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BILATERAL TRANSABDOMINAL PREPERITONEAL HERNIA REPAIR IN PATIENTS WITH PRIMARY UNILATERAL INGUINAL HERNIA

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In this article, we used the advantages of laparoscopic surgery to determine the safety and efficacy of prophylactic bilateral transabdominal preperitoneal repair surgery performed on the contralateral side in unilateral inguinal hernias. We performed such operations on 101 patients with primary unilateral inguinal hernias. The patients were divided into two groups: 49 patients underwent unilateral transabdominal preperitoneal repair and 52 patients prophylactic bilateral transabdominal preperitoneal repair. The results were compared in the short and long term (3 years). In bilateral transabdominal preperitoneal repair group, the average operating time was 24 minutes longer, and there were no significant differences in other parameters and postoperative indicators such as postop pain, length of stay, chronic pain, seroma hematoma, and recurrences.

Key words: inguinal hernia, bilateral TAPP, prophylactic repair, chronic pain, recurrence.

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БІЛАТЕРАЛЬНА ТРАНСАБДОМІНАЛЬНА ПРЕПЕРИТОНЕАЛЬНА ГЕРНІОПЛАСТИКА У ПАЦІЄНТІВ ІЗ ПЕРВИННИМИ ОДНОСТОРОННІМИ ПАХОВИМИ ГРИЖАМИ

У цій статті ми використовували переваги лапароскопічної хірургії для визначення безпеки та ефективності профілактичної білатеральної трансабдомінальної преперитонеальної герніопластики, виконаної на протилежному боці при односторонніх пахвинних грижах. Ми виконали операції трансабдомінальної преперитонеальної герніопластики у 101 пацієнта з первинною односторонньою пахвинною грижею. Пацієнти були поділені на дві групи: 49 пацієнтам було виконано односторонню трансабдомінальну преперитонеальну герніопластику, а 52 пацієнтам – профілактичну білатеральну трансабдомінальну преперитонеальну герніопластику. Результати порівнювалися у короткостроковій та довгостроковій перспективі (3 роки). У групі білатеральної трансабдомінальної преперитонеальної герніопластики середня тривалість операції була на 24 хвилини довшою, водночас значущих відмінностей за іншими параметрами та післяопераційними показниками, такими як післяопераційний біль, тривалість перебування в стаціонарі, хронічний біль, серома, гематома і рецидиви, не відзначено.

Ключові слова: пахова грижа, білатеральна ТАПП, профілактична герніопластика, хронічний біль, рецидив.

Inguinal hernias are one of the most common types of abdominal wall hernias, with over 20 million cases of various forms recorded annually in adults worldwide [4]. The treatment for inguinal hernias is exclusively surgical. Surgical procedures can be performed either openly or laparoscopically. Despite the successful execution of inguinal hernia repairs with both methods, the recurrence and formation of hernias on the contralateral side are always a concern. Recent studies indicate that in 5–10 % of patients with unilateral primary inguinal hernias, a hernia develops on the opposite side within 10 years post-operation [3, 6, 11]. However, this risk percentage can vary depending on the patient's age, genetic factors, and lifestyle. In such cases, there may be a need for additional surgical intervention. The advantages of laparoscopic surgery facilitate the repair of bilateral inguinal hernias and previously anteriorly repaired recurrent inguinal hernias [2, 4]. Recent studies also suggest that for patients with unilateral inguinal hernias, especially those in high-risk groups, a bilateral TAPP approach may be appropriate. This ensures the protection of both sides without the need for a second surgery and has a positive impact on long-term outcomes [7]. The purpose of this article is to determine the safety and efficacy of contralateral prophylactic repair during laparoscopic bilateral transabdominal preperitoneal (TAPP) surgery for unilateral inguinal hernias.

The purpose of the study was to determine the effectiveness of bilateral transabdominal preperitoneal repair surgery in unilateral inguinal hernias.

Materials and methods. At the Main Clinical Hospital of the Ministry of Defense of Azerbaijan from January 2021 to January 2024, 101 military personnel who presented with unilateral inguinal hernia were divided into two groups based on their level of physical activity and family history. 49 patients underwent unilateral TAPP hernioplasty, while the other group 52 patients received prophylactic bilateral TAPP hernioplasty. Postoperative indicators and outcomes were evaluated during the postoperative period.

Based on the classification of inguinal hernias by the European Hernia Society, an electronic database was created, noting the type and character of the hernia, intraoperative and postoperative complications, chronic pain, and recurrence rates.

All patients were diagnosed with a unilateral inguinal hernia through preoperative physical examination and underwent planned laparoscopic surgery. The diagnosis was confirmed during laparoscopy (direct or indirect hernia, femoral hernia).

No prophylactic antibiotics were used for any of the patients. Antibiotics were prescribed after the surgery. The severity and intensity of pain in the postoperative period were assessed using the visual-analog scale. Pain was recorded on the first and seventh days after surgery. Chronic pain assessments were conducted during the postoperative 1st, 3rd, 6th, and 12th months. All patients were informed about the procedure to be performed, and signed consent forms were obtained.

For statistical processing of the obtained results, SPSS software for Windows (version 12.0, SPSS Inc., Chicago, IL, USA) was used. Indicators were expressed as numbers and percentages. To compare values between groups, the chi-square test ($\chi 2$) was calculated.

All surgical procedures were performed under general anesthesia in a 30-degree Trendelenburg position. To access the abdomen, an open technique (Hasson's technique) was used, and 10 mm trocars were inserted below the umbilicus into the abdominal cavity. A pneumoperitoneum was created with a pressure of 12 mmHg. Two 5 mm working trocars were inserted into the abdominal cavity at the level of the umbilicus, along the lateral edge of both rectus abdominis muscles, with the assistance of a videoscope (fig. 1A, B).

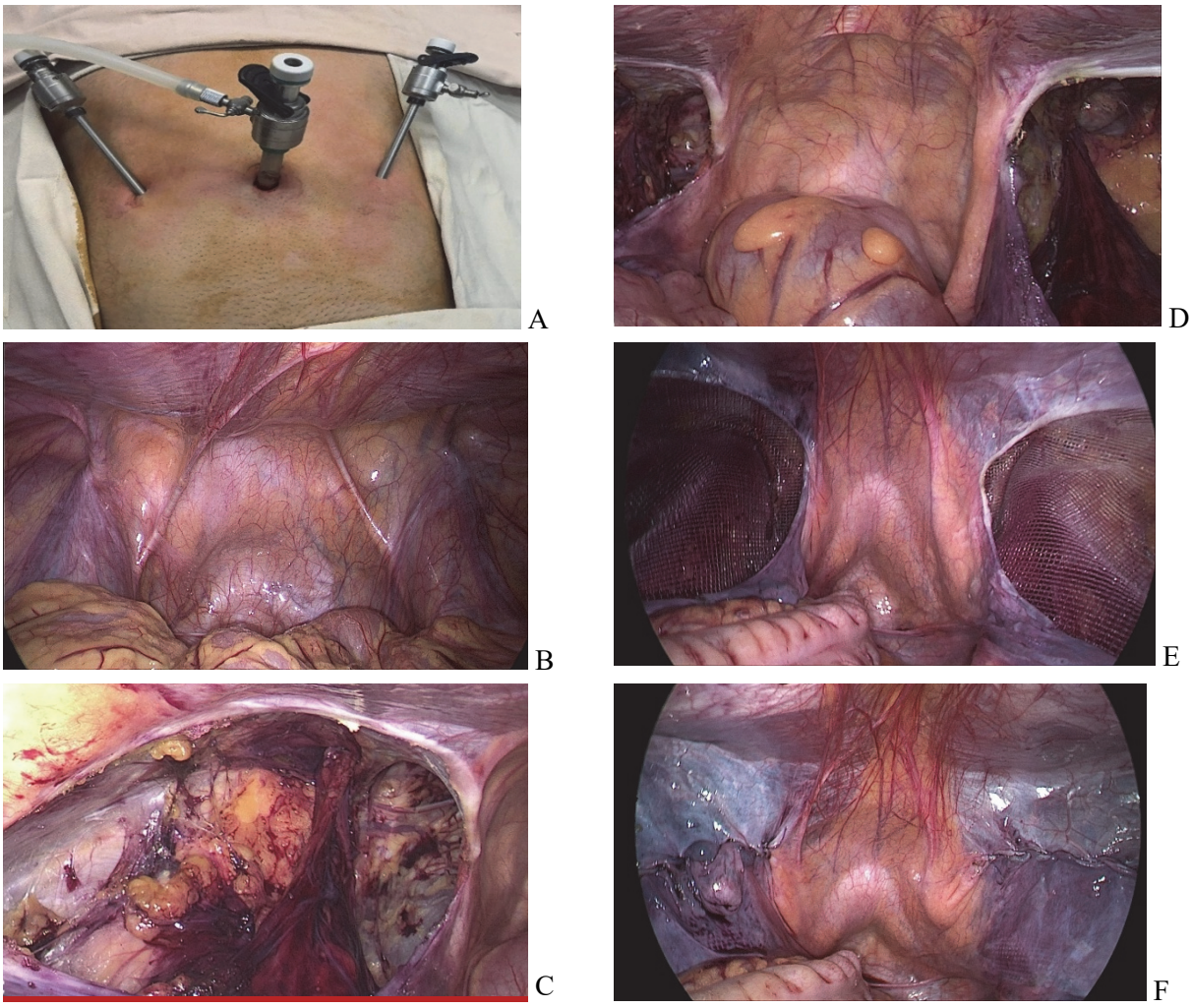

Fig. 1. Stages of bilateral TAPP procedure. A – placement of trocars B –appearance abdominal wall after pneumoperitoneum. C – dissection of the myopectineal orifice and Cooper's ligament. D – bilateral dissection of the inguinal regions. E – placement of the meshes. F – the closure of the peritoneum was performed using continuous sutures.

After determining the location (right or left), type (straight, left or femoral) and size (EHS I, II, III) of the hernia using a videoscope, the peritoneum is fully opened above the defect from the SIAS along the inguinal ligament to the pubis with an electric scalpel. The procedure continues with the full dissection and release of the medial Retzius, lateral Bogros' space, cord structures, and the hernia sac. The dissection is extended up to the pubic symphysis without exception (fig 1C). Once the myopectineal orifice, Cooper's ligament, and cord elements are fully visualized, the dissection procedure proceeds on the contralateral side (fig.1D).

After both sides are completely freed from the peritoneum, two lightweight polypropylene meshes, measuring 10x15 cm, are inserted into the abdominal cavity through 10 mm trocars and placed appropriately in both inguinal regions (fig.1E). Then, the peritoneal layers of both inguinal areas are sutured with continuous stitches to close the peritoneal defect (fig.1F).

Results of the study and their discussion. 101 admitted for inpatient treatment with unilateral inguinal hernias were divided into two groups based on their level of physical exertion and genetic anamnesis. In the first group, all patients underwent unilateral TAPP repair, while in the second group, all patients underwent bilateral TAPP repairPostoperative outcomes were compared between these two groups (Fig. 2).

The average age of the patients was 34 (18–76) years in the first group and 33.5 (18–70) years in the second group. The size of the hernias was 86 % M II and MI (hernia size <3 sm) in the first group and 84 % M II and M I (hernia size < 3sm) in the second group. In the first group, the mesh was fixed with absorbable staples in 23 patients, while in the second group, it was fixed in 9 patients. In the other patients, the mesh was not fixed.

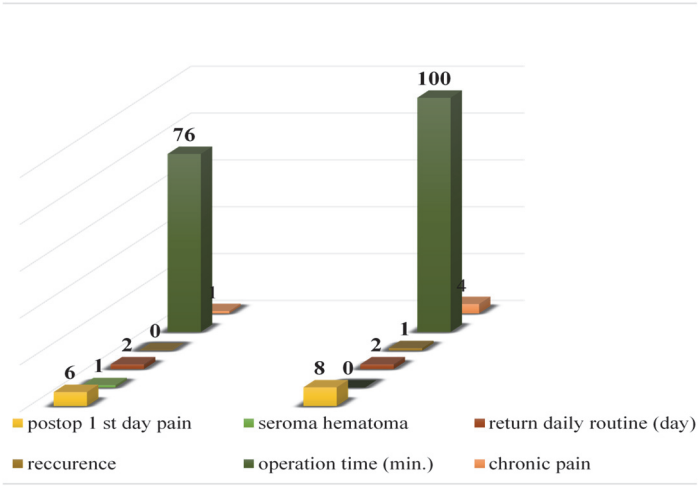

Fig. 2. Graphical representation of comparison groups.

The pain intensity, assessed using the visual analog scale (VAS; E.C. Huskisson, 1974), was 1.02 points (range 0 to 4 points) in the first group and 1.23 points (range 0 to 3 points) in the second group.

There was no significant intraoperative complication in either group. After the surgery, one patient in the first group developed a seroma, which did not required evacuation.

In the first group, one patient experienced chronic pain within two months after surgery, rated at 2 points. In the second group, chronic pain was observed in four patients overall. Three of these patients had pain rated at 2 to 3 points, ccurring within the first three months after surgery. One patient experienced pain lasting up to six months. Pregabalin treatment was recommended for these patients.

In both groups, approximately 80 % of the patients completed the 12-month follow-up, while the remaining 20 % discontinued follow-up after 3 months.

In the second group, one patient experienced a recurrence after 6 months and was scheduled for surgery again. The average duration of surgery was 76.5 minutes (55–140) in the first group and 100.2 (60–190) minutes in the second group. The duration of surgery was 24 minutes longer in the second group (Table 1).

Table 1

Comparison of intraoperative and postoperative indicators between the two groups

Indicators investigated	Unilateral TAPP	Bilateral TAPP
Number of patients	49	52
Average age of patients	34	33
Postop 1st day pain	6	8
Average operation time (minute)	76	100
Time to return to daily routine (day)	2	2
Cases of early recurrence of inguinal hernia	-	1
Seroma and hematoma	1	-
Chronic pain	1	4

As presented in the table, postoperative pain on day 1 was observed in 15.4 % of patients with bilateral TAPP and in 12.2 % of patients with unilateral TAPP, chronic pain in 7.7 % and 2.0 % of patients, respectively. There were no statistically significant differences between the groups regarding the presence of postoperative pain on day 1 ($\chi2=0.208$, $p=0.649$) and chronic pain ($\chi2=1.712$, $p=0.191$).

An inguinal hernia is a pathological condition where internal abdominal organs or the anterior abdominal wall protrude through weak spots in the inguinal region. Military personnel, especially when standing for long periods, bending, lifting heavy objects, or climbing to height, may experience a painful bulge in the inguinal area, which can lead to restricted movement. Although not a serious disease, the hernia

does not resolve on its own and can cause life-threatening complications, such as incarceration and strangulation [1].

Inguinal hernia repair is the most commonly performed surgery worldwide. Approximately 20 million inguinal hernia repair surgeries are performed each year, with 96 % of these surgeries being for inguinal hernias and 4 % for femoral hernias [4].

With the development of minimally invasive techniques, laparoscopic transabdominal preperitoneal (TAPP) and totally extraperitoneal (TEP) surgical methods have emerged in inguinal hernia surgery [4, 8, 10]. These methods involve small incisions to access the abdominal cavity and the peritoneal space, allowing intervention in the inguinal region and placement of a mesh to repair the defect. During the surgery, after accessing the abdominal cavity, a cut is made on the peritoneum, the mesh is placed in the hernia area, and then the peritoneal layers are sutured. After these surgeries, the rehabilitation period for patients is shortened, and the time to return to active duty is faster. These operations are more effective, with quicker recovery times after surgery, and are preferred over the Lichtenstein method for their advantages. Another benefit of the TAPP operation is that it allows detecting the fact that in the case of one-sided inguinal hernias, there is an asymptomatic hernia on the other side. This is observed in 10–25 % of cases [5]. İf asymptomatic hernias are not intervened, there is a high probability that most of these hernias will turn into symptomatic hernias in the future. TAPP advantage allows for bilateral intervention when treating unilateral inguinal hernias [4, 6].

Studies show that, after a certain period following the repair of unilateral inguinal hernias, patients' physical strain levels, influenced by genetic predisposition, can lead to the development of a hernia on the contralateral side. A study conducted at Leuven University Hospital between 1995 and 1999 found that in patients who underwent surgery for a unilateral inguinal hernia, the incidence of contralateral inguinal hernias over the next twenty-five years was 29 %. The study included 758 patients, and the frequency of contralateral hernias was found to be 5.9 % after five years, 16.7 % after fifteen years, and 29 % after twenty-five years [2]. In the state of New York, between 2002 and 2003, primary inguinal hernia repairs were performed on 32,384 patients, who were then followed for 10 years to evaluate the outcomes of contralateral hernia repair. The patients were identified using ICD-9 and CPT codes. During the follow-up period, 3,364 patients who had undergone bilateral hernia repair were also evaluated. After excluding patients with incomplete follow-up data, the rate of contralateral hernia repair was found to be 10.8 % [11].

A similar study was conducted in Taiwan using the National Health Insurance Database, covering 170,492 patients over a period of 87 months. The overall contralateral hernia rate was 10.5 %, with an average time to subsequent surgery of 48 months. The recurrence rates at 1, 2, 3 and 5 years were 2.65 %, 3 %, 4.1 % and 6.7 %, respectively [6].

Another study in Taiwan by Shihi I Tseng et al., conducted between 2003 and 2008 on 64,089 male patients who underwent unilateral inguinal hernia repair and the same number of unoperated patients for 93.53 months, showed that in the group with prior unilateral inguinal hernia repair, the occurrence of contralateral hernia the percentage of arrival is significantly higher [9].

Modern studies show that for patients in high-risk groups (such as those engaged in heavy physical labor or those with genetic predisposition) a bilateral TAPP approach may be appropriate. This approach ensures protection on both sides without the need for a second surgery, positively influencing long-term outcomes. However, the decision to perform a bilateral approach is made based on the patient's individual condition, risk factors, and the surgeon's experience.

Conclusion

In our experience, during the surgical treatment of primary inguinal hernias using the laparoscopic TAPP approach, there was no significant difference in intraoperative outcomes when comparing bilateral TAPP procedures performed on the contralateral side to unilateral TAPP procedures. The duration of surgery was, on average, 24 minutes longer during prophylactic bilateral TAPP procedures. In the postoperative period, over a one-year follow-up, there were no significant differences in surgical outcomes concerning first-day postoperative pain, length of hospital stay, chronic pain, seroma, hematoma and recurrence. Therefore, the decision to perform prophylactic repair of primary unilateral inguinal hernias using the TAPP approach should be made considering the patient's individual condition, risk factors, and the surgeon's experience.

References

1. Ambar M, Susan H, Alex BB, Anirudh D, Chet I W, Gina A, Hien TN. Emergency department utilization and predictors of mortality for inpatient inguinal hernia repairs. J Surg Res. 2017 May 15;212:270-277. doi: 10.1016/j.jss.2016.12.012.
2. Barragán F, Díaz PM, Cingolani PA, Iudica FM. Outcomes of laparoscopic transabdominal (TAPP) inguinal hernia repair with single mesh in bilateral direct inguinal hernias. Revista Argentina De Ciruga, 2022. 114(1), 12–19. https://doi.org/10.25132/raac.v114.n1.1637.

3. Glorieux R, Van Aerde M, Vissers S, Fieuws S, De Groof P, Miserez M. Incidence and risk factors of metachronous contralateral inguinal hernia development up to 25 years after unilateral inguinal hernia repair: a single-centre retrospective cohort study. Surg Endosc. 2024 Mar;38(3):1170-1179. doi: 10.1007/s00464-023-10606-9.
4. International Guidelines for groin hernia management. The Hernia Surge Group Hernia 2018;22(1):1-165. https://doi. org/10.1007/s10029-017-1668-x.
5. Jacob DA, Hackl JA, Bittner R, Kraft B, Köckerling F. Perioperative outcome of unilateral versus bilateral inguinal hernia repairs in TAPP technique: analysis of 15,176 cases from the Herniamed Registry. Surg Endosc. 2015 Dec;29(12):3733-40. doi: 10.1007/s00464-015-4146-5.
6. Lee CH, Chiu YT, Cheng CF, Wu JC, Yin WY, Chen JH. Risk factors for contralateral inguinal hernia repair after unilateral inguinal hernia repair in male adult patients: analysis from a nationwide population based cohort study. BMC Surg. 2017 Nov 21;17(1):106. doi: 10.1186/s12893-017-0302-2.
7. Lin HY, Chen CY, Chen JH. Predictive model for contralateral inguinal hernia repair within three years of primary repair: a nationwide population-based cohort study. Surg Endosc. 2024 Nov;38(11):6605-6613. doi: 10.1007/s00464-024-11233-8.
8. National Institute for Health and Care Excellence NICE technology appraisal guidance no.83: laparoscopic surgery for inguinal hernia repair. https://www.nice.org.uk/guidance/ta 83. Accessed 22 May 2023.
9. Tseng SI, Li CC, Lee HY, Chen JH. Previous unilateral inguinal hernia repair increase risk of new developed inguinal hernia: a nationwide Longitudinal Cohort Study in Asian male adult patients. Surg Endosc. 2022 Jan;36(1):346-351. doi: 10.1007/s00464-021-08287-3.
10. Waite KE, Herman MA, Doyle PJ. Comparison of robotic versus laparoscopic transabdominal preperitoneal (TAPP) inguinal hernia repair. J Robot Surg. 2016 Sep;10(3):239-44. doi: 10.1007/s11701-016-0580-1.
11. Zheng R, Altieri MS, Yang J, Chen H, Pryor AD, Bates A, Talamini MA, Telem DA. Long-term incidence of contralateral primary hernia repair following unilateral inguinal hernia repair in a cohort of 32,834 patients. Surg Endosc. 2017 Feb;31(2):817-822. doi: 10.1007/s00464-016-5037-0.

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EFFICACY OF THORACOSCOPIC SURGERY AND CONVENTIONAL OPEN SURGERY FOR CONGENITAL DIAPHRAGMATIC HERNIA IN NEONATES

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With the purpose of the study was a comparative analysis of the effectiveness of traditional laparotomy and video-assisted thoracoscopic surgery in the treatment of congenital diaphragmatic hernia in newborns 70 newborns (1st group – 44 newborns, operated on using the traditional open method; the 2nd group – 26 newborns, operated on using endosurgery) were observed. According to results, the Apgar score at the 1st minute in the 2nd group was 5.42±0.22 points, and in the 1st group – 5.66±0.17 points ($p=0.3943$). Similar distinctive features in the data were observed in the groups at the 5th minute after birth: 8.35±0.14 and 8.64±0.11 points, respectively ($p=0.1118$). The quality of life of children after surgical treatment of diaphragmatic hernia, both by the total score and by all scales, was significantly higher than before the treatment of the pathology ($p<0.05$), with the exception of the data of the parental form of the Ability to remain alone (ARA) scale ($p>0.05$).

Key words: children, congenital diaphragmatic hernia, open access, thoracoscopy, quality of life.

Ф.Р. Гусейнов

ЕФЕКТИВНІСТЬ ТОРАКОСКОПІЧНОЇ І ТРАДИЦІЙНОЇ ВІДКРИТОЇ ХІРУРГІЇ У ЛІКУВАННІ ВРОДЖЕНОЇ ДИФРАГМАЛЬНОЇ ГРИЖІ У ДІТЕЙ РАННЬОГО ГРУДНОГО ВІКУ

З метою дослідження було проведено порівняльний аналіз ефективності традиційної лапаротомії та відеоторакоскопічної хірургії під час лікування вродженої діафрагмальної грижі у новонароджених. Під наглядом перебувало 70 новонароджених (1-ша група – 44 новонароджених, прооперованих традиційним відкритим способом; 2-га група – 26 новонароджених, прооперованих ендохірургічним способом). Згідно з результатами, оцінка за шкалою Апгар на 1-й хвилині у 2-й групі становила 5,42±0,22 бала, а в 1-й групі – 5,66±0,17 бала ($p=0,3943$). Аналогічні відмінні риси в даних спостерігалися в групах на 5-й хвилині після народження: 8,35±0,14 і 8,64±0,11 бала відповідно ($p=0,1118$). Якість життя дітей після хірургічного лікування діафрагмальної грижі, як за загальним балом, так і за всіма шкалами, була достовірно вищою, ніж до лікування патології ($p<0,05$), за винятком даних батьківської форми шкали «Можливість залишатися на самоті» ($p>0,05$).

Ключові слова: діти, вроджена діафрагмальна грижа, відкритий доступ, торакоскопія, якість життя.

Unfortunately, in recent years there has been an increase in one of the severe forms of congenital malformations in children, which is congenital diaphragmatic hernia [5]. Most pediatric surgeons testify to the high relevance and great medical and social significance of this developmental defect in modern medicine [13]. At present, due to the high digital values characterizing the number of cases of postoperative