International Surgery Journal
Hernández APV et al. Int Surg J. 2026 Jun;13(6):1056-1060
https://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: https://dx.doi.org/10.18203/2349-2902.isj20261584

Case Report

A case report on intestinal malrotation in an adult patient

Ana P. V. Hernández*, Fidel F. B. Morales, Miguel U. Ruiz, Maria F. V. Moreno, Alicia E. A. Rosales

Faculty of Medicine, Dr. Ignacio Morones Prieto High-Specialty Regional Hospital, Autonomous University of San Luis Potosí, UASLP. CP 78290 San Luis Potosí, San Luis Potosí, México

Received: 17 April 2026
Accepted: 14 May 2026

***Correspondence:**
Dr. Ana P. V. Hernández,
E-mail: ana.valdez.hernandez@hotmail.com

ABSTRACT

Intestinal malrotation corresponds to an embryological developmental anomaly resulting from a defect in the rotation and fixation of the midgut around the axis of the mesenteric artery. It is diagnosed in 75-85% of cases during childhood, with an incidence between 0.0001% and 0.19%. A case is presented of a 22-year-old young adult with multiple episodes of pain that worsened over the course of a year, abdominal distension, vomiting of gastric contents, and occasional constipation. She visited various healthcare services and was diagnosed with gastritis due to *H. pylori* infection, received treatment, and showed partial improvement. Subsequently, she returned to the emergency services with symptoms of intestinal obstruction. Studies were conducted, including an IV contrast computed tomography (CT) scan, which showed the presence of a characteristic whirl sign, associated with abnormal rotation of the midgut around the superior mesenteric artery. Early recognition of the diagnosis of intestinal malrotation in adults is important because its occurrence is rare, which necessitates the use of diagnostic tools such as imaging studies for an appropriate surgical intervention, which is the cornerstone for improving the prognosis of these patients.

Keywords: Abdominal pain, Congenital anomaly, Intestinal malrotation

INTRODUCTION

Intestinal malrotation corresponds to an embryological developmental anomaly derived from a defect in the rotation and fixation of the midgut around the axis of the superior mesenteric artery, which can cause obstruction and manifest acutely or with chronic and intermittent gastrointestinal symptoms.[1,2]

During embryonic development, the digestive tube undergoes a complex morphogenetic process that involves an initial counterclockwise rotation of 90°, followed by an additional 270° rotation in the same direction within the abdominal cavity. This process allows for the correct anatomical arrangement of the midgut and its mesenteric fixation. More than 90% of individuals with intestinal malrotation present clinical manifestations before the first year of life. The estimated incidence of this congenital anomaly is approximately 1 in every 500 live births.[3]

Intestinal malrotation is diagnosed in 75-85% of cases during childhood, while its presentation in adulthood constitutes an exceptional entity, with an estimated incidence between 0.0001% and 0.19%. In the adult population, a slight predominance in the female sex has been described.[4]

The diagnosis in this population represents a significant challenge, as patients often present with mild or nonspecific obstructive symptoms, leading to diagnostic errors and requiring a high degree of clinical suspicion.[1,3,4] Both timely diagnosis and treatment are essential to prevent serious complications such as small intestine necrosis.

For diagnosis, various modalities are employed, such as barium studies, computed tomography, angiography, and emergency laparotomy.[1] The standard treatment for

malrotation, regardless of the patient's age, is the Ladd procedure, first described by Dr. Ladd in 1936.[1,2,5]

CASE REPORT

This article describes a case of intestinal malrotation of the middle intestine in a 22-year-old adult, who went to the emergency room with chronic obstructive symptoms, which intensified over a period of one month. He had experienced this pain since childhood, with a progressive exacerbation in the year before its presentation. The pain was located in the upper right quadrant and the periumbilical region. He had a history of intermittent vomiting of food content, occasionally with bile material, as well as episodes of constipation and abdominal distension of similar duration.

He had gone to different health services on multiple occasions without observing improvement. In these evaluations, he was allegedly diagnosed with chronic gastritis secondary to *H. pylori* infection. He received medical treatment with proton pump inhibitor and antibiotic therapy for 14 days, with partial improvement of gastrointestinal symptoms.

At the beginning of September 2025, the patient went to the emergency room for presenting again gastrointestinal symptoms compatible with a picture of intestinal obstruction, characterized by epigastralgia, nausea, incoercible vomiting and intolerance to the oral route. Medical treatment was established with water replacement and intravenous electrolyte, in addition to antiemetics.

Laboratory studies showed data compatible with metabolic alkalosis and hypokalemia, which was corrected in a timely manner. Two days later, an attempt was made to reintroduce the oral route without success due to the persistence of food intolerance.

The case was evaluated by the gastroenterology service, which indicated the performance of an upper digestive endoscopy, in which a gastric chamber of abnormal shape, situation and distribution was observed, of ecstatic appearance, with the presence of more than 2 liters of biliary content, which was partially aspirated. No intragastric lesions were identified; the gastric fundus was within normal limits.

During the exploration, the duodenum was accessed through the pylorus, which was permeable and without visible lesions. However, an anomalous fixation of the duodenum was evidenced, without peristaltic activity, which prevented the advancement of the endoscope towards the second duodenal portion. In the most distal site, a reduction in light was observed, suggestive of extrinsic stenosis or associated structural alteration.

Given the persistence of the clinical picture and the endoscopic findings suggestive of intestinal obstruction, the General Surgery service was requested to interconsult.

After the comprehensive assessment, the surgical team determined the need for surgical intervention by exploratory laparotomy, due to the clinical and radiological evidence compatible with intestinal occlusion secondary to intestinal malrotation.

The preoperative diagnosis was based on the findings of the computed tomography of the abdomen with intravenous contrast, which showed the presence of a characteristic swirl sign, associated with anomalous rotation of the middle intestine around the superior mesenteric artery, a finding suggestive of the diagnosis of intestinal malrotation.[6]

Physical examination

General appearance

The patient appeared ill with clinical evidence of malnutrition, having lost 26% of her weight in the previous two months. The nutritional assessment using the MUST tool indicated a high risk of malnutrition, while the subjective global assessment (SGA) and the GLIM criteria classified the patient as malnourished. Vital signs with a heart rate of 90 beats per minute, a respiratory rate of 18 breaths per minute, a temperature of 36.5°C, and a blood pressure of 100/70 mmHg.

Head and neck

Pink and scleral conjunctiva without jaundice.

Abdomen

The abdomen moved symmetrically with respiration, with present peristalsis more pronounced in the right upper quadrant and the epigastric region. Bowel sounds were normal and no areas of tenderness were identified upon palpation.

Imaging studies abdominopelvic computes tomography with intravenous contrast

The tomography showed marked dilation of the stomach and duodenum, which were filled with fluid. The dilated small intestine presented an abrupt transition in the mid-abdomen region, with a spiral appearance of the mesenteric vessels (superior mesenteric artery and vein). Distally, the small intestine was observed collapsed up to the proximal point of the spiral image. No abnormal thickening of the intestinal wall or masses was observed (Figure 1).

Intraoperative findings

During the surgical intervention, a dilated stomach and duodenum were observed with a possible Ladd's band extending toward the root of the mesentery, causing obstruction secondary to dense adhesions localized at the duodenojejunal junction. The rest of the small intestine

was collapsed and located in the lower left quadrant, exhibiting a 360-degree rotation in both clockwise and counterclockwise directions (Figures 2 and 3).

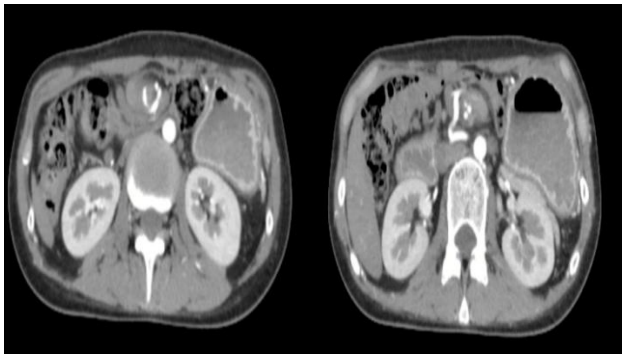

Figure 1: In the contrast-enhanced abdominal CT scan, findings are identified the "whirlpool" sign of the mesenteric vessels is identified, a finding suggestive of midgut volvulus and potential vascular compromise.

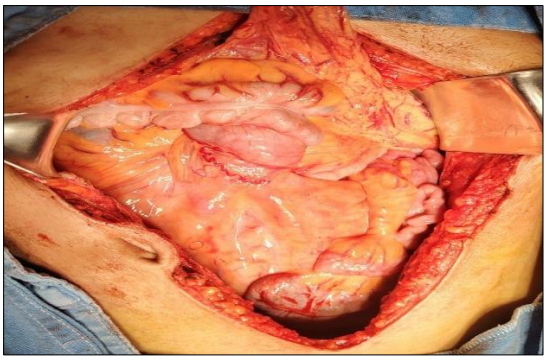

Figure 2: Intestinal rotation at the robot of the mesentery in a clockwise direction.

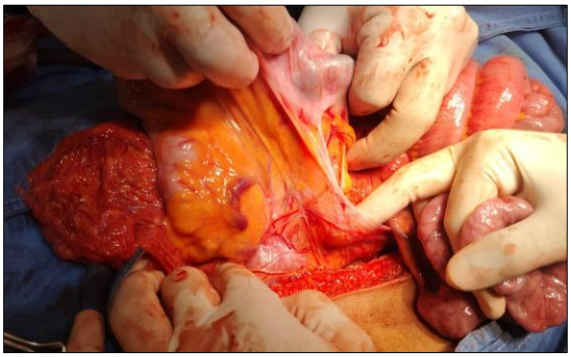

Figure 3: Intraoperative image of widening of the mesentery of the small intestine and release of adhesions (adhesiolysis).

DISCUSSION

Malrotation of the small intestine constitutes a congenital anomaly derived from a disruption in the process of rotation and fixation of the midgut during embryonic development. In this condition, the fetal intestine does not complete, or incorrectly performs, the rotation around the axis of the superior mesenteric artery.[7] More specifically, the cecum remains adhered to the right side of the abdominal wall by fibrous peritoneal bands known as Ladd's bands; the duodenum descends on the right side of the abdomen, and the ligament of Treitz does not cross the midline to the left side.[8]

Intestinal malrotation is significantly more common in the pediatric population than in adults and is associated with higher morbidity and mortality. For this reason, it should be considered within the differential diagnosis of unexplained abdominal pain, even in adult patients.[9-11]

Clinical manifestations are heterogeneous and nonspecific, without a characteristic clinical pattern.[1,2] The predominant symptom is abdominal pain, which can present intermittently or continuously. Vomiting is also a common finding, although not necessarily bilious, and may alternate with periods of apparent normalcy. Among the less frequent manifestations are intolerance to solid foods, malabsorption, chronic diarrhea secondary to protein-losing enteropathy, pancreatitis, peritonitis, biliary obstruction, intestinal motility disorders, and chylous ascites.[1,11,12]

In adulthood, the symptoms can mimic other gastrointestinal disorders such as irritable bowel syndrome or peptic ulcer disease.[13] It is worth noting that, in older patients, the symptoms are often atypical, which can delay the diagnosis.[14] In the described case, the patient presented with long-standing colicky abdominal pain, intermittent vomiting with food and bile content, intermittent constipation, and abdominal distension.

The contrast study of the upper gastrointestinal tract (UGI), widely used in pediatric practice, continues to be considered the gold standard for diagnosing intestinal malrotation. However, in the adult population, computed tomography (CT) with oral and intravenous contrast has demonstrated greater diagnostic performance. Various studies recommend its use as the test of choice in cases of clinical suspicion of this condition.[6,15,16] Among the most characteristic tomographic findings are the anomalous position of the superior mesenteric vein and the alteration in the location of the duodenojejunal junction, which are of great value for confirming the diagnosis.

The classic findings in abdominal computed tomography (CT) in cases of intestinal malrotation include the predominant location of the small intestine on the right side of the abdomen (98.2%), the position of the cecum toward the left (12%), an inverted anatomical relationship between the superior mesenteric artery (SMA) and the superior mesenteric vein (SMV) (8.4%), as well as aplasia of the uncinate process of the pancreas.[1,13,17] The abnormal positions of the superior mesenteric vein (SMV) in the context of malrotation were first described by Nichols and Li, who documented the disposition of the SMV to the left

of the SMA instead of its usual position to the right as a characteristic sign of this congenital anomaly.[18]

Intestinal malrotation can cause shortening of the mesenteric root and narrowing of the suspensory pedicle of the intestine, which favors the twisting of the small intestine and its mesentery around the pedicle of the SMA. This phenomenon leads to midgut volvulus, which is manifested in CT as the characteristic whirlpool sign.[18]

In the presented case, the abdominal CT with intravenous contrast revealed a dilation of the loops of the small intestine with an abrupt transition point in the mid-abdomen and a whirlpool appearance of the mesenteric vessels, SMA, and SMV, findings compatible with intestinal malrotation associated with midgut volvulus, despite the volvulus not being confirmed intraoperatively.

Patients with chronic symptoms attributable to intestinal malrotation often require surgical correction to achieve complete resolution of the clinical picture.[1,3] Both laparotomy and laparoscopy are considered safe and feasible techniques, with low rates of postoperative complications.[2] The laparoscopic Ladd procedure has established itself as a valid alternative to open surgery in patients with chronic symptoms.[19-21] However, controversy persists regarding the surgical approach in asymptomatic patients or those with minimal clinical manifestations.[11,20]

In the described case, an exploratory laparotomy and a Ladd procedure were chosen due to the presence of chronic symptoms associated with intestinal malrotation.

Delays in diagnosis can lead to the onset of acute complications and unfavorable surgical outcomes.[11,21,24] In the adult population, postoperative complications are more frequent, highlighting the importance of early diagnosis and timely treatment.[11,22-25] Malrotated intestine has an anatomical predisposition to the development of volvulus, with the consequent risk of intestinal obstruction and gangrenous necrosis of the small intestine.[26]

CONCLUSION

Intestinal malrotation in adults can manifest with a wide variety of symptoms, which represents a significant diagnostic challenge. This condition, usually diagnosed in childhood, presents an infrequent form of onset in adulthood, in which clinical diagnosis is particularly complex. Early recognition thru imaging studies and timely surgical intervention are the fundamental pillars for improving patient prognosis. Among the available therapeutic options, the Ladd procedure is considered a safe and effective surgical technique for the definitive treatment of intestinal malrotation.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Salamanca IMG, Jaime MTE, Puertas AEM, Martínez JS. Malrotación intestinal inusual en paciente adulto. Cirugía Española. 2016;34:36.
2. Gobriel M, Chan A, Griffith B, Almerie Q. Symptomatic intestinal malrotation in adulthood: how we managed it. BMJ Case Rep. 2023;16(9).
3. Herle P, Halder T. Intestinal malrotation in an adult patient with other congenital malformations: A case report. Int J Surg Case Rep. 2018;53:180-3.
4. Eccleston JL, Su H, Ling A, Heller T, Koh C. Adult presentation of intestinal malrotation. J Gastroenterol Hepatol. 2016;31(8):1382.
5. Prasil P, Flageole H, Shaw KS, Nguyen LT, Youssef S, Laberge JM. Should malrotation in children be treated differently according to age? J Pediatr Surg. 2000;35(5):756-8.
6. Xiong Z, Shen Y, Morelli JN, Li Z, Hu X, Hu D, et al. CT facilitates improved diagnosis of adult intestinal malrotation: a 7-year retrospective study based on 332 cases. Insights Imaging. 2021;12:58.
7. Singh U, Baker A. Midgut malrotation: a rare presentation of bowel obstruction in the adult. J Surg Case Rep. 2021;2021(7):rjab309.
8. McCallum RW, Liu RP, Asatrian A. Small bowel malrotation: a perspective for the adult gastroenterologist. Pract Gastroenterol. 2016;23:23-7.
9. Ribeiro T, Greene B, Bennett S, Msallak H, Karanicolas P. Variations of intestinal malrotation in adults: a case report of midgut volvulus and literature review for the surgeon. Int J Surg Case Rep. 2022;91:106750.
10. Lin JN, Lou CC, Wang KL. Intestinal malrotation and midgut volvulus: a 15-year review. J Formos Med Assoc.1995;94(4):178-81.
11. Glosser LD, Lombardi CV, Knauss HM, Rivero R, Liu S, Jones TJ. Case report of congenital intestinal malrotation in an adult discovered three months status-post appendectomy. Int J Surg Case Rep. 2022;91:106795.
12. Nehra D, Goldstein AM. Intestinal malrotation: varied clinical presentation from infancy through adulthood. Surgery. 2011;149(3):386-93.
13. Pradiptha NT, Wiargitha K. Adult intestinal malrotation: a case report. Int J Surg Case Rep. 2021;88:106547.
14. Nagdeve NG, Qureshi AM, Bhingare PD, Shinde SK. Malrotation beyond infancy. J Pediatr Surg. 2012;47(11):2026-32.
15. Kotobi H, Tan V, Lefevre J, Valleur P, Chapuis O. Total midgut volvulus in adults with intestinal malrotation: Report of eleven patients. J Visc Surg. 2017;154(3):175-83.
16. Durkin ET, Lund DP, Shaaban AF, Schurr MJ, Weber SM. Age-related differences in diagnosis and morbidity of intestinal malrotation. J Am Coll Surg. 2008;206(4):658-63.

17. Zissin R, Rathaus V, Oscadchy A, Kots E, Gayer G, Shapiro-Feinberg M. Intestinal malrotation as an incidental finding on CT in adults. Abdom Imaging. 1999;24(6):550-5.
18. Nichols DM, Li DK. Superior mesenteric vein rotation: a CT sign of midgut malrotation. Am J Roentgenol. 1983;141(4):707-8.
19. Nguyen RK, Crouse RM, Talbot EA, Allard AK. Intestinal malrotation in the adult. Int J Surg Case Rep. 2020;1:2.
20. Sipahi M, Caglayan K, Arslan E, Erkoc MF, Aytekin FO. Intestinal malrotation: a rare cause of small intestinal obstruction. Case Rep Gastroenterol. 2014;2014:2-6.
21. Haqqani M, Seetharaman M, Teo R, Adkisson C, Nessen M, Dauer M, et al. Midgut malrotation complicated by small bowel obstruction in an 80-year-old woman: a case report. Int J Surg Case Rep. 2019;63:89-93.
22. Panda N, Bansal NK, Narasimhan M, Ardhanari R. Laparoscopic correction of intestinal malrotation in adults. Int J Surg Case Rep. 2014;10(2):90-3.
23. Mizuta N, Kikuchi T, Fukuda Y. Adult Intestinal Malrotation Treated with Laparoscopic Ladd Procedure. Case Rep Surg. 2022;2022:6874885.
24. Anand U, Kumar R, Priyadarshi RN, Kumar B, Kumar S, Singh VP. Comparative study of intestinal malrotation in infants, children, and adults in a tertiary care center in India. Indian J Gastroenterol. 2018;37(6).
25. Altayb A, Hegazi A, Elhag O, Abdelgadir A. Midgut volvulus due to congenital malrotation in an adult: a case report. J Med Case Rep. 2023;1:4.
26. McMahon E, Penfold M. 18-year-old with abdominal pain due to congenital bowel malrotation: a case report. Int J Surg Case Rep. 2022;65:8.

Cite this article as: Hernández APV, Morales FFB, Ruiz MU, Moreno MFV, Rosales AEA. A case report on intestinal malrotation in an adult patient. Int Surg J 2026;13:1056-60.