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Giant Spigelian Hernia with Bilateral Inguinal Hernia: A Case Report

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ABSTRACT

Spigelian hernia itself is a rare subset of abdominal wall defect and the incidence of giant spigelian hernias reported are only fewer in number. While a universally accepted definition or specific size criterion for a "giant" Spigelian hernia is not rigidly standardized across all literature, the term typically denotes a hernia that is exceptionally large, often exceeding 10 cm in any dimension, leading to significant clinical manifestations, chronic incarceration, and particularly, "loss of domain." Here the authors are reporting a rare case of Giant spigelian hernia measuring 20 x 12 x 10 cm along with bilateral inguinal hernia – its workup, management and clinical outcome.

Keywords: Giant spigelian hernias, Case report, Spigelian hernia with inguinal hernia, mesh repair

INTRODUCTION

Spigelian hernias, characterized by a protrusion through the Spigelian fascia, represent a rare subset of abdominal wall defects, accounting for less than 2% of all abdominal hernias [1]. This anatomical peculiarity, often arising along the semilunar line, can make preoperative diagnosis challenging due to its variable presentation and the potential for occult herniation [1]. The elusive nature of these hernias is further compounded by their typical concealment beneath the aponeurosis of the external oblique muscle and overlying adipose tissue, often delaying diagnosis until complications arise or the hernia attains a substantial size [4]. When small, they are often described as interparietal, interstitial, or intermuscular due to their location between tissue planes [1]. While many Spigelian hernias are small and often diagnosed incidentally, some can attain remarkable dimensions, often referred to as "giant" spigelian hernias. While a universally accepted definition or specific size criterion for a "giant" Spigelian hernia is not rigidly standardized across all literature, the term typically denotes a hernia that is exceptionally large, often exceeding 10 cm in any dimension, leading to significant clinical manifestations, chronic incarceration, and particularly, "loss of domain." Such hernias present significant diagnostic and surgical challenges due to their size, content, and the physiological implications of reducing large volumes of viscera back into the abdominal cavity [2]. The surgical management of these

giant Spigelian hernias requires careful consideration of repair strategies, including approaches that may or may not involve techniques like preoperative pneumoperitoneum [3].

Given their rarity and nonspecific symptoms, only approximately 50% of Spigelian hernias are diagnosed preoperatively, necessitating a high index of suspicion in patients presenting with atypical abdominal wall pain or swelling [1]. Their subtle presentation often mimics other abdominal pathologies, making accurate differentiation crucial for timely and effective management [4]. This report aims to shed light on the intricacies of large Spigelian hernias, emphasizing the diagnostic workup, various treatment modalities, and essential follow-up considerations. Specifically, we present a unique case of a large Spigelian hernia, detailing the diagnostic journey from initial clinical suspicion to advanced imaging, and subsequently, the surgical approach employed for its repair, alongside the post-operative management and long-term outcomes. This case provides a valuable contribution to the surgical literature, highlighting critical aspects of managing large Spigelian hernias that extend beyond routine repair, particularly concerning the challenges posed by their size and the potential for associated complications. The diagnostic pathway for Spigelian hernias often involves a combination of clinical examination and advanced imaging, with computed tomography being the gold standard for delineating the fascial defect and assessing hernia contents. The infrequency of these hernias, approximately 0.12% to 2% of all abdominal wall hernias, coupled with their often-insidious presentation, underscores the diagnostic challenge.

CASE PRESENTATION

A 67-year-old male presented with complaints of swelling with occasional pain over the right side of the abdomen and groin for two years. Clinically, he was diagnosed with a giant Spigelian hernia, measuring 20 x 12 x 10 cm, which was irreducible, along with irreducible bilateral inguinal hernias with large defects. The patient had controlled comorbidities of diabetes and hypertension.

Fig 1: Patient with right sided giant spigelian and bilateral inguinal hernia- preoperatively

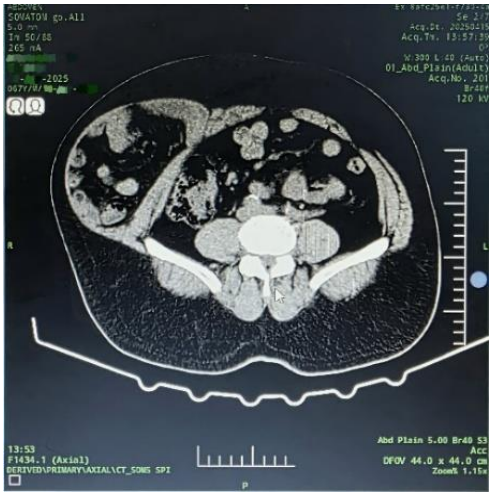

Fig 2: CT Abdomen showing right giant spigelian hernia containing small bowel and mesentery

Evaluation with CT abdomen revealed a right giant Spigelian hernia containing small bowel and mesentery, with a volume of 1177cc [Fig 2]. The TANAKA index was 0.17. Additionally, the CT scan showed bilateral inguinal hernias with herniated urinary bladder and fat stranding on the right side. Focal supraumbilical divarication of recti was also present.

The patient was scheduled for surgery after cardiology and pulmonary evaluation and optimising the pulmonary function

preoperatively. The procedure was performed under combined epidural and general anaesthesia.

PROCEDURE

A transverse incision was made from the right lumbar region extending 5 cm to the left side of midline. The thinned-out external oblique and anterior rectus sheath were opened transversely. The hernial sac was opened which contained small bowel loops and reduced. The defect was found to be extending medially for 8 cm in transverse diameter from the left iliac crest [Fig 3], and a part of the inguinal ligament was pulled up, causing muscle defect in the posterior wall of the inguinal region.

The contents were reduced, the sac was excised and the defect was closed with No. 1 polypropylene sutures [Fig 4]. This repair was reinforced with a 15 x 12 cm wide-pored soft polypropylene mesh, which was fixed to the muscular layer around the defect with full-thickness sutures on either side of the defect and also in the periphery [Fig 5(a) & (b)]. The external oblique was closed with No. 1 polypropylene after placing a suction drain.

Fig 3: showing intraoperative measurement of the hernial defect

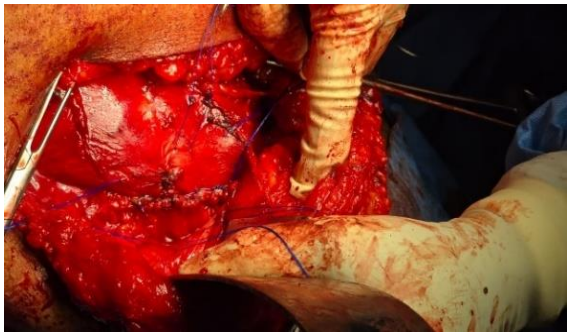

Fig 4: showing closure of hernial defect with no 1 polypropylene sutures

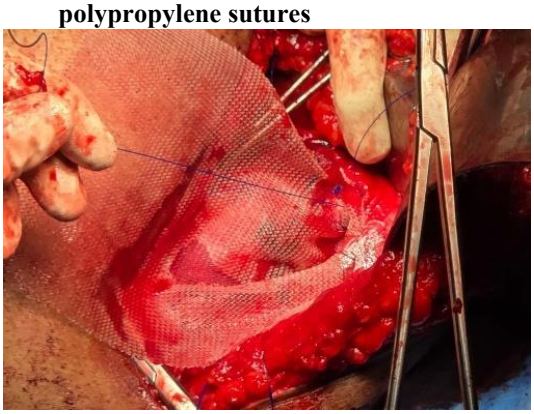

Fig 5 (a) & (b): showing repaired spigelian hernial defect reinforced with 15 x 12 cm wide-pored polypropylene mesh fixed to the muscular layer around the defect with full-thickness sutures on either side of the defect and also in the periphery.

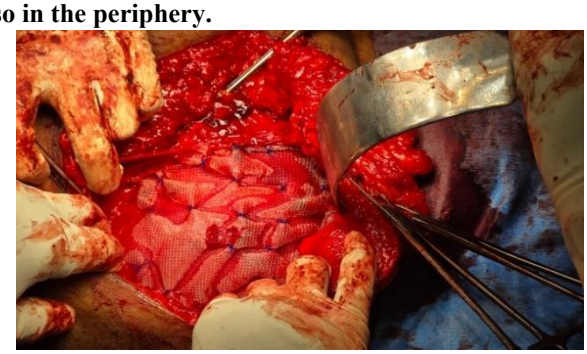

Fig 6: showing 15 x 12 cm mesh was placed as an on-lay and fixed to the abdominal wall after correcting divarication of recti

The skin and fat flap were raised 5 cm above the umbilicus, and the divarication of recti was corrected with No. 1 polypropylene. A 15 x 12 cm mesh was placed as an on-lay and fixed to the abdominal wall [Fig 6].

Bilateral inguinal hernias were repaired after reducing the sacs and closing the defects with 15 x 7.6 cm polypropylene mesh, extending from the reflected part of the inguinal ligament above the pubic symphysis to the anterior superior iliac spine.

Postoperatively, the patient was managed in the ICU for one day. He developed mild respiratory distress due to loss of domain, despite the TANAKA index being 0.17, which was relieved by supervised treatment from a pulmonologist. The patient was discharged on the 5th postoperative day after the suction drain was removed.

Patient was followed up for 6 months post procedure and there are no recurrence or any related symptoms till date.

DISCUSSION

Spigelian hernia is a rare type of abdominal wall hernia where abdominal contents protrude through a defect in the Spigelian fascia, located along the Linea semilunaris. In the case presented, a 67-year-old male presented with a giant Spigelian hernia coexisting with bilateral irreducible inguinal hernias, a presentation that underscores several critical diagnostic and management considerations.

The diagnostic journey for Spigelian hernias is often challenging due to their insidious onset and nonspecific symptoms, as highlighted in the introduction. Historically, only about 50% of Spigelian hernias are diagnosed preoperatively due to their subclinical nature and variable presentation. This patient's two-year history of symptoms before presentation further emphasizes the diagnostic difficulty, allowing the hernia to reach a remarkable size of 20 x 12 x 10 cm. The "giant" nature of this Spigelian hernia, in itself, is a rare occurrence. While Spigelian hernias are uncommon, comprising less than 2% of all abdominal wall hernias, the coexistence of such a large Spigelian defect with bilateral irreducible inguinal hernias, including bladder involvement, renders this case exceptionally rare and complex. Such a confluence of large and irreducible abdominal wall defects significantly increases surgical complexity and the potential for postoperative complications.

Radiological workup, particularly Computed Tomography of the abdomen, proved invaluable in delineating the exact nature and extent of these defects. In this case, CT not only confirmed the presence of the giant Spigelian hernia, its contents (small bowel and mesentery), and volume (1177cc), but also provided crucial information regarding the concomitant bilateral inguinal hernias, detailing the herniated urinary bladder. A key quantitative assessment from the CT was the TANAKA index, which was calculated at 0.17. The TANAKA index, defined as the ratio of the volume of the hernia sac to the volume of the abdominal cavity, is a valuable predictive tool in assessing the risk of "loss of domain" in giant hernias. Generally, an index below 0.20 (or 20%) suggests that the patient's abdominal cavity is likely to accommodate the reduced contents without significant increase in intra-abdominal pressure or respiratory compromise.

Paradoxically, despite a favourable TANAKA index of 0.17, the patient still experienced mild postoperative respiratory distress due to loss of domain. This highlights an important nuance: while the TANAKA index is a useful guide, it is not an absolute predictor, and individual patient factors, such as lung compliance, comorbidities, and the sheer volume of reduced contents, can still contribute to respiratory compromise [which can be self-limiting in most scenarios], especially in cases of exceptionally large, long-standing irreducible hernias where the abdominal cavity has adapted to the absence of the herniated viscera. This emphasizes the need for careful perioperative management, including multidisciplinary supervision by pulmonologists, even when predictive indices suggest a lower risk.

The management of such extensive and complex hernia disease, as demonstrated in this case, necessitates a meticulous surgical approach. The repair involved sequential reduction and mesh reinforcement for all three hernia sites, demonstrating a comprehensive surgical strategy to address the multiple large defects and restore abdominal wall integrity.

CONCLUSION

This case report details the challenging presentation and management of a 67-year-old male with a rare combination of a giant Spigelian hernia coexisting with irreducible bilateral inguinal hernias, including bladder involvement, and a focal divarication of recti. The two-year delay in presentation highlights a significant diagnostic difficulty, emphasizing the need for a high index of suspicion and early, comprehensive imaging in patients presenting with persistent, atypical abdominal wall discomfort, especially in the presence of risk factors.

The comprehensive surgical approach involving the sequential repair of all three defects with mesh reinforcement was successful in restoring abdominal wall integrity. However, the unexpected postoperative respiratory distress points to a potential loophole in current predictive models [*In this case the volume of the bilateral inguinal hernia if taken into consideration, the TANAKA index would have been nearer to the critical value of 0.2*] and the need for more intensive preoperative conditioning [like incentive spirometry etc] even for cases with seemingly 'low risk' indices, to optimize abdominal domain and patient physiology before surgery.

Looking forward, several avenues for research and clinical improvement emerge from this case:

1. **Clinical:** Enhanced awareness among clinicians regarding the rarity and diagnostic challenges of giant Spigelian hernias and their rare co-occurrence with other complex abdominal wall defects is paramount. Promoting early referral for advanced imaging in equivocal cases could mitigate diagnostic delays.
2. **Radiological:** Further research is needed to refine existing radiological indices or develop new ones that more accurately predict postoperative complications, particularly respiratory compromise, in cases of massive, multi-component hernias. This could involve exploring dynamic imaging studies or incorporating patient-specific physiological parameters.
3. **Interventional:** Continued exploration and standardization of preoperative adjuncts like progressive pneumoperitoneum or botulinum toxin in carefully selected patients, even those with initially 'favourable' TANAKA indices, could further reduce the risk of loss of domain-related complications.
4. **Postoperative Care:** Development of more tailored and proactive postoperative care protocols for patients undergoing repair of multi-component giant hernias, including enhanced respiratory physiotherapy and close monitoring for early signs of respiratory compromise, is crucial.
5. **Further Research:** Systematic collection and analysis of similar rare, complex hernia cases in a centralized registry could provide a larger evidence base to develop more robust diagnostic algorithms, refine prognostic tools like the TANAKA index, and optimize surgical and perioperative management strategies for these challenging conditions. This would ultimately lead to improved patient outcomes and reduced morbidity.

Authors' Contributions

We certify that we have participated sufficiently in the intellectual content, conception and design of this work or the analysis and interpretation of the data [when applicable], as well as the writing of the manuscript, to take public responsibility for it and have agreed to have our name listed as a contributor.

Data Access Statement

Research data supporting this publication are available from the EMR [Electronic Medical Records] of Travancore Medical College Hospital, Kollam, Kerala, India.

Declaration by Authors

Ethical Approval: The authors certify that all appropriate patient consent forms in accordance with the Declaration of Helsinki were duly obtained and is archived. The patient has given consent to publish the images and other clinical information in the journal. Care was taken to maintain the anonymity throughout the report.

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