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Unilateral undescended testis with a contralateral “over-descended testis” present in a left groin interstitial hernia presenting in mid-adulthood

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Abstract

Hernia repair remains one of the most common operative procedures performed by general surgeons and herniologists (hernia specialists). Congenital or acquired hernias fall into predictable categories: inguinal, ventral or abdominal, and incisional. Inguinal hernias are the most common accounting for roughly 70% of all hernias. Ventral, abdominal, and incisional hernias are interrelated and their prevalence varies. Other obscure or less common types of hernias include interparietal, obturator, femoral, and interstitial, and their prevalence is around 1%–2% at most. During our operative week, a unique patient presented for evaluation. Until that moment, our team of United States-based adult and pediatric surgeons lacked exceptional first-hand experience with inguinal interstitial hernias. These are generally recognized after previous abdominal wall trauma or surgeries as well as in the setting of congenital defects due to a testis that has not descended. Here, we present a rare case of an inguinal interstitial hernia containing an undescended left testicle that traversed through the internal ring, pivoting lateral and passing parallel to the inguinal canal and into the superficial thigh. Along its course, it traveled through the abdominal wall fascia protruding into the lower extremity, followed by the fascia lata, allowing the testicle and the hernia sac to reside in the left lower extremity thigh anterior compartment.

Keywords:

Cryptorchidism, hernia, interstitial hernia, undescended testicle

Introduction

Hernia repair remains one of the most common operative procedures performed by general surgeons and herniologists (hernia specialists). Congenital or acquired hernias fall into predictable categories: inguinal, ventral or abdominal, and incisional. Inguinal hernias are the most common accounting for roughly 70% of all hernias.^[1] Ventral, abdominal, and incisional hernias are interrelated and their prevalence varies.^[2]

Other obscure or less common types of hernias include interparietal, obturator,

femoral, and interstitial, and their prevalence is around 1%–2% at most.

During our operative week, a unique patient presented for evaluation. Until that moment, our team of United States-based adult and pediatric surgeons lacked exceptional first-hand experience with inguinal interstitial hernias. These are generally recognized after previous abdominal wall trauma or surgeries as well as in the setting of congenital defects due to a testis that has not descended.^[3-7]

Here, we present a rare case of an inguinal interstitial hernia containing an undescended left testicle that traversed

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through the internal ring, pivoting lateral and passing parallel to the inguinal canal and into the superficial thigh. Along its course, it traveled through the abdominal wall fascia protruding into the lower extremity, followed by the fascia lata, allowing the testicle and the hernia sac to reside in the left lower extremity thigh anterior compartment.

Case Report

A 34-year-old male presented to our temporary clinic complaining of infertility with a lateral thigh and groin bulge. Local surgeons told him he had an inguinal hernia requiring repair. His past surgical history was significant only for infertility. On the physical examination, our surgeons appreciated an uncircumcised glans with no inguinal defect palpable except for a dilated internal ring and a fluid-filled mass in the lateral thigh, not in the usual location for a femoral hernia [Figure 1].

His left and right hemiscrotum were empty, with scrotal dermal hypoplasia appreciated. As mentioned, local doctors initially thought the patient had a primary inguinal hernia, and routine tissue or mesh-based repair would suffice. Before the patient's surgical procedure, the patient obtained computed tomography (CT) imaging to confirm our team's suspicion of a more complicated etiology [Figure 2].

The testicle on the left side was located within the thigh, and no intra-abdominal testis was present. The latter would have necessitated intra-abdominal laparoscopic or open exploration with resection, which

was a potential concern following the physical exam and the patient's age and noting the absence of a testis in the scrotum.

In the operating room, we subsequently explored the patient via a traditionally placed inguinal incision. As a routine, we made a 7 cm incision starting two fingerbreadths above the line adjoining the anterior superior iliac spine and pubic tubercle. Next, we exposed the external oblique (EO) aponeurosis and, then, flooded the inguinal canal floor with a local anesthetic mixture. After satisfactory anesthetization had occurred, the EO was identified and divided in the direction of its fibers to the inguinal ring. The hernia sac was identified lateral to the inguinal ring, traveling with the testicle and spermatic cord into the thigh [Figure 3]. We delivered the hernia sac and testicle back into the inguinal canal with gentle bimanual pressure. Subsequently, we relocated the testicle into the scrotum after separating the indirect sac from the spermatic cord and vessels. Following the adequate dissection of the hernia sac with ligation of the redundant sac at its base, we reduced the ligated sac back into the preperitoneal space. Subsequently, we tunneled the testicle and cord from the entrance at the internal ring and through the external ring, allowing us to relocate the structures back into the appropriate anatomical location within the scrotum. Next, we made a transscrotal incision and performed an orchiopexy to prevent torsion due to its lack of congenital attachments that are normally seen at the base of the testicle. A standard "Amid modification" of the Lichtenstein repair technique was then performed with lightweight macroporous polypropylene mesh.

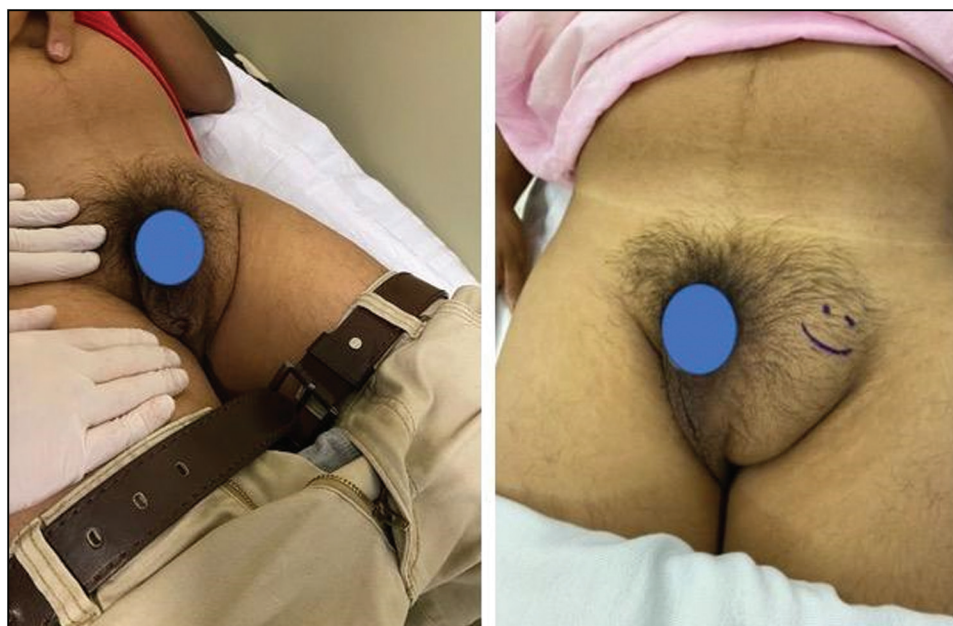


Figure 1: Preoperative images

The external ring and EO aponeurosis were closed with a running absorbable 3-0 Vicryl suture.

Scarpa's fascia was also closed with a running absorbable 3-0 Vicryl suture and, then, the skin incisions were closed with running subcuticular Monocryl 4-0 sutures and Dermabond was utilized for skin dressings at both the scrotal and inguinal incisions.

Postoperatively, the patient was observed overnight due to the long distance he lived from the hospital, making travel unreasonable postoperatively, and he was subsequently discharged home on postoperative day 1 after a brief overnight observation. Routine to our humanitarian mission trips, we usually have patients stay overnight because of transportation and social issues that preclude safe discharge home on the same day of surgery.

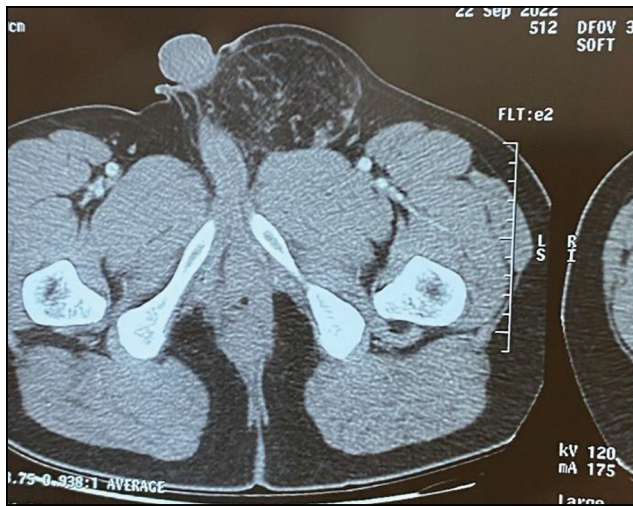


Figure 2: Preoperative CT abdominal and pelvic scan demonstrating herniation of contents into the lower thigh

Discussion

Recently, our team participated in and helped run a medical mission for adult and pediatric hernia repair in Guatemala City, Guatemala. We successfully repaired over 80 hernias over a week during this humanitarian mission. We fixed all hernias with an open Lichtenstein approach. Many of our operations were for routine, uncomplicated, and straightforward patients and hernias. We also had the opportunity to repair many recurrent hernias that local surgeons had previously operated on.

Our case report not only represents a unique presentation and technique to manage interstitial hernias of the thigh (IHOT) but also highlights a need for more succinct guidelines regarding managing adult cryptorchidism or failure of the testis to descend spontaneously.

Abdominal wall hernias tend to form in predictable areas of weakness or thinning of the myofascial envelope of the abdominal wall and peritoneal cavity and often originate at a previous site of abdominal surgery. In most instances, the hernia sac protrudes through all layers of the abdominal wall, transversus abdominis, internal oblique, and EO. Indirect inguinal hernias follow along said course, lateral to the epigastric vessels through the internal (deep) inguinal ring toward the external (superficial) inguinal ring and, in some instances of scrotal hernias, into the scrotum. A direct hernia passes medially to the epigastric vessels and through the posterior wall of the inguinal canal.

Some hernias can form in unexpected areas. Our case report focuses on one such rare instance with an "interstitial" hernia, a subgroup of intraparietal hernias.

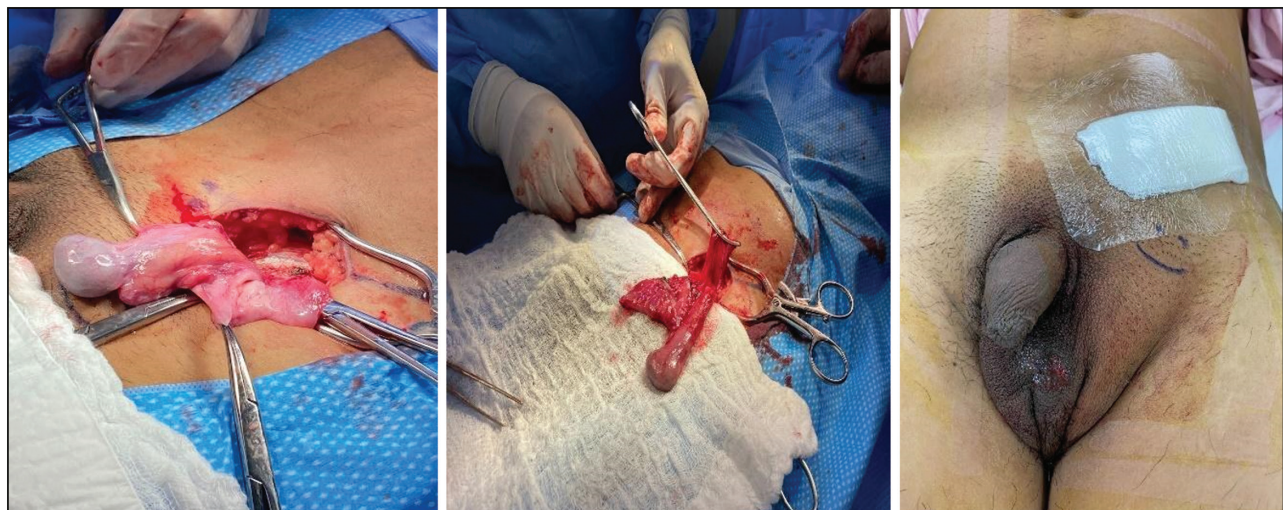


Figure 3: Identification of the hernia sac traveling with the testicle and spermatic cord into the thigh

Based on our literature review, we have yet to see a hernia traversing through a weakening in the abdominal fascia and into the lower extremity (fascia lata).

We present our case report to highlight two main principles. The first is to present a surgical technique that includes the reduction of the hernia sac and testicle into the inguinal canal with subsequent relocation of the testicle into the scrotum with orchiopexy to prevent torsion after relocation due to the congenital absence of these standard attachments. We closed the lateral defect and performed a standard mesh repair in a Lichtenstein–Amid fashion. Additionally, our case presentation also calls into question the timing and appropriate management of undescended testis presenting in adulthood.

Intraparietal hernias are hernia sacs located between layers of the abdominal wall and are unique entities. These hernias are further subdivided based on location; preperitoneal delineates a sac located between the peritoneum and transversalis fascia. In interstitial hernias, the hernia sac resides between the muscle layers of the abdominal wall; in superficial hernias, the sac resides between the EO aponeurosis and the skin. Of these, interstitial hernias are the most common.

Respectively, our situation differs from other previous reports in the literature. Our individual had never undergone surgery before, negating the propensity for such a defect to form at a previous incision site or as a result of a surgical procedure. Additionally, our individual had an undescended testis.

The testicle normally starts descending *in utero* during the eighth week of pregnancy, ending up in the scrotum during the second trimester. Unfortunately, neonatal cryptorchidism impacts 1%–4% of newborns and is a fairly common congenital abnormality.^[8,9] For newborns suffering from cryptorchidism, the testicle descends spontaneously by months 3–6 routinely. Testicles that fail to do so by 6 months are recommended to undergo elective orchiopexy.^[10]

This recommendation is built from the following rationale: testicular cancer and diminished fertility rates.

Meta-analyses conducted on the topic of cancer with cryptorchidism have shown that men with a history of this condition, or undescended testicles, have a three to four times higher risk of developing testicular cancer than the general population.^[11] In cases of one-sided cryptorchidism, where only one testicle is undescended, the risk is even higher and approaches

6.3 times higher risk for the undescended testicle and interestingly even an additional 1.7 times higher risk for the descended testicle.

Cryptorchidism after puberty is a rare phenomenon, as was the case with our patients, and studies investigating the proper management vary. Some authors cite the nonfunctionality of the undescended testes in the post-pubertal state with 3%–8% with oligo-teratoasthenospermia.^[8] In unilateral cryptorchidism, the incidence of infertility may be as high as 32% and up to 59% of men with bilateral cryptorchidism may be infertile despite surgical correction by orchidopexy following their post-pubertal repair.^[8]

Additionally, some studies have mentioned both abnormal semen analysis and testicular biopsy results of patients with post-puberty cryptorchidism who underwent orchiectomy, respectively.^[12,13] Based on these findings, some authors recommend orchiectomy in this setting as atrophy is common. On the contrary, other authors have found individuals experiencing post-pubertal orchiopexy capable of producing spermatogenesis and inducing pregnancy.

We propose that these newly defined and named hernias, that is, IHOT, described herein with their new terminology, be included in the description and management of all types of interstitial hernias. Furthermore, we suggest that future studies/work be conducted so that collaboration with adult and pediatric surgeons can lead to a consensus for treatment with both the American Hernia Society and European Hernia Society.

Author contribution

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.

Ethical policy and Institutional Review Board statement

This work was performed following all local rules and regulations and was approved by the local ethical committee after patient informed consent was obtained and documented in the local hospital chart in both English, Spanish, and Mayan languages.

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 available from the corresponding author on reasonable request.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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