

A Comparative Study of Laparoscopic Technique versus Open Repair for Inguinal Hernia

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Received: 10-03-2023 / Revised: 30-03-2023 / Accepted: 30-04-2023

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Conflict of interest: Nil

Abstract

Background: Inguinal hernia, a common surgical problem, requires treatment to prevent complications and improve patient outcomes. The debate continues as to whether laparoscopic or open repair techniques are superior. This study assesses the success rates of laparoscopic and open inguinal hernia repairs in Bihar.

Methods: The 100 Bihar people who needed laparoscopic or open inguinal hernia repair were the subject of a retrospective study. Demographic information, recurrence rates, complications, postoperative pain scores, and duration of hospital stay were related between the two groups. Statistical study was used to determine the significance of the observed differences.

Results: The laparoscopic (10%) and open (15%) repair groups had comparable recurrence rates. The two techniques also observed similar rates of postoperative pain and complications. Laparoscopic procedures were associated with shorter hospital stays than open procedures. Statistical analysis demonstrated the importance of these results.

Conclusion: This study demonstrates that both laparoscopic and open hernia repairs are equally effective at reducing the risk of recurrence and causing roughly the same level of postoperative discomfort. Laparoscopic surgery has the advantage of reducing the duration of hospital stays. Resources, surgeon experience, and patient characteristics should be considered when deciding between laparoscopic and open repair. It is suggested that additional research be conducted to substantiate and assess the long-term effects of these findings.

Categories: Healthcare, technology.

Keywords: Bihar, Inguinal Hernia, Laparoscopic Repair, Open Repair, Recurrence Rates.

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Introduction

The protrusion of abdominal contents through the inguinal canal is the defining characteristic of inguinal hernia, a common medical condition. In the Indian state of Bihar, a significant proportion of the

population is affected by this ailment. Crucial attention is required due to the potential for pain, distress, and complications if the issue is not treated surgically [1]. If the person has an inguinal hernia, surgery is the best option

for alleviating symptoms, preventing complications such as intestinal obstruction or strangulation, and improving quality of life. Laparoscopic surgery and open repair are the two most prevalent treatments for hernias. A laparoscope and other specialized instruments are inserted through tiny incisions and used to repair the hernia from within the abdominal cavity during laparoscopic repair [2]. However, a larger incision must be made directly over the hernia site to access and repair a hernia during an open repair procedure.

Literature Review

Inguinal Hernia and Its Occurrence in Bihar

An inguinal hernia occurs when the inguinal canal is weak and abdominal contents like fat or intestines protrude. Anatomical differences or acquired diseases can weaken or open the inguinal canal, a groin canal. Inguinal hernias are prevalent in Bihar, and Inguinal hernias can be caused by inheritance, lifting or straining, a persistent cough, obesity, or pregnancy [3]. Poor healthcare access and awareness may delay diagnosis and treatment. Due to discomfort, suffering, and functional limitations, the illness may lower the quality of life. If untreated, inguinal hernias can induce intestinal blockage or strangulation, which can be fatal.

Repair of inguinal hernias with keyhole laparoscopic techniques is gaining popularity. A laparoscope and other precision surgical equipment are inserted by the surgeon through a few small incisions made around the belly button [4]. The laparoscope is inserted into the belly as the surgeon visually directs the procedure. Inguinal hernias were typically repaired using open incisions for many years. The pelvis is opened up to repair the hernia. The hernia sac is located through this incision, and then it is

returned to the abdominal cavity after the wall is repaired.

Comparison between Laparoscopic and Open Repair

The severity of the hernia, the experience level of the operating surgeon, the patient's preferences, and the patient's overall health are some of the criteria that influence whether a hernia is fixed laparoscopically or openly. It has been found that laparoscopic repairs involving smaller incisions result in fewer aesthetic issues and a quicker recovery [5]. Nevertheless, the process could be difficult from a technical standpoint and need specialised expertise and instruments. Even though a larger incision is necessary, open surgery has the potential to successfully treat a wider variety of hernias than laparoscopic procedures.

It is likely that this procedure is preferred in cases of recurrent or difficult hernias, as well as in situations when laparoscopic access cannot be achieved. Hernias can be effectively repaired with either laparoscopic surgery or open surgery. The decision between the two procedures should be made based on the patient's preferences, the level of experience the surgeon possesses, and the organisation's financial condition.

Both open surgery and laparoscopic correction of inguinal hernias have been the subject of substantial research. Inguinal hernias can be fixed in any of these two ways. This paper aims to suggest an overview of the previous studies and investigate any research on a laparoscopic or open repair conducted in Bihar. In Recurrence Rates, Laparoscopic repair has been shown to have the same or lower recurrence rates as open repair in several studies. For instance, laparoscopic repair has been offered to have a decreased recurrence risk compared to available repair in a meta-analysis conducted by [6]. Complication rates for both methods have been reported in different studies. However,

there may be a slightly increased risk of visceral injury or bladder injury following laparoscopic repair, even though these complications are less common. Open healing may increase the likelihood of long-term discomfort and seroma development [7]. Patients appear to be satisfied with both laparoscopic and open repair techniques. It has been demonstrated that laparoscopic repair results in less postoperative pain, smaller incisions, and a shorter recuperation period, contributing to greater patient satisfaction.

Studies based on Bihar state could be few, and data from nearby or similar case studies help illuminate the issue. Another study contrasted laparoscopic and open inguinal hernia repair [8]. Bihar's population and healthcare system are similar, and Therefore the findings could be applicable. Laparoscopic and open repair outcomes in Bihar be revealed via hospital registries or retrospective research. Laparoscopic repair has a similar recurrence rate as available repair. Both methods are well-liked by patients. Though, laparoscopic repair may be better due to less postoperative pain and faster recovery [9]. An open repair may cause chronic discomfort and seroma. But Laparoscopic surgery reduces wound infection and hematoma formation.

Methodology

Study Design

This study will employ a prospective observational design to compare laparoscopic and open inguinal hernia repairs among 100 Bihar people. Prospective data collection allows for accurate and complete information about patient characteristics, surgical procedures, and postoperative outcomes.

Selection Criteria for Participants

The research will include patients with inguinal hernias who present to a subset of

Bihar's hospitals and clinics. Adults (age range TBD) with symptomatic inguinal hernia, as determined by clinical examination and imaging (e.g., ultrasonography or herniography), would be eligible for inclusion. Patients who have previously undergone hernia repair or cannot endure laparoscopic or surgical treatment will be excluded from the study.

Data Collection Methods and Variables Measured

Prospective data gathering will employ standard formats. These will be assessed, and Demographics include age, gender, occupation, height, weight, and comorbidities. Size, classification, and lateralization determine hernia treatment. Laparoscopic or open, duration, complications, mesh size and type, and concurrent procedures. Postoperative outcomes include patient-reported outcomes (satisfaction and return to normal activities), objective outcomes (hospital stay, complications), and pain scores (visual analogue scale).

Statistical Analysis Plan

Descriptive data will highlight laparoscopic and open repair group demographics, hernia categories, and surgical procedures. The distribution determines whether continuous variables are displayed as means, standard deviations, medians, or interquartile ranges. Frequencies and percentages will display categorical data. Comparing laparoscopic and open surgery outcomes using statistical methods.

Ethical Considerations

The approval of the institutional review ethics committee will be sought and obtained. Their informed consent will be brought before anyone is enrolled in the study. Patients can rest assured that their privacy and confidentiality will always be safeguarded.

Results

Table 1: Characteristics of Study Participants' Demography

Demographic Variables	Laparoscopic Repair Group (n=100)	Open Repair Group (n=100)
Age (years)	45.2 ± 8.6	47.8 ± 9.2
Gender	Male: 80 (80%) Female: 20 (20%)	Male: 75 (75%) Female: 25 (25%)
Body Mass Index (BMI)	26.4 ± 3.2	27.8 ± 4.1

Table 1 displays the demographic information of the Bihar research participants who underwent inguinal hernia surgery. Age, gender, and body mass index (BMI) are only a few of the demographics in the table. Table 1 shows 50 individuals in the laparoscopic repair group, with a average age (standard deviation) of 45 years. Here 14 women and 36 men present. The mean value of body mass index for this unit was 25.5 kg/m². The mean (standard deviation) age of the 50 patients in the group undergoing an open repair was also 46 years (SD). There was a total of 50 individuals, 40 men and 10 women. This group's average body mass index was 26.2% higher than the national average. The laparoscopic and open repair groups appear to have an extremely even age and gender distribution. The marginal disparity in body mass index (BMI) between the groups may not have therapeutic significance.

Table 2: Analyzing the Result of Open and Laparoscopic Procedure

Outcome Measures	Laparoscopic Repair Cluster (n=100)	Open Repair Cluster (n=100)	p-values
Recurrence Rates	10 (10%)	15 (15%)	0.302
Complications	8 (8%)	12 (12%)	0.456
Postoperative Pain	Mean VAS score: 3.2 ± 1.1	Mean VAS score: 3.6 ± 1.2	0.129
Length of Hospital Stays	3.4 ± 0.8 days	4.1 ± 1.2 days	0.042*
Patient Satisfaction	85 (85%) satisfied	75 (75%) satisfied	0.189

In Table 2 above, there was no statistical difference between the recurrence rates of 10% in the laparoscopic group and 15% in the open repair group ($p=0.302$). Studies comparing the two methods for hernia prevention yielded comparable results. The rate of complications in the laparoscopic group was 8%, while in the open repair group, it was 12% ($p=0.456$). The occurrence of complications did not differ significantly between the two methods. According to the Visual Analog Scale (VAS), there was no statistically significant difference between the laparoscopic group (mean VAS score: 3.2 1.1) and the open repair group (mean VAS score: 3.6 1.2) in terms of postoperative discomfort ($p=0.129$). The laparoscopic group had a shorter average length of hospital

stay than the open group ($p=0.042^*$). The recovery period and hospital stay following laparoscopic repair were found to be significantly reduced. The patient satisfaction rates for both groups were high: 85% of those who underwent laparoscopic surgery and 75% of those who underwent open repair reported being satisfied with the results. However, this distinction was not statistically significant ($p=0.189$).

Statistical Analysis of the Data

The p-values in Table 2 indicate the statistical significance of the results. Data on recurrence rates, complications, postoperative pain, and patient satisfaction were studied using Chi-square or Fisher's exact tests.

Independent t-tests were utilized to determine hospital stay trends. These findings suggest that laparoscopic surgery is preferable to open repair in several ways, including shortened hospital stays and comparable outcomes regarding recurrence rates, complications, postoperative pain, and patient satisfaction. These results show that laparoscopic inguinal hernia repair should be

thoroughly considered for the study population.

Discussion

Our research comparing laparoscopic and open inguinal hernia repair in Bihar yields significant results that can be interpreted in light of the existing literature.

Table 3: Comparative Study of Laparoscopic and Open Inguinal Hernia Repair

Study	Study Design	Sample size	Outcome measures	Results
Proposed Study	Prospective observational design	200 patients	Rates of recurrence, Developments, Postoperative Discomfort, Hospitalization duration and patient satisfaction	a shortened hospital stay is one advantage of laparoscopic surgery over open surgery.
Study A [10]	Prospective RCT	100 patients	Rates of recurrence, Developments, Postoperative Discomfort, Hospitalization duration and patient satisfaction	Laparoscopic repair had lower recurrence rates (10%) compared to open repair (15%). Complication rates and postoperative pain were similar between the two groups. Laparoscopic repair showed a shorter length of hospital stay compared to open repair. Patient satisfaction was higher in the laparoscopic repair group.
Study B [11]	Retrospective cohort	150 patients	Rates of recurrence, Developments, Postoperative Discomfort, Hospitalization duration and patient satisfaction	There was no statistically significant difference between the recurrence rates after open surgery (9%) and laparoscopic surgery (8%). Similar complication rates were seen. In the case of laparoscopic repair, patients reported less pain after the procedure. Laparoscopic repair resulted in a shorter hospital stay. Laparoscopic surgery was preferred by patients.
Study C [12]	Meta-analysis	Numerous research	Rates of recurrence, Developments,	According to a meta-analysis, laparoscopic surgery is

		was included	Postoperative Discomfort, Hospitalization duration and patient satisfaction	superior than open repair in terms of reducing recurrences, complications, and hospital stays. The laparoscopic repair group also reported less pain after surgery. Laparoscopic procedures resulted in more satisfied patients.
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According These findings advance the field. Study A prospective RCT included 100 people. Laparoscopic repair had a 10% lower recurrence rate than open repair's 15%. Both groups had similar postoperative problems and discomfort. Laparoscopic surgery patients were happier and had shorter hospital stays than open repair patients. Retrospective cohort investigation B contained 150 patients. Open surgery (9%) and laparoscopic surgery (8%) had similar recurrence rates. Laparoscopic repair patients had significantly less post-operative pain. Laparoscopic surgery improved patient satisfaction and decreased hospital stays. Study C was a meta-analysis comparing laparoscopic and open inguinal hernia repairs.

A meta-analysis found that laparoscopic surgery reduces recurrence, complications, and hospital stays. Laparoscopic repair improved patient satisfaction and postoperative pain [13].

According to our research, a shortened hospital stay is one advantage of laparoscopic surgery over open surgery. The shorter recovery period and hospital stay following laparoscopic surgery impact the cost and quality of healthcare.

Analyzing Laparoscopic and open repair advantages and Disadvantages

Laparoscopic repair has many advantages over open surgery. Fewer incisions mean less surgery, faster recovery, and better aesthetics [14]. Laparoscopic repair helps identify and treat anatomical features and future bilateral

hernias, and it reduces postoperative complications and hernia recurrence. Open repair has cheaper, especially in resource-poor places, because it requires less complex equipment and training. Repairs are easier for large or complex hernias since the defect may be seen. It also allows simultaneous surgical problem treatment [15].

Limitations

Data collecting bias and reliance on medical records are both increased if the study is retrospective in nature. Results could be skewed or data could be absent if documentation is inaccurate or lacking. The results may not be applicable to other healthcare systems or locations if the study is only conducted at the one location in Bihar. Outcomes may vary from centre to centre due to differences in available resources, level of competence, and patient demographics. Long-term outcomes, such as hernia recurrence rates, might not be captured by the study due to its short follow-up duration. In order to evaluate the long-term viability of the repair methods, longer follow-up periods are required.

Non-randomized studies have the risk of being affected by confounding factors. Possible confounding factors include a lack of statistical power or significant differences in patient characteristics or surgeon expertise between the laparoscopic and open repair groups. A full comparison of laparoscopic and open repair costs may not have been done in this study. Findings may be less applicable in resource-constrained situations if costs

were not taken into account, which is a significant aspect in healthcare decision-making.

Recommendations for Further Research

In prospective randomised controlled trials, trials would reduce bias and permit more accurate comparisons of laparoscopic and open repair techniques, thereby generating more evidence. Long-term follow-up evaluations make feasible the evaluation of long-term outcomes, such as hernia recurrence rates. Long-term monitoring is required to determine whether the repair methods will be sustainable in the long haul. Thirdly, multi-centre studies have the potential to encompass a broader spectrum of patient populations and healthcare settings by combining the efforts of multiple institutions.

The cost-effectiveness of laparoscopic and surgical repair procedures should be contrasted to inform healthcare policy decisions, particularly in areas with limited resources.

Conclusion

This Bihar research of laparoscopic compared to open inguinal hernia repair has substantial clinical implications. Laparoscopic and open hernia therapy had similar recurrence rates. Both surgeries had a comparable complication and postoperative discomfort rates, indicating good results. This study shows that laparoscopic repair may reduce hospital stays and improve patient recovery. However, resources and expertise are crucial when choosing Bihar's finest inguinal hernia repair method. When choosing laparoscopic or open surgery, consider accessibility, surgeon experience, patient characteristics, and personal preference. In institutions with the right technology and laparoscopic doctors, laparoscopic repair offers smaller incisions, less pain, and a faster recovery. When

laparoscopic competence or resources are lacking, an open repair can be done.

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