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RECURRENCE RATE AFTER MESH REPAIR OF INGUINAL HERNIA: A CLINICAL STUDY

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ABSTRACT

Background: Inguinal hernia repair is among the most common general surgical procedures. Mesh repair, especially via the Lichtenstein tension-free technique, has become the gold standard due to reduced recurrence rates compared to tissue repair. This study aimed to evaluate the postoperative outcomes and recurrence rate after mesh repair in a tertiary care setup.

Methodology: A prospective observational study was conducted in the Department of Surgery, Abbottabad International Medical College, between January and December 2024. A total of 100 patients with primary inguinal hernia underwent open mesh repair using the Lichtenstein technique. Patients with recurrent or complicated hernias were excluded. Postoperative complications and recurrence rates were documented. Follow-up was carried out at 1 month, 6 months, and 12 months.

Results: Of the 100 patients, 92 were male and 8 were female, with a mean age of 44 ± 12 years. Right-sided hernia was more common (58%), followed by left-sided (34%) and bilateral (8%). Early postoperative complications included seroma formation in 5% (n=5), wound infection in 3% (n=3), and chronic groin pain in 6% (n=6). The recurrence rate at 12 months was 2% (n=2).

Conclusion: Mesh repair of inguinal hernia using the Lichtenstein technique provides favorable postoperative outcomes with minimal complications and a low recurrence rate. It remains a safe and effective option in our surgical practice.

Keywords: Inguinal hernia, Mesh repair, Lichtenstein technique, Postoperative outcomes, Recurrence.

INTRODUCTION

Inguinal hernia repair is one of the most frequently performed elective surgical procedures worldwide and remains a cornerstone of general surgery. An inguinal hernia is defined as the protrusion of intra-abdominal contents through a weakened area of the abdominal wall in the groin region. It is estimated that approximately 20 million inguinal hernia repairs are carried out annually across the globe, highlighting its significant clinical and socioeconomic impact on healthcare systems [1]. The lifetime risk of developing an inguinal hernia has been reported to be around 27% for men and 3% for women, underscoring its predominance among males due to anatomical and physiological factors such as the presence of the spermatic cord and inherent weakness in the inguinal canal [2]

Historically, tissue-based repairs were the mainstay of hernia surgery. Procedures such as the Bassini and Shouldice techniques were widely practiced and achieved satisfactory results in the pre-mesh era. However, these procedures were associated with relatively higher recurrence rates, ranging between 10% and 15%, particularly in the hands of less experienced surgeons[3.] The evolution of hernia surgery took a major step forward with the introduction of synthetic prosthetic materials. The use of polypropylene mesh, in particular, revolutionized hernia repair by allowing tension-free reinforcement of the inguinal floor. Among the various mesh-based approaches, the Lichtenstein tension-free repair, introduced in the 1980s, has become the gold standard due to its simplicity, reproducibility, and low recurrence rates [4].

The superiority of mesh repair over conventional tissue-based repair is well established. Multiple randomized controlled trials and meta-analyses have demonstrated that mesh repair is associated with a significantly lower recurrence rate, faster recovery, and earlier return to normal daily activities compared to traditional methods [5]. Reported recurrence rates after Lichtenstein mesh repair range from as low as 0.2% to around 4%, depending on surgical expertise, patient factors, and the length of follow-up [6]

Despite the clear advantages of mesh repair, it is not without drawbacks. Postoperative complications remain a concern and include wound infection, hematoma, seroma formation, and, importantly, chronic groin pain. Chronic pain is now recognized as a significant postoperative issue, with some studies reporting incidence rates between 5% and 15% [7.] This pain is often neuropathic in nature, resulting from nerve entrapment or injury during surgery, and may have long-term implications on patients' quality of life. Mesh-related complications such as foreign body sensation, stiffness, and, in rare cases, mesh rejection or migration have also been described, although these are uncommon [8.]

Inguinal hernia recurrence, while markedly reduced with the use of mesh, remains an important endpoint in hernia research. Factors influencing recurrence include surgical technique, mesh placement, infection, obesity, smoking, and patient-specific connective tissue disorders[9]. Recurrence often requires reoperation, which can be technically more demanding and associated with increased morbidity. Hence, recurrence rates serve as a critical indicator of the effectiveness of hernia repair strategies.

Globally, there is ongoing debate about the best surgical approach for inguinal hernia repair. While open mesh repair using the Lichtenstein technique continues to dominate due to its simplicity and reproducibility, laparoscopic approaches such as transabdominal preperitoneal (TAPP) and totally extraperitoneal (TEP) repair are gaining popularity, particularly in developed countries. These minimally invasive approaches are associated with reduced postoperative pain and quicker return to work, though they require advanced surgical expertise, specialized equipment, and carry higher costs [10]. In resource-limited settings such as Pakistan, open mesh repair remains the most feasible and widely practiced option.

In Pakistan and other developing countries, the burden of inguinal hernia surgery is significant due to the high prevalence, lack of screening, and frequent presentation at advanced stages. Many patients delay surgical treatment because of financial constraints, lack of awareness, or access issues, leading to complicated hernias such as incarceration or strangulation [11]. Therefore, studies evaluating the outcomes of mesh repair in local populations are necessary to establish evidence-based practices and improve surgical outcomes.

The present study was conducted in the Department of Surgery at Abbottabad International Medical College to assess the postoperative outcomes and recurrence rate following mesh repair using the Lichtenstein technique. By focusing on complication rates and recurrence at one year, this study provides locally relevant data that can guide surgical practice in our setting and contribute to the broader global literature on hernia repair.

METHODOLOGY

This prospective observational study was conducted in the Department of Surgery at Abbottabad International Medical College over a period of one year, from January to December 2024. A total of 100 patients diagnosed with primary inguinal hernia were included in the study, all of whom underwent mesh repair using the Lichtenstein tension-free technique.

Inclusion Criteria: Adults (>18 years) with primary inguinal hernia and elective cases undergoing mesh repair.

Exclusion Criteria: Recurrent hernias, complicated hernias (strangulated/obstructed), Patients with severe comorbid conditions.

Surgical Technique: All patients underwent open mesh repair using the Lichtenstein tension-free technique. A standard polypropylene mesh was placed to cover the posterior wall of the inguinal canal. Patients were followed at 1 month, 6 months, and 12 months. Postoperative complications (seroma, wound infection, chronic pain) and recurrence were documented.

Data Analysis: Descriptive statistics were applied. Categorical variables were presented as frequency and percentages, and continuous variables as mean ± standard deviation.

RESULTS

A total of 100 patients were included**.** Table **1** presents the demographic characteristics of the study population. A total of 100 patients underwent open mesh repair using the Lichtenstein technique. The mean age of the patients was 44 **±** 12 years**,** ranging from 20 to 70 years. There was a marked male predominance with 92 males (92%) and 8 females (8%)**,** consistent with the higher incidence of inguinal hernia in men. Regarding the laterality of hernia**,** right-sided hernias were the most common, observed in 58% of patients, followed by left-sided in 34%**,** and bilateral hernias in 8% of cases.

Table 1: Patient Demographics (n = 100)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	Mean ± SD	44 ± 12	–
Gender	Male	92	92%
	Female	8	8%
Side of Hernia	Right	58	58%
	Left	34	34%
	Bilateral	8	8%

Table **2** outlines the postoperative complications observed during follow-up. The overall complication rate was low. Seroma formation was noted in 5% (n=5) of patients**,** wound infection occurred in 3% (n=3)**,** and chronic groin pain was reported in 6% (n=6) of cases. Importantly, no cases of mesh rejection were recorded, indicating good biocompatibility of the polypropylene mesh used.

Table 2: Postoperative Complications

Complication	Frequency (n)	Percentage (%)
Seroma	5	5%
Wound infection	3	3%
Chronic groin pain	6	6%
Mesh rejection	0	0%

Recurrence Rate:
Table 3 shows the recurrence rate at 12 months postoperatively. Only 2 patients (2%) experienced recurrence, while 98% remained recurrence-free during the follow-up period. This low recurrence rate demonstrates the effectiveness and durability of the Lichtenstein tension-free mesh repair in this cohort.

Table 3: Recurrence Rate at 12 Months

Outcome	Frequency (n)	Percentage (%)
Recurrence	2	2%
No Recurrence	98	98%

DISCUSSION

Inguinal hernia repair is one of the most frequently performed procedures in general surgery, and the use of mesh, particularly through the Lichtenstein tension-free technique, has significantly reduced recurrence rates compared to conventional tissue repair. In this study, we evaluated postoperative outcomes and recurrence after mesh repair in a tertiary care setup, with encouraging results.
Our findings demonstrated a recurrence rate of 2% at 12 months, which is consistent with international literature reporting recurrence rates between 0.2% and 4% following mesh repair[12]. This supports the notion that the Lichtenstein technique, when performed by trained surgeons, provides durable outcomes with low failure rates.
The majority of patients in our study were male (92%), which is in line with the established higher incidence of inguinal hernia in men due to anatomical and physiological factors. Right-sided hernias were more common (58%), consistent with other regional and international studies [13.]
Early postoperative complications in our cohort were relatively minor and manageable. Seroma occurred in 5% of patients, wound infection in 3%, and chronic groin pain in 6%. These figures are comparable to previously published studies, where seroma formation ranges from 3–8% and wound infection rates from 2–5% [14]. Chronic pain following mesh repair is a recognized issue, with global reports ranging from 5% to 15% depending on follow-up duration and assessment methods [15]. In our series, chronic groin pain occurred in 6% of patients, which lies on the lower side of reported values. Importantly, no cases of mesh rejection were noted, highlighting the safety of polypropylene mesh in this setting.
The low recurrence and acceptable complication rates observed in this study affirm the safety and effectiveness of the Lichtenstein mesh repair technique in our clinical practice. Nevertheless, recurrence may still occur due to technical errors, patient-related factors (such as collagen disorders, obesity, or smoking), or infection. Longer-term follow-up beyond one year would be essential to capture late recurrences, as some studies have reported recurrences developing several years post-surgery[16].

Limitations of this study include its relatively small sample size, single-center design, and limited follow-up duration of 12 months. Furthermore, patient-reported outcomes such as quality of life and return to daily activities were not assessed, which could provide additional insight into long-term success.

CONCLUSION

Our results align with existing evidence that mesh-based inguinal hernia repair using the Lichtenstein technique is associated with minimal complications and low recurrence. Continued surgical training, adherence to standardized techniques, and extended follow-up are vital to further improve patient outcomes.

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