International Journal of Medical and Pharmaceutical Research

Online ISSN-2958-3683 | Print ISSN-2958-3675
Frequency: Bi-Monthly
Website: https://ijmpr.in/

Research Article

An Analytical Study of Comparison Between Laparoscopic Hernioplasty and Lichtenstein's Tension-Free Hernioplasty

Dr. K. Sailaja[1], Dr. G. Rajani Devi[2], Dr. Mohammed Roohila[3]

[1]DNB, Associate professor,Rangaraya medicalcollege,Kakinada
[2]M.S. Associate professor,Rangaraya medical college
[3]M.S., Junior resident.

OPEN ACCESS

Corresponding Author:

Dr. K. Sailaja
DNB, Associate professor, Rangaraya medical college, Kakinada
sailaja7074@gmail.com

Received: 18-01-2026
Accepted: 03-03-2026
Published: 11-03-2026

ABSTRACT

Background: Inguinal hernia repair is one of the most commonly performed surgical procedures worldwide. The optimal surgical technique remains debated, with both open Lichtenstein and laparoscopic Transabdominal Preperitoneal (TAPP) approaches offering distinct advantages.
Objectives: To compare the outcomes of TAPP hernioplasty versus Lichtenstein's open hernioplasty in terms of operative time, postoperative pain, complications, hospital stay, return to daily activities, recurrence, and patient satisfaction.
Methods: This prospective interventional study was conducted over two years (May 2023 to May 2025) at Government General Hospital, Kakinada, Andhra Pradesh. A total of 50 patients with inguinal hernia requiring surgical intervention were randomly allocated into two groups: Group 1 (n=25) underwent TAPP hernioplasty, and Group 2 (n=25) underwent Lichtenstein open hernioplasty. Both groups were compared regarding demographic profile, comorbidities, intraoperative and postoperative complications, pain scores, hospital stay, return to daily activities, recurrence, and patient satisfaction. Statistical analysis was performed using SPSS version 20, with $p<0.05$ considered significant.
Results: The mean age was higher in the TAPP group (50.8±2.5 years) compared to the Lichtenstein group (42.9±2.20 years) ($p<0.05$). Male predominance was observed in both groups (80% overall). Mean operative time was significantly longer in the TAPP group (80.75±16.3 minutes) versus Lichtenstein group (50.9±16.0 minutes) ($p=0.001$). Intraoperative complications were comparable between groups ($p>0.05$). Postoperative complications were significantly higher in the Lichtenstein group (32% vs. 4%, $p<0.05$), with seroma being the most common complication. Postoperative pain was significantly lower in the TAPP group, with 92% reporting mild pain compared to 72% in the Lichtenstein group ($p<0.05$). Hospital stay was shorter in the TAPP group (4.73±1.17 days vs. 7.15±1.98 days, $p<0.05$), and return to daily activities was faster (7.80±1.89 days vs. 15.25±2.51 days, $p<0.05$). Recurrence was observed only in the Lichtenstein group (16%) ($p<0.05$). Patient satisfaction was higher in the TAPP group (96% good satisfaction) compared to Lichtenstein group (88%), though not statistically significant ($p>0.05$).
Conclusion: While Lichtenstein repair offers shorter operative time, laparoscopic TAPP hernioplasty provides superior outcomes in terms of reduced postoperative pain, fewer complications, shorter hospital stay, faster recovery, and lower recurrence rates. TAPP is particularly advantageous in older patients and complex hernia cases. The choice of technique should be individualized based on patient characteristics and surgical expertise.

Keywords*: TAPP Hernioplasty; Lichtenstein Repair; Inguinal Hernia; Postoperative Outcomes; Laparoscopic Surgery.*

INTRODUCTION

A hernia is defined as an abnormal protrusion of organs or tissues through a defect or weakness in the surrounding walls from a cavity. Hernias can occur in any part of the body, but they are most commonly found in the abdominal area.[1] Abdominal wall hernias occur only in areas where the aponeurosis and fascia are not reinforced by striated muscle. These areas commonly include the inguinal, femoral, and umbilical regions, the linea alba, the lower part of the semilunar line, and sites of previous surgical incisions. The "neck" or "orifice" of a hernia corresponds to the innermost musculoaponeurotic layer, while the hernia sac, lined with peritoneum, protrudes through this opening. The size of the hernia defect does not consistently correlate with the size of the hernia sac [2].

Hernias may involve intra- or retro peritoneal organs, which can either remain within the hernia sac permanently or protrude intermittently. Depending on the extent of the herniation, hernias are classified as complete (total) when the entire organ or structure protrudes into the hernia sac, or incomplete (partial) when only a portion of the organ or structure is involved. Hernias are further categorized based on their mode of formation. Congenital hernias arise from developmental anomalies, such as a failure of closure in embryonic structures. Examples include umbilical hernias, which occur due to incomplete closure of the umbilical ring, and indirect inguinal hernias, which result from an open processus vaginalis that fails to obliterate during development. Acquired hernias, on the other hand, develop over time due to weakening of the abdominal wall caused by factors such as increased intra-abdominal pressure, aging, trauma, or prior surgeries. Examples of acquired hernias include direct inguinal hernias, which occur through a weakened area in the posterior wall of the inguinal canal; femoral hernias, which emerge through the femoral canal; and incisional hernias, which develop at the site of previous surgical incisions. This classification highlights the diverse mechanisms underlying hernia formation and the importance of understanding their origins for diagnosis and treatment [3].

The incidence of inguinal hernia in the general population ranges from 2% to 4%, with a significant increase in prevalence with age, reaching up to 20% in older individuals. Among hernias, 95% are classified as external, while the remaining 5% are internal. Inguinal hernias account for the majority of all hernias, comprising 75% of cases, of which two-thirds are indirect and one-third are direct. Other types include incisional hernias (10% of cases) and umbilical, femoral, or rarer hernias, which collectively make up 5–7%. Gender differences are evident in hernia occurrence. Approximately 80–90% of inguinal hernias are found in males, whereas 75% of femoral hernias are observed in females. This gender disparity reflects anatomical differences that predispose specific groups to certain types of hernias. Inguinal hernia repair is one of the most frequently performed procedures in general surgery, highlighting its prevalence and the need for surgical management in affected individuals [4].

The surgical management of inguinal hernias primarily involves two techniques: Laparoscopic hernioplasty(Minimally invasive) and Open Lichtenstein's tension-free hernioplasty. Laparoscopic approaches, such as Transabdominal Preperitoneal (TAPP) and Totally Extraperitoneal (TEP), are minimally invasive, offering advantages like faster recovery, reduced postoperative pain, and smaller incisions. These techniques are particularly suitable for bilateral or recurrent hernias. In contrast, the Lichtenstein technique is an open procedure known for its simplicity, safety, and low recurrence rates. It involves placing a mesh over the hernia defect without tension on surrounding tissues and is often performed under local anesthesia using a standardized method [5].

This study aimed to compare total transabdominal preperitoneal (TAPP) hernioplasty with Lichtenstein's open hernioplasty in terms of outcomes and complications, to evaluate whether laparoscopic hernioplasty is superior or comparable to the open technique.

MATERIALS AND METHODS

This prospective interventional study, conducted over two years (May 2023 to May 2025) at the Government General Hospital in Kakinada, Andhra Pradesh, will enroll randomly selected patients admitted to the general surgery and emergency departments with a diagnosis of hernia requiring surgical intervention.

Inclusion Criteria:

- Patients aged 18 to 60 years.
- Cases of reducible unilateral hernias (Incomplete and complete, Bubonocoele).
- Cases of reducible bilateral inguinal hernias.
- Patients who provided informed consent.

Exclusion Criteria:

- Patients with complicated hernias.
- Patients with excessively large hernias.
- Cases of recurrent hernias.
- Immunocompromised patients.
- Patients deemed unfit for general anesthesia.
- Patients with a history of prior surgeries.

Sample Size: A sample of 50 patients is taken using non probability consecutive sampling method divided into two groups.

- **Group 1:** 25 patients undergoing Total Transabdominal Preperitoneal (TAPP) hernioplasty.
- **Group 2:** 25 patients undergoing Lichtenstein's open hernioplasty.

STUDY PROCEDURE:

Preoperative Evaluation

- Informed consent was obtained from all participants before the commencement of the study.
- A detailed clinical history and thorough physical examination were conducted for each patient. Baseline investigations included a complete blood count, renal and liver function tests, and imaging studies such as ultrasound when needed for hernia evaluation.

Randomization and Group Allocation

Participants were allocated to one of two groups using consecutive sampling until each group reached 25 patients. Group 1 underwent Total Transabdominal Preperitoneal (TAPP) hernioplasty, while Group 2 underwent Lichtenstein's open hernioplasty.

Surgical Procedure

Group 1 (TAPP):

The procedure was performed under general anesthesia. Pneumoperitoneum was established, and transabdominal access was gained. Dissection was carried out to expose the hernia sac, and a mesh was placed over the defect preperitoneally and secured. The peritoneum was closed to ensure no mesh exposure.

Group 2 (Lichtenstein):

The procedure was performed under local or spinal anesthesia. An incision was made over the inguinal canal, and the hernia sac was reduced. A polypropylene mesh was fixed to reinforce the inguinal floor, and the wound was closed without tension on the sutures.

Postoperative Care

All patients were monitored for potential complications, such as hematoma, seroma, or infection. Pain management followed a standardized protocol using oral or intravenous analgesics. Early mobilization was encouraged for both groups. Hospital stay duration and postoperative analgesia requirements were recorded.

Outcome Measures

Primary Outcomes:

- Postoperative pain, assessed using the Visual Analog Scale (VAS) at 6, 12, and 24 hours.
- Time to return to normal activities.

Secondary Outcomes:

- Operative time, measured in minutes.
- Length of hospital stay, recorded in days.
- Incidence of complications, including hematoma, wound infection, and neuralgia.
- Recurrence rates within a 6-month follow-up period.

Follow-Up

Patients were followed up at at 6 months, 1 year, and 2 years postoperatively. During follow-up visits, any chronic pain or discomfort, hernia recurrence, and long-term complications were documented.

Data Analysis:

Data from the questionnaires was entered in MS Excel 2016 and was analyzed using SPSS Software version 20. Data is represented in the form of frequencies and percentages with the help of tables, bar diagrams and pie diagrams. Descriptive statistics, including frequency and percentage analysis, were used for categorical variables, while mean and standard deviation were calculated for continuous variables. Bivariate analysis was conducted using the chi-square test, with a p-value of less than 0.05 considered statistically significant.

RESULTS

Table 1:

Variables	Lichtenstein	%	TAPP	%	Total	%
Age (Mean±SD)	42.9±2.20		50.8±2.5			
Gender						
Male	22	88.0	18	72.0	40	80.0
Female	3	12.0	7	28.0	10	20.0

Total	25	100.0	25	100.0	50	100.0

The mean age of patients in the Lichtenstein group was 42.9 years with a standard deviation (SD) of 2.20 years, whereas the mean age in the TAPP group was 50.8 years with an SD of 2.5 years. patients undergoing TAPP hernioplasty were relatively older compared to those in the Lichtenstein group and this difference was statistically significant ($p<0.05$). It was observed that the majority of patients in both groups were males. In the Lichtenstein group, 88% (22 out of 25) of the patients were male, while females accounted for only 12% (3 out of 25). In comparison, the TAPP group had a relatively higher proportion of female patients, with males comprising 72% (18 out of 25) and females contributing to 28% (7 out of 25) of the cases.

Table 2: Distribution based on Co-morbidities

Co-morbidities	Lichtenstein	%	TAPP	%	Total	%
None	17	68.0	20	80.0	37	74.0
BA	1	4.0	0	0.0	1	2.0
COPD	1	4.0	0	0.0	1	2.0
DM	2	8.0	2	8.0	4	8.0
HTN	4	16.0	3	12.0	7	14.0
Total	25	100.0	25	100.0	50	100.0

In the present study, most patients undergoing either Lichtenstein or TAPP hernia repair had no associated co-morbidities (74.0% overall), with a slightly higher proportion in the TAPP group (80.0%) compared to the Lichtenstein group (68.0%). Hypertension (HTN) was the most common co-morbidity observed (14.0%), followed by diabetes mellitus (8.0%). Bronchial asthma (BA) and chronic obstructive pulmonary disease (COPD) were each present in only one patient (2.0%), both from the Lichtenstein group. The distribution of co-morbidities between the two surgical groups was not statistically significant ($p>0.05$)

Table 3: Distribution of Intraoperative and Postoperative Complications

Complication	Lichtenstein (n=25)	%	TAPP (n=25)	%	Total (n=50)	%
Intraoperative Complications						
Nil	24	96.0	25	100.0	49	98.0
Vascular Injury	1	4.0	0	0.0	1	2.0
Postoperative Complications						
Nil	17	68.0	24	96.0	43	86.0
Seroma	6	24.0	1	4.0	7	14.0
Wound Infection	2	8.0	0	0.0	2	4.0
Total Patients	**25**	**100.0**	**25**	**100.0**	**50**	**100.0**

Intraoperative complications were absent in all TAPP patients (100%), while in the Lichtenstein group, 96% had none, with a single case (4%) of vascular injury. Overall, 98% of patients experienced no intraoperative issues, and this difference was not statistically significant ($p>0.05$). Post-operatively, complications were more frequent in the Lichtenstein group. While 96% of TAPP patients had an uneventful recovery, this was true for only 68% of the Lichtenstein group. Seroma was the commonest complication, affecting 24% of Lichtenstein patients versus 4% in the TAPP group. Wound infections occurred in 8% of the Lichtenstein group but none in the TAPP group. This difference in postoperative complication rates was statistically significant ($p<0.05$).

Table 4: Distribution based on Recurrence, Postoperative Pain, and Patient Satisfaction

Parameter	Lichtenstein (n=25)	%	TAPP (n=25)	%	Total (n=50)	%
Recurrence						

Parameter	Lichtenstein (n=25)	%	TAPP (n=25)	%	Total (n=50)	%
Nil	21	84.0	25	100.0	46	92.0
Yes	4	16.0	0	0.0	4	8.0
Postoperative Pain						
Mild	18	72.0	23	92.0	41	82.0
Moderate	6	24.0	2	8.0	8	16.0
Severe	1	4.0	0	0.0	1	2.0
Patient Satisfaction						
Good	22	88.0	24	96.0	46	92.0
Satisfactory	1	4.0	1	4.0	2	4.0
Poor	2	8.0	0	0.0	2	4.0

Analysis of recurrence, postoperative pain, and patient satisfaction revealed notable differences between the two study groups. Regarding recurrence, none of the patients in the TAPP group (0%) experienced a recurrence during the follow-up period, whereas recurrence was observed in 16% (4 patients) of the Lichtenstein group. Overall, recurrence was noted in 8% of the total study population. In terms of postoperative pain, the majority of patients in both groups reported mild pain, accounting for 72% in the Lichtenstein group and 92% in the TAPP group. Moderate pain was experienced by 24% of patients in the Lichtenstein group compared to only 8% in the TAPP group, while severe pain was reported by a single patient (4%) in the Lichtenstein group and none in the TAPP group. Patient satisfaction levels were generally high across both groups, with good satisfaction reported in 88% of Lichtenstein patients and 96% of TAPP patients. Satisfactory outcomes were noted in 4% of patients in each group, while poor satisfaction was observed only in the Lichtenstein group, affecting 8% of patients. Overall, 92% of all patients reported good satisfaction, with only 4% each reporting satisfactory or poor outcomes.

Table 5: Mean Duration of Surgery, Hospital Stay, and Return to Daily Activities

Parameter	Lichtenstein (n=25)	TAPP (n=25)
Mean duration of surgery (minutes)	50.90 ± 16.0	80.75 ± 16.3
Mean duration of hospital stay (days)	7.15 ± 1.98	4.73 ± 1.17
Mean return to daily activities (days)	15.25 ± 2.51	7.80 ± 1.89

The comparison of operative and recovery parameters revealed distinct differences between the two surgical techniques. The mean duration of surgery was considerably shorter in the Lichtenstein group (50.90 ± 16.0 minutes) compared to the TAPP group (80.75 ± 16.3 minutes), indicating that the open procedure was faster to perform. However, recovery outcomes favored the minimally invasive approach, as the TAPP group experienced a markedly shorter mean hospital stay (4.73 ± 1.17 days vs. 7.15 ± 1.98 days) and a substantially quicker return to daily activities (7.80 ± 1.89 days vs. 15.25 ± 2.51 days) when compared to the Lichtenstein group.

DISCUSSION

In the present study, the mean age of patients undergoing Lichtenstein open hernioplasty was 42.9 ± 2.20 years, whereas patients treated with the TAPP laparoscopic technique had a higher mean age of 50.8 ± 2.5 years. This difference was statistically significant ($p<0.05$), indicating that the laparoscopic approach was more frequently utilized in relatively older patients. These findings align with those reported by Gomes CA et al.[6], who documented a higher mean age of 54.6 ± 17

years among patients undergoing hernia repair, with 71.4% of cases involving individuals older than 55 years. The preference for the laparoscopic approach in elderly patients, as noted in both studies, may be attributed to its benefits of faster recovery and reduced postoperative complications, which are particularly advantageous in this age group. In contrast, Salibasic M et al.[7] reported a higher mean age in the Lichtenstein group (59.82 years) compared to the TAPP group (56.26 years), although this difference was not statistically significant (p=0.450).

Regarding gender distribution, the present study observed a male predominance in both surgical groups, with 88% of patients in the Lichtenstein group and 72% in the TAPP group being male. This observation is consistent with the findings of Salibasic M et al.[7], who reported that 98.6% of their study population was males, reflecting the known higher incidence of inguinal hernias among males. Importantly, in both studies, the choice of surgical approach was independent of patient gender, as no statistically significant association was observed (p>0.05).

In terms of co-morbidities, the present study found that most patients were free from co-morbid conditions, with 80% of the Lichtenstein group and 68% of the TAPP group having no associated medical illness. Hypertension and diabetes mellitus were the most common co-morbidities observed. This observation is in concordance with the study by Gomes CA et al., who noted that BMI did not significantly affect the choice of surgical technique (p=0.846), although laparoscopic repair was preferred in obese patients due to its technical advantages. Additionally, seroma formation was significantly associated with higher BMI in their study (p=0.005), highlighting the role of obesity in influencing postoperative outcomes. Bittner R et al.[8] advocated for the laparoscopic approach in obese patients due to its favorable postoperative profile, including fewer wound complications.

Regarding operative time, the current study demonstrated that the mean operative time was significantly longer in the TAPP group (80.75 ± 16.3 minutes) compared to the Lichtenstein group (50.9 ± 16.0 minutes), with a highly significant p-value of 0.001. This observation is similar to the findings of Gomes CA et al.[6], who reported that the open Lichtenstein repair was completed within 90 minutes in 71.4% of cases, whereas 83.1% of laparoscopic repairs exceeded 90 minutes (p=0.047). The prolonged operative time associated with laparoscopy can be attributed to the technical complexity and the learning curve associated with this approach. In line with the present findings, several studies have reported that TAPP hernioplasty generally requires a longer operative time compared to the open Lichtenstein method. Touzi M et al.[9] reported statistically significant longer operative durations in the TAPP group, attributing this to the technical complexity and steep learning curve associated with laparoscopic repairs. Similarly, Bansal VK et al.[10] found that TAPP repair had longer operative times compared to TEP, particularly in less experienced hands.

Analysis of intraoperative complications revealed that they were rare in the present study, with a single case (4%) of vascular injury reported in the Lichtenstein group and none in the TAPP group. Salibasic M et al.[7] similarly reported no significant association between surgical technique and intraoperative complications (p=0.43), and Gomes CA et al.[6] also did not report significant intraoperative bleeding differences between the two techniques.

Postoperative complications, however, were more frequently observed in the Lichtenstein group (32%) in the present study compared to the TAPP group (4%), with seroma formation being the most common complication. This difference was statistically significant (p<0.05). Gomes CA et al.[6] reported a low overall complication rate in both groups, with no significant difference in postoperative seroma formation (p=0.670), although higher BMI was associated with increased seroma risk (p=0.005). In contrast, Salibasic M et al.[7] noted that complications occurred exclusively in the TAPP group (2 patients), and this was also statistically significant (p<0.05). Bansal VK et al.[10] reported that seroma formation was more common in the TEP group, while TAPP was associated with higher rates of cord edema.

Regarding hernia recurrence, the present study reported recurrence only in the Lichtenstein group (16%), whereas no recurrences were observed in the TAPP group, a difference that was statistically significant (p<0.05). Salibasic M et al.[7] similarly reported that all recurrence cases (3 patients) occurred in the Lichtenstein group; however, this difference did not achieve statistical significance (p=0.280). Univariate and multivariate regression analyses in their study further confirmed that surgical technique was not a significant predictor of recurrence. Bittner et al.[8] emphasized that TAPP repair, when executed correctly, is associated with recurrence rates and chronic pain rates below 1%, supporting its efficacy and safety. They further highlighted that while both TAPP and Lichtenstein techniques have similar recurrence outcomes, TAPP provides additional advantages in terms of less postoperative pain and faster recovery. The TAPP procedure has been increasingly favored for complex scenarios such as bilateral or recurrent inguinal hernias. This finding was emphasized by Gomes CA et al.[6] who recommended TAPP as the first-choice procedure in cases involving bilaterality, associated umbilical hernia, obesity, or recurrence following anterior repair. Yang et al. demonstrated the superiority of TAPP in managing recurrent inguinal hernias, reporting lower complication rates and faster recovery compared to Lichtenstein repair, further supporting the adoption of the laparoscopic approach in these clinical scenarios.

Postoperative pain assessment in the present study revealed that mild pain was more commonly reported in the TAPP group (92%) compared to the Lichtenstein group (72%), while moderate to severe pain was more frequent in the Lichtenstein group (28%). This difference was statistically significant (p<0.05). These findings correlate well with the results of Gomes CA et al.[6], who observed that laparoscopy was associated with a higher proportion of pain-free patients (26.3%), with this difference being statistically significant (p=0.025). Additionally, they reported that moderate-to-severe pain was more

common among overweight and obese patients (p=0.03), underscoring the role of BMI in pain perception. The superiority of the TAPP approach in minimizing postoperative pain was strongly supported by multiple studies. The findings of Scheuermann U et al.[11] confirmed that TAPP repair significantly reduces the risk of chronic inguinal pain when compared to Lichtenstein repair (OR = 0.42). This aligns with the results of Salma U et al.[12] who reported lower postoperative VAS scores in the TAPP group. Yang et al further reinforced these observations, demonstrating significantly lower chronic pain rates (3.4% in TAPP vs. 15.9% in Lichtenstein, p=0.031) and reduced analgesic consumption postoperatively in patients undergoing laparoscopic repair.

In the current study, good patient satisfaction was reported by 88% of patients in the Lichtenstein group and 96% in the TAPP group, although this difference was not statistically significant (p>0.05). The findings are consistent with the literature, including the study by Salibasic M et al.[7], where no significant difference in patient satisfaction was observed between the two surgical approaches.

The mean duration of hospital stay was significantly shorter in the TAPP group (4.73 ± 1.17 days) compared to the Lichtenstein group (7.15 ± 1.98 days) in the present study (p<0.05). This is in agreement with the findings of Gomes CA et al.[6], who reported that 81.2% of laparoscopic patients were discharged within 24 hours, although the difference was not statistically significant (p=1.122). Salibasic M et al.[7], however, demonstrated that the TAPP technique was a significant predictor of shorter hospital stay (p=0.019 in univariate and p=0.043 in multivariate analysis), reinforcing the advantage of laparoscopy in facilitating early recovery. Consistent with the present study's observations, several recent studies reported a shorter hospital stay and earlier return to routine activities in patients undergoing laparoscopic TAPP repair. Although Gomes CA et al.[6] observed a shorter time to return to work in the Lichtenstein group, the faster recovery associated with TAPP in terms of reduced pain and early mobilization was evident in their findings and was particularly beneficial in patients with bilateral hernias, recurrences, or obesity.

Finally, regarding return to daily activities, the present study found that patients who underwent the TAPP procedure resumed routine activities significantly earlier (mean 7.80 ± 1.89 days) compared to those in the Lichtenstein group (mean 15.25 ± 2.51 days) (p<0.05). In contrast, Gomes CA et al.[6] found that the open Lichtenstein group resumed work earlier within 15 days (78.9%) compared to the laparoscopic group (50.5%) (p=0.019). The difference between the two studies may be attributed to variations in postoperative rehabilitation protocols and patient counseling practices regarding return to activity.

CONCLUSION

In conclusion, both Lichtenstein open hernioplasty and laparoscopic TAPP repair are effective and safe techniques for inguinal hernia repair. The present study highlights that while Lichtenstein repair is associated with shorter operative time, the TAPP approach offers significant advantages in terms of reduced postoperative pain, lower complication rates, shorter hospital stay, and earlier return to daily activities. Laparoscopy was preferred in older patients and complex hernia cases such as bilateral or recurrent hernias. Ultimately, the choice of surgical technique should be individualized based on patient profile, hernia characteristics, and surgical expertise, with laparoscopy emerging as a favorable option for enhanced recovery and better postoperative outcomes.

REFERENCES

1. Sabiston DC, Townsend CM, Beauchamp RD, Evers BM, Mattox KL, editors. Sabiston textbook of surgery: the biological basis of modern surgical practic. 20th edition. Philadelphia, PA: Elsevier; 2017. 2146 p.
2. Kulaylat MN, Karakousis CP. Large gaps of midline abdominal incisions and their management. Am Surg. 2008 Nov;74(11):1094-9.
3. Conze J, Klinge U, Schumpelick V. Hernias. In: Holzheimer RG, Mannick JA, editors. Surgical Treatment: Evidence-Based and Problem-Oriented. Munich: Zuckschwerdt; 2001. Available from: https://www.ncbi.nlm.nih.gov/books/NBK6888/.
4. Rutkow IM, Robbins AW. Demographic, classificatory, and socioeconomic aspects of hernia repair in the United States. Surg Clin North Am. 1993 Jun;73(3):413-26. doi: 10.1016/s0039-6109(16)46027-5.
5. Bringman, S., Ramel, S., Heikkinen, T., Englund, T., Westman, B., & Anderberg, B. (2003). Tension-Free Inguinal Hernia Repair: TEP Versus Mesh-Plug Versus Lichtenstein: A Prospective Randomized Controlled Trial. Annals of Surgery, 237, 142-147.
6. 40. Gomes CA, Gomes FC, Podda M, Braga APF, Ribeiro SC, Vaz LF. Lichtenstein versus laparoscopic transabdominal preperitoneal (TAPP) hernia repair: a prospective comparative study focused on postoperative outcomes in a general surgery unit. *Arq Bras Cir Dig*. 2022 Jan 31;34(4):e1642.
7. Salibašić M, Hodzić E, Bičakčić E, Halilović E, Ganić S. Lichtenstein versus laparoscopic transabdominal preperitoneal (TAPP) hernia repair: retrospective study. South-East European Endo-Surgery. 2024;3:198-205.
8. Bittner R, Schwarz J. Primary unilateral not complicated inguinal hernia: our choice of TAPP, why, results and review of literature. Hernia. 2019 Jun;23(3):417-428.
9. Touzi M, Khefacha F, Saidani A, Belhadj A, Chebbi F. Inguinal hernia repair: Transabdominal preperitoneal (TAPP) versus Lichtenstein hernioplasty. Br J Surg. 2024;
10. Bansal VK, Misra MC, Babu D, Victor J, Kumar S, Sagar R, Rajeshwari S, Krishna A, Rewari V. A prospective, randomized comparison of long-term outcomes: chronic groin pain and quality of life following totally

extraperitoneal (TEP) and transabdominal preperitoneal (TAPP) laparoscopic inguinal hernia repair. Surg Endosc. 2013;27(7):2373–82.
11. Salma U, Ahmed I, Ishtiaq S. A comparison of post-operative pain and hospital stay between Lichtenstein's repair and Laparoscopic Transabdominal Preperitoneal (TAPP) repair of inguinal hernia: A randomized controlled trial. Pak J Med Sci. 2015;31(5):1062–6.
12. Scheuermann U, Niebisch S, Lyros O, Jansen-Winkeln B, Gockel I. Transabdominal Preperitoneal (TAPP) versus Lichtenstein operation for primary inguinal hernia repair - A systematic review and meta-analysis of randomized controlled trials. BMC Surg. 2017;17:55. doi: 10.1186/s12893-017-0253-7.