Intestinal Malrotation in Adults. Laparoscopic Ladd's Surgery

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ABSTRACT

Ladd's band malrotations are a subtype of abnormalities of embryogenesis consisting of fibrous extensions, product of abnormal fixation of the mesentery, that goes from the poorly rotated cecum towards the retroperitoneum, which can cause extrinsic compression of the duodenum. In 90% of cases, the clinical presentation takes place within the first year of life, as an acute condition, like duodenal occlusion or small bowel volvulus with its consequent ischemia or internal hernia. In adulthood, the forms of presentation are less specific. The gold standard methods used for diagnosis are gastroduodenal series and computed tomography. Surgical treatment consists of Ladd's surgery, whose conventional approach was described in 1936 by William Ladd. We present ta case of an adult patient with an occlusive presentation, given by this anomaly, diagnosed in a timely manner and safely resolved by laparoscopic approach.

Key words: intestinal malrotation, Ladd bands, Ladd surgery, duodenal occlusion

INTRODUCTION

Intestinal malrotations are a range of abnormalities that occur during embryogenesis (weeks 5-12 of gestation). They vary from the presence of a mobile caecum to a complete lack of rotation and associated intestinal volvulus. There is a subtype of malrotation caused by Ladd's bands (Fig. 1). These correspond to fibrous prolongations resulting from the abnormal fixation of the mesentery, which extends from the malrotated cecum towards the liver and the right lateral paracolic gutter, and pass over the duodenum, which may cause its compression. In adulthood, it is a rare pathology (90% of patients develop symptoms within the first 12 months of life) and usually presents with nonspecific symptoms (abdominal distension, episodes of intermittent constipation, dyspepsia). Therefore, its diagnosis requires a high preoperative suspicion.

CASE PRESENTATION

Male patient, 20 years old, with no clinical or surgical history. He consulted in the emergency room due to vomiting after 14 days of evolution associated with the absence of transit and gastroesophageal reflux. On physical examination, he presented abdominal swelling without signs of peritoneal reaction. A blood test showed no significant alterations, and a frontal abdominal X-ray showed two radiolucent images in the left hypochondrium and mesogastrium ("double bubble sign"). With suspicion of occlusive symptoms, the patient underwent an abdominopelvic CT scan, showing small bowel loops arranged in the right iliac fossa, ascending colon crossing the midline to the left, and distension of the duodenum with a net change of caliber between the third and fourth portions of the duodenum.

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Figure 1. Ladd's bands.

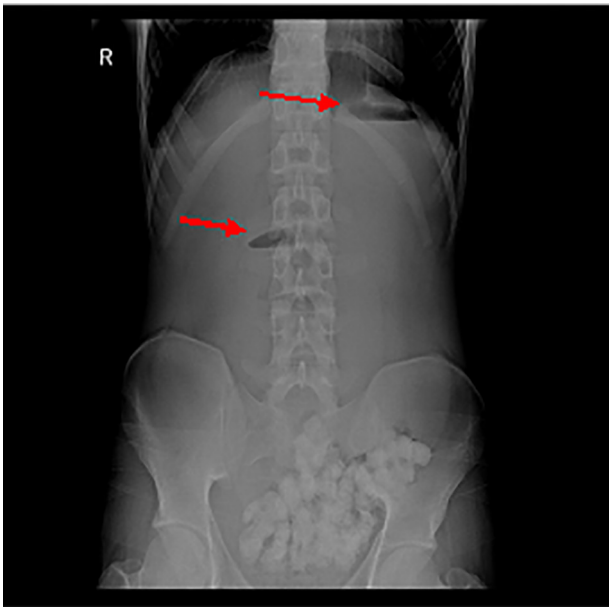

Figure 2. Frontal Radiograph of the abdomen, the double bubble sign (Red arrows).

The study shows duodenal occlusion with intestinal malrotation (Fig. 3). The patient's initial treatment included the placement of a nasogastric tube and an extensive intravenous hydration plan. Following the diagnosis of intestinal occlusion, we decided to resolve the patient's condition surgically. The exploratory laparoscopy showed small bowel loops in the right lower hemiabdomen and ascending colon to the left of the midline. There was a fibrous band (Ladd's band) extending from the caecum to the retroperitoneum and compressing extrinsically the third and fourth duodenal portions, thus generating the occlusive picture (Fig. 4). We sectioned these bands with a harmonic scalpel and confirmed he recovery of intestinal transit. To complete the procedure, we performed a prophylactic appendectomy. The patient was treated postoperatively in the general hospital ward without any complications. He started a liquid diet the day after surgery, well tolerated, and left the hospital on the first postoperative day.

DISCUSSION

Intestinal malrotation is a rare congenital disease caused by a partial or complete failure of the 270-degree counterclockwise rotation of the midgut around the superior mesenteric vessels in fetal life (between the fifth and twelfth week of gestation). There are different types of malrotation, depending on the stage of development that is affected[3].

There is a wide range of clinical presentations according to age group. In most cases (90%), it presents within the first year of life as an acute condition such as duodenal occlusion or small bowel volvulus with consequent small bowel ischemia or internal hernia.[1] In adulthood, the forms of presentation are less specific and include colicky abdominal pain, abdominal distension, chronic vomiting, malabsorption, inability to gain weight, and alternating diarrhea and constipation, which makes diagnosis more difficult[2].

Among the diagnostic studies, both gastroesophageal series (more common in children) and computed tomography with oral and intravenous contrast (commonly used in adults) are considered the "gold standard," the latter having the advantage of exposing the inversion of the mesenteric vessels, the disposition of the small intestine and the presence or absence of volvulus[3,4].

The surgical resolution is determined by Ladd's surgery, first described by William Ladd in 1936. The procedure consists of: 1) division of Ladd's bands, 2) widening of the narrowed root of the mesentery, 3) if present, counterclockwise rotation of the midgut volvulus, 4) prophylactic appendectomy, and 5) placement of the small bowel on the right and fixation of the colon on the left.

Although the original procedure was performed conventionally, the use of laparoscopy is safe and effective, improving postoperative pain management, shortening the fasting time, and thus reducing the length of hospital stay[5].

CONCLUSION

Intestinal occlusion due to intestinal malrotation in adults is a challenging diagnosis due to its rare frequency.

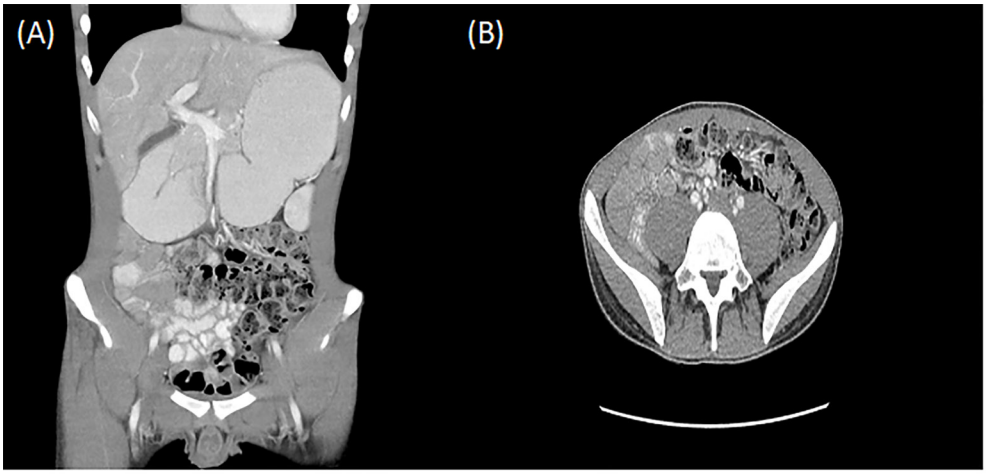

Figure 3. Abdominopelvic tomography (A) Coronal view, (B) Sagittal view. Dilated duodenum, with a thin loop-thick loop transition at the second portion level. Small bowel loops arranged in the right hemiabdomen and the right colon in the left..

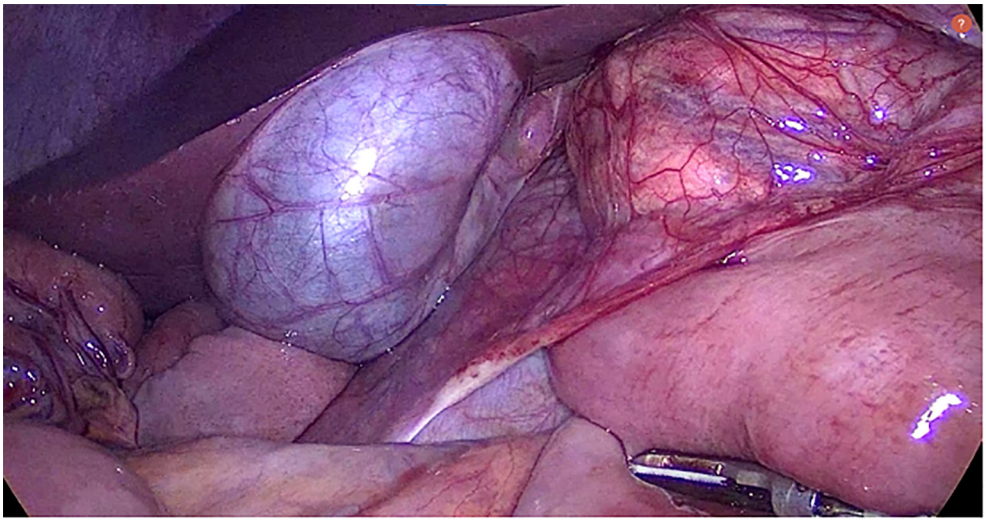

Figure 4. Ladd's bands during exploratory laparoscopy.

We could diagnose this type of case thanks to accurate imaging and clinical suspicion and safely solve it with laparoscopy.

Conflict of interests: the authors declare no conflict of interests.

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