rare clinical condition, and intussusception caused by M.D. inversion is even more uncommon. We present a case report of an inverted Meckel's diverticulum with associated lipoma as a cause of unexplained anemia and acute intestinal obstruction in a young man, and a brief literature review. The patient presented to the emergency room with acute abdomen. A computed tomography (CT) scan revealed ileo-ileal intussusception with a suspected intraluminal lipoma. Surgical resection of the intussuscepted ileal segment was performed, with an uneventful postoperative course. Histopathology showed an inverted Meckel's diverticulum with a lipoma associated. Inversion of a Meckel Diverticulum with an associated lipoma causing intussusception is extremely uncommon, and emergency abdominal surgeon could face it in differential diagnosis and treatment of acute abdomen. Surgical resection with primary anastomosis is the treatment of choice of this rare finding, with a high percentage of good results.

Keywords: Meckel's diverticulum (M.D.); lipoma; bowel obstruction; emergency surgery; intussusception; obstruction; case report

Introduction

Meckel's diverticulum (M.D.) is the most frequent congenital anomaly of the gastrointestinal tract, occurring in 1–3% of the population [1]. The preoperative diagnosis of Meckel's diverticulum remains challenging in both pediatric and adult populations, even in emergency settings. This congenital anomaly, when symptomatic, can clinically mimic a wide range of conditions, including acute appendicitis, chronic inflammatory bowel diseases, peptic ulcer disease, acute enteritis, and various other causes of intestinal obstruction [1]. In addition, Meckel's diverticulum may be subject to a rare complication known as inversion, in which the diverticulum turns inward into the intestinal lumen. The even more uncommon association of an inverted Meckel's diverticulum with a lipoma as a lead point further increases the likelihood of complications, particularly intestinal obstruction. This condition is very rarely reported in the literature [2,3]. We present a case of an inverted M.D. with associated lipoma causing unexplained anemia ad acute intestinal obstruction in a young man, along with a brief literature review.

Submitted: 20 March 2025 Revised: 7 May 2025 Accepted: 20 May 2025 Published: 16 July 2025
Correspondence to: Gabriele D'Amata, Department of Surgery, Ospedale di Colleferro "Parodi Delfino", ASL Roma 5, 00034 Colleferro, Italy (e-mail: gabridamata@gmail.com).

Case Presentation

A 30-year-old male patient presented to the emergency department in July 2023 with diffuse abdominal pain and vomiting. He had a history of childhood appendectomy, hiatal hernia, and intermittent iron deficiency anemia in recent years. There was no history of substance abuse, and his family history was unremarkable. The patient reported having undergone unspecified medical evaluations recommended by his primary care physician for this anemia; however, these investigations did not lead to a definitive diagnosis.The abdominal pain began suddenly in full health the day before admission. An abdominal X-ray in the emergency room showed several air fluid levels. Laboratory tests revealed hematocrit 43.1%, Hemoglobin 14.5 g/dL, leukocytosis (White Blood Count (WBC) 16.300/µL with associated neutrophilia at 85.4%), platelets 277,000/µL, C reactive protein 1.22 mg/dL. Physical examination showed a pulse rate of 95 beats per minute, blood pressure of 120/80 mmHg, temperature 36.5 °C, respiratory rate 15 breaths for minute, and a diffuse tenderness in mid and lower quadrants with moderate guarding. During his stay in the emergency department, the patient reported worsening abdominal pain over several hours, and upon repeat physical examination, new signs of peritoneal irritation were noted. Emergency computed tomography (CT) revealed multiple air–fluid levels with a distinct transition point in the pelvic cavity. A target-like image demonstrated a central hypodense fatty mass measuring 6 × 1 cm within the small bowel lumen

(Fig. 1), associated with a perivisceral fluid collection of a few centimeters. Additionally, multiple lymph nodes were noted in the mesenteric root, and a horseshoe kidney was incidentally identified. The radiological diagnosis was ileo-ileal intussusception with a suspected intraluminal lipoma (Fig. 2). Given the abdominal CT findings, the progressive escalation of abdominal pain, and following consultation with the general surgery team, the patient underwent an urgent exploratory laparotomy on the same day as admission. Intraoperative findings revealed a 10 cm intussuscepted ileal segment located approximately 70 cm proximal to the ileocecal valve, with small bowel obstruction. The affected segment was resected, and a side-to-side stapled ileo-ileal anastomosis was performed. The postoperative course was uneventful, the patient tolerated a normal diet and was discharged three days later. Histopathological examination demonstrated an inverted Meckel's diverticulum containing a subserosal lipoma and areas of heterotopic gastric mucosa, with no evidence of malignancy (Fig. 3). Immunohistochemical staining showed negativity for CK AE1/AE3, CD117, and DOG1. At 21 months of outpatient followup, he remained in good health, with no evidence of anemia or altered bowel transit; moreover, he declined the postoperative abdominal CT scan that had been proposed.
This case has been reported in line with the case report guidelines: Case Report (CARE) Guidelines to ensure the accuracy and completeness of the report (**Supplementary Material**).

Discussion

Meckel's diverticulum becomes symptomatic in less than 6% of cases, manifesting as obstruction, intussusception, or bleeding [4]. It is a true diverticulum containing all layers of the intestinal wall and arises from incomplete obliteration of the omphalomesenteric duct. Complications occur in 4–6% of cases, including intestinal bleeding, perforation, or diverticulitis [5]. Intestinal obstruction, the most common complication in adults, accounts for 20–25% of symptomatic cases [1,6]. Inversion of the Meckel's diverticulum is rare and can cause intestinal obstruction by direct luminal obliteration or acting as a lead point for intussusception [6–9]. Possible mechanisms include abnormal peristalsis, ulceration, ectopic tissue, or a lipomatous component [2]. Tumors within Meckel's diverticulum are rarely observed. Histological types are similar to those observed in the small intestine, and benign tumors include myoma, neuroma, adenoma and lipoma. The presence of a lipoma within a Meckel's diverticulum may serve as a lead point for inversion (Fig. 4), with the risk of intussusception proportionally increasing with the size of the lipoma [10]. Nonetheless, the precise pathophysiological mechanisms responsible for the inversion remain largely undefined.
Fewer than 50 cases of inverted Meckel's diverticulum have been reported in the literature [6,10], and we found only eight cases which involved a lipoma [2,3,10–15].

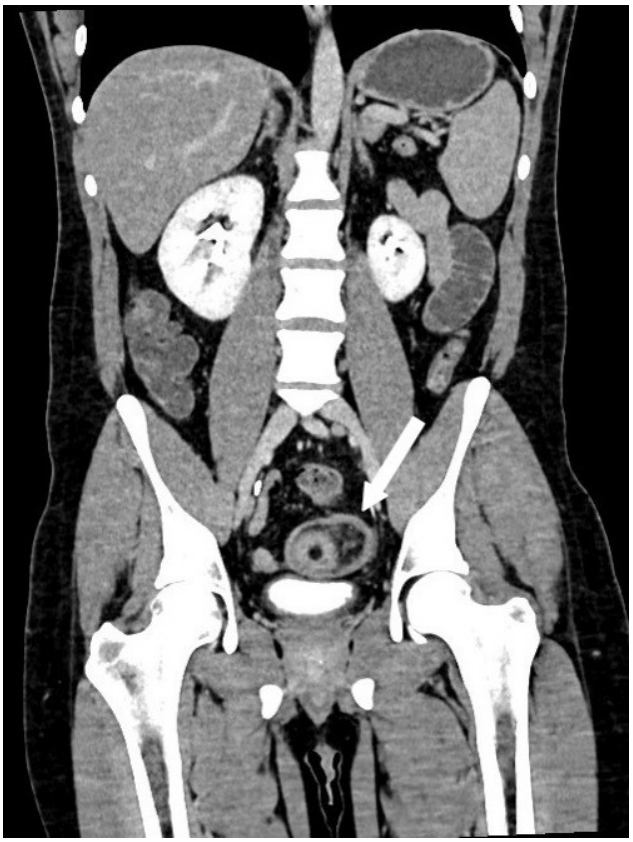

Fig. 1. Computed tomography (CT) image (coronal section) with a target-like image, revealing a central hypodense fatty mass in the ileal lumen with intussusception (white arrow).

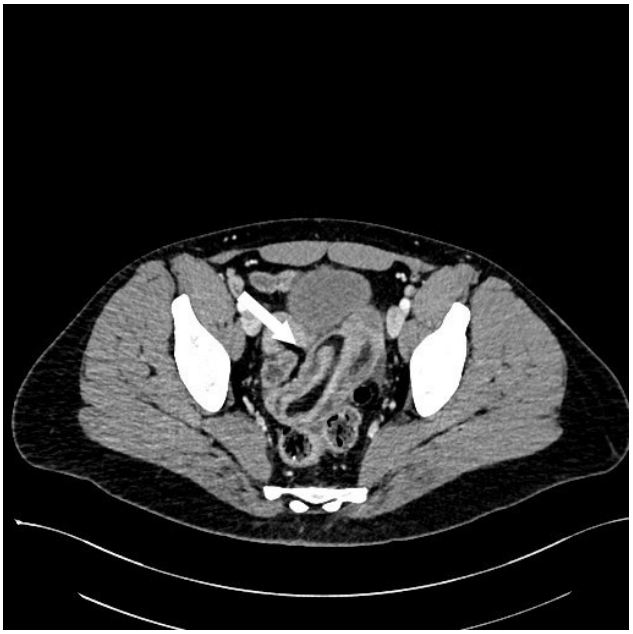

Fig. 2. Axial computed tomography image showing a target-shaped mass in the pelvic cavity, consistent with an ileo-ileal intussusception (white arrow). The central low-density component is suggestive of an intraluminal lipoma.

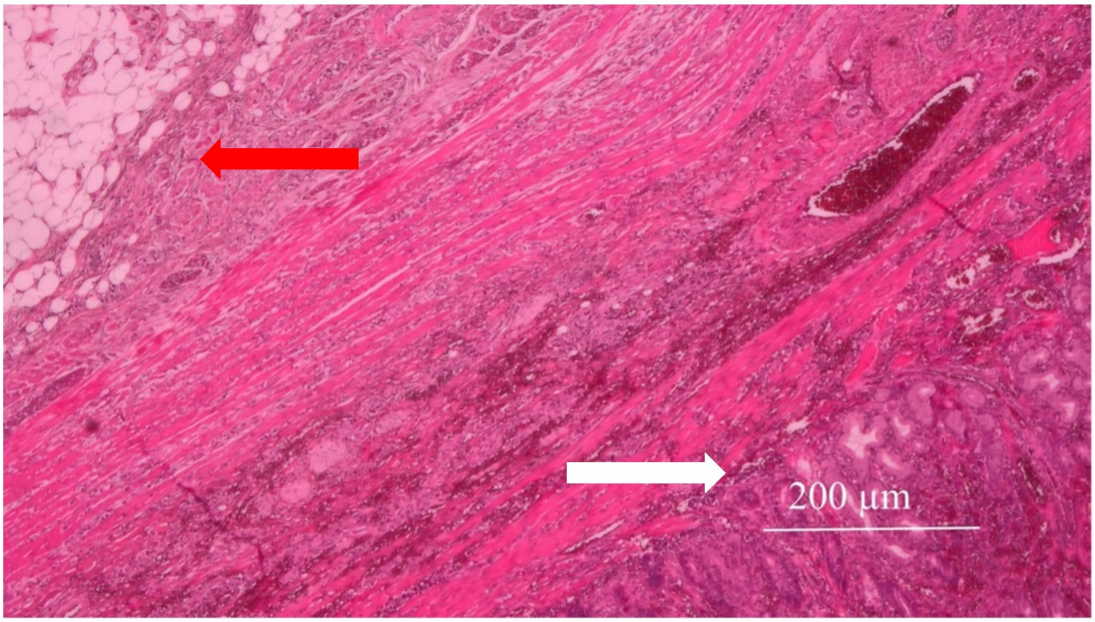

Fig. 3. Histological examination of the inverted diverticulum by hematoxylin–eosin staining: the mass consists of a Meckel diverticulum with a subserosal lipoma associated (red arrow), and the overlying mucosa is characterized by gastric type epithelium (white arrow).

Fig. 4. Schematic illustration showing the anatomical relationship between an inverted Meckel's diverticulum (red), which is causing intestinal intussusception, and an associated subserosal lipoma (yellow), as observed intraoperatively and on histological examination.

Symptoms of adult intussusception are often chronic and include abdominal pain, altered bowel habits, vomiting, and rectal bleeding. Most patients with this condition present to the emergency department with signs of an acute abdomen, including vomiting and symptoms of intestinal obstruction. However, some patients report a history of similar episodes of abdominal pain occurring months or even years prior, which had resolved with conservative management [2]. Occasional episodes of melena are also reported [12]. Preoperative diagnosis, in the absence of an acute abdomen, can be extremely challenging due to nonspecific signs and symptoms such as abdominal colic, intermittent intestinal obstruction, unexplained anemia, and lower gastrointestinal bleeding [12]. Anecdotally, this condition has also been identified during follow-up for oncologic disease [3]. However, the characteristics of abdominal pain, particularly its intermittent nature, can cause a significant delay in diagnosis. Emergency surgical intervention is always required in cases of acute intestinal obstruction, as demonstrated in our case [15].

CT is the primary imaging modality for diagnosing this condition in an emergency setting, revealing a characteristic intraluminal mass with a surrounding collar of soft tissue density (target sign). Other imaging techniques, such as Meckel's scan or wireless capsule endoscopy are not suitable in emergencies [5]. Misdiagnosis may occur if entrapped mesenteric fat is mistaken for a lipoma [2,13]. Surgical resection of the involved segment with primary anastomosis remains the treatment of choice once the diagnosis is confirmed, especially in an emergency setting. A laparoscopic approach can be considered to confirm the diagnosis giving a minimally invasive treatment [11]. This case report presents several limitations. First, the patient declined to undergo a postoperative abdominal CT scan, limiting our ability to assess for potential recurrence or anastomotic complications. Second, the follow-up period remains relatively short. Ongoing and extended follow-up is warranted to fully evaluate the long-term clinical outcome and detect any delayed postoperative issues.

Conclusions

Intussusception caused by an inverted Meckel's diverticulum with an associated lipoma is extremely rare and can present acutely with intestinal obstruction. CT imaging allows for an accurate diagnosis, while surgical resection typically leads to excellent outcomes and is often mandatory in emergency settings. Emergency surgeons should consider this rare condition in the differential diagnosis of acute abdomen as a potential atypical cause of intestinal obstruction.

Availability of Data and Materials

All data generated or analyzed during this study are included in this published article.

Author Contributions

GD conceived the study concept. GD, LM, GF, DC, MD, FA, ARDF and IP are responsible for the definition of intellectual content, literature search and data acquisition, and analysis. MGM is responsible for the histopathological evaluation of the surgical specimen. All authors have been involved in revising it critically for important intellectual content. All authors gave final approval of the version to be published. All authors have participated sufficiently in the work to take public responsibility for appropriate portions of the content and agreed to be accountable for all aspects of the work in ensuring that questions related to its accuracy or integrity.

Ethics Approval and Consent to Participate

Ethical approval was waived by the institutional ethics committee. Written informed consent was obtained from the patient for the publication of this case report and any accompanying images. A copy of the written consent is available from the corresponding author upon request. The study was conducted in accordance with the Declaration of Helsinki.

Acknowledgment

We use AI-assisted tool (ChatGPT) to improve the language quality and take responsibility for the accuracy, integrity, and originality of this article.

Funding

This research received no external funding.

Conflict of Interest

The authors declare no conflict of interest.

Supplementary Material

Supplementary material associated with this article can be found, in the online version, at https://doi.org/10.62713/aic.4063.

References

[1] Morris G, Kennedy A, Jr. Small Bowel Congenital Anomalies: A Review and Update. The Surgical Clinics of North America. 2022; 102: 821–835. https://doi.org/10.1016/j.suc.2022.07.012.

[2] Kim SM, Jung MJ, Kim YO. Lipoma within Inverted Meckel's Diverticulum: A Case Report. Korean Journal of Pathology. 2013; 47: 86–88. https://doi.org/10.4132/KoreanJPathol.2013.47.1.86.

[3] Yamauchi N, Ito T, Matsuoka H, Chohno T, Hasegawa H, Kakeji Y, *et al*. Intussusception caused by a small intestinal lipoma with ectopic gastric mucosa containing gastric cystica profunda component cells within the inverted Meckel's diverticulum: a case report. Surgical Case Reports. 2020; 6: 286. https://doi.org/10.1186/s40792-020-01061-y.

[4] Craine S, Agarwal S, Al-Hamid Z. Intussusception of Meckel's Diverticulum: A Case Report. Cureus. 2024; 16: e76513. https://doi.org/10.7759/cureus.76513.

[5] Butler K, Peachey T, Sidhu R, Tai FWD. Demystifying Meckel's diverticulum - a guide for the gastroenterologist. Current Opinion in Gastroenterology. 2025; 41: 146–153. https://doi.org/10.1097/MOG.0000000000001085.

[6] Akao A, Otsuki T, Ishizuka K, Katayama M, Ie K, Okuse C. Adult Intussusception with Inverted Meckel's Diverticulum as the Leading Point. The American Journal of Medicine. 2025; S0002–S0002–9343(25)00201–3. https://doi.org/10.1016/j.amjmed.2025.03.017. (online ahead of print)

[7] Dujardin M, de Beeck BO, Osteaux M. Inverted Meckel's diverticulum as a leading point for ileoileal intussusception in an adult: case report. Abdominal Imaging. 2002; 27: 563–565. https://doi.org/10.1007/s00261-001-0070-3.

[8] Liu T, Yu C, Li J. Adult intussusception secondary to inverted Meckel's diverticulum. Journal of Gastrointestinal Surgery: Official Journal of the Society for Surgery of the Alimentary Tract. 2024; 28: 590–591. https://doi.org/10.1016/j.gassur.2024.01.022.

[9] Konstantakos AK. Meckel's diverticulum-induced ileocolonic intussusception. American Journal of Surgery. 2004; 187: 557–558. https://doi.org/10.1016/j.amjsurg.2003.12.032.

[10] Bains L, Bhatia R, Kaushik R, Lal P, Rajpaul G, Veerpal. Inverted Meckel's diverticulum: a case report. Journal of Medical Case Reports. 2021; 15: 264. https://doi.org/10.1186/s13256-021-02736-2.

[11] Formejster I, Mattern R. Ileus due to ileo-cecal intussusception caused by lipoma coexistent with Meckel's diverticulum. Wiadomosci Lekarskie (Warsaw, Poland: 1960). 1971; 24: 1101.

[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 Journal of Gastroenterology. 2007; 13: 1141–1143. https://doi.org/10.3748/wjg.v13.i7.1141.

[13] Sharp G, Kozman D. Inverted Meckel's diverticulum causing intussusception in a Crohn's patient. Journal of Surgical Case Reports. 2015; 2015: rjv112. https://doi.org/10.1093/jscr/rjv112.

[14] Krespis EN, Sakorafas GH. Partial intestinal obstruction caused by a lipoma within a Meckel's diverticulum. Digestive and Liver Disease: Official Journal of the Italian Society of Gastroenterology and the Italian Association for the Study of the Liver. 2006; 38: 358–359. https://doi.org/10.1016/j.dld.2005.11.008.

[15] Ahmed HU, Wajed S, Krijgsman B, Elliot V, Winslet M. Acute abdomen secondary to a Meckel's lipoma. Annals of the Royal College of Surgeons of England. 2004; 86: W4–5. https://doi.org/10.1308/147870804173.