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Case report

Incarcerated Littre's Hernia: A Case Report

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Abstract

Introduction: Meckel's diverticulum is a congenital anomaly of the gastrointestinal tract. It is usually asymptomatic and occurs in approximately 0.6% to 4% of individuals. A Littre's hernia is defined as the presence of a Meckel's diverticulum within a hernia sac. Littre's hernias can occur at various anatomical sites, including inguinal, femoral, and umbilical locations. **Clinical Case:** An 80-year-old female presented to the emergency department of a quaternary care center with a 14-hour history of symptoms compatible with a right inguinal hernia (indirect) incarcerated NYHUS IIIB, containing a narrow-necked Meckel's diverticulum, constituting a mixed Littre's hernia. **Results:** Few cases of Littre's hernias have been reported in the literature, with an approximate incidence of 1% among patients with a Meckel's diverticulum. Diagnosis is typically intraoperative, with clinical manifestations including abdominal pain and distension. Complications such as obstruction and incarceration occur similarly to other abdominal wall hernias. Management is based on both hernia repair and resection of the diverticulum. **Conclusions:** To date, no standardized consensus exists regarding the surgical approach for this condition, particularly when it is an incidental finding. Surgical technique may depend on multiple factors, making knowledge of anatomy, clinical presentation, and diagnostic imaging crucial for timely diagnosis and treatment of Littre's hernia.

Keywords

Inguinal hernia, ileal diverticulum, inguinal canal, acute abdomen, indirect inguinal hernia.

INTRODUCTION

Meckel's diverticulum is the most common congenital anomaly of the gastrointestinal tract, with a reported incidence of approximately 0.6%-4%[(1)]. It is a true diverticulum, containing all three layers of the intestinal wall, and is attributed to failure of the omphalomesenteric duct to close during the fifth week of gestation; this duct typically regresses between the fifth and ninth weeks of gestation[(1,2)]. Meckel's diverticulum is usually asymptomatic and, in most cases, is an incidental finding during laparoscopic procedures or may be seen on imaging studies[(3)]. It has a long-term complication incidence of 4.2%, which decreases with age; complications include intestinal obstruction, bleeding, intussusception, perforation, among others[(2)]. One of the rarest and most uncommon complications occurs when the Meckel's diverticulum enters the hernial sac, a condition known as *Littre's hernia*.

Littre's hernias are considered a relatively uncommon pathology. According to Malling et al., by 2020, only 50 cases had been reported in the literature over the previous 300 years[(4)]. A Littre's hernia can present in various forms and its anatomical site is variable; they can present as femoral, inguinal, or umbilical hernias with symptoms and

complications similar to any other hernia containing small bowel[3]. Littre's hernia can become obstructed, incarcerated, or strangulated, like the complications of any abdominal wall hernia. This case report presents a female patient with an incarcerated Littre's hernia due to the herniation of a Meckel's diverticulum found intraoperatively.

CASE PRESENTATION

An 80-year-old female patient with a history of arterial hypertension and hypothyroidism on replacement therapy, and no history of abdominal surgery, presented to the emergency department of a hospital in Bogotá with a 14-hour clinical picture consisting of generalized, moderate-intensity abdominal pain, associated with two episodes of diarrhea. She had no symptoms suggestive of intestinal obstruction. She was evaluated by the general surgery service, and a contrast-enhanced computed tomography scan of the abdomen was requested by the emergency department.

Physical examination revealed a non-distended abdomen, with a painful, non-reducible right inguinal hernia defect upon palpation, without signs of strangulation or peritoneal irritation. Complete blood count and arterial blood gas analysis revealed leukocytosis due to neutrophils and hyperlactatemia.

The abdominal CT report revealed a right indirect inguinal hernia with partial protrusion of the distal portion of the ileum, mild regular concentric thickening of its walls with an inflammatory appearance, and a slight amount of peripheral fluid with a reactive inflammatory appearance. There was no intestinal obstructive pattern (**Figure 1**).

Considering the above, the decision was made to proceed with an urgent surgical procedure under general anesthesia. An open inguinal herniorrhaphy was performed via a posterior preperitoneal approach (Nyhus technique). Findings included an incarcerated right inguinal hernia Nyhus IIIB (involvement of the posterior wall of the inguinal canal and a dilated deep inguinal ring) and a hernial sac with edematous and congestive ileal loops. As an incidental finding, a narrow-based Meckel's diverticulum approximately 1.5 cm in base width and 5 cm in length, arising from the incarcerated ileal segment, was found (**Figure 2**).

Reduction of the intestinal loops was performed, along with diverticulectomy using a linear stapler, high ligation of the hernial sac, and defect correction with a tension-free technique using a polypropylene mesh. During the immediate postoperative period, the patient was in good general condition, with adequate pain control and oral intake tolerance, but with signs of systemic inflammatory response syndrome (SIRS), evidenced by leukocytosis with neutrophilia (13,100 WBC, PMN 80%) and tachycardia >90 beats per minute (bpm), which was expected postoperatively. Abdominal physical examination revealed a surgical wound in good condition, with perilesional ecchymosis, without signs of infection or stigmata of active bleeding, so she was discharged from the service with follow-up instructions for the next six months. At the postoperative consultation one month later, she showed adequate clinical progress. The pathology result confirmed the presence of Meckel's diverticulum with moderate chronic inflammation and the presence of heterotopic gastric mucosa without ulceration or perforation.

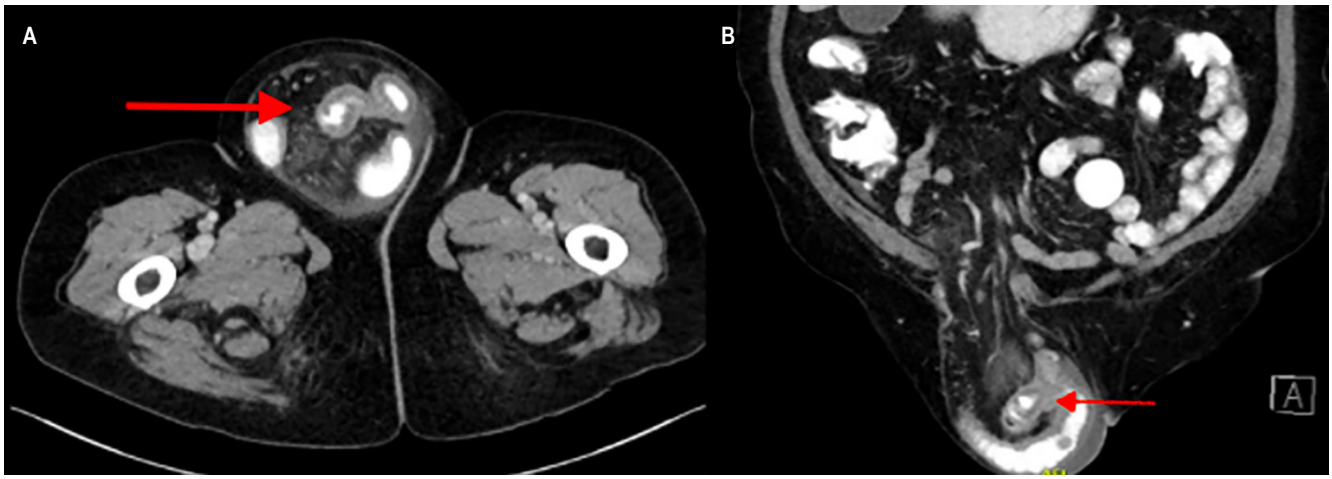

Figure 1. Axial computed tomography of the abdomen. **A.** Axial view. **B.** Coronal view. Hernial defect indicated by red line. Images property of the authors.

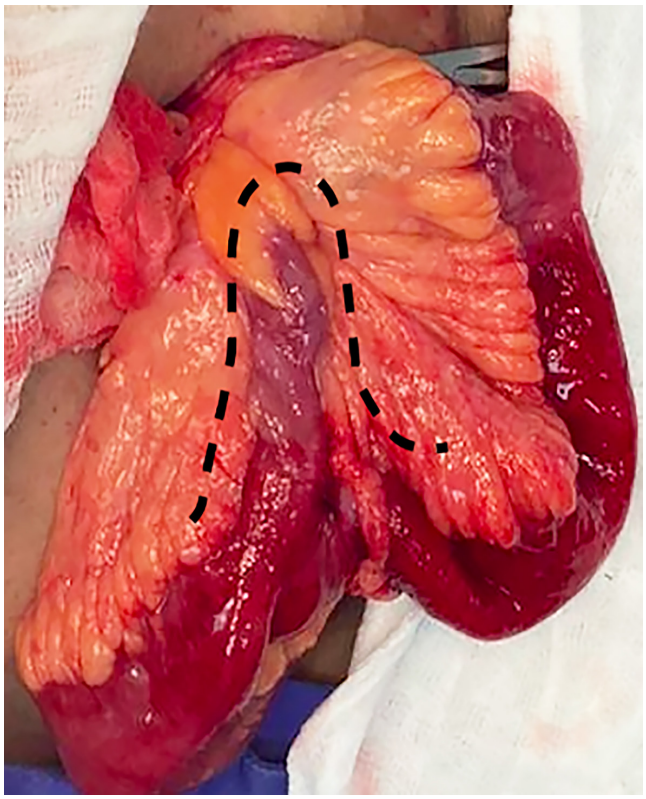

Figure 2. Intraoperative findings of congestive, edematous intestinal loops, with Meckel's diverticulum outlined in the image by the dotted line. Images property of the authors.

DISCUSSION

A Littre's hernia is defined as the presence of a Meckel's diverticulum within the hernial sac, with the first case reported in 1700 by the French surgeon Alexis Littré[5,6]. Although there is no consensus on the current incidence of this complication, it is estimated that approximately 1% of patients with a Meckel's diverticulum will develop a Littre's hernia[6]. A report by M. Racy mentioned that one in 680 strangulated femoral hernias and four in 654 strangulated inguinal hernias contain a Meckel's diverticulum[7].

It is important to understand the morphological and anatomical distinction of Meckel's diverticulum to promptly identify this variation of the hernial defect. It is defined as the most common congenital gastrointestinal tract defect, consisting of a pouch with all intestinal layers, and is present in 0.3%-3% of the adult population[6]. It is an embryological remnant of the omphalomesenteric duct and arises from its incomplete obliteration during the fifth week of gestation[8].

Small bowel diverticula can be classified as false or true. False diverticula are acquired and characterized by involving only two layers of the intestine: the mucosa and submucosa, which herniate through the muscular layer of the intestine at points of weakness, usually where the *vasa vasorum* penetrate the intestinal wall. Consequently, they are found on the mesenteric border of the small intestine. The thin wall and the morphology of the diverticulum's neck prevent fluid from escaping freely, resulting in the presence of fluid levels within the diverticulum. In contrast, true diverticula contain all layers of the intestine: mucosa, submucosa, and muscular layer. They do not present with fluid levels and usually occur on the antimesenteric border of the intestine, with Meckel's diverticulum being the only example[8].

Generally, Meckel's diverticulum is asymptomatic, and its diagnosis may be incidental through imaging or intraoperative. However, patients can present with lower gastrointestinal bleeding (hematochezia), acute intestinal obstruction, infection (diverticulitis), and, in specific cases, peritonitis due to diverticular perforation[9]. Age less than 50 years, male sex, diverticulum length >2 cm, and the presence of histologically abnormal tissue constitute the main risk factors for a symptomatic Meckel's diverticulum in adults[6].

The diagnosis of Littre's hernia is usually intraoperative, and although imaging methods such as non-contrast abdominal computed tomography (CT) and abdominal ultrasonography can be used, they do not lead to a definitive diagnosis[9]. Littre's hernias can present as inguinal, femoral, and umbilical hernias. A meta-analysis conducted by Schizas and Katsaros in 2018 mentions that, out of 53 hernias meeting the inclusion criteria, femoral and inguinal hernias accounted for 39.6% and 34% of cases, respectively[6]. Among inguinal hernias, 98% are right-sided, as in the reported case.

On the other hand, the study explains that while Meckel's diverticulum is more common in men, Littre's hernias occur more frequently in women, primarily due to the high incidence of femoral and obturator hernias[6]. Littre's hernia has been classified in the literature as true when the hernial sac contains only the Meckel's diverticulum, or mixed (7 times less common), when the Meckel's diverticulum is accompanied by ileal loops or other intra-abdominal organs.

Littre's hernia presents with atypical manifestations such as abdominal pain, distension, and nausea with or without vomiting episodes, and the clinical picture is gradual compared to other hernial defects. Physical examination may reveal incomplete reduction of the hernia or an enterocutaneous fistula through the hernial sac[9].

It is estimated that patients present to the emergency department between 5 hours and 11 days after the onset of symptoms, as in the case presented, where the patient had an insidious clinical picture that led her to seek consultation 14 hours after its onset. Some complications include incarceration, strangulation, and perforation, the latter resulting from vascular compromise or peptic ulceration related to gastric acid[5,6].

Repair of a Littre's hernia is based on repairing the hernial defect along with resection of the Meckel's diverticulum (diverticulectomy). The surgical treatment of Meckel's diverticulum depends on the location of the diverticulum and the progression and severity of the disease[9]. Complete resection, including all ectopic tissue, is always recommended to prevent hemorrhage. However, to date, there is no standardized management plan for the incidental and asymptomatic finding of a diverticulum; some authors suggest not resecting diverticula with a wide opening, thin walls, and no adhesions[2]. If surgical management is chosen, three approaches have been described: segmental resection and anastomosis, wedge resection, and tangential stapled diverticulectomy.

T-resection with primary anastomosis is indicated when inflammation and ischemia of the ileum, perforation, bleeding ulcer are found, or when the base is identified with macroscopic injury, edema, inflammation, or perforation[7,9,10]. For long diverticula, diverticulectomy alone is suggested, as diverticula with length/diameter ratios >2 cm usually have ectopic tissue in the body and tip, while wide diverticula usually have it at the base[9].

Nevertheless, to date, there is no universal consensus on the absolute indications for performing diverticulectomy. In 2005, a group from the Mayo Clinic published the results of a retrospective study of 1476 patients who underwent diverticulectomy, finding that age less than 50 years, male sex, diverticulum length >2 cm, and macroscopic findings suggesting the presence of ectopic mucosa increase the risk of complications to up to 70% when all criteria are present (Park et al. criteria)[11].

CONCLUSION

Knowledge of the anatomical, clinical, and imaging features of Littre's hernia is important to achieve timely diagnosis and treatment, thereby preventing some of the mentioned complications. In the presented case, the rapid onset of the clinical picture, along with signs of incarceration of the hernial defect, were the main considerations for performing urgent inguinal herniorrhaphy, in addition to complete diverticulectomy due to the long diverticulum and high suspicion of ectopic tissue, aiming to prevent complications from the presence of ectopic tissue, such as gastrointestinal bleeding or intestinal obstruction. However, this is still considered a demanding scenario for the surgeon, especially due to the lack of scientific evidence and studies with high epidemiological weight that outline objective criteria for deciding to perform diverticulectomy.

Ethical Considerations and Consent to Participate

This study was conducted in accordance with ethical standards and was approved by the Fundación Cardioinfantil (LaCardio) in Bogotá, Colombia. Written informed consent was obtained from the patient for their participation in this study.

Consent for Publication

Written informed consent was obtained from the patient for the publication of this case report and any accompanying images in accordance with institutional protocols. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Availability of Supporting Data

All relevant data supporting the findings of this study are included in the article. Additional data may be available upon request from the corresponding author.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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Author Contributions

Álvaro Flechas, Carlos Moya, Paulo Cabrera, Alejandro González, and Natalia Quintana participated in the design and conception of the study, data acquisition, and data analysis and interpretation. Critical revision was performed by Paulo Cabrera, Alejandro González, and Natalia Quintana. Finally, the manuscript was written by Álvaro Flechas and Carlos Moya.

Use of Artificial Intelligence

No artificial intelligence tools were used in the development of this article.

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