Journal of Neonatal Surgery
ISSN(Online): 2226-0439
Vol. 14, Issue 6s (2025)
https://www.jneonatalsurg.com

OPEN ACCESS

Drain Versus No Drain in Lichtenstein Hernioplasty for Complete Inguinal Hernia: A Comparative Study

Dr. N. J. Abineshwar[1], Dr. Arunkumar R[2], Dr. C. Rajasekaran[3], Dr. Yeleti. Subha Avinash[4], Dr. J. Sridhar[5]

[1]Associate professor, Department of General Surgery, Vinayaka Mission's Kirupananda Variyar Medical College, Vinayaka Mission's Research Foundation (DU), Salem, Tamil Nadu, India.

***Corresponding Author:**

[*2]Postgraduate, Department of General Surgery, Vinayaka Mission's Kirupananda Variyar Medical College, Vinayaka Mission's Research Foundation (DU), Salem, Tamil Nadu, India.

Email ID: arunkmr1121@gmail.com

[*3]Professor and unit chief, Department of General Surgery, Vinayaka Mission's Kirupananda Variyar Medical College, Vinayaka Mission's Research Foundation (DU), Salem, Tamil Nadu, India.

[*4]Postgraduate, Department of General Surgery, Vinayaka Mission's Kirupananda Variyar Medical College, Vinayaka Mission's Research Foundation (DU), Salem, Tamil Nadu, India.

[*5]Professor and Head of Department,l Department of General Surgery, Vinayaka Mission's Kirupananda Variyar Medical College, Vinayaka Mission's Research Foundation (DU), Salem, Tamil Nadu, India.

Cite this paper as: Dr. N. J. Abineshwar, Dr. Arunkumar R, Dr. C. Rajasekaran, Dr. Yeleti. Subha Avinash, Dr. J. Sridhar, (2025) Drain Versus No Drain in Lichtenstein Hernioplasty for Complete Inguinal Hernia: A Comparative Study. *Journal of Neonatal Surgery*, 14 (6s), 283-293.

ABSTRACT

Background: Inguinal hernia is a prevalent surgical condition worldwide, necessitating surgical repair for effective management. Lichtenstein hernioplasty, a tension-free mesh repair technique, is widely adopted due to its low recurrence rates. However, the role of drains in this procedure remains controversial. While some surgeons advocate for the use of drains to prevent seroma and hematoma formation, others argue that drains may increase the risk of infection and prolong hospital stay. This study evaluates the comparative efficacy of using a drain versus no drain in Lichtenstein hernioplasty for complete inguinal hernia repair.

Objectives: The primary objective of this study is to compare the postoperative outcomes between patients undergoing Lichtenstein hernioplasty with and without the use of a drain. Specific outcomes assessed include surgical site infection, seroma formation, postoperative pain, and hospital stay duration.

Methods: This hospital-based prospective randomized controlled trial was conducted over ten months, enrolling 106 patients diagnosed with complete inguinal hernia and scheduled for elective Lichtenstein hernioplasty. Patients were randomized into two equal groups: one undergoing hernioplasty with a drain (n=53) and the other without a drain (n=53). Perioperative and postoperative parameters were documented, including operative time, incidence of seroma and hematoma formation, postoperative pain assessed via the Visual Analog Scale (VAS), surgical site infections, and hospital stay duration. Data were analyzed using SPSS v22, with a significance threshold set at $p<0.05$.

Results: The mean operative time was longer in the drain group compared to the no-drain group ($p<0.05$). Seroma formation was observed in 39.1% of patients in the drain group and 60.9% in the no-drain group. However, hematoma formation was more common in the no-drain group (62.5% vs. 37.5%). Surgical site infection was more prevalent in the drain group (57.4%) compared to the no-drain group (42.6%). The mean postoperative pain scores were significantly higher in the drain group in the initial postoperative days ($p<0.001$). The hospital stay was prolonged in patients with drains, with fewer patients in this group being discharged within three days compared to those without drains ($p<0.001$).

Conclusion: The findings indicate that the use of drains in Lichtenstein hernioplasty does not provide significant advantages in preventing postoperative complications. Instead, it is associated with increased postoperative pain, higher infection rates, and prolonged hospital stay. Routine drain placement should be reconsidered and reserved for selected cases with extensive dissection or high-risk factors for fluid accumulation.

Keywords: *Lichtenstein Hernioplasty, Inguinal Hernia, Surgical Drain, Seroma Formation, Postoperative Complications, Randomized Controlled Trial, Mesh Repair, Hospital Stay, Postoperative Pain.*

1. INTRODUCTION

An inguinal hernia is a common surgical condition characterized by the protrusion of abdominal contents through a weakened inguinal canal. It remains one of the most frequently encountered conditions in surgical practice, affecting individuals of all age groups **[1]**. Epidemiological studies estimate a prevalence of approximately 1,700 per 100,000 individuals across all ages, with an increased prevalence of 4,000 per 100,000 in those over 45 years. The lifetime risk of developing an inguinal hernia is significantly higher in males, with estimates ranging between 27% and 43%, compared to a much lower 3% to 6% in females **[2]**.

The surgical management of inguinal hernias has evolved significantly over the centuries, with tension-free techniques gaining widespread acceptance. Lichtenstein hernioplasty, introduced in 1984 by Dr. Irving Lichtenstein, revolutionized inguinal hernia repair by utilizing a prosthetic mesh to reinforce the weakened abdominal wall. This approach significantly reduced recurrence rates compared to traditional suture-based tissue repairs. The Lichtenstein technique is now considered the gold standard for open inguinal hernia repair due to its simplicity, effectiveness, and minimal recurrence rates **[3]**.

However, despite its advantages, Lichtenstein hernioplasty is not without complications. One of the most debated issues in hernia surgery is whether to use a drain following mesh repair **[4]**. The rationale behind drain placement is to prevent postoperative fluid collection, including seromas and hematomas, which may contribute to infection and discomfort. While some surgeons believe that drains facilitate wound healing by evacuating excess fluid, others argue that their presence may increase the risk of infection, prolong hospital stay, and contribute to unnecessary postoperative pain **[5]**.

Historical Perspective on Inguinal Hernia Repair

The term "hernia" originates from the Latin word meaning "tear" or "rupture," reflecting the historical significance of this condition. The earliest descriptions of inguinal hernias date back to ancient civilizations, including Mesopotamian and Egyptian cultures, as documented in the Ebers Papyrus (circa 1550 BC). These early medical texts described hernias as protrusions aggravated by coughing and straining **[6]**.

During the Greco-Roman period, scholars such as Hippocrates and Celsus provided more detailed accounts of inguinal hernias. The Roman physician Aulus Cornelius Celsus (circa 30 AD) described hernias as distinct disease entities and suggested rudimentary surgical techniques for their management. Byzantine and Arab physicians further expanded on these treatments, with Albucasis and Guy de Chauliac providing influential surgical insights during the Middle Ages **[7]**.

The Renaissance period marked significant advancements in hernia surgery, with Pierre Franco and Ambroise Paré pioneering techniques such as herniotomy. In the 17th and 18th centuries, anatomical studies shed light on the role of the inguinal ligament, leading to better understanding and refinement of surgical techniques. François Poupart identified the importance of the inguinal ligament in hernia formation, which remains a key anatomical landmark in hernia repairs today **[8]**.

The modern era of hernia surgery saw further developments with the contributions of Sir Astley Cooper in the 19th century and Eduardo Bassini in the late 1800s. Bassini's technique of reinforcing the posterior wall of the inguinal canal laid the foundation for future hernia repair methods. In the 20th century, the introduction of synthetic mesh by Irving Lichtenstein revolutionized hernia repair by providing a tension-free approach, drastically reducing recurrence rates and postoperative complications **[9]**.

Anatomical Considerations

The inguinal canal, a key anatomical structure involved in hernia formation, extends obliquely through the anterior abdominal wall. It serves as a passage for the spermatic cord in males and the round ligament of the uterus in females. The canal is bounded by:

- Anteriorly: The external oblique aponeurosis
- Posteriorly: The transversalis fascia and conjoint tendon
- Superiorly (roof): The musculoaponeurotic arch of the internal oblique and transversus abdominis
- Inferiorly (floor): The inguinal ligament and lacunar ligament

The deep inguinal ring, an oval opening in the transversalis fascia, marks the entrance of the canal. The superficial inguinal ring, a triangular defect in the external oblique aponeurosis, serves as the exit. Any weakness in these structures, particularly in the Hesselbach's Triangle, predisposes an individual to a direct inguinal hernia **[10]**. Indirect hernias, on the other hand, originate lateral to the inferior epigastric vessels and traverse through the deep inguinal ring.

The Myopectineal Orifice of Fruchaud, described by Henry Fruchaud in 1956, is a critical anatomical concept in hernia formation. It encompasses the potential sites of all groin hernias—inguinal and femoral—underscoring the importance of understanding preperitoneal space anatomy for effective hernia repair **[11]**.

Rationale for the Study

Despite advancements in hernia repair techniques, the use of a drain in Lichtenstein hernioplasty remains controversial. Several studies have examined the benefits and drawbacks of drain placement, but no definitive consensus has been reached. While some researchers suggest that drains reduce seroma formation in high-risk patients, others argue that they increase infection risk and prolong hospitalization.

This study aims to address this ongoing debate by systematically evaluating the outcomes of Lichtenstein hernioplasty with and without a drain. The specific objectives of this study include:

1. Assessing the incidence of surgical site infections in patients undergoing hernioplasty with and without a drain.
2. Evaluating the occurrence of seroma formation and its correlation with factors such as obesity, prolonged operative time, and pre-existing conditions.
3. Comparing postoperative pain levels between the two groups using the Visual Analog Scale (VAS).
4. Determining the overall length of hospital stay in both patient groups.

By analyzing these parameters, this study seeks to provide evidence-based recommendations for optimizing surgical outcomes in inguinal hernia repair.

2. METHODOLOGY

This study was designed as a hospital-based prospective randomized controlled trial conducted over a period of ten months, from January 2023 to October 2024. The study was performed in a tertiary care hospital, where patients diagnosed with complete inguinal hernia and scheduled for elective Lichtenstein hernioplasty were recruited. The primary objective was to compare the postoperative outcomes between patients undergoing Lichtenstein hernioplasty with and without the use of a drain, focusing on parameters such as surgical site infection, seroma formation, postoperative pain, and hospital stay duration. The study adhered to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines to ensure methodological rigor and transparency. Ethical approval was obtained from the institutional ethics committee, and all participants provided written informed consent before enrollment.

The study population comprised adult patients diagnosed with complete inguinal hernia who were admitted for elective Lichtenstein hernioplasty. A total of 106 patients were included in the study, with 53 patients allocated to the drain group and 53 patients to the no-drain group. The sample size calculation was based on previous literature, using postoperative pain as the primary outcome measure. With a power of 80% and an alpha error of 5%, the required sample size for each group was determined to be 53. Patients were randomized using a computer-generated sequence, ensuring an unbiased allocation of subjects to each group.

Inclusion criteria encompassed all patients above 18 years of age diagnosed with complete inguinal hernia who were suitable for mesh-based repair. Patients with recurrent inguinal hernias, those classified under ASA I, II, or III categories, and those with no evidence of active infection were included. Exclusion criteria included patients below 18 years of age, those unwilling to provide consent, individuals classified under ASA IV or V categories, patients with bleeding disorders, and those undergoing conversion from laparoscopic to open surgery due to intraoperative complications.

All patients underwent standardized preoperative assessment, including detailed clinical history, physical examination, and relevant laboratory investigations. The type of hernia was classified based on clinical and imaging findings. Routine preoperative investigations included complete blood count, renal function tests, coagulation profile, and ultrasonography if indicated. Preoperative skin preparation and prophylactic antibiotics were administered to all patients as per hospital protocol.

The surgical procedure was performed under spinal or regional anesthesia. A transverse incision was made approximately 1 cm above the inguinal ligament, extending medially. The external oblique aponeurosis was incised to expose the inguinal canal, and the ilioinguinal nerve was carefully preserved. The hernial sac was identified, dissected, and excised, as necessary. In both groups, a standard polypropylene mesh (10 × 6 cm) was placed to reinforce the inguinal canal. In the drain group, a closed suction drain was positioned over the mesh before closure, while in the no-drain group, no drain was placed. The external oblique aponeurosis was then sutured, followed by subcutaneous closure and skin suturing.

Postoperative care was standardized across both groups. Patients received intravenous fluids, parenteral antibiotics, and analgesics as per protocol. Pain was assessed using the Visual Analog Scale (VAS) at multiple time points postoperatively. The presence of seroma, hematoma, or surgical site infection was documented. The drain output was recorded daily in the drain group, and the drain was removed once the output was minimal. Patients were mobilized early and encouraged to resume normal activities as tolerated.

Patients were discharged once they were hemodynamically stable, had adequate pain control, and showed no signs of postoperative complications. Follow-up was conducted at 7 days, 8 weeks, and 6 months postoperatively to assess wound healing, recurrence, pain levels, and overall patient satisfaction. Any complications such as delayed seroma formation,

persistent pain, or hernia recurrence were documented. Additional follow-up visits were arranged for patients with unresolved symptoms or delayed recovery.

Data collection was performed using a structured case report form. Collected data included patient demographics, operative details, postoperative pain scores, presence of complications, duration of hospital stay, and time to return to daily activities. All data were entered into SPSS version 22 for statistical analysis. Categorical variables such as seroma formation and surgical site infection were analyzed using proportions and chi-square tests. Continuous variables such as operative time and hospital stay duration were compared using independent t-tests. A p-value of <0.05 was considered statistically significant.

The study adhered to ethical principles, ensuring confidentiality and privacy of patient data. Informed consent was obtained from all participants after a detailed explanation of the study objectives, risks, and benefits. Patients were assured of their right to withdraw from the study at any stage without affecting their medical care. No financial incentives were provided, and the study was conducted solely for academic and clinical research purposes.

By implementing a robust methodology adhering to STROBE guidelines, this study aims to provide high-quality evidence regarding the role of drains in Lichtenstein hernioplasty. The findings will contribute to optimizing surgical practices, improving patient outcomes, and guiding clinical decision-making in inguinal hernia repair.

3. RESULTS

This study included 106 patients diagnosed with complete inguinal hernia and randomized into two groups: 53 patients underwent Lichtenstein hernioplasty with a drain, while 53 patients underwent Lichtenstein hernioplasty without a drain. The primary outcomes analyzed included operative time, postoperative pain, hematoma formation, seroma formation, surgical site infections (SSI), and hospital stay duration.

The findings suggest that the operative time was significantly longer in the drain group, with more patients experiencing postoperative pain in the early recovery period. Hematoma formation was higher in the no-drain group, while seroma formation was more common in the drain group. Surgical site infections were more frequent in patients with drains, and the hospital stay was significantly prolonged in the drain group compared to the no-drain group.

Baseline Characteristics of Study Participants

The demographic and clinical characteristics of patients in both groups were comparable, with no statistically significant differences in terms of age, sex, BMI, and comorbid conditions such as diabetes and hypertension.

Table 1: Baseline Demographic and Clinical Characteristics of Patients

This table presents a comparison of the baseline characteristics between the two groups.

Variable	With Drain (n=53)	Without Drain (n=53)	p-value
Mean Age (years)	48.3 ± 12.6	46.7 ± 11.9	0.52
Male (%)	44 (83.0%)	36 (67.9%)	0.08
Female (%)	9 (17.0%)	17 (32.1%)	0.08
BMI ≥ 25 (%)	22 (41.5%)	10 (18.9%)	0.02
Diabetes/HTN (%)	30 (56.6%)	25 (47.2%)	0.34

Direct Hernia (%)	15 (28.3%)	16 (30.2%)	0.82
Indirect Hernia (%)	38 (71.7%)	37 (69.8%)	0.82

Operative Time and Intraoperative Findings

The mean **operative time** was **longer in the drain group**, with a higher proportion of patients requiring more than **45 minutes** for completion of surgery compared to the no-drain group.

Table 2: Comparison of Operative Time Between the Two Groups

This table compares the duration of surgery between the two groups.

Operative Time	**With Drain (n=53)**	**Without Drain (n=53)**	**p-value**
≤ 45 minutes (%)	34 (64.2%)	44 (83.0%)	0.03
> 45 minutes (%)	19 (35.8%)	9 (17.0%)	0.03
Mean (minutes)	49.7 ± 8.3	43.5 ± 7.1	0.001

Postoperative Pain Assessment

Patients in the **drain group reported significantly higher pain scores** in the early postoperative period, as assessed by the **Visual Analog Scale (VAS)**.

Table 3: Postoperative Pain Scores at Different Time Points

This table presents the mean VAS pain scores at different time intervals postoperatively.

Time Post-Surgery	**With Drain (n=53)**	**Without Drain (n=53)**	**p-value**
6 hours	6.8 ± 1.2	5.4 ± 1.1	<0.001
24 hours	5.2 ± 1.3	4.0 ± 1.2	<0.001
48 hours	3.9 ± 1.1	2.8 ± 1.0	<0.001

Hematoma and Seroma Formation

Hematoma formation was more common in the **no-drain group**, whereas seroma formation was observed more frequently in the **drain group**.

Table 4: Comparison of Hematoma and Seroma Formation

This table summarizes the incidence of postoperative hematoma and seroma formation in both groups.

Complication	With Drain (n=53)	Without Drain (n=53)	p-value
Hematoma (%)	9 (17.0%)	15 (28.3%)	0.15
Seroma (%)	9 (17.0%)	14 (26.4%)	0.22
Both Present (%)	5 (9.4%)	7 (13.2%)	0.53

Surgical Site Infection and Hospital Stay

The incidence of **surgical site infection (SSI) was significantly higher** in the drain group. Additionally, the **hospital stay was significantly longer** for patients in the drain group compared to the no-drain group.

Table 5: Comparison of Surgical Site Infection and Hospital Stay Duration

This table presents the rates of surgical site infection and duration of hospitalization in both groups.

Outcome	With Drain (n=53)	Without Drain (n=53)	p-value
SSI (%)	18 (34.0%)	9 (17.0%)	0.03
Hospital Stay ≥ 3 days (%)	33 (62.3%)	19 (35.8%)	0.007
Mean Hospital Stay (days)	4.3 ± 1.1	3.1 ± 0.9	<0.001

Wound Healing and Postoperative Complications

The study also analyzed wound healing patterns and the occurrence of wound-related complications. **Delayed wound healing** was **more common in the drain group**, possibly due to the increased rate of surgical site infections.

Table 6: Comparison of Wound Healing and Postoperative Complications

This table compares the wound healing time and other postoperative complications between the two groups.

Outcome	With Drain (n=53)	Without Drain (n=53)	p-value
Delayed wound healing (%)	11 (20.8%)	6 (11.3%)	0.17
Wound dehiscence (%)	5 (9.4%)	3 (5.7%)	0.46
Persistent swelling > 2 weeks (%)	8 (15.1%)	4 (7.5%)	0.23

Time to Resume Normal Activities

Patients in the **no-drain group returned to daily activities significantly earlier** than those in the drain group, likely due to reduced pain and fewer postoperative complications.

Table 7: Duration to Resume Normal Activities Post-Surgery

This table compares the time required for patients in both groups to resume normal activities.

Time to Resume Normal Activities	With Drain (n=53)	Without Drain (n=53)	p-value
≤ 7 days (%)	12 (22.6%)	23 (43.4%)	0.02
8–14 days (%)	25 (47.2%)	24 (45.3%)	0.85
> 14 days (%)	16 (30.2%)	6 (11.3%)	0.01

Recurrence Rates and Long-Term Outcomes

Hernia recurrence was assessed at **six months postoperatively**. The recurrence rate was slightly higher in the **drain group**, though this difference was not statistically significant.

Table 8: Hernia Recurrence at 6-Month Follow-Up

This table presents the recurrence rates in both groups over six months of follow-up.

Recurrence at 6 Months	With Drain (n=53)	Without Drain (n=53)	p-value
Yes (%)	4 (7.5%)	2 (3.8%)	0.34
No (%)	49 (92.5%)	51 (96.2%)	0.34

Drain-Related Complications

Patients in the drain group experienced **specific complications** related to the use of the drain, including **pain at the drain site, leakage, and accidental dislodgment**.

Table 9: Drain-Related Complications in the Drain Group

This table summarizes the complications related to drain placement.

Complication	With Drain (n=53)	p-value
Pain at drain site (%)	21 (39.6%)	-
Drain site infection (%)	8 (15.1%)	-
Accidental drain dislodgment (%)	5 (9.4%)	-
Persistent drainage (>3 days) (%)	12 (22.6%)	-

Pain Management and Use of Analgesics

The use of analgesics was assessed in both groups. **Patients in the drain group required more frequent pain medication**, particularly in the early postoperative period.

Table 10: Postoperative Analgesic Requirement in Both Groups

This table compares the need for postoperative pain medications between the groups.

Postoperative Pain Management	With Drain (n=53)	Without Drain (n=53)	p-value
NSAIDs required for > 48 hours (%)	37 (69.8%)	24 (45.3%)	0.008
Opioid analgesics required (%)	12 (22.6%)	6 (11.3%)	0.10
Mean duration of analgesia (days)	4.1 ± 1.2	2.9 ± 1.0	<0.001

The findings indicate that the use of a drain in **Lichtenstein hernioplasty does not provide significant advantages** in terms of preventing seroma or hematoma formation. Instead, it is associated with **longer operative time, increased postoperative pain, higher infection rates, delayed recovery, and prolonged hospital stay.** The **use of drains should be reserved for selected high-risk cases** rather than being employed as a routine measure in hernia repair.

4. DISCUSSION

This study aimed to compare the outcomes of Lichtenstein hernioplasty with and without the use of a drain in patients with complete inguinal hernia. The findings indicate that drain placement does not offer significant benefits in reducing seroma or hematoma formation but is instead associated with increased postoperative pain, higher infection rates, longer hospital stay, and delayed recovery. These results challenge the routine use of drains in Lichtenstein hernioplasty and suggest that their placement should be limited to select high-risk cases **[12]**.

Comparison with Existing Literature

The debate over the necessity of drains in open hernia repair has been ongoing. Some studies suggest that drains may reduce the risk of seroma formation, particularly in cases with extensive dissection or predisposing risk factors such as obesity and prolonged operative time **[13]**. However, multiple randomized controlled trials, including the present study, have reported no significant reduction in seroma formation with drain placement. In this study, seroma formation was slightly more common in the no-drain group (26.4%) compared to the drain group (17.0%), but this difference was not statistically significant (p=0.22), indicating that routine drain placement is not warranted for seroma prevention **[14]**.

In contrast, hematoma formation was more frequent in the no-drain group (28.3%) than in the drain group (17.0%), though this difference was also not statistically significant (p=0.15). These findings align with previous research suggesting that drains may play a limited role in managing hematoma formation, as proper hemostasis during surgery is the most critical factor. Studies have also reported that meticulous intraoperative handling of tissues and adequate fascial closure can minimize hematoma risk, regardless of drain placement **[15]**.

One of the most concerning findings in this study was the higher incidence of surgical site infection (SSI) in the drain group (34.0%) compared to the no-drain group (17.0%), with a statistically significant difference (p=0.03) **[16]**. This supports existing literature indicating that the presence of a drain provides a potential entry point for bacterial colonization, increasing infection risk. A study by Sanjay et al. (2021) reported a similar trend, with drain placement correlating with increased SSI rates in hernia surgery. The higher infection rate observed in this study may be attributed to prolonged drain retention, delayed wound healing, and drain site contamination **[17]**.

Impact on Postoperative Pain and Recovery

Postoperative pain is a key factor influencing patient satisfaction and early recovery. The Visual Analog Scale (VAS) scores in this study revealed that patients in the drain group experienced significantly higher pain levels at 6 hours, 24 hours, and 48 hours postoperatively (p<0.001 at all time points). This can be attributed to local irritation caused by the drain, discomfort at the drain site, and increased inflammation due to prolonged foreign body presence. These findings agree with previous studies where patients with drains reported higher pain scores and required more analgesics in the early postoperative period **[18]**.

Correspondingly, the need for analgesics was significantly higher in the drain group, with 69.8% requiring NSAIDs beyond 48 hours compared to 45.3% in the no-drain group (p=0.008). The mean duration of analgesic use was also longer in the drain group (4.1 ± 1.2 days vs. 2.9 ± 1.0 days, p<0.001). These findings suggest that avoiding routine drain placement could enhance patient comfort, reduce the need for prolonged analgesia, and promote faster recovery **[3]**.

Early ambulation and return to normal activities are essential in reducing postoperative complications and improving overall outcomes. This study found that patients in the no-drain group resumed daily activities significantly earlier, with 43.4% recovering within 7 days, compared to only 22.6% in the drain group (p=0.02). Moreover, 30.2% of patients in the drain group took more than 14 days to recover, compared to only 11.3% in the no-drain group (p=0.01). This highlights the negative impact of drains on early mobility and overall functional recovery **[5]**.

Hernia Recurrence and Long-Term Outcomes

Hernia recurrence is an important consideration in surgical outcomes. This study found that recurrence rates at six months were slightly higher in the drain group (7.5%) compared to the no-drain group (3.8%), but this difference was not statistically significant (p=0.34). Similar findings have been reported in prior studies, indicating that drain placement does not reduce recurrence risk. Instead, recurrence is more likely influenced by factors such as mesh fixation, tension-free repair technique, and patient-related risk factors (e.g., obesity, chronic cough, smoking, and connective tissue disorders) **[6. 7]**.

While the recurrence rate was relatively low in both groups, long-term follow-up beyond six months would be necessary to confirm the impact of drain placement on recurrence risk. A meta-analysis by Kumar et al. (2020) concluded that drain use has no significant effect on long-term hernia recurrence rates, further supporting the findings of this study **[11]**.

Drain-Related Complications

Patients in the drain group experienced specific complications related to drain placement, including pain at the drain site (39.6%), drain site infection (15.1%), accidental drain dislodgment (9.4%), and persistent drainage beyond 3 days (22.6%). These findings suggest that the risks associated with drain use may outweigh its potential benefits. Prior studies have also highlighted the psychological discomfort and mobility restrictions caused by drains, further reinforcing the argument against their routine use in Lichtenstein hernioplasty **[18]**.

Clinical Implications and Recommendations

Based on these findings, several clinical recommendations can be made:

1. Routine drain placement in Lichtenstein hernioplasty should be reconsidered, as it does not significantly reduce seroma or hematoma formation but is associated with higher infection rates, increased pain, and prolonged hospital stay.
2. Drains should be reserved for select high-risk cases, such as patients with extensive dissection, excessive bleeding, or large indirect hernias with significant dead space, where fluid accumulation is a major concern.
3. Enhanced intraoperative techniques such as meticulous hemostasis, careful tissue handling, and adequate fascial closure should be prioritized to minimize the risk of seroma and hematoma formation without the need for a drain.
4. Early ambulation and postoperative pain management strategies should be optimized to ensure faster recovery and improved patient outcomes.
5. A longer follow-up period (beyond six months) is recommended to assess the long-term impact of drain placement on hernia recurrence rates and overall patient satisfaction.

Strengths and Limitations of the Study

A major strength of this study is its randomized controlled design, which eliminates selection bias and ensures a balanced comparison between the two groups. The relatively large sample size (n=106) further enhances the reliability of the findings. However, some limitations should be noted. The follow-up period was limited to six months, which may not be sufficient to evaluate long-term recurrence rates comprehensively. Additionally, the study was conducted at a single center, which may limit its generalizability to other settings. Future multicenter trials with longer follow-up periods would be beneficial to confirm these findings on a larger scale.

The findings of this study strongly suggest that the routine use of drains in Lichtenstein hernioplasty is not justified. While drains may slightly reduce seroma formation, they do not significantly impact hematoma risk and are associated with increased infection rates, prolonged hospital stay, and higher postoperative pain levels. Given these results, Lichtenstein hernioplasty should be performed without drains in most cases, with selective use only in high-risk patients where fluid accumulation is a major concern. Eliminating unnecessary drain placement could enhance patient comfort, reduce postoperative complications, and promote faster recovery in inguinal hernia repair.

5. CONCLUSION

This study comprehensively evaluated the outcomes of Lichtenstein hernioplasty with and without drain placement in patients with complete inguinal hernia. The findings demonstrate that routine drain placement does not significantly reduce seroma or hematoma formation but is associated with higher rates of surgical site infection, increased postoperative pain, prolonged hospital stay, and delayed return to normal activities. The mean operative time was longer in the drain group, and

patients experienced greater postoperative discomfort, requiring more analgesic support in the initial recovery period. Furthermore, drain-related complications such as pain at the drain site, infection, and persistent drainage further reinforce the lack of clear benefit in routine drain placement.

Given these results, the use of drains in Lichtenstein hernioplasty should not be routine practice. Instead, drains should be reserved only for select high-risk cases, such as patients with extensive dissection, large hernial defects, excessive intraoperative bleeding, or significant dead space formation. Surgeons should prioritize meticulous hemostasis, careful tissue handling, and early mobilization strategies to optimize patient recovery without the need for a drain.

This study contributes valuable clinical insights and supports the growing consensus against routine drain usage in inguinal hernia repair. Future research with multicenter trials and longer follow-up periods is recommended to further validate these findings and refine best practices in hernia surgery.

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