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Intestinal malrotation in a 50-year-old adult. A case report

Malrotación intestinal en adulto de 50 años. Reporte de caso

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Keywords:
intestinal malrotation, adult, surgery Mexico.

Palabras clave:
malrotación intestinal, adulto, cirugía México.

ABSTRACT

Introduction: intestinal malrotation is a congenital anomaly associated with a lack of midgut rotation, often related to other developmental anomalies. The condition affects 1% of the population, and medical professionals diagnose it in 90% of cases before one year. However, diagnosing the condition in adults is challenging due to vague and nonspecific symptoms, and in many cases, the only manifestation is high intestinal occlusion. **Clinical case:** a 50-year-old male with a history of early satiety presents symptoms of abdominal distension with peritoneal irritation. An abdominal radiography in a standing position and supine decubitus shows hydro-aerial levels, a stack of coins image, interact edema, and intestinal dilatation. The medical team performed an exploratory laparotomy to investigate the cause of the symptoms; The surgical team performed the Ladd procedure and observed a spiral arrangement of the ascending colon and ileum, making adequate fixation impossible and increasing the risk of torsion and necrosis. As a result, they decided to perform a right hemicolectomy with an intertransverse anterolateral anastomosis. **Conclusions:** each case should tailor the approach to minimize the risk of complications in the presence of associated congenital anomalies, although Ladd's procedure is the preferred surgical option.

RESUMEN

Introducción: *la malrotación intestinal, es una anomalía congénita, asociada a falta de rotación del intestino medio, relacionada con frecuencia a otras anomalías del desarrollo. Afecta a 1% de la población, se diagnostica en 90% de los casos antes de un año de edad; en el adulto el diagnóstico es difícil, pues los síntomas son vagos e inespecíficos, en muchas ocasiones la oclusión intestinal alta es la única manifestación.* ***Caso clínico:*** *masculino de 50 años, con antecedente de saciedad temprana, acude presentando distensión abdominal con irritación peritoneal, radiografía de abdomen en posición de pie y decúbito supino con niveles hidroaéreos, imagen en pila de monedas, edema interasa y dilatación intestinal, se procedió a laparotomía exploradora; como hallazgo se encontró malrotación intestinal tipo IIIB; se realizó procedimiento de Ladd, donde se observó colon ascendente e íleon en espiral, con imposibilidad para una fijación adecuada, con alto riesgo de torsión y necrosis posterior; se decidió realizar hemicolectomía derecha con ileotransverso anastomosis laterolateral.* ***Conclusiones:*** *el procedimiento de Ladd es el manejo quirúrgico de elección; sin embargo, ante el hallazgo de alteraciones congénitas asociadas, se tendrá que individualizar cada caso, con la finalidad de minimizar los riesgos de complicaciones.*

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INTRODUCTION

Intestinal malrotation is an anatomical defect caused by abnormalities in the rotation of the intestine in one of the three stages of embryonic development.

Stage I, rotation is given at 90º within the physiological umbilical hernia.

Stage II, a rotation of 180º occurs during the return to the abdominal cavity, completing the rotation of 270º.

In stage III, the cecum descends from the subhepatic level to the final position in the right iliac fossa; these changes originate between the fifth and twelfth week of gestation.

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Table 1: Midgut rotation abnormalities.

Type	Defect	Clinical effect
IA	No rotation	Midgut volvulus
IIA	Lack of duodenal rotation, regular colon rotation	Duodenal band obstruction
IIB	Reverse rotation of duodenum and colon	Transverse colon obstruction by the duodenal mesentery
IIC	Reverse rotation of the duodenum; normal rotated colon	Right mesenteric pouch (obstruction)
IIIA	Regular rotation of the duodenum; the colon does not rotate.	Midgut volvulus
IIIB	Incomplete fixation of the hepatic angle of the colon	Ladd's band obstruction
IIIC	Incomplete fixation of the cecum and its mesentery	Cecal volvulus invagination (Waugh's syndrome)
IIID	Internal hernias	Paraduodenal hernia

Taken from: Ballesteros GE et al.[3]

It is considered that midgut rotation anomalies *(Table 1)* present an incidence of one in 6,000 live newborns, and it is more frequent in males than in females; it is essential to know that intestinal malrotation is related to other anomalies, such as intestinal atresia 5-26%, Meckel's diverticulum 1-4%, hernia 7%, and trisomy 21 3-10%.[1,2]

It affects 1% of the population and is usually detected in 90% of cases before the age of one year.[4] The clinical manifestations of intestinal malrotation are characterized by biliary vomiting and abdominal distension; as age advances, symptoms become vaguer but may include chronic abdominal pain, weight loss, failure to thrive, and other nonspecific complaints. Adult intestinal malrotation is often asymptomatic and is diagnosed incidentally during a radiological examination for another cause. However, it is common for these patients to report chronic symptoms with a history of episodes of acute pain and cyclic vomiting for years. Many are even labeled as psychological disorders, so diagnosis in adulthood can become complicated. A high percentage of these adults have clinical evidence of malnutrition due to intermittent intestinal occlusions, which alter the venous and lymphatic drainage of the intestine and produce malabsorption.[5]

High bowel occlusion may be the only clinical manifestation in the adult admitted to the emergency department due to extrinsic compression of Ladd's bands.

PRESENTATION OF THE CASE

The patient is a 50-year-old male, native and resident of Tepotzotlán, State of Mexico, Mexico, with a history of early satiety, when eating food since childhood and without any other added symptomatology.

His condition began 15 days prior to his hospital admission when he presented pain with a visual analog scale score of 4/10, of periumbilical location, gradual, and colicky type, with irradiation to the entire abdomen, of intermittent duration and frequency, aggravated with food intake, attenuated with rest, and accompanied by discrete abdominal distention. The patient's condition worsened two days prior to admission due to constant generalized pain and significant abdominal distention, with the impossibility of passing gas and evacuating; he came to the hospital for management and treatment. On physical

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examination, his vital signs were within normal parameters; he was conscious, calm, and oriented in his three neurological spheres, with good skin coloration and mucous membranes, painful facies, and forced attitude. He had an average general constitution, good hydration status, a normal skull without exostoses or sinkholes, cylindrical central neck without adenomegaly, cardiopulmonary without compromise, globose abdomen at the expense of abdominal distension, peristalsis of struggle, tympanic to percussion, with hyperesthesia and hyperalgesia throughout the abdomen, and with generalized involuntary muscle resistance. The rectal examination revealed an empty rectal ampulla.

Laboratory findings are shown in *Tables 2 to 4*. Plain abdominal radiography in the standing position showed the presence of slight bowel distention, inter loop edema with a coin stack image, and hydro-aerial levels without air in the colon *(Figure 1)*. Simple abdominal radiography in the supine position showed a coin stacking and a duodenal bubble image *(Figure 2)*.

Table 2: Blood chemistry.

Glucose	113.3 mg/dl
BUN	19.9 mg/dl
Urea	43 mg/dl
Creatinine	1.2 mg/dl
Cholesterol	126 mg/dl
Amylase	100 U/l
Lipase	7.7 U/l

BUN = blood urea nitrogen, laboratory tests.
Laboratory tests.

Table 3: Cell blood count.

Hemoglobin	14.6 g/dl
Hematocrit	42.5%
Platelets	324×10^3
White blood cells	13.300 µl
Granulocytes	87.7%
Lymphocytes	1.1×10^3

Laboratory tests.

Table 4: Coagulation times.

Prothrombin time	14.70*
Partial thromboplastin time	26.70*
INR	1.05
Activity	97.40%
Prothrombin time	14.70*

INR = international normalized ratio.
* Data expressed in seconds.
Laboratory tests.

Treatment

Due to the poor response to conservative medical management for 24 hours, with the placement of a nasogastric tube and given the impossibility of having a complementary study such as a CT scan of the abdomen, it was decided to go to the operating room to perform an exploratory laparotomy. The preoperative diagnosis was high intestinal occlusion. On surgery, there were findings of intestinal occlusion by extrinsic duodenal compression and incomplete intestinal rotation, with the duodenum located to the right of the midline, Ladd peritoneal bands *(Figure 3)*, significant duodenal dilatation *(Figure 4)*, and an incomplete fixation of the hepatic angle of the colon in abnormal position. The presence of partial stenosis of jejunum at 15, 25, and 35 cm from the duodenum, two varicose veins of 1.5 cm in diameter, which run along the mesenteric border of the jejunum for approximately 150 cm *(Figure 5)*, the jejunum with atrophy in its first 100 cm, and the hepatic angle of the colon located to the right of the midline were identified.

However, despite the lysis of adhesions, the cecum remains in a spiral form without the possibility of fixing it adequately, so a right hemicolectomy with manual anterolateral intertransverse anastomosis was performed. First, the ends of the transverse colon and ileum were closed in two planes: the first

Figure 1: *Plain radiograph of the abdomen in a standing position.*

Figure 2: *Simple radiograph of the abdomen in the supine decubitus position.*

with polyglactin 2-0 simple suture, and the second plane was closed with separate Lembert stitches with 2-0 silk. Next, the anastomosis was performed in two planes, the first with polyglactin 2-0 single suture stitches on the posterior aspect of the anastomosis and a Connell Mayo stitch on the anterior aspect; and the second plane was closed with separate invaginating Lembert stitches with 2-0 silk.

During his hospitalization, the patient had a satisfactory clinical evolution; he restarted the oral route on the fifth day, and was managed with a double antibiotic regimen of ceftriaxone and metronidazole for seven days; at the end of the treatment, he was discharged

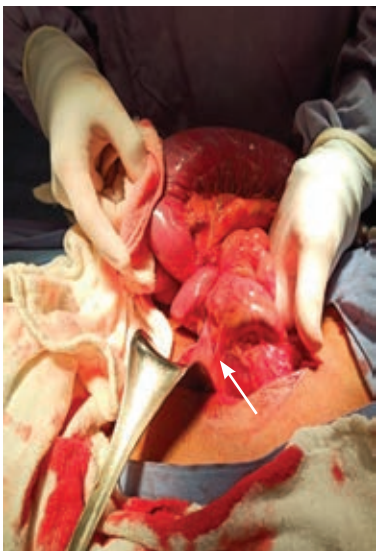

Figure 3: *Ladd bands.*

Figure 4: *The incomplete fixation of the hepatic angle of the abnormally positioned colon is observed.*

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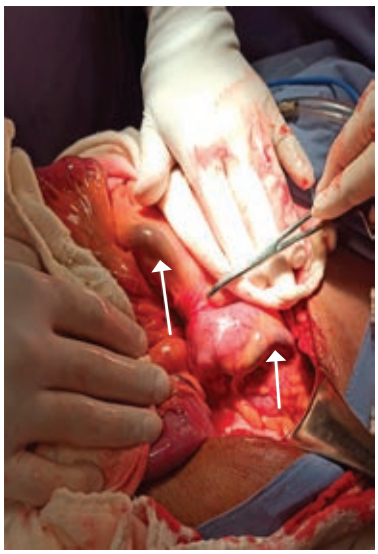

Figure 5: *Presence of partial jejunal stenosis at 15, 25, and 35 cm from the duodenum; two varicose veins of 1.5 cm in diameter are seen, running along the mesenteric border of the jejunum for approximately 150 cm.*

to continue his outpatient follow-up, with no complications to date.

DISCUSSION

The diagnosis of intestinal malrotation in adults is complex, mainly due to the absence of specific previous signs and symptoms and its low incidence in this age range.[6] Therefore, most of the time, this pathology is identified during surgery since adults are generally admitted to the emergency department with data of acute intestinal occlusion and, on many occasions, without more specific or specialized studies in some hospital units, which makes immediate surgical intervention necessary to avoid complications.

In newborns, infants, and children up to two years of age, intestinal malrotation should be corrected at the time of diagnosis since it is a surgical emergency; however, in older children and adults, this need is questionable because knowing that one suffers from this developmental anomaly allows immediate action to be taken in the event of any complication and, on the other hand, the frequency of symptoms at this age is lower.[7]

Consequently, many adults with this pathology, who have been asymptomatic during their lives, present some degree of malnutrition since the presence of chronic volvulus can cause intermittent and sporadic clinical manifestations, alter the venous and lymphatic drainage of the intestine, and produce malabsorption and hypoproteinemia.[8]

The Ladd procedure is the surgical treatment of choice described for the resolution of this anomaly; whereby the volvulus is reduced if present, the intestinal flanges are released, the mesenteric pedicle is widened to prevent midgut torsion, and the small and large bowel are fixed in their usual position, with the performance of a prophylactic appendectomy.[9,10]

However, in this reported case, and despite performing the maneuvers described above, the patient continued to have the ascending colon and terminal ileum in a spiral form without the possibility of an adequate and safe fixation; to avoid the possibility of intestinal torsion and subsequent necrosis, the decision was made to perform a right hemicolectomy with intertransverse anterolateral anastomosis, which resulted in a satisfactory evolution during his hospital stay and up to the present time.

CONCLUSIONS

Although the literature describes the surgical procedure to be performed in the presence of intestinal malrotation and the existing types of malrotation, the possibility of individual anatomical alterations is always latent. A surgical decision will have to be made according to the case presented, with the sole purpose of minimizing risks and favoring a good evolution for the patient's benefit.

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