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Primary lumbar hernia: Laparoscopic correction of Grynfeltt's hernia (GRYNFELTT)—A case report

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Abstract

Lumbar hernias, defined as the protrusion of intra- or extra-peritoneal contents through a defect in the posterolateral abdominal wall between the 12th rib and the iliac crest, are extremely rare. Until 2015, only about 300 cases had been reported since the first formal publication on the subject by the French surgeon R.J.C. de Garangeot in 1731. Lumbar hernias can be classified anatomically and etiologically. Anatomically, they can be divided into superior and inferior hernias, appearing in the upper or lower lumbar triangle, respectively, and diffuse hernias, which are considerably larger and not defined by specific anatomical structures. Etiologically, they are classified as primary or secondary. Primary lumbar hernias form spontaneously, while secondary lumbar hernias result from an event such as surgical procedures or trauma. Both types of lumbar hernia are rare, but the primary hernia is the least common. Thus, when a physician encounters a patient with this complaint, it is important to report the case in order to include the incidence in available literature on this rare defect and gradually achieve a comprehensive understanding of lumbar hernias, including their risk factors, clinical presentation, diagnosis, and treatment. In this study, we present the case of a 56-year-old female patient who attended the Conde de Lara outpatient clinic at the Santa Casa de Misericórdia Hospital in São Paulo, Brazil, with the complaint of a bulge in the left lumbar region, associated with pain and constipation, which she had been experiencing for at least 3 years. The patient had a clinical history, and imaging studies had indicated diagnosis of primary lumbar hernia. She underwent laparoscopic surgery for hernia repair, with satisfactory recovery. It is worth noting that there is no consensus regarding the best surgical technique for the treatment of lumbar hernias, and the treatment performed in this case was successful. The patient's clinical history, the diagnostic process, and the treatment will be thoroughly described in this article.

Keywords:

Grynfeltt, hernia, lumbar

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Introduction

The Swiss physician Pierre Barbette initially suggested the existence of the condition in 1672, but it was not until 1731 that the French surgeon De Garangeot described the first case of primary lumbar hernia. Lumbar hernias, defined as the protrusion of intra- or extra-peritoneal contents through a defect in the posterolateral abdominal wall, are extremely rare, and thus their diagnosis and treatment can be difficult due to the lack of data on their different clinical presentations and optimal treatment modalities.[1,2] To date, three types of lumbar hernias have been identified: superior, inferior, and diffuse.

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These classifications largely follow anatomical criteria, with superior hernias appearing in the superior lumbar triangle, inferior hernias in the inferior lumbar triangle, and diffuse hernias being considerably larger and not defined by specific anatomical structures like the others described here. To better understand this, it is important to know that there are two spaces in the posterior abdominal wall, the superior (Grynfeltt–Lesshaft) and inferior (Petit's) lumbar triangles. The superior lumbar triangle is bound by the posterior border of the internal oblique muscle anteriorly and the anterior border of the sacrospinalis muscle posteriorly. Its base is formed by the 12th rib and the serratus posterior inferior muscle. The external oblique and the latissimus dorsi muscles form its roof, and the aponeurosis of the transversus abdominis is its floor. The boundaries of the inferior lumbar triangle correspond to the iliac crest as the inferior boundary, the lateral border of the latissimus dorsi muscle as the medial boundary, and the medial border of the external oblique muscle as the lateral boundary.[3,4]

In addition to their anatomical classification, lumbar hernias are also classified as primary or secondary. Primary lumbar hernias form spontaneously, whereas secondary lumbar hernias result from an event such as surgical procedures or trauma. In the case report, we discuss the case of a patient with primary lumbar hernia, a condition that is rarer than secondary lumbar hernias. It is known that the risk factors for the development of primary lumbar hernias are similar to those for the formation of other types of abdominal hernias, including conditions that increase intra-abdominal pressure, such as obesity, as well as conditions that cause weakening of the posterolateral abdominal wall, such as aging, muscle atrophy, sedentary lifestyle, smoking, and debilitating chronic diseases. The anatomical condition of each individual is also a risk factor, with a higher likelihood of these hernias occurring in shorter, obese patients with horizontal ribs, who have a larger superior lumbar space.[5,6] The clinical presentation of abdominal hernias generally includes a palpable, reducible mass that can move and increase in size with voluntary maneuvers that increase intra-abdominal pressure, such as the Valsalva maneuver. The major symptoms can include low back pain and pain in the areas innervated by the sciatic nerve. Complications such as bowel obstruction occur in approximately 10% of cases and require emergency surgical intervention. Differential diagnoses such as tumors (lipomas, sarcomas, and renal masses), infectious conditions that can cause abscesses, and possible hematomas should also be considered.[5] The primary diagnostic method for lumbar hernias is computed tomography (CT), which has a sensitivity of 98% as it can differentiate muscle layers and their fasciae, allowing for more effective identification of hernia contents. CT is also essential in cases where the hernia is not visible or palpable clinically. There is a lack of significant studies suggesting that magnetic resonance imaging (offers greater diagnostic accuracy, and ultrasound is not recommended for asymptomatic or obese patients.[5] There is a high risk of incarceration and strangulation in this type of hernia, and therefore surgery is the recommended treatment mode for these patients. Although a number of studies have evaluated the best surgical method, there is no consensus on whether the laparoscopic approach is better than the open approach, with the latter being more commonly used due to the lower complexity of the technique and the greater availability of specialized centers and surgeons. Surgery is not indicated for patients at high risk or those who do not wish to undergo surgery.[7,8] The case reported here, which was identified during an outpatient consultation at the Conde de Lara outpatient clinic at the Santa Casa Hospital in São Paulo, presents an excellent opportunity to describe and document all aspects of the patient's clinical history and treatment to increase the availability of information on this rare medical condition. By comparing this case with previously described cases of primary lumbar hernias, we hope to contribute to the medical knowledge on this condition and thus enable the improvement of the management of such patients in the future and their treatment outcomes.

Case Report

A 56-year-old female patient, a retired cleaner of mixed race, attended the Conde de Lara outpatient clinic at the Santa Casa de Misericórdia Hospital in São Paulo, presenting with the complaint of a bulge in the left lumbar region, which she had been experiencing for at least 3 years. The bulge was reducible and associated with incapacitating, intermittent severe pain (10/10), with no apparent cause, which improved after using dipyrone. Constipation was associated with these periods of pain.

Regarding personal data, especially risk factors for lumbar hernia reported in the literature, she had had 10 pregnancies (7 normal deliveries and 3 miscarriages), was a smoker since the age of 11 years (11 pack years), and had a sedentary lifestyle. Additionally, she had gastroesophageal reflux disease and osteopenia and was being treated with omeprazole and vitamin D replacement, respectively, and had also been prescribed simvastatin due to high cholesterol. The patient reported having undergone a perineoplasty 15 years ago.

On physical examination, she had a body mass index of 21.1 kg/m^2 and a bulge in the left lumbar region [Figure 1] measuring 6 cm × 5 cm that was reducible, without signs of inflammation, which became much more visible after performing the Valsalva maneuver

Figure 1: Presence of lumbar hernia in the standing position

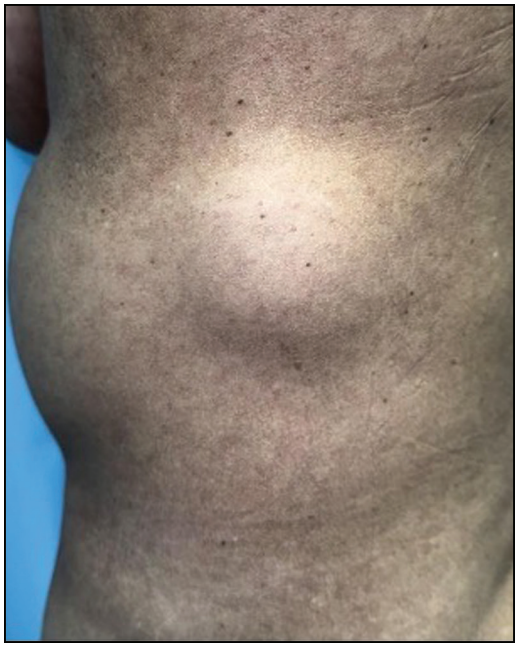

Figure 2: Lumbar hernia after the Valsalva maneuver

[Figure 2]. The physical examination identified no other abnormalities.

The patient initially had an ultrasound examination on April 19, 2021, which described the presence of a hernial sac containing adipose tissue with volume variation during compressive and respiratory maneuvers and with a diagnosis compatible with the Grynfeltt triangle region. To conduct a more detailed assessment, a CT scan was performed at Santa Casa de Misericórdia de São Paulo [Figures 3 and 4], which identified the presence

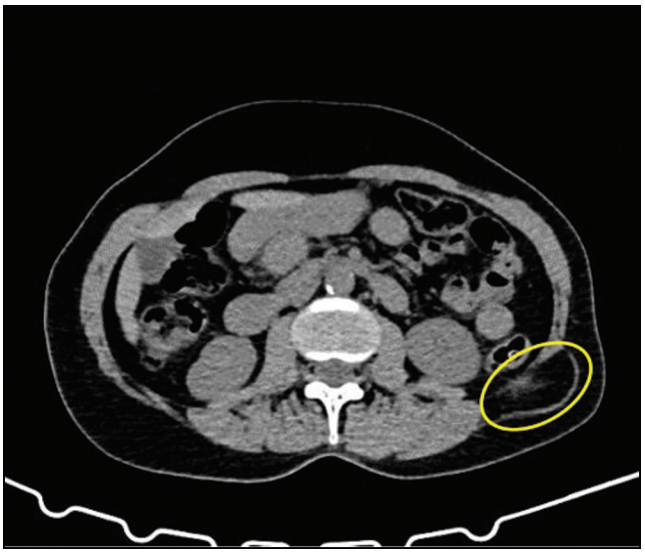

Figure 3: Presence of lumbar hernia in computed tomography (yellow circle)

Figure 4: Presence of lumbar hernia in computed tomography (yellow circle)

of a left lumbar hernia with a neck width of 35 mm and fatty content.

To correct the problem, laparoscopic lumbar hernioplasty was scheduled after full clinical evaluation. Under general anesthesia, the patient was positioned in the right lateral decubitus position. After antisepsis and the positioning of sterile fields, a lateral incision to the umbilical scar was made. Dissection was performed in layers, and an open pneumoperitoneum was created by inserting a 10-mm trocar [Figure 5]. Additionally, a 10-mm and a 5-mm trocar were inserted in the left flank along the midclavicular line under direct visualization [Figure 6]. Then, a peritoneal flap was opened in the left lumbar region and dissected up to the lumbar triangle. A lumbar hernia with an approximately 5 cm ring was identified in the superior triangle [Figure 6]

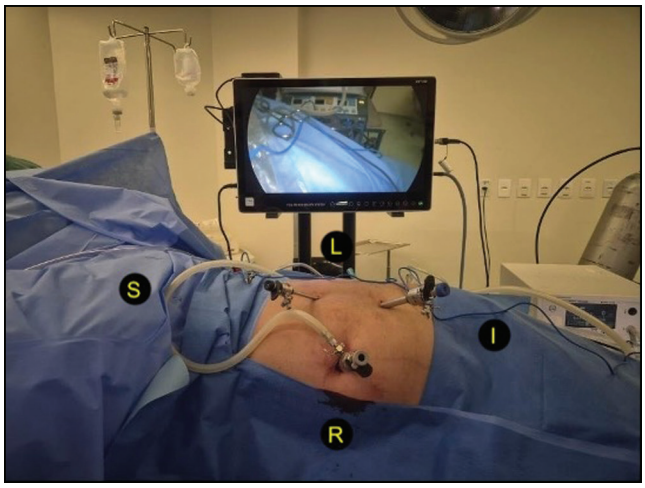

Figure 5: Trocar positioning (ipsilateral). S: superior, I: inferior, L: left, and R: right

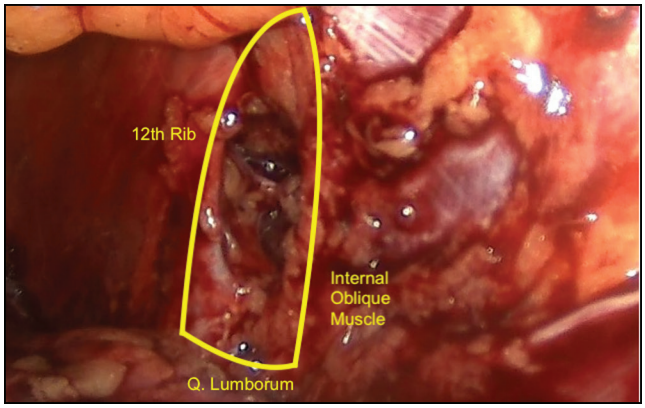

Figure 6: Hernia defects and anatomical limits

containing adipose tissue, which was reduced into the abdominal cavity. Subsequently, the hernia was closed with a V-Loc™ (Medtronic, Dublin, Ireland) 0 device, and a 14 cm × 10 cm polypropylene mesh was placed and fixed with 2.0 polypropylene sutures at its four corners [Figure 7]. Hemostasis was confirmed, a close the peritoneal flap, continuous suture with a 3.0 absorbable barbed suture was performed. The aponeurosis was closed with 0 Vicryl and skin with 4.0 Monocryl. The total operation time was 150 min [Figure 8].

The patient recovered without complications and was discharged the next day. She was instructed to avoid strenuous physical activities for at least 3 months, and an appointment was scheduled for postoperative follow-up in 4 weeks. After the first return, the patient had a second appointment 8 weeks after the surgery and, finally, a third appointment 16 weeks after the surgery, totalizing 116 days of follow-up time. During the postoperative follow-up, she presented with a significant reduction in pain and had no complaints of constipation. The surgical wound showed no signs of infection, and there was no evidence of hernia recurrence.

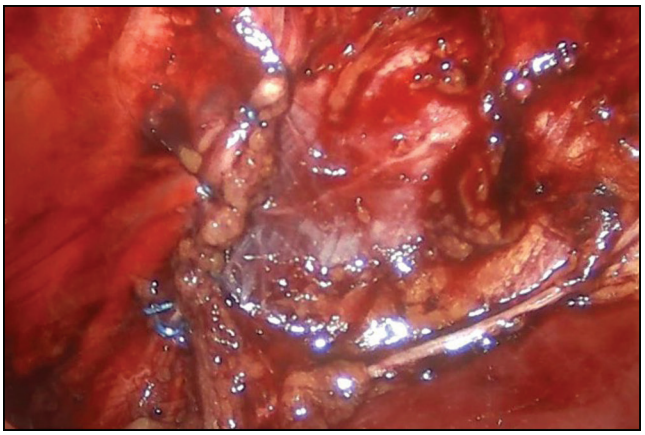

Figure 7: Closure of the hernia ring with a V-Loc™ device

Discussion

Primary lumbar hernias are rare and are thus infrequently encountered by clinicians, which means that they have less direct experience in diagnosing and treating them. Thus, it is important that practitioners have an understanding of the anatomical, clinical, and etiological aspects of primary lumbar hernias to aid in their early identification and appropriate management. The description of the patient's clinical presentation, the imaging studies used, and the laparoscopic repair approach implemented in this case provide a comprehensive example of the successful management of such a rare case and contribute valuable information to the medical literature.

Patients with lumbar hernias generally present with nonspecific complaints or may even be asymptomatic. According to the literature, this type of hernia is more common in men and on found on the left side.[9] Complications such as incarceration can occur in 25% of cases, and strangulation was observed in 10% of cases. Therefore, surgery should be considered even for asymptomatic patients. The main complaint is pain in the flank region, which may or may not be associated with physical exertion. In the reported case, the patient was highly symptomatic, although there were no events of incarceration requiring emergency surgery. While awaiting her elective surgery in the public health system, her pain was managed with common analgesics. The main line of treatment for pain management in these patients includes the administration of non-opioid analgesics such as nonsteroidal anti-inflammatory drugs, and if the pain persists, weak opioids may be introduced into the treatment.[10]

It should be emphasized that it is important to consider this possible, though rare, diagnosis when a patient presents with pain in this area after eliminating any other possible diagnoses. In this case, the primary factor that led the patient to actively seek medical help was pain, defined

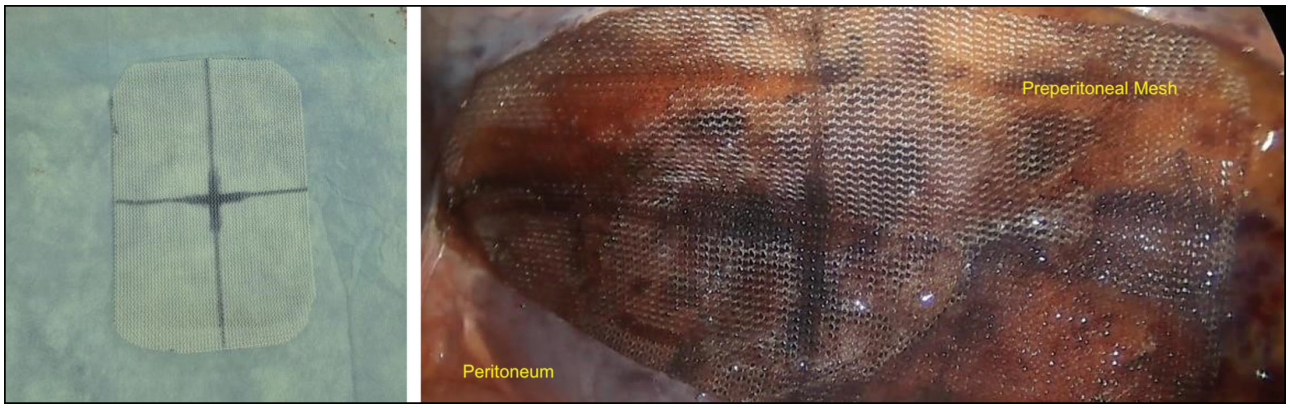

Figure 8: Polypropylene screen during planning and after being fixed in position

as having an intensity of 10/10 in the visual analog scale, and the score was given by her even when was asked to compare it with the pain intensity she experienced during her previous normal deliveries. Despite being suggestive, the physical examination alone was not sufficient to make a definitive diagnosis, necessitating the use of complementary exams such as ultrasound and CT. The ultrasound examination was effective and initially helped guide the diagnostic process. The performance of this exam was well-indicated, as the patient had complaints related to the hernia and had a body composition that allowed for good visualization of the hernia sac (non-obese patient). The CT, in turn, allowed for better visualization of the location, size, composition, and association of the hernia sac with adjacent structures and was essential for differentiating the lumbar hernia from other possible differential diagnoses such as tumors, for instance, lipomas. This differential diagnosis can be confused with that of a lumbar hernia on ultrasound, as described in the literature by Mingolla and Amelio.[11] Therefore, CT is shown to be the best choice for precise diagnosis in such cases. This information was crucial for surgical planning. The absence of clinical history, laboratory tests, and physical examination findings compatible with the possibility of an abscess or hematoma was sufficient to exclude these differential diagnoses.

As described by Amaral and Tastaldi,[12] open access surgery for the correction of lumbar hernias is reserved for defects larger than 15 cm. For primary hernia defects up to 5 cm, as in the described case, exclusive laparoscopic surgery is the current method of choice.[12] Advantages of this approach include better visualization of defects and their anatomical relationships; placement of the mesh in a retromuscular position, allowing for minimal fixation; less postoperative pain; and faster recovery with low morbidity.[13] For this, the lateral positioning of the patient with trocar insertion on the ipsilateral side of the herniation is strategic to allow for better visualization of the defect after colon rotation. Although robotic surgery is an option, restricted access in Brazil's public health services (Unified Health System) still impedes wider use of the method, making laparoscopy more commonly used.[12]

Conclusion

Based on this case report, it was possible to confirm aspects already well-established in the literature, such as the location of the hernia, the symptomatic clinical presentation, and the diagnosis made through suspicious clinical findings and CT as the gold standard method. Additionally, this was an opportunity for surgical resolution of the hernia through a minimally invasive method, which proceeded without complications and with satisfactory results for the patient. Increasing the database related to lumbar hernias broadens the understanding of this rare pathology and assists in the management and treatment of future patients. This was the intention and objective of this case report.

Author contributions

João Vitor Ciciliano, Igor Tadeu Nishimori Silva, and Andrezza Soildera Graziano conceptualized and drafted the manuscript. Eduardo Rullo Maranhão Dias and Pedro Henrique de Freitas Amaral performed the surgery for the case. Sergio Roll contributed to editing, supervision, and project administration, and served as the third reviewer. Critical revisions were provided by Lucas Giovanni Antonio Pivetta, João Paulo Venancio de Carvalho, Rodrigo Altenfelder Silva, and Jessica Zilberman Macret. All authors reviewed and approved the final manuscript.

Ethical policy and institutional review board statement

The study was conducted per the ethical principles of the Declaration of Helsinki.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/

have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Data availability statement

The datasets generated during and/or analyzed during the current study are not publicly available due to Brazilian General Data Protection Law but are available from the corresponding author on reasonable request.

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Nil.

Conflicts of interest

Dr. Sergio Roll is an Associate Editor of *International Journal of Abdominal Wall and Hernia Surgery*. The article was subject to the journal's standard procedures, with peer review handled independently of this Editor and their research groups.

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