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Giant inguinal hernia repair with loss of dominance

Reparación de la hernia inguinal gigante con pérdida de dominio

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ABSTRACT

Giant inguinal hernia with loss of dominance is rare. It is diagnosed when the hernia sac extends below the midpoint of the thigh with the patient standing. Repair of these defects is challenging due to the risk of developing abdominal compartment syndrome. We present the case of a 32-year-old man with a giant inguinal hernia with loss of dominance, who was treated with preoperative progressive pneumoperitoneum and hernioplasty with the Lichtenstein technique. No standard repair technique has been adopted for this condition. Whatever the approach, abdominal cavity preparation should be performed before surgical treatment to reduce the risk of abdominal compartment syndrome.

RESUMEN

La hernia inguinal gigante con pérdida de dominio es poco común. Se diagnostica cuando el saco herniario se extiende por debajo del punto medio del muslo con el paciente en bipedestación. La reparación de estos defectos es un desafío debido al riesgo de desarrollar un síndrome compartimental abdominal. Presentamos el caso de un hombre de 32 años, con una hernia inguinal gigante con pérdida de dominio, que fue tratado con neumoperitoneo progresivo preoperatorio y hernioplastía con técnica de Lichtenstein. No se ha adoptado una técnica de reparación estándar para este padecimiento. Cualquiera que sea el abordaje, se debe realizar una preparación de la cavidad abdominal previo al tratamiento quirúrgico para disminuir el riesgo de un síndrome compartimental abdominal.

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INTRODUCTION

Giant inguinal hernia (GIH) with loss of dominance is uncommon and results from neglect and fear of the surgical procedure. The social impact is significant; it can cause social isolation, fear of seeking medical attention, and subsequent worsening of the condition.[1] A GIH is established when the hernia sac extends below the midpoint of the inner thigh with the patient standing.[2] The designation of loss of dominance is subjective. Its management represents a challenge due to the risk of developing abdominal compartment syndrome (ACS), produced by suddenly reintroducing the herniated contents into an abdominal cavity with decreased capacity.[3] No treatment has been adopted as a standard procedure for this condition. The literature describes several surgical repair strategies. This paper aims to present the case of a patient with GIH with loss of dominance, successfully treated with prior progressive pneumoperitoneum (PPP) and tension-free plasty with the Lichtenstein technique.

PRESENTATION OF THE CASE

A 32-year-old male Mexican patient of mestizo ethnicity, a cab driver with a personal history of a sedentary lifestyle, and morbid obesity (body mass index [BMI] = 57), came for consultation for presenting a left inguinoscrotal hernia of 10 years of evolution. Physical examination confirmed that the patient had an inguinoscrotal hernia exceeding the upper border of the left patella and trophic changes of the

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scrotal skin *(Figure 1)*. Inguinal ultrasound showed a hernial sac with intestinal and omental contents. He was started on NPP during his hospital stay by inserting a Veress needle at Palmer's point. 200 cm^3 of room air was insufflated with a 100 cm syringe.[3] Subsequently, a double-lumen catheter (subclavian) was placed with the Seldinger technique. An 800 cm^3 of room air was insufflated, and a standing chest X-ray corroborated pneumoperitoneum. 1,000 cm^3 were administered every 24 hours for 21 days up to a total volume of 21,000 cm^3.

Under regional anesthesia, a left inguinal approach was performed through a standard transverse incision. A direct hernial sac was identified, dissected, and separated from the spermatic cord. After opening the hernia sac, small bowel loops, sigmoid colon, and omentum were identified *(Figures 2 to 4)*, which were manually introduced into the abdominal cavity without difficulty. The anatomical defect was repaired according to the Lichtenstein technique; there were no restrictive pulmonary changes during the transoperative and postoperative periods. The patient was discharged on the fourth day of hospital stay due to improvement. There was no hernia recurrence after clinical and ultrasound follow-ups for 1.5 years *(Figure 5)*. The patient reports that his quality of life has improved notably, increasing his personal and sexual relationships.

Figure 1: *A giant left inguinoscrotal hernia.*

Figure 2: *The sigmoid colon.*

DISCUSSION

The surgical treatment of a GIH with loss of dominance differs significantly from the usual cases of inguinal hernia due to the technical difficulty of repair and the high risk of morbidity and mortality, which implies a challenge for the surgeon. Forced reduction of the viscera to the abdominal cavity can produce a sudden increase in intra-abdominal pressure (IAP) and trigger an acute coronary syndrome (ACS), defined as a sustained IAP > 20 mmHg associated with multiple organ failure.[4,5] Several techniques have been proposed to avoid these complications and obtain satisfactory results after surgical repair. Among the pre-surgical techniques are the creation of PPP and the application of botulinum toxin A (BTA), which aim to increase the abdominal cavity volume.[6] In 1940, Goñi Moreno[7] described the PPP, which consists of placing an intraperitoneal catheter, through which an average of 14,000-20,000 cm^3 of ambient

air is progressively insufflated to enlarge the abdominal cavity and thus achieve an adequate visceral reduction of the hernial sac. On the other hand, it stabilizes diaphragmatic shape and function and improves ventilatory function by allowing elongation of the abdominal wall muscles, adhesiolysis, and pneumatic dissection of the hernia sac.[8,9] There is no consensus in the literature on the optimal duration and volume of insufflation. Goñi-Moreno[7] described that the procedure ends when the abdominal flanks are found to be prominent and under tension by palpation. On the other hand, Mayagoitia-Gonzalez JC[10] recommends maintaining the pneumoperitoneum for nine to 15 days for a GIH. In this case, it was decided to perform PPP for 21 days as described by Goñi-Moreno, where 1,000 cm^3 of room air was administered every 24 hours for approximately 20,000 cm^3 of room air.

Today, PPP and BTA are mainly used for giant abdominal incisional hernias, and some isolated cases of these techniques for treating a GIH have been reported in the literature.[4,6,9,11]

BTA causes a reversible flaccid paralysis of the abdominal wall muscles by blocking the synaptic release of acetylcholine, achieving an increase in the transverse diameter of the abdomen, a decrease in the thickness, and an increase in the length of the abdominal muscles, which facilitates the reduction of the hernial contents into the abdominal cavity.[6,11,12] It has been observed that BTA complements the objective of PPP since it allows for handling larger insufflation volumes.[8]

Other techniques reduce the content of the hernial sac, also known as debulking, which consists of resection of the colon, small intestine, omentum, and spleen, among others;

Figure 3: *The omentum.*

Figure 4: *Reduction of the hernia sac contents.*

Figure 5: *Absence of hernial sac in the left inguinal canal and scrotal wall edema.*

however, they are associated with a high rate of complications such as dehiscence, abdominal sepsis, and intestinal fistulas.[8-12] In our case, there was no difficulty in reducing the hernial content. Therefore, a debulking procedure was not necessary.

Given the complex nature of GIHs, we chose to perform an open repair with the Lichtenstein technique, considered the technique of choice for most surgeons and is recommended by international guidelines for this type of hernia.[13]

Other surgical alternatives are the transabdominal preperitoneal approach (TAPP) and the totally-extraperitoneal approach (TEP), which are safe therapeutic options for scrotal hernia repair when performed by surgeons with a higher level of experience in either technique, obtaining favorable results and the benefits of minimally invasive surgery.[9,13,14]

CONCLUSION

There is no standard technique for the surgical repair of giant inguinal hernias with loss of dominance. The approach should be adapted to the surgeon's experience, the hernia's characteristics, and each hospital's resources. Whatever the approach, preparation of the abdominal cavity should be performed before surgical treatment to reduce the risk of abdominal compartment syndrome and the need for visceral resection or anatomic separation of components, either by PPP, BTA, or a combination of both.

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