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Comparing laparoscopic and open umbilical hernia repair: Quality of life and outcomes

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Introduction

Umbilical hernia repair is a frequently conducted elective procedure in general surgery. Independent of the surgical approach used, various clinical hurdles must be successfully navigated to achieve the best possible patient outcomes with this procedure.[1,2]

Despite the operation's widespread occurrence, there is a noticeable absence of agreement on the most appropriate surgical approach for repairing umbilical hernias. The general consensus among surgeons is that umbilical hernias larger than 2 cm should be addressed using mesh repair, and some experts even suggest considering mesh repair for all hernias larger than 1 cm. It is commonly agreed that hernias smaller than 1 cm can be adequately managed with suture repair. However, there are opposing viewpoints, with certain professionals recommending mesh usage for umbilical hernias of all dimensions.[2-7]

As with other surgeries, there are various recommendations for improving patient outcomes after surgery for patients undergoing abdominal wall reconstruction.[8-10] Challenges that demand significant attention after surgery include postoperative pain, the possibility of readmission, and complications associated with the wound, such as surgical site infections, hematoma, and the formation of seromas. In recent years, laparoscopic methods of umbilical hernia repair have gained increasing popularity. Studies indicate that this technique offers several benefits, such as a decrease in recurrence rates and fewer wound-related complications.[11-14]

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This study compares the impact of laparoscopic and open surgical approaches to repairing abdominal hernias on patient outcomes. By evaluating patients' demographic and clinical characteristics, postoperative complications, operative durations, hospital stays, pain scores, and quality of life, this research provides new insights into the effectiveness and advantages of both methods.

Material and methods

Study design and setting

This retrospective observational single-center study included patients who were diagnosed with primary umbilical hernia and underwent hernia repair surgery between January 2016 and June 2020 in the Department of General Surgery at Bursa Cekirge State Hospital. This study was approved by the Ethics Committee of Izmir Bakircay University (1150.1130.2023). All procedures were carried out in accordance with the ethical rules and principles of the Declaration of Helsinki.

Participants

The patients were informed about the potential risks and complications associated with open and laparoscopic umbilical hernia repair during the process of securing their consent. Patients who did not consent to laparoscopic surgery after counseling underwent open hernia repair.

Inclusion criteria: The study recruited individuals 18 years of age or older who had willingly undergone elective surgery for an umbilical hernia. Those who participated were invited to follow-up assessments at specific time intervals, including the 10th day, 30th day, 90th day, 180th day, and first year postoperatively. Importantly, patients were included only if they had no missing data on either the visual analog scale (VAS) or Short Form (SF)-36 questionnaires.

Exclusion criteria: Patients under the age of 18, those with a defect size smaller than 2 cm, and those who underwent emergency surgery were excluded from the study. Moreover, the analysis excluded patients with recurring umbilical and incisional abdominal hernias, those with incomplete tracking data or missing VAS ratings or SF-36 surveys, and patients who underwent emergency inguinal hernia surgery.

Study groups

Patients underwent either laparoscopic umbilical hernia repair (LUHR) or open umbilical hernia repair with mesh (OUHR). Within the scope of the study, patients who underwent LUHR were defined as the laparoscopic repair group, while those who underwent an OUHR procedure were defined as the open repair group. Demographic characteristics, including age, sex, and body mass index (BMI), as well as preoperative findings, such as defect size, American Society of Anesthesiologists (ASA) classification, smoking habits, alcohol usage, cardiac comorbidities, chronic obstructive pulmonary disease, diabetes, hypertension, and onset of hernia (measured in days), were meticulously recorded. Furthermore, we systematically documented several contextual factors: time spent in the operating room, duration of hospital stay, and costs of materials used in the operation, such as mesh, sutures, and fixation devices. We also recorded postoperative outcomes, including conditions such as seroma, hematoma, chronic pain, infection, and recurrence.

Follow-up

In clinical follow-ups at this hospital, 36-item short-form health survey (SF-36) responses and visual analog scale (VAS) scores are routinely recorded. Pain levels are quantified using a VAS. Instances of recurrence were tracked during follow-up clinical visits and through self-reports by patients, all of which were meticulously entered into the database. Prior to the surgical procedure, all patients' pain was assessed using a preoperative VAS. Following the surgery, postoperative pain levels were gauged at specific time intervals, including the sixth and 12th hours, as well as on the 10th day post-surgery, employing the VAS. To manage postsurgery discomfort effectively, patients received diclofenac sodium injections every 8 hours for the first 24 hours after the procedure. Additionally, patients were instructed to self-administer 500 mg of oral paracetamol as needed. Along with the evaluation of pain levels, patients were asked to fill out approved questionnaires related to health and quality of life, notably including the SF-36 survey. This detailed assessment consists of 11 categories totaling 36 questions. The SF-36 form was provided in each patient's native language, which is a crucial practice.[15,16] The completed SF-36 questionnaires, obtained prior to each surgery and during subsequent follow-up visits on the 30th, 90th, and 180th days and first year postoperation, underwent meticulous analysis.

Surgical techniques

The intraperitoneal onlay mesh plus (IPOM Plus) technique was adopted for the laparoscopic procedures. Laparoscopic access to the peritoneal cavity was established using the Veress needle technique. The primary access point was commonly positioned in the left upper quadrant, while 2 additional ports were strategically placed to ensure proper triangulation around the target area. The surgical approach utilized a combination of 2 5-mm ports along with an 11-mm port, the latter of which was used to introduce the mesh required for the procedure. The hernia contents were carefully returned to the abdominal cavity. Following this, the dimensions of the hernia defect were carefully measured. The defect itself was meticulously closed using barbed sutures. Subsequently, a mesh was chosen and custom-fitted to cover the defect area, with an allowance of at least 3 cm of circumferential coverage. To ensure secure fixation, the mesh was anchored in 4 quadrants using sutures. Supplementary sutures or tacks were strategically placed at 1-cm intervals to provide additional reinforcement.

We performed only repair in the open surgeries. Repairs were conducted through an infraumbilical incision. The hernia sac was meticulously dissected, allowing the hernia contents to be gently returned to the peritoneal cavity. Subsequently, the hernia defect was methodically closed using a nonabsorbable suture. Following the closure of the defect, a mesh was positioned to cover an area extending up to 3 cm from the defect's edges. This mesh was securely affixed using sutures. Additionally, a drainage tube was introduced into the mesh-covered area. The subcutaneous adipose planes were approximated using separate sutures.

Statistical analysis

Initial clinical information was subjected to a thorough statistical evaluation. We used SPSS 22.0 (IBM Corp., Armonk, NY, USA) for the analysis, conducting all tests as two-tailed, with the significance threshold set at $P < 0.05$. For continuous variables, t-tests and Mann–Whitney U tests were applied, whereas categorical variables were examined using either Fisher's exact test or chi-square tests.

Results

In our comparative study of 67 patients, 35 were assigned to the laparoscopic repair group, and 32 were placed in the open repair group. The demographic and clinical characteristics of the 2 groups displayed no marked differences. The average age in the laparoscopic repair group was 44.11 years, with a standard deviation of 15.82, compared to 43.18 years in the open repair group, with a standard deviation of 15.36; this difference was not statistically significant, assuming a *P*-value of 0.809. Additionally, there was no significant difference in BMI between the groups; the average BMI for the laparoscopic repair group was 26.12, with a standard deviation of 2.87, and for the open repair group, it was 26.66, with a standard deviation of 2.72. The *P*-value was 0.427. The gender in both groups was also statistically similar, with a *P*-value of 0.381.

All cases in the laparoscopic repair group underwent general anesthesia, whereas in the open repair group, one patient underwent spinal anesthesia. This difference was not statistically significant, with a *P*-value of 0.478. Similarly, the distribution of patients according to ASA classification did not differ significantly, with a *P*-value of 0.648.

Interestingly, there was a significant difference in the smoking habits of the two groups: 71.4% of patients in the laparoscopic repair group were smokers, as opposed to 37.5% in the open repair group, with a *P*-value of 0.005. The prevalence of other comorbidities, such as diabetes, hypertension, and cardiac conditions, showed no statistical difference, with p-values above 0.05.

Finally, hernia-related variables, such as defect size and days of onset, did not show any significant difference between the groups. In the laparoscopic repair group, the average defect size was 41.25 mm, with a standard deviation of 14.80, while in the open repair group, it was 41.50 mm, with a standard deviation of 12.73; the *P*-value was 0.943. The average onset time for hernias in the laparoscopic repair group was 95.89 days, with a standard deviation of 105.60, as opposed to 108.97 days in the open repair group, with a standard deviation of 112.59. The *P*-value for this variable was 0.625 (Table 1).

In our comparison of postoperative outcomes in the two groups, seroma stood out as a significant complication. It was identified in 37.5% of patients in the open surgery group as opposed to only 8.6% in the laparoscopic group. The observed difference was meaningful, with a *P*-value of 0.005. In contrast, there were no notable disparities between the groups for other postoperative issues, such as hematoma, infection at the surgical site, enduring pain, or reoccurrence, as indicated by *P*-values that ranged from 0.269 to 0.534.

The duration spent in the operating room differed substantially between the groups. On average, the laparoscopic repair group required 48.37 minutes for the procedure, with a standard deviation of 12 minutes, whereas the open repair group took an average of 36.56 minutes, with a standard deviation of 9.58 minutes. This time discrepancy was statistically significant, as evidenced by a *P*-value below 0.001. For the laparoscopic repair group, the mean cost of materials was calculated as $477.28, with a standard deviation of ± 121.78 and a range of $320 to $683. Conversely, the open repair group exhibited a substantially different mean cost, at $28.34, with a standard deviation of ± 7.66 and a range between $20 and $44. A *P*-value of less than 0.001 was obtained in the statistical analysis, emphasizing the significance of the observed differences in the cost of materials between the 2 groups. In terms of the average length of hospitalization, both groups showed comparable stays. Patients in the laparoscopic repair group stayed for an average of 1.05 days, with a standard deviation of 0.23 days, while those in the open surgery group were hospitalized for an average of 1.21 days, with a standard deviation of 0.60 days. The difference in hospital stay duration was not statistically meaningful, as highlighted by a *P*-value of 0.150.

Finally, an in-depth look at pain scores revealed interesting patterns. The preoperative pain scores in the 2 groups were comparable (with a *P*-value of 0.678). The laparoscopic repair group experienced notably higher pain levels at the 6-hour postoperative mark, corroborated by a *P*-value of less than 0.001. Nevertheless, by the time they reached the 12-hour and 10-day post-

Table 1
Demographic and clinical characteristics of the patients.

Variables	Laparoscopic repair n = 35	Open repair n = 32	*P*-value
Age (y)			
Mean ± SD	44.11 ± 15.82	43.18 ± 15.36	0.809
Range	(21-82)	(19-79)	
Sex			
Male n, (%)	31 (88.6)	30 (93.8)	0.381
Female n, (%)	4 (11.4)	2 (6.2)	
BMI (kg/m^2)			
Mean ± SD	26.12 ± 2.87	26.66 ± 2.72	0.427
Range	(20.7 - 32.3)	(21.2 - 31.2)	
Defect size (mm)			
Mean ± SD	41.25 ± 14.80	41.50 ± 12.73	0.943
Range	(22 - 86)	(22 - 65)	
Anesthesia type n,(%)			
General	45 (100)	31 (96.9)	0.478
Spinal	0	1 (3.1)	
ASA class n, (%)			
I	9 (25.7)	9 (28.1)	0.648
II	20 (57.1)	20 (62.5)	
III	6 (17.1)	3 (9.4)	
Smoking, n, (%)	25 (71.4)	12 (37.5)	0.005
Alcohol usage, n, (%)	2 (5.7)	4 (12.5)	0.294
Cardiac comorbidities, n, (%)	6 (17.1)	8 (25)	0.312
COPD, n, (%)	2 (5.7)	2 (6.3)	0.658
Diabetes, n, (%)	8 (22.9)	11 (34.4)	0.220
Hypertension, n, (%)	7 (20)	4 (12.5)	0.311
Onset of hernia (days)			
Mean ± SD	95.89 ± 105.60	108.97 ± 112.59	0.625
Range	(3-450)	(7-450)	

SD, standard deviation; BMI, body mass index; ASA, American Society of Anesthesiologists physical status classification; COPD, chronic obstructive pulmonary disease.

operative intervals, patients in the same group reported notably less pain. The statistical significance of this finding was confirmed by *P*-values smaller than 0.001 (Table 2).

Quality of life

In this study, quality of life was evaluated using the SF-36 scale both before surgery and at multiple time points afterward—30, 90, and 180 days post-operation—for both the laparoscopic and open repair groups. Before surgery, most parameters, such as physical and emotional well-being and overall mental health, were comparable between the two groups, with p-values between 0.157 and 0.867. However, a significant difference was seen in vitality, as indicated by a *P*-value of 0.013.

At the 1-month postoperative mark, a significant improvement in physical function was noted in the laparoscopic group, as substantiated by a *P*-value of 0.005. The rest of the dimensions remained statistically indistinguishable between the groups, as evidenced by *P*-values higher than 0.05.

Three months after surgery, both physical and social functioning showed statistically significant differences in favor of the laparoscopic group, with *P*-values of 0.014 and 0.006, respectively. The remaining categories were statistically similar, with *P*-values ranging from 0.065 to 0.745.

Six months postoperation, only the category of physical role performance showed a significant difference, with a *P*-value of 0.040. No other quality of life domains, including physical and

Table 2
Comparison of postoperative outcomes.

Variables	Laparoscopic repair n = 35	Open repair n = 32	*P*-value
Complications within the 15 days, n, (%)			
Seroma	3 (8.6)	12 (37.5)	0.005
Hematoma	2 (5.7)	1 (3.1)	0.534
Wound infection	1 (2.9)	3 (9.4)	0.430
Chronic pain	0	1 (3.1)	0.478
Recurrence	2 (5.7)	0	0.269
Operation room time (min.)			< 0.001
Mean ± SD	48.37 ± 12	36.56 ± 9.58	
Range	(25-75)	(22-55)	
Cost of materials* used in operation ($)			< 0.001
mean ± SD	477.28 ± 121.78	28.34 ± 7.66	
Range	(320-683)	(20-44)	
Hospital stays (days)			0.150
Mean ± SD	1.05 ± 0.23	1.21 ± 0.60	
Range	(1-2)	(1-2)	
Pain scores, Mean ± SD, range			
Preoperative	4.88 ± 1.15 (3-8)	5 ± 1.07 (3-8)	0.678
Postoperative 6th hour	3.31 ± 0.86 (2-5)	2.43 ± 0.87 (1-4)	< 0.001
Postoperative 12th hour	2.08 ± 0.81 (1-4)	3.84 ± 1.37 (2-7)	< 0.001
Postoperative 10th day	1.25 ± 0.70 (0-4)	2.03 ± 0.96 (1-4)	< 0.001

* Mesh, suture, fixation device.SD, standard deviation.

emotional function as well as general well-being, showed any substantial differences between the 2 surgical methods, as corroborated by insignificant *P*-values.

The 1-year postoperative findings were based on the SF-36 quality of life scale for patients who underwent either laparoscopic or open umbilical hernia repair. Across multiple health dimensions—physical function, emotional role, vitality, mental health, social function, pain, and general health—no statistically significant differences were observed between the 2 groups, as shown by *P*-values ranging from 0.375 to 0.961. However, a notable exception was found in the "physical role" dimension. In this respect, the study found a statistically significant difference, with a *P*-value of 0.040. The mean score for physical role was 88.57 (± 15.27) for the laparoscopic repair group, as compared to 95.53 (± 9.75) for the open repair group (Table 3).

Discussion

Our study represents a contribution to the existing literature, as it is the only known research that comprehensively compares laparoscopic and open umbilical hernia repair using SF-36 forms to assess patient outcomes preoperatively, as well as on the 30th, 90th, and 180th days and at the 1-year mark postoperatively. Our findings underscore the advantages of laparoscopic hernia repair in reducing postoperative pain and the incidence of seroma formation. However, open hernia repair also presents its own set of advantages, such as shorter operating room times and reduced pain at the sixth postoperative hour. This nuanced landscape calls for a more in-depth understanding so that surgical choices can be tailored to individual patient needs and clinical contexts.

It is evident that LUHR leads to fewer complications within the first 15 days postsurgery, most notably in the significantly reduced occurrence of seroma formation. In a study whose findings parallel our own, it was observed that patients who underwent LUHR and had their defects closed with barbed sutures experienced fewer instances of seroma formation. In another study, it was found that LUHR resulted in a higher number of seromas compared to OUHR.[17,18]

Table 3
A 36-item Short Form Health Survey Questionnaire (SF-36) scores of both groups.

SF-36 Timing	Variables	Laparoscopic repair n = 35	Open repair n = 32	*P*-value
Preoperative	Physical function, mean ± SD, range	61.28 ± 11.26 (40-100)	64.37 ± 12.16 (40-100)	0.285
	Physical role, mean ± SD, range	47.85 ± 18.56 (25-75)	53.90 ± 15.02 (25-75)	0157
	Emotional role, mean ± SD, range	66.61 ± 22.89 (33-100)	65.57 ± 27.43 (0-100)	0.867
	Vitality, mean ± SD, range	53.28 ± 12.83 (25-75)	61.71 ± 14.17 (30-85)	0.013
	Mental health, mean ± SD, range	69.48 ± 8.94 (56-88)	71.81 ± 9.31 (56-92)	0.301
	Social function, mean ± SD, range	56.07 ± 14.33 (25-75)	60.93 ± 16.72 (25-87.5)	0.205
	Pain, mean ± SD, range	65.07 ± 13.03 (32.5-100)	65.31 ± 14.25 (32.5-100)	0.943
	General health, mean ± SD, range	59.96 ± 13.72 (40-100)	57.78 ± 15.59 (20-100)	0.548
Postoperative 30th day	Physical function, mean ± SD, range	93 ± 7.49 (80-100)	85.15 ± 13.82 (45-100)	0.005
	Physical role, mean ± SD, range	85 ± 17.36 (50-100)	86.71 ±21.04 (25-100)	0.716
	Emotional role, mean ± SD, range	96.18 ± 13.48 (33.3-100)	89.55 ± 19.78 (33.3-100)	0.111
	Vitality, mean ± SD, range	78.28 ± 8.82 (55-100)	74.68 ± 18.44 (20-100)	0.306
	Mental health, mean ± SD, range	77.02 ± 10.41 (48-100)	73.75 ± 12.23 (48-100)	0.241
	Social function, mean ± SD, range	85 ± 14.15 (50-100)	85.15 ± 19.68 (37.5-100)	0.970
	Pain, mean ± SD, range	85.70 ± 8.36 (67.5-100)	86.40 ± 11.96 (55-100)	0.779
	General health, mean ± SD, range	80.13 ± 7.73 (64.8 -100)	78.12 ± 14.12 (45-100)	0.468
Postoperative 90th day	Physical function, mean ± SD, range	97.71 ± 4.90 (85-100)	89.84 ± 17.80 (40-100)	0.014
	Physical role, mean ± SD, range	88.57 ± 15.27 (50-100)	89.84 ± 16.63 (50-100)	0.745
	Emotional role, mean ± SD, range	100 (100)	96.86 ± 9.89 (66.6-100)	0.065
	Vitality, mean ± SD, range	81.4 ± 7.81 (55-100)	77.96 ± 13.55 (40-100)	0.200
	Mental health, mean ± SD, range	77.02 ± 10.41 (48-100)	76.42 ± 11.43 (48-100)	0.417
	Social function, mean ± SD, range	93.07 ± 6.62 (75-100)	87.5 ± 16.49 (50-100)	0.006
	Pain, mean ± SD, range	93.07 ± 5.14 (87.5-100)	90.70 ± 9.42 (67.5-100)	0.201
	General health, mean ± SD, range	88.41 ±11.05 (64.8-100)	83.11 ±11.36 (60-100)	0.057
Postoperative 180th day	Physical function, mean ± SD, range	98.42 ± 3.79 (85-100)	96.89 ± 5.07 (85-100)	0.172
	Physical role, mean ± SD, range	88.57 ± 15.27 (50-100)	95.53 ± 9.75 (75-100)	0.040
	Emotional role, mean ± SD, range	100 (100)	98.80 ± 6.31 (66.6-100)	0.267
	Vitality, mean ± SD, range	81.57 ± 7.83 (55-100)	81.78 ± 9.15 (65-100)	0.921
	Mental health, mean ± SD, range	78.04 ± 11.41 (48-100)	76.40 ± 11.43 (48-100)	0.829
	Social function, mean ± SD, range	96.07 ± 6.62 (75-100)	93.30 ± 8.66 (75-100)	0.156
	Pain, mean ± SD, range	93.07 ± 5.14 (87.5-100)	94.46 ± 7.14 (77.5-100)	0.372
	General health, mean ± SD, range	88.41 ±11.05 (64.8-100)	86.60 ± 9.35 (64.8-100)	0.491
Postoperative 1 year	Physical function, mean ± SD, range	97.57 ± 4.90 (85-100)	96.89 ± 5.07 (85-100)	0.592
	Physical role, mean ± SD, range	88.57 ± 15.27 (50-100)	95.53 ± 9.75 (75-100)	0.040
	Emotional role, mean ± SD, range	99.04 ± 5.64 (66.6-100)	100 (100)	0.375
	Vitality, mean ± SD, range	81.57 ± 7.83 (55-100)	81.96 ± 9.26 (65-100)	0.856
	Mental health, mean ± SD, range	77.05 ± 11.60 (48-100)	76.82 ± 11.42 (48-100)	0.829
	Social function, mean ± SD, range	96.07 ± 6.62 (75-100)	95.98 ± 7.64 (75-100)	0.961
	Pain, mean ± SD, range	93.07 ± 5.14 (87.5-100)	94.58 ± 7.24 (77.5-100)	0.372
	General health, mean ± SD, range	88.41 ± 11.05 (64.8-100)	86.60 ± 9.35 (64.80-100)	0.491

SD, standard deviation.

In a study that assessed data collected by the American College of Surgeons National Quality Improvement Program, the outcomes of laparoscopic and open surgical approaches to elective umbilical hernia repair were compared. The study, which involved 14,652 patients, revealed that laparoscopic repair was associated with fewer wound-related complications. Regner et al. observed that obese patients who underwent laparoscopic ventral hernia repair experienced fewer surgical site complications than those who underwent open ventral hernia repair.[19,20] In contrast to prior research, we observed a higher incidence of seroma formation in patients who underwent OUHR. We hypothesize that this discrepancy might be related to our practice of using barbed sutures to close the defect, which seems to result in fewer instances of seroma. As for surgical site infections, we found no significant differences between the laparoscopic and open repair groups. This divergence in outcomes compared to the existing literature may be attributed to the relatively small sample size of our study.

We found that laparoscopic repair tends to require a longer duration in the operating room compared to open repair, a result consistent with the existing literature.[20,21] However, these elements need to be weighed carefully when selecting the surgical approach. For instance, patients with multiple existing health conditions may not be suitable candidates for procedures that extend operative times. Moreover, longer surgeries could escalate operational costs, posing a significant drawback, particularly in healthcare systems with limited resources.

The cost of the materials used in the operation was lower in the open repair group, as expected. However, the overall total cost of both groups could not be compared because we did not have this data. Therefore, no conclusion could be drawn about differences between the groups in long-term cost-effectiveness, as in other studies.[22]

We found that patients in the laparoscopic surgery group experienced more pain at the 6-hour postoperative mark. However, at the 12-hour and 10-day marks, those in the open surgery group reported more pain. The existing literature on this topic reports varying outcomes. One study, for example, noted higher pain scores in the laparoscopic group during the first postoperative month.[23] In another study, it was concluded that pain was significantly reduced in patients who underwent laparoscopic surgery compared to those who underwent open surgery.[24] We attribute the elevated pain scores in our study's laparoscopic group during the early postoperative period to the longer duration of the surgery and the inflation of the abdomen with gas. The inconsistency in long-term pain findings across the literature could be linked to the variability in laparoscopic mesh fixation methods (tack versus suture), which depend on the surgeon, as well as a lack of standardization in the type of repair performed. In addition, when we assessed SF-36 scores during the first postoperative month, laparoscopic surgery seemed to offer superior physical and social functioning in the early postoperative period, consistent with the pain parameters we observed. It appears that laparoscopic surgery allows for quicker recovery, enabling patients to return to their daily lives faster, which may lead to lower pain scores in the early period.

In a separate study, quality of life was found to be better in the OUHR group in terms of pain, overall quality of life, and activity limitations at the 6- and 12-month marks.[17] In our study, given that laparoscopic surgery patients scored lower in long-term physical role performance compared to open surgery patients, it seems that a balance between the 2 techniques was achieved. The higher “physical role” scores in the open surgery group in the long run suggest that long-term outcomes should also be considered. In other words, while laparoscopic surgery offers early benefits, such as quick recovery and less pain, the potential long-term advantages of open surgery should not be overlooked.

In 2016, 2 studies compared laparoscopic and open incisional hernia repair, observing that the quality of life was higher in the laparoscopic surgery group.[25,26] Our results point to a higher recurrence rate for incisional hernias compared to umbilical ones, as well as longer surgery durations for open procedures. However, this advantage was not observed in the 1-year follow-up data for LUHR. Thus, we cannot definitively endorse laparoscopic repair as the best choice for treating primary umbilical hernias.

It is crucial to acknowledge the limitations of our study, such as its focus on a single medical center, reliance on a single surgeon's expertise, and limited number of participants. Further studies are needed for a more comprehensive understanding. Moreover, the 1-year follow-up period restricts our ability to accurately gauge recurrence rates, which could have a notable impact on quality of life.

Conclusion

This study provides a detailed analysis of the relative merits of laparoscopic versus open methods of umbilical hernia repair, underscoring the need for a case-by-case surgical strategy.

While laparoscopic techniques seem preferable in facilitating faster postsurgery recovery and reducing early complications, their effectiveness over traditional methods is not universally established, especially in terms of long-term functional outcomes. Further comprehensive research involving multiple centers and larger sample sizes is essential to corroborate these findings and better understand the optimal surgical approach for treating umbilical hernias.

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Availability of data and material

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Code availability

Not applicable.

Ethics approval

This study was performed in line with the principles of the Declaration of Helsinki. This study was approved by the Ethics Committee of Izmir Bakircay University (1150.1130.2023).

Declaration of competing interest

The authors have no relevant financial or nonfinancial interests to disclose.

CRediT authorship contribution statement

Suleyman Caglar Ertekin: Conceptualization, Methodology, Formal analysis, Investigation, Writing – original draft, Writing – review & editing, Funding acquisition, Resources, Supervision. **Muhammer Ergenç:** Conceptualization, Methodology, Formal analysis, Investigation, Writing – original draft, Writing – review & editing, Funding acquisition, Resources, Supervision.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.cpsurg.2024.101527.

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