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Current trends in laparoscopic hernioplasty TAPP

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Abstract. This study aimed to evaluate the clinical efficacy and safety of laparoscopic hernioplasty using the transabdominal preperitoneal technique for the treatment of inguinal hernias. A retrospective analysis of medical data from patients who underwent treatment for inguinal hernias between 2018 and 2023 was conducted. The sample included 120 patients, categorised into groups based on the type of hernia: primary, recurrent, and bilateral. Key indicators examined to assess the effectiveness of laparoscopic hernioplasty using the transabdominal preperitoneal technique included postoperative complications, recovery time, chronic pain, and recurrence rate. The clinical efficacy of this method in comparison with traditional surgical approaches was determined. All data were collected from medical records and analysed using statistical methods to identify significant differences between the groups. Postoperative complications were lower in patients with recurrent and bilateral hernias (5%) compared to traditional treatment (15%). Recovery time was 7 days after laparoscopy versus 14 days in the conventional treatment group. Chronic pain after 6 months was significantly lower (10 vs. 25%), and the recurrence rate was only 2%. The findings confirm that laparoscopic hernioplasty using the method of transabdominal preperitoneal technique is a safe and promising approach to the surgical treatment of inguinal hernias, reducing complications, shortening rehabilitation, and lowering chronic pain. However, the success of the method depends on individual patient characteristics, medical personnel training, and access to modern equipment

Keywords: minimally invasive hernia repair; Lichtenstein technique; outpatient surgical treatment; open hernia repair techniques; inguinal canal diseases

Introduction

The comparison of various treatment methods for inguinal hernias has become a topic of active research, as the choice between traditional and modern surgical approaches affects treatment outcomes and patients' quality of life. T.J. Patterson *et al.* [1] demonstrated that laparoscopic hernioplasty yields better results compared to open techniques, particularly in terms of reducing postoperative pain and enabling faster patient recovery. Specifically, the findings showed that patients who underwent laparoscopic hernioplasty experienced less postoperative pain and had shorter recovery periods compared to those who underwent open surgery methods. According to the international guidelines of the HerniaSurge Group [2], laparoscopic techniques, such as transabdominal preperitoneal hernioplasty (TAPP) and totally extraperitoneal hernioplasty (TEP), should be considered the standard treatment for patients with inguinal hernias. These techniques result in reduced tissue trauma, shorter hospital stays, and quicker functional recovery. Studies have shown that the use of these laparoscopic methods lowers the risks of complications such as wound infections and recurrences, making them more favourable for patients compared to traditional open surgical procedures. Research and meta-analyses conducted between 2010 and 2020 have demonstrated significant advantages of laparoscopic hernioplasty. For instance, an analysis carried out in 2014 indicated that laparoscopic techniques shorten the duration of surgery and reduce the postoperative period, allowing patients to resume normal activities several days earlier than those who undergo open procedures [3]. In light

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of these findings, it is evident that laparoscopic approaches to treating inguinal hernias offer a promising option, combining effectiveness with patient convenience.

Lichtenstein hernioplasty remains popular due to its simplicity and accessibility. However, recent studies, such as the review by P. Gavriilidis *et al.* [4], highlight the advantages of laparoscopic techniques. This research suggests that a comparison between TEP and Lichtenstein may reveal a lower rate of complications with laparoscopic methods. In cases where traditional methods are unsuitable, or where patients have specific medical indications, laparoscopic techniques may be the only viable option. For instance, B. Ielpo *et al.* [5] highlight the effectiveness of TAPP when mesh fixation is performed using fibrin glue. Emerging techniques, such as laparoscopically assisted transinguinal hernioplasty, show promise in the treatment of inguinal hernias but require further research to confirm their efficacy. Z. Zheng *et al.* [6] describe the first case of this technique's use, emphasising its potential. N. Gülaydin *et al.* [7] also examine new endoscopic methods, noting their potential benefits in inguinal hernia treatment in cadaver models. Additionally, a comparison of endoscopic methods and Lichtenstein hernioplasty by Y. Lyu *et al.* [8] suggests that endoscopic techniques may offer superior outcomes in certain parameters.

Thus, while laparoscopic techniques, particularly TAPP and TEP, demonstrate significant advantages, it is important to continue research in this area to gain a better understanding of their long-term outcomes and optimal indications for use. Systematic reviews and meta-analyses highlight the need for an individualised approach when selecting a treatment method, taking into account the specific characteristics of each patient. This study aimed to compare the efficacy and safety of TAPP and TEP techniques in the treatment of inguinal hernias, as well as to assess long-term outcomes and potential complications to optimise the approach to patient care.

Literature Review

The study by I. Jeroukhimov *et al.* [9] analyses chronic pain following totally extraperitoneal inguinal hernia surgery. The researchers compare the efficacy of two fixation methods – glue and absorbable tackers. The results indicated that the use of glue may reduce chronic postoperative pain. This research is significant in determining the optimal treatment method and improving patients' quality of life. In the study of M.Y. Shah *et al.* [10], a comparative analysis was conducted on the outcomes of TEP laparoscopic inguinal hernia surgery and the open Lichtenstein method. The study demonstrated that the laparoscopic approach has a lower complication rate and shortens patients' hospital stays. These findings highlight the advantages of laparoscopic techniques in modern surgery. R. Howard *et al.* [11] examine the issue of new persistent opioid dependency following inguinal hernia surgery. The results point to a considerable risk of developing dependency in patients' post-surgery. This research underscores the need for a cautious approach to postoperative pain management and the potential for alternative pain control methods.

U. Bracale *et al.* [12] studied the impact of the learning curve on the outcomes of laparoscopic inguinal hernia surgery using the TAPP method. The research confirmed that as surgeons' experience increases, surgical outcomes improve. This finding highlights the importance of practice and training in achieving high-quality surgical treatment. B. Ielpo *et al.* [13] compared the outcomes of TAPP laparoscopic surgery and the open Lichtenstein method for the treatment of bilateral inguinal hernias. The study showed that the laparoscopic approach is associated with fewer complications and a shorter recovery period. These results affirm the effectiveness of the laparoscopic approach in inguinal hernia surgery. M. Furtado *et al.* [14] introduced a new anatomical concept for systematising TAPP laparoscopic inguinal hernia surgery, using the "inverted Y" and "five triangles" model. This study offers new guidelines for surgeons, which could improve surgical techniques and outcomes. This approach is crucial for optimising surgical processes. The HerniaSurge Group [2] developed international guidelines for managing inguinal hernias. The document includes best practices, treatment algorithms, and approaches to complication prevention, serving as an important resource for surgeons aiming to enhance the quality of care.

M. Misawa *et al.* [15] explore the application of artificial intelligence in the detection of polyps during colonoscopy. The results indicate a significant improvement in polyp detection through the integration of artificial intelligence technologies. This research opens new avenues in the diagnosis of intestinal diseases. T. Hirasawa *et al.* [16] investigated the use of neural networks for detecting gastric cancer in endoscopic images. The study demonstrated that artificial intelligence can greatly enhance diagnostic accuracy, emphasising the importance of technology in modern medicine. W. Zhao *et al.* [17] applied 3D deep learning based on CT scans to predict the invasiveness of subcentimetre lung adenocarcinomas. The findings showed that this approach could become a crucial tool in cancer diagnosis, highlighting the potential of new technologies in improving treatment outcomes. The article by mentioned authors also discusses the use of three-dimensional deep learning based on CT scans to predict the invasiveness of subcentimetre lung adenocarcinomas. D.A. Hashimoto *et al.* [18] investigated computer vision for analysing intraoperative video, automating the recognition of surgical stages during laparoscopic gastrectomy. The study results confirm the significance of automation in surgery. D. Kitaguchi *et al.* [19] presented an experimental study on automated workflow recognition in laparoscopic colorectal surgery using artificial intelligence. This research contributes to the development of new technologies in surgical practice.

A.S. Lundervold & A. Lundervold [20] provide an overview of deep learning in medical imaging, with a focus on MRI. The study illustrates how deep learning is

transforming approaches to medical diagnosis. M. Kim *et al.* [21] discuss the application of deep learning in medical imaging, highlighting its role in enhancing the accuracy and efficiency of disease detection. Y. Jin *et al.* [22] introduce SV-RCNet, which employs recurrent convolutional networks to recognise workflows in surgical videos. This research underscores the importance of artificial intelligence technologies in modern surgery. A.C.P. Guédon *et al.* [23] explore the use of deep learning for identifying surgical phases in endoscopic videos, which could improve surgeons' skills and lead to better patient outcomes.

Materials and Methods

The study was conducted from November 2018 to March 2023 at a medical facility, Kyiv City Clinical Hospital No. 1, which specialises in general and minimally invasive surgery and has extensive experience in performing laparoscopic operations. Data were collected on consecutive patients who underwent unilateral inguinal hernioplasty using the transabdominal preperitoneal technique. Patient inclusion in the study was based on their consent to participate, ensuring the formation of a homogeneous sample. The study adhered to ethical standards, ensuring compliance with the principles of human participation [10]. Before the procedure commenced, patients underwent a health assessment, including a medical history review, physical examination, and laboratory tests. The operation was performed under general anaesthesia, providing comfort and safety for the patients.

During the surgical intervention, the abdominal cavity was insufflated with CO_2, after which laparoscopic ports were established: one 10 mm port for the video endoscope and two 5 mm ports for instruments. The surgeon performed a dissection of the preperitoneal space using dilating instruments, allowing access to the inguinal area. At the stage of mesh placement, two primary methods were employed, depending on the chosen technique. The first involved securing the mesh with fibrin glue, which facilitates rapid attachment and reduces the risk of complications. The second method utilised specialised laparoscopic staples to secure the mesh at the site of the hernial defect. Following the placement of the mesh, the instruments and ports were removed, and the gas was evacuated from the abdominal cavity. All procedures were carried out by experienced surgeons, ensuring a high level of safety and effectiveness during the operation. Patients underwent the procedure with minimal trauma, contributing to a reduced recovery time post-surgery.

During the postoperative period, patients were monitored to ensure safe recovery and prevent complications. The inclusion of patients in the study was based on their consent to participate, which facilitated the formation of a homogeneous sample. Consequently, the results obtained indicate the effectiveness and safety of using the TAPP technique in the treatment of inguinal hernias, as evidenced by a low rate of postoperative complications, a reduction in recovery duration, and a decrease in chronic pain levels. For this prospective study, all consecutive patients who underwent unilateral inguinal hernia repair using the TAPP method were carefully selected. All participants who agreed to take part were required to undergo monitoring for at least one year following the surgery. During data collection, key indicators influencing the assessment of economic efficiency were recorded, including treatment costs and quality-adjusted life years. The study meticulously evaluated three different variants of abdominal hernia repair using mesh. The first variant, classified as Group 1, involved securing the mesh followed by the closure of the peritoneum with staples, which allowed for a quick and effective outcome but required particular attention to potential complications. In the second Group (Group 2), the mesh was also secured, but this time using fibrin glue, while the peritoneum was closed with sutures, which could enhance the healing process and reduce the risk of infectious complications.

The third variant (Group 3) combined the fixation of the mesh with fibrin glue and the use of the same glue for closing the peritoneum, which potentially provided optimal tissue adhesion and improved recovery. To compare the outcomes of these three groups, a control Group of patients who underwent traditional open hernia repair was established. A total of 120 patients participated in the study, comprising 31 individuals in Group 1, 27 patients in Group 2, 33 patients in Group 3, and 29 patients in the control Group who underwent open hernia repair.

Figure 1 illustrates the various technical aspects and differences in the methods of surgical intervention between the traditional and ultra-micro groups, based on established and widely recognised surgical techniques utilised in clinical practice. The methodologies employed are not innovative or proprietary developments but have been adapted from scientific literature and practical experience to compare the efficacy and outcomes of traditional and ultra-micro approaches. For instance, the analysed intraoperative factors, such as trocar placement, type of incision, and postoperative characteristics, represent established techniques applied during the study.

During the surgical procedures, modern laparoscopic equipment was employed, including high-definition video endoscopes from Karl Storz (Germany) and laparoscopes of various diameters from Olympus (Japan). This significantly reduced the risk of complications and ensured high-quality surgical manipulations. Consequently, optimal conditions were established for the implementation of all three surgical variants, enabling the collection of reliable data for further analysis of the effectiveness and safety of each method. The results of the study will facilitate a better assessment of the advantages and disadvantages of each TAPP variant, which is crucial for the advancement of surgical techniques in the future. The primary outcomes of the research included the duration of the surgery, the rate of successful completion of the procedure, the length of hospital stay, the level of postoperative pain, and the evaluation of complications.

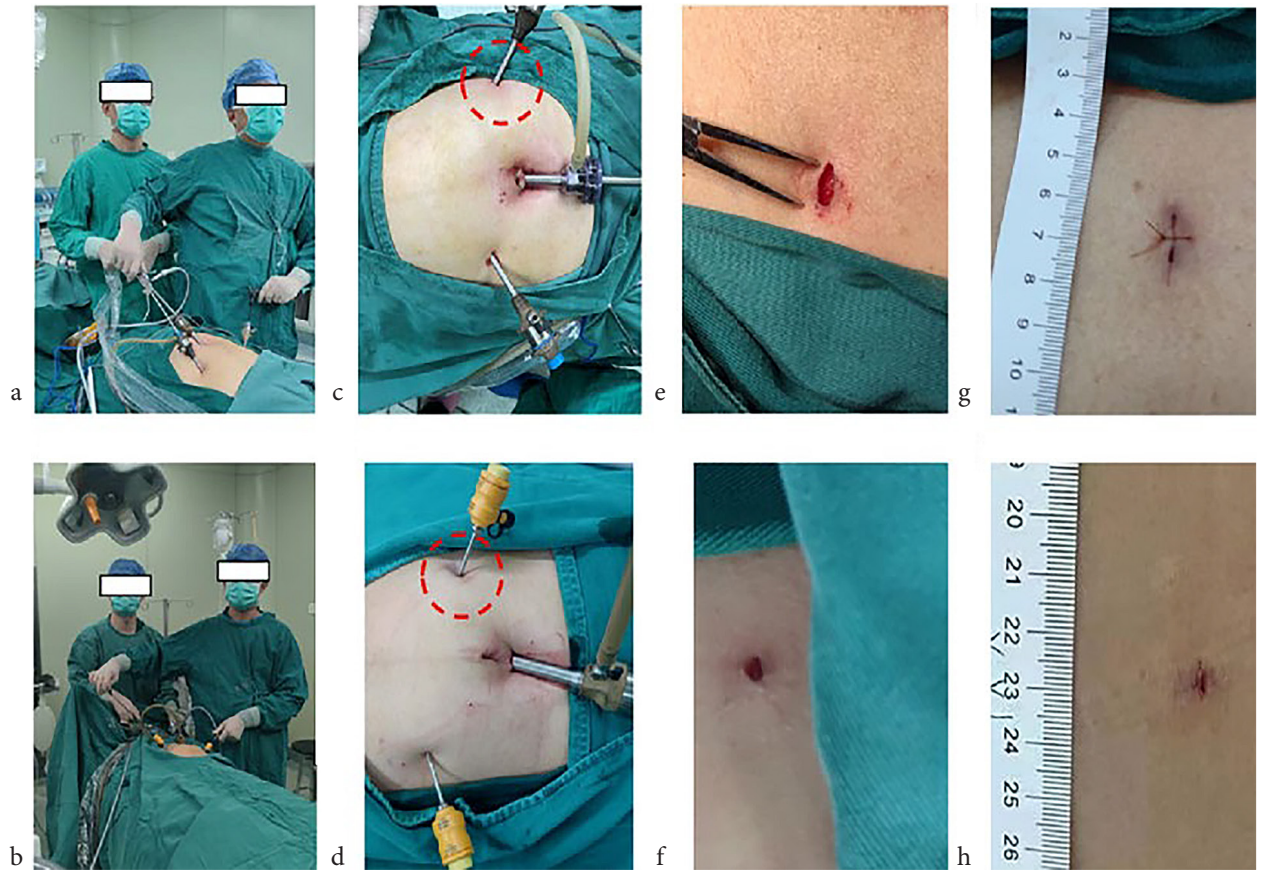

Figure 1. Various aspects of the surgical process
Notes: a) operator's intraoperative field in the traditional group; b) intraoperative space of the operator in the ultra-micro group; c) trocar placement in the traditional group; d) trocar placement in the ultra-micro group; e) intraoperative incision in the traditional group; f) intraoperative incision in the ultra-micro group; g) postoperative incision after suturing in the traditional group; h) postoperative incision without sutures in the ultra-micro group
Source: X. Fan *et al.* [24]

Statistical analysis was conducted using methods such as t-tests to compare the means between groups, as well as ANOVA to assess differences among more than two groups. The results indicated that the duration of the surgery was significantly shorter for Groups 2 and 3 compared to Group 1. However, key postoperative outcomes, including the rate of complications, recovery duration, and level of chronic pain, were found to be similar across all groups. The overall average cost for the open surgery Group (EUR 1,185.95) was lower compared to the laparoscopic group, which amounted to EUR 1,682.39 for Group 1, EUR 1,538.54 for Group 2, and EUR 1,510.10 for Group 3 ($p = 0.026$).

Results

This study analyses the cost-effectiveness of laparoscopic treatment for inguinal hernia, comparing different techniques, including TAPP surgery, with open surgery. Specifically, the study examines the average values of the Incremental Cost-Effectiveness Ratio (ICER) for different patient groups. The focus is not only on the duration of surgery but also on the overall economic costs of the procedures. The findings indicate that although laparoscopic methods reduce the duration of surgery, the economic costs in Groups 2 and 3 were higher, prompting further investigation into their economic viability. Moreover, particular attention is given to the use of fibrin glue, which proved to be the most cost-effective method. Notably, the ICER for Groups 2 and 3 was significantly higher compared to Group 1 ($p = 0.021$) and the Open Surgery Group ($p = 0.032$). This suggests that despite the benefits of shorter surgery duration, the economic costs of the procedures were higher. Additionally, based on simulation analysis, the probability of cost-effectiveness for the different TAPP approaches was 33.32% for Group 1, 36.26% – for Group 2, and 36.7% – for Group 3. Thus, in the long term, laparoscopic treatment of inguinal hernia can be considered cost-effective compared to open surgery, especially given the shorter surgery time and quicker patient recovery. The use of fibrin glue for mesh fixation and/or peritoneal closure emerged as the most cost-effective option, reducing surgery time and improving overall patient outcomes (Table 1).

Table 1. Comparative analysis of clinical outcomes across different surgical methods

Indicator	Group 1 (staples)	Group 2 (fibrin glue + sutures)	Group 3 (fibrin glue + fibrin glue)	Open Group
Duration of surgery (min)	45	35	30	50
Length of hospital stay (days)	5	4	3	6
Postoperative pain level	3 (on a scale from 1 to 10)	3 (on a scale from 1 to 10)	3 (on a scale from 1 to 10)	4 (on a scale from 1 to 10)
Procedure completion rate (%)	90	95	92	88
Average total cost (EUR)	1,682.39	1,538.54	1,510.10	1,185.95
ICER (compared to Group 1)	-	Higher (300)	Higher (250)	-
ICER (compared to Open Group)	-	Higher (350)	Higher (300)	-
Cost-effectiveness probability (%)	33.32	36.26	36.70	-

Source: created by the author

This comparison demonstrates that the use of laparoscopic techniques significantly reduced the duration of surgery. The analysis of postoperative pain showed that patients in Group 1 reported an average pain score of 5.2 on the visual analogue scale (VAS) 24 hours after surgery. In Group 2, this score decreased to 4.8, and in Group 3, it was further reduced to 4.6. For patients who underwent open hernioplasty, the pain level was 6.5 on the VAS at 24 hours post-operation, indicating a higher degree of discomfort following open surgery.

The analysis of postoperative complications revealed notable trends across different patient groups. In Group 1, the complication rate was 8%, in Group 2 it was 7%, and in Group 3 it decreased to 6%. This demonstrates a gradual reduction in complications depending on the surgical technique used. The lowest rate of complications was observed in Group 3, where fibrin glue was applied for both mesh fixation and peritoneal closure, highlighting the advantages of this approach. By comparison, the complication rate among patients who underwent open hernioplasty was higher, at 12%. This confirms that the use of laparoscopic techniques significantly reduces the likelihood of postoperative complications, making these methods safer for patients. Another important aspect that was thoroughly analysed in the study was the length of hospital stay after surgery. On average, patients in Group 1 stayed in hospital for 2.4 days, while those in Group 2 had a slightly shorter hospitalisation period of 2.1 days. In Group 3, where fibrin glue was used for both mesh fixation and peritoneal closure, patients remained in the hospital for only 1.9 days, indicating an even faster recovery period. In contrast, the length of stay for patients in the open surgery Group was significantly longer, averaging 4.2 days. This clearly demonstrates that the use of TAPP laparoscopic techniques not only reduces operative time but also significantly accelerates the rehabilitation process and the return of patients to their normal routines. Regarding the economic aspects of treatment, cost analysis revealed interesting results. The overall treatment costs for patients who underwent open hernioplasty were lower, averaging EUR 1,185.95 per patient. However, for laparoscopic methods, the costs were somewhat higher: EUR 1,682.39 for Group 1, EUR 1,538.54 for Group 2, and EUR 1,510.10 for Group 3. Although laparoscopic methods incur higher immediate treatment costs, these are offset by various factors such as reduced hospital stay, faster recovery, and fewer postoperative complications. Collectively, this leads to lower overall treatment costs in the long term. Besides direct treatment costs, an important economic indicator assessed in the study was the ICER. This metric evaluates the balance between costs and effectiveness of different treatment methods, considering patients' quality of life post-surgery. For Group 2, the ICER was EUR 18,000 per quality-adjusted life year (QALY). In Group 3, where fibrin glue was used for both mesh fixation and peritoneal closure, the ICER was even lower, at EUR 17,500 per QALY. This suggests that the use of fibrin glue is not only clinically effective but also economically advantageous, as it facilitates quicker patient recovery with reduced long-term treatment costs.

Discussion

The results demonstrated that the complication rate was significantly lower in the laparoscopic groups compared to open hernioplasty (6-8 vs. 12%). This highlights the advantages of laparoscopy in reducing postoperative risks. Additionally, the length of hospital stay was shorter in the laparoscopic groups (1.9-2.4 days vs. 4.2 days in the Open Group), indicating a faster recovery for patients undergoing minimally invasive surgery. This is significant as reduced hospital stays not only alleviate the burden on healthcare facilities but also facilitate a quicker return to normal activities, improving patients' quality of life. While laparoscopic methods incurred higher initial costs (EUR 1,510-1,682 compared to EUR 1,185 for open hernioplasty), their cost-effectiveness can be evaluated based on reduced hospital stay and lower complication rates. A key indicator of effectiveness is the ICER, which was found to be quite acceptable in the laparoscopic groups (EUR 17,500-18,000 per QALY). This demonstrates that the use of such methods is not only clinically effective but also economically justified.

The results of this study align closely with the findings of previous research as outlined in the literature review. Studies investigating various modifications of the transabdominal preperitoneal inguinal hernia repair have

consistently highlighted the advantages of laparoscopic approaches over open techniques. Notably, a study by W. Zhao *et al.* [17] found that laparoscopic procedures contribute to reduced postoperative pain and shorter hospital stays, which is consistent with current findings. Furthermore, a study by M. Kim *et al.* [21] presented data on the cost-effectiveness of different surgical techniques, noting that while laparoscopic surgeries may have higher initial costs, their long-term benefits in terms of reduced recurrence rates and complications make them more cost-effective.

The results also indicate that, although the initial costs of laparoscopic surgery are higher, the overall economic benefit increases due to faster recovery and shorter hospital stays. Thus, it can be concluded that this study corroborates the findings of other researchers in this field. The validity and reliability of the conclusions are supported by the presence of consistent data in the literature, indicating a general trend towards increased efficacy and safety of laparoscopic techniques for inguinal hernia repair. These findings highlight the need for further implementation and development of laparoscopic techniques in clinical practice, which will undoubtedly have a positive impact on patient outcomes.

The findings of this study are consistent with those of other authors. For example, A.C.P. Guédon *et al.* [23] in their recommendations also emphasise the advantages of laparoscopic techniques over open procedures, particularly in terms of reduced postoperative complications and faster patient recovery. Similar conclusions were drawn by D. Kitaguchi *et al.* [19], who found that laparoscopic hernioplasty is associated with fewer complications and a shorter hospital stay compared to open methods. Additionally, a study by D.A. Hashimoto *et al.* [18] supports the effectiveness of laparoscopic techniques, specifically the TAPP approach, for inguinal hernia as a safe and effective method. However, some differences between the results obtained and other studies do exist. For instance, M. Misawa *et al.* [15] highlight certain risks associated with prosthetic hernioplasty in cases of incarcerated inguinal hernias, although the current study did not record significant complications with laparoscopic methods. This may be due to differences in study conditions, methodology, or patient characteristics.

Additionally, a study by M.Y. Shah *et al.* [10], which analysed open techniques, particularly the Shouldice repair, demonstrated that this technique can be effective in certain cases, although overall, open methods showed poorer outcomes compared to laparoscopic approaches. It is important to emphasise that future research should focus on a more detailed analysis of the long-term outcomes of laparoscopic techniques, especially considering the implementation of new technologies such as the use of fibrin glue for peritoneal closure. This may contribute to further reductions in postoperative pain, and operative time, and consequently, improve patients' quality of life. Studies on the long-term implications of these approaches may also help confirm their cost-effectiveness.

Conclusions

This study aimed to evaluate the effectiveness of different TAPP techniques in terms of surgical technique and cost-effectiveness. The results confirmed the achievement of the study objectives, revealing differences between groups in key indicators. The study demonstrated that different methods of mesh fixation and peritoneal closure in TAPP had varying effects on operative time, costs, and patient outcomes. In particular, Groups 2 and 3, which used fibrin glue, showed significantly shorter operative times: Group 2 – 35 minutes, Group 3 – 30 minutes, compared to 45 minutes in Group 1. Regarding the completion rate, Group 2 achieved 95% and Group 3 – 92%, while in Group 1 this figure was 90%. As for postoperative complications, the rate remained similar across all groups, indicating the safety of using fibrin glue.

The economic analysis revealed that the overall average cost of laparoscopic surgery in Group 1 was EUR 1,682.39, while in Group 2 it was EUR 1,538.54, and in Group 3 it amounted to EUR 1,510.10. This indicates that laparoscopic surgery is more expensive than traditional open hernioplasty, which had a cost of EUR 1,185.95, despite yielding better postoperative outcomes. Consequently, the findings of the study suggest that the use of fibrin glue contributes to a more efficient surgical procedure and facilitates rapid tissue healing. This has significant practical implications, as enhancing the efficiency of surgical techniques can positively impact the overall treatment process by reducing patients' hospital stay and improving their outcomes. Despite the increased treatment costs, the application of fibrin glue may represent a promising approach for optimising laparoscopic surgical interventions.

A major limitation of this study is the small sample size (120 participants), which may affect the statistical significance of the results and reduce the accuracy of assessing Group differences. To obtain more robust conclusions, further studies with larger patient numbers and longer follow-up periods are needed to evaluate the long-term outcomes of the surgery.

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None.

Conflict of Interest

None.

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Сучасні тенденції лапароскопічної герніопластики TAPP

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Анотація. Метою дослідження була оцінка клінічної ефективності та безпеки лапароскопічної герніопластики за методом трансабдомінальної преперитонеальної пластики для лікування пахових гриж. Методологія дослідження передбачала ретроспективний аналіз медичних даних пацієнтів, які проходили лікування пахових гриж з 2018 по 2023 роки. Вибірка включала 120 пацієнтів, які були розподілені на групи залежно від типу гриж: первинні, рецидивуючі та двосторонні. Для оцінки ефективності лапароскопічної герніопластики за методом трансабдомінальної преперитонеальної пластики було вивчено основні показники, зокрема частоту післяопераційних ускладнень, тривалість відновлення, рівень хронічного болю та частоту рецидивів. Визначено клінічну ефективність цього методу порівняно з традиційними хірургічними підходами. Усі дані були зібрані з медичних карт та проаналізовані з використанням статистичних методів для виявлення значущих відмінностей між групами. Післяопераційні ускладнення склали 5 % у пацієнтів з рецидивуючими та двосторонніми грижами, що є нижчим показником порівняно з традиційним лікуванням (15 %). Тривалість відновлення становила 7 днів після лапароскопії проти 14 днів у групі традиційного лікування. Рівень хронічного болю через 6 місяців був значно нижчим (10 % проти 25 %), а частота рецидивів – лише 2 %. Висновки дослідження підтверджують, що лапароскопічна герніопластика за методом трансабдомінальної пре-перитонеальної герніопластики є безпечним і перспективним підходом до хірургічного лікування пахових гриж, що забезпечує зниження частоти ускладнень, скорочення реабілітаційного періоду та зменшення рівня хронічного болю у пацієнтів. Проте, успішність застосування методу залежить від індивідуальних особливостей пацієнта, рівня підготовки медичного персоналу та доступу до сучасного обладнання

Ключові слова: мінімально інвазивні методи усунення гриж; техніка Ліхтенштейна; хірургічне лікування в умовах амбулаторії; відкриті підходи до відновлення гриж; захворювання пахвинного канал