Original Research

# OPERATIVE PAIN AND WOUND INFECTION IN LICHTENSTEIN REPAIR VERSUS LAPAROSCOPIC TAPP REPAIR IN INGUINAL HERNIA

**Dr Priya Bai[1], Dr Rakesh Kumar[2], Dr Rabel Qureshi[3], Dr Beenish Khan[4], Dr Ashfaq Hussain[5], Dr Adil Dawach[6], Dr Mohammad Sohail Asghar[7]**

[1]MBBS FCPS, Consultant Surgeon, Rims Trauma Hospital Pechs Karachi.
[2]MBBS FCPS Registrar General Surgery, Al Amiri Hospital Kuwait.
[3]MBBS FCPS, Consultant Surgeon, Ward 3 JPMC Karachi.
[4]MBBS FCPS Senior Registrar Ward 2 JPMC Karachi.
[5]MBBS FCPS, Senior Registrar General Surgery, Sohail Trust University Hospital Karachi.
[6]MBBS FCPS, Consultant Surgeon, JPMC ward 3 Karachi.
[7]MBBS FCPS MRCS Consultant Surgeon, Yasin Hospital and Urology Centre Chiniot.
**Email:** [1]Priyamandhan24@gmail.com, [2]Rakesh.k108@yahoo.com, [3]Rabelqureshi2013@gmail.com, [4]Doc.beenishkhan.bk@gmail.com, [5]Ashfaqmemon512@gmail.com, [6]adildawach@hotmail.com,

**Objective** The purpose of this study is to evaluate the efficacy of lichtenstein mesh repair vs laproscopic TAPP mesh repair for inguinal hernias in terms of postoperative discomfort and wound infection. Surgical Unit 4 of Jinnah Post Graduate Medical College JPMC in Karachi is where the procedure took place. The research utilised a randomised control trial design and lasted for six months, from September 1, 2023, to February 1, 2024.
**Methods:** The study comprised all patients admitted to the JPMC Karachi Department of Surgery who met the inclusion criteria. After ensuring their anaesthetic readiness, getting ethical clearance, and receiving written consent, they had surgery. Group 1 (Lichtenstein repair) and Group 2 (TAPP) were the two groups into which the patients were split. We compared the two groups based on the outcomes, which included the mean post-operative pain level and wound infection at 8, 24, and 5 days after the surgery.
**Result:** A total 100 patients with inguinal hernias were included. The mean post-operative pain score (at 8 hours, 24 hours & 5$^{th}$ day) in group 1 was 6.440$\pm$1.090, 5.560$\pm$0.860 & 3.500$\pm$0.735 respectively while in group 2 it was 4.160$\pm$0.865, 3.040$\pm$0.668 & 1.580$\pm$0.537 respectively. The wound infection at 8 hours, 24 hours & 5$^{th}$ day in group 1 was seen in 3 patients (3%), (3%) & 2(2%) respectively while in group 2 it was noted in one patient (1%),1(1%) & 1(1%) respectively
**Conclusion:** Laparoscopic TAPP operation demonstrated significantly less post-operative pain and wound infection as compared to Lichtenstein mesh repair.

**Keywords:** Inguinal Hernia, Lichtenstein Repair, Transabdominal Pre Peritoneal Repair.

## INTRODUCTION

A hernia occurs when the viscus or a section of the viscus sticks out of its natural hole in the wall of the cavity that it normally occupies [(1)]. Inguinal hernias account for around 75% of all hernias in the abdominal wall; 27% of men and 3% of women will develop one at some point in their lives[(2)]. Regardless of ethnicity, nationality, or socioeconomic status, inguinal hernias account for 10-15% of all procedures performed, have a significant impact on healthcare costs, and require considerable draining[(3)]. One of the most common types of surgical treatments performed on a global scale is inguinal hernia repair[(4)].

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Inguinal hernia repair has a long and storied history that begins in ancient Egypt. A dramatic decrease in recurrence rates and subsequent widespread adoption of Irving Lichtenstein's tension-less repair surgery occurred towards the end of the twentieth century. On the other hand, a new controversy arose over the optimal method of inguinal hernia repair when Ralf Ger introduced a laparoscopic surgery in the early 1990s[(5)].

The current gold standard for inguinal and groin hernias is hernioplasty. The two most common methods of mesh placement are inlay (in the preperitoneal area) and onlay/underlay (across the conjoint tendon to the inguinal ligament). The open technique and the less invasive laparoscopic procedure are the two options for mesh installation at the moment[(6, 7)]. When it comes to persistent pain, laparoscopic repairs appear to be the most promising option. However, after three to four

years, the difference between laparoscopic and the Lichtenstein repair appears to level off.

TEP differs from other methods that it seals the hernia from the outside rather than opening the peritoneal cavity (7).

The two most popular laparoscopic procedures are total extra-peritoneal (TEP) and transabdominal preperitoneal (TAPP) resections [7]. Typically, when comparing laparoscopic versus open repair, randomized trials have highlighted the benefits (less postoperative pain, faster recovery) and drawbacks (longer operation, steeper learning curve, greater complication and recurrence rates early in a surgeon's experience, etc.)[6]

Data on this subject is rare both locally and internationally, which is why the study is justified. So, in order to alleviate post-operative pain and wound infections in our low-resource nation, the current study is structured to collect local data for the purpose of using the proper approach. Both the financial and emotional strain on patients was alleviated as a result of this.

## OBJECTIVE AND METHODOLOGY

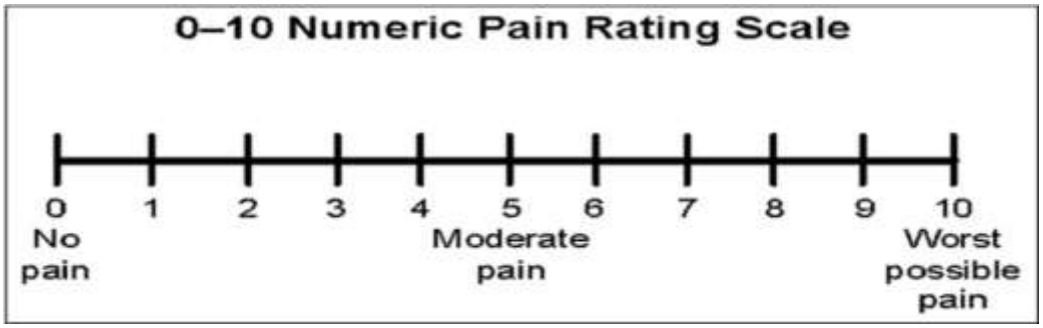
In this study, we will assess the effectiveness of two surgical procedures for inguinal hernias: Lichtenstein mesh repair and laproscopic TAPP mesh repair. We will look at the two methods in terms of postoperative discomfort and wound infection. We will do this in a tertiary care hospital in Karachi. A randomized control trial was the method of choice for this investigation. Anatomical Unit 4 of the Department of General Surgery at Jinnah Post Graduate Medical College in Karachi, Pakistan, was the primary location of the research. The average (standard deviation) post-operative pain score in the two groups (6±1.89 vs. 3.6±1.35) was used to determine the sample size.6. Power of 90%; confidence interval of 95%. Although there were 100 patients in total (50 in each group), a minimum of 20 individuals was required for one- or two-sided significance (n=10 in each group). The study period began on September 1, 2023, and ended on February 1, 2024. As an example, we offer a sequential sampling approach that is not based on probability. Participants will be male patients between the ages of 18 and 60 who have a history of or present diagnosis of recurrent inguinal hernias. Patients who have undergone bladder or prostate surgery without giving written informed permission are also not eligible to participate, as are those whose irreducibility, obstruction, or strangulation is established by history, clinical examination, or CT scan of the abdomen.

Our investigation comprised patients who met the inclusion criteria. After patients underwent anesthesia, received ethical approval, and gave their informed written consent, they were monitored and admitted to the out-patient surgery department at Karachi's Jinnah Postgraduate Medical Centre, where they had surgery. One hundred and ten people who underwent inguinal hernia repair are part of this study. Using a lottery method, they were randomly divided into two groups of 55 instances each. The first group of patients underwent sutured mesh repair, whereas the second group got self-gripping mesh repair. A consultant with a minimum of five years of post-fellowship experience oversaw the surgical team, and the research itself assessed their performance. Following the procedure, all patients were assessed for postoperative pain and wound infection at 8, 24, and 5 days postoperatively, in accordance with established protocols.

The social services statistical package 20 entered a database. Age, post-operative discomfort, body mass index (BMI), socioeconomic position, and mean and standard deviation were all computed. Mean postoperative pain and gender were the outcome variables that were quantified using percentages and frequencies, respectively. The mean levels of pain experienced by both groups following surgery were compared using a student t-test. By using a student t-test to stratify participants according to age, gender, and body mass index, we were able to account for the effect modifier and examine its impact on the outcome variable. A significance level of less than 0.05 was considered.

**Follow Up:** Patients included in this study was followed after 8 hours of surgery, 24 hours and 5$^{th}$ post-operative day.

**Visual Analogue Score**



**0= No pain.**
**1-4 = mild pain.**
**5-7 = moderate pain.**
**8-10 = severe pain**

## RESULTS

A total of 100 male patients with inguinal hernia were enrolled in this randomized controlled trial and were equally divided into two groups of 50 patients each. **Group 1** underwent open **Lichtenstein mesh repair**, while **Group 2** underwent **laparoscopic TAPP mesh repair**. The baseline demographic characteristics including age, height, weight, BMI, and socio-economic status were comparable between the two groups ($p > 0.05$), indicating successful randomization.

Table 1: Comparison of mean postoperative pain scores between the two groups **(Visual Analogue Scale)**

| Time Point | Group 1 (Lichtenstein) Mean ± SD | Group 2 (TAPP) Mean ± SD | Overall Mean ± SD | p-value |
|---|---|---|---|---|
| 8 hours post-op | 6.44 ± 1.09 | 4.16 ± 0.87 | 5.30 ± 1.51 | **0.001** |
| 24 hours post-op | 5.56 ± 0.86 | 3.04 ± 0.67 | 4.30 ± 1.48 | **0.001** |
| 5th postoperative day | 3.50 ± 0.74 | 1.58 ± 0.54 | 2.54 ± 1.16 | 0.760 |

Patients who underwent **laparoscopic TAPP repair** experienced **significantly less postoperative pain** compared to the Lichtenstein group at 8 hours and 24 hours after surgery ($p = 0.001$). This indicates that the laparoscopic approach provides a clear advantage in terms of early postoperative pain relief. By the 5th postoperative day, pain had substantially decreased in both groups, and the difference between them was no longer statistically significant. Overall, the laparoscopic TAPP technique was associated with better pain control during the critical early recovery period.

Table 2: Comparison of wound infection rates between the two groups

| Time Point | Group 1 (Lichtenstein) | Group 2 (TAPP) | Total | p-value |
|---|---|---|---|---|
| 8 hours post-op | 3 (6%) | 1 (2%) | 4 (4%) | 0.799 |
| 24 hours post-op | 3 (6%) | 1 (2%) | 4 (4%) | 0.799 |
| 5th postoperative day | 2 (4%) | 1 (2%) | 3 (3%) | 0.837 |

The overall incidence of wound infection was low in both groups. However, the Lichtenstein (open) repair group consistently showed a higher rate of wound infection at all three assessment points compared to the laparoscopic TAPP group. Although the difference did not reach statistical significance (likely due to the relatively small sample size), the trend clearly favors the laparoscopic approach. All cases of wound infection were managed conservatively. This finding supports the advantage of the minimally invasive TAPP technique in reducing surgical site infections. Stratification analysis according to age, BMI, and socio-economic status revealed no significant effect of these variables on postoperative pain scores or wound infection rates between the two groups.

## DISCUSSION

There is a dearth of high-quality research comparing TAPP to Lichtenstein repair for primary inguinal hernias, and the studies that do exist often have small sample sizes. Therefore, in order to further evaluate the relative benefits of each surgical approach, we conducted a meta-analysis by finding appropriate papers.

Chronic inguinal pain syndrome after hernia[17] repair appears to be influenced by factors such as age, hernia recurrence, and pain experienced before and immediately after surgery [(8)]. Neither the pre- nor the post-operative inguinal discomfort was evaluated in the majority of the trials. Not much is known about the postoperative course of pain, its intensity, or the need for pain medication. From the data that was provided, we were able to determine that the TAPP treatment was superior in terms of pain scores within 12 hours after surgery by comparing VAS (Visual Analogue Scales) values[(6)]. It is worth mentioning that the numerous forms of anesthesia and the varying time points of the VAS-documentation make it very difficult to draw conclusions favoring one approach over the other. Patients having open repair in two studies of this meta-analysis were given local anesthesia, even though all patients in the TAPP group were given general anesthesia[(9)]. It is noteworthy to note that in addition to general anesthesia, all patients in the TAPP group and the Lichtenstein group in the trial also underwent local anesthetic [(10)].

Although both groups experienced mild tolerable pain for the first two weeks following surgery, a group of investigators found that laparoscopic

hernia repair resulted in significantly less pain overall compared to open inguinal mesh hernioplasty (10, 11). This difference was most noticeable in the early post-operative period. When it came to bilateral hernias, the researchers found that patients undergoing laparoscopic management needed less analgesia (mean VAS score of 4.29) than those undergoing open procedures (mean VAS score of 6.74). However, when it came to unilateral hernias, there was no difference between the two groups[12].

In addition, Garg et al. found that compared to the open group, LH patients experienced much reduced discomfort at 0, 12, 24, and 72 hours postoperatively[13]. On 14 days after surgery, both groups reported less pain on the visual analog scale (VAS), although the difference was not statistically significant. while it took 47.3 minutes in Group B (laparoscopic) which runs counter to the earlier results that were presented. The average operating time for the open group was 55.30 minutes, whereas for the laparoscopic group it was 76.07 minutes, according to Faisal et al.[14] on the other hand, Shah et al. found that the average operating time for the open group was 71.50 minutes and the laparoscopic group was 84.25 minutes [15] .

In our study wound infection at 8 hours, at 24 hours & at 5th day in group 1 were seen in 3 patients (3%),(3%) & 2(2%) respectively while in group 2 wound infection at 8 hours, at 24 hours & at 5th day 1(1%),1(1%) & 1(1%) respectively El Sherpiny et al., [16] study regarding post-operative complications of superficial wound infection was found only in open inguinal hernia repair group and not in laparoscopic (TAPP) hernia repair and all were managed conservatively.

Our results corroborate those of El Sherpiny et al.[16], who found that the lichtenstein mesh repair group had a higher rate of wound infection than the laproscopic TAPP mesh repair group. Similarly, Koshariya et al. found that the open inguinal hernia repair group had a higher rate of superficial wound infection than the laparoscopic hernia repair group. Recurrence rate for the laparoscopic group was 4%, while it was 0% for the open group [17].

In our study, the average post-operative pain score at 8 hours, 24 hours, and 5th day was 5.300+1.507, 4.300+1.480, and 2.540+1.158, respectively. This is in comparison to a previous study where the average post-operative pain score at 12 hours and 24 hours was 5.66+1.16 and 4.80+1.02, respectively, in the laparoscopic hernioplasty group, and in the open inguinal mesh hernioplasty group, at 6.51+0.98 and 5.94+0.68 respectively [18]. With a p-value of 0.0048, group I had a higher mean VAS score than group II. In group I, the Lichtenstein hernia repair, it was 6±1.89, and in group II, the laparoscopic transabdominal preperitoneal technique, it was 3.6±1.35. Group I had three cases of wound infection (7.5%), but group II did not have a single case (p=0.0405) [18]. Despite the growing number of patients undergoing laparoscopic inguinal hernia repair surgery, opinions remain divided on the procedure's effectiveness and outcomes [19].

Our study had a limited sample size and was a single-center investigation. We need further research with bigger samples.

## CONCLUSION

In comparison to Lichtenstein mesh repair, laparoscopic TAPP surgery had a far lower incidence of postoperative wound infection and much less postoperative discomfort.

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