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A Comparative Study of Laparoscopic versus Open Inguinal Hernia Repair

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ABSTRACT

Background: Inguinal hernia repair is among the most common procedures performed in general surgery. With the introduction of laparoscopic techniques, outcomes such as postoperative pain, hospital stay, and recovery time have significantly improved. This study compares laparoscopic and open inguinal hernia repair regarding intraoperative and postoperative outcomes.

Methods: This randomized prospective comparative study was conducted at Dr. L.N. Pandey Government Medical College & Hospital, Ratlam (M.P.), over 18 months. Patients were divided into two groups—Group A (Laparoscopic hernioplasty using TAPP/TEP) and Group B (Open Lichtenstein repair). Parameters compared included operative time, complications, postoperative pain, hospital stay, and return to normal activity.

Results: Laparoscopic repair demonstrated shorter hospital stay, reduced pain scores, and faster return to activity. However, operative time and cost were higher than open repair. Recurrence and complication rates were comparable.

Conclusion: Laparoscopic hernia repair offers superior recovery and less pain, while open repair remains a cost-effective alternative suitable for resource-limited settings.

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1. INTRODUCTION

Inguinal hernia repair is one of the most frequently performed surgical procedures worldwide. Traditionally, the Lichtenstein open mesh repair has been considered the gold standard due to its simplicity, cost-effectiveness, and reproducible results. However, with the advent of minimally invasive techniques, laparoscopic hernia repair has emerged as a promising alternative, offering distinct advantages in terms of reduced postoperative pain, faster recovery, and superior cosmetic outcomes.[1,2]

The concept of "keyhole surgery" has revolutionized the field of general surgery by enabling smaller incisions, minimal tissue trauma, and early ambulation. Laparoscopic techniques—Transabdominal Preperitoneal (TAPP) and Totally Extraperitoneal (TEP)—allow for bilateral hernia repair through the same incisions and better visualization of the myopectineal orifice. Despite these benefits, laparoscopic repair requires general anesthesia, specialized equipment, and trained surgeons, which may limit its use in resource-constrained environments.[3,4,5]

Conversely, open hernioplasty can be performed under regional or local anesthesia, making it suitable for older patients and those with comorbidities. The debate between laparoscopic and open hernia repair continues, particularly in developing countries, where economic and infrastructural limitations influence surgical decisions.[6,7]

This study was designed to compare laparoscopic and open inguinal hernia repair concerning operative time, postoperative pain, hospital stay, complications, recurrence, and return to daily activities, with the objective of evaluating their relative merits and feasibility in an Indian tertiary care hospital setting.

2. MATERIALS AND METHODS

A randomized prospective comparative study was conducted in the Department of Surgery, Dr. L.N. Pandey Government Medical College & Hospital, Ratlam (M.P.), over a period of 18 months, following approval from the Institutional Ethics Committee.

Study Population
All adult patients (>18 years) presenting with unilateral or bilateral inguinal hernia and fit for surgery were included. Patients were randomly allocated into two groups:
• Group A: Laparoscopic hernioplasty (TAPP or TEP technique) under general anesthesia.
• Group B: Open Lichtenstein tension-free mesh repair under spinal anesthesia.

Inclusion Criteria
• Adult patients (≥18 years) with unilateral or bilateral uncomplicated inguinal hernias.

Exclusion Criteria
• Complicated hernias (strangulated, obstructed).
• Recurrent hernias.
• Contraindications to pneumoperitoneum or anesthesia.
• Associated hydrocele or varicocele.
• Unwilling patients.

Procedure
Eligible participants were enrolled after written informed consent. Demographic data, medical history, and relevant investigations (CBC, ultrasound abdomen/pelvis) were recorded. Patients in Group A underwent laparoscopic hernioplasty (TAPP/TEP), while those in Group B underwent Lichtenstein's open mesh repair.

Outcome Parameters
• Operative duration (minutes)
• Intraoperative and postoperative complications
• Postoperative pain (VAS score at 6, 12, and 24 hours)
• Hospital stay (days)
• Time to return to normal activity (days)
• Recurrence rate

3. RESULTS

Comparison between laparoscopic and open hernia repair outcomes is summarized below.

Table- 1

Parameter	Open Hernia Repair	Laparoscopic Hernia Repair
Average Pain (24 hrs)	8.14	6.15686274509804
Average Hospital Stay (Days)	3.8	3.4705882352941178
Average Return to Work (Days)	14.84	7.764705882352941

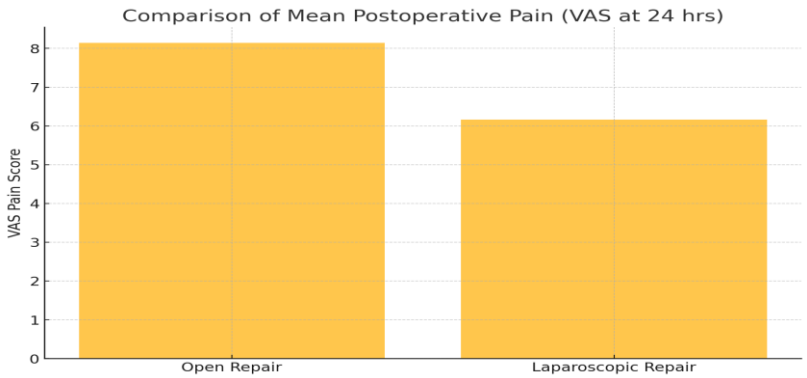

Figure 1: Comparison of postoperative pain (VAS at 24 hours).

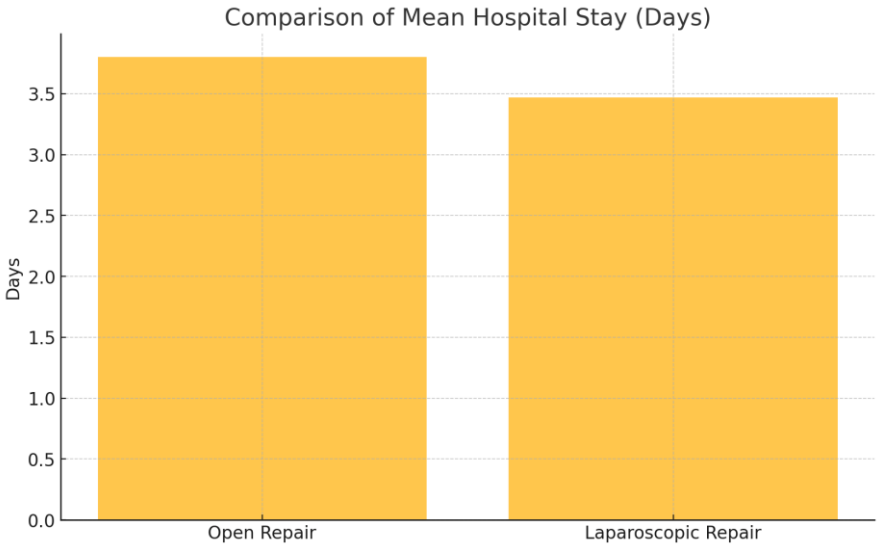

Figure 2: Comparison of hospital stay (days).

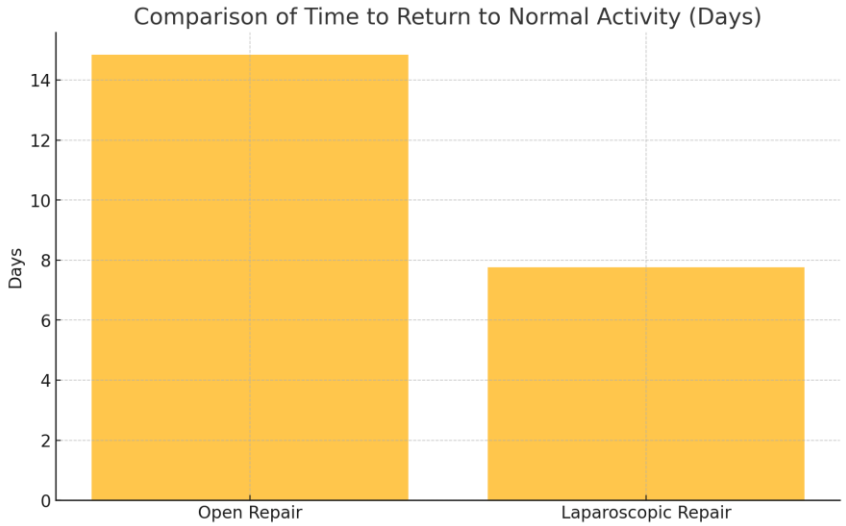

Figure 3: Comparison of time to return to normal activity.

The results of this study demonstrate that laparoscopic repair provides significant advantages in terms of postoperative recovery, pain reduction, and early resumption of activity. Although the laparoscopic approach is associated with longer operative time and higher costs, it offers enhanced visualization and minimal invasiveness. In contrast, open mesh repair remains a dependable, cost-effective option suitable for rural and resource-limited hospitals.

4. DISCUSSION

The findings of this study demonstrate that laparoscopic hernia repair offers several postoperative advantages compared to open mesh repair. Patients undergoing laparoscopic repair experienced significantly less postoperative pain, a shorter hospital stay, and an earlier return to routine activities. These findings are consistent with previous studies, including those by Neumayer et al. and McCormack et al., which confirmed improved postoperative comfort and faster recovery with laparoscopic repair.

The magnified intra-abdominal view during laparoscopic surgery allows better identification of anatomical structures, leading to meticulous dissection and decreased risk of nerve injury and chronic pain. However, the technique requires general anesthesia and longer operative time, particularly during the surgeon's learning curve. Moreover, the higher cost of equipment and consumables remains a limitation in low-resource settings.

In contrast, open Lichtenstein repair continues to be a reliable and cost-effective procedure, suitable for centers where

laparoscopic infrastructure or expertise is limited. It can be performed under spinal or local anesthesia, reducing perioperative risks for high-risk patients.

Overall, while both methods are safe and effective, laparoscopic repair provides superior patient comfort and faster recovery, making it ideal for younger, working individuals requiring early mobilization. Open repair, however, retains its value in rural or resource-limited hospitals, ensuring accessibility and affordability. Thus, the choice of technique should be individualized based on patient profile, institutional resources, and surgeon experience.

5. CONCLUSION

Both laparoscopic and open hernia repairs are safe and effective. Laparoscopic repair offers superior patient comfort and faster recovery, whereas open repair remains practical and economical in low-resource settings. The choice should depend on patient preference, surgeon expertise, and institutional capability.

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