



A COMPARATIVE STUDY OF MESH FIXATION VERSUS NON-FIXATION IN LAPAROSCOPIC INGUINAL HERNIA REPAIR

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ABSTRACT

Introduction: Laparoscopic hernia repair is an established technique for inguinal hernia management. Mesh fixation has traditionally been performed to prevent recurrence, but it may increase operative time, cost, and post-operative pain. Recent evidence suggests that non-fixation may be equally effective without increasing complications. **Aim:** To compare post-operative pain, operative time, recurrence, complications, and chronic groin pain between mesh fixation and non-fixation techniques in TEP inguinal hernia repair. **Materials And Methods:** This prospective comparative study included 60 patients undergoing laparoscopic inguinal hernia repair, divided into two groups:

- **Group A (Non-fixation):** 30 patients
- **Group B (Fixation):** 30 patients

Operative time, post-operative pain (VAS at 24h, 10 days, 3 and 6 months), complications, recurrence, chronic groin pain, and hospital stay were evaluated. Statistical significance was set at $P < 0.05$. **Results:** Mean operative time was significantly lower in Group A (65.74 ± 8.62 min) compared to Group B (80.18 ± 6.39 min) ($P < 0.001$). At 24 hours, VAS pain scores were lower in the non-fixation group (3.02 ± 0.38) vs fixation (5.02 ± 0.31). Seroma occurred in 1 patient in each group. Recurrence occurred in 2 patients (6.67%) in Group A and 1 patient (3.33%) in Group B ($P = 0.646$; not significant). Chronic groin pain was negligible and similar in both groups. Hospital stay and return to activity were comparable. **Conclusion:** Non-fixation of mesh in laparoscopic hernia repair significantly reduces operative time and early post-operative pain without increasing recurrence or complications. It is a safe, effective, and cost-saving alternative to traditional fixation.

KEYWORDS

Inguinal hernia, mesh fixation, non-fixation, postoperative pain, recurrence.

INTRODUCTION

Laparoscopic inguinal hernia repair has become the preferred approach due to reduced postoperative pain, shorter hospital stay, and faster return to normal activity. The two primary laparoscopic techniques are TAPP and TEP, with TEP favored for avoiding peritoneal entry and reducing intra-abdominal complications.

Although recurrence rates have significantly decreased with improved techniques, chronic groin pain (CGP) remains a concern. Mesh fixation using tackers or staples may contribute to postoperative pain and nerve irritation. To minimize these risks, non-fixation techniques have been proposed. Existing literature indicates non-fixation may not increase recurrence rates when adequate dissection and mesh overlap are ensured.

This study compares mesh fixation and non-fixation in Laparoscopic inguinal hernia repair with regard to pain, operative time, recurrence, complications, and long-term outcomes.

MATERIALS AND METHODS

Study Design: Prospective comparative study.

Study Population: 60 patients diagnosed with unilateral or bilateral inguinal hernia undergoing elective TEP repair.

Study Groups:

- **Group A:** Mesh non-fixation ($n = 30$)
- **Group B:** Mesh fixation using tackers ($n = 30$)

Inclusion Criteria:

- Age > 18 years
- Primary uncomplicated inguinal hernia
- Fit for general anesthesia

Exclusion Criteria:

- Recurrent hernia
- Strangulated or obstructed hernia
- Previous pelvic surgery
- Coagulopathy
- Unfit for general anesthesia

Surgical Technique:

All procedures were performed under general anesthesia by

experienced laparoscopic surgeons. Standard Laparoscopic approach was used. Group A received large pre-peritoneal mesh placement without fixation. Group B had mesh fixation using two tackers (Cooper's ligament and lateral fixation point).



Fixation Of Mesh With Tackers



Mesh Without Fixation

Parameters Assessed:

- Operative duration
- VAS pain score at 24 hours, 10 days, 3 months, 6 months
- Wound seroma
- Recurrence at 6 months
- Chronic groin pain (VAS ≥ 1 after 3 months)
- Length of hospital stay
- Time to return to activities

RESULTS:

Group A exhibited a significantly shorter operative duration than Group B (65.74 ± 8.62 vs. 80.18 ± 6.39 minutes; $p < 0.001$). At 24 hours post-operatively, VAS pain scores were significantly lower in Group A (3.02 ± 0.38) compared with Group B (5.02 ± 0.31 ; $p < 0.05$), while pain assessments at the 10th day, 3 months, and 6 months demonstrated no statistically significant intergroup differences. The 6-month recurrence rates were comparable between the two cohorts (6.67% vs. 3.33%; $p = 0.646$). Wound seroma developed in one patient in each group ($p = 1.000$). Chronic groin pain remained minimal (VAS = 1) and showed no difference between groups at both 3 and 6 months. Additionally, no significant variation was observed between the groups with respect to hospital stay or time to resumption of normal physical activities.

Comparison Of Mean Between Two Groups

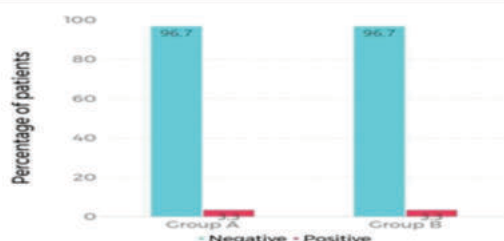
Parameter	Group		P value
	Group A	Group B	
Age	43.22 ± 13.47	35.74 ± 11.60	<0.001

Comparison Of Procedure Between Two Groups

Procedure	Group		Total	Chi square	P value
	Group A	Group B			
TAPP	2 (6.67%)	1 (3.34%)	3 (5%)	0.178	0.673
TEP	28 (93.33%)	29 (96.66%)	57 (95%)		
Total	30 (100%)	30 (100%)	60 (100%)		

Comparison Of Pain By Vas Between Two Groups

Pain by VAS Score	Group		P value
	Group A	Group B	
Pain by vas score at 24 hours	3.02 ± 0.38	5.02 ± 0.31	<0.001
On 10 th day(day of suture removal)	1 ± 0	1.25 ± 0.46	0.170
On 3 rd month Follow-up	1 ± 0	1 ± 0	-
6th month Follow-up	1 ± 0	1 ± 0	-

Comparison Of Wound Site Seroma Between Two Groups**DISCUSSION**

This study demonstrates that mesh non-fixation significantly reduces operative time and early postoperative pain in Laparoscopic hernia repair. The 15-minute reduction in operative duration in non-fixation cases is attributable to elimination of tacker application and reduced manipulation in danger zones such as the triangle of pain or doom.

Pain scores at 24 hours were markedly lower in the non-fixation group. Early postoperative pain is typically related to nerve irritation by fixation devices; eliminating fixation reduces this irritation. By 10 days and during long-term follow-up, pain differences equalized.

Recurrence rates did not differ significantly between groups (6.67% vs 3.33%). Adequate mesh size and proper pre-peritoneal dissection appear more important than fixation. This finding aligns with multiple randomized trials and meta-analyses.

Seroma incidence was identical in both groups and resolved conservatively. Seroma formation is more closely related to dissection technique than fixation.

Chronic groin pain was minimal in both groups, demonstrating that fixation primarily affects acute pain rather than long-term discomfort.

Overall, non-fixation is safe, cost-effective, and reduces early morbidity without compromising outcomes.

CONCLUSION

Mesh non-fixation in Laparoscopic inguinal hernia repair significantly reduces operative time and post-operative pain while offering similar recurrence and complication rates to mesh fixation. It is a safe, effective, and economical alternative, especially suitable for high-volume centers and patients prioritizing faster recovery and reduced postoperative discomfort.

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