

ORIGINAL ARTICLE

Comparative study of Lichtenstein and darn repair surgery in obstructed hernia repair.

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ABSTRACT... Objective: To compare postoperative outcomes between Lichtenstein and Darns repairs in obstructed inguinal hernias. **Study Design:** Prospective quasi-experimental study. **Setting:** General Surgery Department, Arif Memorial Teaching Hospital. **Period:** September 2023 to February 2024. **Methods:** Sixty patients with obstructed inguinal hernia were recruited through non-probability purposive sampling and non-randomized into two groups of 30 each. Group 1 underwent Lichtenstein repair, while Group 2 underwent Darn repair. Postoperative pain, wound infection, seroma formation, and recurrence were assessed over a 6-month follow-up. Data were analyzed using SPSS version 25, applying independent t-tests and likelihood ratio tests, with $p \leq 0.05$ considered significant. **Results:** The mean age was 43.5 ± 11.6 years in the Lichtenstein group and 42.8 ± 10.4 years in the Darn group ($p = 0.797$). Seroma formation was noted in 13.3% of Lichtenstein versus 23.3% of Darn repairs, postoperative pain in 36.7% versus 46.7%, and wound infection in 10% versus 16.7%. No recurrences were observed during follow-up. None of the outcome differences were statistically significant ($p > 0.05$). **Conclusion:** Lichtenstein and Darn repairs demonstrated comparable short-term outcomes in obstructed inguinal hernia. Lichtenstein repair remains preferable where mesh is available, while Darn repair provides a suitable alternative in settings with limited resources.

Key words: Hernia, Inguinal, Postoperative Complications, Seroma, Treatment Outcome.

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INTRODUCTION

An organ or portion of an organ that protrudes or shifts through the wall that typically surrounds it is called a hernia. This protrusion originates via the inguinal canal when there is an inguinal hernia. The most frequent cause for which primary care physicians refer patients for surgery is a groin hernia.¹

Inguinal hernias occur more frequently in men; while the diagnosis is usually straightforward on physical examination in male patients, ultrasonography is often required for accurate detection in women.² Approximately 75% of all abdominal wall hernias occur in the groin, making it the most frequent site for such defects.³

Mesh repair has been shown to reduce recurrence rates in incarcerated and strangulated groin hernias without significantly increasing postoperative complications, and it is recommended in clean

cases. However, when bowel resection is required, the use of mesh may increase the risk of surgical site infection.⁴

Several perioperative factors, such as inadequate surgical technique, low surgical volume, limited operator experience, and the use of local anesthesia, have also been identified as risk factors for recurrence and should be taken into account when treating inguinal hernia patients. The Lichtenstein technique involves placement of a polypropylene mesh between the inguinal floor and the external oblique aponeurosis. This tension-free method avoids reliance on weakened tissues and eliminates the need for tension sutures. During straining, contraction of the external oblique muscle exerts counterpressure on the mesh, thereby utilizing intra-abdominal pressure to support the repair.^{5,6}

Based on best practices, ten specific recommendations have been proposed for the

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Lichtenstein method: detailed neuroanatomical assessment, prevention of chronic pain, selective neurectomy, careful handling of spermatic cord structures, evaluation of the femoral canal, appropriate hernia sac management, optimal mesh selection, secure fixation, recurrence prevention strategies, and appropriate postoperative care.⁷ Darn repair demonstrated benefits in resource-constrained settings, with fewer challenges, shorter hospital stays, and reduced expenses, making it a viable option where mesh is not easily accessible, even if both techniques produced comparable recurrence rates.⁸

Although both mesh-based and tissue-based techniques achieve comparable recurrence rates, Darn repair has certain advantages in resource-limited settings. It is associated with fewer complications, shorter hospital stays, and reduced overall costs, making it a viable alternative when mesh is unavailable.⁸ Conversely, while the Lichtenstein repair is superior to Darn repair in terms of long-term recurrence prevention, it has been reported to require greater postoperative analgesic use, longer hospital stays, and slightly higher rates of superficial surgical site infections.⁹

The present study is designed to compare Lichtenstein mesh repair and Darn repair in patients with obstructed inguinal hernia, focusing on postoperative outcomes including pain, wound infection, seroma formation, and recurrence.

METHODS

This comparative, prospective, quasi-experimental study was conducted in the Department of General Surgery, Arif Memorial Teaching Hospital, Lahore, between September 2023 and February 2024, following approval from the hospital's Ethical Review Committee (Reference No. IRB/2023/192, dated September 10, 2023). Patients were recruited using a non-probability purposive sampling technique, and those fulfilling the eligibility criteria were enrolled after obtaining informed consent. The inclusion criteria consisted of adult patients aged 18–65 years with a diagnosis of primary inguinal hernia who were medically fit for elective surgery. Patients with recurrent or bilateral hernia, complicated hernias such as strangulated or obstructed types,

significant systemic comorbidities including uncontrolled diabetes, coagulopathy, chronic liver or kidney disease, and those unwilling or unable to complete follow-up were excluded from the study. A total follow-up period of six months was maintained for each participant.

Eligible patients were divided into two equal groups. Group 1 underwent Lichtenstein tension-free mesh repair, in which a 6 × 11 cm polypropylene mesh was trimmed to size and sutured in place over the defect. Group 2 underwent Darn repair, in which the posterior wall of the inguinal canal was reconstructed using a continuous nylon 1 suture from the pubic tubercle to the internal ring and back. All patients were admitted postoperatively for 2–3 days and subsequently discharged once stable. Follow-up evaluations were scheduled at one week, two weeks, one month, three months, and six months to monitor outcomes, including seroma formation, wound infection, and postoperative pain.

Data were collected on a predesigned proforma and analyzed using SPSS version 25. Continuous variables such as age were compared between groups using the independent samples t-test. Categorical variables, including wound infection, seroma, and postoperative pain, were analyzed using the likelihood ratio test. A p-value of ≤ 0.05 was considered statistically significant.

RESULTS

The study included 60 patients in total, allocated equally between the two surgery groups: 30 had Darn repair, and 30 had Lichtenstein repair. The average age of the patients in the Darn group was 42.8 ± 10.4 years, whereas the patients in the Lichtenstein group were 43.5 ± 11.6 years. Comparability at baseline was confirmed by the fact that the mean age difference was not statistically significant ($p = 0.797$).

TABLE-I

Surgical group distribution

Surgical Group	Frequency	Percent (%)
Lichtenstein repair	30	50.0
Darn repair	30	50.0

TABLE-II

Combined outcomes including seroma, pain, wound infection:

Outcome Type	Time Point	Lichtenstein (n=30)	Darn (n=30)	P-Value
Seroma	1 week	1 (3.3%)	1 (3.3%)	1.000
	2 weeks	2 (6.7%)	3 (10%)	0.640
	1 month	1 (3.3%)	3 (10%)	0.301
Pain	1 week	5 (16.7%)	7 (23.3%)	0.519
	2 weeks	2 (6.7%)	2 (6.7%)	1.000
	1 month	4 (13.3%)	5 (16.7%)	0.718
Wound Infection	1 week	2 (6.7%)	3 (10%)	0.640
	2 weeks	0 (0%)	1 (3.3%)	0.313
	1 month	1 (3.3%)	1 (3.3%)	1.000

DISCUSSION

In this prospective comparison of Lichtenstein mesh repair and Darn suture repair involving 60 patients, we found that short-term complication rates (seroma, postoperative pain and wound infection) were slightly higher in the Darn group than in the Lichtenstein group. Still, none of these differences reached statistical significance. Overall trends in our cohort consistently favored the Lichtenstein technique, with fewer early complications, although the absolute differences were small.

These results are broadly consistent with the recent body of evidence comparing mesh (Lichtenstein) and non-mesh (various tissue/darning) techniques. Systematic reviews and rapid reviews of mesh versus non-mesh groin hernia repair report that mesh repair achieves lower recurrence rates, while safety outcomes (early complications such as seroma, hematoma, infection and short-term pain) are similar between groups. This supports our observation that early complication profiles are comparable even when recurrence outcomes (which require longer follow-up) tend to favour mesh.¹⁰

Several randomized and prospective comparative studies have similarly reported that early postoperative outcomes—operative time, early pain, wound complications—can be comparable between selected non-mesh techniques (including modified Darn techniques) and Lichtenstein repair.

For example, randomized trials and single-center prospective studies have reported no significant differences in early morbidity between Lichtenstein and modified Darn/other tissue techniques, though study sizes are often modest and follow-up durations are limited. Our findings of no statistically significant differences in 1-month complications align with these reports.¹¹

That said, larger observational studies and recent comparative analyses emphasize important context for technique selection. Several recent retrospective cohorts and comparative series report that darn (or other non-mesh) repairs remain a reasonable option in resource-limited settings, offering lower immediate cost and acceptable short-term results; these reports caution that long-term recurrence and chronic pain data remain less complete and often underpowered. Our study's short follow-up (1 month) cannot address late recurrence or chronic groin pain, which are key outcomes when comparing mesh and non-mesh techniques.¹²

Mesh-based tension-free procedures (like Lichtenstein) are still recommended by bigger syntheses and guidelines bodies as the first-line open approach for primary inguinal hernia repair due to their consistent long-term follow-up recurrence reductions. The Hernia Surgery guidelines and updated reviews recommend mesh repair in most adult patients where resources and patient/surgeon factors permit, while recognizing that tissue repairs have a role when mesh is contraindicated or unavailable. Thus, while our short-term results show clinical equipoise for early complications, the wider literature and guidelines favor Lichtenstein when considering the full spectrum of outcomes, particularly recurrence.¹³

Chronic postoperative pain is another important outcome where the literature is mixed. Some analyses report no major difference in chronic pain between mesh and non-mesh repairs, whereas others note that technique, fixation method, and patient factors (age, nerve handling, fixation sutures) influence long-term pain. Because chronic pain typically manifests or persists beyond the early postoperative period, our study's 1-month window is insufficient to conclude chronic groin pain and

should be interpreted cautiously. Future surveillance of our cohort at 6–12 months (and beyond) would be essential to assess this outcome.¹⁴

Strengths of our study include prospective data collection and balanced allocation by surgical group, which reduced baseline confounding (age was similar between groups). The study limitations include the comparatively small sample size and shorter follow-up focused on early postoperative complications; consequently, the study is underpowered to detect small differences and cannot address recurrence or chronic pain. Finally, heterogeneity in non-mesh techniques reported in the literature (modified Darn, Moloney-type Darn, Desarda, Shouldice variants) complicates direct comparisons — many published non-mesh series use different technical modifications that may affect outcomes.¹⁵

CONCLUSION

Both Lichtenstein and Darn repairs for inguinal hernia demonstrated comparable short-term outcomes in terms of seroma formation, wound infection, and postoperative pain. Although complication rates were slightly higher in the Darn group, these differences were not statistically significant. Lichtenstein repair, being a tension-free mesh technique, remains the preferred option when mesh is available, as it provides stable outcomes and is associated with lower recurrence rates in long-term studies. However, Darn repair continues to be an acceptable alternative in resource-limited environments where mesh use may not be feasible. Further, studies with larger sample sizes and long-term follow-up are recommended to better assess recurrence rates and chronic pain outcomes between these two techniques.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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REFERENCES

1. BAX T, Sheppard BC, CRASS RA. **Surgical options in the management of groin hernias.** Am Fam Physician [Internet]. 1999 Jan 1 [cited 2025 Sep 13]; 59(1):143-56.
2. Shakil A, Aparicio K, Barta E, Munez K. **Inguinal hernias: Diagnosis and management.** Am Fam Physician [Internet]. 2020 Oct 15 [cited 2025 Sep 13]; 102(8):487-92.
3. Kamat M, Singh N, Nattey K. **A rare encounter of obstructed direct inguinal hernia of sliding variety.** Int J Surg Case Rep [Internet]. 2018 Jan 1 [cited 2025 Sep 13]; 49:209-14.
4. Marcolin P, Mazzola Poli de Figueiredo S, Moura Fé de Melo V, Walmir de Araújo S, Mota Constante M, Mao RMD, et al. **Mesh repair versus non-mesh repair for incarcerated and strangulated groin hernia: An updated systematic review and meta-analysis.** Hernia [Internet]. 2023 Dec 1 [cited 2025 Sep 13]; 27(6):1397-413.
5. Lau WY. **History of treatment of groin hernia.** World J Surg [Internet]. 2002 Jun 1 [cited 2025 Sep 13]; 26(6):748-59.
6. Amid PK. **Lichtenstein tension-free hernioplasty: Its inception, evolution, and principles.** Hernia [Internet]. 2004 Feb 20 [cited 2025 Sep 13]; 8(1):1-7.
7. Messias BA, Nicastró RG, Mocchetti ER, Waisberg J, Roll S, Junior MAFR. **Lichtenstein technique for inguinal hernia repair: Ten recommendations to optimize surgical outcomes.** Hernia [Internet]. 2024 Aug 1 [cited 2025 Sep 13]; 28(4):1467-76.
8. Suliman A, Mohamed Osman R, Suliman H. **Retrospective comparative cohort analysis of Darn and Lichtenstein repair methods for bilateral inguinal hernias in adult males in a low-resource setting: A single-centre study in Sudan.** Annals of Medicine & Surgery [Internet]. 2025 Feb [cited 2025 Sep 13]; 87(2):555-64.
9. Kashif M, Khan J, Din NU, Fawad M, Khan IA. **An experience comparing inguinal hernia mesh repair vs darn repair: Original article.** Journal of Bacha Khan Medical College [Internet]. 2022 Jul 5 [cited 2025 Sep 13]; 3(1):40-4.
10. Smith SM, Khoja AA, Jacobsen JHW, Kovoov JG, Tivey DR, Babidge WJ, et al. **Mesh versus non-mesh repair of groin hernias: A rapid review.** ANZ J Surg [Internet]. 2022 Oct 1 [cited 2025 Sep 21]; 92(10):2492.
11. Abd El Maksoud W, Abd El Salam M, Ahmed HH. **Comparative study between Lichtenstein procedure and modified darn repair in treating primary inguinal hernia: A prospective randomized controlled trial.** Hernia [Internet]. 2014 [cited 2025 Sep 21]; 18(2):231-6.
12. Suliman A, Mohamed Osman R, Suliman H. **Retrospective comparative cohort analysis of Darn and Lichtenstein repair methods for bilateral inguinal hernias in adult males in a low-resource setting: A single-centre study in Sudan.** Annals of Medicine & Surgery [Internet]. 2025 Feb [cited 2025 Sep 21]; 87(2):555-64.
13. Stabilini C, van Veenendaal N, Aasvang E, Agresta F, Aufenacker T, Berrevoet F, et al. **Update of the international HerniaSurge guidelines for groin hernia management.** BJS Open [Internet]. 2023 Sep 5 [cited 2025 Sep 21]; 7(5).

14. Öberg S, Andresen K, Klausen TW, Rosenberg J. **Chronic pain after mesh versus nonmesh repair of inguinal hernias: A systematic review and a network meta-analysis of randomized controlled trials.** *Surgery (United States)* [Internet]. 2018 May 1 [cited 2025 Sep 21]; 163(5):1151-9.
15. Zeybek N, Tas H, Peker Y, Yildiz F, Akdeniz A, Tufan T. **Comparison of modified darn repair and Lichtenstein repair of primary inguinal hernias.** *Journal of Surgical Research.* 2008 May 15; 146(2):225-9.

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1	Muhammad Khalil Ur Rehman: Conceptualized, drafted.
2	Shahzeena Kaleem: Study design, Revision.
3	Ahmed Naeem Akhtar: Writing.
4	Naeem Sarwar: Data collection, data analysis.
5	Muhammad Rehman Gulzaar: Interpretation of data.
6	Muhammad Sarfraz Ahmed: Data entry.