UDC: 617.552

NEW APPROACHES TO INGUINAL HERNIA SURGERY: REDUCING COMPLICATIONS AND PREVENTING RECURRENCES



Rizaev Jasur Alimjanovich[1], Khashimov Rustam Uktamjanovich[2], Rakhmanov Kosim Erdanovich
1 - Samarkand State Medical University, Republic of Uzbekistan, Samarkand;
2 - Navoi Regional Multidisciplinary Medical Center, Republic of Uzbekistan, Navoi

ЧОВ ЧУРРАСИ ХИРУРГИЯСИДА ЯНГИ ЁНДАШУВ: АСОРАТЛАРНИ КАМАЙТИРИШ ВА РЕЦИДИВЛАРНИ ОЛДИНИ ОЛИШ

Ризаев Жасур Алимджанович[1], Хашимов Рустам Уктамжонович[2], Рахманов Қосим Эрданович[1]
1 - Самарқанд давлат тиббиёт университети, Ўзбекистон Республикаси, Самарқанд ш.;
2 - Навоий вилоят куп тармокли тиббиет маркази, Ўзбекистон Республикаси, Навойи ш.

НОВЫЕ ПОДХОДЫ В ХИРУРГИИ ПАХОВОЙ ГРЫЖИ: СНИЖЕНИЕ ОСЛОЖНЕНИЙ И ПРОФИЛАКТИКА РЕЦИДИВОВ

Ризаев Жасур Алимджанович[1], Хашимов Рустам Уктамжонович[2], Рахманов Косим Эрданович[1]
1 - Самаркандский государственный медицинский университет, Республика Узбекистан, г. Самарканд;
2 - Навоийский областной многопрофильный медицинский центр, Республика Узбекистан, г. Навоий

e-mail: qosimmedik@mail.ru

Резюме. *Тадқиқотда Самарқанд давлат тиббиёт университетининг кўп тармоқли клиникасида 2019-2024-йилларда жарроҳлик амалиётидан ўтган 196 нафар эркак бемор таҳлил қилинди. Асосий хавф омиллари жисмоний меҳнат, қорин бўшлиғи босими ортиши ва бириктирувчи тўқима дисплазиясидир. Дифференциал даволаш ёндашуви чурра қайталанишини 0% га қисқартирди ва ҳаёт сифатини яхшилади, беморларнинг 100% аъло ёки яхши натижаларни қайд этди. Ишлаб чиқилган жарроҳлик алгоритми ва преперитонеал аллопластика асоратлар сонини камайтирди ва натижаларни яхшилади.*

Калит сўзлар: *чов чурраси, преперитонеал аллопластика, бириктирувчи тўқима дисплазияси, жарроҳлик асоратлари, ҳаёт сифати.*

Abstract. *The study analyzed 196 male patients who underwent surgery at the multidisciplinary clinic of Samarkand State Medical University from 2019 to 2024. The main risk factors include physical labor, increased intra-abdominal pressure, and connective tissue dysplasia. A differentiated treatment approach reduced recurrence to 0% and improved quality of life, with 100% of patients reporting excellent or good results. The developed surgical algorithm and preperitoneal alloplasty reduced the number of complications and improved outcomes.*

Keywords: *Inguinal hernias, preperitoneal alloplasty, connective tissue dysplasia, surgical complications, quality of life.*

Relevance. Inguinal hernias account for a significant proportion of surgical pathology and remain one of the most common causes of patients seeking medical help [1]. According to the World Health Organization, inguinal hernias occur in 4-5% of the adult population, and men are 7-10 times more likely to get sick than women [2, 3, 4]. The development of optimal treatment methods that minimize the risk of complications and relapses, as well as improve the quality of life of patients, is an urgent task of modern surgery [5, 6].

The contribution of authors from different countries highlights the global significance of the problem. Research by Uzbek surgeons (I.B. Khamdamov 2023) focuses on the importance of an individual approach to choosing a hernioplasty method that takes into account the morphological and anatomical characteristics of patients [7, 8]. Ukrainian authors (V. Boyko et al., 2021) studied the effect of physique on the development of inguinal hernias and the effectiveness of various alloplasty methods [9]. Belarusian researchers (V.S. Novitskaya et al., 2017) emphasize the need to improve surgical instruments to prevent damage to the spermatic cord [10].

Ukrainian surgeons and scientists make a significant contribution to the study of the problem of inguinal hernias, paying special attention to the morphofunctional features of tissues, the impact of concomitant diseases and the role of technical aspects in surgical treatment. Studies by Ukrainian authors such as V.V. Skyba et al. (2021), emphasize the importance of

taking into account the patient's constitutional characteristics, including congenital connective tissue dysplasia and hypersthenic physique, which are key risk factors for inguinal hernias [11].

Ukrainian scientists emphasize the need to improve the methods of surgical plastic surgery of the inguinal canal. For example, studies by O.V. Pyptiuk and colleagues (2024) have confirmed that the use of preperitoneal alloplasty can achieve a lower recurrence rate in the treatment of inguinal hernias of medium and large size [12]. In addition, in the work of V.V. Makarov et al. (2024) it is noted that the use of biomaterials with improved properties (mesh implants) It helps to reduce the frequency of complications such as infiltrate, dropsy and testicular atrophy, especially in patients with severe concomitant pathology [13].

An important area of Ukrainian research is the analysis of complications and relapses. A.O. Dvorakevich, A.A. Pereyaslov (2015) highlights the need to develop new surgical instruments that prevent damage to the spermatic cord and improve the techniques of "non-tensioning" hernioplasty. This allowed Ukrainian surgeons to achieve a reduction in early postoperative complications such as scrotal edema and infiltration, as well as improve the quality of life of patients, which is confirmed by studies using questionnaires based on international scales [14].

Thus, the work of Ukrainian surgeons emphasizes the importance of an individual approach, technical improvement of surgical interventions and the use of new biomaterials. These studies make a significant contribution to solving the problem of inguinal hernias, which makes the topic relevant both regionally and globally [15].

International studies confirm the relevance of the problem. In China (D. Xu et al., 2021), the focus is on the use of modern mesh implants and minimizing complications such as testicular dropsy and testicular atrophy. Japanese surgeons (T. Hori et al., 2021) have developed innovative approaches to "non-stretching" hernioplasty in order to shorten the postoperative period. South Korean authors (M.S. Cho et al., 2019) studied the use of bioresorbable meshes, which reduced the incidence of chronic pain. Turkish researchers (M.B. Yıldırım et al., 2021) focused on improving preperitoneal alloplasty, which reduces relapses [16, 17, 18, 19].

Large-scale studies are being conducted in Western European countries (Italy, Portugal, Spain, France, Germany) aimed at standardizing approaches to the treatment of inguinal hernias. In particular, Italian surgeons (C. Stabilini et al., 2023) noted that using algorithms for choosing a treatment method allows achieving better long-term results. German specialists (A. Kohler et al., 2019) focused on morphological changes in aponeuroses in patients with inguinal hernias [20, 21].

In North America (USA, Canada, Mexico), the key areas of research are the introduction of advanced imaging techniques and biomaterials for mesh implants. American surgeons (A. Hatewar et al., 2024) confirm that the Lichtenstein technique remains the "gold standard", but requires modernization in terms of preventing relapses [22].

Analysis of domestic and foreign data, as well as the results of our own research, have shown that the introduction of developed algorithms and improved surgical instruments can significantly reduce the risk of complications such as scrotal edema, infiltrates, dropsy and testicular atrophy, shorten the early postoperative period and improve the quality of life of patients [23].

Thus, the development and implementation of optimized approaches to an open method of surgical treatment of patients with inguinal hernias is of great importance for surgical practice. The present study is aimed at improving the effectiveness of treatment, reducing the frequency of relapses and complications, as well as improving long-term treatment outcomes.

Research materials and methods. This study is based on data from the diagnosis and treatment of patients with inguinal hernias who underwent surgery in the surgical department of the multidisciplinary regional hospital of Samarkand in the period from 2019 to 2024. The study included 196 men with different types of inguinal hernias selected for retrospective and prospective analysis.

The main objective of the work was to improve approaches to surgical treatment aimed at reducing the frequency of adverse outcomes in the early postoperative period, reducing the likelihood of relapses and preserving reproductive function in men of childbearing age, which generally contributes to improving their quality of life. In this regard, women were not included in the study.

The patients were operated on both as planned and as an emergency, and depending on the choice of treatment tactics, the patients were divided into two groups (Fig. 1).

Surgical interventions were performed both as planned and in emergency cases. The patients were divided into two groups depending on the treatment method used. The first group, consisting of 93 people (47.4%), underwent treatment using traditional hernioautoplasty (69 patients, 74.2%) and inguinal hernioalloplasty using the Lichtenstein method (24 patients, 25.8%). The second group included 103 patients (52.6%) who underwent modified inguinal hernioalloplasty (61 patients, 59.2%) and Postempsky hernioautoplasty (42 patients, 40.8%).

In the anamnesis, repeated infringements were noted in 22 patients of the main group (21.3%) and in 17 people in the comparison group (18.3%). Of the total number of operated on, 134 patients (68.4%) underwent elective surgery, while 62 patients (31.6%) required emergency intervention due to inguinal hernia injury. Hernioautoplasty was 3.5 times more often used for pinched hernias (79.0%), while hernioalloplasty was preferred for uncomplicated hernias (53.7%).

The distribution of hernia types in the study groups, performed according to the classification of L.M. Nyhus, is shown in Table 1. Among all patients, oblique hernias accounted for 149 cases (76.0%). Hernias of type IIIA (direct) were detected in 43 patients (21.9%), and recurrent hernias in 9 cases (4.6%). According to the statistical analysis, there are no differences between the groups according to the type of hernias. ($p\chi 2 > 0,05$).

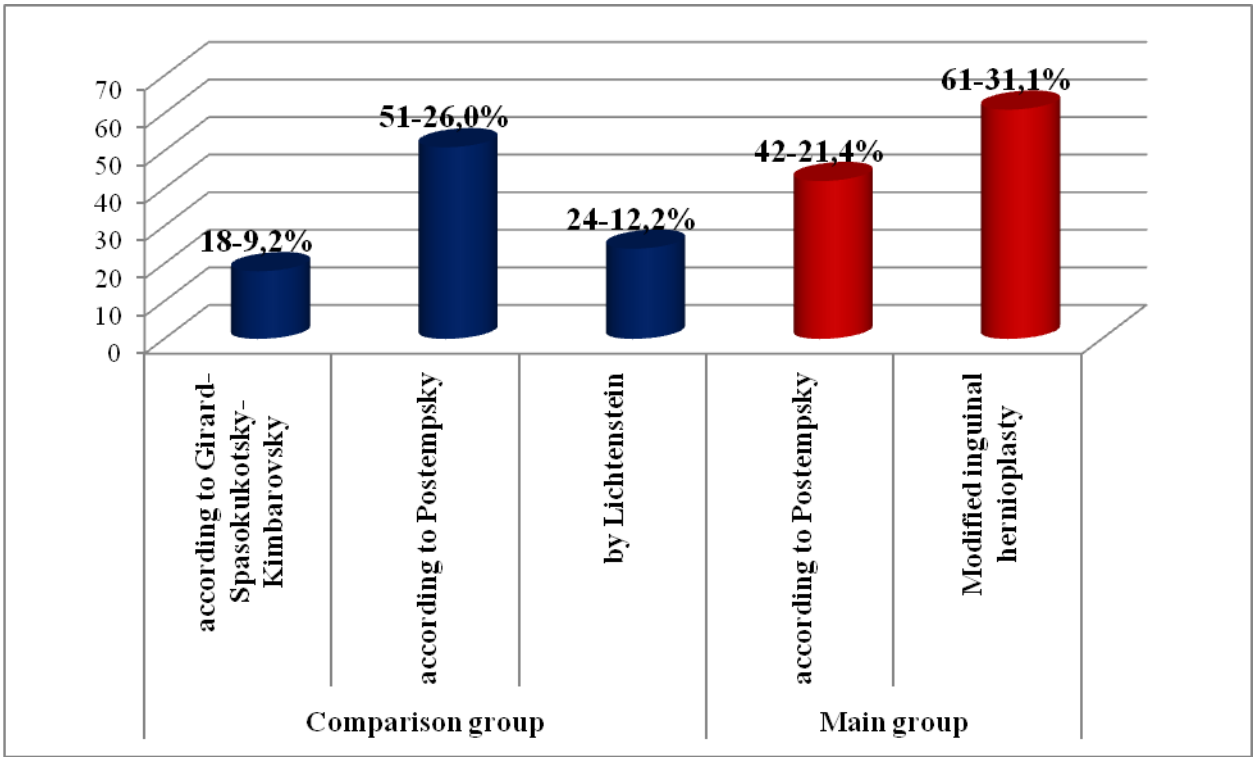

Fig. 1. Distribution of patients by study groups (n=196)

Table 1. Distribution of inguinal hernias according to L.M. Nyhus hernia classification

Study groups		Types of hernias						Total hernias
		I type	II type	III type		IV type		
				IIIA	IIIB	IVA	IVB	
Comparison Group	by Girard-Spasokukotsky-Kimbarovsky	15	3	-	-	-	-	18
	by the Postemsky		21	13	15	1	1	51
	by Lichtenstein		13	6	5	-	-	24
Main group	by Postemsky		19	12	9	1	1	42
	Modified inguinal hernioalloplasty		26	12	18	2	3	61
Total		15	82	43	47	4	5	196
%		7,6	41,8	21,9	23,9	2,0	2,5	100

Table 2. Immediate results of surgical treatment of patients with inguinal hernia in the comparison group

Complications		Type of operation						Total	
		by Girard-Spasokukotsky-Kimbarovsky		by the Postemsky		by Lichtenstein			
		abs.	%	abs.	%	abs.	%	abs.	%
		18	100	51	100	24	100	93	100
In the area of the postoperative wound	Suppuration of the wound	-	-	1	1,96	-	-	1	1,1
	Infiltration	-	-	1	1,96	-	-	1	1,1
	Swelling of the scrotum	1	5,5	1	1,96	-	-	2	2,1
	hydrocele	-	-	1	1,96	-	-	1	1,1
	Hematoma of the postoperative area	1	5,5	-	-	-	-	1	1,1
	Postoperative wound seroma	-	-	-	-	4	16,7	4	4,3
Others	Acute urinary retention	-	-	3	5,9	1	4,2	4	4,3
	Infection of the genitourinary tract	-	-	1	1,96	-	-	1	1,1
Total complications:		2	11,1	8	15,7	5	20,8	15	16,1
Total patients:		2	11,1	4	7,8	3	12,5	9	9,7

The results of the study. In 84 (90.3%) of the 93 patients in the comparison group, the immediate postoperative period was uneventful. 9 (9.7%) patients had 15 (16.1%) complications of surgery: 1 had wound suppuration, 1 had inguinal infiltration, 2 had scrotal edema, 1 had testicular dropsy, 1 had inguinal hematoma, 1 had an infection of the genitourinary system, and 4 had acute urinary retention (Table 2).

One patient had hematomas of the spermatic cord and another patient with testicular dropsy underwent multiple puncture within 3-4 weeks. In cases of wound infiltration and scrotum edema, compresses were used. In one patient with suppuration of the wound, the healing process occurred a second time. In 4 patients (4.3%), complications were observed that were not directly related to the wound or the use of a urinary catheter: acute urinary retention was detected in 3 people (3.2%), urinary tract infection in 1 patient (1.1%). These cases concerned mainly older men.

The results of treatment of 24 patients with inguinal hernia who underwent surgery using various types of mesh implants were analyzed. In the early postoperative period, postoperative wound seroma was observed in 4 patients and eliminated by puncture. Acute urinary retention was noted in 1 patient. Of the 9 patients (37.5%) operated on using the Lichtenstein method, at the time of discharge, 9 people indicated a feeling of a foreign body in the groin area, of which 3 patients (33.3%) suffered from inguinal neuralgia.

Complications were more pronounced in patients with "severe" implants (25.0%), which is explained by irritation of the nerves of the inguinal region (16.7%) (Fisher's angular criterion $\varphi<0,01$).

6 months after the operation, 90 patients (96.8% of the total number) were examined. In 6 patients (6.7%), after Lichtenstein surgery, the sensation of a foreign body in the intervening area persisted. 5 patients (5.5%) (2 after Postempsky surgery, 3 after Lichtenstein surgery) had constant aching pain in the groin area, which did not require anesthesia. Testicular atrophy after Postempsky surgery was detected in 3 patients (3.3%).

Three years after surgery, 77 (82.8%) patients were examined, in addition to testicular atrophy in 3 (3.9%) operated patients, 4 (5.2%) patients had recurrent inguinal hernia. Of these, 1 patient had Girard-Spasokukotsky-Kimbarovsky surgery, 2 had Postempsky surgery, and 1 had I.L.Lichtenstein surgery.

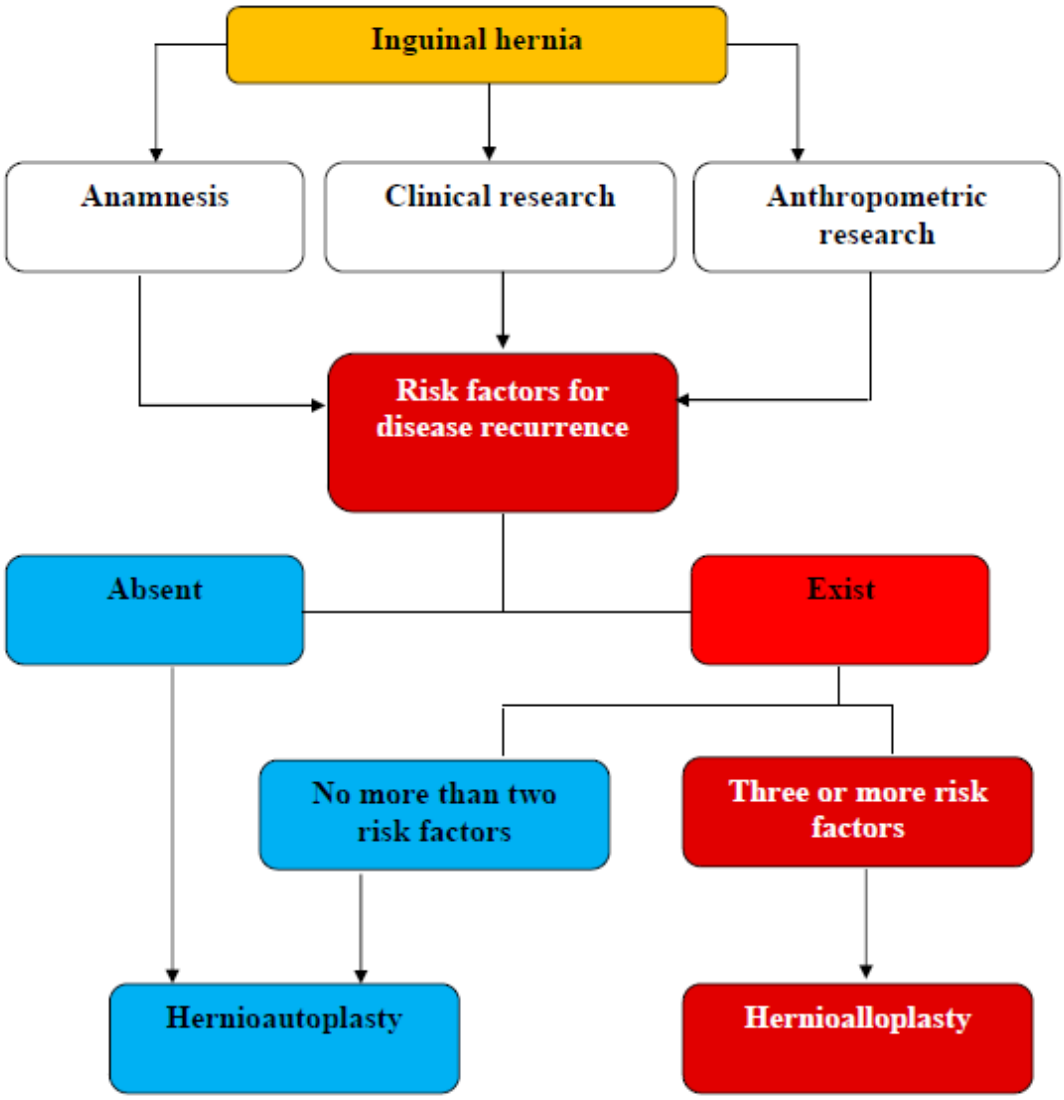

Fig. 2. Algorithm of tactics for choosing hernioplasty for inguinal hernias

Summing up, it can be noted that the strengthening of the anterior wall of the inguinal canal was accompanied by a recurrence of inguinal hernia in 7.7% of cases. After tensioning surgery to strengthen the posterior wall of the canal, relapses occurred less frequently (4.4%), however, 6.7% of patients had testicular atrophy caused by impaired blood supply. Treatment of inguinal hernias by the Lichtenstein method was characterized by relative technical simplicity, with an operation duration of about 52.3 ± 11.2 minutes. However, the method was not always effective: a recurrence of the disease was observed in 1 patient (5.3%).

Factor analysis of the causes of relapses and the results of treatment allowed us to develop an algorithm for choosing the method of inguinal canal plastic surgery (Fig. 2).

The factor analysis of the causes of relapse and unsatisfactory results in patients in the comparison group, such as impaired sexual function and testicular atrophy on the surgical side, had a positive effect in the long-term period in patients in the main group. Of the 82 (79.6%) patients observed in the long-term period, there was no recurrence of the disease. None of the patients complained of a foreign body sensation in the area of surgery, and patients of reproductive age complained of sexual dysfunction. Patients with impaired blood supply and testicular atrophy were not observed on the control ultrasound of Dopplerography.

Thus, the analysis of the quality of life of patients showed that the application of the algorithm of a differentiated approach to choosing the optimal treatment tactics for inguinal hernias allowed to increase the proportion of "excellent and good" results from 88.3% (68 out of 77 patients in the comparison group) to 100.0% (82 patients in the main group) (p=0,030).

Conclusion. One to four risk factors have been identified in patients with inguinal hernia. The main ones include heavy physical activity (58.7%), concomitant diseases that increase intra-abdominal pressure (58.7%), as well as signs of congenital connective tissue dysplasia (28.1%). Inguinal hernias are most often found in people with hypersthenic physique (65.8%), in whom morphological studies show a progressive structural disorder of the abdominal muscles aponeurosis. The developed treatment algorithm allows choosing the optimal method of inguinal canal plastic surgery based on individual risk factors. The introduction of an improved surgical instrument that prevents infringement of the spermatic cord reduced the incidence of early postoperative complications (such as scrotal edema, testicular dropsy, infiltrate and testicular atrophy) from 16.1% to 4.8%.

A comparison of surgical methods showed that surgery using the I.L. Lichtenstein method is technically simple, but causes relapses in 5.3% of patients. At the same time, modified preperitoneal alloplasty has proven to be a reliable alternative, especially for medium and large hernias, as well as for relapses, demonstrating the absence of relapses and a low complication rate ($\varphi < 0.05$), regardless of the type of mesh implant. The use of a differentiated approach to the choice of treatment tactics increased the proportion of "excellent and good" results from 88.3% to 100% ($p = 0.030$) and contributed to a significant improvement in the physical and mental condition of patients after "non-strenuous" hernioalloplasty ($p < 0,05$).

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НОВЫЕ ПОДХОДЫ В ХИРУРГИИ ПАХОВОЙ ГРЫЖИ: СНИЖЕНИЕ ОСЛОЖНЕНИЙ И ПРОФИЛАКТИКА РЕЦИДИВОВ

Ризаев Ж.А., Хашимов Р.У., Рахманов К.Э.

Резюме. *В исследовании проанализированы 196 пациентов мужского пола, перенесших операцию в многопрофильной клинике Самаркандского государственного медицинского университета с 2019 по 2024 год. Основные факторы риска включают физический труд, повышенное внутрибрюшное давление и дисплазию соединительной ткани. Дифференцированный подход к лечению снизил рецидивы до 0% и улучшил качество жизни, при этом 100% пациентов сообщили об отличных или хороших результатах. Разработанный хирургический алгоритм и предбрюшинная аллопластика снизили количество осложнений и улучшили результаты.*

Ключевые слова: *Паховые грыжи, предбрюшинная аллопластика, дисплазия соединительной ткани, хирургические осложнения, качество жизни.*