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A Comparative Study of Self-Fixating Versus Standard Polypropylene Mesh in Open Inguinal Hernia Repair

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Abstract: ***Background: Chronic postoperative pain remains a significant concern following inguinal hernia repair. Self-fixating meshes may reduce early pain and operative time. Aims: To compare surgical outcomes and cost-effectiveness of sutured polypropylene mesh versus self-fixating meshes. Methods: A non-randomized observational study was conducted on 34 patients with primary unilateral inguinal hernia at Navodaya Medical College, Raichur, between October 2023 and August 2024. Patients were divided into two groups: sutured mesh, self-gripping mesh. Outcomes included operative time, postoperative pain (VAS), complications, recurrence, and cost. Patients were followed for 1.5 years. Results: Operative time was significantly shorter in self-fixating groups (p<0.01). Early postoperative pain was lower in these groups (p<0.01). No significant difference was observed in chronic pain or recurrence. Despite higher mesh cost, overall procedural cost was comparable due to reduced operative time. Conclusion: Self-fixating meshes reduce early postoperative pain and operative time but do not significantly affect long-term outcomes.***

Keywords: Inguinal hernia, Mesh repair, Chronic pain, Lichtenstein repair

1. Introduction

Open mesh repair is the gold standard for inguinal hernia due to low recurrence rates. However, chronic postoperative pain continues to be a concern.

Self-fixating meshes eliminate the need for sutures and may:
- Reduce nerve irritation
- Decrease operative time
- Improve early recovery

This study evaluates their effectiveness compared to standard sutured mesh.

2. Materials and Methods

Study Design: Non-randomized observational study
Study Period: October 2023 – August 2024
Study Setting: Navodaya Medical College, Raichur
Sample Size:34 patients

Inclusion criteria:
- Age >18 years
- Primary unilateral inguinal hernia
- ASA I–III

Exclusion criteria:
- Recurrent/complicated hernia
- Severe comorbid illness

Procedure:
All patients underwent Lichtenstein tension-free hernioplasty under local or regional anesthesia.

Outcome Measures
- Operative time
- Postoperative pain (VAS score)
- Complications
- Recurrence
- Cost analysis

Follow-Up
Patients were followed at:
- Day 1
- 1 week
- 1 month
- 6 months
- 1 year
- 1.5 years

Investigations:
- Surgical profile
- USG of inguinoscrotal region.

Statistical analysis:
Ethical clearance was obtained from the institutional ethics committee, and informed consent was obtained from all patients or their attendants.

3. Results

A total of 50 patients with primary unilateral inguinal hernia were included in the study and divided into two groups:

Group S (sutured mesh, n=17), Group G (self-gripping mesh, n=17). The baseline characteristics including age, body mass index, comorbidities such as hypertension and diabetes mellitus, and ASA grading were comparable among the three groups, with no statistically significant differences ($p>0.05$), indicating homogeneity of the study population.

Table 1: Baseline Characteristics of Patients

Variable	Group S (n=17)	Group G (n=17)	p-value
Mean Age (years)	56.8 ± 10.2	54.9 ± 9.6	NS
BMI (kg/m²)	27.2 ± 2.4	26.1 ± 2.6	NS
Hypertension (%)	35%	24%	NS
Diabetes Mellitus (%)	18%	12%	NS
ASA I (%)	35%	41%	NS
ASA II (%)	47%	47%	NS
ASA III (%)	18%	12%	NS
Indirect Hernia (%)	50%	60%	NS
Direct Hernia (%)	29%	24%	NS
Combined Hernia (%)	21%	16%	NS

The mean operative time was significantly higher in Group S (42 ± 8 minutes) compared to Group G (31 ± 4 minutes), demonstrating a statistically significant reduction in operative duration with the use of self-fixating meshes ($p<0.01$).

Table 2: Operative and Early Postoperative Outcomes

Parameter	Group S	Group G	p-value
Operative Time (min)	42 ± 8	31 ± 4	<0.01
VAS Day 1	5.8 ± 1.2	3.7 ± 1.0	<0.01
VAS 1 Week	3.4 ± 1.1	2.5 ± 0.9	<0.01
Return to Activity (days)	10 ± 2	7 ± 2	<0.01

Postoperative pain assessment using the Visual Analog Scale (VAS) revealed that patients in Group G and Group A experienced significantly lower pain scores in the early postoperative period. On postoperative day 1, the mean VAS score was highest in Group S (5.8 ± 1.2), compared to 3.7 ± 1.0 in Group G. Similarly, at 1 week follow-up, pain scores remained significantly lower in the self-fixating groups (Group G: 2.5 ± 0.9) compared to Group S (3.4 ± 1.1) ($p<0.01$). Additionally, patients in Group G returned to normal daily activities earlier (approximately 7 days) compared to Group S (10 days), which was statistically significant ($p<0.01$).

During the follow-up period of 1.5 years, the incidence of chronic pain was low across all groups and did not show a statistically significant difference. One patient (6%) in Group S reported persistent pain, whereas no cases were observed in Group G. Mild pain and discomfort were reported in a small proportion of patients in all groups, with slightly higher incidence in the sutured mesh group; however, these differences were not statistically significant ($p>0.05$).

Table 3: Follow-Up Outcomes (1.5 Years)

Outcome	Group S	Group G	p-value
Chronic Pain (%)	6% (1)	0%	NS
Mild Pain (%)	6% (1)	6% (1)	NS
Discomfort (%)	18% (3)	12% (2)	NS
Recurrence (%)	6% (1)	0%	NS

The overall complication rate was comparable between the groups. Seroma or hematoma formation was observed in 24% of patients in Group S, compared to 18% in Group G. Wound infection occurred in one patient in Group S, while none were reported in Group G. These differences were not statistically significant.

Table 4: Postoperative Complications

Complication	Group S	Group G	p-value
Seroma/Hematoma	24% (4)	18% (3)	NS
Wound Infection	6% (1)	0%	NS
Overall Complications	29%	18%	NS

The recurrence rate was low across all groups. One case (6%) of recurrence was noted in Group S, whereas no recurrences were observed in Group G during the follow-up period. However, this difference was not statistically significant.

Cost analysis revealed that although the mesh cost was significantly higher in the self-fixating groups (Group G), the overall theatre cost was significantly lower due to reduced operative time. The mean theatre cost was highest in Group S. When total procedural cost was considered, the difference between the groups was not statistically significant, indicating that the higher mesh cost was offset by reduced operative time.

Table 5: Cost Analysis

Parameter	Group S	Group G	p-value
Theatre Cost (₹)	4500 ± 500	3600 ± 400	<0.01
Mesh Cost (₹)	500 ± 100	3500 ± 300	<0.01
Total Cost (₹)	5000 ± 600	7100 ± 500	NS

4. Discussion

Self-fixating meshes showed advantages in:
- Reduced early postoperative pain
- Shorter operative time

However:
- No significant difference in long-term outcomes
- Chronic pain likely multifactorial

5. Conclusion

Self-fixating meshes:
- Improve early postoperative outcomes
- Reduce operative time

But:
- Do not significantly impact long-term pain or recurrence

References

[1] Simons MP et al. International guidelines for groin hernia management.
[2] Sanders DL et al. Self-gripping mesh vs sutured mesh study.
[3] Molegraaf M et al. Meta-analysis of self-fixating meshes.