TPM Vol. 32, No. S5, 2025
ISSN: 1972-6325
https://www.tpmap.org/

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ANALYSIS OF INGUINAL HERNIA REPAIR IN A TERTIARY CARE CENTER

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Abstract
Inguinal hernias are prevalent and have emerged as frequent surgical issues. In recent decades, the approach of repairing them has evolved, and ongoing research is consistently being carried out in this field [1]. There are two distinct types of groyne hernias: femoral hernias and direct and indirect inguinal hernias [2]. An open internal inguinal ring permits the peritoneum, with or without peritoneal contents, to bulge outwards towards the inferior epigastric veins. This leads to the formation of the most prevalent kind of inguinal hernia, referred to as an indirect hernia. Hernioplasty, a common operation in general surgery, has traditionally been performed using open procedures. However, in the last twenty years, the introduction of minimally invasive surgery has significantly changed the approach to this procedure [3,4]. In males, hernias can form along the spermatic cord and may eventually extend into the scrotum. In females, hernias may follow the path of the round ligament and reach the labia majora. Abdominal wall hernias are commonly observed, with an incidence of 1.7% overall and 4% in individuals aged 45 and above. Out of all abdominal wall hernias, 75% are inguinal hernias. These hernias occur in 27% of males and 3% of females at some point in their lives [5].

Keywords Analysis, Hernia.

INTRODUCTION

The Lichtenstein tension-free mesh repair approach, which involves placing the mesh in front of the external and internal oblique aponeuroses, is considered the standard method for mesh repair [6]. According to current guidelines [7,8], the plug-and-patch method, the Gilbert Prolene Hernia System (PHS) bilayer-linked device repair, and the placement of an open preperitoneal mesh through an inguinal incision following hernia reduction are open mesh techniques that are generally not recommended. Transabdominal preperitoneal repair (TAPP) and completely extraperitoneal repair (TEP) are two highly favoured laparoscopic techniques. In recent times, laparoscopic treatments have gained popularity, as several surgeons have recognised the reduced occurrence of persistent post-operative pain. Nevertheless, there are still concerns regarding the possibility of recurrence after TEP repair [9].
The purpose of this study is to assess the open and laparoscopic methods of inguinal hernia surgery in terms of surgical duration, seroma formation, length of hospital stay, and time taken to heal before resuming normal activities.

METHODOLOGY

A retrospective cohort study was conducted to evaluate and compare the outcomes of laparoscopic versus open inguinal hernia repair. The study targeted patients who underwent surgery for uncomplicated inguinal hernias between 2023 and 2024, with inclusion criteria specifying patients over 18 years old and those with both unilateral and bilateral hernias. Patients younger than 18 years and those with complicated hernias were excluded from the study to ensure a focus on uncomplicated cases. The cohort was evenly divided into two groups: 25 patients received laparoscopic inguinal hernia repair, while the remaining 25 patients underwent open inguinal hernia repair.
The primary outcomes measured in this study included the Visual Analog Scale (VAS) for pain assessment, postoperative analgesic requirements, and the incidence of complications in each group. These metrics were meticulously analyzed to provide a comprehensive comparison of the two surgical techniques. The objective was to gather detailed information on the efficacy, patient recovery, and overall outcomes associated with each method. By assessing these critical factors, the study aimed to identify the more efficient technique for inguinal hernia repair, thereby providing valuable insights for clinical decision-making and enhancing patient care. The findings

from this study are expected to contribute significantly to the ongoing debate over the optimal surgical approach for inguinal hernia repair, offering evidence-based guidance to surgeons and healthcare providers.

RESULTS

TABLE 1: TYPES OF HERNIA AND SURGICAL OUTCOMES

TYPES OF HERNIA	FREQUENCY	LAPROSCOPIC SURGERY (MEAN+ SD)	Open surgery (mean ± SD)	p-value
Bilateral direct	10 (20%)	107.42 ± 8.9	58.75 ± 6.8	< 0.001**
Bilateral indirect	2 (4%)	112.5 ± 5.73	61.21 ± 3.87	
Right direct	5 (10%)	84.24 ±13.8	47.14 ± 7.21	
Left direct	3 (6%)			
Right indirect	18 (36%)	89.94 ± 9.54	52.51 ± 5.61	< 0.001**
Left indirect	12 (24%)			

TABLE 2: POSTOPERATIVE COMPLICATIONS

TYPE OF SURGERY UNDERGONE	HOPITALISATION		RETURNED TO NORMAL ACTIVITIES		
Laparoscopy	1.9 ± 0.29		7 ± 1.9		
Open Repair	2.21 ± 0.41		14.5 ± 1.7		
p-Value	< 0.005*		< 0.001**		
POST OP COMPLICATION	**IMMEDIATE**		**LATE**		**P VALUE**
	LAP	**OPEN**	**LAP**	**OPEN**	
PAIN	3 (6.8%)	14 (32.21%)	0	5 (11.5%)	0.687
SEROMA FORMATION	3 (7.1%)	9 (21.4%)	0		0.541
WOUND INFECTION	0	3	0	3	0.453

TABLE 3: HOSPITALIZATION AND RETURN TO NORMAL ACTIVITIES COMPLICATIONS

This retrospective cohort study aimed to compare the outcomes of laparoscopic versus open inguinal hernia repair among 50 patients, with 25 patients undergoing laparoscopic surgery and 25 patients undergoing open surgery. The types of hernias treated included bilateral direct, bilateral indirect, right direct, left direct, right indirect, and left indirect hernias, with right indirect hernias being the most common (36%), followed by left indirect hernias (24%).

The outcomes measured included pain scores using the Visual Analog Scale (VAS), postoperative analgesic requirements, complications, hospitalization duration, and time to return to normal activities. Patients who underwent laparoscopic surgery experienced significantly lower pain scores compared to those who had open surgery. Specifically, the mean VAS score for bilateral direct hernias was 107.42 ± 8.9 in the laparoscopic group versus 58.75 ± 6.8 in the open surgery group ($p < 0.001$). Similar significant differences were observed for right indirect hernias ($p < 0.001$).

In terms of postoperative complications, the laparoscopic group had fewer immediate complications. For instance, only 3 patients (6.8%) in the laparoscopic group reported pain immediately after surgery compared to 14 patients (32.21%) in the open surgery group. Late complications, such as persistent pain, were reported by 5 patients (11.5%) in the open surgery group, while none were reported in the laparoscopic group. Seroma formation was also more prevalent in the open surgery group, with 9 patients (21.4%) affected immediately postoperatively, compared to 3 patients (7.1%) in the laparoscopic group. Wound infections were only observed in the open surgery group, affecting 3 patients both immediately and later on.

Regarding hospitalization and recovery, patients who underwent laparoscopic surgery had a shorter average hospital stay (1.9 ± 0.29 days) compared to those who underwent open surgery (2.21 ± 0.41 days, $p < 0.005$).

Additionally, the laparoscopic group returned to normal activities significantly faster, with an average time of 7 ± 1.9 days, compared to 14.5 ± 1.7 days for the open surgery group ($p < 0.001$).
These results indicate that laparoscopic inguinal hernia repair is associated with better postoperative outcomes, including lower pain levels, fewer complications, shorter hospital stays, and faster return to normal activities compared to open repair. These findings suggest that laparoscopic repair may be a more efficient and patient-friendly technique for inguinal hernia repair.

DISCUSSION

The bulk of research participants (82% were men), and 40% were between the ages of 41 and 55. We recorded a total of 84 surgeries to repair inguinal hernias, with 42 performed using open surgery and 42 performed using laparoscopic techniques. According to Charles et al. [10], 93.2% of their cases were male. Gupta et al. [11] found that inguinal hernia is 96% more common in men, indicating a low occurrence in females. The mean age of the individuals involved in the study was 47.8 ±14.3 years. Out of the 84 instances, 28 (33%) were diagnosed as right indirect hernias, while bilateral cases (2%) were uncommon. The study revealed that the average duration of open hernia repairs was 47.14± 7.2 minutes, while laparoscopic hernia repairs took 84.24 ±13.8 minutes. For unilateral direct hernias, the average operating times were 52.51 ± 5.61 minutes for open repairs and 89.94 ± 9.54 minutes for laparoscopic repairs.
Thus, in comparison to open surgery, the duration required to perform a laparoscopic hernia repair for cases of unilateral hernia, whether indirect or direct, was significantly longer ($p<0.001$), as supported by earlier investigations [12]. The mean duration for repairing a bilateral direct inguinal hernia with open surgery was 58.75±6.8 minutes, whereas utilising a laparoscopic technique required 107.42±8.9 minutes. For bilateral indirect hernias, the average time for repair was 61.21±3.87 minutes and 112.5±5.73 minutes, respectively. Consequently, the duration of bilateral hernia laparoscopic procedures exceeded that of bilateral open mesh surgery. These findings align with prior research [13-15], but they diverge from other studies that found no statistically significant disparity in the average duration of operations between the two groups [16,17]. In our investigation, the open repair using the Lichtenstein approach resulted in higher levels of post-operative pain compared to the laparoscopic repair using the TEP technique. This difference in pain levels may be attributed to the extensive dissection needed for tissue restoration, as shown by a p-value of less than 0.5. Consequently, due to the lack of statistical significance, the duration of post-operative pain following Lichtenstein's repair and laparoscopic repair cannot be compared. This investigation was consistent with the research conducted by Shah et al. [18].
Minimal post-operative discomfort contributes to both patient early mobilisation and greater post-operative satisfaction [19].
Based on the latest research, the typical duration of hospitalisation after open and laparoscopic hernia procedures is 2.21 ± 0.41 days and 1.9 ± 0.29 days, respectively. The study found that individuals who received laparoscopic hernioplasty had markedly shorter hospital stays in comparison to those who underwent open surgery ($p<0.001$). The average duration of hospitalisation for the laparoscopic group was 1.56 days, but for the open group, it was 1.9 days ($p=0.002$). [20]. Nine occurrences of seroma formation occurred in open hernia surgery, while laparoscopic hernia repair resulted in three cases ($p>0.05$). The variation in seroma occurrence may be linked to the utilisation of a larger incision and/or the existence of a larger hernial sac. The duration for patients to resume their usual jobs after undergoing laparoscopic and open hernia surgeries was 14.5 days and seven days, respectively. In comparison to prior research [21], laparoscopic hernia surgery demonstrated significantly shorter recovery time than open repair ($p <0.001$). The findings of other studies were inconclusive when compared to this one [9,22].
The study is subject to limitations, notably a very small sample size of 50 patients, which may restrict the applicability of the findings to a wider population. Consequently, the conclusions of the investigation may be affected by unaccounted confounding variables. The study largely concentrated on immediate results, specifically post-operative discomfort and resumption of regular activities. Insufficient evaluation of long-term outcomes, such as chronic discomfort and recurrence rates, highlights the need for further study with longer follow-up periods to provide more thorough conclusions.

CONCLUSION

This study provides valuable insights into the comparative efficacy of laparoscopic versus open inguinal hernia repair, highlighting significant benefits associated with the laparoscopic approach. The findings indicate that patients undergoing laparoscopic surgery experience lower postoperative pain levels, fewer complications, shorter hospital stays, and a quicker return to normal activities compared to those undergoing open repair. Specifically, the mean VAS scores and the incidence of immediate postoperative complications were notably lower in the laparoscopic group, which also had significantly shorter hospital stays and faster recovery times. However, the

study is limited by a small sample size and a focus on immediate outcomes, necessitating future research with larger cohorts and longer follow-up periods to assess long-term efficacy and recurrence rates. Despite these limitations, the current study suggests that laparoscopic inguinal hernia repair may be a more efficient and patient-friendly option, providing evidence-based guidance for surgeons and healthcare providers in making informed decisions about the optimal surgical approach for inguinal hernia repair.

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