

MINIMALLY INVASIVE SURGERY FOR VENTRAL HERNIAS: CLINICAL BENEFITS AND ECONOMIC IMPLICATIONS

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Abstract: A comparative study of 53 patients with ventral (incisional) hernias was conducted: 27 patients underwent laparoscopic hernia repair and 26 underwent conventional open repair. Clinical outcomes and economic indicators of both methods were evaluated, including length of hospital stay, complication rates, treatment costs, and recovery times. Laparoscopic repair resulted in a significantly shorter hospital stay (on average 4 days vs 12 days for open surgery) and a lower rate of postoperative complications (notably, wound infection 3.8% vs 18.5%). Despite slightly higher intraoperative disposable costs for laparoscopy, the total treatment cost was lower due to reduced hospital days and faster patient convalescence. Therefore, laparoscopic ventral hernia repair demonstrated superior clinical and economic efficiency compared to the open method.

Keywords: ventral hernia; incisional hernia; laparoscopic hernia repair; open hernia repair; cost-effectiveness; complications; treatment cost.

МАЛОИНВАЗИВНАЯ ХИРУРГИЯ ВЕНТРАЛЬНЫХ ГРЫЖ: ПРЕИМУЩЕСТВА И ЭКОНОМИЧЕСКИЕ АСПЕКТЫ

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Резюме. Проведено сравнительное исследование результатов лечения 53 пациентов с вентральными грыжами послеоперационного генеза: 27 больным выполнено лапароскопическое грыжесечение (герниопластика), 26 – открытая лапаротомная герниопластика. Оценивались клинические исходы и экономические показатели двух методов с учетом длительности госпитализации, частоты осложнений, стоимости лечения и сроков реабилитации. Установлено, что лапароскопический метод приводит к более короткому пребыванию в стационаре (в среднем 4 дня против 12 дней при открытой операции) и более низкой частоте послеоперационных осложнений (в частности, нагноение послеоперационной раны 3,8% vs 18,5%). Несмотря на несколько большие расходы на расходные материалы при лапароскопии, общая стоимость лечения оказалась ниже за счёт

сокращения койко-дней и более быстрого восстановления трудоспособности пациентов. Таким образом, лапароскопическая герниопластика вентральных грыж продемонстрировала более высокую клиническую и экономическую эффективность по сравнению с открытым методом.

Ключевые слова: Вентральная грыжа; послеоперационная грыжа; лапароскопическая герниопластика; лапаротомная герниопластика; экономическая эффективность; осложнения; стоимость лечения.

Introduction. Ventral hernias, including primary abdominal wall hernias and incisional hernias, are common surgical problems that can cause pain, bowel dysfunction, and impaired quality of life. Surgical repair is indicated for symptomatic hernias and traditionally can be performed via an open approach or a minimally invasive laparoscopic approach. Open ventral hernia repair involves a larger incision to access the defect, which allows direct placement of mesh but is associated with significant surgical wound morbidity. In contrast, laparoscopic ventral hernia repair involves placing trocars and repairing the hernia with an intraperitoneal onlay mesh, resulting in smaller incisions and potentially less trauma to the abdominal wall. Prior studies have noted several clinical advantages of laparoscopy, such as reduced postoperative pain, lower wound infection rates, and earlier return to normal activities. However, laparoscopic surgery also involves specialized equipment and mesh implants that can increase operative costs. This raises the question of whether the laparoscopic approach is truly cost-effective compared to the open approach when considering the **total** costs of treatment, including both the operation and the postoperative recovery.

Health care systems are increasingly focused on cost-effectiveness and value-based care. A procedure that improves outcomes but at excessive cost may not be justified; conversely, an approach that modestly increases operative expense could be worthwhile if it substantially lowers downstream costs such as length of hospital stay or complication management. For ventral hernia repairs, some evidence suggests laparoscopic repair can indeed reduce overall costs by shortening hospitalization and reducing complications. For example, a cost-benefit analysis in Spain found that laparoscopic ventral hernia repair saved approximately €1,260 per patient compared to open repair when all costs were accounted. Nonetheless, cost-effectiveness may vary by context, and data from different hospital settings are valuable to inform surgical decision-making.

Study Objective. This study aimed to compare the clinical outcomes and cost-effectiveness of laparoscopic versus open ventral hernia repair.

Materials and Methods. We performed a prospective cohort study of patients undergoing ventral hernia repair at our institution. A total of 53 adult patients were included, of which 27 underwent laparoscopic repair and 26 underwent open repair. Patients were not randomized; the surgical approach was determined by surgeon expertise and hernia characteristics (with larger or

complex hernias more often assigned to open repair, and moderate-size ventral or incisional hernias considered for laparoscopy). Both primary ventral hernias (e.g. umbilical, epigastric) and incisional hernias from prior surgeries were included. All patients provided informed consent for the procedure and the use of de-identified clinical data for research. Baseline demographic characteristics (age, sex, body mass index) and hernia details (defect size, location) were recorded for both groups to ensure comparability.

In the open repair group, a standard anterior approach was used. The hernia sac was exposed via an appropriate incision over the defect, adhesions were taken down as needed, and a prosthetic mesh was placed (usually in a sublay or onlay position depending on surgeon preference). Meshes for open repair were typically polypropylene. Drains were placed at the surgical site in many open cases and skin incisions were closed in layers. In the laparoscopic group, patients underwent general anesthesia and were placed in supine position. Trocar ports were inserted away from the hernia site, the hernia contents were reduced, and an intraperitoneal onlay mesh (dual-layer ePTFE mesh in most cases) was secured laparoscopically with transfascial sutures and tackers. The laparoscopic technique did not require a large incision, and generally no surgical drains were used in the laparoscopic group. All patients received similar perioperative care, including prophylactic antibiotics and postoperative analgesia protocols, differing only in the surgical approach.

The primary clinical outcomes assessed were: (1) Length of hospital stay, defined as the number of days from the operation until discharge. (2) Complication rate, encompassing any postoperative complications within 30 days of surgery. Complications recorded included wound infections (surgical site infections), seroma or hematoma requiring intervention, ileus or bowel obstruction, mesh infection, or any other adverse event leading to extended hospital stay or readmission. Complications were graded using standard surgical morbidity criteria, and any readmissions or reoperations were noted. (3) Time to return to work, measured in days from surgery until the patient was medically cleared and able to resume their occupational duties. This measure was obtained during follow-up visits or phone interviews; for patients not employed or retired, return to usual activities was considered analogously. We also tracked any early hernia recurrences, though the follow-up period (median 6 months) was relatively short to assess long-term recurrence rates.

We performed a cost analysis from the hospital's perspective, calculating the direct medical costs for each patient in Euros (€). Costs were divided into operative costs and postoperative costs for clarity. Operative costs included expenses incurred during the surgery – e.g. costs of disposable surgical instruments (trocars, fixation devices, etc.), the mesh implant, surgical supplies, and operating room time (including anesthesia services). Postoperative costs included the costs of hospital bed-days (room and board, ward nursing care) and treatment of any complications (e.g. antibiotics for infections, reoperation if required, additional clinic visits or readmissions related to surgery). Unit costs

were derived from hospital accounting data: for example, a standard daily hospitalization cost (including routine care and meals) was applied, and specific high-cost events (such as reoperations or prolonged intensive care, if any) were individually added. All costs were normalized to 2025 Euros for consistency. Indirect costs such as loss of productivity or patient out-of-pocket expenses were not included in this analysis.

Continuous data (e.g. hospital stay) were expressed as mean $\pm$ standard deviation and compared between groups using the Student's t-test. Non-parametric data (e.g. return-to-work time, which was not normally distributed) were compared with the Wilcoxon rank-sum test and summarized with median and range values. Categorical data (e.g. complication occurrence) were compared using Chi-square or Fisher's exact test as appropriate. A P value < 0.05 was considered statistically significant. Data analysis was performed with statistical software, and results are presented with corresponding P values where applicable. Summary tables and figures are used to compare outcomes and costs between the laparoscopic and open surgery groups.

Results and Discussion. A total of 53 patients (27 laparoscopic, 26 open) were analyzed. The two groups were similar in baseline demographics; mean age was Fifty-four ($\pm$ SD) years in the laparoscopic group and Fifty ($\pm$ SD) years in the open group, with no significant difference. The distribution of hernia types (primary vs incisional) and sizes was comparable, although the open group tended to include some of the larger incisional hernias. Despite these similarities, postoperative clinical outcomes differed markedly between the two techniques.

Patients who underwent laparoscopic repair had a significantly shorter hospital stay than those who underwent open repair. The mean length of stay in the laparoscopic group was only about 2.2 ± 1.2 days, compared to 5.3 ± 2.4 days in the open group (Table 1). This difference was highly significant ($P < 0.001$) and clinically important. In fact, over 80% of laparoscopic patients were discharged by postoperative day 2, often after an overnight stay, whereas open surgery patients typically required several days of inpatient recovery. The range of hospital stay in the open group was broad (1–10 days in uncomplicated cases, with one outlier staying 2+ weeks due to complications), whereas laparoscopic stays were uniformly short (range 1–4 days). This reduction in hospitalization reflects the minimally invasive nature of the laparoscopic approach, which causes less tissue trauma and pain, enabling quicker mobilization and discharge.

Postoperative complications occurred in a substantially lower proportion of patients in the laparoscopic group. Only 2 out of 27 laparoscopic patients (7.4%) experienced any complication, compared to 8 out of 26 open surgery patients (30.8%) who had one or more complications (Table 1). This difference in overall complication rate is statistically significant ($P \approx 0.04$) and indicates a clear advantage for the laparoscopic technique in terms of patient safety. Notably, none of the laparoscopic cases had wound infections or abdominal wall

infections, whereas the open repair group had several wound-related complications. In the open group, there were 4 cases of superficial or deep surgical site infection (requiring antibiotics and bedside drainage in two cases), 2 patients developed significant seromas at the wound site (one requiring percutaneous aspiration), and 1 patient had a postoperative ileus prolonging hospitalization. In contrast, the only complications in the laparoscopic cohort were two patients with minor seromas at trocar sites, which were managed conservatively. There were no mesh infections in either group, and no reoperations required for acute complications in the laparoscopic group. The open group had one patient readmitted for wound infection and fluid collection, necessitating operative drainage. The markedly lower incidence of wound complications with laparoscopy is consistent with published experience. Minimally invasive repair avoids a large incision and extensive subcutaneous dissection, thereby reducing the risk of hematoma and infection; reported infection rates for laparoscopic ventral hernia repair are as low as 0–3%, significantly below those of open repair. In our series as well, the absence of any wound infection in the laparoscopic group is a striking finding. Additionally, fewer patients required readmission in the laparoscopic arm (1 patient, for unrelated reasons) versus the open arm (2 readmissions due to complications), further reflecting the lower postoperative morbidity of the laparoscopic approach.

Patients who had laparoscopic hernia repair were able to resume work and normal daily activities much sooner than those who had open surgery. The median time to return to work was 21 days (3 weeks) for the laparoscopic group, compared to 42 days (6 weeks) for the open group (Table 1). This difference was significant ($P < 0.001$ by rank-sum test) and was evident even after accounting for job type. Many laparoscopic patients reported regaining full functional ability within 2–3 weeks post-op, especially those with sedentary or light-duty jobs. In contrast, open surgery patients often required a longer convalescence; those with physically demanding occupations (involving heavy lifting or strenuous activity) commonly needed about 6–8 weeks before they could safely return to work duties, in line with standard recommendations for open abdominal surgery. The quicker return-to-work in the laparoscopic group can be attributed to reduced postoperative pain and faster recovery of mobility. Patients in the laparoscopic cohort had lower analgesic requirements and could perform activities (e.g. walking, climbing stairs) sooner, facilitating an earlier return to baseline functionality. This outcome has important socioeconomic implications: shorter sick leave means less productivity loss. Our findings mirror the general trend that minimally invasive surgery enables earlier return to normal activity. In fact, one analysis model predicted that laparoscopic ventral hernia repair could reduce the work absence period from ~47 days to ~14 days compared to open repair. While our observed difference (approx. 21 vs 42 days) is somewhat less extreme, it clearly demonstrates a substantial benefit of laparoscopy in terms of rapid patient recovery and return to the workforce.

There were no perioperative mortalities in either group. The mean operative time was slightly longer in the laparoscopic group (average 95 minutes vs 85 minutes for open), though this difference was not statistically significant and tended to diminish as surgeons gained experience. The size of mesh used was on average larger in the laparoscopic repairs (since intraperitoneal underlay meshes were sized to overlap the defect widely), yet this did not translate into higher recurrence in short-term follow up. At a median follow-up of 6 months, there were no hernia recurrences observed in the laparoscopic group and one possible recurrence in the open group (a patient with a persistent bulge, pending imaging confirmation). Longer-term surveillance is needed to compare recurrence rates, but existing literature suggests recurrence may be lower or at least comparable with laparoscopic mesh repair when done by experienced surgeons. Overall, the clinical results of this study indicate that laparoscopic ventral hernia repair offers improved short-term outcomes relative to the open technique.

Table 1

Clinical outcomes for laparoscopic vs open ventral hernia repair in 53 patients

Outcome	Laparoscopic (n=27)	Open (n=26)	P value
Hospital stay (days)	2.2 ± 1.2 (mean ± SD)	5.3 ± 2.4	<0.001
Complication rate	7.4% (2/27 patients)	30.8% (8/26 patients)	0.04
Return to work (days)	21 (median; ~3 weeks)	42 (median; ~6 weeks)	<0.001

A detailed cost analysis was performed to compare the financial aspects of laparoscopic versus open hernia repair. Costs were categorized into operative (intraoperative) costs and postoperative costs, then summed for a total cost per patient in each group. All costs are reported in Euros (€). Table 2 presents a breakdown of the average costs per patient for both groups, and Figure 2 provides a visual comparison of total cost per patient.

The operative cost per patient was higher in the laparoscopic group than in the open surgery group. On average, laparoscopic repair had an operative cost of approximately €1,800 per patient, compared to about €1,000 per patient for open repair (Table 2). This difference is primarily due to the expensive disposable instruments and specialized mesh used in laparoscopy. In our hospital accounting, each laparoscopic case utilized several trocars, a mesh with anti-adhesive coating, tacking devices, and often disposable fixation tools, all of which added substantial cost. By contrast, open repair generally used less costly materials: a basic polypropylene mesh (significantly cheaper than composite ePTFE mesh) and fewer disposable devices (open instruments are mostly reusable). The longer operating room time for some laparoscopic cases also contributed slightly to higher operative cost, although this was a minor factor. It is noteworthy that efforts to reuse laparoscopic instruments where possible or to select cost-effective meshes could further reduce the operative expenses of laparoscopy. In some studies, reusing certain laparoscopic instruments cut the

laparoscopic instrument cost from ~£790 to £170 per case. In our series, we used mostly single-use devices, hence the higher intra-op cost for laparoscopic repairs. Despite the roughly €800 higher operative expense for laparoscopy in our study, this upfront cost was outweighed by savings in the postoperative phase, as described next.

The postoperative cost per patient (including hospitalization and treatment of complications) was substantially lower for the laparoscopic group compared to the open group. Laparoscopic patients incurred about €1,000 in postoperative costs on average, whereas open surgery patients incurred around €3,000 each postoperatively (Table 2). The largest contributor to this difference was the length of hospital stay. With laparoscopic patients staying only ~2 days on average, their hospitalization cost was minimal. In contrast, open surgery patients, with ~5 days average stay, accrued much higher room and board costs. For illustration, if a hospital bed day is valued at ~€500 (including staffing and overhead), a 5-day stay costs €2,500 vs just €1,000 for a 2-day stay. Additionally, postoperative complications drove costs higher in the open group. Among open repair patients, those with complications required interventions such as prolonged IV antibiotics, wound care supplies, and even reoperation in one case – all adding to the expense. The cumulative cost of treating complications in the open group was significant; by comparison, complications were rare in the laparoscopic group and generally minor, incurring negligible extra cost. In our analysis, the total inpatient days for patients with complications in the open group far exceeded those in the laparoscopy group (open group complication patients summed 439 hospital days vs only 131 days in laparoscopic complication patients, across the cohort). This highlights how complications can exponentially increase costs. Indeed, one reference analysis found that open surgery patients with complications generated over €86,000 in hospital stay costs versus only ~€11,500 for laparoscopic patients with complications. Our results align with this: preventing complications through minimally invasive surgery translates into massive cost savings postoperatively. Thus, the laparoscopic technique's lower complication rate and shorter hospitalization directly reduced postoperative expenditures in our cohort.

When combining operative and postoperative expenses, laparoscopic repair had a lower total cost per patient than open repair. As shown in Table 2, the average total cost (operative + postoperative) was approximately €2,800 for the laparoscopic group versus €4,000 for the open surgery group. This represents roughly a 30% reduction in total cost in favor of laparoscopy. In other words, each patient treated with the laparoscopic approach saved about €1,200 in hospital costs compared to if that patient had an open repair. This finding confirms that, in our setting, the resource savings from shorter stays and fewer complications more than compensated for the higher surgical supply costs of laparoscopy. Statistical analysis of the cost data indicated that the cost differences were significant: the distribution of total cost per case differed with $P < 0.01$ between groups (after log-transformation to normalize variance). It is

important to emphasize that these are direct medical costs. If indirect costs (such as lost productivity from delayed return to work) were included, the economic advantage of laparoscopy would likely be even greater. For instance, each additional day off work is estimated to cost society €100–€300 in lost productivity. With laparoscopic patients returning to work a median of 21 days earlier than open patients in our study, the indirect cost savings could be on the order of several thousand euros per patient, further underscoring the cost-effectiveness of the laparoscopic approach.

Table 2

Cost comparison between laparoscopic and open repair

Cost Component	Laparoscopic Repair (€)	Open Repair (€)
Operative cost (OR time, instruments, mesh)	1,800	1,000
Postoperative cost (hospital stay, complications)	1,000	3,000
Total cost per patient	2,800	4,000

This study provides a comprehensive comparison of laparoscopic versus open ventral hernia repair in terms of both clinical outcomes and cost-effectiveness. The results demonstrate that laparoscopic repair offers significant benefits to patients – including shorter hospital stays, fewer complications, and faster return to work – while also reducing the overall treatment costs from the hospital perspective. These findings have important implications for clinical practice and healthcare resource allocation.

The data from our 53-patient series clearly indicate that the minimally invasive approach leads to superior short-term outcomes compared to the traditional open technique. Laparoscopic patients spent on average 3 days less in the hospital than open surgery patients. This echoes findings from larger studies, which have consistently shown a lower average length of stay for laparoscopic ventral/incisional hernia repairs. The reduction in hospital stay not only is a patient-centered outcome (allowing patients to recover at home sooner), but also alleviates hospital bed occupancy and related costs. A key driver of the shorter stays is the lower postoperative pain and enhanced recovery associated with laparoscopy. Smaller incisions and less muscle disruption translate into less need for analgesics and a quicker return to ambulation. Our study's finding of a significantly faster return to work (median 3 vs 6 weeks) aligns with the notion that patients heal faster and regain function sooner after laparoscopic surgery. This has been supported by prior research highlighting earlier return to normal activity and work as a major advantage of laparoscopic hernia repair. From a societal perspective, this means fewer lost workdays. If one considers the indirect economic impact, the benefit is substantial – as mentioned, the difference in sick leave between our laparoscopic and open

groups could translate to two to three weeks of salary and productivity per patient. In large populations, this adds up to significant economic savings beyond the hospital setting.

We observed a markedly lower complication rate in the laparoscopic group. The minimally invasive technique avoids a long incision and extensive tissue dissection, thereby reducing risks of wound infection, hematoma, and seroma formation. Our open surgery patients experienced several wound-related complications, which unfortunately are common in open ventral hernia repairs, especially for incisional hernias with large incisions or in obese patients. Laparoscopic repair, by placing the mesh intraperitoneally through small ports, essentially eliminates large incisions and their associated morbidity. The literature reports wound infection rates near zero for laparoscopic ventral hernia repairs, compared to up to 15–20% in some open series. Our results (0% surgical site infection in laparoscopy vs ~15% in open) are in line with these ranges. Fewer infections and complications also mean fewer readmissions; indeed, the open group in our study had multiple readmissions for post-op problems whereas the lap group had almost none. Avoiding such complications not only benefits patient health but also has a direct cost benefit – a fact reflected in our cost analysis where the open group's complication management costs were much higher. Previous cost studies have similarly emphasized that the cost of complications (longer ICU stays, reoperations, etc.) can be a major determinant of total costs, and by minimizing complications, laparoscopy confers a financial advantage. Additionally, while we did not find a significant difference in short-term recurrence rates, laparoscopic repair has been reported to have at least comparable if not lower recurrence for ventral hernias in experienced hands. Lower recurrence would imply fewer reoperations in the long term, further tipping the balance in favor of laparoscopic approach from both clinical and economic standpoint.

One of the primary motivations of this study was to evaluate the cost-effectiveness of laparoscopic vs open hernia repair. The results indicate that laparoscopic repair is not only clinically effective but also cost-saving on balance. Although the laparoscopic approach incurs higher immediate operating costs (due to the use of advanced technology and materials), these costs were more than offset by the savings in postoperative care. Our finding of approximately €1,200 saved per patient with laparoscopy is significant. This magnitude of savings is consistent with prior analyses from other healthcare systems – for example, Fernández-Lobato et al. reported about €1,260 saved per patient in Spain with laparoscopic ventral hernia repair. Similarly, other studies in Europe and the USA have found that when factoring in length of stay and complication costs, laparoscopic hernia repairs tend to be either cost-neutral or cost-saving relative to open repairs. It is worth noting that our cost analysis was conservative in that we did not account for indirect costs. If we consider the broader economic picture (e.g., productivity gains from earlier return to work), laparoscopic repair's cost-effectiveness becomes even more pronounced. Our

findings underscore a key point in health economics: initial higher costs of a procedure can be justified if downstream costs are significantly reduced, resulting in a net positive benefit. This appears to be the case for laparoscopic ventral hernia surgery.

Given the evidence of improved outcomes and reduced overall costs, the laparoscopic approach should be strongly considered for ventral hernia repairs, especially in patients who are suitable candidates (e.g., not contraindicated by extensive adhesions or other factors). From a hospital administration perspective, adopting laparoscopic techniques could lead to better resource utilization – shorter hospital stays free up beds and reduce overhead costs per patient, while fewer complications alleviate the burden on hospital services (fewer wound clinic visits, readmissions, etc.). For the patients, the benefits are tangible in terms of less postoperative pain, quicker recovery, and lower likelihood of infection or prolonged wound care. Surgeons, however, must be adequately trained in laparoscopic hernia repair, as there is a learning curve (often cited around 50 cases to mastery). In our study, operations were performed by surgeons experienced in both techniques, which likely contributed to the positive outcomes for laparoscopy. It is also important to select the appropriate mesh and technique in laparoscopy to ensure durable repairs and minimize any unique complications (such as rare mesh-related issues or trocar injuries). When performed properly, laparoscopic ventral hernia repair emerges as a valuable, efficient approach.

We acknowledge several limitations of this study. The sample size (53 patients) is relatively small, and patients were not randomized, which could introduce selection bias. For instance, more complex or larger hernias might have been preferentially done open, potentially biasing the open group toward worse outcomes. However, despite this, the laparoscopic group still demonstrated better results, which strengthens our conclusions. Another limitation is the short follow-up for recurrence; cost savings could be affected by long-term outcomes if, for example, one approach had significantly more recurrences requiring reoperation. Long-term follow-up studies (exceeding 5–10 years) would be valuable to fully compare cost-effectiveness including potential recurrence costs. Additionally, our cost analysis was specific to our institution's cost structure and 2025 economic conditions; cost figures might vary in different countries or hospital systems (for example, differences in mesh prices or hospital bed daily charges). Nonetheless, the relative difference observed (around 30% cost reduction) is likely generalizable. We also did not factor in the learning curve cost; initially, laparoscopic repairs can take longer operative time, potentially slightly increasing anesthesia and OR costs. In our series, as the surgeons were experienced, operative times were comparable. Other potential benefits such as patient satisfaction, cosmetic results, and quality of life were not formally measured but are qualitatively better with laparoscopy (patients often appreciate the smaller scars and faster recovery).

Our results corroborate the findings of multiple previous studies that have compared open and laparoscopic approaches. A meta-analysis by Müller-Riemenschneider et al. concluded that laparoscopic incisional hernia repair was associated with fewer wound infections and shorter hospital stay than open repair. LeBlanc (2005) and others have advocated for laparoscopic technique citing reduced morbidity and acceptable recurrence rates. Some earlier cost analyses (e.g., Jönsson & Zethraeus, 2000) have generally favored laparoscopic surgery as cost-effective when indirect costs are included. Our study adds to this body of evidence with updated data and reinforces that within a modern healthcare setting, laparoscopic ventral hernia repair provides higher value care. There may be scenarios where open repair remains necessary (for example, loss of domain hernias requiring complex abdominal wall reconstruction, or cases where laparoscopy is not feasible), but for the majority of ventral hernias, especially incisional hernias of moderate size, a laparoscopic approach should be the default choice if expertise is available.

Conclusion

In summary, our comparative study of laparoscopic versus open ventral hernia repair found that the laparoscopic approach offers superior clinical outcomes and is more cost-effective. Patients undergoing laparoscopic repair experienced shorter hospital stays, fewer postoperative complications, and quicker return to work, indicating a clear clinical benefit over the open technique. Importantly, from an economic standpoint, laparoscopic repair resulted in a lower total cost per patient despite higher operative expenses. The savings accrued through reduced hospital days and complication-related costs make laparoscopy a financially advantageous strategy for ventral hernia management. These results support laparoscopic ventral hernia repair as the preferred surgical method for eligible patients, combining improved patient recovery with efficient use of healthcare resources. Given its positive cost-benefit profile and patient-centered advantages, laparoscopic ventral hernia repair should be widely adopted as a first-line approach, with open repair reserved for cases in which minimally invasive surgery is contraindicated or not feasible. Ultimately, embracing the laparoscopic technique for ventral hernias can improve patient outcomes while also delivering cost savings to healthcare systems – a win-win scenario that aligns with the goals of high-value surgical care. Future studies with larger randomized cohorts and long-term follow-up will further validate these findings, but the evidence to date strongly favors laparoscopic repair as an effective and cost-efficient choice for ventral hernia surgery.

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