INTERNATIONAL SEVEN JOURNAL
OF HEALTH RESEARCH
ISSN: 2764-9415

Conservative treatment of testicular ischemia after right inguinal hernia repair: A case report

DOI: 10.56238/isevjhv3n4-010
Receipt of originals: 06/11/2024
Acceptance for publication: 07/31/2024

Helen Brambila Jorge Pareja[1], Michaela Helena Moretto Alves[2], Alexandre Casari Donida[3], João Antonio Panzner Nabhan Garcia[4], José Lucas Nigre[5], Maíra Molinari Fronza[6].

ABSTRACT

Introduction: Generalized testicular ischemia is defined as the occlusion of venous return capable of generating edema and vascular rupture, preventing oxygenation and nutrition of tissues and germ cells such as Leydig cells. The risk factors for testicular ischemia are previous trauma, physical exertion, cold weather and especially abnormality in the bell clapper, which allows the movement of the testicle inside the tunic, increasing the risk of torsion of the spermatic cord. The diagnosis is made through clinical examination and ultrasound or ultrasound of the scrotum with doppler. Surgical methods vary depending on the observation of the testicles during surgery and the duration of ischemia. Objective: To demonstrate the importance of a good diagnosis of testicular ischemia and its complications, to improve treatment success. Methods: From a medical case that occurred at the Santa Casa da Misericórdia de Presidente Prudente, and its medical records, information was collected to carry out this report. Results: The fundamental importance of rigorous postoperative follow-up and readiness for rapid interventions in the face of crises, such as testicular ischemia, is highlighted. This manifests the need for constant and careful surveillance soon after surgical procedures of inguinal hernia repair. Conclusion: The relevance of early diagnosis and the use of technologies such as Doppler ultrasonography to monitor testicular vascularization is emphasized. Conservative management, including analgesics, anti-inflammatories, and continuous monitoring, can prevent more invasive

[1] Master of Science in Health Sciences
University of Western São Paulo
LATTES: 8792800011270177
E-mail: Brambila_hj@hotmail.com
[2] Graduated in Medicine
Aparício Carvalho University Center
LATTES: 5279549743262168
E-mail: michaela.helena1@hotmail.com
[3] Graduating from Medicine
University of Western São Paulo
LATTES: 1243703252142367
E-mail: alexandrecdonida@gmail.com
[4] Graduating from Medicine
University of Western São Paulo
LATTES: 6699029397584986
E-mail: joaoantoniopng@gmail.com
[5] Graduating from Medicine
University of Western São Paulo
LATTES: 4048549329085575
Email: josenigre04@gmail.com
[6] Medical Graduate
University of Western São Paulo
LATTES: 4557159567397670
E-mail: mairafronza330@gmail.com

interventions such as orchiectomy, preserving testicular function and avoiding further complications.

Keywords: Testicular ischemia, Diagnosis, Complications, Treatment.

INTRODUCTION

Generalized testicular ischemia is defined as the occlusion of venous return capable of generating edema and vascular rupture, preventing oxygenation and nutrition of tissues and germ cells such as Leydig cells (C OELHO, 2016). The main cause of this pathology is the torsion of the spermatic cord, characterized by the atypical rotation of the testicle in relation to the vascular or longitudinal axis, since it interrupts the blood circulation of the affected testicle. This condition affects approximately 4 thousand men under 25 years of age annually, and between 1992 and 2010, research indicates the admission of 21,289 patients diagnosed with testicular torsion, most of them in the Southeast region of Brazil. The affected patients have different age groups, however the highest rate is found in children and adolescents, a significant decrease in the condition was observed after the adolescence period (MATHEUS et al., 2016).

The risk factors for testicular ischemia are previous trauma, physical exertion, cold weather, and especially abnormality in the bell clapper, which allows the movement of the testicle inside the tunic, increasing the risk of torsion of the spermatic cord (CONCEIÇÃO et al., 2024).

An inguinal hernia is a condition in which part of the small intestine or abdominal fat extends through an opening in the abdominal wall, specifically in the groin area, and the internal tissue or organ enters through a weakened area in the wall of the abdomen. It is a relatively common condition and can affect both men and women. There are two main types of inguinal hernia, indirect inguinal hernia, the most common form of inguinal hernia, which usually occurs due to a congenital weakness in the abdominal wall, and its protrusion occurs through the inner inguinal ring, which is a natural opening in the abdominal wall. And direct inguinal hernia, which usually occurs in older adults and is the result of an acquired weakness in the abdominal wall, its protrusion occurs through the outer inguinal ring, which is a weakened area near the groin. The diagnosis is usually made based on symptoms and a physical examination. Imaging tests such as ultrasound or CT scans can sometimes be used to confirm the diagnosis (HAMMOUD and GERKEN, 2023) (LEBLANK et al., 2013) (MINOSSI et al., 2011).

The most common treatment for inguinal hernia is surgery, which involves repairing weakness in the abdominal wall and repositioning the intestine or fat (inguinal hernia repair)

(WATSON and MORITZ, 2023). One of the post-surgical complications for individuals with testicles is testicular ischemia, which is characterized by the reduction in the arrival of arterial blood to the organ due to obstructions in the vessels that irrigate it, causing a low flow of oxygen, which can lead to tissue necrosis (WANG et al., 2018).

Symptoms of inguinal hernia include lump or swelling in the groin or scrotal area, discomfort or pain in the groin area, especially when coughing, lifting heavy objects, or exerting physical exertion, feeling pressured or heaviness in the groin. Symptoms of testicular ischemia may include: sudden, severe pain in the scrotum or one of the testicles; swelling in the scrotum; increased sensitivity in the testicles; in severe cases, there may be redness or discoloration of the skin of the scrotum (WANG et al., 2018).

The prognosis cannot be clinically predicted, because in some situations, postoperative testicles usually become unquestionably atrophied within 12 months. On the other hand, enlarged, painful, hardened testicles accompanied by low-grade fever often boil down to normal appearance and function. Therefore, the importance of careful dissection during the manipulation of the spermatic cord in inguinal hernia repair is perceived, something particularly difficult in relapsing cases or bulky and complicated indirect hernia sacs (ATES et al., 2019).

The diagnosis is made through clinical examination and ultrasound or ultrasound of the scrotum with doppler. On clinical examination there are signs such as swelling, hardening, redness of the scrotum, elevation of the affected testicle and absence of the cremasteric reflex (an involuntary contraction of the cremaster muscle, located in the scrotum). Pain is exacerbated on ambulation, when bent over, and in hip hyperextension. Ultrasound or ultrasound of the scrotum is a quick, painless and non-invasive imaging test that allows a wide visualization of the internal structures of the scrotum, the testicles and the epididymis. The procedure does not present radiation and can be done at any age. With the help of doppler, it is possible to have a broad visualization of the vascularization status of the area (CHANG et al., 2022).

However, there is no consensus in the literature on the relationship between factors, including the structures of the spermatic cord, testicular volumes, and changes in arterial blood flow. Reductions in testicular arterial perfusion and testicular temperature were observed. Ultrasonography demonstrates decreased systolic blood flow and increased resistive index in testicular ischemia. On the contrary, there are other studies that argue that blood flow and testicular perfusion do not change after hernia surgeries (DELLABIANCA et al., 2011). Ischemic orchitis in the testicle presents on the day 2 or 3 days following an inguinal hernia surgery and progresses to developing a heart attack. Physical examination and Doppler

ultrasound are the initial diagnostic methods in cases where testicular ischemia is suspected. Testicular artery, blood flow, and testicular perfusion should be evaluated by scrotal Doppler ultrasound. In these cases, the possibility of a twisted testicle should be considered as well, despite the history of recent inguinal hernioplasty. In our case, the exploration decision was made when it was determined that there was no blood supply to the testicle. The treatment method is an emergency surgical intervention. Surgical methods vary depending on the observation of the testicles during surgery and the duration of ischemia. The necrotic regions of the testicle are excised and repaired by surgical interventions, however, orchiectomy is inevitable when ischemia at an early stage, after inguinal surgeries (OZDAMAR and KARAKUS, 2017).

CASE DESCRIPTION

C.L.C., a 65-year-old male patient, presented to the Presidente Prudente Regional Hospital complaining of left inguinal bulging and pain on physical exertion. The clinical diagnosis was left inguinal hernia, and it was indicated for a hernia repair surgical procedure. In the surgical procedure: A left inguinotomy incision was performed. The dissection was performed in planes, exposing the external inguinal ring, the inguinal ligament and the joint tendon, identifying a defect in the posterior wall. The elements of the spermatic cord were isolated, visualizing the hernial sac. The presence of an inguinal hernia type Nyhus III A was confirmed, with hernial content composed of cord lipoma, without involvement of intestinal tissue. The hernial contents were invaginated and the posterior wall was reinforced with a Nylon 0 suture, fixed to the joint tendon and the inguinal ligament using the Bassini technique. Subsequently, a polypropylene mesh was inserted and attached to the pubis, joint tendon, and inguinal ligament according to the Lichtenstein technique. The anatomy and hemostasis were reviewed, and the incision was closed by planes: aponeurosis with Vicryl 1.0, subcutaneous with Vicryl 3-0, and skin with Nylon 3-0. A compressive dressing was applied. In the immediate postoperative period, the patient was referred to the Post-Anesthetic Recovery Room (PACU), where he remained under observation. During the immediate postoperative period, C.L.C. showed a satisfactory recovery, and was released for hospital discharge the next day with home care guidelines and recommendations to avoid intense physical exertion

A few days after the surgery, C.L.C. returned to the hospital complaining of severe pain in the left testicle. Physical examination and scrotal Doppler ultrasound indicated signs of testicular ischemia, a possible complication after inguinal hernia repair due to impaired blood flow to the testis. Given the severity of the condition, it was decided to initiate conservative

measures, including painkillers for pain management, anti-inflammatories to reduce swelling, elevation of the scrotum, and close monitoring of testicular status. Doppler ultrasound was used to monitor blood flow to the testicle.

DISCUSSION

Surgical treatment (inguinal hernioplasty) remains the best option in cases of inguinal hernia, where when detecting signs and symptoms such as pain on exertion, bulge, swelling in the groin and/or scrotal region, discomfort or pain in the groin area, especially when coughing and/or pain on exertion, it becomes necessary to the therapeutic approach, which is, surgical correction (COELHO, 2016).

According to the literature, for preventive and therapeutic diagnosis, in this situation, ultrasonography or computed tomography is recommended. This approach is advantageous for patients with small intestine or abdominal fat that extends through an opening in the abdominal

wall, specifically in the groin area, and the internal tissue or organ pushes through a weakened area in the wall of the abdomen, and especially patients with such exacerbated symptoms and those whose diagnosis is early.

Physical examination and Doppler ultrasonography are the non-negotiable initial tests for diagnosis in cases where testicular ischemia is suspected. Ultrasound or ultrasound of the scrotum is a quick, painless and non-invasive imaging test that allows a wide visualization of the internal structures of the scrotum, the testicles and the epididymis. The procedure does not present radiation and can be done at any age. With the help of doppler, it is possible to have a broad visualization of the vascularization status of the area (CHANG et al., 2022).

Injury to the structures that supply the testicle (whether in the open, laparoscopic or extraperitoneal method), usually during dissection of the hernial sac, is the most important cause in the pathogenic mechanism. In the laparoscopic method, the incidence of ischemic orchitis is lower when compared to open repair, with approximately 0.9% of cases, and 0.6% for persistent testicular pain. Testicular atrophy, which can succeed ischemic orchitis, occurs in 0.2 to 1.1% of all inguinal hernia repair cases for the open surgical method, with even higher rates for relapsed cases. In less common situations, the cause of testicular infarction may result from torsion of the spermatic cord, extrinsic compression of cord structures, testicular entrapment in the inguinal canal, or fibrotic reaction to polypropylene mesh (ATES et al., 2019).

Therefore, considering the increasing number of cases of incidence and prevalence of testicular ischemia after inguinal hernia repair, associated with the scarcity of prevention of such a condition that should start in the operating room and also related to the lack of consensus in the literature on the relationship of factors, including the structures of the spermatic cord, testicular volumes and alterations in arterial blood flow, It is extremely important to reorganize actions prioritizing the reduction of this relationship between the factors that potentiate the condition and this complication. Therefore, it is essential to address this issue, which allows defining and developing strategies aimed at the population at risk.

Although there have been several attempts with antimicrobial and anti-inflammatory therapies, there is no specific treatment for ischemic orchitis that prevents the progression to testicular atrophy. Thus, the instituted conduct cannot be easily standardized, depending on the clinical evolution and refractoriness of the condition. The self-limitation of cases will hardly be concluded early, which is one of the impasses in the therapeutic decision. Therefore, it is necessary to prevent its occurrence through careful dissection of the components of the spermatic cord during hernia repair, either by open or laparoscopic method (FLAVIO et al., 2016).

METHODOLOGY

From a medical case that occurred at the Santa Casa da Misericórdia de Presidente Prudente, together with his medical record, information was collected to carry out this case report. In addition, a search for information was carried out in databases.

RESULTS

The fundamental importance of rigorous postoperative follow-up and readiness for rapid interventions in the face of crises, such as testicular ischemia, is highlighted. This manifests the need for constant and careful vigilance soon after surgical procedures for inguinal hernia repair — especially due to the possible risk of testicular ischemia, which can cause serious consequences to the patient's reproductive and hormonal health.

CONCLUSION

Therefore, the relevance of early diagnosis and the use of technologies such as Doppler ultrasonography to monitor testicular vascularization are emphasized. Conservative management, including analgesics, anti-inflammatories, and continuous monitoring, can prevent more invasive interventions such as orchiectomy, preserving testicular function and avoiding further complications.

In addition, the importance of careful dissection during inguinal hernia repair is emphasized, especially in situations of recurrent hernias or bulky and complicated hernia sacs. Preventing testicular ischemia begins in the operating room, with precise techniques and meticulous attention to anatomical detail.

REFERENCES

Ates, E., Kazici, H. G., & Amasyali, A. S. (2019). A rare complication of inguinal hernia repair: Total testicular ischemia and necrosis. Archivio Italiano di Urologia, Andrologia: Organo Ufficiale di Societa Italiana di Ecografia Urologica e Nefrologica, 91(1), 46-48. https://doi.org/10.4081/aiua.2019.1.46

Chang, W., Schulze, B., & Stephens, D. (2022). Testicular ischemia as a result of an incarcerated inguinal hernia containing omentum: A two-case series. Journal of Surgical Case Reports, 2022(4), 1-3. https://doi.org/10.1093/jscr/rac406

Coelho, H. R. (2016). Torção do cordão espermático: Isquemia e reperfusão, avaliação toxicogenética e dos efeitos da fosfatidilcolina em ensaio pré-clínico (Master's thesis). Universidade Federal de Mato Grosso do Sul, Campo Grande.

Conceição, H. N. da, et al. (2024). Aspectos clínicos e fisiopatológicos da torção testicular. Brazilian Journal of Health Review, 7(1), 4021-4030. https://doi.org/10.34119/bjhrv7n1-235

Dellabianca, C., Bonardi, M., & Alessi, S. (2011). Testicular ischemia after inguinal hernia repair. Journal of Ultrasound, 14(4), 205-207. https://doi.org/10.1007/s40477-011-0044-6

Flávio, N. V., et al. (2016). Complicações urológicas da herniorrafia inguinal com uso de tela. Sociedade Brasileira de Urologia - Serviço de Cirurgia Geral do Hospital Municipal Monsenhor Flávio D'Amato, Sete Lagoas, Minas Gerais.

Hammoud, M., & Gerken, J. (2023). Inguinal hernia. In StatPearls. StatPearls Publishing. https://www.ncbi.nlm.nih.gov/books/NBK557486/

LeBlanc, K. E., et al. (2013). Inguinal hernias: Diagnosis and management. American Family Physician, 87(12), 844-848.

Matheus, L. G. M., Lima, C. P., & de Castilho, D. (2016). Torção de cordão espermático: Uma emergência urológica. Arquivos Médicos do Hospital das Clínicas da Faculdade de Ciências Médicas da Santa Casa de São Paulo, 61, 142-145. https://doi.org/10.5935/1678-5746.20160027

Minossi, J. G., Minossi, V. V., & Silva, A. L. da. (2011). Manejo da dor inguinal crônica pós-hernioplastia (inguinodinia). Revista do Colégio Brasileiro de Cirurgiões, 38(1), 59-65. https://doi.org/10.1590/S0100-69912011000100009

Ozdamar, M. Y., & Karakus, O. Z. (2017). Testicular ischemia caused by incarcerated inguinal hernia in infants: Incidence, conservative treatment procedure, and follow-up. Urology Journal, 14(4), 4030-4033. https://doi.org/10.22037/uj.v14n04a24

Wang, Y., et al. (2018). Epigenetic influences on aging: A longitudinal genome-wide methylation study in old Swedish twins. Epigenetics, 13(9), 975-987. https://doi.org/10.1080/15592294.2018.1487904

Watson, T. J., & Moritz, T. (2023). Sliding hernia. PubMed. https://pubmed.ncbi.nlm.nih.gov/29083633