CLINICAL CASE

INTERNAL HERNIA ASSOCIATED WITH INTESTINAL MALROTATION IN AN ADULT: A CASE REPORT.

HERNIA INTERNA ASOCIADA A MALROTACIÓN INTESTINAL EN ADULTO: REPORTE DE CASO

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RESUMEN

Introducción: Las hernias internas se definen como aquella protrusión visceral a través del peritoneo o mesenterio que permanece dentro de la cavidad abdominal, ya sea por causas adquiridas o congénitas como la malrotación intestinal. Este tipo de patologías representan un gran desafío para el profesional médico debido a su difícil diagnóstico por presentar una sintomatología inespecífica aumentado a su vez el riesgo de complicaciones de este al considerarse como diagnóstico ante un dolor abdominal. ***Reporte de caso:*** Se presenta el caso clínico de un paciente de 27 años de edad que ingresa a servicio de urgencias por cuadro clínico de 7 horas de evolución consistente en epigastralgia asociado a múltiples episodios eméticos postprandiales y náuseas, quien se realizó intervención quirúrgica por sospecha imagenológica de hernia interna evidenciando malrotación intestinal de ciego,

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apéndice y colon transverso replegado en hemiabdomen izquierdo con válvula ileocecal izquierda que requirió lisis de adherencias peritoneales, apendicectomía, desplazamiento de contenido intestinal y eventrorrafia por laparotomía. ***Discusión:*** La patología herniaria interna hace parte de las causas más rara de obstrucción intestinal sin embargo es necesario considerar dicha patología ante un cuadro de dolor abdominal por su alto riesgo de complicación en caso de no ser tratado oportunamente debido a que el tratamiento radica en resolver su obstrucción a través de la cirugía. ***Conclusiones:*** El sospechar una hernia interna ante un cuadro de dolor abdominal permite una acción rápida y oportuna para disminuir la morbimortalidad.

PALABRAS CLAVE: Hernia interna, Obstrucción Intestinal, Dolor abdominal, Malrotación intestinal, Anomalías congénitas

SUMMARY

Introduction: Internal hernias are defined as visceral protrusions through the peritoneum or mesentery that remain inside the abdominal cavity, due to acquired or congenital causes such as intestinal malrotation. This type of pathology represents a great challenge for the medical professional because of its difficult diagnosis, due to its presentation of non-specific symptoms, which in turn increases the risk of complications when abdominal pain is considered as the diagnosis. **Report of case:** We present the clinical case of a 27-year-old patient who was admitted to the emergency department with a clinical picture of 7 hours of evolution consisting of epigastric pain associated with multiple postprandial emetic episodes and nausea. The patient underwent surgical intervention, following imaging suggesting internal hernia that showed intestinal malrotation of the cecum, appendix and folded transverse colon in the left hemiabdomen with left ileocecal valve. The surgery comprised lysis of peritoneal adhesions, appendectomy and enterorrhaphy, with displacement of intestinal contents by laparotomy. **Discussion:** Internal hernias are one of the rarest causes of intestinal obstruction; however, it is necessary to consider this pathology in the presence of abdominal pain due to its high risk of complications if not treated promptly, and because the treatment lies in resolving its obstruction through surgery.

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Conclusions: Consideration of an internal hernia diagnosis in the event of abdominal pain allows rapid and timely action to reduce morbidity and mortality.

KEYWORDS: Internal hernia, intestinal obstruction, abdominal pain, intestinal malrotation, congenital abnormalities.

INTRODUCTION

Internal hernias are defined as visceral protrusion of acquired or congenital origin through the peritoneum or mesentery which remains within the abdominal cavity. They are the cause of 0.6 to 6% of small bowel obstructions, in most cases due to artificial openings of the peritoneum or mesentery during surgical procedures (1, 2).

Within them we find different types of internal hernias according to their origin and topographic distribution such as: paraduodenal hernias (most frequent), intersigmoid, pericecal, trans mesenteric (associated to the performance of the Roux-en-Y procedure), retro anastomotic and Winslow's hernia (1). Likewise, procedures of the ileal duct, pancreatic duct or small intestine (2).

However, it is also associated with congenital anomalies, among which intestinal malrotation is described, this being an anomaly characterized by a failure in the rotation of one of the intestinal loops or in the fixation to the mesentery that occurs in the embryonic development mainly of the midgut, being a congenital alteration that affects 1% of the general population, of which 90% is manifested in pediatric age, being even rarer the presentation in adults. Intestinal rotation was first described by Frazer and Robbins in 1915, classified according to midgut rotation anomalies and associated intestinal compromise (3,4).

Additionally, within the congenital anomalies it is important to rule out diaphragmatic hernias through which intra-abdominal contents protrude into the thorax, such as Bochdalek and Morgagni hernias, which occur either due to a defect in the junctions of the posterolateral and anterior channels of the diaphragm respectively, causing gastric, intestinal or epiploic incarceration with obstruction and ischemia of these (5).

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The diagnosis of this type of pathology represents a great challenge for the medical professional because its symptomatology is not precise and may vary in terms of recurrence, however some of the manifestations to be taken into account are intermittent and/or constant abdominal pain that is accentuated post prandially associated with a feeling of abdominal distension, vomiting postingesta of feeding, dyspepsia or persistent nausea; Given that the symptomatology is not usually clear, imaging studies are an important part for its diagnosis, being the Computerized Axial Tomography (CAT) and barium studies the method of choice, by which it allows to identify abnormal localizations of an intestinal segment, encapsulation and/or grouping of several intestinal loops within the same peritoneal area (6).

Undoubtedly, the treatment of this type of pathology is surgical, since it allows the identification and treatment of areas of obstruction, ischemia, perforation and/or necrosis, preceded by support measures to reduce complications (7).

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27-year-old male patient, with no pathological or surgical history, who was admitted to the high complexity emergency department for a clinical picture of 7 hours of evolution consisting of epigastralgia associated with multiple postprandial emetic episodes of food content in addition to nausea, Physical examination showed pain in the epigastrium and mesogastrium with no signs of peritoneal irritation, therefore, support measures were indicated with blood tests and ultrasound imaging, showing leukocytosis with neutrophilia, normal hepatobiliary function and acute phase reactants with an ultrasound reported within the normal range, but with significant limitation in its technique due to intestinal gas interposition.

Due to the above and associated to the persistence of the symptoms, a contrasted CAT scan was requested (Figure 1.) which showed alteration in the position of the ascending colon and part of the transverse colon with location to the left of the abdominal cavity; cecal appendix located in the left iliac fossa, distension of thin intestinal loops with abrupt decrease in caliber in

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a jejunal loop, conditioning the formation of transition zone in this location, additionally highlighted the apparent presence of swirling of the root of the mesentery in this location, therefore the presence of internal hernia was suspected.

Figure 1. Admission computed axial tomography. A: Evidence of right lateralization of the thin intestinal loops (orange arrow). **B and C:** distension of the jejunal small bowel loops with transition zone in a loop of the jejunum. **D:** Alteration in the position of the ascending colon and part of the transverse colon with location to the left of the abdominal cavity and presence of the cecal appendix in the left iliac fossa (white arrow).

It was decided to perform laparoscopic exploration showing great distension of thin intestinal loops agglomerated in fixed right hypochondrium and cloudy liquid in pelvic cavity with laparoscopic difficulty so it was decided to convert to laparotomy showing intestinal malrotation of the cecum, appendix and transverse colon (Figure 2.), folded in the left hemiabdomen with left ileocecal valve in addition to periapendicitis, critical flanges 1 meter from the ileocecal valve with ecchymosis in the intestinal wall and proximal dilatation with changes suggestive of chronic obstruction, therefore it was decided to perform lysis of peritoneal adhesions, appendectomy, The procedure was uncomplicated, support measures and broad-spectrum antibiotic therapy were left as well as a liquid diet with progression towards solids. During the procedure the patient presented transitory ileus with resolution of the same without requiring additional measures.

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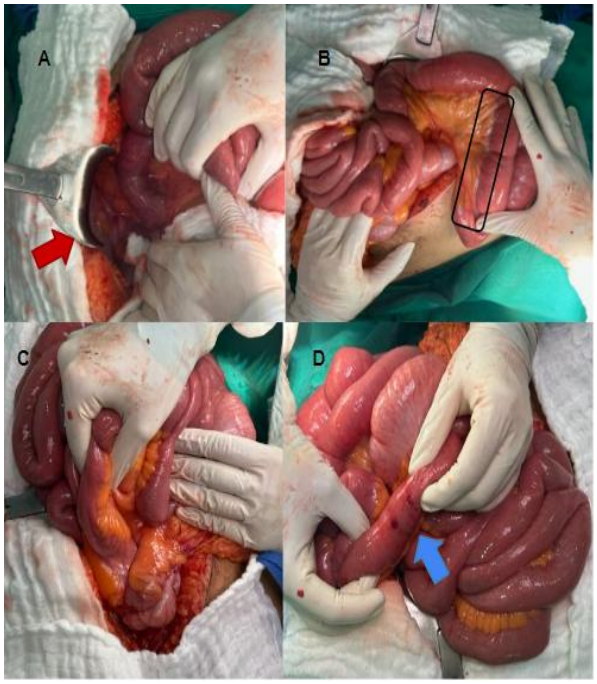

Figure 2. Exploratory laparotomy: A: Evidence of fixed loop at the level of the right retroperitoneum (red arrow) where there is evidence of agglomerates with adhesions which were released. **B:** Evidence of changes due to chronic obstruction (black rectangle). **C:** left ileocecal valve with appendicular stump. **D:** blue arrow reflects the transition zone.

Figure 3. Cecal appendix. Pathology report: reactive follicular lymphoid hyperplasia.

DISCUSSION

Internal hernias are protrusions of one or more viscera through openings in the peritoneum or mesentery, which can manifest with symptoms of acute or chronic intestinal obstruction that can lead to strangulation, intestinal ischemia and even death if not treated quickly (8).

It is considered that the etiology of this type of hernias can be associated to acquired factors such as a history of abdominal surgery, etiopathogenic factors such as birth trauma, pelvic inflammatory disease, however, there

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are reported cases that do not include any of these factors as our patient, in whom the congenital factor that affects a low percentage of the adult population can be contemplated, due to the alteration in the fixation of the intestinal loops and the malposition of the loops in the abdominal cavity during embryonic development (9).

Within this etiology is the classification of internal hernias devised by Ghahremania, it is separated into 6 groups: paraduodenal hernias the most common (50-55%), hernias through the foramen of Winslow (6-10%), transmesenteric hernias (8-10%), pericecal hernias (10-15%), inter sigmoid hernias (4-8%) and paravesical hernias (pelvic < 4%) (8,9). **See table No.1.**

Similarly, intestinal malrotation is classified into three categories. Type IA or non-rotation is the most frequent, when intestinal rotation is incomplete because only the first counterclockwise rotation occurs in embryonic development, which causes the cecum to be located to the left of the mesenteric vessels and is located in the midline, as in the patient's case.

Likewise, type IIA due to lack of duodenal rotation with normal colon rotation and IIIB when fixation to the hepatic angle of the colon is incomplete. Both classifications are associated with the presence of peritoneal bands or Ladd bands, which are formed in an attempt to fix and stabilize the malpositioned intestine and the fixation points are more proximal (at the level of the second or third portion of the duodenum) predisposing to volvulus, unlike type IA, where the fixation points are distal, decreasing the risk of volvulus (3). In our patient, characteristics of type IA were found, as well as the presence of proximal and distal peritoneal bands, preventing the classification of the patient's intestinal malrotation into a single type based on intraoperative findings.

Considering that internal abdominal hernias are rare, diagnosis is a challenge for the radiologist, emergency room physician and surgeon. Symptomatology is non-specific as it consists of intermittent abdominal discomfort, nausea, vomiting, abdominal distension,

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dyspepsia, allowing these symptoms to be confused with other more frequent pathologies in adulthood. CT can facilitate the diagnosis if it is accurate, since an erroneous diagnosis increases the risk of complications due to delay in adequate management; however, authors such as Mathieu and Luciani recommend performing CT before diagnostic laparoscopy. (11)

Laparoscopy is the surgical approach that best benefits the patient with less aggression and greater postoperative recovery, however, in the case of our patient, taking into account the intraoperative findings with laparoscopic difficulty, it was necessary to convert to laparotomy; however, there were no complications (12).

CONCLUSION

This article seeks to inform the importance of taking into account internal hernias and as a cause of intestinal malrotation within the differential diagnoses in abdominal pain. Taking into account that the symptomatology is frequent and non-specific, being a rare condition is a challenge for the physician and / or specialist because with a timely diagnosis, proper and early management, morbidity and mortality can be avoided.

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Table 1. Classification of internal hernias (10).

Location	**Features**	**Frequency of presentation**
Through the Winslow Hole	It originates through an epiploic orifice where an intestinal loop enters the lesser peritoneal sac due to very mobile loops with excessively long mesentery.	8%
Paraduodenal hernia	It originates through anomalies in the rotation and reduction of the intestine in the embryological development due to non-absorption of the splanchnic mesoderm sacs, during the tenth embryonic week. The hernial sac is formed by peritoneal tissue that develops with the ascending and descending mesocolon causing it to fuse abnormally.	53%, of which 75% are on the left side (also called mesocolic) and 25% on the right.
Hernia through defects in the mesentery	They originate through: A) Transmesenteric hernias: due to defect of the intestinal mesentery near the ligament of Treitz, congenital etiology due to defect of the mesentery	Transmesenteric as 5-10%. Transomental 1-4%, most frequently those formed in the

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	or secondary to surgeries such as Roux-en-Y anastomosis. B) Transomental hernias: where they form through the lesser omentum extending to the gastric lesser curvature or the greater omentum where the hernia extends from the greater gastric curvature and the first portion of the duodenum to the transverse colon.	greater omentum.
Transmesocolic hernia	It frequently originates through a post-surgical hole in the transverse mesocolon where a loop of small intestine protrudes.	8%
Pericecal hernia	They originate through a peritoneal ring in the pericecal kingdom, which may form during embryological development in the fifth month or due to tissue fragility related to predisposing factors such as age, increased intra-abdominal pressure, formation of adhesions.	6-13%
Intersigmoid hernia	It originates through a peritoneal pocket between the sigmoid colon loop and its mesentery. Within this are: Intersigmoid, transmesosigmoid and intramesosigmoid.	6%
Paravesical hernias	It originates when a portion of the urinary bladder or diverticulum exits through a hernia sac.	6%

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