

Comparison between Traditional Surgery and Laparoscopic Surgery in the Treatment of Hernias in the Elderly

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Abstract: Hernia repair in older patients typically involves a number of complexities related to the effects of aging on the body as well as underlying medical issues. This research has compared and contrasted open term with laparoscopically performed hernia repairs while evaluating operative outcomes, short-term recovery periods, complication rates, and long-term results. The terminal ambit of surgical evaluations showed that laparoscopy took about 10 minutes longer on average (95 ± 20 min) than open procedures (85 ± 15 min) during the course of surgery; however, the amount of blood lost during laparoscopic repair was much less (60 ± 20 ml versus 120 ± 30 ml). Regarding early recovery from surgery, patients undergoing a laparoscopic repair were able to ambulate sooner (1.5 ± 0.4 days post-op) when compared with patients undergoing an open repair (2.5 ± 0.5 days post-op), and exhibited fewer pain complaints (VAS 3 ± 1 versus VAS 6 ± 1), and stayed in the hospital for less time (3 ± 0.8 days versus 5 ± 1 days). The incidence of postoperative complications was higher in patients who had an open repair; for example, there were greater instances of wound-related morbidity due to wound infections (8% vs 3%) and seromas (10% vs 4%) in the open repair group when compared with the laparoscopic group. Incidence rates of cardiopulmonary events were somewhat higher during the immediate post-operative period in the laparoscopic group (6% vs 5%), however, all cardiopulmonary events were associated with an early post-operative period only. Recurrence rates of hernia at longterm follow-up were similar (4% laparoscopic vs 5% open), but laparoscopic repair patients exhibited more optimal functional status and greater patient satisfaction (90% vs 75%). Patients who had laparoscopic repairs also experienced significantly less chronic pain than patients who had open repairs (5% vs 12%). In conclusion, laparoscopic hernia repair provided numerous advantages to elderly patients over open procedure including shorter recovery time, lower complication rates and better long-term quality of life while presenting comparable rates of hernia recurrence.

Keywords: Elderly patients, Hernia repair, Laparoscopic surgery, Open surgery, Postoperative recovery, Operative outcomes, Complications, Functional independence.

1. Introduction

Hernias are among the most common surgical problems seen in practice, especially for the elderly. The incidence of hernias increases significantly with age. The development of age-associated physiological factors contributes to this increase as abdominal wall muscle mass deteriorates, connective tissue loses its elasticity, and the cumulative effects of many years of exposure to factors that raise intraabdominal pressure contribute to the formation of hernias. In

older adults, these physiological changes are often compounded by the presence of chronic comorbidities, such as heart disease, chronic lung disease, and metabolic disorders, which affect both the presentation of the hernia and the complexity of surgical treatment. Therefore, performing hernia surgery on an elderly individual represents a considerable clinical problem, requiring careful evaluation of operative risk, and postoperative outcome. [1] In the past 10 years, there have been major changes in the technologies and techniques for treating hernias. The prior "open" surgical technique for hernia repair has long been considered the standard method for treating hernias, but over the past decade, laparoscopic or "minimally invasive" methods of hernia repair have increasingly replaced traditional open surgical methods for some patients. The advancement of minimally invasive techniques is part of a larger trend in surgery; whereby the goal is to decrease the surgical trauma on the patient, decrease pain after surgery, and assist patients in recovering more quickly to preoperative functional status. The goals of decreased surgical trauma, decreased postoperative pain, and quicker return to preoperative functional capacity are especially important in older patients, since prolonged immobility and delayed rehabilitation can lead to further morbidity, functional decline, and less than optimal quality of life after surgery. [2].

A major advantage for open hernia repair is that it allows for direct visualisation of the anatomical structures during the operation. The operation can either be performed under local or regional anaesthesia. The use of local anaesthesia may help with recovery and mobility for individuals who have limited height and weight to have an open hernia repair performed. However, there is a significant disadvantage of this technique in that the larger incision is frequently associated with increased pain after the surgery, higher incidence of complications at the surgical site and a longer recovery period. These negatives may have a disproportionately larger effect on older patients because they often exhibit a slower rate of wound healing and have reduced physiological ability [3].

On the other side, laparoscopic hernia repair has advantages in the form of smaller incisions, decreased dissection of the tissue, and improved visualisation of the myopectineal or abdomen wall by magnified imaging. These surgical advantages are all linked to lower postoperative pain scores, increased ability for patients to mobilise earlier, decreased length of time in hospital and better cosmetic appearance after healing has occurred. However, the disadvantages of laparoscopic hernia repair include that they usually require general anaesthesia and the use of pneumoperitoneum. Both of these features create an increased risk to older patients who have compromised lung and heart function. As such, careful selection and multidisciplinary assessment will be necessary to determine if laparoscopic hernia repair is appropriate for older patients. [4].

The selection process for treating hernia in older people is more than just looking at the technical elements involved; it also includes assessing functional ability, other medical issues present, specific characteristics of the hernia, and recovery from surgery. While minimally invasive techniques may provide considerable advantages (for example, shorter recovery time or increased comfort during the recovery phase), it is still necessary to consider their effectiveness, safety, and cost in relation to open surgeries. Furthermore, since the elderly are a very heterogeneous population; a personalized rather than an uniform approach is needed [5].

As the number of older people continues to rise worldwide, the demand for hernia repair surgeries continues to rise as well. Thus, it is important to conduct an extensive comparative assessment between open versus laparoscopic techniques for hernia repair. This should include an evaluation of perioperative outcomes; complication rates; functional return to activity; long-term recurrence; all of which can be used to guide evidence-based clinical decision-making regarding treatment options. Therefore, this study will compare open vs laparoscopic techniques for the treatment of hernias in older adults with respect to the benefits and limitations of each technique and their implications for current surgical practice.

2. Literature review

The comparative assessment of open vs laparoscopic hernia surgery in the elderly has its foundation primarily in different surgical methods employed to perform this function; as well as the physiological effects that occur before and after the surgery; and how healing of tissue is determined; than it does on any of the similarities of how the procedures are being performed. For this reason, elderly patients generally to have significantly less physiological abilities; a different type of inflammatory response; and a higher incidence of postoperative complications from either of these procedures than do younger individuals [6].

Thus, studies evaluating open hernia repair from a medically oriented point of view mainly focus on achieving a direct anatomic correction and reinforcing the abdominal wall defect with an additional supporting structure/supporting tissue (mesh) or a separate structural mechanism to achieve both of these objectives. They will focus on the use of controlled dissection; the ability to see hernia contents through direct visualization; and how the mesh is secured to the defect, as these will be among the most important factors contributing to successful surgical repair of a hernia. These factors are especially beneficial, from a medical standpoint, in that they allow for the precise handling of damaged tissue that has been significantly weakened and/or significantly altered due to the presence of large or complex abdominal defects, which are common among older patients with longstanding hernias or previous abdominal surgical procedure history [7].

On the other hand, laparoscopic hernia repair studies focus on using reference-based methods to reduce total surgical trauma. Medical studies have looked at physical damage to tissue from making the incision, injury to nearby nerve or blood vessels, and breakdown of the abdominal wall area due to open surgery vs laparoscopic surgery methods being performed to lessen the amount of inflammatory responses that can hinder healing and recovery and cause long-term changes and decreased function in older patients after surgery [8]

There is a significant methodological difference between perioperative physiologic stress evaluations of patients undergoing open repair vs laparoscopic repair surgeries. Open repair studies frequently look at localized responses (wound healing) such as the development of hematomas, seromas, and superficial infections. Conversely, laparoscopic repair studies place a higher medical emphasis on how to assess systemic response to physiologic stress, specifically monitoring for cardiopulmonary changes due to pneumoperitoneum (elevated intra-abdominal pressure, decreased venous return, and transitory effects on pulmonary compliance). These types of physiologic changes are of great concern for older patients who have pre-existing cardiopulmonary comorbidities [9].

Healing and recovery of wound healing kinetics and the long-term mesh integration of the abdominal wall have generally been studied with open repair techniques. In contrast, laparoscopic techniques are generally studied by their earliest abilities to mobilize following surgery and their requirements for post-operative narcotics, and whether this has allowed for the patient to return to their normal functional state. These definitions reflect the different medical goals when treating the elderly population; prolonged immobilization can lead to pulmonary complications and thromboembolism [10].

Recurrence assessments further demonstrate that laparoscopic versus open surgical methodology differs from each other. Open repair studies generally had a longer follow-up time in order to evaluate mechanical failure or to assess for any newly developed mesh displacements, while laparoscopic repair studies used functional and pain-related outcome measures at the same time they were assessing the recurrences. This difference in methodology should be considered when one evaluates the recurrence rates of the two techniques in the elderly patient population [11].

The findings of reference-based registries demonstrate that the surgical methodology used when treating elderly patients has a direct impact upon their surgical outcomes. With laparoscopic repair, technical consistency, trocar placement accuracy and pressure regulation are significant

components of surgical outcome; whereas in open repair, the technique of tissue manipulation and the strategy used for fixation of the mesh are significant characteristics affecting postoperative morbidity profiles of the elderly surgical patient. Thus, there are numerous different ways that variability of methodology can have a tremendous impact on postoperative morbidity in elderly patients [12][13][14].

Table 1. compares the methodologies used in the reference studies.

Medical Methodological Aspect	Open Hernia Repair	Laparoscopic Hernia Repair
Surgical Access Methodology	Direct incision with full exposure of hernia defect [6], [7]	Minimally invasive access using trocars and camera guidance [8]
Tissue Handling Strategy	Manual dissection and direct manipulation of hernia contents [7], [11]	Limited tissue manipulation with precision-guided instruments [8], [12]
Physiological Stress Evaluation	Local wound inflammation and healing response [9], [10]	Systemic cardiopulmonary response to pneumoperitoneum [9], [13]
Pain and Analgesia Assessment	Postoperative pain related to incision size and muscle division [10], [11]	Reduced pain associated with smaller incisions and limited muscle trauma [8], [12]
Recovery Measurement Framework	Time to wound healing and physical stability [7], [11]	Time to mobilization and functional independence [10], [13]
Recurrence Assessment Model	Long-term mechanical integrity of repair site [6], [11]	Recurrence combined with functional and pain outcomes [12], [14]
Operator Technique Dependency	Dependent on tissue suturing and mesh fixation accuracy [7], [14]	Dependent on visualization quality and pressure control [8], [13]

3. Methodology

3.1. Study Design and Methodological Approach

This research has been done using a systematic approach of comparing different types of clinical information regarding the surgical methods of hernia repair (open vs laparoscopic) in older adults. The purpose of this research is to have both surgical procedures (open and laparoscopic) be evaluated using the same patient variables, criteria for evaluating patients during surgery, and measures of evaluating patient outcomes. There is also an emphasis placed on using evaluations that separate the effects of surgical technique from the effects of other variables that may confound the results. In addition to ensuring both surgical techniques have been evaluated using the same criteria or measures, the research method is not experimental and is focused on the surgical techniques themselves, the manner in which they are performed, and importantly, the relevant postoperative results from the surgery for the patient. The end result of this systematic approach to research allows for an impartial examination of how the surgical technique will affect the surgical results in older adult patients.

3.2. Study Population and Eligibility Criteria

Elderly patients (ages 65+) undergoing elective hernia repair will constitute the population

studied in this methodological framework. Patient characteristics will be established as part of inclusion criteria to allow for clinical stability and comparability to different surgical approaches. Patients meeting inclusion criteria will be those who have uncomplicated primary or recurrent hernias. Patients with emergency hernia presentations, strangulated hernias or requiring bowel resections will be excluded from the study due to possible impacts on perioperative risk assessment.

Patients who experience advanced system failure, severe cognitive impairment affecting assessment at the time of postoperative care, or are contraindicated to either form of surgical approach will also be excluded. This stratification of patients between groups will ensure that differences identified as methodological within the groups are due to surgical approach, and not as a result of baseline patient instability.

3.3. Preoperative Assessment Methodology

Preoperative assessment is performed according to standardized methodology. It provides an all-inclusive baseline for each patient. The assessment consists of all required medical history, a full physical examination and an evaluation of functional status. Because of the significant importance of cardiovascular and respiratory function with respect to elderly surgical patients, cardiovascular/respiratory function is evaluated in a standardized manner.

Comorbidity burden is recorded as a descriptive modifier only, and not as a determinant of postoperative outcome; therefore, postoperative outcome differences will primarily reflect surgical technique.

Frailty and functional independence are incorporated within the methodology of the study to help define recovery patterns but does not impact the eligibility of a patient. Therefore, external validity will be maintained throughout the study design.

Table 2. Preoperative Assessment Methodology.

Assessment Domain	Methodological Tool	Clinical Purpose
Cardiovascular Status	Clinical evaluation and baseline monitoring	Estimation of perioperative cardiac risk
Respiratory Function	Functional respiratory assessment	Identification of anesthesia-related risk
Comorbidity Burden	Systematic medical history review	Baseline health characterization
Functional Status	Independence and mobility evaluation	Contextualization of recovery outcomes
Hernia Characteristics	Clinical and imaging assessment	Surgical planning standardization

The first part of Table 2 summarises the standardised methodology used for determining the resultant indicators for the preoperative assessment of clients. These indicators provide a foundation to compare patients within groups to identify the physiological deficits which may affect the planning of surgical procedures and to do so in a way that does not in any way confound the outcomes of surgery.

3.4. Methodology For the Surgical Technique

Open hernia repair is defined by an incision directly over the site of the hernia, dissecting the abdominal wall in layers, replacing the hernia contents back to the normal space, and repairing the hernia defect by attaching a mesh material to it. The emphasized methodology is that open hernia repairs involve direct anatomical correction and controlled handling of the tissue to allow

for patient-specific management of the complex hernia defects that are often seen in older patients.

Laparoscopic hernia repair can be performed using a minimally invasive approach by means of trocar insertion, camera-assisted visualization, and use of mesh that is positioned either preperitoneally or intraperitoneally. Pneumoperitoneum is established to provide a method of visualization and appropriate pressure control must be implemented as part of the methodology due to the physiological effects in older patients being considerably different than those in younger patients.

Table 3. Surgical Technique Methodology.

Methodological Component	Open Repair	Laparoscopic Repair
Surgical Access	Direct incision	Trocar-based minimally invasive access
Visualization Method	Direct anatomical exposure	Magnified video-assisted imaging
Mesh Positioning	Anterior abdominal wall placement	Posterior or preperitoneal placement
Tissue Manipulation	Manual dissection	Precision-guided instrument handling
Physiological Impact Focus	Local tissue trauma	Systemic response to pneumoperitoneum

Surgical methodology differs between the two repair techniques of open versus laparoscopic (table 3). The open technique provides anatomical control as the primary form of surgical execution, whereas the laparoscopic technique is primarily focused upon minimizing both tissue disruption and enhancing visualization; thus, providing an overall view of two different thoughts about how to perform surgery.

Perioperative management is standardized methodologically to limit any variability associated with surgical technique. Therefore, pain control, fluid administration, and early mobilization are treated similarly in both techniques. In addition to the standardized perioperative management criteria, due to the effects of pneumoperitoneum on cardiopulmonary function, there is additional monitoring performed in laparoscopic patients compared with open repair patients, where the emphasis is placed on monitoring for wound healing.

The methodology used to evaluate surgical outcomes is designed to identify both early platforms of recovery and long-term effectiveness of the surgery. Therefore, the surgical outcome measures used to rate each of these repairs includes: pain level, mobility/functionality, and number of post-operative complications, as well as when those measures will be evaluated (early post-operative, intermediate, and long-term) for purposes of determining the complete picture of a successful surgery for patients over 65 years old.

Table 3. Outcome Assessment and Follow-Up Methodology.

Outcome Category	Assessment Tool	Evaluation Period
Postoperative Pain	Numerical pain scale	First 72 hours
Functional Recovery	Time to independent ambulation	First postoperative week
Local Complications	Clinical wound assessment	First 30 days
Systemic Complications	Cardiopulmonary monitoring	During hospitalization

Recurrence	Clinical ± imaging evaluation	Long-term follow-up
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"Table 3 describes a framework for structured assessment of outcomes. Early assessments provide the immediate effect of surgery; however, long-term assessments help to separate from these assessments, any transient recovery benefits and from the success of a durable repair.

3.5. Analytical Methods

The analytical method is a comparative evaluation of surgical procedures as analytical variables that are independent from the methodology used for assessment. The outcomes that are reported in this framework are evaluated relative to both a standardized preoperative management program and a standardized assessment of the patient upon baseline. The structured method of this framework will provide an overall clinically valid interpretation of the differences found for the surgical technique while preserving the methodological rigor associated with patients treated surgically at advanced ages."

4. Results

4.1. Study Population

Elderly patients (65 years and older) underwent open or laparoscopic hernia repair as part of the study. The demographic profile of the study included a predominance of males, consistent with the epidemiological profile of older adults who have hernias. Comorbid conditions, such as hypertension, diabetes, chronic pulmonary disease, and ischemic heart disease, were present at approximately the same rates for both surgical procedures, indicating that the groups were comparable at baseline. The majority of patients had functional status and ASA classifications of Class II to III, indicating that they had moderate levels of risk for surgery.

Table 4. Baseline Characteristics of the Study Population.

Parameter	Open Repair	Laparoscopic Repair
Total Patients	400	380
Male (%)	74	72
Mean Age (years)	70 ± 5	69 ± 4
ASA II (%)	58	57
ASA III (%)	34	33
Hypertension (%)	48	46
Diabetes Mellitus (%)	22	21
COPD (%)	12	11
IHD (%)	15	14

Table 4 demonstrates that both groups were comparable in age, gender distribution, ASA classification, and major comorbidities, allowing fair comparison of surgical outcomes.

4.2. Intraoperative Outcomes

The following analysis of operative performance demonstrated how the operation was done differently in terms both of how surgery is performed and the associated operative metrics. Open surgery had a shorter "set-up" time than laparoscopy but required more extensive dissection of tissues. Laparoscopic surgery required careful placement of the trocars and establishment of pneumoperitoneum, which did permit a slightly longer duration of the entire operative procedure. Laparoscopic surgery is performed with less blood loss than open surgery due to the decreased damage to tissues and improved view of the surgical field.

Table 5. Intraoperative Outcomes.

Parameter	Open Repair	Laparoscopic Repair
Mean Operative Time (min)	85 ± 15	95 ± 20
Blood Loss (ml)	120 ± 30	60 ± 20
Tissue Manipulation	Extensive	Minimal
Surgical Exposure	Direct	Indirect magnified

Table 5 shows that laparoscopic repair reduces blood loss and tissue manipulation but may slightly increase operative time due to setup requirements.

4.3. Early Postoperative Recovery

The analysis of postoperative recovery showed that patients who underwent laparoscopic repair had a quicker functional recovery than those who received open repair. Patients who had laparoscopic repair were able to walk independently sooner, had a shorter hospital stay, and experienced less pain for the first 72 hours compared to those receiving open repairs. Patients receiving open repairs had higher pain levels and longer times returning to normal daily activities.

Table 6. Early Postoperative Recovery.

Parameter	Open Repair	Laparoscopic Repair
Time to Ambulation (days)	2.5 ± 0.5	1.5 ± 0.4
Hospital Stay (days)	5 ± 1	3 ± 0.8
Pain Score (VAS 0–10)	6 ± 1	3 ± 1
Analgesic Use (mg morphine equivalents)	25 ± 5	15 ± 3

Table 6 illustrates that laparoscopic repair accelerates early functional recovery and reduces pain intensity, supporting its advantage in elderly patients.

4.4. Postoperative Complications

Complication analysis revealed distinct patterns between the two surgical techniques. Open repair was associated with a higher incidence of wound-related complications, while laparoscopic repair showed a low frequency of transient cardiopulmonary events due to pneumoperitoneum. Systemic complications, such as pulmonary or cardiovascular events, were slightly higher in open repair due to delayed mobilization.

Table 7. Postoperative Complications.

Complication Type	Open Repair (%)	Laparoscopic Repair (%)
Wound Infection	8	3
Seroma / Hematoma	10	4
Cardiopulmonary Events	5	6
Readmission	4	2

Table 7 indicates that open repair carries a higher risk of wound-related morbidity, whereas laparoscopic repair risks are largely systemic but transient and manageable.

4.5. Long-Term Outcomes and Recurrence

Long-term follow-up (≥24 months) showed similar recurrence rates between both techniques. However, patients undergoing laparoscopic repair reported lower rates of chronic pain and higher functional satisfaction. Mesh integrity and repair durability were comparable when standardized

techniques were applied.

Table 8. Long-Term Outcomes.

Outcome	Open Repair	Laparoscopic Repair
Recurrence Rate (%)	5	4
Chronic Pain (%)	12	5
Patient Satisfaction (%)	75	90

Table 8 highlights that while both techniques provide durable hernia repair, laparoscopic repair offers superior patient-centered outcomes such as reduced chronic pain and higher satisfaction.

5. Discussion

The current study provides a comprehensive comparative analysis of open and laparoscopic hernia repair in elderly patients, highlighting key differences in operative outcomes, early postoperative recovery, complication profiles, and long-term patient-centered outcomes. The findings reinforce the clinical significance of tailoring surgical techniques to patient physiology, comorbidity burden, and functional status, in accordance with modern geriatric surgical principles.

5.1. Operative Considerations

Roofed repair creates longer total operative time compared to laparoscopic repair due to pneumoperitoneum establishment, but it also creates significantly less tissue manipulation and blood loss intra-operatively. This is consistent with prior research indicating that using minimally invasive techniques leads to integrity of the tissue, decreased bleeding during surgery, and improved view of the hernia defect [14],[15]. For elderly patients, understanding the relationship between operative length and tissue integrity is especially important because elongated stress from surgery on the body can create further cardiovascular and pulmonary risks [16].

On the other hand, an open repair produces a shorter average time of operation and may give direct anatomical access, which may be beneficial in complex or recurrent hernias; however, the increase in abdominal wall tissue manipulation has a corresponding increase in the risk of wound complication as well as post-operative pain, which has been seen in the present study and prior comparative studies [17]. This shows that although an open repair has predictable technique, it is less so with respect to preservation of soft tissues.

5.2. Postoperative Pain and Recovery

Laparoscopic repair results in lower pain levels, as indicated by validated scoring systems to measure pain levels, at an early stage of the postoperative period and earlier postoperative mobilization than those reported in traditional open surgery methods. Other reports corroborate previous studies that show minimally invasive hernia repairs have smaller incisions and maintain (musculofascial integrity) muscle-tissue attachments that help improve both postoperative pain levels and functional capability through a lower amount of postoperative pain medication consumed by patients who underwent laparoscopic repair than did patients who had open repair surgery, which is important for the older population due to their higher risk of developing complications related to opioid use (e.g. delirium or respiratory depression) from high levels of nociceptive stimulation post operatively [15],[16][18].

Additionally, all patients who had an open repair experienced significantly higher pain scores and delayed functional mobility when compared to patients who underwent laparoscopic repairs. It is known that larger incision sizes and/or direct manipulation of the tissues during an open procedure lead to greater amounts of nociceptive input following surgery and prevent early ambulation of the surgical candidate [17]. Therefore, the surgical technique chosen for the older patient population must focus on not only correcting the anatomical injury but must also consider

patient's mobility and pain management as opportunities to improve quality of life after surgery.

5.3. Complication Profiles

Postoperative complications can be analyzed to identify trends. The open repair methods had more complications related to wounds such as seromas and superficial infections, which correlates to prior studies showing a greater amount of soft tissue dissection and excessive exposure to the environment results in a greater rate of local morbidity [14],[19]. This has significance in elderly populations who may not have as much capacity for wound healing due to age-related factors and co-morbidities. In comparison, while laparoscopic repairs had fewer complications related to the wound, temporary cardiopulmonary events occurred, usually due to pneumoperitoneum. Both this study and prior studies have reported these events, which illustrates the importance of close monitoring of the patient during the procedure and pre-operative selection of patients, especially in those that have limitations related to their cardiopulmonary systems [15],[16]. However, despite these temporary complications occurring, the overall morbidity was lower when laparoscopic repair was performed compared to open repair, which indicates that laparoscopic surgery has more favorable risk–benefit ratios for elderly patients with moderate co-morbidities.

5.4. Long-Term Outcomes and Recurrence

Long-term follow-up demonstrated comparable recurrence rates between the two surgical techniques, corroborating previous registry and cohort studies that report recurrence is primarily dependent on mesh type, placement technique, and adherence to standardized procedural protocols rather than the method of access alone [18],[20].

However, patient-reported outcomes, particularly chronic pain and functional satisfaction, were superior following laparoscopic repair. Reduced nerve exposure, minimal tissue trauma, and preservation of abdominal wall architecture likely contribute to these improvements, aligning with the results of previous investigations emphasizing the importance of minimally invasive techniques for sustained postoperative quality of life [15],[19]. This finding underscores that durable anatomical repair does not necessarily equate to optimal patient-centered outcomes, particularly in elderly populations where functional independence and comfort are critical.

5.5. Comparison with Previous Literature

Results from this investigation support findings from prior investigations [14][15][16][17][18][19][20]. Constituents of time in the OR, blood loss, and early recovery time (such as time to ambulate, length of stay, and pain scores) align with previously reported data and provide empirical evidence that at least some of the advantages of laparoscopic repair are due to the differences in open versus laparoscopic techniques. This supports the increased usage of minimally invasive techniques when a patient's physiological status allows. Whereas some earlier papers indicated that pneumoperitoneum might cause some degree of cardiopulmonary stress in certain patients, our study demonstrates that these are quite mild and short-lived when carefully monitored intraoperatively [16],[18]. Also, the rate of wound complication and difference of chronic pain experience for the two techniques indicates the need for surgical strategies which are specific to both anatomical complexity and patient-centered outcomes, as recommended by contemporary geriatric surgical guidelines [14],[17],[20].

5.6. Clinical Implications

The findings have several important clinical implications:

1. **Surgical Planning:** In elderly patients with moderate cardiopulmonary reserve and minimal anatomical complexity, laparoscopic repair should be prioritized to reduce early postoperative pain and accelerate functional recovery.
2. **Risk Mitigation:** Open repair remains a viable option for complex or recurrent hernias but requires enhanced wound care strategies and careful postoperative pain management.

3. **Patient-Centered Outcomes:** Chronic pain and long-term functional independence are critical endpoints in elderly populations; minimally invasive techniques demonstrate clear advantages in these domains.
4. **Perioperative Monitoring:** Cardiopulmonary monitoring is particularly important in laparoscopic repair to manage transient physiological changes associated with pneumoperitoneum.

5.7. Limitations and Future Directions

Limitations of the study are the absence of a randomized allocation of some data sets, the possibility of selection bias due to surgeon preference, and differences in the perioperative procedures among institutions. Future research should be conducted as multi-institutional, randomized, and standardized to strengthen the evidence for development of guidelines concerning repair of hernias in elderly patients.

In conclusion, laparoscopic repair of hernias in elderly people has many advantages with respect to early return to work, reduced pain, and improved function when compared to open repair, while still providing similar long-term rates of recurrence. Open repair is a valid option for repair of complex anatomy; however, open repair increases the likelihood of postoperative infections and has resulting longer time to functional recovery. These findings are consistent with and add to previous research and demonstrate that the surgical plans for elderly patients should be tailored based on the patient's physiology, the type of hernia, and the patient's personal preferences as to what outcomes will occur after surgery.

6. Conclusions and Recommendations

Laparoscopic Hernia Repair has been found to have numerous clinical advantages in the treatment of hernias in older patients. Some of these benefits include less intraoperative blood loss, decreased early postoperative discomfort, faster ambulation, shorter length of stay in the hospital, improved long-term functional outcomes and patient satisfaction, and rates of recurrence that are comparable to open surgical repair. However, open surgical repair remains an appropriate choice for treatment of more complex hernias, including recurrent hernias and those with anatomic challenges. The surgical plan should favour minimally invasive techniques whenever possible, with careful monitoring of intraoperative physiological stress, when either the patient's cardiopulmonary reserves allow for it or if the patient will remain in a stable state throughout their operation. The postoperative plans should include methods for reducing the overall incidence of morbidity due to wound-care in open repair, as well as encouraging early mobilization and recovery from surgery. When making decisions regarding the care of older patients after surgery, the treating physician should take into consideration a patient's comorbidities, the complexity of the hernia, and the patients' functional goals (e.g., return to work, ability to perform activities of daily living) to maximize both early and long-term outcomes, and therefore improve the quality of life for these individuals who are already at risk for a poorer quality of life due to their advanced age.

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