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QUALITY OF LIFE IN INCISIONAL HERNIA SURGERY

SUMMARY OF THE DOCTORAL THESIS

PhD Supervisor:
PROF. UNIV. DR. BURCOȘ TRAEAN

PhD Student:
MANDI DRAGA-MARIA

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Dedication,

This thesis could not have been possible without the guidance and help of my supervisor, Prof.Dr. Traean Burcoș, who offered me support and encouragement throughout the entire process.

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"Per aspera ad astra!"

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Lista cu lucrările științifice publicate

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Introduction

The choice of the theme of this paper: "Quality of life in incisional hernia surgery", was inspired by both clinical observation and direct experience of the long-term consequences of incisional hernia surgery on patients. Noting the difficulties and challenges faced by patients in the postoperative period, this theme was selected to explore and improve the understanding and therapeutic approaches in this field, as the significant impact of incisional hernia surgery on the quality of life emphasizes the need for a thorough evaluation of current surgical practices and their effects.

From the point of view of the topicality of the chosen theme, this pathology represents a persistent and recurrent clinical problem among patients who have undergone abdominal surgery. The study of the quality of life of these patients is of significant importance for improving clinical outcomes and for optimizing care strategies, thus, addressing this topic is not only relevant, but also imperative in the current medical context, where an emphasis is placed more and more high on the evaluation of therapeutic results from the patient's perspective, and in addition, the research brings an element of novelty to the local landscape by specifically focusing on the evaluation of the quality of life of patients after this surgery, an area less explored in the specialized literature at the national level.

The main hypothesis of this thesis suggests that the preoperative optimization of the patient but also the implementation of current surgical techniques for abdominal wall reconstruction, including the use of certain alloplastic materials, has the potential to significantly improve the quality of life of patients on multiple dimensions, both physical and mental. It is assumed that these modern techniques, carried out through a minimally invasive approach, can offer superior advantages compared to the traditional methods of classical surgery, by minimizing post-operative discomfort and promoting a faster and more efficient recovery, due to the significant reduction of post-operative pain, the shortening of the period of recovery and reducing the incidence of complications. This hypothesis emphasizes the importance of technology and innovation in contemporary surgical practice, having the potential to transform the treatment paradigm for incisional hernias nationwide.

Furthermore, the additional hypothesis of this thesis is of particular relevance, as it highlights the effect of using a validated tool to measure quality of life in patients with incisional hernias who have undergone surgery. This approach is important because the success

of surgical treatment is not only limited to immediate clinical results, but also includes the long-term impact on patients quality of life of life. Consistent application of this questionnaire aims to collect objective and meaningful data that can provide valuable insights for optimizing treatment and adjusting interventions according to individual patient needs. Also, this hypothesis could influence clinical practice by encouraging the adoption of standardized methods of quality of life assessment, which could contribute to the revision of clinical guidelines and therapeutic strategies at the local or national level. Thus, the thesis will not only make a valuable contribution to academic research, but will also have a direct impact on clinical practice, improving the quality of medical care for patients with incisional hernias.

Finally, this research will hopefully contribute to the initiative to establish a national registry for patients with parietal defects, an essential step to improve the management of this condition at the national level, as this registry will facilitate data collection, allowing patient traceability but at the same time being able to facilitate his access to a treatment plan that is as accurate and personalized as possible.

I. THE CURRENT STATE OF KNOWLEDGE

1. Incisional Hernias

1.1. Definition and Epidemiology

The current definition of incisional hernia, proposed by the European Hernia Society (EHS), is based on the recommendations of experts from the 1998 "Groupe pour la recherche sur la paroi abdominal (GREPA)" meeting in Cologne, which states that "any separation at the level of the abdominal wall, with or without protrusion, located in the area of a surgical scar, detectable by clinical or imaging examination, represents an incisional hernia."[1–3].

Primary ventral hernias and incisional hernias of the abdominal wall have different etiopathogenies, so the first mentioned category occurs independently, while incisional hernias of the anterior abdominal wall are caused by the vicious healing of a previous incision. A hernia that recurs after initial treatment of a primary ventral hernia is classified as an incisional hernia [1].

Currently, the global prevalence of incisional hernias in people who have undergone abdominal surgery varies between 12.8% and 30%[2,4] . In Romania it is very difficult to obtain a real estimate of the prevalence of this pathology, largely due to the lack of a centralized database for the registration of patients with abdominal wall defects, as many countries within the European Union have successfully implemented, an example being the Dutch Hernia Registry.

1.2. Classification

The main purpose of a classification is to facilitate the comparison of different studies and their results, so that by standardizing the way incisional hernias are described, useful comparisons can be made between groups of patients[5] . The second goal of a classification system is to use the current literature to gather information about different surgical methods and use this information to make evidence-based treatment recommendations. . The classification we currently use regarding incisional hernias is an updated and improved version of the Chevrel classification published in 2000 and supported by the European Hernia Society, being developed by consensus of expert committees[1,6] .

1.2.1. Midline Incisional Hernias

The anterior abdominal region was divided into a medial or midline area and a lateral area. Midline incisional hernias are those that are located between the lateral edges of the sheaths of the rectus abdominis muscles [7].

Different from the Chevrel classification that mentions only 3 types, in this new classification the consensus has been reached to have 5 subgroups, marked with numbers from 1 to 5 on the median line, which will be marked with the letter “M. The length of the hernial defect is determined by measuring the vertical distance, in centimeters, between the highest point and the lowest point of the defect. If there are several hernial defects originating from the same incision, the length is measured from the upper edge of the uppermost defect to the lower edge of the caudal hernial orifice. Regarding the width of the hernial defect, it alone is not sufficient to accurately indicate the size of the defect, so in the current consensus of the European Society of Herniology, both width and length should be used, and should be measured together as a unit unique.

The width of the hernial defect is determined by measuring the largest horizontal distance, in centimeters, between the lateral edges of the defect on both sides. If there are multiple herniated defects, the width is determined by measuring the distance between the outer edges of the most lateral defect on that side.

1.2.2. Lateral Incisional Hernias

Lateral incisional hernias (L) are hernias that occur at the site of a surgical incision in the lateral part of the anterior abdominal wall[8] . Unlike midline incisional hernias, which occur along the white line, lateral incisional hernias are located in the following areas: L1: subcostal (between the edge of the costal rim and an imaginary horizontal line located 3 cm above the navel); L2: flank (lateral to the sheath of the rectus abdominis muscle in the area located 3 cm above and below the navel); L3: iliac (between a horizontal line located 3 cm below the navel and the inguinal region); L4: lumbar (lateral-dorsal to the anterior axillary line).

1.3. Risk Factors

Surgeons are frequently faced with the problem of incisional hernias, the exact pathophysiological process underlying the formation of an incisional hernia remaining

unclear. It is believed that there are several contributing factors that may favor a primary peritoneal suture deficiency and which may be related to patient-specific factors, technical aspects of the surgical intervention or comorbidities.

1.3.1. Patient-Related Risk Factors

One of the main risk factors for the occurrence of incisional hernias is related to the individual characteristics of the patient [9]. Obesity is a major factor, as excess adipose tissue puts pressure on the abdominal wall and can prevent a surgical incision from healing properly . In addition, advanced age is associated with a reduced capacity for tissue regeneration, which may increase the risk of incisional hernias . Chronic active smoking and the subsequent smoker's cough may contribute to intra-abdominal pressure fluctuations. Chronic pathologies of the patient play a significant role in increasing the risk of incisional hernias. Chronic diseases and conditions that compromise the immune system or healing processes can have a major impact on the integrity of the abdominal wall after surgery, including chronic lung disease, kidney disease, diabetes and cancer [10]. Collagenase defects represent another important factor in the pathogenesis of incisional hernias, due to the essential role that this enzyme plays in the remodeling of the extracellular matrix [11].

1.3.2. Technical Factors of Surgical Intervention

Surgical techniques and materials used during abdominal surgery are other important factors in preventing incisional hernias. Proper closure of the abdominal wall is essential to ensure adequate healing and prevent herniation[12] . Technical factors that may influence the risk of incisional hernias include suturing technique, suture materials, type of incision, and surgeon experience [13,14].

1.3.3. Postoperative factors

Important factors that influence the risk of developing incisional hernias are those that occur in the postoperative period, such as wound infections that can compromise the granulation process, establishing a favorable ground for the development of a parietal defect. Premature or excessive physical activity after surgery can also lead to tension of the wound, thus affecting the integrity of the abdominal wall, therefore compliance with postoperative instructions regarding physical activity and wound hygiene is essential to prevent both complications and incisional hernias.

1.4. Therapeutic Options in Parietal Surgery: Advantages and Disadvantages

In this subchapter, we will explore and evaluate various therapeutic options in parietal surgery, focusing on the most prevalent techniques used in the current management of incisional hernias: Onlay Technique, Rives-Stoppa Technique, IPOM (IntraPeritoneal Onlay Mesh), and eTEP (extended Totally Extraperitoneal).

These methods were selected to describe their advantages and disadvantages due to their wide applicability and clinical relevance in current medical practice, including in our clinic.

Although there are numerous surgical approaches available in incisional hernia surgery, the focus on these four techniques is justified by their high frequency of use and robust evidence of their efficacy and safety compared with other less conventional or emerging methods.

1.4.1. "Onlay" technique

The "Onlay" technique involves mounting the supraaponeurotic prosthetic material, and among the advantages of this method of placing the alloplastic material is the simplification of the surgical procedure and the reduction of the time required for the operation, which minimizes the patient's exposure to anesthesia and the complications that may occur as a result of anesthetic risks - increased surgical, when it becomes a risk factor in their exacerbation[15]
.

1.4.2. Rives-Stoppa Technique

The Rives-Stoppa technique involves placing the mesh in a retro-muscular plane, between the abdominal muscles and the transversalis fascia [16]. This method uses a surgical approach that requires a more detailed and precise dissection and a more advanced degree of surgical expertise. Considered the gold standard for ventral hernia repair, the Rives-Stoppa technique is appreciated for its durable results and low rate of postoperative complications, the procedure allowing solid integration of the mesh into the structure of the abdominal wall, significantly reducing the risk of recurrence. However, its technical complexity can be a disadvantage, requiring a steeper learning curve and a deep understanding of abdominal wall anatomy.

1.4.3. IPOM

IPOM (IntraPeritoneal Onlay Mesh) is a controversial surgical technique, in which alloplastic material is placed intraperitoneally through a minimally invasive approach (laparoscopic or robotic). It is directly applied to the hernial defect inside the peritoneal cavity, and is fixed with the help of special devices such as tackers, surgical adhesives or transfixing threads.

1.4.4. eTEP

The eTEP (extended Totally ExtraPeritoneal) technique involves the creation of a total extraperitoneal working space for mounting the alloplastic material, without entering the peritoneal cavity, using a minimally invasive laparoscopic or robotic approach [17,18]. In terms of advantages, being a technique that requires an extraperitoneal approach, ETEP significantly reduces the risk of postoperative adhesions between the prosthetic material and the abdominal viscera, a major advantage compared to minimally invasive intraperitoneal techniques. At the same time, it allows a faster postoperative recovery, with reduced pain and a short hospital stay.

3.5. Types of Nets and Ways of Fixing

Prostheses used in parietal reconstructive surgery are a constantly evolving field, having a crucial importance in the success of surgical interventions[19]. Appropriate selection of mesh type is essential to optimize clinical outcomes and minimize post-operative risks as there are currently more than 70 types of mesh available on the medical device market, each with specific characteristics that make them suitable for different types of interventions, currently lacking a consensus in terms of an ideal prosthesis[19] .

2. Ways to Quantify the Quality of Life

Initial methods of assessing quality of life in parietal surgery focused primarily on clinical outcomes such as recurrence rates, postoperative complications, and physical function[20] . Over time, there has been a shift toward the integration of patient-centered measures to complement these clinical indicators.

Specific Instruments for Measuring Quality of Life in Parietal Surgery

The development of quality of life assessment tools specific to hernias has shown a trend towards creating tools that are specifically designed to assess the effects of parietal surgery on the general well-being of patients.

2.1. The EuraHs-QoL Questionnaire

In 2012, the EuraHS working group established the EuraHS-QoL score to assess quality of life (QOL) before and after ventral hernia surgery[21] .This questionnaire, designed specifically for hernias, includes nine questions that are scored on a scale of 0 to 10. The questions were chosen collectively by a panel of 14 experts from nine different countries, aiming to address relevant aspects of patients' quality of life with hernias. The total score of the EuraHS-QoL questionnaire ranges from 0 to 90, where lower scores indicate a more favorable outcome.

The EuraHS-QoL questionnaire classifies questions into three domains: "Pain", with a scale from 0 to 30, "Restriction of activities", with a scale from 0 to 40, and "Aesthetic discomfort", with a scale from 0 to 20, each with specific criteria. The purpose of the questionnaire is to comprehensively assess the effect of hernia repair on patients' quality of life by examining pain, activity limitations, and aesthetic concerns. This provides valuable insight into the overall well-being of patients throughout the entire treatment process.

2.2. Carolina Comfort Scale® (CCC) Questionnaire

The Carolina Comfort Scale® (CCS), a questionnaire created in 2008 by Heniford and his team, is a tool used to assess quality of life (QOL) in patients who have not yet

undergone ventral hernia repair. This questionnaire has undergone a rigorous study and validation process and is specifically intended for patients who have undergone mesh hernia repair surgery.

CCS is distinguished by its ability to track in detail the evolution of a patient's quality of life throughout the entire recovery period. This feature makes CCS applicable both preoperatively and postoperatively, providing valuable insight into the impact of surgery on patient well-being.

2.3. Abdominal Hernia-Q (AHQ) Questionnaire

The Abdominal Hernia-Q (AHQ), developed in 2020, is an outcome assessment tool designed based on patient reports to measure quality of life (QOL) in people with abdominal hernias. The AHQ was created with input from a wide range of stakeholders, including both patients and healthcare professionals, and has undergone rigorous testing to ensure it is both accurate and consistent in its assessments.

2.4. Hernia-Related Quality of Life Survey (HerQLes) Questionnaire

The Hernia-Related Quality of Life Survey (HerQLes) was developed in 2012 by a group of four general surgeons with the specific aim of assessing the quality of life of patients who underwent hernia repair interventions. In the original study by Krpata et al., the HerQLes questionnaire initially included 16 questions. After careful evaluation of the reliability and accuracy of these questions, the form was reduced to 12 questions to ensure a more focused and efficient assessment.

II. PERSONAL CONTRIBUTIONS

3. Working Hypothesis and General Objectives

3.1. Working Hypothesis

The central working hypothesis advances the idea that the implementation of optimized surgical techniques, including the choice of alloplastic materials but also of specific fixation techniques, adapted to each individual case, can lead to significant improvements in the quality of life of patients on multiple levels, both physical and mental. It is argued that certain contemporary surgical techniques, which have already become the standard of treatment in other countries, through their minimally invasive approach, can offer superior benefits compared to the traditional methods of classical surgery, still widely used at national level. The additional hypothesis of this thesis is particularly important and relevant as it explores the impact of using a validated tool to quantify quality of life in patients with incisional hernias undergoing surgery. This approach is essential because the success of surgical treatment is not measured exclusively by immediate clinical results, but also by the long-term influence on the quality of life of patients.

Through the systematic application of this questionnaire, the aim is to obtain objective and relevant data, which can provide valuable information for optimizing treatment and adapting interventions to the individual needs of patients. Furthermore, this hypothesis has the potential to change clinical practices by promoting standardized methods of assessing quality of life, thus influencing clinical guidelines and therapeutic strategies. Thus, the contribution of the thesis will be significant not only in academic research, but also in clinical practice, having a real impact on the improvement of medical care in incisional hernia surgery.

3.2. The Purpose of the Study

This PhD thesis aims to explore the effectiveness of implementing optimized surgical techniques and the use of advanced materials in the treatment of incisional hernias. Specifically, the paper focuses on evaluating the role of laparoscopic surgery in optimizing clinical outcomes, assuming that these modern approaches can significantly

reduce recovery time and minimize the incidence of post-operative complications. The main aim of the study is to verify the hypothesis that the combined use of minimally invasive techniques and innovative materials in incisional hernia surgery can significantly improve the quality of surgical interventions.

By focusing on postoperative quality of life, this research aims to overcome the limitations of traditional evaluations, which often focus exclusively on clinical criteria such as recurrence rate and postoperative complications. Quality of life assessment provides a more holistic and personalized perspective on treatment success, reflecting not only the technical effectiveness of the surgical procedure, but also its impact on the patient's overall well-being.

Consequently, the research will use validated tools to measure quality of life, thereby allowing an objective comparison between different surgical approaches and providing data that can inform evidence-based clinical recommendations.

3.3. Objectives of the Study

Objective 1 – Preoperative assessment of quality of life by measuring patients' quality of life prior to surgery for incisional hernias using validated assessment tools, to establish a baseline of comparison for the postoperative period.

Objective 2 – Comparison of surgical techniques: This objective aims to evaluate the benefits of laparoscopic surgery in terms of duration of intervention, hospital stay, complication rate compared to classical surgery.

Objective 3 – Analysis of postoperative impact on quality of life: evaluation of the postoperative impact of different surgical techniques on patients' quality of life at 30 days and 90 days post-intervention, respectively, using standardized questionnaires to measure different dimensions of patient well-being.

Objective 4 – Impact of prosthetic materials on clinical outcomes: Analysis of the influence of different types of prosthetic meshes used in incisional hernia surgery on quality of life, including assessment of mesh types and fixation techniques.

Objective 5 – Determining predictors of surgical outcomes: To identify demographic, clinicopathological factors and surgical techniques that influence

postoperative quality of life, in order to develop evidence-based recommendations to optimize the selection of surgical techniques.

4. General Research Methodology

4.1. Inclusion and Exclusion Criteria

In order to carry out this study, it was essential to establish some rigorous inclusion and exclusion criteria to ensure the accuracy and relevance of the results obtained. These criteria were meticulously designed to form a study cohort as homogeneous and representative as possible relative to the activity of the Colțea Surgery Clinic, thus facilitating a detailed and comprehensive analysis of the relevant variables for surgical interventions in the case of incisional hernias.

4.2. Material and Methods

In order to achieve the proposed objectives of the research, we performed a prospective observational study of preoperative and postoperative data collection at 30 days and 90 days, respectively, on a sample of 222 patients who were diagnosed and surgically treated for incisional hernia within The Surgery Clinics of Colțea Clinic Hospital, Bucharest in the period 2017 - 2023. The pandemic period 2020 - 2021 was excluded from the study, as this may bring additional changes to the condition of the patients, the degree of satisfaction, the type of surgical approach and also due to the significantly higher number of complicated cases. General informed consent was obtained from participants at the time of their hospital admission, prior to the start of the data collection process.

The selection of patients was made in the order of hospitalization in the Clinic and in the order of fulfilling the inclusion and exclusion criteria, processing the recorded data of patients with incisional hernias between January 2017 and December 2023 in the Colțea Clinical Hospital, Bucharest.

The analyzed data used were entered on separate forms, for each individual study, forms filled in with the data: anamnestic after patient interrogation, clinical-biological evaluation, study of the observation sheet, of the investigations carried out, according to the operative protocols, the completed questionnaires with the degree of satisfaction (VAS) on the 1st and 5th postoperative day, followed by questionnaires at the 30- and 90-day visit.

Subsequently, a database was created in Microsoft® Excel® 2021 MSO version 2404 Build 16.0.17531.20152 - Microsoft Corporation, Redmond, Washington, USA,

which includes: demographic data, personal pathological and hereditary-collateral history of the patients, clinical characteristics (size and location of the hernial defect according to the EHS classification), paraclinical investigations (glycemia, HbA1c, hemoglobin value), data about the surgical intervention, postoperative complications (exemplified by the Clavien-Dindo Grade), the results of the satisfaction questionnaires (VAS) performed on day 1 and 5 postoperatively and the quality of life questionnaire (EuraHS-Qol questionnaire) performed on day 30 and 90. Each patient's comorbidity was noted and based on them the age-adjusted Charlson Comorbidity Index (CCI) was calculated.

4.3. Statistical Analysis

All data were statistically analyzed using SPSS (Statistical Package for Social Sciences) version 28.0 (IBM, Armonk, NY, USA) and Origin Pro 2018 (OriginLab Corporation, Northampton, MA). The data were considered to be nominal, ordinal or quantitative; for each of the variables using specific tests. Uni-/multivariate logistic regression models were also used, and in the case of comparing two groups, the following tests were used: Chi-Square $\chi 2$ (categorical variables), Fisher's test (categorical variables, but when the number of cells was ”0”), Mann Whitney U (continuous variables). The results were presented in visual forms, including tables and graphs, which allowed the effective interpretation and comparison of the obtained data with those existing in the specialized literature and current medical protocols.

5. STUDY 1. Optimizing Incisional Hernia Surgery: The Role of Laparoscopic Surgery

The study presented in this section of the thesis aims to explore and compare the parameters obtained through both types of approach in the Surgery Clinic of Colțea Clinical Hospital. Also, the aim of this study is to evaluate the impact of optimized surgical techniques, including the selection of alloplastic materials and customized fixation approaches, on the efficiency and clinical effectiveness in the treatment of incisional hernias.

Based on the hypothesis that laparoscopic surgical procedures can confer significant benefits, the aim is to demonstrate the superiority of these techniques compared to traditional surgical methods.

This analysis will not only provide a solid basis for understanding the advantages and limitations of each type of approach in the local context, but will also contribute to the literature by providing comparative data between the two.

The material and methods used are those presented in the Research Methodology chapter.

5.1. Limitations of Study 1

One of the significant limitations of this study is the lack of access to robotic surgery, which restricted the minimally invasive approach exclusively to laparoscopic techniques, as Colțea Clinical Hospital does not have any robotic surgery platform. This aspect may influence comparability with studies where robotic surgery is included, given that it may offer additional advantages in the management of incisional hernias.

Another limitation was the considerable heterogeneity between the groups, due to variations in the level of expertise of the surgeons within the clinic in the use of advanced laparoscopic surgical techniques. Not all surgeons were trained in advanced laparoscopic surgical techniques, which may influence the consistency of results and comparability between cases.

5.2. Results and Discussions

The descriptive analysis of the study group, consisting of 222 cases, reveals a gender distribution, with a predominance of the female sex (68.5%), and the average age of the patients was in the sixth decade of life, indicating a predominantly elderly population.

Looking at the associated comorbidities of patients diagnosed with incisional hernia, according to the age-adjusted ACCI, most of the patients were classified as having multiple comorbidities, with grade 3, 2, and 4 being the most common. 41.4% of patients have neoplastic history, 31.1% hypertension, 8.6% COPD and 29.7% type II diabetes.

Patients' regular physical activity before surgery was considered significant if they participated in sports activities for more than 30 minutes on at least three days a week, which was the case for 23.41% of patients. About half of the patients were classified as overweight, and 20.7% of them were obese. Furthermore, only 38.3% of patients with incisional hernias reported a weight loss of more than 7% of total body weight in the six months before surgery.

From the perspective of the biological picture, the average of the glycemic values was 104.17±26.04, placing it in the characteristic range for pre-diabetes. In addition, more than half of the patients (55.9%) were diagnosed with anemia according to hemoglobin levels measured the day before surgery.

Following the clinical evaluations of each patient, the majority (44.6%) had hernial defects between 4 and 10 cm in size, while 27.5% of participants presented defects smaller than 4 cm. Large hernias were less common, with 14.9% classified as W3 and 13.1% as SC. Regarding the location of the hernias, the area of the white line was predominantly affected compared to the antero-lateral regions of the abdomen, supraumbilical hernias being the most common, representing 49.5% of the total. A percentage of 57.2% of the studied patients were diagnosed with irreducible non-obstructive type hernias.

The mean duration of surgical procedures varied significantly between open and laparoscopic techniques. In the case of classic surgery, the average time was 107.29±41.20 minutes, while for laparoscopic interventions, the average time was 97.75±35.19 minutes. These values in contrast to those reported by Bayomi et al., which indicate 51.2±5.1 minutes for open interventions and 89.7±9.5 minutes for laparoscopic ones, highlight the differences in the time needed for operations between different researches and methods used surgical.

Patients who underwent laparoscopic surgery had significantly fewer associated comorbidities compared to those treated by classical methods.

Also, the most frequent grade of the Charlson Comorbidity Index (ACCI) recorded in both study groups was 3, indicating a moderate presence of comorbidities among the analyzed patients. These observations suggest that the laparoscopic approach may be preferred in cases with a less complicated profile, possibly due to careful case selection.

The analysis of the annual evolution of the number of surgical interventions reveals a constant increase in the preference for laparoscopic operations in the post-pandemic period, in contrast to a significantly lower number of open surgical interventions, approximately 1 in 4 cases being operated laparoscopically in the Colțea Clinic. This trend suggests an increased adoption of minimally invasive approaches, considered safer and with a faster recovery.

6. STUDY 2. Evaluation of the Impact of the Type of Approach on the Quality of Life in Incisional Hernias

6.1. Introduction

Postoperative quality of life is an essential indicator in evaluating the success of surgical interventions, especially in incisional hernia surgery, where the techniques and materials used can have a significant impact on patients' recovery. This analysis was performed by applying the Eura-HS QoL (European Hernia Society Quality of Life Score) questionnaire, which is a validated and specific tool for measuring quality of life in the context of hernias. By using this questionnaire, the study aims to provide a detailed insight into the impact of different surgical techniques on the long-term well-being of patients, an essential aspect in choosing the most appropriate surgical technique.

6.2. Material and Methods

The use of the EuraHS-QoL questionnaire is added to the general research methodology of this work.

It was chosen for this study due to its specificity and validity in assessing quality of life in the context of patients with incisional hernias, being specifically designed to reflect the impact of surgical interventions on the daily life of patients, thus providing relevant, subjective, and direct measurements applicable in the context of incisional hernia surgery.

Regarding the use of the Eura-HS QoL questionnaire without the explicit consent of the authors, it can be freely used for clinical and research purposes, since instruments of this kind developed under the auspices of a scientific society, such as the European Society of Herniology, are designed to be accessible to the medical community, thus facilitating the dissemination and application of knowledge without additional restrictions.

6.3. Results and Discussions

In Study 2, the evaluation of the quality of life of patients with incisional hernia, performed preoperatively and at 30 and 90 days postoperatively, respectively, using the EuraHS-QoL questionnaire, revealed notable improvements. Pain scores, both at rest and during daily activities, showed a significant decrease from baseline to follow-up assessments, reflecting a favorable evolution of the patients.

A relevant aspect of this study is the significant difference between patients who benefited from open surgery and those who were treated by minimally invasive methods. Those who underwent open procedures reported a higher degree of pain, activity restriction, and aesthetic discomfort, regardless of their comorbidities, compared to patients who received minimally invasive surgery. These results highlight the considerable advantages of minimally invasive approaches, which not only reduce recovery time, but also significantly improve the quality of life of patients postoperatively.

In evaluating the correlation between hernia defect size and EuraHS-QoL scores, a significant improvement in patients' quality of life was observed, regardless of defect size, after surgery. Patients with small hernia defects, less than 4 cm, reported a pronounced increase in quality of life after the intervention, as reflected by a significant decrease in preoperative scores at the 1- and 3-month postoperative assessments.

Analysis of the correlation between the location of the hernial defect and the results of the EuraHS-QoL assessment revealed a higher quality of life in patients with laterally located defects (L) compared to those with medial defects (M). Although both groups reported an improvement in quality of life at postoperative visits, patients with lateral defects had a more pronounced increase in quality of life scores after the intervention.

7. Conclusions and Personal Contributions

7.1. Conclusions

The present study evaluated the impact of different types of surgical approach on the quality of life of patients with incisional hernia, using the EuraHS-QoL questionnaire to measure postoperative quality of life. The conclusions obtained from this research highlight the following essential aspects:

Objectives of Scientific Research:

The research managed to achieve the proposed objectives, demonstrating that the laparoscopic approach significantly improves the quality of life of patients compared to the classical approach. Data collected showed that patients treated by laparoscopic surgery reported faster recovery and more effective postoperative pain management. This suggests that the minimally invasive approach has a positive impact not only on immediate clinical outcomes, but also on the overall well-being of patients.

Outstanding Issues:

The study revealed significant heterogeneity between groups, caused by variations in the level of expertise of the surgeons. This emphasizes the need for standardized training programs to ensure consistency and comparability of outcomes between different surgical centers. In addition, differences in patients' perceptions of postoperative quality of life were observed, suggesting that individual factors such as comorbidities and patient expectations may influence perceived outcomes. These aspects point to future research directions focused on personalizing surgical interventions according to individual patient characteristics. It is essential to develop strategies to personalize treatment, taking into account the specificities of each patient, in order to maximize benefits and minimize risks.

The directions in which research must be continued:

Future research should focus on multicenter studies with larger cohorts to validate these results and reduce the impact of confounding variables. A long-term assessment of patients' quality of life is also needed to determine the sustainability of the observed short-term benefits. Further studies could explore the impact of different laparoscopic

techniques and materials used in hernia repair on long-term outcomes, helping to optimize and personalize surgical treatment. Research should also investigate ways to reduce the costs associated with laparoscopic techniques without compromising the quality and efficiency of treatment.

The need to establish a National Hernia Registry:

Another essential aspect identified in this research is the need to establish a national hernia registry. This registry would allow the systematic collection and analysis of data on hernia cases, surgeries performed, short- and long-term outcomes, and associated complications. By centralizing this information, valuable data can be obtained to support the development of informed health policies, evidence-based clinical guidelines, and effective prevention strategies. Such a register would also facilitate the monitoring of the quality of surgery at national level, the identification of best practice and the promotion of continuous improvement in standards of care.

7.2. Personal Contributions

The introduction and validation of the use of the EuraHS-QoL questionnaire in the context of incisional hernias within the studied population is one of the major contributions of this thesis. This assessment tool allowed a detailed and specific measurement of postoperative patient well-being, providing valuable data to compare the effectiveness of different surgical approaches. The use of this questionnaire highlighted the advantages of laparoscopic surgery in improving patients' quality of life, thus contributing to the foundation of evidence-based clinical recommendations. This allowed not only an objective evaluation of postoperative results, but also the identification of specific areas where interventions could be improved. The research also highlighted the importance of using standardized and validated measurement tools, such as the EuraHS-QoL questionnaire, to objectively and accurately assess the quality of life of postoperative patients.

Interdisciplinary approaches:

Promoting an interdisciplinary approach in the preoperative preparation of patients with incisional hernias represents another important contribution of this thesis. Collaboration between surgical teams, specialists in other medical branches is essential to ensure holistic patient care, thus optimizing postoperative results, especially in patients with complex incisional hernias that associate comorbidities that can influence their postoperative evolution. This multidisciplinary approach is essential to meet the complex needs

of patients and to permanently improve their quality of life, enabling more effective management of complications and faster recovery, while ensuring adequate psychosocial support for patients.

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