Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.6 No. 6 (2025): June 2025 Issue
https://doi.org/10.51168/sjhrafrica.v6i6.1861
Original Article

# Clinical outcomes of lichtenstein's tension-free inguinal hernioplasty under local anesthesia: A prospective study.

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## Abstract

### Background

A portion of a viscus protruding through the inguinal canal is commonly referred to as an inguinal hernia. Types of hernias that are inguinal, that is, either direct or indirect, were distinguished by Casper Stromayr in 1559. However, in terms of contemporary surgical biology, hernia of the inguinal is termed to be useless in terms of direct or indirect distinction because only traction or removal of the inferior epigastric arteries can change one into the other.

### Objectives

The purpose of the study was to evaluate the clinical results of local anesthesia-assisted Lichtenstein's tension-free inguinal hernioplasty.

### Materials and Methods

A prospective investigation was conducted. At the Mata Gujri Memorial Medical College and Lions Seva Kendra Hospital, Kishanganj, Bihar, India, the study was carried out. It has been conducted for 18 months. A total of sixty patients were included in the research. Participants in the study were chosen from the General Surgery Outpatient Department's inguinal hernia wards. Not all instances of strangulated and blocked hernias were included.

### Results

Four patients (6.67%) had retention or urine, two patients (3.33%) had infection, four patients (6.67%) had seroma, one patient (1.67%) had hematoma, two patients (3.33%) had scrotal enlargement, and two patients (3.33%) had induration. A visual analog scale was used to carefully assess pain severity and classify it as mild, if the score ranges between 0 to 3, moderate if the score ranges between 4 to 5, and severe if the score ranges from 6–10.

### Conclusion

According to the study's findings, the techniques used for tension-free Lichtenstein's inguinal hernioplasty under anesthesia that is local are safe, easy, cost-effective, and devoid of adverse effects such as spinal headaches, nausea, vomiting, hypotension, and retention of urine.

### Recommendations

Future research may also be carried out to clarify the results for a larger population.

***Keywords-*** *Local anesthesia, Lichtenstein repair, inguinal hernia, inguinal hernioplasty*
***Submitted: 2025-03-29 Accepted: 2025-06-03 Published: 2025-06-13***

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## Introduction

A viscus or a portion of a viscus protruding through the inguinal canal is commonly referred to as an inguinal hernia. Direct and indirect types of inguinal hernias were distinguished by Casper Stromayr in 1559. However, in terms of contemporary surgical biology, this distinction between direct and indirect inguinal hernias is useless because only traction or removal of the inferior epigastric arteries can change one into the other. However, the

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distinction between congenital and acquired conditions is still widely used today. The patent processus vaginalis is known to protrude simply in the congenital variation. In contrast, herniation in the acquired variety is mostly caused by a disruption in collagen metabolism [1, 2].

The transverse abdominal arching fibers approximate the inguinal ligament during effort, strengthening the transversalis fascia. A herniation happens when the musculo-tendinous barrier's buttressing function is compromised. The mere existence of a hernia indicates the canal floor's weakness, therefore there is little use in restoring its normal morphology [3].

Simply put, fascia is a connective tissue with less inherent strength. Since Bassini (1884), most techniques advocate physiologic restoration of the canal floor by corporating the musculo-tendinous arch instead of anatomic repair, which primarily relies on fascia transversalis repair and high ligation of the sac. This is because the structure that supports the abdominal wall is the collagen-rich aponeurosis [4].

Avoiding tension when rebuilding the elastic or muscular components is the most crucial rule in reconstructive surgery. An old proverb eloquently explains this idea. It is against reconstructive surgery principles to try to sew the dynamic muscle side into the ligament of Cooper's which cannot move and is fixed. In addition to being physiologically naïve and structurally harmful, pulling muscle tissue to an immovable framework causes mainly discomfort and severe pain in future phases of follow-up and in the duration of the study [5].

Conversely, the principles of reconstructive surgery are fulfilled by a patch between moveable structures. This makes a patch structurally sound, mechanically reasonable, and delightfully simple. The current physiologically based idea for repairing a groin hernia that was developed in adulthood involves applying a patch, avoiding tension, and using local, spinal, or epidermal anesthesia. To test the outcome during surgery. With minimal post-operative discomfort, simple micturition, early return to regular activities, and an almost nil long-term recurrence rate, this surgery can be the preferred method for hernia repair. Synthetic materials, such as polypropylene mesh, are the best for patches due to their inertness and pliability.

The purpose of the study was to evaluate the clinical results of local anesthesia-assisted Lichtenstein's tension-free inguinal hernioplasty.

## Methodology

### Study Design

It was a prospective, observational study. At the Mata Gujri Memorial Medical College and Lions Seva Kendra Hospital, Kishanganj, Bihar, India, the study was carried out. The study has been conducted for 18 months, i.e., from June 2023 to November 2024.

### Study Population

A total of sixty patients were included in the research. Patients over the age of 18 who were admitted for primary inguinal hernia repair as an outpatient procedure utilizing an open surgical approach with mesh and who previously had prehabilitation were eligible to be included. Collagen diseases, inguinal hernias that were strangulated or imprisoned, hernia recurrence, prior preperitoneal space alteration (prostatectomy, cystectomy), untreated benign prostatic hyperplasia, inguinal, abdominal, or systemic active soft tissue infection, and patients younger than 18 years were excluded. Our inclusion and exclusion criteria were predetermined to minimize selection bias. Over a predetermined period, all of the study's patients were chosen either sequentially or at random from a predetermined population.

### Study Procedure

For a unilateral hernia repair, all patients in this series of hernioplasty procedures had local anesthesia with the use of 45 milliliters on average of a solution containing lidocaine which is one percent and 0.5% bupivacaine, with or without epinephrine. All patients are monitored during the intraoperative operation to ensure they accept the local anesthetic technique. To test the strength of the repair, the patient is asked to cough and execute the Valsalva maneuver because he is conscious and cooperative. A continuous absorbable suture was used to seal the external oblique aponeurosis over the cord.

The scale of score of visual pain and the need for further analgesia or sedative analgesics were used to carefully evaluate and categorize the post-operative pain. Just before

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the incision and 12 hours following the procedure, a 1-gram intravenous injection of Reflin was administered to provide antibiotic coverage. After that, 625 mg TDS of amoxicillin and clavulanic acid is administered for five days. If there were no additional contraindications, patients who had undergone local anesthesia were permitted to move freely for twelve hours.

To check for early post-operative problems including seroma and hematoma, the first dressing change was performed in a strictly aseptic way 48 hours after the procedure. In order to check for any wound infections, the second dressing change was performed in a strictly aseptic way five days following the first. After one week, four weeks, two months, and then every month for the next six months, the discharge of the patients was given after instructing them about further follow-up and attending it. Additionally, the patient was instructed to go to OPD if a problem arose later.

## Statistical Analysis

Microsoft Excel was initially used to enter the data. Numbers (n) and percentages (%) were used to display the data.

## Results

Initially, 80 patients were thought to be eligible for the trial. Of these, 65 satisfied the inclusion requirements after 70 were evaluated for eligibility. Sixty participants were enlisted after five people were rejected to participate. Following surgery and follow-up, all 60 patients had their data incorporated into the final analysis.

Sixty-three percent of the participants were in the age range of 31 to 60. Compared to left-sided hernias (41.7%), right-sided hernias were more prevalent (58.3%). Since indirect hernias are more common overall, especially in younger men, the prevalence of indirect hernias was higher (60.0%) than that of direct hernias (40.0%). The demographics of the enrolled participants are shown in Table 1.

**Table 1. Patients Demographics**

| Variable | Category | Number of Participants (n) | Percentage (%) |
|---|---|---|---|
| **Age Group (years)** | 18–30 | 12 | 20.0% |
| | 31–45 | 20 | 33.3% |
| | 46–60 | 18 | 30.0% |
| | >60 | 10 | 16.7% |
| **Gender** | Male | 56 | 93.3% |
| | Female | 4 | 6.7% |
| **Side of Hernia** | Right-sided | 35 | 58.3% |
| | Left-sided | 25 | 41.7% |
| **Type of Hernia** | Direct | 24 | 40.0% |
| | Indirect | 36 | 60.0% |
| **Comorbidities** | Present | 8 | 13.3% |
| | Absent | 52 | 86.7% |
| **ASA Grade** | I | 45 | 75.0% |
| | II | 15 | 25.0% |

Over the course of one and a half years, 60 cases with inguinal hernia are included in this study. These instances were all examined prospectively, and the findings were examined from a number of perspectives. A visual analogue scale was used to carefully assess pain severity and classify it as mild, if the score ranges between 0 to 3, moderate if the score ranges between 4 to 5, and severe if the score ranges from 6–10. The degree of pain experienced by subjects is shown in Table 2.

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**Table 2. Severity of Pain Observed among Participants**

| Pain and its types | No. of Participants | Percentage (%) |
|---|---|---|
| **Mild** | 44 | 73.33 |
| **Moderate** | 11 | 18.33 |
| **Severe** | 05 | 8.33 |

Table 3 lists the complications that participants experienced in less than a week. Four patients (6.67%) had retention or urine, two patients (3.33%) had infection, four patients (6.67%) had seroma, one patient (1.67%) had hematoma, two patients (3.33%) had scrotal enlargement, and two patients (3.33%) had induration.

**Table 3. Complications observed among Participants in less than a week**

| Complications and its types | No. of Cases | Percentage (%) |
|---|---|---|
| **Retention of urine** | 04 | 6.67 |
| **Infection** | 02 | 3.33 |
| **Seroma** | 04 | 6.67 |
| **Hematoma** | 01 | 1.67 |
| **Scrotal swelling** | 02 | 3.33 |
| **Induration** | 02 | 3.33 |

Table 4 depicts complications and their types observed among participants in more than a week.

**Table 4. Complications and their types observed among participants over more than a week**

| Complications | Number of Participants | Percentage (%) |
|---|---|---|
| **Scar tenderness** | 01 | 1.67 |
| **Post-herniorrhaphy pain syndrome (neuralgia)** | 06 | 10.00 |
| **Wound dehiscence** | 01 | 1.67 |
| **Testicular atrophy** | 01 | 1.67 |
| **Recurrence** | 00 | 0.00 |
| **No complication** | 51 | 85.00 |

## Discussion

With an emphasis on intraoperative and postoperative outcomes, such as discomfort, complications, and recurrence, this study set out to evaluate the efficacy and safety of Lichtenstein's tension-free inguinal hernioplasty carried out under local anesthesia. A thorough discussion from all angles might be held in light of the study's findings, which are shown in various tables, in order to reach a definitive assessment of Lichtenstein's tension-free inguinal hernioplasty performed under local anesthesia.

Within 48 hours following surgery, the degree of pain is noted. Forty-four cases (73.3%), eleven cases (18.33%), and only five cases (8.33%) experienced severe pain, while the majority of patients experienced mild discomfort.

Fifteen cases (25%) in this study experienced early problems, including four cases (6.67%) with urine retention, two cases (3.33%) with wound infection, four cases (6.67%) with seroma, one case (1.67%) with hemorrhage, two cases (3.33%) with scrotal enlargement, and two cases (3.33%) with induration. The study by Callesen et al. in 1998, which

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found minimal rates of infection, hematoma, and urine retention after hernioplasty under local anesthetic, is consistent with our complication rates. Additionally, our study's lack of hernia recurrence is in line with Lichtenstein's long-term results, which highlighted recurrence rates of less than 1% when the procedure is correctly performed [8].

The combination of edema and wound hemorrhage was blamed for wound induration, which is likely related to the amount of dissection needed for the repair. Ponka reported that the occurrence was 5.2% in Western literature, whereas Desarda found that it was 1.5% [2, 6].

Just 4 (1%), out of 40 individuals in Desarda's collection, had minor skin infections. In 0.58% of Wantz's 4114 hernioplasty instances, there was a mild wound infection [7, 8]. Even though our economically disadvantaged patients had inadequate personal hygiene, the current result was not as depressing as the Western series [9, 10, 11, 12].

The outstanding outcomes of the open tension-free operation of the Lichtenstein, which is less dependent on the surgeon's experience, show how simple the process is and how quickly it can be learned. Types of hernias that are inguinal that are either direct or indirect involving all recurrent hernias, can be safely treated using the same method [13, 14].

## Conclusion

According to the study's findings, the techniques used for tension-free Lichtenstein's inguinal hernioplasty under anesthesia that is local are safe, easy, cost-effective, and devoid of adverse effects such as spinal headaches, nausea, vomiting, hypotension, and retention of urine. Under local anesthesia, an open tension-free inguinal hernioplasty decreases patient suffering to a minimum and has a consistently low recurrence rate. It also enables the patient to be mobilized right away and return to work early. Local infiltration anesthetic is useful and increasingly being used in inguinal hernioplasty, an operation where visceral pain is minimal and deep muscle relaxation is not necessary.

## Limitations

The study's single-centric design and small sample size are among its drawbacks. Results from a small sample might not be representative of the general population. These restrictions could be biased and have poor generalizability, which makes them inadequate for forming generalizations.

## Recommendations

Future research may also be carried out to clarify the results for a larger population.

## List of Abbreviations

OPD- Outpatient Department

TDS- Three times a day

## Acknowledgment

We are thankful to the Department of General Surgery, Mata Gujri Memorial Medical College, and Lions Seva Kendra Hospital, Kishanganj, Bihar, India for their support and contribution to the study.

## Source of Funding

No funding was obtained for the study.

## Conflict of Interest

The authors have no conflicts of interest to declare.

## Availability of Data

All data analysed during this study are included in this published article

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**Original Article**



https://doi.org/10.1016/S0002-9610(70)80178-7 PMid:4249908

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https://doi.org/10.51168/sjhrafrica.v6i6.1861
Original Article

**PUBLISHER DETAILS**

**Student's Journal of Health Research (SJHR)**
(ISSN 2709-9997) Online
(ISSN 3006-1059) Print
Category: Non-Governmental & Non-profit Organization
Email: studentsjournal2020@gmail.com
WhatsApp: +256 775 434 261
Location: Scholar's Summit Nakigalala, P. O. Box 701432, Entebbe Uganda, East Africa