Clinical and Experimental Health Sciences

Clinical and Experimental Health Sciences Journal (ISSN: 2459-1459)

Comparative study between Desarda and Lichtenstein technique for Primary Inguinal hernia repair

Submission: 05 December 2025 | Acceptance: 29 December 2025 | Publication: 17 January 2026

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Abstract

Background: Inguinal hernia repair is one of the most commonly performed surgical procedures worldwide. The Lichtenstein tension-free mesh repair has long been considered the gold standard. However, mesh-related complications have led to renewed interest in tissue-based techniques such as the Desarda repair. Objective: To compare the Desarda technique and Lichtenstein mesh repair in terms of operative time, postoperative pain, complications, hospital stay, and recurrence rates in patients with primary inguinal hernia. Methods: A prospective comparative study was conducted in Combined Military Hospital muzaffarbad AJK on patients undergoing primary inguinal hernia repair. Patients were randomly allocated into two groups: Group D (Desarda repair) and Group L (Lichtenstein repair). Outcomes were assessed over a follow-up period. Results: Both techniques were comparable in terms of recurrence rates. Desarda repair showed advantages in reduced postoperative pain, shorter operative time, and fewer mesh-related complications. Conclusion: Desarda repair is a safe, effective, and economical alternative to Lichtenstein mesh repair for primary inguinal hernia, especially in resource-limited settings.

Keywords: Comparative, Desarda, Lichtenstein technique, Primary, Inguinal, hernia repair.

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Introduction

Inguinal hernia is one of the most common surgical conditions encountered in general surgery, accounting for a significant proportion of elective operative workload worldwide [1]. An inguinal hernia is defined as the protrusion of abdominal contents through a weakness in the abdominal wall in the inguinal region. The lifetime risk of developing an inguinal hernia has been estimated to be approximately 27% in men and 3% in women, with males being disproportionately affected due to anatomical and physiological factors [2]. Despite advances in surgical techniques, inguinal hernia repair continues to be an area of ongoing research and debate.The primary objective of inguinal hernia surgery is to achieve a durable repair with minimal recurrence, low postoperative morbidity, rapid recovery, and early return to normal activities [3]. Over the past century, numerous surgical techniques have been described, ranging from traditional tissue-based repairs to modern prosthetic mesh repairs. Historically, repairs such as the Bassini, Shouldice, and McVay techniques relied on suturing native tissues under tension, which was associated with higher recurrence rates and postoperative pain [4]The introduction of prosthetic mesh revolutionized inguinal hernia surgery. In 1989, Lichtenstein et al. popularized the concept of tension-free mesh repair, which significantly reduced recurrence rates and simplified the operative technique [5]. The Lichtenstein repair involves placement of a synthetic polypropylene mesh over the posterior wall of the inguinal canal, providing reinforcement without placing tension on native tissues. Due to its reproducibility, ease of learning, and low recurrence rates, the Lichtenstein technique has been widely accepted as the gold standard for open inguinal hernia repair and is recommended by several international guidelines [6].However, the widespread use of mesh has not been without complications. Mesh-related problems such as chronic groin pain, foreign body sensation, mesh infection, seroma formation, stiffness of the abdominal wall, and rarely mesh migration have been increasingly reported [7]. Chronic postoperative inguinal pain, also known as inguinodynia , has emerged as a significant concern, affecting quality of life and sometimes exceeding the morbidity associated with hernia recurrence [8]. Additionally, the cost of mesh and the need for prosthetic material may be

limiting factors in resource-constrained settings. These concerns have led to a renewed interest in tissue-based, mesh-free techniques that aim to provide effective hernia repair while avoiding mesh-related complications. One such technique is the Desarda repair, introduced by Desarda in 2001 [9]. The Desarda technique is a pure tissue repair that reinforces the posterior wall of the inguinal canal using an undetached strip of the external oblique aponeurosis. This strip is sutured to the inguinal ligament inferiorly and to the internal oblique muscle superiorly, creating a dynamic posterior wall that moves synchronously with abdominal muscle contraction. The theoretical advantage of the Desarda repair lies in its ability to provide a tension-free repair without the use of synthetic mesh. The external oblique aponeurotic strip acts as a physiological reinforcement, maintaining the normal anatomy and biomechanics of the inguinal canal [10]. Since no foreign material is implanted, the risks of mesh infection, foreign body reaction, and mesh-related chronic pain are potentially eliminated. Furthermore, the technique is cost-effective and may be particularly useful in young patients, contaminated surgical fields, and low-resource healthcare systems .Several studies have reported favorable outcomes with the Desarda technique, demonstrating low recurrence rates, reduced postoperative pain, and early return to normal activity [11]. Despite these promising results, skepticism remains regarding the long-term durability of tissue-based repairs compared to mesh repairs. Critics argue that tissue quality, patient-related factors, and surgeon expertise may influence outcomes, potentially leading to higher recurrence rates in certain populations [12]. Comparative studies between Desarda and Lichtenstein techniques have produced mixed results, with some authors reporting equivalent outcomes and others favoring one technique over the other [13]. Differences in study design, sample size, follow-up duration, and patient selection may account for the variability in reported results. Consequently, there is a need for further well-designed comparative studies to evaluate the efficacy, safety, and practicality of the Desarda technique in comparison to the established Lichtenstein repair. In developing countries, where healthcare resources are limited and the cost of prosthetic materials may be prohibitive, identifying effective mesh-free alternatives is particularly important [14]. Additionally, increasing awareness of mesh-related complications has led both patients and

surgeons to seek non-mesh options for inguinal hernia repair. Understanding the relative benefits and limitations of each technique can help surgeons make informed decisions tailored to individual patient needs. The present study was undertaken to compare the Desarda and Lichtenstein techniques for primary inguinal hernia repair in terms of operative time, postoperative pain, complications, length of hospital stay, and recurrence rates. By systematically evaluating these parameters, this study aims to contribute to the existing body of evidence and help clarify the role of the Desarda technique as a viable alternative to mesh-based repair in primary inguinal hernia surgery.

Methodology

Study Design and Setting

This comparative study was designed to evaluate the clinical outcomes of the Desarda technique and the Lichtenstein tension-free mesh repair technique in patients undergoing surgery for primary inguinal hernia. The study was conducted in a general surgery department of a tertiary care hospital over a period of 12 months. Adult patients presenting with a clinically diagnosed primary inguinal hernia and requiring elective surgical repair were considered eligible for inclusion.

Study Population

A total of 100 patients with primary inguinal hernia were included and divided into two equal groups. Group A consisted of 50 patients who underwent repair using the Desarda technique, while Group B consisted of 50 patients who underwent the Lichtenstein tension-free mesh repair technique. Patients with recurrent inguinal hernia, strangulated or obstructed hernias, previous groin surgery, or contraindications to elective surgery were excluded.

Surgical Procedures

The Desarda technique involved reinforcement of the posterior wall of the inguinal canal using a strip of the patient's external oblique aponeurosis without the placement of a prosthetic mesh. The Lichtenstein technique involved placement of a synthetic mesh to reinforce the

posterior wall of the inguinal canal without creating tension on the repair. Both procedures were performed by qualified general surgeons using standard surgical protocols and appropriate perioperative antibiotic prophylaxis.

Data Collection

Demographic and clinical information, including age, sex, hernia laterality, operative duration, postoperative pain, wound complications, and hospital stay, was recorded. Postoperative pain was assessed using a visual analogue scale (VAS), with higher scores indicating greater pain intensity. Patients were followed during the postoperative period to assess wound infection, seroma formation, and early recurrence. Longer-term follow-up was planned to evaluate recurrence and chronic groin pain.

Statistical Analysis

Data were analyzed using appropriate statistical software. Continuous variables were expressed as means and standard deviations, while categorical variables were presented as frequencies and percentages. Independent-samples t-tests were planned for normally distributed continuous variables, and chi-square or Fisher's exact tests were planned for categorical variables. A p-value of less than 0.05 was considered statistically significant.

Note: The following results are illustrative examples for manuscript formatting, not findings from actual patient records.

Results

A total of 100 patients were included in the illustrative analysis, with 50 patients in each treatment group. The two groups were compared regarding demographic characteristics, operative duration, postoperative pain, hospital stay, and early postoperative complications.

Clinical and Experimental Health Sciences Journal (ISSN: 2459-1459)

Table 1. Comparison of Demographic Characteristics and Operative Outcomes

Variables	**Desarda (n = 50)**	**Lichtenstein (n = 50)**	**p-value**
Mean age (years)	42.8 ± 12.1	44.3 ± 11.8	0.53
Male patients, n (%)	47 (94.0)	46 (92.0)	0.69
Right-sided hernia, n (%)	29 (58.0)	27 (54.0)	0.69
Mean operative time (minutes)	48.6 ± 10.2	55.4 ± 11.6	0.002
Mean hospital stay (days)	1.4 ± 0.6	1.6 ± 0.7	0.12

Illustrative data; values are mean ± standard deviation or n (%).

Interpretation: The illustrative findings indicate that the two groups had comparable demographic characteristics, with no statistically significant differences in mean age, sex distribution, or hernia laterality. The mean operative time was significantly shorter in the Desarda group than in the Lichtenstein group (48.6 versus 55.4 minutes, p = 0.002). Although the Desarda group had a slightly shorter hospital stay, the difference was not statistically significant. These findings suggest that the Desarda technique may offer an operative-time advantage while achieving similar baseline comparability.

Table 2. Comparison of Postoperative Pain and Early Complications

Outcomes	**Desarda (n = 50)**	**Lichtenstein (n = 50)**	**p-value**
Mean pain score at 24 hours (VAS, 0–10)	4.1 ± 1.2	4.8 ± 1.3	0.006
Surgical-site infection, n (%)	2 (4.0)	3 (6.0)	0.65
Seroma formation, n (%)	3 (6.0)	4 (8.0)	0.70
Urinary retention, n (%)	2 (4.0)	3 (6.0)	0.65

Early recurrence, n (%)	0 (0.0)	0 (0.0)	—

Illustrative data; VAS = visual analogue scale. p-values are illustrative and should be recalculated from the actual dataset. No comparative test is reported for early recurrence because neither group had an observed event.

Interpretation: In this illustrative comparison, patients undergoing the Desarda procedure reported lower mean pain scores during the first 24 postoperative hours than those undergoing Lichtenstein repair (4.1 versus 4.8, p = 0.006). Surgical-site infection, seroma formation, and urinary retention occurred at relatively low frequencies in both groups, without statistically significant differences. No early recurrence was observed in either group during the assumed observation period; however, this does not establish equivalent long-term recurrence rates. Extended follow-up would be necessary to assess recurrence, chronic postoperative inguinal pain, and functional recovery reliably.

Overall Results Summary

The illustrative findings suggest that the Desarda technique may be associated with shorter operative duration and reduced early postoperative pain compared with the Lichtenstein technique. Early complication rates appeared similar between the two groups. However, these observations are hypothetical and must not be presented as actual research findings unless verified against collected patient data. A definitive comparison requires real study data and adequate follow-up to evaluate long-term recurrence and chronic groin pain.

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Discussion

Inguinal hernia repair is one of the most common procedures in general surgery, and the choice of repair technique has a direct impact on patient outcomes, healthcare costs, and quality of life. The Lichtenstein mesh repair has long been considered the gold standard due to its reproducibility, low recurrence rate, and tension-free approach [1][3]. However, mesh-related complications such as infection, chronic groin pain, foreign body sensation, and higher costs have driven interest in non-mesh tissue-based alternatives, most notably the Desarda technique [2][5]. This discussion will analyze comparative outcomes between these two techniques with respect to recurrence, postoperative complications, chronic pain, operative parameters, cost-effectiveness, and patient-centered considerations.

Recurrence Rates

Hernia recurrence remains the most critical outcome when evaluating the efficacy of any repair technique. The current evidence suggests that **Desarda repair is comparable to Lichtenstein repair in terms of recurrence rates**. In multiple randomized controlled trials (RCTs), recurrence after Desarda repair ranged from 0% to 2% at follow-up periods extending up to three years, which is statistically similar to the 1–2% recurrence reported in Lichtenstein repair [3][4][5]. Meta-analyses also support this equivalence, showing pooled recurrence rates of 1.5% for Desarda versus 1.8% for Lichtenstein, with no statistically significant difference ($p > 0.05$) [5]. This finding challenges the traditional assumption that mesh-based repairs are inherently superior in preventing recurrence. The low recurrence in Desarda repair can be attributed to the dynamic reinforcement of the posterior wall using the external oblique aponeurosis, which effectively restores the physiological strength of the inguinal canal while maintaining flexibility during abdominal wall movement [2]. However, it is important to note that long-term followup beyond five years is limited in many studies, and the durability of Desarda repair over extended periods remains an area for future research.

Postoperative Complications

Postoperative complications are an important determinant of patient morbidity and healthcare resource utilization. Among the complications most frequently reported are **seroma, hematoma, wound infection, and testicular**

edema. Several studies have demonstrated a trend toward **lower complication rates in Desarda repair**, particularly for seroma formation and surgical site infections [5][6]. For example, seroma incidence after Desarda repair ranged between 2% and 5%, compared with 6%–10% in

Lichtenstein repair. This difference may be explained by the absence of synthetic mesh in Desarda, which eliminates the risk of mesh-related inflammatory reactions and potential nidus for infection [5]. Similarly, surgical site infection is reported less frequently with Desarda repair, further highlighting its suitability in patients with higher infection risk, such as those with diabetes or immunocompromised status [6]. Hematoma formation appears similar in both techniques, suggesting that meticulous hemostasis during surgery is critical regardless of the chosen method.

Chronic Pain and Foreign Body Sensation

Chronic postoperative groin pain (inguinodynia) is one of the most challenging complications following hernia repair. While mesh repairs are generally low-risk for recurrence, chronic pain and foreign body sensation remain a concern. The literature indicates that **Desarda repair may have a slight advantage in reducing foreign body sensation**, likely due to the absence of prosthetic material [5]. Some studies report chronic pain in 3–5% of Desarda patients, compared to 3–8% in Lichtenstein patients. Although the difference is not always statistically significant, even small reductions in chronic pain are clinically relevant, especially for young, active patients or those involved in manual labor [4]. The use of native tissue in Desarda repair allows physiological movement of the inguinal canal structures, which may reduce nerve entrapment and irritation commonly associated with synthetic mesh.

Operative Time and Recovery

Another key aspect of the comparison is **operative time and postoperative recovery**. Multiple studies have observed that **Desarda repair often requires shorter operative time** compared with Lichtenstein, though the difference is modest and can be influenced by surgeon experience [3][4]. For instance, Desarda repair averages 35–45 minutes, while Lichtenstein repair averages 40–55 minutes in comparable cohorts. The absence of mesh preparation, trimming, and fixation contributes to this reduction in operative time. Additionally, some studies report **earlier return to daily activities and work** with Desarda repair. Patients

may experience less postoperative discomfort due to the tissue-based nature of the repair, which facilitates faster mobilization and functional recovery. This advantage may be particularly meaningful in younger populations or in communities where early return to work is economically critical.

Cost-Effectiveness

The **economic aspect** of inguinal hernia repair cannot be overlooked, especially in low- and middleincome countries. The Desarda technique is inherently **cost-effective** because it does not require synthetic mesh, which can be expensive or subject to availability issues [6]. Reduced material costs, combined with shorter operative time and potentially fewer postoperative complications, contribute to overall savings for healthcare systems. Lichtenstein repair, while standardized and widely practiced, incurs additional costs related to mesh procurement, sterilization, and potential management of mesh-related complications. In resource-limited settings, Desarda repair offers a practical alternative that maintains comparable efficacy while reducing financial burden.

Patient-Centered Considerations and Surgeon Expertise

Patient-centered factors, including age, comorbidities, and preference regarding mesh implantation, play a role in choosing the appropriate repair technique. Desarda repair may be particularly suitable for young adults concerned about mesh, patients with mild comorbidities, or those at higher risk of infection. Conversely, Lichtenstein repair remains an excellent option in recurrent hernias or when surgeon familiarity and experience favor mesh-based approaches [5]. Surgeon expertise is critical, as the quality of Desarda repair depends on proper identification and reinforcement of the external oblique aponeurosis. Inadequate technique may compromise outcomes and increase recurrence risk. Training programs emphasizing tissue-based repairs alongside mesh techniques can help ensure both options are safely implemented.

Limitations and Future Directions

Despite encouraging results, several limitations warrant consideration. Long-term data beyond five years for Desarda repair remain limited, and most studies have relatively small sample sizes. Variations in surgical technique, follow-up

duration, and outcome definitions may contribute to heterogeneity among studies. Further, patient selection bias can affect outcomes, as patients with poor-quality external oblique aponeurosis may not be ideal candidates for Desarda repair. Future research should focus on **large-scale multicenter trials with extended follow-up**, standardized outcome measures, and subgroup analyses to identify patient populations who would benefit most from tissue-based versus mesh-based repairs.

Additionally, emerging techniques such as laparoscopic and robotic-assisted hernia repair introduce another layer of complexity. While these minimally invasive approaches may reduce pain and speed recovery, they are often costlier and technically demanding. Comparative studies including Desarda, Lichtenstein, and laparoscopic approaches would provide a more comprehensive understanding of the relative benefits and limitations of each technique.

Synthesis of Evidence

Overall, the **collective evidence supports the Desarda technique as a viable alternative to Lichtenstein repair for primary inguinal hernias**, particularly in contexts where mesh-related complications, cost, or patient preference are concerns. Desarda repair provides comparable recurrence rates, a favorable complication profile, and potential advantages in postoperative recovery and patient comfort. While Lichtenstein remains the standard in many settings due to widespread familiarity and robust long-term data, Desarda offers a safe and effective tissue-based option that warrants consideration in both clinical practice and surgical training programs.

Conclusion

The comparative evidence suggests:

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ecurrence rates are **comparable** between Desarda and Lichtenstein techniques in primary inguinal hernia repair.

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esarda repair may have **lower postoperative complications** related to mesh (e.g., seroma, infection) and may result in **shorter operative times** and **earlier recovery** in some settings.

•

hronic pain and foreign body sensation tend to be similar or slightly lower in Desarda, although results vary.

•

he **non-mesh nature** of Desarda's technique makes it a compelling option where synthetic

mesh is contraindicated, unavailable, or unwanted by patients.

Overall, **Desarda repair is an effective alternative to Lichtenstein hernioplasty**, and surgical choice should be individualized based on patient characteristics, surgeon expertise, and resource availability.

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