International Journal of Life Sciences, Biotechnology and Pharma Research Vol. 13, No. 7, July 2024 Online ISSN: 2250-3137
Print ISSN: 2977-0122

DOI: 10.69605/ijlbpr_13.7.2024.121

ORIGINAL RESEARCH

Comparison of Outcomes between Laparoscopic TAPP Mesh Repair and Open Hernia Repair

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Received: 28 May, 2024 Accepted: 30 June, 2024

ABSTRACT

Background: Hernia repairs are frequently performed surgically, using both open and laparoscopic methods. There is disagreement regarding whether laparoscopic Transabdominal Preperitoneal (TAPP) mesh repair is better than open hernia repair, despite the fact that it may have advantages including less pain following surgery and a speedier recovery. The purpose of this study was to compare the results of open hernia repair vs laparoscopic TAPP mesh repair. **Methods:** One hundred participants were randomised to have either open hernia repair (n = 50) or laparoscopic total anterior posteriorplasty (n = 50) in a prospective, comparative trial. Demographic information, surgical specifics, problems, length of stay in the hospital, return to regular activities, and patient satisfaction were all gathered. The statistical analysis was done with SPSS 23.0. **Results:** The laparoscopic TAPP group had a significantly shorter mean duration of surgery (70.2 ± 15.4 minutes) and less blood loss (50.3 ± 20.5 ml) compared to the open hernia repair group (95.3 ± 18.6 minutes and 120.6 ± 35.2 ml, respectively; $p < 0.001$). The laparoscopic group also had a shorter hospital stay (2.5 ± 0.8 days) and quicker return to normal activities (10.5 ± 3.2 days) compared to the open repair group (4.3 ± 1.2 days and 18.7 ± 4.6 days, respectively; $p < 0.001$). Patient satisfaction was higher in the laparoscopic group (8.9 ± 1.1) compared to the open repair group (7.4 ± 1.3; $p < 0.001$). Complication rates did not significantly differ between the groups ($p = 0.221$). **Conclusion:** Laparoscopic TAPP mesh repair offers advantages over open hernia repair, including shorter surgery duration, reduced blood loss, shorter hospital stay, quicker recovery, and higher patient satisfaction. Both techniques are safe and effective, but the laparoscopic approach may enhance patient outcomes and recovery. **Recommendations:** It is advised to conduct more extensive research and long-term monitoring to corroborate these results and investigate whether laparoscopic TAPP mesh repair is more affordable than open hernia surgery.

Keywords: Hernia Repair, Laparoscopic TAPP, Open Hernia Repair, Surgical Outcomes, Patient Satisfaction

INTRODUCTION

Hernia repair is one of the most common surgical procedures performed worldwide, with millions of cases managed annually. Inguinal hernias, in particular, account for a significant proportion of these cases, leading to considerable healthcare costs and patient morbidity if not treated effectively. Traditional open hernia repair has been the gold standard for many years, offering reliable results with well-documented long-term outcomes. However, the advent of minimally invasive techniques, specifically laparoscopic repairs, has revolutionized the field of hernia surgery by promising reduced postoperative pain, shorter recovery times, and improved cosmetic outcomes [1].

Laparoscopic Transabdominal Preperitoneal (TAPP) mesh repair is one such minimally invasive technique that has gained widespread acceptance among surgeons. TAPP repair involves the placement of a synthetic mesh through a laparoscopic approach, which is believed to result in less postoperative pain and quicker return to daily activities compared to open techniques [2]. Despite its advantages, there is ongoing debate regarding its superiority over the traditional open hernia repair in terms of complication rates, recurrence, and overall patient satisfaction.

Open hernia repair, particularly the Lichtenstein technique, has been extensively studied and remains a widely used method due to its simplicity, cost-effectiveness, and low recurrence rates. However, it is often associated with longer recovery times, higher

DOI: 10.69605/ijlbpr_13.7.2024.121

incidence of chronic pain, and larger incisions compared to laparoscopic methods. With the increasing emphasis on patient-centered care and rapid recovery, the need to compare these two techniques comprehensively has become paramount.

Recent studies have highlighted mixed outcomes regarding the efficacy and safety of laparoscopic versus open hernia repair. For instance, a meta-analysis indicated that laparoscopic TAPP repair is associated with a lower risk of chronic pain and quicker return to normal activities but noted a comparable rate of hernia recurrence between the two techniques [3]. Similarly, a randomized controlled trial demonstrated that while laparoscopic repair offered better early postoperative outcomes, the long-term results in terms of recurrence and chronic pain were similar to those of open repair [4].

This study aimed at evaluating the outcomes of laparoscopic Transabdominal Preperitoneal (TAPP) mesh repair and open hernia repair.

METHODOLOGY

Study Design

A prospective, comparative study.

Study Setting

The study spanned from October 2022 to October 2023 at G.M.E.R.S. Junagadh, India.

Participants

The study included a total of 100 participants who met the inclusion criteria.

Inclusion Criteria

1. Patients aged 18 to 65 years.
2. Patients diagnosed with inguinal hernia.
3. Patients who consented to participate in the study.
4. Patients fit for either laparoscopic TAPP mesh repair or open hernia repair as determined by preoperative assessment.

Exclusion Criteria

1. Patients with recurrent hernias.
2. Patients with complicated hernias (e.g., strangulated or incarcerated hernias).
3. Patients with significant comorbidities making them unfit for surgery.

Bias

To minimize selection bias, participants were randomly assigned to either the laparoscopic TAPP mesh repair group or the open hernia repair group. Blinding of the outcome assessor was employed to reduce observer bias.

Data Collection

Data were collected through patient medical records, preoperative assessments, intraoperative findings, and postoperative follow-ups. Information collected included:

- Demographic details
- Clinical history and examination findings
- Surgical procedure details
- Intraoperative and postoperative complications
- Duration of hospital stay
- Time to return to normal activities
- Patient satisfaction scores

Procedure

Participants were randomly assigned to either the laparoscopic TAPP mesh repair group or the open hernia repair group. Both surgical procedures were performed by experienced surgeons following standard protocols. Postoperative care was standardized for all participants, with regular follow-ups to monitor recovery and any complications.

Statistical Analysis

SPSS version 23.0 was used to analyse the data. The baseline characteristics of the subjects were compiled using descriptive statistics. Using t-tests for continuous variables and chi-square tests for categorical variables, a comparative study between the two groups was carried out. Statistical significance was attained when the p-value was less than 0.05. Accompanying the results were the relevant confidence intervals.

RESULT

The study included 100 participants, with 50 assigned to the laparoscopic TAPP mesh repair group and 50 to the open hernia repair group.

Table 1: Baseline Characteristics

Characteristic	Laparoscopic TAPP	Open Hernia Repair	p-value
Mean Age (years)	45.2 ± 10.3	46.1 ± 9.8	0.635
Gender (Male, n, %)	42 (84%)	40 (80%)	0.602
Mean BMI (kg/m²)	27.5 ± 4.2	28.1 ± 4.0	0.452
ASA Grade (n, %)			
- I	15 (30%)	17 (34%)	0.673
- II	25 (50%)	24 (48%)	0.845
- III	10 (20%)	9 (18%)	0.798

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Intraoperative data comparing the two surgical techniques are presented in Table 2. The mean duration of surgery was significantly shorter in the laparoscopic TAPP group compared to the open hernia repair group ($p < 0.001$).

Table 2: Intraoperative Data

Parameter	Laparoscopic TAPP	Open Hernia Repair	p-value
Duration of Surgery (min)	70.2 ± 15.4	95.3 ± 18.6	<0.001
Intraoperative Complications	3 (6%)	5 (10%)	0.464
Mean Blood Loss (ml)	50.3 ± 20.5	120.6 ± 35.2	<0.001

Table 3 provides an overview of postoperative outcomes, including complications, length of hospital stay, and time to resume regular activities. Compared to the open hernia repair group, the laparoscopic TAPP group experienced a considerably shorter hospital stay and a quicker return to normal activities ($p < 0.001$).

Table 3: Postoperative Outcomes

Outcome	Laparoscopic TAPP	Open Hernia Repair	p-value
Postoperative Complications	4 (8%)	8 (16%)	0.221
Mean Duration of Hospital Stay (days)	2.5 ± 0.8	4.3 ± 1.2	<0.001
Mean Time to Return to Normal Activities (days)	10.5 ± 3.2	18.7 ± 4.6	<0.001
Mean Patient Satisfaction (mean)	8.9 ± 1.1	7.4 ± 1.3	<0.001

Complications were categorized into minor and major complications, as shown in Table 4. The overall complication rate was lower in the laparoscopic TAPP group, although the difference was not statistically significant ($p = 0.221$).

Table 4: Complications

Type of Complication	Laparoscopic TAPP	Open Hernia Repair	p-value
Minor Complications			
- Wound Infection	2 (4%)	4 (8%)	0.400
- Seroma	1 (2%)	2 (4%)	0.559
Major Complications			
- Hernia Recurrence	1 (2%)	2 (4%)	0.559
- Deep Vein Thrombosis (DVT)	0 (0%)	1 (2%)	0.316

DISCUSSION

The study included 100 participants who were randomly assigned to either the laparoscopic TAPP mesh repair group or the open hernia repair group. Both groups were well-matched in terms of baseline characteristics, including age, gender, BMI, and ASA grade, indicating a balanced randomization process.

Intraoperative data revealed that the laparoscopic TAPP mesh repair had a significantly shorter mean duration of surgery (70.2 ± 15.4 minutes) compared to the open hernia repair (95.3 ± 18.6 minutes), with a p-value of <0.001. Additionally, the laparoscopic group experienced significantly less blood loss (mean 50.3 ± 20.5 ml) compared to the open repair group (mean 120.6 ± 35.2 ml), also with a p-value of <0.001. However, intraoperative complications did not significantly differ between the two groups.

Postoperative outcomes demonstrated that the laparoscopic TAPP group had a notably shorter hospital stay (mean 2.5 ± 0.8 days) compared to the open hernia repair group (mean 4.3 ± 1.2 days), with a p-value of <0.001. Participants in the laparoscopic group also returned to normal activities significantly faster (mean 10.5 ± 3.2 days) than those in the open repair group (mean 18.7 ± 4.6 days), again with a p-value of <0.001. Furthermore, patient satisfaction was higher in the laparoscopic group, with a mean satisfaction score of 8.9 ± 1.1 compared to 7.4 ± 1.3 in the open repair group ($p < 0.001$).

While the overall complication rate was lower in the laparoscopic TAPP group (8%) compared to the open hernia repair group (16%), this difference was not statistically significant ($p = 0.221$). Although they did not reach statistical significance, minor issues like seroma and wound infection as well as significant complications like deep vein thrombosis and hernia recurrence were somewhat more common in the open repair group.

Overall, the study's findings show that laparoscopic TAPP mesh repair is superior than open hernia repair in a number of ways, including shorter recovery times from surgery, less blood loss, shorter hospital stays, a faster return to regular activities, and better patient satisfaction. Overall, the tendency was in favour of the laparoscopic method, even though the complication rates did not differ much. According to these results, laparoscopic TAPP mesh repair provides a risk-free and efficient substitute for open hernia repair, with advantages that could speed up healing and improve patient satisfaction.

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Quality of life (QoL) and long-term results were compared between patients undergoing TAPP with self-gripping (PROGRIP) mesh and normal heavyweight mesh in a prospective case control study. The two types of mesh did not significantly differ in terms of quality of life, recurrence rates, or early morbidity, according to the study. Following surgery, both groups saw reductions in pain, limits in their range of motion, and discomfort with their appearance [5].

In a different study, the length of the procedure, length of hospital stay, time to return to normal activities, cosmesis, postoperative pain, wound infection, recurrence, and complications were compared between Lichtenstein tension-free open hernioplasty and laparoscopic TAPP. According to the study's findings, laparoscopic TAPP is a better option than open hernioplasty since it produces statistically better results in terms of cosmesis and postoperative cord oedema [6].

For primary unilateral inguinal hernias, a study evaluated the short-term surgical outcomes following laparoscopic TAPP to open inguinal hernia mesh hernioplasty (Lichtenstein). According to the study, the median time for the laparoscopic group to return to work was eight days, whereas the open group's was nine days. At different postoperative time points, the laparoscopic group's postoperative pain levels were significantly lower [7].

Comparing laparoscopic and open primary unilateral inguinal hernia repairs, a comprehensive review and meta-analysis was conducted. There were no discernible variations in the recurrence rates between the two groups according to the study. On the other hand, compared to open repair, laparoscopic surgery was linked to lower incidence of both acute and chronic postoperative discomfort [8].

The results of TAPP inguinal hernia repair with and without mesh fixation were compared in a study. According to the study, non-fixation of the mesh reduced postoperative pain and lengthened surgical durations without raising the possibility of complications or recurrence [9].

CONCLUSION

These results demonstrate that laparoscopic TAPP mesh repair is associated with a shorter duration of surgery, reduced hospital stay, quicker return to normal activities, and higher patient satisfaction compared to open hernia repair. The complication rates between the two groups were not significantly different, indicating that both techniques are safe and effective for hernia repair.

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