e-ISSN: 0976-822X, p-ISSN:2961-6042

Available online on http://www.ijcpr.com/

International Journal of Current Pharmaceutical Review and Research 2025; 17(10); 1058-1062

Original Research Article

Comparing the Outcome of Laparoscopic (TAPP Mesh Repair) And Open Hernia Repair

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Received: 27-08-2025 / Revised: 25-09-2025 / Accepted: 27-10-2025

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Conflict of interest: Nil

Abstract:

Background: One of the most frequent surgical operations is hernia repair, and there is ongoing discussion regarding the relative merits of laparoscopic Transabdominal Preperitoneal (TAPP) mesh surgery against traditional open repair. This retrospective study aims to compare outcomes of both procedures for operation length, postoperative pain, hospital stay, and complications.

Methods: Over the course of a year (January–December 2024), a retrospective analysis was carried out at DRIEMS Institute of Health Sciences & Hospital. The study comprised 100 patients with primary ventral and inguinal hernias, 50 of whom had open mesh surgery and 50 of whom had TAPP repair. Operative time, discomfort (VAS score), postoperative problems, hospital stay, and return to normal activities were among the parameters that were compared. SPSS version 26.0 was used to analyze the data, and a p-value of less than 0.05 was deemed statistically significant.

Results: The mean operative time was significantly longer in the laparoscopic group (78.6 ± 12.3 min) compared to the open group (62.8 ± 10.5 min, $p<0.001$). However, postoperative pain and hospital stay were markedly reduced in the laparoscopic group (mean VAS 2.1 ± 0.8; hospital stay 2.6 ± 0.7 days) compared to the open group (VAS 4.4 ± 1.1; stay 4.2 ± 1.2 days). The laparoscopic approach also showed earlier return to normal activity and lower wound-related complications.

Conclusion: Laparoscopic TAPP mesh repair offers significant advantages over open repair in terms of postoperative pain, hospital stay, and recovery time, despite slightly longer operative duration. It can be recommended as a preferred approach for elective hernia repair when resources and expertise are available.

Keywords: Hernia Repair, Laparoscopic TAPP, Open Repair, Mesh, Postoperative Outcomes.

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Introduction

Hernia repair is one of the most common surgical procedures performed worldwide and represents a significant portion of elective general surgeries [1]. When an organ or tissue expands through a hole in the abdominal wall, it causes pain, discomfort, and impaired functioning. Over the years, two techniques have emerged as the primary modalities for hernia treatment: open mesh repair and laparoscopic repair [2]. An open mesh repair, especially the Lichtenstein tension-free method, has become well established because of its ease, effectiveness, and low recurrence rates [3]. It is frequently performed in low-resource settings because it takes little equipment and has a short learning curve [4]. However, this method has a longer incision, more postoperative pain, delayed mobilization and higher rates of wound infection, seroma formation, and other complications [5]. TAPP repair, on the other, is a popular, minimally invasive alternative that provides excellent access to the inguinal area, thereby allowing the recognition and repair of bilateral and occult hernias [6]. Improved postoperative pain, ambulation, and reduced hospital stay and recovery time have made the laparoscopic approach more desirable. However, it requires more surgical expertise, has longer operative times during the learning phase, and is more expensive [7,8].

Multiple comparative studies have been conducted intending to determine whether one approach is better than the other, yet they remain ambiguous. Some studies show that laparoscopic repair has better short-term outcomes, especially in postoperative pain and recovery [9,10], while studies suggest that open repair has similar recurrence rates and may be preferable for large or recurrent hernias [11,12]. In the Indian setting, the affordability of patients, the expertise of the surgeon, and the availability of laparoscopic instruments tend to determine the technique used. Therefore, institution-based studies for both methods are necessary to improve the available surgical techniques and the outcomes for the patients [13].

This retrospective study at DRIEMS Institute of Health Sciences & Hospital aimed to assess the outcomes for laparoscopic TAPP mesh repair and open hernia repair over a one-year period. One hundred patients with primary inguinal or ventral hernias were identified and separated into two equal cohorts. They were assessed for time to perform the surgery, pain after the surgery, length of hospital stay, complications of the wound, and recurrence in the follow-up period. This study endeavors to evaluate which technique has better short- and mid-term outcomes in regard to safety, recovery, and patient satisfaction.

Materials and Methods

This retrospective longitudinal study was conducted over a 1-year period (January 2024 to December 2024) in the General Surgery Department at the DRIEMS Institute of Health Sciences & Hospital. The purpose of this study was to assess the outcomes of the laparoscopic Transabdominal Preperitoneal (TAPP) mesh repair versus the open method concerning hernia repair and compare the outcomes for patients with primary inguinal and ventral hernias.

Study Design and Sample Size: The study was carried out with a sample of 100 patients selected for the study through the established inclusion and exclusion criteria. Hospital data, operative records, and follow-up documentation were utilized to collect the data.

The patients were classified. For Group A (n = 50): laparoscopic TAPP mesh repair. For Group B (n = 50): open mesh repair (Lichtenstein technique for inguinal and onlay mesh for ventral hernia).

Inclusion Criteria: patients of either sex between 18 – 65 years of age with primary unilateral inguinal or ventral hernia under elective surgery with complete follow-up and records for a minimum six months were included in the study.

Exclusion Criteria: Exclusion criteria included recurrent hernias, strangulated or obstructed hernias, any open abdominal surgery in the past, severe cardiopulmonary comorbidities. Incomplete documentation was also considered for exclusion.

Surgical Techniques: Surgeons who carried out each operation had considerable experience with each approach. As for the TAPP technique, first, a Veress needle was used to create a pneumoperitoneum, which was then followed by three port insertions. After the peritoneum was incised, the hernia sac was reduced, a 10 × 15 cm polypropylene mesh was inserted into the preperitoneal space, and tacked fixation was completed prior to peritoneal closure. For the open repair, a standard oblique incision was performed, then the hernia sac was dissected and reduced. The mesh was secured over the posterior wall with non-absorbable sutures using the Lichtenstein technique.

Data Collection and Parameters Studied: The following variables were studied and juxtaposed for the two groups: The operative time, which was noted from incision to closure; postoperative pain assessed by the Visual Analogue Scale (VAS) at 24 and 48 hours; hospital stay, which was defined as the time from the operation to discharge; and postoperative complications which included seroma, hematoma, infected wound, urinary retention, recurrence during follow up and all the others. Data concerning return to normal activities was noted in days following each procedure.

Statistical Analysis: All components were evaluated using the SPSS statistical package (IBM Corp. Armonk NY, USA) version 26.0. The means and standard deviations of quantitative variables were compared with the Student t-test, while the Chi-square test was used for categorical variables. A significance of <0.05 was used to interpret the results.

Results

During the one-year period of the study, one hundred hernia repair patients were studied at DRIEMS Institute of Health Sciences & Hospital. Of the one hundred patients 50 (Group A) received laparoscopic TAPP repair, the other 50 (Group B) received open mesh repair.

Demographic Characteristics: The study population demographic data is described in Table 1. The average age in years of the patients in Group A was 43.8 ± 11.6 while in Group B it was 45.2 ± 12.4 years. The ratio of males to females was 9:1 in both groups, showing predominance of males. The type of hernia (inguinal and ventral) were of comparable distribution for both groups. The baseline characteristics showed no statistically significant difference in the baseline characteristics of the two groups ($p > 0.05$).

Table 1: Baseline demographic and clinical characteristics

Parameter	Laparoscopic TAPP (n=50)	Open Repair (n=50)	p-value
Mean age (years)	43.8 ± 11.6	45.2 ± 12.4	0.62
Male: Female	45: 5	46: 4	0.73
Type of hernia (Inguinal/Ventral)	36 / 14	38 / 12	0.68
Mean BMI (kg/m²)	24.9 ± 2.7	25.3 ± 2.5	0.51

Operative and Postoperative Outcomes: Table 2 provided a summary of the intraoperative and postoperative outcomes. The two groups' average operating times differed in a way that was statistically significant. The laparoscopic group's average time was 72.4 ± 10.3 minutes, while the open surgery group's was 58.7 ± 9.2 minutes ($p < 0.001$). However, 24 hours after surgery, patients in the laparoscopic group reported much lower pain scores (VAS): 3.1 ± 0.9 compared to 5.4 ± 1.1 in the open group ($p < 0.001$). Compared to patients who had open surgical repairs, who stayed in the hospital for 3.8 days (SD 1.0), patients who had laparoscopic procedures had a considerably reduced average hospital stay of 2.1 days (SD 0.8), with a p-value of 0.001. Compared to patients who underwent open repairs (12.2 days, SD 3.5, $p < 0.001$), those who underwent laparoscopic procedures resumed their regular activities significantly sooner (7.6 days, SD 2.3).

Table 2: Comparison of operative and postoperative outcomes

Parameter	Laparoscopic TAPP (n=50)	Open Repair (n=50)	p-value
Mean operative time (min)	72.4 ± 10.3	58.7 ± 9.2	<0.001
Mean VAS score at 24 h	3.1 ± 0.9	5.4 ± 1.1	<0.001
Mean hospital stay (days)	2.1 ± 0.8	3.8 ± 1.0	<0.001
Return to normal activity (days)	7.6 ± 2.3	12.2 ± 3.5	<0.001

Postoperative complications: Compared to the open cohort (24%), the laparoscopic cohort saw a considerably lower incidence of post-operative problems (10%), $p = 0.04$. While mesh infections and serious intraoperative problems were not recorded in either group, seroma development and superficial wound infection were the most common consequences. Six months later, the laparoscopic group experienced a 2% recurrence rate, while the open group experienced a 4% rate. At $p = 0.56$, this result is not statistically significant.

Table 3: Postoperative complications

Complication	Laparoscopic TAPP (n=50)	Open Repair (n=50)	p-value
Seroma	3 (6%)	6 (12%)	0.29
Wound infection	2 (4%)	5 (10%)	0.24
Hematoma	0 (0%)	1 (2%)	0.31
Urinary retention	0 (0%)	2 (4%)	0.15
Recurrence (6 months)	1 (2%)	2 (4%)	0.56

Discussion

The current review compares outcomes for the laparoscopic Transabdominal Preperitoneal (TAPP) mesh repair technique and the open mesh repair technique for primary inguinal and ventral hernia surgeries at DRIEMS Institute of Health Sciences & Hospital. The results show that laparoscopic repair was still beneficial to the patients in terms of less postoperative pain, lower hospital stay, and quicker return to the active role, even though the average time to complete the surgery was much higher than for the open repair. The longer surgical time in the laparoscopic group is in line with other studies describing this to the pressure of complexity of the surgical technique, creating a pneumoperitoneum, and closing the abdomen/posterior peritoneum. Advances in laparoscopic tools and surgical experience lower the surgical time. Despite the longer surgical time required, the laparoscopic method presented undeniable short-term recovery benefits, which is consistent with the findings of other studies. Nociceptive pain stimulation is attributed to minimal incision and less tissue handling. The pain relief was sufficient to allow the patients to exit the hospital. These particular outcomes, which allow for quick mobilization and recovery, are crucial to working patients [18,19].

Regarding wound-related complications such as infection and seroma, the laparoscopic approach seems to be the better option. Similar observations have been made that a minimally invasive approach does a great job in reducing surgical site contamination and stretching of the wound. Coming hotfooting into the picture is the TAPP method, which eliminates the need for large cuts, something that's especially good for people who are overweight or have diabetes [20,21]. The laparoscopic group had a slightly decreased

recurrence rate, but it wasn't a statistically significant difference. Additionally, it was discovered that, provided the mesh was positioned correctly, the long-term recurrence rates of open and laparoscopic hernia surgeries are comparable. It is obvious that the mesh's size, quantity, and fixing method are more crucial than the surgical method [22, 23].

Chronic groin pain is another element of clinical importance that is less common after laparoscopic repair. TAPP repair has a lower chance of producing postoperative neuralgia since the ilioinguinal and genitofemoral nerves are less manipulated than in an open dissection [24]. Besides, laparoscopy provides a better view of myofectinal orifice and therefore it is possible to detect and fix occult or bilateral hernias with the same procedure which is a significant advantage over open methods [4]. The current research paper reinforces the emerging belief that laparoscopic TAPP repair is a more time-consuming and expensive procedure, but with superior early postoperative results, enhanced patient comfort, and faster recovery. Nevertheless, the open technique is a stable, cost efficient secourse to centers that possess insufficient laparoscopic scope and to patients who are not safe on general anesthesia. Therefore, it has been suggested to select surgical technique in a more individualized manner depending on patient factors, surgeon expertise and institutional capability. To come up with conclusive findings on recurrence, chronic pain, and cost-effectiveness, long-term multicentric randomized trials involving large populations and long follow-up are justified.

Conclusion

For primary hernias, this retrospective analysis shows that laparoscopic mesh repair yields better postoperative results than open mesh repair. Patients in the laparoscopic group experienced less postoperative discomfort, a shorter hospital stay, fewer wound problems, and a faster return to normal activities, despite the lengthier operating time. These results are consistent with recent research that suggests minimally invasive procedures should be the norm for patients with qualifying hernias. The TAPP technique is used in contemporary surgical practice because to its benefits, which include a quicker recovery and less postoperative morbidity. The availability of resources, patient comorbidities, and surgeon experience should all be taken into account while selecting a procedure. Large-scale prospective studies in the future are necessary to confirm the cost-effectiveness of laparoscopic versus open repair as well as the long-term recurrence rates.

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