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ORIGINAL

Comparative evaluation between conventional and laparoscopic hernioplasty, it's indications and complications

Evaluación comparativa entre hernioplastia convencional y laparoscópica, sus indicaciones y complicaciones

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ABSTRACT

Introduction: hernia is one of the most prevalent wall pathologies, and its resolution can be achieved through conventional or laparoscopic methods. This study provides information on inguinal hernias and their various presentations according to etiology. Additionally, it addresses different causes related to age, comorbidities, and prior surgeries. The methods of resolution through open hernioplasty and laparoscopic techniques were analyzed, and the postoperative complications of the patients involved in the study were also considered.
Method: this systematic review utilized search engines such as PubMed, Google Scholar, and Scielo to find clinical trials and randomized studies, identifying statistical analyses on the use of both surgical techniques.
Results: this study compared the outcomes of inguinal hernia repair using laparoscopic and open techniques in 204 patients (96,6 % male, 3,4 % female), with an average age of 53,5 years. The duration of the procedure, postoperative complications, hospital stay, and recovery time were analyzed. Laparoscopic surgery had a longer operative time compared to the open technique, but showed benefits such as shorter recovery time (7 days versus 14,5 days, $P < 0,001$), less postoperative pain, and a shorter hospital stay. Complications, such as seromas and chronic pain, were more frequent in open surgery, although no infections were reported in either group. No recurrences were detected during the 6-month follow-up.
Conclusion: the laparoscopic technique for inguinal hernia repair offers significant advantages in terms of less postoperative pain, faster recovery, and shorter hospital stay compared to open surgery, despite a longer operative time. These results suggest that laparoscopy is a more favorable option for patients seeking a quicker recovery and early return to daily activities.

Keywords: Laparotomy; Laparoscopy; Inguinal Hernia; Herniorrhaphy; Postoperative Complications.

RESUMEN

Introducción: la hernia inguinal es una de las patologías de paredes más prevalente, su resolución puede ser por la vía convencional o laparoscópica. Este trabajo contiene informaciones sobre hernias inguinales y sus variables presentaciones según cada etiología, además aborda las diferentes causas relacionadas a edad, comorbilidades y cirugías previas. Se analizaron los métodos de resolución a través de la hernioplastia abierta y la técnica laparoscópica y por fin se consideraron las complicaciones postoperatorias de los pacientes involucrados en el estudio.
Método: la presente revisión sistemática ha utilizado buscadores como PudMed, Google Academic y Scielo para búsqueda de artículos de tipo ensayos clínicos y randomizado, encontrado estudios estadísticos sobre la utilización de ambas técnicas quirúrgicas.

Resultados: este estudio comparó los resultados de la reparación de hernias inguinales mediante técnicas laparoscópicas y abiertas en 204 pacientes (96,6 % varones, 3,4 % mujeres), con una edad promedio de 53,5 años. Se analizaron la duración del procedimiento, complicaciones postoperatorias, estancia hospitalaria y tiempo de recuperación. La cirugía laparoscópica presentó una mayor duración operativa en comparación con la técnica abierta, pero mostró beneficios como menor tiempo de recuperación (7 días frente a 14,5 días, P < 0,001), menos dolor postoperatorio y una estancia hospitalaria más corta. Las complicaciones, como seromas y dolor crónico, fueron más frecuentes en la cirugía abierta, aunque sin infecciones reportadas en ninguno de los grupos. No se detectaron recurrencias durante el seguimiento de 6 meses.
Conclusión: la técnica laparoscópica para la reparación de hernias inguinales ofrece ventajas significativas en términos de menor dolor postoperatorio, recuperación más rápida y estancia hospitalaria más corta en comparación con la cirugía abierta, a pesar de una mayor duración quirúrgica. Estos resultados sugieren que la laparoscopía es una opción más favorable para pacientes que buscan una recuperación acelerada y un retorno temprano a sus actividades cotidianas.

Palabras clave: Laparotomía; Laparoscopia; Hernia Inguinal; Herniorrafia; Complicaciones Postoperatorias.

INTRODUCTION

An inguinal hernia is a protrusion through an anatomically constituted orifice preceded by a hernial sac with or without abdominal contents. On the other hand, a recurrent inguinal hernia occurs in patients who have had previous surgery in the inguinal area and experience recurrence.[1] Recurrence depends on the time of appearance. If it is less than one month, the probable cause is technique failure. If it is more than one month, it can be related to other causes, such as weight gain or premature postoperative effort.[2]

They can be classified as direct, indirect, and crural. Direct inguinal hernias occur when the abdominal contents protrude directly through a posterior wall weakness through Hesselbach's Triangle and are extrafunicular.[3] Indirect hernias happen when the hernial sac follows the path of the inguinal canal, protruding through the deep or internal inguinal ring and is intrafunicular.[3] Finally, crural hernias appear below the inguinal arch through the crural ring.

One of the leading causes of this pathology is the weakness of the abdominal wall due to different collagen alterations related to cellular aging. In addition, intense physical exertion, chronic cough, constipation, benign prostatic hyperplasia, and/or family history can also provoke or aggravate an inguinal hernia. There is evidence of a genetic predisposition to develop inguinal hernias due to a family history that significantly increases the risk.[5] Although overweight and obesity are risk factors for many health conditions, in the case of inguinal hernias, excess weight increases intra-abdominal pressure, contributing to hernia development.[6] Finally, smoking and chronic lung diseases such as COPD, associated with connective tissue weakness, chronic cough, and increased intra-abdominal pressure, may increase the risk of inguinal hernias.[7]

The choice between conventional (open surgery) and laparoscopic (minimally invasive surgery) hernioplasty for treating inguinal hernias depends on several factors, including the patient's condition, the surgeon's experience, and the specific characteristics of the hernia.[4]

Inguinal hernias can lead to various complications. The most common are impaction and strangulation.[4] In strangulation, blood flow to the trapped tissue is compromised. Suppose the impaction does not resolve spontaneously or with the Taxis maneuver. In that case, it may progress to a severe form of strangulation, which can result in tissue necrosis due to arterial ischemia and require immediate surgical intervention6. Another possible complication is intestinal obstruction, in which the hernia causes entrapment of the bowel, preventing the typical passage of intestinal contents and causing symptoms such as abdominal pain, nausea, vomiting, absence of bowel movement, and catharsis (obstructive mechanical ileus).[7,8,9,10,11,12]

METHODS

Study Design

A systematic review was performed to understand and outline the advantages and disadvantages of inguinal hernia repair through conventional and laparoscopic techniques. In addition, a search was performed with the terms mesh in the National Library of Medicine (PUBMED), Google Academic, Medigraphic.com, and Scielo databases, with the terms: "Laparotomy" [Mesh] and "Hernia, Inguinal" [Mesh] and "Laparoscopy" [Mesh] AND "PostoperativeComplication" [Mesh].

Study Population

Patients submitted to conventional hernioplasty or by laparoscopic technique due to the presence of inguinal hernia or recurrence.

Inclusion Criteria

- Patients with direct inguinal hernia.
- Patients with indirect inguinal hernia.
- Patients who have undergone conventional hernioplasty.
- Patients who have undergone laparoscopic hernioplasty
- Patients who have undergone laparoscopic hernioplasty
- Patients with previous hernioplasties
- Patients with previous hernioplasties
- Patients with postoperative complications.

Exclusion Criteria

- Patients with other previous surgeries
- Patients with other previous surgeries
- Patients with comorbidities

Scope of the study

The research was conducted in a university setting under the supervision of a counselor and a professor at the same university.

Bibliographic search strategy

- The bibliographic search strategy used was the National Library of Medicine (PUBMED) database, Google Academic, Medigraphic.com, and Scielo.
- Database information and randomized clinical trials were used.
- The following Mesh terms were used: "Laparotomy"[Mesh] AND "Hernia, Inguinal"[Mesh] AND "Laparoscopy"[Mesh] AND "Postoperative Complication"[Mesh].
- From the results obtained, 14 literature sources entered the review.

RESULTS

A comparative analysis of three articles evaluating the results of inguinal hernia repair using laparoscopic techniques in contrast to open techniques was performed. A total of 204 patients were included in these studies, of whom 197 were male (96,6 %) and seven were female (3,4 %). Their ages ranged from 20 to 87 and an average of 53,5 years. The patients were divided into two groups: one underwent the laparoscopic technique and the other the open technique, considering both unilateral and bilateral hernias.

Duration of the procedure

Open surgery had a duration of 58,75 ± 6,8 minutes for direct bilateral hernias, while for indirect bilateral hernias, the duration was 61,21 ± 3,87 minutes. In contrast, laparoscopic surgery registered a duration of 107,42 ± 8,9 minutes.[13] Open surgery lasted 47,14 ± 7,2 minutes for direct unilateral hernias, compared to 84,24 ± 13,8 minutes for laparoscopy.[13] Open surgery lasted 52,51 ± 5,61 minutes for indirect unilateral hernias, and laparoscopic surgery 89,94 ± 9,53 minutes, with a mean operative time of 74,6 minutes.[13] The mean operative time was statistically significant between groups, although the difference in bilateral cases was minor but still substantial (P > 0,05)[15] (figure 1).

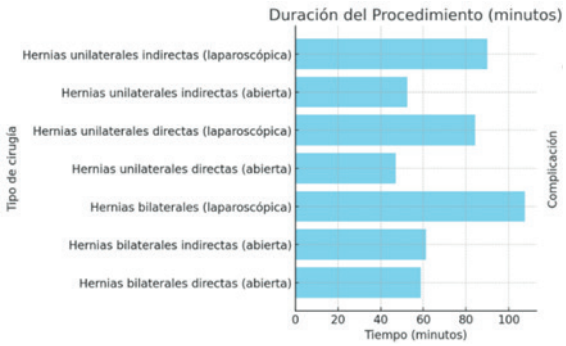

Figure 1. Duration of the procedure

Postoperative complications

Complications included seromas and chronic pain. At 1 week, there were 5 cases of seromas in the laparoscopic surgery group and 11 cases in the open surgery group, with no cases reported at 4 weeks.[15] One patient in the laparoscopic surgery group experienced chronic pain, with significant improvement at 6 months (P < 0,05).[14]

Conversion to open surgery occurred in one patient in the laparoscopic group due to anatomical difficulties. No recurrences were detected during the 6-month follow-up in either group[15] (figure 2).

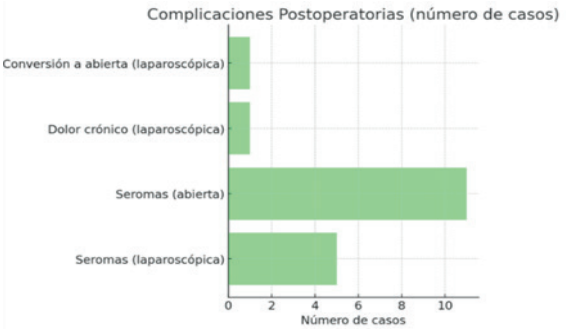

Figure 2. Postoperative Complications

Postoperative discomfort

7,1 % of laparoscopic surgery patients reported less discomfort at weeks 1 and 4 compared to open surgery patients, although without a statistically significant difference.[13] No wound infections were reported in either surgical group. Postoperative pain duration was shorter in the PET repair group compared to the Lichtenstein method (1,3 days vs. 2,9 days), with a significant difference (P < 0,001).[14] Pain measurements at 0, 12, 24, and 72 hours postoperatively showed less pain in the laparoscopic group (P < 0,05), and at 14 days, although the laparoscopic group continued to report less pain, it was not statistically significant[15] (figure 3).

Hospital stay

Patients who underwent laparoscopic surgery had a mean hospital stay of 2,68 days, while in the open surgery group it was 3,25 days, without a statistically significant difference (P > 0,5).[15] In bilateral cases, the difference was smaller, but not significant (P > 0,05).[15] Patients undergoing the laparoscopic technique had a shorter length of stay compared to those undergoing open repair (figure 4).

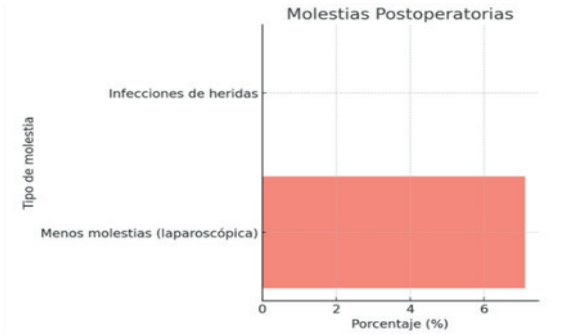

Figura 3. Postoperative Discomfort

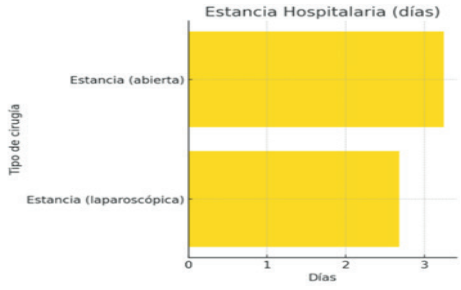

Figure 4. Hospital Stay

Recovery time

Postoperative recovery time was significantly shorter in the laparoscopic surgery group, averaging 7 days, versus 14,5 days in the open surgery group. This difference was statistically significant (P < 0,001 and P < 0,005), suggesting a clear advantage of laparoscopy in terms of faster recovery and earlier return to daily activities[13] (figure 5).

Figure 5. Recovery Time

DISCUSSION

Large or complicated hernias, such as those that are incarcerated or strangulated, may require laparotomy to allow better visualization and management of the hernial contents. Although laparoscopy may be chosen for good visualization of the abdominal cavity to resolve clogging of the abdominal loops,[4] patients with multiple previous abdominal surgeries may have significant adhesions that make laparoscopy more difficult and risky.[8] Sometimes, the choice is based on surgeon preference, considering the benefits and risks of each technique.[9]

On the other hand, laparoscopy is particularly useful for bilateral hernias, as it allows simultaneous repair through the same incisions.[8] This approach is also associated with less postoperative pain and faster recovery, which is beneficial for patients who wish to return to normal activities quickly.[10] In addition, laparoscopy generally has a lower risk of infection than open surgery due to the smaller incisions.[11] In cases of recurrent inguinal hernias, laparoscopy may be preferred to approach the area by preserving the anatomy, deformed from the inguinal by the previous surgery.[9]

Suppose the impaction does not resolve spontaneously or with the Taxis maneuver. In that case, it may progress to a severe form of strangulation, which can result in tissue necrosis due to arterial ischemia and require immediate surgical intervention.[6] In addition, hernia recurrence is another complication, although the use of mesh has decreased the number of recurrences to 1 %. Finally, some patients may experience chronic pain in the inguinal region after hernia repair surgery due to nerve entrapment in the mesh fixation or the placement of tackers (staples used for mesh fixation) by the laparoscopic method.[12]

In fragile patients, the tackers can be touched from the outside, causing chronic discomfort, and should be removed.

CONCLUSIONS

In conclusion, the comparative analysis between laparoscopic and open techniques for inguinal hernia repair shows significant differences in several clinical aspects that favor using laparoscopy in certain patients. Although laparoscopy presents a longer operative duration, it offers clear advantages in terms of recovery, with less postoperative pain and a shorter hospital stay compared to the open technique. These benefits make laparoscopy especially useful for bilateral and recurrent hernias, allowing simultaneous repair and better preservation of the anatomy affected by previous surgeries and being associated with a lower risk of infection.

However, the selection of the surgical technique must be adapted to the patient's clinical conditions. In cases of adhesions or complex hernias, such as incarcerated or strangulated hernias, open surgery may offer better visualization and control of the hernial contents. Also, the possibility of chronic discomfort in thin patients, associated with using tackers in laparoscopy, represents a factor to consider in postoperative management. Therefore, although laparoscopy offers essential advantages, its indication should be based on an individualized evaluation of the risks and benefits of each case.

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FINANCING

None.

CONFLICT OF INTEREST

None.

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