



## Research Article

## Section: General Surgery

### A Comparative Study of Desarda's Technique with Lichtenstein Mesh Repair in Treatment of Inguinal Hernia: A Prospective Randomized Control Study

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## ARTICLE INFO

### Article History:

Received: 22-05-2025

Accepted: 17-06-2025

### Keywords:

Desarda Repair

Lichtenstein Repair

Mesh Problems

Tissue-Based Hernia Repair

And Inguinal Hernia

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## ABSTRACT

**Introduction:** Repair of an inguinal hernia is one of the most prevalent types of surgery. Some mesh-based techniques, such as Lichtenstein repair, have become more popular because they have a lower rate of recurrence. However, the difficulties associated with using a mesh have prompted the creation of alternative tissue-based mending techniques, such as the method devised by Desarda.

**Objective:** To assess the efficacy and safety of the Desarda technique of no mesh repair compared to the Lichtenstein mesh repair for the treatment of primary inguinal hernias.

**Methods:** Prospective randomized control trial was done in PSG Institute of Medical Sciences and Research. Sixty patients diagnosed with unilateral primary inguinal hernia were randomly assigned to receive one of two interventions: the Desarda or Lichtenstein repair. The primary outcome of interest was postoperative complications. The secondary endpoints included the duration of surgery, postoperative pain, length of hospital stay, and resumption of regular activities.

**Findings:** The two groups had the same amount of time in surgery and the same level of complications. The patients who had Desarda repair had a lot less pain after surgery and were able to get back to their normal activities much faster. During the follow-up, none of the cases had any recurrences.

**Conclusion:** The Desarda repair is a viable alternative to the Lichtenstein mesh repair, demonstrating similar effectiveness with reduced pain and expedited recovery time. It provides a cost-effective option in situations where mesh is inaccessible or contraindicated.

## INTRODUCTION

Inguinal hernia is a common surgical operation frequently characterized by the protrusion of abdominal contents through a defect in the inguinal canal. It makes up more than 75% of all hernias of the abdominal wall. It is currently quite common among men, with a 27% lifetime risk for men and a 3% lifetime risk for women (Kingsnorth & LeBlanc, 2003). Repairing the abdominal wall largely by surgery is the usual way to treat it in order to stop it from happening again.

The Lichtenstein tension-free mesh repair is one of the most common ways to fix an inguinal hernia. It was first used in the late 1980s and became quite popular since it is easy to do and the chance of it happening

again is low (Amid, 2004). It involves putting a manufactured mesh in place to support the back wall of the inguinal canal. Even yet, mesh-based repair comes with a lot of problems, such as chronic groin pain, the feeling of a foreign body, mesh migration, infection, and even infertility in men caused by injury to the spermatic cord (Klinge et al., 2005; Bay-Nielsen et al., 2004). Surgeons have had to rethink tissue-based repairs because of these problems. In response, Desarda proposed a novel technique in 2001 that eliminates the necessity for prosthetic mesh. His technique relies on a strip of the external oblique aponeurosis, providing dynamic reinforcement of the inguinal canal without compromising physiological freedom of movement and eliciting a minimal foreign body response (Desarda, 2001).

This technique produces comparable outcomes to mesh utilization regarding recurrence and may offer advantages in terms of pain management and cost-effectiveness (Szopinski et al., 2012; Gedam et al., 2017). This method is particularly relevant for low-resource environments where mesh procedures are inaccessible or inappropriate due to infection risks. Moreover, new concerns regarding the enduring complications associated with mesh have made the adoption of alternate solutions more appealing, particularly in resource-rich environments (Simons et al., 2009). Numerous research have demonstrated the efficacy of Desarda's technique; however, many are inadequately controlled, and most comparative studies involve small samples and limited follow-up periods. Furthermore, this area remains underresearched, particularly regarding Indian data, and in comparison to existing data on both techniques, it is primarily situated within an Indian and tertiary care context, where data is deficient in evaluating the techniques through a randomized controlled design. This limits the applicability of universal findings to local populations. The strength of the present research lies in its design as a prospective randomized study undertaken at an Indian tertiary care institution, directly comparing the Desarda and Lichtenstein procedures concerning short-term surgical outcomes, recovery

profiles, and postoperative complications. The study addresses the existing gap in the literature by providing context-specific data regarding the efficacy and safety of the Desarda approach, thereby implicitly impacting clinical practice and surgical decision-making in a resource-constrained environment.

The objective of this study is to compare the efficacy, safety, and patient-reported outcomes of the Desarda no-mesh repair against the Lichtenstein mesh approach in patients with unilateral primary inguinal hernia. Work-specific outcomes including operation duration, postoperative discomfort, complication rates, hospitalization duration, and the time required to return to routine activities. This study is important because it offers high-quality comparison data to further the exploration of non-mesh hernia repair techniques.

## METHODOLOGY

### Study design:

The prospective randomized controlled study was conducted in the Department of General Surgery, PSG Institute of Medical Sciences and Research, Tamil Nadu, India, from November 2022 to July 2024. The institutional ethics committee approved a research protocol, and all subjects provided informed consent (Simons et al., 2009).

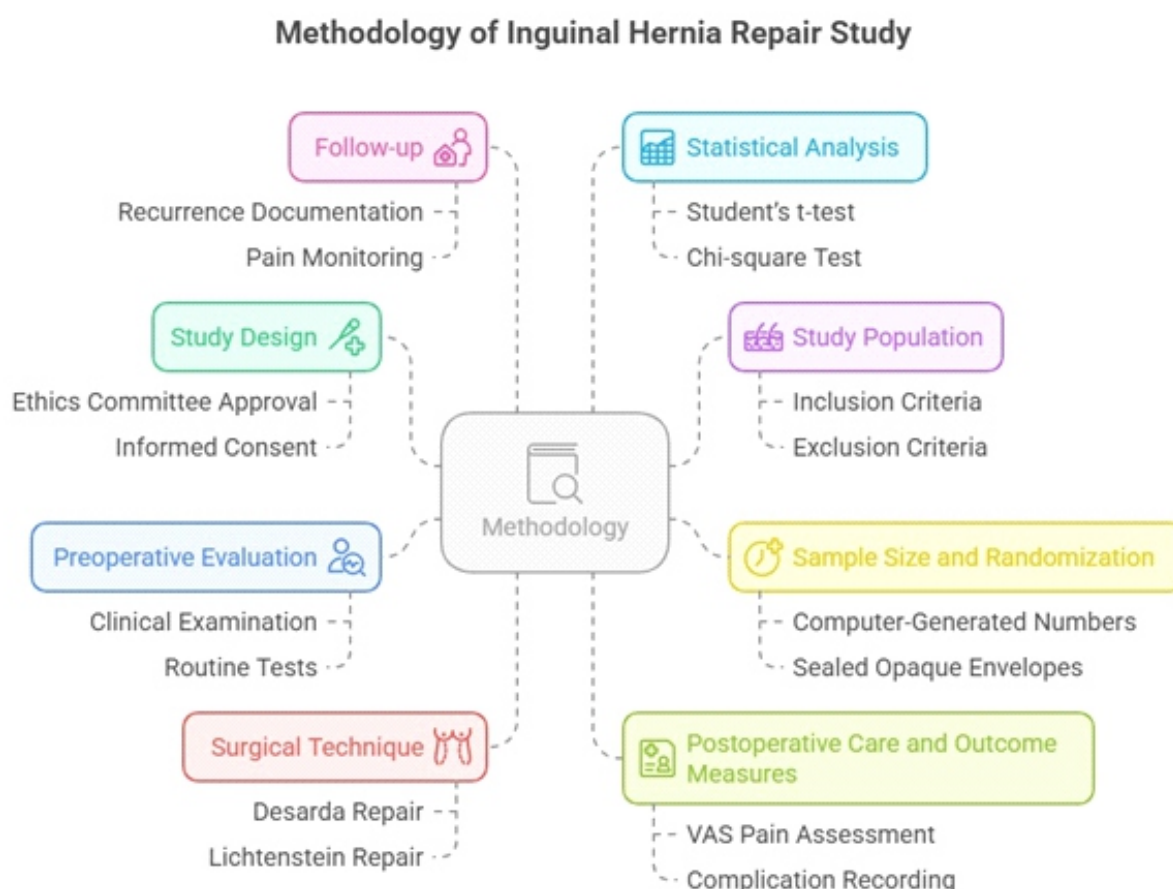


Figure 1: Methodology flow chart

**Study population:**

Patients with a unilateral, reducible, primary inguinal hernia, without contraindications to elective surgery and deemed suitable for such intervention to repair the hernia, were included. Exclusion criteria encompassed individuals under 18 years, bilateral or recurring hernias, difficult hernias (obstructed, strangulated, or irreducible), coagulopathies, and any intraoperative indications of inadequate external oblique aponeurosis (Desarda, 2008).

**Size of the sample and randomization:**

There were 60 patients in the sample population, and they were split into two groups of 30 people each at random. The randomization process included computer-generated numbers and sealed opaque envelopes. The first group (Group A) got the repair without mesh (Desarda, 2012), whereas the second group (Group B) had the repair with mesh (Lichtenstein, 2012).

**Preoperative evaluation:**

All patients underwent a conventional preoperative evaluation, including clinical examination, routine hematological and biochemical tests, ECG, and chest X-ray as necessary. An extra anesthetic examination was done on the cases that were at high risk (Kingsnorth & LeBlanc, 2003).

**Surgical technique:**

Experts used both spinal and general anesthesia to get the surgeons involved. They all had the same oblique groin incision.

In the Desarda repair, the external oblique aponeurosis is cut out. After a normal herniotomy, a 2 cm-wide strip of aponeurosis is made and sewn against the inguinal ligament in the medial direction and the internal oblique or conjoint tendon in the upper direction to make a new posterior wall (Desarda, 2008).

For the Lichtenstein repair, a pre-formed polypropylene mesh was attached to the inguinal ligament and the left pubic tubercle using non-absorbable sutures. The mesh was cut so that the spermatic cord could get through it. The tails of the mesh were sewn together to make the deep ring back (Amid, 2004).

**Results of perioperative practice and outcomes:**

We also used the Visual Analogue Scale (VAS) to quantify pain after surgery on the first, third, seventh, thirtieth, and ninetieth days. We measured how long it took to start walking, how long the person stayed in the hospital, and when they could go back to their normal activities. It has been noted that the complications encompassed seroma, surgical site infection, cord edema, and recurrence (Gedam & Bansod, 2017).

**Follow up:**

Patients were followed up in person or by phone one month, three

months, and six months after the procedure. Any recurrence, discomforts, or chronic issues were documented.

**Analysis of statistics:**

The information was placed into Microsoft Excel, and SPSS 2.0 was used to analyze it on a computer. The mean values of continuous variables were presented as the mean  $\pm$  standard deviation and analyzed using the unpaired Student's t-test for comparison. The Chi-square test or Fisher test was used to compare categorical variables. The p-value for statistical significance was set at less than 0.05 (Szopinski et al., 2012).

**RESULTS****Basic characteristics:**

A total of 60 patients were recruited and randomly assigned to two groups: Group A (n = 30) underwent Desarda surgery, and Group B (n = 30) underwent Lichtenstein repair, with isolation halfway around the neck. The six groups exhibited comparable demographic and clinical characteristics, including age, sex distribution, and hernia laterality.

**Operative time:**

The average operative time for Group A (Desarda) was  $65.64 \pm 6.09$  minutes, while for Group B (Lichtenstein) it was  $65.76 \pm 6.30$  minutes. There was no significant difference between the groups ( $p = 0.93$ ).

**Post-operative pain:**

The visual analogue scale (VAS) score for pain was lower in the Desarda group ( $2.86 \pm 0.83$ ) than in the Lichtenstein group ( $3.50 \pm 0.57$ ) on the first postoperative day, with a p-value of 0.0004. The average pain scores on day 3 were 1.66 0.84 in Desarda and 2.26 0.69 in Lichtenstein ( $p = 0.0039$ ).

**Hospital Stay:**

The mean length of hospital stay for Group A ( $2.58 \pm 0.82$  days) was significantly lower than that of Group B ( $3.90 \pm 0.71$  days), with a p-value of 0.0001.

**Return to normal activity:**

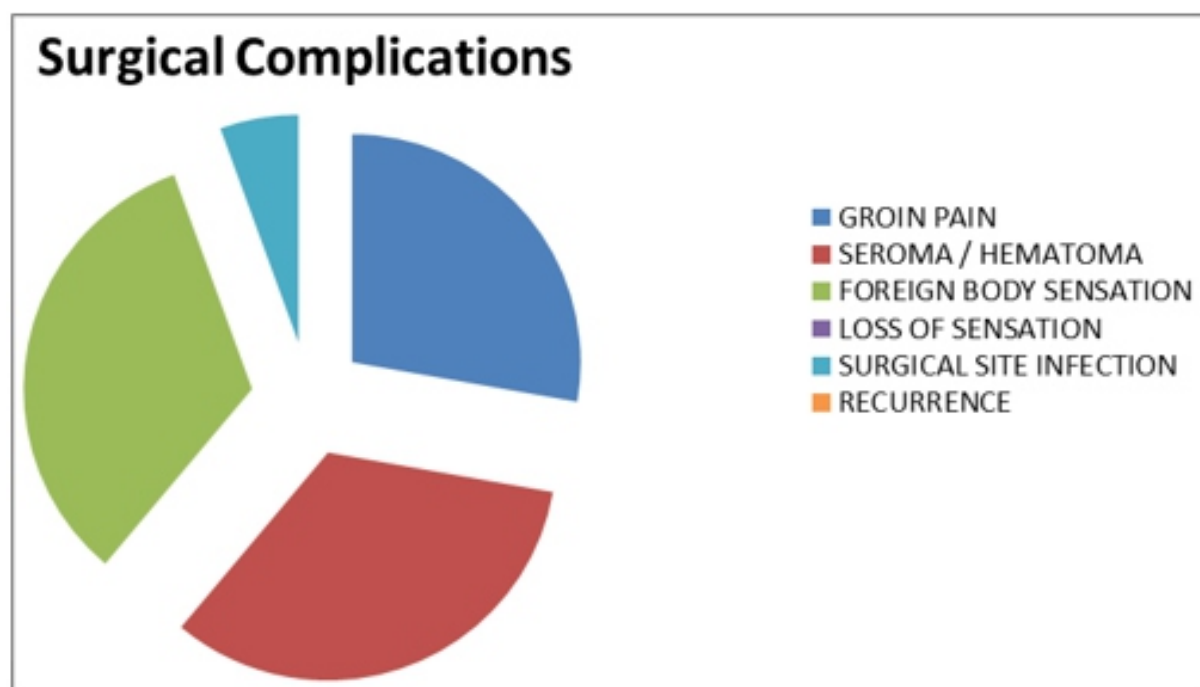
The Desarda group could start doing basic physical activity again after  $7.04 \pm 0.64$  days, while the Lichtenstein group needed  $11.30 \pm 1.29$  days ( $p = 0.0001$ ).

**Postoperative complications:**

Six patients were monitored, revealing a surgical site infection rate of 6.67% (n = 2) in the Lichtenstein group and 10.0% (n = 3) in the Desarda group. One individual (3.3%) in the Lichtenstein group exhibited cord edema, whereas none in the Desarda group did. There was no seroma present in either party. The follow-up done six months later did not show any recurrences in either group.

**Table 1: Distribution of complications frequency in the study population**

| S NO | COMPLICATIONS         | PRESENT | ABSENT |
|------|-----------------------|---------|--------|
| 1    | GROIN PAIN            | 5       | 55     |
| 2    | SEROMA / HEMATOMA     | 6       | 54     |
| 3    | FOREIGN BODY SENSAT   | 6       | 54     |
| 4    | LOSS OF SENSATION     | 0       | 60     |
| 5    | SURGICAL SITE INFECTI | 1       | 59     |
| 6    | RECURRENCE            | 0       | 60     |



**Figure 2: Surgical complications in the study population**

**Summary:**

Desarda repair led to a significant decrease in postoperative analgesic and hospitalization requirements, as well as a quicker

return to activity, with comparable operation times and complication rates when compared to Lichtenstein mesh repair.

**Table 2: Summary of results**

| Variable/Category         | Group/Category        | Desarda's (n=30) | Lichtenstein's (n=30) | Total (n=60)    | pvalue | Notes/key findings                      |
|---------------------------|-----------------------|------------------|-----------------------|-----------------|--------|-----------------------------------------|
| <b>Age Distribution</b>   | mean $\pm$ SD         | 57.1 $\pm$ 15.4  | 63.2 $\pm$ 13.4       | 60.2 $\pm$ 14.7 | 0.105  | Majority >60 yrs (53.3%)                |
| <b>Duration of Hernia</b> | mean $\pm$ SD (years) | 1.87 $\pm$ 1.25  | 2.00 $\pm$ 1.31       |                 | 0.689  | Most <6 months (58.3%)                  |
|                           | categorical (% <6 mo) | 63.3%            | 53.3%                 | 58.3%           |        |                                         |
| <b>Gender</b>             | % Male                | 100%             | 100%                  | 100%            |        | All male sample                         |
| <b>Hernia Side</b>        | Bilateral             | 8 (27%)          | 18 (60%)              | 26 (43.3%)      | 0.033  | Bilateral significantly higher in Lich. |
|                           | Left                  | 12               | 6                     | 18              |        |                                         |
|                           | Right                 | 10               | 6                     | 16              |        |                                         |
| Variable/Category         | Group/Category        | Desarda's (n=30) | Lichtenstein's (n=30) | Total (n=60)    | pvalue | Notes/key findings                      |

| Hernia Type                                    | D/ID/ID/D/IR/OBS/<br>P     | (see raw<br>data)  | (see raw data)  |                    |           | Majority<br>"D" (60%)                                 |
|------------------------------------------------|----------------------------|--------------------|-----------------|--------------------|-----------|-------------------------------------------------------|
| Type of Surgery                                |                            | 30 (50%)           | 30 (50%)        | 60<br>(100%)       |           | Equal<br>groups                                       |
| Duration of<br>Surgery (min,<br>mean $\pm$ SD) |                            | 80.2 $\pm$<br>18.8 | 79.0 $\pm$ 20.5 | 79.6 $\pm$<br>19.5 | 0.804     | Most 61–<br>90 min                                    |
| Type of<br>Anaesthesia                         | General                    | 2                  | 0               | 2                  | 0.048     | Spinal<br>most<br>common                              |
|                                                | Spinal                     | 28                 | 26              | 54                 |           |                                                       |
|                                                | Spinal + Epidural          | 0                  | 4               | 4                  |           |                                                       |
| Complications<br>(%)                           | Groin pain                 | 5<br>(16.7%)       | 0 (0%)          | 5<br>(8.3%)        | 0.188     | NSD                                                   |
|                                                | Seroma/Hematoma            | 3 (10%)            | 3 (10%)         | 6<br>(10%)         | 0.822     | NSD                                                   |
|                                                | Foreign body<br>sensation  | 0 (0%)             | 6 (20%)         | 6<br>(10%)         | 0.015     | <b>Significant</b><br>– higher in<br>Lichtenstei<br>n |
|                                                | Loss of sensation          | 0                  | 0               | 0                  |           | None                                                  |
|                                                | Surgical Site<br>Infection | 1 (3.3%)           | 0 (0%)          | 1<br>(1.7%)        | 0.500     | NSD                                                   |
|                                                | Recurrence                 | 0                  | 0               | 0                  |           | None                                                  |
| Duration of<br>Hospital Stay<br>(days, mean)   | mean $\pm$ SD              | 3.3 $\pm$<br>0.84  | 3.6 $\pm$ 0.86  | 3.4 $\pm$<br>0.85  | 0.228     | NSD                                                   |
|                                                | Median (2/3/4/5)           | 4/16/7/3           | 3/11/12/4       |                    |           | Most<br>stayed 3<br>days                              |
| Duration of<br>Groin Pain                      | No pain                    | 27                 | 28              | 55                 | 0.414     | NSD                                                   |
|                                                | >7 days                    | 3                  | 1               | 4                  |           |                                                       |
| Duration<br>Seroma/ Hematom<br>a               | No                         | 27                 | 27              | 54                 | 0.549     | NSD                                                   |
|                                                | 7–14 days                  | 3                  | 3               | 6                  |           |                                                       |
| Duration Foreign<br>Body Sensation             | None                       | 30<br>(100%)       | 24 (80%)        | 54                 | 0.03<br>6 | Significant,<br>more in<br>Lichtenstei<br>n           |
|                                                | 14–30 days                 | 0                  | 6 (20%)         | 6                  |           |                                                       |

Abbreviations: SD = Standard deviation; NSD = No significant difference ( $p > 0.05$ ).

## DISCUSSION

The aim of the current prospective randomized controlled trial was to evaluate the no-mesh technique of Desarda against the mesh-repair method of Lichtenstein in the treatment of primary inguinal hernia. There was no difference in the operating times or recurrence-free status of the two approaches in the short-term follow-up, but the Desarda technique had big advantages in terms of how quickly patients got better after surgery, how much pain they felt, and how much it cost. Their labor hours were likewise similar, which fits with the fact that Szopinski et al. (2012) didn't say that Desarda needed more time to complete the treatment because the surgeons were trained to do it. The results of the dissertation, which showed that each of the two groups took about 65 minutes on surgery, back up all of this even more. The Desarda technique utilizes a non-dissected strip of external oblique aponeurosis, which restricts instrumentation and dissection, hence confining its application to general surgical domains, which constitutes its advantage (Desarda, 2001).

The Desarda group also had very little discomfort after surgery, which implies that the approach is good for the tissue. The Lichtenstein procedure is tension-free and involves placing mesh that has been shown to produce chronic groin pain due to nerve entrapment, fibrosis, and mesh contraction (Bay-Nielsen et al., 2001; Klinge et al., 2005). In contrast, the Desarda repair does not include an exogenous agent into the physiological dynamics of the inguinal canal, as observed in previous repair methods, hence mitigating postoperative discomfort and inflammatory responses (Desarda, 2008). Other studies, such as those by Ahmed et al. (2018)

and Vupputuri et al. (2019), back up these results by showing that the Desarda group had less discomfort and healed faster.

Gedam et al. (2017) and Rodriguez et al. (2018) say that the Desarda group spent less time in the hospital and got back to physical activities considerably faster. In the study, the patients in the Desarda group were able to do basic activities again roughly four days earlier than those who had Lichtenstein repair. This has important social and economic effects, especially for working-age men, who make up most of the hernia patients, and in places where hospital stays and follow-up care are expensive (Islam et al., 2022).

Both groups exhibited minimal complication rates. The Lichtenstein group did have a little bit higher rates of seroma, foreign body sensation, and surgical site infections, according to a metaanalysis by Mohamed Ahmed et al. (2020) and Issa et al. (2024). They also say that the Desarda repair had a low risk of sequelae. This observation is corroborated by the absence of recurrence and the limited incidence of postoperative complaints in both groups, with the Desarda group demonstrating earlier mobilization and less discomfort, as indicated by the dissertation results. The next point is the cost-benefit of not using mesh. The conventional repair with mesh at most centers has the downsides of higher material costs and a low chance of mesh rejection or infection. Desarda repair alleviates these problems, rendering it especially beneficial for cases with contraindications to mesh utilization and for patients undergoing surgery in areas with insufficient sterilization control (Jain et al., 2021).

Despite the positive results, there are limitations, including a small sample size and a short follow-up period. Long-term recurrence and chronic pain necessitate further investigation. The study supports Desarda's technique, showing that it is safe, effective, and cost-effective compared to mesh repair, especially in places where mesh isn't practical or desirable.

## CONCLUSION

The research demonstrates that the no-mesh technique introduced by Desarda is a safe and effective alternative to the conventional Lichtenstein mesh repair for the treatment of primary unilateral inguinal hernia. Both methods were said to be similar in terms of how long they took to do and how many problems they caused. However, the method that Desarda used was better overall since it caused less discomfort after surgery, shorter hospital stays, and faster recovery times. These findings enhance the advantages of tissue-based restoration for particular patient cohorts, especially in resource-limited settings or for those contraindicated for mesh utilization. Desarda repair is another useful tool for surgeons who do inguinal hernia repairs since it is easy to use, cheap, and has a good track record for recovery. Additional validation is warranted through subsequent studies using larger sample sizes and extended follow-up to assess the longterm recurrence and chronic pain associated with this approach.

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**How to Cite:** Dr. Surendran A, Dr. Vimalraj S., Dr.G. Sivagnanam MS, Dr. Tracy Rosalin Poulose, Dr. S. Prem Kumar, Naveena Nandhikesan. A Comparative Study of Desarda's Technique with Lichtenstein Mesh Repair in Treatment of Inguinal Hernia: A Prospective Randomized Control Study. *International Medicine*, 2025;11(2):1-7