

Shkarban Victor, Bulyk Ivan, Gutculiak Andrii, Prudnikov Oleksandr. Quality of life of patients after inguinal hernia repair. *Journal of Education, Health and Sport*. 2022;12(5):386-392. eISSN 2391-8306. DOI <http://dx.doi.org/10.12775/JEHS.2022.12.05.030> <https://apcz.umk.pl/JEHS/article/view/JEHS.2022.12.05.030> <https://zenodo.org/record/7054534>

The journal has had 40 points in Ministry of Education and Science of Poland parametric evaluation. Annex to the announcement of the Minister of Education and Science of December 1, 2021. No. 32343. Has a Journal's Unique Identifier: 201159. Scientific disciplines assigned: Physical Culture Sciences (Field of Medical sciences and health sciences); Health Sciences (Field of Medical Sciences and Health Sciences).

Punkty Ministerialne z 2019 - aktualny rok 40 punktów. Załącznik do komunikatu Ministra Edukacji i Nauki z dnia 1 grudnia 2021 r. Lp. 32343. Posiada Unikatowy Identyfikator Czasopisma: 201159. Przypisane dyscypliny naukowe: Nauki o kulturze fizycznej (Dziedzina nauk medycznych i nauk o zdrowiu); Nauki o zdrowiu (Dziedzina nauk medycznych i nauk o zdrowiu).

© The Authors 2022;

This article is published with open access at Licensee Open Journal Systems of Nicolaus Copernicus University in Torun, Poland

Open Access. This article is distributed under the terms of the Creative Commons Attribution Noncommercial License which permits any noncommercial use, distribution, and reproduction in any medium, provided the original author(s) and source are credited. This is an open access article licensed under the terms of the Creative Commons Attribution Non commercial license Share alike. (<http://creativecommons.org/licenses/by-nc-sa/4.0/>) which permits unrestricted, non commercial use, distribution and reproduction in any medium, provided the work is properly cited.

The authors declare that there is no conflict of interests regarding the publication of this paper.

Received: 29.04.2022. Revised: 11.05.2022. Accepted: 31.05.2022.

QUALITY OF LIFE OF PATIENTS AFTER INGUINAL HERNIA REPAIR

Victor Shkarban¹, Ivan Bulyk¹, Andrii Gutculiak², Oleksandr Prudnikov²

¹State Institute «Shalimov National Institute of Surgery and Transplantation» to NAMS of Ukraine, Department of pancreatic surgery, laparoscopic and reconstructive surgery of the bile ducts, Kyiv, Ukraine

²Ivano-Frankivsk National Medical University, Department surgery # 1 and pediatric surgery, Ivano-Frankivsk, Ukraine.

Victor Shkarban – leading researcher, Department of pancreatic surgery, laparoscopic and reconstructive surgery of the bile ducts, State Institute «Shalimov National Institute of Surgery and Transplantation» to NAMS of Ukraine, Kyiv, Ukraine; ORCID 0000-0003-3233-9802

Ivan Bulyk – researcher, Department of pancreatic surgery, laparoscopic and reconstructive surgery of the bile ducts, State Institute «Shalimov National Institute of Surgery and Transplantation» to NAMS of Ukraine, Kyiv, Ukraine; ORCID 0000-0001-5931-7764 Shalimov National Institute of Surgery and Transplantation, Geroiv Sevastopolia Str., 30, Kyiv, UA, 03126; Phone: +38067 773 66 05; E-mail: bulikivan3@gmail.com - *Corresponding author*

Andrii Gutculiak – professor, Department surgery # 1 and pediatric surgery, Ivano-Frankivsk National Medical University, Ivano-Frankivsk, Ukraine; ORCID 0000-0002-3665-7798

Oleksandr Prudnikov – Ph.D., Department surgery # 1 and pediatric surgery, Ivano-Frankivsk National Medical University, Ivano-Frankivsk, Ukraine; ORCID 0000-0002-1970-218x

Consent to participate

Written informed consent was obtained from the patients.

Data availability

Further data are available from the corresponding author on reasonable request.

Conflict of interest

The authors declare that there is no conflict of interest.

Abstract

Introduction. Endoscopic procedures for inguinal hernia repair have become widespread. There are many methods of such treatment: transinguinal preperitoneal mesh-plasty (TIPP), TAPP, TEP, MINI (combination of TEP and TAPP). However, the most common among them are TAPP and TEP. Despite the fact that these procedures are now common in many hospitals, the choice of tactics and repair procedures for different types of inguinal hernias is still uncertain. First, it concerns the quality of life of patients.

Aim. The aim of this study was to compare TAPP, TEP and Lichtenstein based on quality of life analysis using the EuraHS-QoL scale.

Materials and methods. We performed surgical treatment of inguinal hernia in 211 patients. Lichtenstein's procedure was performed in 65 patients (Lichtenstein group), transabdominal preperitoneal (TAPP) inguinal hernia repair in 81 patients (TAPP group) and totally extraperitoneal (TEP) inguinal hernia repair in 65 patients (TEP group). We assessed quality of life using a special scale for hernias (EuraHS-QoL). The missing values were treated according to the instructions of the validation study.

Results and discussion. As we expected, inguinal hernia repair improved EuraHS-QoL scores in all groups. In the Lichtenstein group, the total mean decreased from 51.2 to 11.8 (4.3 times) ($r=-0.13$), in the TAPP group – from 51.1 to 9.9 (5.2 times), in the TEP group – from 51.2 to 12.6 (4.1 times). Cosmetic discomfort was highest at the follow-up visit in patients in the Lichtenstein group (4.2). In the TAPP group, this indicator was probably ($p<0.05$) the smallest (3.0). Low-traumatic methods of operations in modern surgery are priorities today. The Lichtenstein procedure, despite its simplicity, is a traumatic operation compared to TAPP and TEP.

Conclusions. Different options for inguinal hernia repair, which are based on the tension-free principle of inguinal canal correction, can be useful. However, when we analyzed the quality of life according to the EuraHS-QoL scale, we decided that transabdominal preperitoneal (TAPP) inguinal hernia repair is the most optimal in terms of various indicators.

Key words: inguinal hernia repair; Lichtenstein's procedure; TAPP; TEP; quality of life.

Introduction. The principle of tension-free inguinal hernia repair proposed by Lichtenstein opened a new page in herniology. The implementation of this procedure made it possible to significantly reduce the number of relapses and speed up the recovery of patients. However, according to various authors, recurrence after the Lichtenstein procedure in patients with small hernias is from 0.5% to 2.5%. In patients with inguinal and scrotum hernia or recurrent hernias, the probability of recurrence is much higher - 2.7-11.3% [1, 2, 3].

With the development and spread of endoscopic procedures in surgery, the number of diseases treated by laparoscopic procedures is increasing. The currently common Lichtenstein procedure, which is appreciated by many surgeons due to its ease of execution and good postoperative results, does not always have advantages over transabdominal preperitoneal (TAPP) inguinal hernia repair and totally extraperitoneal (TEP) inguinal hernia repair [3, 4, 5].

Endoscopic repair of inguinal hernias is a technically complex operation in abdominal surgery. Actually, the increase in the frequency of intra- and postoperative complications is often explained by the "surgeon's learning curve". These procedures require a good knowledge of the anatomy of the abdominal cavity, abdominal wall, practical skills and experience from the surgeon. However, there is no complete systematic review, analysis and data accumulated in the literature that would determine the surgical strategy and the best results for the patient in the early and late period after surgery [4, 5].

Nowadays, endoscopic procedures for inguinal hernia repair have become widespread. There are many methods of such treatment: transinguinal preperitoneal mesh-plasty (TIPP), TAPP, TEP, MINI (combination of TEP and TAPP). However, the most common among them are TAPP and TEP. Despite the fact that these procedures are now common in many hospitals, the choice of tactics and repair procedures for different types of inguinal hernias is still uncertain. First, it concerns the quality of life of patients.

Aim. The aim of this study was to compare TAPP, TEP and Lichtenstein based on quality of life analysis using the EuraHS-QoL scale.

Materials and methods. We performed surgical treatment of inguinal hernia in 211 patients. Lichtenstein's procedure was performed in 65 patients (Lichtenstein group), transabdominal preperitoneal (TAPP) inguinal hernia repair in 81 patients (TAPP group) and totally extraperitoneal (TEP) inguinal hernia repair in 65 patients (TEP group). Hernia treatment was carried out according to generally accepted methods described in the literature. Patients were randomized to groups and did not differ in terms of basic demographic and clinical parameters (Table 1).

We assessed quality of life using a special scale for hernias (EuraHS-QoL) [6]. The EuraHS-QoL questions are divided into 3 domains: pain (3 questions, range 0–30), restriction of activities (4 questions, range 0–40) and cosmetic discomfort (2 questions, range 0–20). The total score ranges from 0 to 90, with the lower scores being the most favorable outcome. The missing values were treated according to the instructions of the validation study [7]. The EuraHS-QoL has interesting features compared to other quality of life scales, including pre- and post-operative assessment and cosmetic discomfort, which is an important but understudied element in the management of inguinal hernia.

Table 1. Baseline characteristics of patients with inguinal hernia included in the study (n=211)

Demographics of the study population and baseline parameters	Lichtenstein (n=65)	TAPP (n=81)	TEP (n=65)	p
Male/Female	65/0	77/4	62/3	0.19
Age (years), mean (SD)	67.1 (11.4)	67.6 (12.3)	68.1 (12.5)	0.31
Intruding hernia	59 (90.8 %)	69 (85.2 %)	53 (81.5 %)	0.31
Non-resecting hernia	6 (9.2 %)	12 (14.8 %)	12 (18.5 %)	0.31
Left hernia	30 (46.2 %)	27 (33.3 %)	26 (40.0 %)	0.28
Right hernia	30(46.2 %)	48 (59.3 %)	32 (49.2 %)	0.24
Bilateral hernia	5 (7.7 %)	6 (7.4 %)	7 (10.8 %)	0.73
Nyhus-I	14 (21.5 %)	15 (18.5 %)	15 (23.1 %)	0.78
Nyhus-II	20 (30.8 %)	22 (27.2 %)	22 (33.8 %)	0.68
Nyhus-IIIa	9 (13.8 %)	13 (16.0 %)	11 (16.9 %)	0.88
Nyhus-IIIb	9 (13.8 %)	14 (17.3 %)	6 (9.2 %)	0.37
Nyhus-IV	13 (20.0 %)	17 (20.9 %)	11 (16.9 %)	0.81

Abbreviations: p – p-level (significant level); SD – standard deviation;

We carried out statistical processing of the material using the "Statistica 10" program. We calculated the mean, the probability of differences in the research results (p) relative to the indicators of different groups (the results were considered probable when the reliability coefficient was less than or equal to 0.05), the median of the series, quartiles, the quality of the binary classification, the criterion Pearson consistency (χ^2), the Pearson's *r*. Furthermore, we set the confidence interval (CI) at 95%, and we defined it as ± 1.96 standard errors.

Results and discussion

As we expected, inguinal hernia repair improved EuraHS-QoL scores in all groups. In the Lichtenstein group, the total mean decreased from 51.2 to 11.8 (4.3 times) ($r = -0.13$), in the TAPP group – from 51.1 to 9.9 (5.2 times), in the TEP group – from 51.2 to 12.6 (4.1

times) (table 2, 3).

Table 2. EuraHS-QoL score at the preoperative

	Mean (SD)	S (SD)	GT	Median	LQ-UQ (IQR)	p
Pain (0–30)						
Lichtenstein (n=65)	17.4 (6.80)	0.23 (0.29)	1.85	17.0	12.0-23.0 (11.0)	1.0
TAPP (n=81)	17.2 (6.15)	0.14 (0.26)	2.08	17.0	12.0-21.0 (9.0)	1.0
TEP (n=65)	17.5 (6.31)	0.17 (0.29)	1.97	17.0	12.0-23.0 (11.0)	1.0
ADLR (0–40)						
Lichtenstein (n=65)	22.3 (7.45)	0.46 (0.29)	2.10	21.0	17.0-27.0 (10.0)	1.0
TAPP (n=81)	22.5 (8.44)	0.33 (0.26)	1.83	21.0	17.0-30.0 (13.0)	1.0
TEP (n=65)	22.2 (8.01)	0.87 (0.29)	2.09	22.0	17.0-25.0 (8.0)	1.0
CD (0–20)						
Lichtenstein (n=65)	11.4 (5.12)	-0.55 (0.29)	2.03	12.0	10.0-15.0 (5.0)	1.0
TAPP (n=81)	11.4 (6.17)	-0.23 (0.26)	2.03	12.0	5.0-17.0 (12.0)	1.0
TEP (n=65)	11.3 (5.88)	-0.26 (0.29)	1.76	12.0	7.0-17.0 (10.0)	1.0
Total EuraHS-QoL (0–90)						
Lichtenstein (n=65)	51.2 (10.27)	0.29 (0.29)	2.90	50.0	45.0-57.0 (12.0)	0.17
TAPP (n=81)	51.1 (9.36)	0.45 (0.26)	3.18	50.0	45.0-56.0 (11.0)	0.08
TEP (n=65)	51.2 (9.63)	0.41 (0.29)	3.09	52.0	44.0-56.0 (12.0)	0.08

Abbreviations: SD – standard deviation; S – skewness; GT – Grubbs test; LQ – lower quartile; UQ – upper quartile; IQR – interquartile range; p – p-level (significant level); ADLR – restrictions of activities because of pain or discomfort at the site of the hernia; CD – cosmetic discomfort.

We noted that at the follow-up visit, the highest ADLR (restrictions of activities because of pain or discomfort at the site of the hernia) score was improbably highest in the TEP group (5.5), while in the Lichtenstein group, it was 4.8, and in the TAPP group, it was 4.6 (table 3). It is known that TER has a shorter duration of operation in experienced surgeons, a shorter stay in the hospital and a lower frequency of postoperative complications. However, with this inguinal hernia repair, there is a higher frequency of intraoperative damage to small vessels of the preperitoneal space and the formation of subcutaneous hematomas. In many patients of the TEP group, the pain (Cunningham's classification) within 30 days had an intensity of 2-4 degrees. If in the Lichtenstein group the higher ADLR score was caused by the skin incision, then in the TEP group the ADLR was changed by a subcutaneous hematoma in the groin area.

Cosmetic discomfort was highest at the follow-up visit in patients in the Lichtenstein group (4.2). In the TAPP group, this indicator was probably ($p < 0.05$) the smallest (3.0). Low-traumatic methods of operations in modern surgery are priorities today. The Lichtenstein procedure, despite its simplicity, is a traumatic operation compared to TAPP and TEP. We

should discuss this with the patient during their first visit to the surgeon.

Table 3. EuraHS-QoL score at the end of follow-up visit

	Mean (SD)	S (SD)	GT	Median	LQ-UQ (IQR)	p
Pain (0–30)						
Lichtenstein (n=65)	2.8 (2.31)	1.02 (0.29)	3.08	2.0	1.0-4.0 (3.0)	0.08
TAPP (n=81)	2.2 (1.88)	1.58 (0.26)	3.05	2.0	1.0-3.0 (2.0)	0.13
TEP (n=65)	3.2 (2.17)	0.67 (0.29)	2.18	3.0	2.0-4.0 (2.0)	1.0
ADLR (0–40)						
Lichtenstein (n=65)	4.8 (2.96)	0.04 (0.29)	2.06	5.0	3.0-7.0 (4.0)	1.0
TAPP (n=81)	4.6 (3.04)	0.05 (0.26)	2.08	4.0	3.0-7.0 (4.0)	1.0
TEP (n=65)	5.5 (5.01)	3.49 (0.29)	6.07	5.0	3.0-8.0 (5.0)	0.0
CD (0–20)						
Lichtenstein (n=65)	4.2 (2.35)	0.54 (0.29)	2.05	3.0	2.0-6.0 (4.0)	1.0
TAPP (n=81)	3.0 (1.62)	0.03 (0.26)	1.85	3.0	2.0-4.0 (2.0)	1.0
TEP (n=65)	3.9 (2.11)	0.14 (0.29)	1.92	4.0	2.0-6.0 (4.0)	1.0
Total EuraHS-QoL (0–90)						
Lichtenstein (n=65)	11.8 (3.94)	0.26 (0.29)	2.05	12.0	10.0-14.0 (4.0)	1.0
TAPP (n=81)	9.9 (3.76)	0.16 (0.26)	2.66	10.0	7.0-13.0 (6.0)	0.52
TEP (n=65)	12.6 (3.90)	0.31 (0.29)	2.40	12.0	10.0-15.0 (5.0)	0.92

Abbreviations: SD – standard deviation; S – skewness; GT – Grubbs test; LQ – lower quartile; UQ – upper quartile; IQR – interquartile range; p – p-level (significant level); ADLR – restrictions of activities because of pain or discomfort at the site of the hernia; CD – cosmetic discomfort.

Conclusions

1. Different options for inguinal hernia repair, which are based on the tension-free principle of inguinal canal correction, can be useful. However, when we analyzed the quality of life according to the EuraHS-QoL scale, we decided that transabdominal preperitoneal inguinal hernia repair is the most optimal in terms of various indicators.

2. We noted the best overall EuraHS-QoL score in the TAPP group at the follow-up visit. The patients of this group also noted low rates of pain, restrictions of activities because of pain or discomfort at the site of the hernia, and cosmetic discomfort.

References

1. Lyu Y, Cheng Y, Wang B, Du W, Xu Y (2020) Comparison of endoscopic surgery and Lichtenstein repair for treatment of inguinal hernias: A network meta-analysis. *Medicine* (Baltimore). Feb;99(6):19134.
2. Bittner R, Montgomery MA, Arregui E, et al. (2015) Update of guidelines on laparoscopic (TAPP) and endoscopic (TEP) treatment of inguinal hernia (International Endohernia Society). *Surg Endosc*; 29:289–321.

3. Lydeking L, Johansen N, Oehlenschläger J, Bay-Nielsen M, Bisgaard T (2020) Recurrence and pain 12 years after laparoscopic transabdominal preperitoneal (TAPP) or Lichtenstein's repair for a recurrent inguinal hernia: a multi-centre single-blinded randomised clinical trial. *Hernia*. 24(4):787-792.
4. Aiolfi A., Cavalli M., Ferraro S., Manfredini L., Lombardo F., Bonitta G., Bruni P., Panizzo V., Campanelli G., Bona D. (2021) Total extraperitoneal (TEP) versus laparoscopic transabdominal preperitoneal (TAPP) hernioplasty: systematic review and trial sequential analysis of randomized controlled trials. *Hernia*. Oct;25(5):1147-1157.
5. Köckerling F. (2019) TEP for elective primary unilateral inguinal hernia repair in men: what do we know? *Hernia*. Jun;23(3):439-459.
6. Muysoms F., Campanelli G., Champault G., DeBeaux A., Dietz U., Jeekel J., Klinge U., Köckerling F., Mandala V., Montgomery A., Morales Conde S., Puppe F., Simmermacher R., Śmietański M., Miserez M. (2012) EuraHS: the development of an international online platform for registration and outcome measurement of ventral abdominal wall hernia repair *Hernia*. Jun;16(3):239-50.
7. Muysoms FE, Vanlander A, Ceulemans R, Kyle-Leinhase I, Michiels M, Jacobs I et al (2016) A prospective, multicenter, observational study on quality of life after laparoscopic inguinal hernia repair with ProGrip laparoscopic, self-fixating mesh according to the European registry for abdominal wall hernias quality of life instrument. *Surgery* 160(5):1344–1357.