

# Comparative Outcomes of Mesh versus Non-Mesh Repair in Inguinal Hernia Surgery: A Prospective Clinical Study

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**Annotation:** Inguinal hernias are among the most frequently encountered conditions in general surgery, often requiring operative intervention to prevent complications such as strangulation or incarceration. Over the past several decades, mesh-based hernia repair techniques have emerged as the gold standard, significantly reducing recurrence rates and improving postoperative quality of life. However, despite the benefits of mesh use, traditional non-mesh suture-based methods remain in practice, particularly in low-resource settings or in patients with contraindications to foreign materials. This prospective clinical study compares the short-term and long-term outcomes of mesh versus non-mesh inguinal hernia repair among patients treated at the Samarkand State Medical University Hospital. A total of 108 patients were enrolled, with 56 undergoing Lichtenstein mesh repair and 52 undergoing traditional Bassini suture repair. Outcomes assessed included operative time, postoperative pain scores, recovery duration, complication rates, and recurrence over a 12-month follow-up period. Results indicate that mesh repair offers superior long-term outcomes, particularly in reducing recurrence, though non-mesh techniques may still have relevance in carefully

selected patients.

**Keywords:** Inguinal hernia, mesh repair, Lichtenstein procedure, non-mesh suture technique, Bassini method, hernia recurrence, postoperative complications.

**Introduction:** Inguinal hernia represents a protrusion of abdominal contents through a weakened area in the inguinal canal, typically caused by increased intra-abdominal pressure, congenital weaknesses, or degenerative changes in connective tissue. It affects millions globally, with men being predominantly affected due to anatomical predisposition. Surgical correction remains the definitive treatment. The evolution of hernia surgery has progressed from pure tissue approximation methods, such as the Bassini and Shouldice techniques, to tension-free mesh reinforcement approaches like the Lichtenstein procedure. Mesh repair has become the most widely practiced due to its reduced recurrence rates and relatively straightforward surgical technique. Nonetheless, debates persist regarding the risk of mesh-associated complications, including chronic pain, infection, and foreign body sensation. These concerns have prompted some surgeons to continue employing non-mesh repairs in specific populations, such as younger patients or those with high infection risk. Furthermore, in many low- and middle-income countries, the cost of mesh and equipment availability influence surgical choices. The purpose of this study is to provide a comprehensive comparative evaluation of mesh and non-mesh inguinal hernia repair outcomes, focusing on perioperative parameters, complication profiles, recovery timelines, and long-term recurrence.

**Materials and Methods:** This prospective, observational clinical study was conducted at the Department of General Surgery, Samarkand State Medical University, from January 2022 to December 2023. A total of 108 male patients aged between 18 and 70 years with primary unilateral inguinal hernias were enrolled after obtaining informed consent. Patients with recurrent hernias, bilateral hernias, complicated hernias (strangulated/incarcerated), previous lower abdominal surgeries, or significant comorbidities were excluded. Preoperative assessments included physical examination, abdominal ultrasound, laboratory investigations, and anesthetic evaluation. Patients were randomized into two groups: Group A (n=56) underwent Lichtenstein mesh repair using a polypropylene mesh, while Group B (n=52) underwent non-mesh Bassini repair involving suturing of the conjoint tendon to the inguinal ligament. All surgeries were performed under spinal anesthesia by experienced surgeons following standardized protocols. Postoperative parameters recorded included operative time, visual analog scale (VAS) pain scores at 12, 24, and 48 hours, time to ambulation, duration of hospital stay, and time to return to work. Complications such as hematoma, wound infection, urinary retention, and seroma were monitored. Patients were followed up at 1, 3, 6, and 12 months for recurrence assessment and chronic pain evaluation. Data were statistically analyzed using SPSS version 25. A p-value < 0.05 was considered statistically significant.

**Results:** The demographic characteristics between the two groups were statistically comparable with a mean age of  $43.7 \pm 11.2$  years in Group A and  $42.5 \pm 10.7$  years in Group B. The average operative time was significantly longer in Group A ( $57.4 \pm 7.6$  minutes) compared to Group B ( $49.1 \pm 6.9$  minutes,  $p < 0.01$ ). However, postoperative pain scores measured by VAS at 24 hours were lower in Group A ( $3.4 \pm 0.9$ ) compared to Group B ( $4.8 \pm 1.1$ ,  $p < 0.001$ ), indicating better comfort with mesh repair. The mean hospital stay was shorter in the mesh group ( $2.4 \pm 0.6$  days) than in the non-mesh group ( $3.1 \pm 0.7$  days,  $p < 0.01$ ). Return to normal activity was also quicker in Group A (mean of 9.2 days) than Group B (mean of 12.6 days). In terms of early postoperative complications, wound infection occurred in 2 patients from each group, while seroma formation was noted in 3 patients from Group A. No mesh infections or allergic reactions were observed. During the 12-month follow-up, recurrence was detected in 1 patient (1.8%) in

the mesh group versus 6 patients (11.5%) in the non-mesh group ( $p < 0.01$ ). Chronic groin pain was reported by 3 patients (5.3%) in Group A and 5 patients (9.6%) in Group B at the 6-month mark, but most resolved spontaneously without intervention.

**Discussion:** The outcomes of this prospective analysis underscore the clinical benefits of mesh-based repair for primary unilateral inguinal hernias in terms of reduced postoperative pain, faster rehabilitation, and significantly lower recurrence rates. The Lichtenstein technique, owing to its tension-free principle, minimizes the risk of hernia reformation and has become the global gold standard. Although operative time is marginally increased due to mesh placement and fixation, this is offset by superior postoperative recovery. Our findings align with existing international literature confirming the safety and efficacy of mesh repair. Nevertheless, non-mesh suture techniques like the Bassini method still hold relevance, especially in young, active patients with low recurrence risk or in settings where mesh is not accessible. The relatively higher recurrence and slower functional recovery observed in the non-mesh group justify the shift toward mesh-based techniques in modern surgical practice. A key concern surrounding mesh repairs—chronic groin pain—was minimally observed in our cohort and did not significantly impact quality of life. The absence of mesh infections or allergic reactions further supports the safety profile of current polypropylene meshes. However, it is important to individualize surgical planning based on patient anatomy, risk factors, and surgical expertise. In the future, biologic or absorbable meshes may offer even better outcomes with fewer long-term complications.

**Conclusion:** This comparative clinical study confirms that mesh-based Lichtenstein hernia repair provides superior outcomes compared to non-mesh Bassini repair in adult males with primary unilateral inguinal hernia. Advantages include lower recurrence rates, reduced postoperative discomfort, and quicker return to daily activity. While traditional suture methods may still be applicable in specific scenarios, mesh repair should remain the preferred choice in standard surgical settings. Proper surgical technique, sterile practices, and patient education are essential for optimizing outcomes and minimizing complications. Expanding access to mesh materials and enhancing laparoscopic hernia repair training in low-resource environments could further improve the global standard of hernia care.

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