

POSTOPERATIVE VENTRAL HERNIAS

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MONOGRAPH

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Annotation

The monograph presents the main theoretical questions concerning postoperative ventral hernias. The etiology, pathogenesis, clinic, diagnosis, treatment and prevention methods in a large contingent of patients with postoperative ventral hernias are described in detail. The article covers the methods of preoperative preparation developed by the authors, autoplasty with duplicate sutures in the modification of the clinic for postoperative hernias of small sizes, and the use of an improved needle holder when performing allogernioplasty with large hernias and concomitant obesity of 2-3 degrees. The analysis of the quality of life of patients based on the improved score assessment of the quality of life of patients after hernioplasty was also carried out.

The monograph is intended for surgeons, clinical residents and students of medical institutes.

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INTRODUCTION

According to the World Health Organization, "hernias of the anterior abdominal wall are one of the most common surgical diseases, occurring in 3-7% of the population, with a predominant lesion of people of working age. "Postoperative ventral hernias (POVH) account for up to 20-22% of all external abdominal hernias and are the second most common after inguinal hernias. "More than 5% of all laparotomies are complicated by the formation of POVH, and the frequency of their occurrence depends on the nature and urgency of the surgical intervention." Surgical interventions to eliminate POVH account for about 10% of all surgical interventions. The existing traditional methods of hernioplasty do not always provide an effective result of treatment, while the number of relapses varies from 4.3% to 46%, and with extensive defects, their frequency can reach up to 60% of cases. In this regard, at present, the priority method of surgical treatment is various options of allogenioplasty, which allowed to significantly improve the long-term results. However, the ongoing developments in this direction, the appearance of publications on the need for a differentiated approach to the choice of the optimal method of surgery, taking into account the background pathology, the size and localization of hernias and other factors, indicate dissatisfaction with the results of treatment of this category of patients and determine the relevance and social significance of this problem.

In the world practice, currently, the most relevant studies continue to be the study of the pathogenetic mechanisms of the development of hernial defects depending on various factors, including structural changes in the musculoskeletal framework of the anterior abdominal wall, metabolic disorders, impaired collagen synthesis in middle-aged and elderly people, and other prerequisites for herniation. The problems of increased production of serous-hemorrhagic fluid in response to the

implantation of a mesh prosthesis remain unresolved. Particularly relevant are the issues of studying the age, type and gender features of the structure of the fascial-musculoskeletal-aponeurotic complex of the anterior abdominal wall, with morphofunctional justification for the treatment of postoperative ventral hernias by various surgical methods and an individual approach to the use of synthetic alloplastic materials.

"The increase in the number of abdominal surgical interventions and surgical aggression, simultaneous, extended, combined operations and the predominance among the operated patients of the elderly and senile age led to a noticeable increase in the POVH" (Berrevoet F.). According to Kulikov N. A. "even with a favorable course of postoperative wound healing, POVH develops in patients with a type III collagen imbalance, which leads to progressive morphofunctional tissue insufficiency, which is most characteristic of patients with recurrent hernias, with the subsequent development of hernia disease in them." A significant number of different methods of treatment of ventral hernias and their improvement indicate that the authors, due to the frequency of relapses that do not tend to decrease, continue research to solve this problem. "The recurrence rate after hernioplasty is 3-13%, and in morbid obesity it reaches 28%" (Baylón K.). The most physiological methods are undoubtedly autoplasmic methods of closing a hernial defect. "Currently, mesh endoprotheses made of polypropylene and polytetrafluoroethylene are widely used." However, the possibilities of their application in practice are often limited due to various factors, including the development of postoperative complications.

According to Kalish Yu. I., "early complications are an urgent problem in the treatment of ventral hernias, since this is the main cause of the prolonged course of the postoperative period, additional moral and physical suffering of the patient and possible fatal outcomes." One of the significant problems in the treatment of large and giant ventral hernias, in addition to technical aspects, is an increase in intra-abdominal pressure (IAP), which leads to the development of intra-abdominal hypertension, respiratory and heart failure, which significantly worsens the course of the

early postoperative period, with a high mortality rate. On the other hand, according to Mukhtarov Z. M. " weakness of the anterior abdominal wall, the process of herniogenesis occurs against the background of a violation of the balance between IAP and the ability of the abdominal walls to counteract it. In other words, the process of formation of POVH today is a combination of many factors, the main operating mechanisms of which are the failure of the connective tissue structures of the abdominal wall in the process of wound healing against the background of increased IAP".

The analysis of the literature shows that the current trends in the treatment of POVH and the prevention of relapse are based on the restoration of the function of the abdominal wall, physical rehabilitation after surgery and achieving a cosmetic effect. A significant percentage of unsatisfactory outcomes, the lack of choice of the optimal treatment method, encourage further research in this area. Above mentioned dictates the need to develop and implement optimal approaches to the surgical treatment of patients with POVH, especially in terms of the preparatory stage with an assessment of the reserve capabilities of the body.

CHAPTER I.

CURRENT STATE OF THE PROBLEM OF SURGICAL TREATMENT OF POVH

Etiology, pathogenesis and classification of POVH

Despite the rapid development of minimally invasive technologies in abdominal surgery, the number of surgical interventions using traditional laparotomy access remains high, after which in 3-19% of cases, POVH develops, and in the general statistical structure of all abdominal hernias, POVH accounts for 20-26% [6, 57]. About 60% of patients with POVH are aged from 21 to 60 years, i.e. they are a significant part of the working-age population of the country [82, 205].

The results of treatment of POVH are characterized by a fairly high number of relapses-from 4.3 to 46% [6, 47, 73], and with BPOVH, relapses reach up to 60% of cases [6, 207].

It would seem that the etiology and pathogenesis of POVH at the present stage of hernia surgery are well studied, but there are a number of issues that require discussion, since, according to many authors, there is no single cause leading to their formation [1, 5, 39, 149].

According to Agayev B. A. and co-authors (2009), approximately 50% of all POVH are formed within the first 2 years, 74% – within 3 years after the initial operation. The use of absorbable suture material increases the risk of postoperative hernia [3].

Violation of the surgical technique of suturing tissues, tamponing the abdominal cavity through the wound, the use of surgical incisions, in which the nerves of the anterior abdominal wall intersect, most often cause a weakening of the structure of the anterior abdominal wall and causes the formation of a hernia [39, 83, 88, 118, 149, 193].

In addition to the surgical intervention, the weakness of the anterior abdominal wall can be caused by individual characteristics of the entire

body, including obesity and fatty degeneration of the tissues of the anterior abdominal wall, anemia, diabetes, etc. [13, 21, 24, 27, 29, 39, 54, 89, 178, 232].

Of great importance in the pathogenesis of POVH is the development and progression of degenerative-dystrophic processes in the tissues of the anterior abdominal wall, which is especially characteristic of elderly and senile patients [39, 41, 90]. Among patients suffering from POVH, 15-30% are in the age group [85].

Age-related destructive processes in certain types of connective tissue of the anterior abdominal wall occur at different times. First of all, they are observed in subcutaneous connective tissue formations: in the elderly, with the progressive accumulation of adipose tissue, both in the interfacial spaces and intrafascially, there is a stratification and thinning of the fascia, the inherent three-layer structure disappears.

Subcutaneous loose connective tissue is poor in cellular elements and is mainly represented by fibrocytes, sedentary macrophages, and modified degenerating cell forms [39]. The total amount of intercellular substance is significantly reduced, and the concentration of hexosamines is increased due to glyco- and mucoproteins, as well as acidic glycosaminoglycans [39].

Due to the loss of tissue elasticity and collagenopathy, the microcirculatory bed is reduced and peripheral polyneuropathy develops at the level of the endings of small nerve branches, which leads to the replacement of the muscle-aponeurotic structures of the anterior abdominal wall with fat and loose connective tissue [39, 120, 140].

Insufficient biosynthesis of collagen by fibroblasts is manifested by systemic weakness of connective tissue. An imbalance in the structure of connective tissue is associated with a different ratio of type I or type III collagen [32, 39, 40, 48, 63].

Experimentally, a pattern was revealed between the frequency of the formation of POVH and the administration of connective tissue growth factors to patients. According to Dubay D. A. co-author (2007), there is a

decrease in the number of patients with primary POVH from 60 to 30% and with recurrent – from 86 to 23% after the introduction of fibroblast growth factor involved in the synthesis of collagen [193].

Many authors recommend to include in the algorithm of preoperative examination of patients with POVH methods of diagnosis of connective tissue dysplasia as a stage of prevention of relapse when choosing a method of plastic surgery [20, 39, 87, 148].

However, expensive methods of studying and diagnosing disorders of collagen metabolism are not always available, so there are a number of algorithms aimed at identifying phenotypic signs of hereditary connective tissue dysplasia in herniators [103, 160, 171].

Thus, whatever causes the weakness of the anterior abdominal wall, the process of herniogenesis proceeds against the background of a violation of the balance between intra-abdominal pressure (IAP) and the ability of the abdominal walls to counteract it [22, 58]. In other words, the process of formation of POVH today is a combination of many factors, the main operating mechanisms of which are the failure of the connective tissue structures of the abdominal wall in the process of wound healing against the background of increased IAP.

In connection with the constant emergence of new knowledge and ways to solve the problem of herniogenesis, various variants of hernia classifications, including POVH, also appear. The authors of many of them are quite critical of their predecessors [30, 52, 154, 190].

Different classification options are based on a combination of several criteria for describing a hernia. For example, the classification of M. N. Yatsenyuk (1989) is based on 9 parameters: from the size of the hernial protrusion and the state of the hernial contents (infringement or absence of it) to concomitant diseases and the degree of disability [39, 179].

A. S. Ermolov et al. (2006) proposed to classify hernias by the ratio of the size of the hernial protrusion to the parameters of the abdominal

cavity, expressed as a percentage and called the relative volume of the hernia, based on data obtained by X-ray computer hernioabdominometry [52].

Anishchenko V. V. and Semenov S. A. (2012) propose a classification of POVH by complexity: technically complex; tactically complex; somatically complex; obese complex; combined hernias [9].

At present times, there are two main working classifications of POVH. One of them was developed and proposed by Toskin K. D. and Zhebrovsky V. V. (1979) and is used in practice to these days, being the most convenient and common among domestic surgeons [30, 57]. This classification is based on the principle of dividing hernias by size, location, hernial defect and clinical feature.

At the XXI International Congress of Herniologists in Madrid in November 1999, the most complete and justified classification was recognized by J. P. Chevrel and Rath (SWR classification), which takes into account three characteristics – the location of the hernia (S), the width of the hernial gate (W), the presence of relapse (R) [57, 190, 224, 228].

I. S-localization of the hernia:

I. Median hernias (M-midline)

- M₁-over-the-navel
- M₂-pericupial
- M₃-sub-navel
- M₄-suprapubic

2. Lateral hernias (L - lateral)

- L₁-subcostal
- L₂-transverse
- L₃-iliac
- L₄-Lumbar

3. Combined (ML)

II. W – width of the hernial gate:

- W₁-less than 5 cm

- W_2 – from 5 to 10 cm
- W_3 – from 10 to 15 cm
- W_4 -more than 15 cm

III. **R** – number of previous relapses

- R_0 – this hernia is the first
- R_1 – first relapse
- R_2 – second relapse
- R_3 -third relapse, etc.

IV. Previously performed plastic surgery methods

- RA-simple suturing of the defect
- MP-myoplasty
- PR-explantation of a synthetic prosthesis.

This classification is most often used by authors when presenting materials at the international level.

Thus, the use of this classification allows for a statistical study of the reliability of the relationship between different groups of patients and the percentage of relapses [6].

Preoperative preparation in the treatment of POVH

Mortality after planned surgical interventions in patients with POVH remains at a high level and reaches 7-10% [25, 47, 57, 126].

In many respects, these unsatisfactory results are determined by the development of abdominal compression syndrome (ACS) with an increase in IAP due to the reduction of hernial contents and a decrease in the volume of the abdominal cavity, which leads to severe violations of the functional activity of most organs and systems, primarily respiratory and cardiovascular, thromboembolic complications, increased tissue hypoxia with excessive load on the suture line in the area of plastic surgery [25, 37, 157, 225].

All measures for the prevention of ACS in patients with large and giant-sized POVH can be divided into 2 groups.

Group I – performing various methods of preoperative preparation: reduction of the contents of the hernia into the abdominal cavity with subsequent abdominal banding in combination with a discharge diet; respiratory gymnastics with a load on the abdomen; compression loads on the spirometry-controlled; metered pneumocompression; tightening of the hernial defect with spokes; pneumobandages with a tightening device and measurements of IAP using catheters inserted into the stomach, bronchi, bladder; application of pneumoperitoneum with insufflation of oxygen into the abdominal cavity; anti-overload space suit for the purpose of training the abdomen and chest [17, 25, 46, 57, 126].

Traditional preparatory methods are not without drawbacks: they have insufficient effectiveness, are difficult to implement, lead in some cases to the development of serious complications, in most cases they are applicable only for hernias of the median localization, there is no possibility to carry out a complex effect on the adaptation of the cardiovascular and respiratory systems, as well as on the functional activity of the muscles of the anterior abdominal wall, the dosed load on the muscle frame and the possibility of reducing the size of the hernial gates during preoperative preparation [23, 25, 223, 225].

Group II – refusal of preoperative preparation: performing corrective (non-strenuous) techniques with the replacement of the hernial defect with a synthetic prosthesis, without reducing the initial volume of the abdominal cavity and increasing the IAP; hardware correction of the hernial defect under the control of IAP; additional dissection of the external oblique and rectus muscles; mathematical models and computational methods for determining the risk of developing ACS to justify the choice of the method of plastic surgery [25, 47, 57, 126, 230].

A limitation for the wide clinical application of group II methods is: low final functional efficiency in corrective operations, which are palliative in nature, when the anatomical integrity of the anterior abdominal wall is not restored, the muscles do not acquire a point of

fixation, further violation of their function progresses; lack of complete physical rehabilitation, and in some cases, a decrease in the quality of life after a massive intersection of muscle structures; assessment of IAP by the level of pressure in the bladder during surgery, performed under general anesthesia against the background of the introduction of muscle relaxants, is not always correct, moreover, its critical level may differ significantly in different patients, depending on the compensatory capabilities of the body [25, 47, 126, 230].

In this regard, of particular importance are not only objective indicators that reflect the level of IAP, but primarily data that characterize the functional state of the main organs and systems, primarily the cardiovascular and respiratory systems, the rational combination of which determines the reasonable choice of plastic techniques. [8, 10, 11, 25, 50, 57, 104, 126, 168, 191, 214].

Thus, the basis for an effective solution to the problem of surgical treatment of patients with large and gigantic POVH is an integrated approach with the formation of optimal conditions (both local and systemic) in the preoperative period for performing objectively justified methods of allogernioplasty in each specific case.

Surgical treatment of POVH

The results of surgical treatment of POVH largely depend on a comprehensive solution of such issues as rational preoperative preparation aimed at adapting the patient to increased intra-abdominal pressure, choosing an adequate method for plastic surgery of abdominal wall defects and preventing postoperative complications. At the same time, the surgeon faces a difficult task in determining the indications for the use of a particular method of plastic surgery, taking into account various risk factors. As a rule, when choosing a particular method of abdominal wall plastic surgery, the surgeon takes into account the possibility of postoperative complications and the risk of recurrence of

postoperative hernia. To solve the tasks set, each surgeon is guided by his own criteria.

Some authors are guided by clinical data, others - by data from all kinds of instrumental research methods, and still others use different algorithms in choosing the method of plastic surgery.

Lukomsky G.I. co-author, 1995 (94) indicated that the results of surgical treatment of POVH depended on the resolution of the following issues: 1) rational preoperative preparation aimed at adapting the patient to increased intra-abdominal pressure; 2) choosing an adequate method of plastic surgery of abdominal wall defects; 3) prevention of postoperative complications.

Maistrenko N. A. co-author, 2000 [99] proposed a program based on algorithms that include the following indicators: gender and age of patients, the nature of work, concomitant diseases, the duration of herniation, the conditions of surgery preceding the development of POVH, the number of operations on the anterior abdominal wall, the localization of hernial protrusion in the anterior abdominal wall, the number of relaparotomies, the seasonality of operations, the degree of obesity, the diameter of hernial protrusion, changes in ECG and blood group. According to the authors, the program allows not only to predict purulent-inflammatory complications in the wound after the removal of postoperative hernias, but also to determine the negative factors that predispose to an unfavorable prognosis. It helps to determine ways to improve the prognosis (postponement of surgery to another time of the year, correction of excess body weight, treatment of concomitant diseases, etc.). No correlation was found between the nature of preoperative preparation and the frequency of hernia relapses.

Pecherov A. A. co-author, 2009 [125] developed and proposed a quantitative assessment of risk factors for recurrent postoperative hernias based on clinical and radiation diagnostics, anatomical and functional state of the abdominal wall in the examined patients, as well as taking into account age, functional state of the respiratory system, digestive system, physical activity and obesity (Table 1.).

Table 1

Score evaluation of perioperative criteria

Risk factors	Quantitative characteristics	Points
The state of the abdominal wall tissues according to CT and MRI data	1. Normal or insignificant degree of atrophy of the abdominal wall tissues	1
	2. Expressed atrophy of the herniated gate tissues	3
	3. Gross scar-degenerative tissue changes	5
Results of morphological and morphometric studies of hernial gate tissues	1. Good	1
	2. Satisfactory	3
	3. Unsatisfactory	5
Hernia gate size	Up to 5 cm	1
	6-15 cm	3
	More than 15 cm	5
Weight (body mass index)	1. Norm	1
	2. Excess	3
	3. Obesity of the I-III degree	5
Age	1. Up to 40 years old	1
	2. 40-60 years old	3
	3. Over 60 years of age	5
Functional state of the respiratory system	1, There are no violations	1
	2. Violations of moderate severity	3
	3. Severe violations	5
Concomitant diseases that lead to increased intra-abdominal pressure	1. Missing	1
	2. Available in light form	3
	3. Are present in severe form	5
Duration of herniation	1. Up to 1 year	1
	2. From 1 year to 3 years	3
	3. More than 3 years	5

Patients with a total score of up to 9 points underwent autoplasty of the abdominal wall with local tissues. Patients with a score from 10 to 18, taking into account the risk of tissue tension, various constitutional features that affect the course of the postoperative period, underwent combined plastic surgery-the defect of aponeurosis was sutured edge to edge with an additional cover of the suture line with a polypropylene mesh. In patients with scores from 19 to 27, who had a high risk of tissue tension and increased intra-abdominal pressure, radicalism was achieved only by eliminating the defect, and not by replacing it with a graft, and therefore the combination of tension and non-tension techniques can be considered the optimal method of abdominal wall plastic surgery [125].

The preoperative diagnosis of the size and shape of the hernia gate, its location, and number is of great importance when choosing the surgical tactics and method of anterior abdominal wall plastic surgery in the treatment of POVH. In addition, the contents of the hernial sac and the severity of the adhesive process in it, the degree of atrophy of the surrounding tissues are of interest. According to M. N. Yatsenyuk [179], a common adhesive process was found in 78% of patients operated on for postoperative hernia.

According to V. P. Rekhachev [139], in order to clarify the contents of the hernial sac, the severity of the adhesive process, and the patency of the intestine, patients with large ventral hernias should undergo contrast ultrasound examination of the gastrointestinal tract, and, if necessary, irigoscopy, cystography, and other studies. For this purpose, clinical and functional (ultrasound) research methods should be widely used. In order to timely assess the activity of the inflammatory process in the preoperative period, a number of authors suggested using ultrasound [18, 81, 126], and some [126,186] and computed tomography. At present time, more than 200 methods and modifications of abdominal wall plasty have been proposed for the treatment of POVH [4, 7, 35, 38, 42, 43, 44, 48, 49, 58, 60, 61, 76, 77, 96, 102, 111, 126, 128, 131, 135, 136, 138, 141, 172, 176, 181, 189, 194, 195, 200, 203, 217, 226, 235, 238], including the use of synthetic materials.

There are various methods of suturing aponeurosis: nodular, mattress, U-and U-shaped, front and rear U-shaped, single - and double-row, shock-absorbing, Girard-Sic sutures with the creation of a duplicate of aponeurosis [35, 79].

Foreign surgeons at a high risk of developing events and hernias use the Smead-Jones method of suturing the median laparotomic wound, which consists in suturing the wound with a single deep suture with the capture of the fascia edges [122]. The Smead-Jones method of suturing aponeurosis of median wounds is quickly feasible and provides good wound retention during the healing process with a low probability of early and late complications.

A.S. Oleynichuk (2010) [115] in order to prevent events and hernias after laparotomy, a deep suture through all layers with silk thread №6 or №8 is used to close the wound. In this case, the suture thread captures the peritoneum together with the aponeurosis and the muscle, applying the suture retreating to both sides of the incision by 2.5-3 cm, in some cases, intermediate non-through single nodal sutures are applied.

However, in elderly and senile patients, as well as in patients with obesity and with a weak muscle-aponeurotic layer, the above-mentioned sutures will not be able to prevent tissue eruption, their ischemia and necrosis, leading to eventration and postoperative hernias. Many of the modern methods are either quite complex or require the use of special materials, which reduces their advantages and sharply restricts their use in most hospitals, especially in urgent surgery. The above mentioned indicates that there is a need to develop and implement a fairly simple, effective and low-cost method of plastic surgery of the anterior abdominal wall, applicable both for the prevention and treatment of hernias in emergency and elective surgery.

At present, the introduction of new endoprotheses with high biocompatibility, low price, and ease of use has led to changes in the treatment of ventral hernias [127, 130, 132, 173, 185, 188, 196, 197, 218]. These methods made it possible to perform hernia repair of the abdominal wall while maintaining the normal anatomy without tension, which led to

a reduction in the typical postoperative difficulties associated with traditional surgery.

Many researchers believe that a high-quality endoprosthesis should have a number of the following features: chemical inertia, hypoallergenic, mechanical strength. It must be suitable for sterilization and factory production, not soften with tissue juices and not cause inflammation, and not have toxic and carcinogenic features. The implant must quickly germinate the body's tissues, therefore, have sufficient porosity, have minimal extensibility and at the same time be sufficiently elastic, preventing the formation of bedsores of adjacent tissues [12, 68, 69, 97, 110, 145, 185, 187]. Some researchers note that in practice, the choice of a mesh endoprosthesis most often depends on its cost [15, 187, 196, 220].

The combination of all the necessary qualities and financial availability served as a prerequisite for the widespread use of polypropylene-based prostheses. It gives a minimal percentage of complications, grows better into the body's tissues, has a high resistance to infection, is quite strong and elastic, so most surgeons nowadays consider this material to be the most acceptable for plastic hernias of the anterior abdominal wall [24, 59, 70, 71, 74, 81, 98, 100, 121, 156, 158, 187, 198, 209, 212, 227, 229]. Strong and inert monofilament filaments are created from polypropylene. Depending on the type of thread weaving, the prostheses Marlex (monofilament polypropylene mesh), Prolene (bifilament polypropylene mesh) and Surgipro (polyfilament polypropylene mesh) are created. According to their density, they are usually divided into super-heavy (the amount of polypropylene is 100 g / m² or more), heavy (70-100 g/m²), light (25-50 g/m²) and ultralight (<25 g/m²). In addition, in the practice of hernia repair, a full arsenal of medical instruments is needed for the purpose of high-quality and rapid surgical intervention. The quality of the operation depends on the choice of a suitable and convenient needle holder. More than 30 types of medical needle holders are known. For suturing the anterior abdominal wall, a conventional Mayo-Gegara needle holder is often used. The well-known medical needle holder is considered a direct classic needle holder. It can

be made with different lengths and widths of handles, as well as different notches on the sponges [33].

A.V. Vlasov (2013) improved the well-known Mayo-Gegar needle holder by beveling the intersecting branches at an angle of 45 degrees from left to right to the horizontal plane of the needle holder [32].

However, this medical instrument also brings some inconvenience when fixing the mesh implant to the aponeurosis of the anterior abdominal wall. It is necessary to improve the existing needle holders in order to increase the stability of the tool fixation and increase the ease of use.

After the endoprosthesis is fixed to the aponeurosis, a wide mobilization of the skin-fat flap is performed, which makes it possible to assess the condition of the tissues around the aponeurosis defect, to identify additional hernial gates and weak areas [152]. The use of abdominoplasty in patients with ADHD and obesity improves the course of the postoperative period, reduces the number of complications and gives better immediate and long-term results [13, 14, 28, 115, 155, 210]. Removal of a significant amount of adipose tissue in the abdominal area is the prevention of recurrence of postoperative hernias. As the integrity of the aponeurosis is restored, the silhouette of the figure is improved, relative comfort is created without eliminating the main cause of obesity [65, 75, 155, 182, 211]. The main advantages of abdominoplasty are [115]:

- * the possibility of removing a large fat mass with an excessive sagging skin flap, a stretched, rough postoperative scar;

- * the possibility of performing abdominoplasty in the epigastric region with the creation of a muscular-aponeurotic corset with a significant reduction in the waist circumference by tens of centimeters (with other types of abdominoplasty, there is a significant excess of skin in the epigastric region, which persists even with additional deep sutures);

Many authors agree that obesity is the dominant factor in the development of postoperative hernias, and only a small number of surgeons note the need to remove the skin-fat apron during ventral herniation [26, 115, 151, 155, 192]. In the literature, there is no logical

explanation based on clinical studies of the need and feasibility of supplementing ventral herniation with abdominoplasty.

Complications in the surgical treatment of POVH

The effectiveness of surgical treatment of patients with large and giant ventral hernias depends on the frequency of possible postoperative complications, both in the immediate and in the separated period, the presence or absence of relapses of the disease, and quality of life indicators [50, 91, 234].

Postoperative complications after open extensive hernioplasty are divided into general and local [57]:

1. General:

- due to increased intra-abdominal pressure (pulmonary embolism, respiratory and cardiovascular failure, paresis of the gastrointestinal tract, etc.);

- unrelated to the increased intra-abdominal pressure (allergic conditions, pyelonephritis, SARS, etc.);

- extraabdominal (thrombophlebitis, pyelonephritis, etc.);

- intra-abdominal (purulent-inflammatory complications, gastrointestinal bleeding, acute intestinal obstruction, generalized peritonitis, etc.);

2. Local:

- without generalization of purulent infection (seroma, hematoma, infiltrates, suppuration, marginal necrosis of the skin, divergence of the wound edges);

- with generalization of the process (phlegmon, sepsis, etc.).

Hypoventilation is the main cause of pulmonary complications after plastic surgery of large defects of the anterior abdominal wall [236, 237]. Intestinal paresis usually occurs as a result of massive adhesiolysis and is eliminated conservatively [1]. According to some authors, the "non-tensioning" method of plastic surgery can promote adhesion in the abdominal cavity with the development of intestinal obstruction [86, 92]. V. N. Egiev states that the nature of postoperative complications depends

on the location of the endoprosthesis [47, 93, 204, 221]. With the "onlay" method, the greatest number of wound complications occurs in the form of suppuration of the operating wound, the formation of seromas, infiltrates, ligature fistulas, and lymphorrhea [47, 68, 80, 101, 199, 201, 202, 222, 231]. Infectious and inflammatory complications in the form of suppuration of a postoperative wound, according to various authors, occur in 6-12% of cases [15, 26, 33, 68, 80, 145, 158, 180].

First of all, such indicators are caused by excessive mobilization of the subcutaneous fat flap. Large perforant vessels pass along the lateral edges of the rectus abdominis, and their damage leads to ischemia, and sometimes necrosis of the wound edges [26, 86, 182, 202]. Predisposing factors to suppuration are also: persistent infection, obesity, diabetes, immunosuppression, long-term volumetric surgery [81, 86, 153, 184, 186, 206].

Some surgeons, predicting the risk of suppuration, divide the POVH into 3 groups: conditionally clean (without suppuration in the past), contaminated (with a history of purulent process) and infected (with a purulent focus at the time of admission) [67, 86, 154, 169, 183, 216, 222]. According to some authors, even adequate antibiotic prophylaxis, conducted antibiotic therapy, do not always provide satisfactory results, leading to infectious and inflammatory complications, which in turn is the main cause of relapse of the disease [86]. A. Garavello and L. Avtan analyzing the results of alloplasty of the anterior abdominal wall, they came to the conclusion that the relief of purulent-inflammatory complications in the postoperative wound, especially in persons suffering from diabetes mellitus, obesity, is possible only with the removal of the explant [86].

One of the most effective ways to prevent purulent-inflammatory wound complications is the use of the active drainage system Redon [47, 86]. Negative pressure in the wound contributes to the convergence of its edges, a reduction in the residual cavity, a better outflow of blood and wound exudate, and makes it possible to control reparative processes [66]. N. A. Baulin, using the method of active drainage of a postoperative

wound, reduced the frequency of suppuration by 2.4 times [86]. However, T. J. White, after analyzing the results of treatment of 99 patients, found that the presence of a drainage tube contributes to infection of the wound, but at the same time, he argues that the produced fluid, being a favorable environment for the development of microorganisms, should be removed [86].

Postoperative wound seroma is formed as a result of intraoperative trauma associated with the intersection of the capillaries of the lymphatic system and close contact of the implant with the surrounding tissues. To prevent this complication in the early postoperative period, it is recommended to wear an elastic compression bandage [47, 86, 208, 213, 215, 219, 233]. In the open combined "non-tensioning" technique of alloplasty of large and giant hernias of the abdominal wall, it is necessary to separate the endoprosthesis with a large omentum from the abdominal cavity, and with the walls of the hernial sac - from the subcutaneous fat. On the one hand, this reduces the risk of formation of the adhesive process, on the other hand, it prevents postoperative complications (infection of serous exudate, lymphorrhea, etc.). However, when applied, the so-called "dead" space remains between the walls of the hernial sac and the implant, in which exudate accumulates, which later leads to infection and abscission. In this case, without repeated surgery and removal of the infected endoprosthesis, as a rule, it is impossible to do [16, 55, 109, 148, 159, 213].

In order to prevent the formation of "dead" spaces between the endoprosthesis and the walls of the hernial sac, Chemyanov G. S. suggests using latex tissue glue (LTG) [5, 165]. LTG is biologically inert, has high adhesiveness and hydrophilicity, easily permeates the surface layers of tissues and quickly polymerizes. Due to the content of chlorhexidine, the glue has bactericidal properties. Aminocaproic acid, which is part of the LTG, provides a hemostatic effect. The sterile LTG is applied in a thin layer to the endoprosthesis, and is kept for 3 to 5 minutes. After the glue has become transparent, the allograft is covered with the walls of the hernial sac, achieving mutual matching and bonding of the surfaces.

Additional fixation with single nodal seams is allowed. An important condition for the use of LTG is adequate hemostasis in the wound. Otherwise, the LTG is diluted with hemorrhagic separable, with the loss of adhesive properties of the glue [165].

In the treatment of patients with large and giant ventral hernias, one of the most severe complications is ACS or "small abdominal syndrome" (Betzner syndrome). It occurs in connection with a sharp increase in IAP, due to the reduction of the contents of the hernial sac in the abdominal cavity, and leads to severe hemodynamic disorders [28, 30, 37, 105, 108, 134, 171]. Normally, the pressure in the abdominal cavity of about 0 mm Hg, IAH is observed in healthy people, but it is short-term: during weight lifting, defecation, laughing, jumping [120, 122, 161] and does not have a negative effect. An increase in IAP of more than 10 mm Hg with a negative systemic effect indicates intra-abdominal hypertension [119]. The following parameters affect intra-abdominal pressure: the degree of tension and weight of the abdominal wall, hydrostatic and atmospheric pressure, the degree of filling of the vascular bed and filling of the gastrointestinal tract, the tone of the abdominal organs and the degree of mobility of the diaphragm, volumetric pathological processes in the abdominal cavity and beyond. M.E. Ivy gives a key role in increasing intra-abdominal pressure to the tension of the abdominal muscles, M.L.N.G. Malbrain allocates hypothermia, acidosis, hypervolemia [126]. An increase in IAP is not immediately accompanied by the development of abdominal compartment syndrome, so the exact value of IAP at which the syndrome begins remains a matter of debate [94, 114, 150, 170]. M. Sugrue considers an intra-abdominal pressure of 30 mm Hg sufficient for organ dysfunction [126].

M. R. Karakozov states that in patients with IAP greater than 35 mm Hg, ACS develops in 100% of cases and is fatal in 100% of cases without surgical intervention [42]. A. I. Cherepanin notes that the higher the rate of IAP increase, the greater the risk of developing ACS [95].

For clinical use, the classification of M. Schein [126] is proposed, which distinguishes between:

1) moderate IAH- 10-20 mm Hg with minor physiological changes and good compensation, conservative treatment may be necessary;

2) the average IAH - 21-35 mm Hg, which requires conservative treatment and may need surgery;

3) severe IAH-more than 35 mm Hg, requiring surgical decompression.

J. Burch and M. Sugrue (1996) offer their own scale of IAP gradation depending on the degree and offer recommendations on the tactics of therapeutic measures [126]:

1st degree - 10-15 cm water column;

2nd degree - 15-25 cm water column;

3rd degree - 25-35 cm water column;

4th degree - more than 35 cm water column.

In 1993, J. A. Morris proposed the most commonly accepted triad that defines ACS [126]:

- acute increase in IAP more than 20-25 mm Hg (27.2-34 cm Hg);

- development of organ dysfunction or the occurrence of severe complications of an operating wound;

- positive effect of abdominal decompression.

ACS affects almost all organs and systems. An increase in IAP leads to a slowdown in blood flow through the inferior vena cava and congestion in it. The upward displacement of the diaphragm and the increase in intra-thoracic pressure are transmitted to the heart and blood vessels, which leads to a decrease in the pressure gradient, a restriction of diastolic filling of the ventricles, an increase in pressure in the pulmonary capillaries, a decrease in the ejection fraction and venous return [42, 146].

An increase in intra-thoracic pressure due to the dislocation of the diaphragm, leads to a violation of respiratory activity. Hypoxemia, hypercapnia, and respiratory acidosis develop [42, 146]. As a rule, decompensation of the respiratory system occurs quite quickly, which requires the transfer of the patient to an artificial lung ventilation device (ventilator). Respiratory disorders are important in diagnostic terms, since they precede other clinical manifestations [19, 42].

Reduced renal blood flow leads to reduced renal filtration and renal failure. Oliguria occurs when IAP is more than 15 mmHg, and anuria is more than 35 mm Hg [146]. Violation of the outflow of blood from the brain, due to intra-thoracic hypertension, leads to increased intracranial pressure, dyscirculatory phenomena, hypoxia and brain edema [19, 41, 42, 111, 137]. In IAH, more than 15 mm Hg leads to a deterioration of blood circulation in all organs of the abdominal cavity. The first to undergo changes in the gastrointestinal tract. Edema of the intestinal mucosa, ischemia with subsequent translocation of microflora into the abdominal cavity and systemic blood flow lead to abdominal sepsis [20, 143, 144]. IAH also impairs blood supply to the anterior abdominal wall and slows down reparative processes [142].

A decrease in the cardiac output fraction and oliguria force us to resort to massive infusion therapy, which in turn exacerbates the deposition of fluid in the interstitial space, increases intestinal edema, and contributes to an even greater increase in IAP, closing a vicious pathogenetic circle. There are direct and indirect methods for measuring intra-abdominal pressure. Direct-refers to the direct measurement of pressure in the abdominal cavity, for example, during laparoscopic surgery. In 1947, S. E. Bradley proposed to consider the abdomen as a reservoir filled with liquid, and therefore, according to Pascal's law, the pressure on the surface of the liquid and in all its departments is the same value. Consequently, the level of IAP can be measured in any part of the abdomen – the bladder [46, 123], stomach [117], rectum [116, 162]. Currently, the most popular method, due to its simplicity, has acquired the method of measuring IAP in the bladder, using a Folley catheter, a tee with a transparent tube and a ruler [47, 106, 124, 126, 140, 182].

In order to prevent ACS, IAP measurement should be performed before surgery, on time and in the postoperative period [112, 133, 147, 166]. An important point in the treatment of compartment syndrome is surgical decompression of the abdominal cavity, which must be performed in all patients with the 4th degree of IAH and in some patients

with 2-3 degrees in the presence of organ dysfunction. [19, 42, 78, 150, 166, 172].

It should be remembered that sudden decompression can lead to hypotension, pulmonary embolism (PE), and asystole [147]. In the treatment of patients with extensive ventral hernias, ACS can be prevented by performing plastic surgery "without tension" or by conducting training in the preoperative period [8, 107]. The most rational combination of both approaches [148].

The classification of Ya.E. Lvovich, based on the "relative size of the hernia" (RSH), helps to choose the correct method of hernioplasty. Its essence is to calculate the ratio of the volume of the hernial sac to the volume of the abdominal cavity, and is calculated by the formula: $RSH = V_{hr.} / V_{a. cavity} * 100 (\%)$, where $V_{hr.}$ - the volume of the hernia, and $V_{ad. cavity}$ - the volume of the abdominal cavity, which are determined according to the method proposed by V. A. Chertovskikh [126].

The classification proposed in 2004 by A. S. Ermolov [52] is more modern and is based on magnetic resonance hernioabdominometry data: small hernia-relative volume from 1 to 5%, medium - from 5.1 to 14%, large - from 14.1 to 18%, giant - more than 18%. However, the main factor in determining the method of plastic surgery remains the level of IAP. Dynamic control of IAP is performed before surgery, taking this indicator as normal, during surgery, after comparing the edges of aponeurosis and in the postoperative period. Krasilnikov considers it possible to perform plastic surgery with tension at a pressure in the abdominal cavity not exceeding 20 mm of water [86].

M. Aster reports that with IAP up to 12 mm Hg, autoplasmic closure of the aponeurosis defect can still be performed [86]. In case of exceeding the permissible threshold, it is necessary to perform plastic without tension. Taking into account the severity of the condition and the high level of mortality in patients with Betzner syndrome, a number of authors recommend conducting comprehensive preoperative preparation in 4

areas: identification of concomitant pathology, assessment of reserves of the respiratory and cardiovascular systems, identification of concomitant surgical diseases requiring simultaneous surgical correction, preparation of the anterior abdominal wall for surgery [25, 86, 137, 163].

The complex of preoperative preparation includes correction of body weight, in patients suffering from obesity, normalization of glucose levels, in patients with diabetes mellitus, long-term wearing of a compression bandage, respiratory gymnastics [25, 44, 206].

V. G. Grankin [33, 146] identifies 3 groups of methods aimed at adapting the patient to an increase in IAP:

1. Creating increased intra-abdominal pressure by conservative and operative methods;
2. Reducing the volume of the gastrointestinal tract;
3. Increase the volume of lung ventilation.

In the long-term postoperative period, one of the most frequent complications of the treatment of large and giant ventral hernias is a relapse of the disease. The basis of relapse is the dislocation of the mesh endoprosthesis [31, 115, 163]. Early pregnancy, excessive physical activity also plays an important role in this process [33, 129]. V. N. Egiev notes the main causes that provoke a relapse of the disease in alloplasty of extensive ventral hernias [47]:

1. Incorrect, weak hemming of the mesh leads to rapid separation of the mesh when coughing, physical exertion.
2. The pronounced tension when sewing the mesh increases the force acting on the threads, and can lead to "cutting " of the fabrics.
3. Sewing the mesh too close to the altered edges of the defect, which are under constant tension, leads to prolonged scar formation and again to the possibility of tissue eruption.
4. Progressive atrophy of the muscles in the place to which the mesh is sewn, with a corresponding displacement of the mesh and a relapse at the place of atrophy.

5. Violation of the prescribed regimen by patients and return to active physical activity in the early stages after surgery, when a sufficiently strong scar has not yet formed that holds the mesh. At the same time, apparently, there is also a partial separation of the grid.

6. Concomitant pathology, which leads to a sharp increase in intra-abdominal pressure in the early stages after surgery.

There are still no generally accepted standardized measures for the prevention of hernia recurrence. Some surgeons consider the primary healing of the postoperative wound to be the main condition for the absence of relapses [34, 159, 164], while others consider the quality of the suture material and the mesh endoprosthesis [36, 115, 129, 163]. A number of researchers see the main reason for relapses in the wrong choice of the method of plastic surgery of the anterior abdominal wall [16, 19, 27, 81].

Thus, the issues of preventing the recurrence of the disease in the treatment of patients with hernias of the anterior abdominal wall remains very much in demand. The assessment of immediate and separated results of surgical treatment, as well as the quality of life, will determine the choice of the best treatment tactics, an adequate method of abdominoplasty, and form an effective program for preoperative preparation and postoperative management of patients with ventral hernias.

Modern ideas about the quality of life

The main objectives of surgical treatment of patients with POVH at present are not only to exclude relapses of the disease, but also to improve the quality of life of patients after surgery.

The MOS SF-36 questionnaire is the most common and widely used in both population-based and specialized quality of life studies, including surgery [112, 174]. Item Short-Form Health Survey (MOS SF-36) created at The Health Institute, New England Medical Center, Boston, USA, includes 36 items, of which 35 form 8 quality of life scales. The different

scales combine from 2 to 10 points, with each point being used by only one specific scale. The value of each scale is expressed in points and ranges from 0 to 100, where 0 is the worst value of quality of life, and 100 is the best [103, 112, 124, 174].

The EuroQol general questionnaire (EQ-5D), consisting of two parts, is quite popular. The first one analyzes five indicators: mobility, activity in everyday life, self-care, pain or discomfort, anxiety or depression. The results of the responses can be presented both as a profile of the patient's "health status" EQ-5Q-profile, and as a quantitative indicator of the "health index" EQ-5Q-utility. The second part of the questionnaire is a vertically graded visual-analog scale, on which 0 means the worst, and 100 – the best state of health of the patient [112, 124].

The main characteristics of the most common questionnaires for assessing the quality of life:

1. Sickness Impact Profile:

a. Physical – the ability to self – care, mobility, independence from bed rest.

b. Psychosocial-social contacts, participation in public life, the level of anxiety in behavioral reactions. Other aspects: sleep, rest, eating, work, household management, leisure activities.

2. Nottingham Health Profile: contains six main sections that reflect the following aspects: pain, physical ability, sleep, emotional responses, energy, social isolation. Six additional sections that reflect the impact of health on work, household management, relationships with other people, personal life, sex life, favorite activities, hobbies, and outdoor activities.

3. Quality of Well Being Index: measuring the actual activity and preferences of patients. The following aspects are considered: the degree of self-service, social activity, the most important symptoms of the disease, the main psychological indicators.

4. Quality of Life Index: consists of five sections, including activity, self-service level, perception of your health status, and health prospects.

Examples of special questionnaires in gastroenterology, as one of the sections of surgery, are: IBS-QoL, IBDQ, QLDUP and others.

Most studies use general questionnaires, which does not always meet the needs of the modern concept of quality of life research [50, 103, 124].

The questionnaires are subjected to strict requirements, such as:

1. universal - cover all health parameters;
2. reliable-record individual health levels in different respondents;
3. sensitive to clinically significant changes in the health status of each respondent;
4. reproducible (test-retest);
5. easy to use and concise;
6. standardized-offer a single version of standard questions and answers for all groups of respondents;
7. evaluative - to give a quantitative assessment of health parameters.

In this regard, an integral element of modern medicine is the study of the quality of life of patients who have undergone surgery for postoperative ventral hernias. The quality of life of patients is assessed by subjective and objective criteria in the immediate and long-term postoperative periods. In patients with surgical pathology, including people suffering from large and giant ventral hernias, the quality of life is one of the main indicators of the effectiveness of the method of treatment [175].

The study of the quality of life is a new modern methodology of surgery, which highlights the main points of surgical treatment related to the preparation of patients for surgery in the preoperative period, the choice of the method of hernioplasty and the management of patients in the postoperative period. The study of the quality of life allows us to evaluate the results of treatment of patients, complementing traditional methods.

Conclusion of the chapter

The analysis of the current literature shows that the problem of treatment of patients with postoperative ventral hernias is currently not fully studied and is very relevant. Despite a significant number of works devoted to the surgical treatment of ventral hernias, the solution of the problem of preventing the recurrence of the disease in the treatment of patients with hernias of the anterior abdominal wall remains very relevant.

The literature indicates that the trend of treatment of postoperative hernias and prevention of relapse is based on the restoration of the strength of the anterior abdominal wall, physical rehabilitation in the postoperative period and the implementation of a cosmetic effect. Given this, the choice of the operation method is still an urgent problem. The modern concept dictates the need to close the hernial defect by combined methods using mesh implants, which ensures the restoration of the function of the anterior abdominal wall.

To these days, for surgeons, the main problem is the assessment of the immediate results of treatment of patients with postoperative ventral hernias. Since the surgical treatment of patients with ventral hernias has a comprehensive impact on the physical, mental and social condition of the patient, it is important to assess the long-term results and analyze the quality of life.

CHAPTER II.

CLINICAL MATERIAL AND APPLIED RESEARCH METHODS

General characteristics of the clinical material

The study is based on a clinical and laboratory examination of 217 patients with postoperative primary and recurrent ventral hernias, who were operated on in the surgical departments of the 1st and 2nd clinics (Research Center for Pediatric Surgery: Chief Physician, Doctor of Medical Sciences Zh. A. Shamsiev) Samarkand State Medical Institute for the period from 2009 to 2017. All patients were operated on as planned.

The patients were divided into two groups:

1 - comparison group – 135 patients (2009-2014), who, depending on the type of hernioplasty, were divided into two subgroups: 1 subgroup consisted of 38 (28.1%) patients with minor aponeurosis defects who underwent tension autogernioplasty; 2 subgroup consisted of 97 (71.9%) patients who underwent allogernioplasty with aponeurosis defect suturing (tension) – 29 (21.5%) and without suturing (non – tension) - 68 (50.4%) patients. In the comparison group, standard measures for preoperative preparation were applied, taking into account the main indicators of the functional state of the gastrointestinal tract, cardiovascular and respiratory systems, including preparatory banding of repairable hernias (W_{2-4}) using a conventional bandage for 5-14 days.

2-the main group – 82 patients (2015-2017), divided into subgroups according to the same principle (autoplasty and alloplasty), but in the treatment of which an improved algorithm was used to select the optimal method of surgical treatment of POVH, taking into account the implemented tactical and technical aspects:

- preoperative preparation according to the traditional scheme, but with the use of improved pneumobandage for large hernias (W₂₋₄) (the proposed method received a positive decision of the Agency for Intellectual Property of the Republic of Uzbekistan, №. IAP 20160046 of 18.02.2016);

- autoplasty with duplicate sutures in the modification of the clinic for small hernias (W1) (the proposed method received a positive decision of the Agency for Intellectual Property of the Republic of Uzbekistan, No. IAP 20180045 of 31.01.2018);

- the use of an improved needle holder when performing allogernioplasty in patients with large hernias and concomitant obesity of 2-3 degrees (the patent of the Agency for Intellectual Property of the Republic of Uzbekistan for utility Model No. FAP 01325 of 19.09.2018 was obtained for the proposed method);

- other distinctive aspects of the tactic taken in the main group were: the expansion of the indications for performing DLE with a sagging abdomen of 3-4 degrees; the addition of the operation by dissecting planar adhesions on intestinal loops (viscerolysis), linking the latter with the omentum and parietal peritoneum into a single conglomerate for the prevention of postoperative adhesive intestinal obstruction;

- In general, the developed algorithm for choosing the optimal method of treatment of POVH (No. DGU 03724 of 17.05.2016) was used in the main group for these improved tactical and technical aspects. Also, in the comparative analysis, an improved score assessment of the quality of life of patients after hernioplasty was used (No. DGU 05632 of 11.09.2018).

The distribution of patients in the comparison groups according to the main distinguishing features is presented in Tables 2., 3. and Fig. 1.

Table 2

Distribution of patients by comparison groups

Difference factor	Comparison group (n=135)		Main group (n=82)	
	abs.	%	abs.	%
Comparison of autogernioplasty results	38	28,1%	24	29,3%
Comparison of allogernioplasty results	97	71,9%	58	70,7%
Preoperative preparation using pneumobandage	0	0	52	63,4%
Application of the advanced needle holder	0	0	28	34,1%
Application of a modified duplicate seam	0	0	24	29,3%
Addition of the main stage of the operation with viscerolysis			21	25,6%
Extension of the indications for DLE with a saggy abdomen 3-4 days	17	12,6%	23	28,0%
Application of the developed tactical algorithm	0	0	82	100,0%
Application of the program for assessing the quality of life after surgery	92	68,1%	64	78,0%

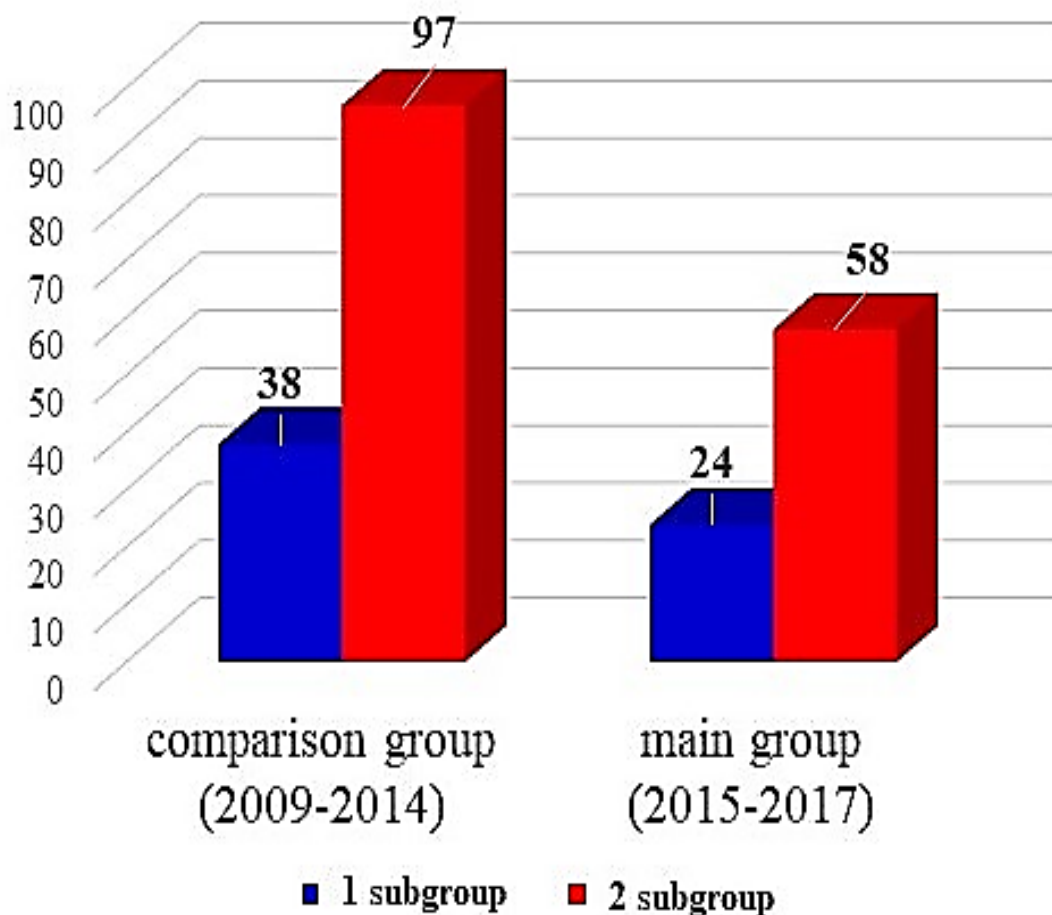


Fig. 1. *Distribution of patients into study groups*

Table 3

Distribution of patients by type of hernioplasty

Type of operation	1-subgroup		2-subgroup		Total	
	abs	%	abs	%	abs	%
<i>Comparison Group</i>						
Tensioning methods of plastics	38	28,1%	29	21,5%	67	49,6%
Plastic by Sapezhko	21	15,6%	0	0,0%	21	15,6%
Mayo Plastic Surgery	17	12,6%	0	0,0%	17	12,6%
Plastic surgery with duplicate stitches in the clinic modification	0	0,0%	0	0,0%	0	0,0%
Implantation of the "onlay" endoprosthesis with suturing of the defect	0	0,0%	29	21,5%	29	21,5%

Monograph

Non-strenuous methods	0	0,0%	68	50,4%	68	50,4%
Implantation of the "onlay" endoprosthesis without suturing the defect	0	0,0%	51	37,8%	51	37,8%
Implantation of the "onlay" endoprosthesis without suturing the defect + DLE	0	0,0%	17	12,6%	17	12,6%
Implantation of the "onlay" endoprosthesis without suturing the defect with the mobilization of the vaginas of the rectus abdominis muscles according to Ramirez + DLE	0	0,0%	0	0,0%	0	0,0%
Total	38	28,1%	97	71,9%	135	100%
<i>Main group</i>						
Tensioning methods of plastics	24	29,3%	20	24,4%	44	53,7%
Plastic by Sapezhko	0	0,0%	0	0,0%	0	0,0%
Mayo Plastic Surgery	0	0,0%	0	0,0%	0	0,0%
Plastic surgery with duplicate stitches in the clinic modification	24	29,3%	0	0,0%	24	29,3%
Implantation of the "onlay" endoprosthesis with suturing of the defect	0	0,0%	20	24,4%	20	24,4%
Non-strenuous methods	0	0,0%	38	46,3%	38	46,3%
Implantation of the "onlay" endoprosthesis without suturing the defect	0	0,0%	15	18,3%	15	18,3%
Implantation of the "onlay" endoprosthesis without suturing the defect + DLE	0	0,0%	12	14,6%	12	14,6%
Implantation of the "onlay" endoprosthesis without suturing the defect with the mobilization of the vaginas of the rectus abdominis muscles according to Ramirez + DLE	0	0,0%	11	13,4%	11	13,4%
Total	24	29,3%	58	70,7%	82	100%

Of the 217 patients, 66 (30.4%) were men and 151 (69.6%) were women (Table 4).

Table 4.

Distribution of patients by gender

Group of patients	Gender of patients					
	Men		Women		Total	
	absolute	%	absolute	%	absolute	%
Comparison Group	41	30,4	94	69,6	135	62,2
Main group	25	30,5	57	69,5	82	37,8
Total	66	30,4	151	69,6	217	100,0

Age distribution: under 45 years – 40 (18.4%), 46-59 years – 121 (55.8%), 60-74 years - 52 (24%), 75-90 years – 4 (1.8%) (Fig. 2).

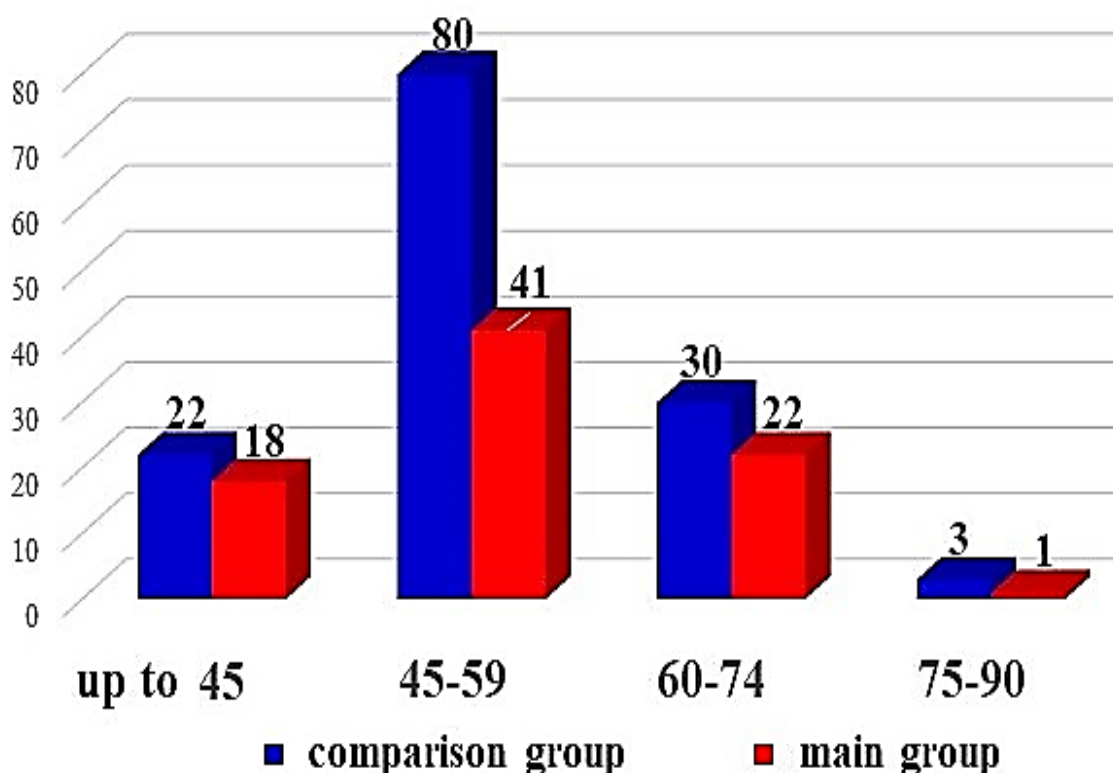


Fig. 2. *Distribution of patients by age*

All patients underwent anthropometry with the identification of body weight, which was important for determining the choice of surgical tactics. Overweight was assessed according to the classification proposed

by WHO (World Health Organization) experts [45]. Of the 217 patients, 8 (3.7%) patients had normal body weight and 209 (96.3%) patients were obese and overweight (Table 5).

Table 5.

Distribution of patients by severity of body weight

BMI (kg/m²) for the Asian population	Patient groups					
	Comparison Group (n=135)		Main group (n=82)		Total (n=217)	
	<i>absolute</i>	<i>%</i>	<i>absolute</i>	<i>%</i>	<i>absolute</i>	<i>%</i>
Normal body weight (18,5–22,9)	5	3,7%	3	3,7%	8	3,7%
Overweight (23,0– 27,4)	33	24,4%	20	24,4%	53	24,4%
Grade I obesity (27,5–32,4)	50	37,0%	31	37,8%	81	37,3%
Grade II obesity (32,5–37,4)	26	19,3%	15	18,3%	41	18,9%
Grade III obesity (>37,5)	21	15,6%	13	15,9%	34	15,7%
Total	135	100,0%	82	100,0%	217	100,0%

In the study groups, 197 patients had uncomplicated forms of hernial protrusion and 20 patients had such a complication as non-rightness (Table 6.). In our observations, such complications as hernia infringement and inflammation of the hernial sac were not observed.

Table 6.

Distribution of patients in the study groups depending on the clinical course

Types of hernias	Patient groups					
	Comparison Group (n=135)		Main group (n=82)		Total (n=217)	
	absolute	%	absolute	%	absolute.	%
Recoverable	123	91,1%	74	90,2%	197	90,8%
The undefeated	12	8,9%	8	9,8%	20	9,2%

Among the concomitant pathologies, cardiovascular diseases were common in 83.4% of cases, respiratory system pathology in 22 (10.1%) patients, varicose veins of the lower extremities in 29 (13.4%) patients, and diabetes mellitus in 12 (5.5%) patients. The frequency of concomitant pathology in the study groups is shown in Table 7.

Table 7.

Distribution of patients by concomitant pathology

Indicators	Patient groups					
	Comparison Group (n=135)		Main group (n=82)		Total (n=217)	
	<i>absolute</i>	<i>%</i>	<i>absolute</i>	<i>%</i>	<i>absolute</i>	<i>%</i>
Hypertension	79	58,5	48	58,5	127	58,5
Coronary heart disease	33	24,4	21	25,6	54	24,9
Chronic obstructive pulmonary disease	14	10,4	8	9,8	22	10,1
Diabetes mellitus	7	5,2	5	6,1	12	5,5
Varicose veins of the lower extremities	20	14,8	9	11,0	29	13,4

The most important factors determining surgical tactics are the location of the hernia, the size of the defect and the presence of a history

of relapses. According to the classification, Chervel J. P. and Rath A.M. (1999), 83 (38.2%) patients had large (W_3) and giant (W_4) hernias. The distribution of patients according to the location of the hernia, the size of the defect and the number of relapses is shown in Table 8.

The vast majority of patients (155 – 71.4%) had supra-umbilical (M_1) and peri-umbilical (M_2) hernias. The smallest number of patients was with lateral (L) 15 (6.9%) and combined (M+L) 5 (2.3%) ventral hernias. Of the 217 patients, 168 (77.4%) had primary (R_0) and 49 (22.6%) patients had recurrent (R_n).

Table 8

Distribution of patients according to the classification of Chervel J. P. and Rath A.M.

Indicators				Comparison Group (n=135)		Main group (n=82)		Total (n=217)	
				abs	%	abs	%	abs	%
S	M	M_1	over-the- navel	47	34,8%	25	30,5%	72	33,2%
		M_2	pericupial	53	39,3%	30	36,6%	83	38,2%
		M_3	sub-navel	24	17,8%	16	19,5%	40	18,4%
		M_4	suprapubic	1	0,7%	1	1,2%	2	0,9%
	L	L_1	subcostal	5	3,7%	4	4,9%	9	4,1%
		L_2	cross sections	0	0,0%	0	0,0%	0	0,0%
		L_3	the iliac	3	2,2%	3	3,7%	6	2,8%
		L_4	lumbar spine	0	0,0%	0	0,0%	0	0,0%
		ML	combined	2	1,5%	3	3,7%	5	2,3%
	W	W_1	less than 5 cm	38	28,1%	22	26,8%	60	27,6%
W_2		from 6 to 10 cm	51	37,8%	28	34,1%	79	36,4%	
W_3		from 11 to 15 cm	29	21,5%	19	23,2%	48	22,1%	
W_4		more than 15 cm	17	12,6%	13	15,9%	30	13,8%	
R	R_0	post-operative surgery	104	77,0%	64	78,0%	168	77,4%	
	R_1	first relapse	19	14,1%	10	12,2%	29	13,4%	
	R_2	second relapse	11	8,1%	7	8,5%	18	8,3%	
	R_3	third relapse	1	0,7%	1	1,2%	2	0,9%	

Research methods.

Checkup of patients.

Clinical method. Clinical method. Ventral hernias are characterized by the presence of hernial protrusion in the area of the defect of the muscloponeurotic layer of the anterior abdominal wall, manifest pain and dyspeptic disorders, which leads to a decrease in physical activity and working capacity of the patient.

In the vertical and horizontal positions (Fig. 3, 4), the size of the hernia formation, its contents, the degree of reduction, the presence of old postoperative scars, ligature fistulas, maceration and dermatitis were determined during the examination. The size of the hernial gate in the longitudinal and transverse directions was studied in the case of rectified ventral hernias.

When collecting anamnesis, the term of herniation was found out, whether there were infringements, the nature and number of previous operations, the presence of postoperative complications, the method of previously performed plastic surgery for relapse and the time of relapse.



Fig. 3. *View of the anterior abdominal wall of the patient M.*

№ IB 2011/143 with POVH in an upright position (left fas).



Fig. 4. *View of the anterior abdominal wall of the patient M.*

№ IB 2011/143 with POVH in an upright position (profile).

Patients underwent anthropometry, including measurement of body weight, height, and calculation of body mass index.

The immediate results of treatment of ventral hernias were retrospectively and prospectively studied in all patients. The clinical assessment of the course of the early postoperative period was carried out.

Laboratory methods.

General blood tests (Abacus junior "B" hematological analyzer, Switzerland) and urine tests were performed in all patients, blood group and Rh factor were determined, blood tests were performed for the Wasserman reaction, hepatitis "B" and "C", and HIV infection.

The following biochemical parameters were determined: total blood protein (according to indications - protein fractions), bilirubin, transaminases, urea, creatinine, blood electrolytes (biochemical analyzer "Stat Fax 3300", USA).

The assessment of the coagulation and anticoagulation systems was carried out by the number of platelets, fibrinogen indicators, international normalized ratio, clotting time and duration of bleeding; according to the indications, a coagulogram was performed.

Blood glucose was determined in all patients, in diabetes mellitus, the presence of sugar and acetone in the urine was additionally determined, and daily monitoring of blood glucose was performed.

Instrumental research methods.

a) ECG patients were performed in the clinic. In the hospital, before the operation, according to the indications, a second ECG study was conducted in patients who received medication for the correction of concomitant cardiovascular pathology (electrocardiograph "ECG-EK-1T-07"). The study of external respiratory function was used according to the indications in outpatient settings in patients with the size of a hernia W_3 and W_4 and the presence of severe cardiovascular and pulmonary pathology.

b) X-ray method. X-ray examination of the chest organs was performed in all patients at the outpatient stage of the examination. In the case of "chronic" intestinal obstruction in patients with ventral hernias W_3 and W_4 , according to the indications, an X-ray examination of the gastrointestinal tract was performed (overview X-ray of the abdominal cavity and X-ray contrast study). According to the indications, a computed tomography (tomograph "Toshiba") was performed.

c) Endoscopic method. The following endoscopic examinations were performed: fibrogastroduodenoscopy, rectoromanoscopy, and fibrocolonoscopy. We used fibrogastroduodenoscopes from Olympus (Japan) and a fibrocolonoscope from Pentax. Indications for endoscopic examinations were complaints of patients with various dyspeptic disorders during hospitalization.

d) Ultrasonic method. d) Ultrasonic method. In the preoperative period, ultrasound was performed on an outpatient basis in all patients to identify concomitant surgical pathology of the abdominal cavity. In the postoperative period, ultrasound was used according to the indications in order to assess the course of the wound process and identify complications. The Aloka-500 and Sim 7000 ICFM CHALL devices were used.

e) Computed tomography (CT) was performed in patients with POVH in the main group of patients aged 26 to 79 years. The scan was performed on a computer tomograph "Toshiba Medical Systems", (Japan). The study was carried out in transverse and frontal projections with the acquisition of T_1 - and T_2 - weighted images.

e) Intravesical strain gauge. For hernia sizes W_3 and W_4 , intraoperative monitoring of IAP was performed indirectly by measuring the pressure in the bladder. The measurement method was carried out as follows. A Foley catheter was inserted into the bladder and completely emptied. Then 50-100 ml of sterile saline solution was injected into the bladder, the catheter was closed with a clamp distal to the measurement site and the infusion system was connected. Using a ruler from the level of the pubic symphysis, the fluid column in the urinary catheter was

measured. The initial pressure was measured, after suturing the aponeurosis and after suturing the skin. Normally, the IAP is 5-6.5 mm Hg (8.8 cm of water).

The level of IAP was measured in cm of water, the values of the digital data were translated into mmHg by the formula $P \text{ mmHg} = P \text{ cm of water} / 1.36$. An IAP score above 12 mm Hg was considered intra-abdominal hypertension (IAH) (Figure 5).

To determine the degree of IAH, we followed the classification of J. Burch (1996) [113].

Classification of "abdominal compartment syndrome" by J. Burch:

Norm – up to 8 mm Hg.

I degree-IAP 8-11 mm Hg.

II degree-IAP 11-19 mm Hg.

III degree-IAP 19-26 mm Hg.

IV degree – IAP 26 mm Hg. and more.

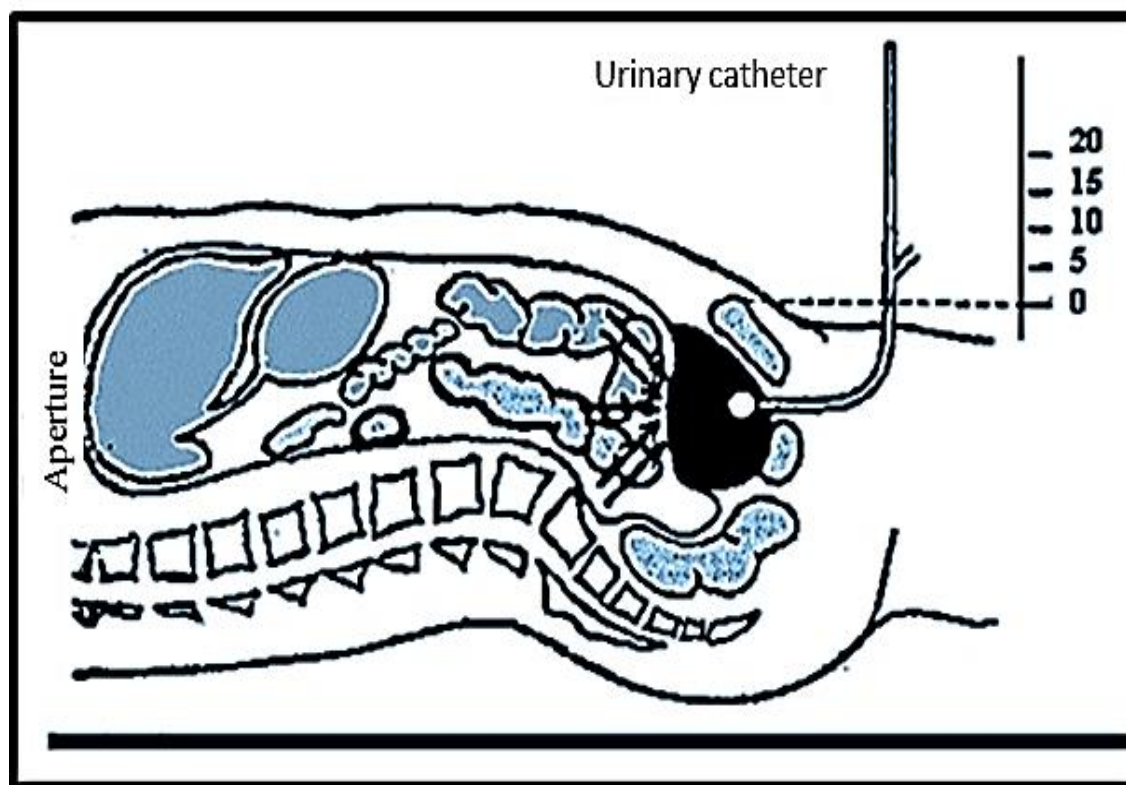


Fig. 5. *The scheme of measurement of intra-abdominal pressure (according to Gain Yu. M. and co-authors, 2004).*

g) Morphological methods of research. g) Morphological methods of research. In order to identify the presence or absence of changes in the anterior abdominal wall, we conducted morphological studies of aponeurosis and rectus abdominis in 36 patients. Morphological studies were conducted in the laboratory of pathological anatomy of the Republican Specialized Scientific and Practical Medical Center of Surgery named after Academician V. Vakhidov (RSSPMCS named after Academician V. Vakhidov) on the basis of a scientific agreement between the Departments of Pediatric Surgery and Surgical Diseases №.1 of Medical Institute of Samarkand and the Laboratory of pathological Anatomy of the RSSPMCS named after V. Vakhidov.

To do this, during the operation, the material was taken from the edges of the hernial defect, retreating 1 cm from the edge, with the capture of the muscle and aponeurotic layers in several areas with biopsies of 5×5 mm. The number of pieces was no more than three. Next, a histological study was performed to identify the regenerative abilities of these tissues.

For light microscopy, standard pieces of anterior abdominal wall aponeurotic tissue taken during surgery were fixed in a 10% formalin solution on a phosphate buffer. Paraffin sections were stained with hematoxylin and eosin. Light-optical micrographs were obtained using an Axioscop 40-ZEISS microscope coupled to a digital camera. All micrographs were processed and stored on a computer using Microsoft application programs - "Windows XP-Professional".

The obtained results of the study were subjected to statistical processing on a Pentium-IV personal computer using the Microsoft Office Excel-2016 software package, including the use of built-in statistical processing functions. We used the methods of variational parametric and nonparametric statistics with the calculation of the arithmetic mean of the studied indicator (M), the mean square deviation (σ), the standard error of the mean (m), and relative values (frequency, %). The statistical

significance of the obtained measurements when comparing the average values was determined by the Student's criterion (t) with the calculation of the error probability (P) when checking the normality of the distribution (by the kurtosis criterion) and the equality of the general variances. The confidence level $P < 0.05$ was taken as statistically significant changes. The statistical significance for qualitative values was calculated using the χ^2 -criterion (**chi-squared**) and the z-criterion according to the following formula:

$$z = (p_1 - p_2) \sqrt{\frac{n_1 \cdot n_2}{p(1-p) \cdot (n_1 + n_2)}}$$

where $p_1 = \mu_1/n_1$ и $p_2 = \mu_2/n_2$ are the compared experimental frequencies, and $p = (\mu_1 + \mu_2)/(n_1 + n_2)$ is the average frequency of occurrence of the trait for both groups.

CHAPTER III.

STRUCTURAL CHANGES IN THE APONEUROSIS OF THE RECTUS ABDOMINIS MUSCLES DEPENDING ON AGE

Study of age-related structural changes in the rectus abdominis

Hernias of the anterior abdominal wall are a common surgical disease. They occur in 3-7% of the population [46, 56]. A hernia can form anywhere in the abdominal wall, but more often it occurs in the so-called weak points. The causes that lead to the formation of a hernia are diverse. These are incomplete formation of certain areas of the body in embryogenesis, underdevelopment of neighboring organs, dilatation of existing natural openings, weak development of the muscle-aponeurotic layer of the abdominal wall, disorders of metabolic processes, impaired collagen synthesis in middle-aged and elderly people [53, 54, 57, 62, 64, 72]. The frequency of occurrence and especially relapses of anterior abdominal wall hernias is due to age-related changes in the corresponding wall structures and, first of all, structural changes in aponeurosis.

However, morphological studies of aponeurosis of the anterior abdominal wall in the age aspect were not carried out. This determined the objectives of this section of the work: To identify structural differences in aponeurosis and muscle in different age groups of patients with abdominal hernias. For the first time, we conducted comparative morphological studies to determine the age-related changes in aponeurosis in 36 patients operated on in 1 and 2 clinics of the Samarkand State Medical Institute for POVH at the age of 30 to 76 years.

The patients were divided into 4 groups according to the WHO age classification:

- I.-Youth 25-44 years;
- II. - Average age 45-59 years;
- III. - Elderly 60-74 years;
- IV. - Senile period 75-90 years.

The conducted studies of muscle tissue biopsies in patients of different age groups revealed significant structural differences that can affect the frequency of anterior abdominal wall hernias and their relapses.

In the first ("youth" - 25-44 years) age group, muscle fibers with a dense arrangement of bundles of collagen fibers and a characteristic tortuosity are determined in the muscle tissue adjacent to the aponeurosis (Fig. 6).

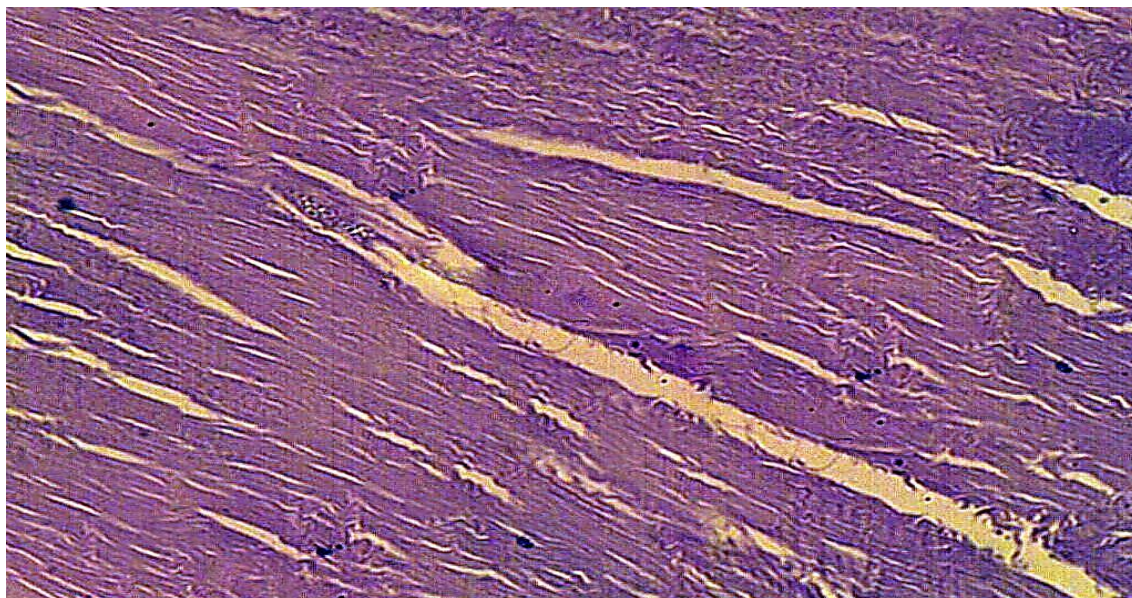


Figure 6. *Muscle tissue of the anterior abdominal wall. Tight fit of the muscle bundles to each other. Patient G. (№ 4592/327) is 33 years old.*

G-E. 10×10.

In the second ("average age" - 45-59 years) age group, the muscle fibers adjacent to the aponeurosis of the muscle tissue are determined to be quite closely adjacent to each other. With layers of fatty and loose connective tissue with vessels (Fig. 7, 8).

In the group of patients aged 60-74 years (elderly), large gaps are identified between the bundles of muscle fibers. Muscle fibers are atrophic. There is an overgrowth of connective tissue with the phenomena of round-cell infiltration. Quite often there are vessels with dilated lumen, both blood and lymphatic. The muscle fibers are arranged randomly. A significant amount is also occupied by "structureless" zones (Fig. 9, 10).

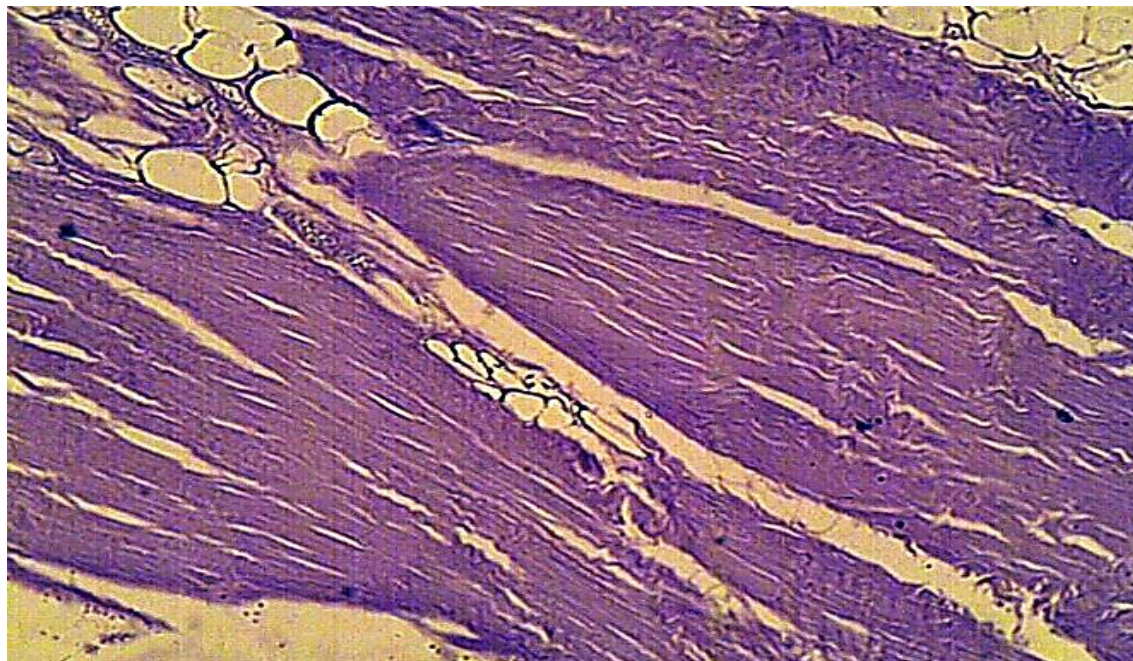


Figure 7. *Muscle tissue of the anterior abdominal wall. Tight fit muscle bundles to each other. Small layers of adipose tissue.*

Patient A. 45 years old (№ 12806/902). G-E. 10×10.

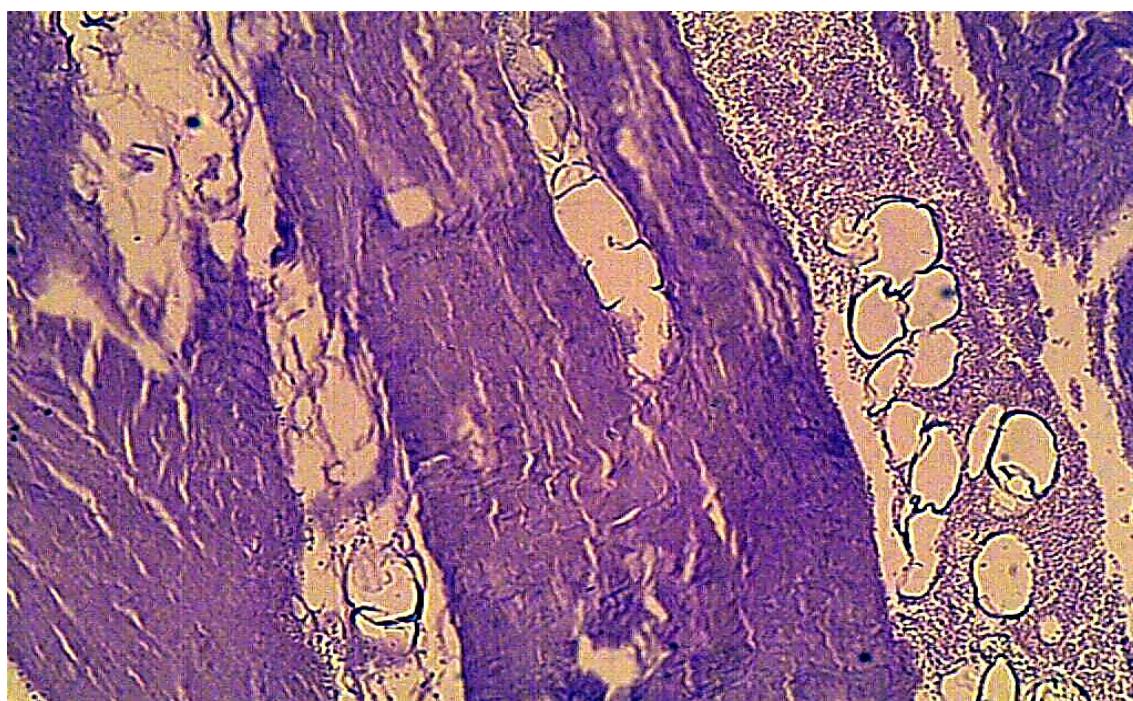


Figure 8. *Muscle tissue of the anterior abdominal wall. Developed layers of adipose and loose connective tissue.*

Patient O. 57 years old (№ 13911/1064). G-E. 10×10.

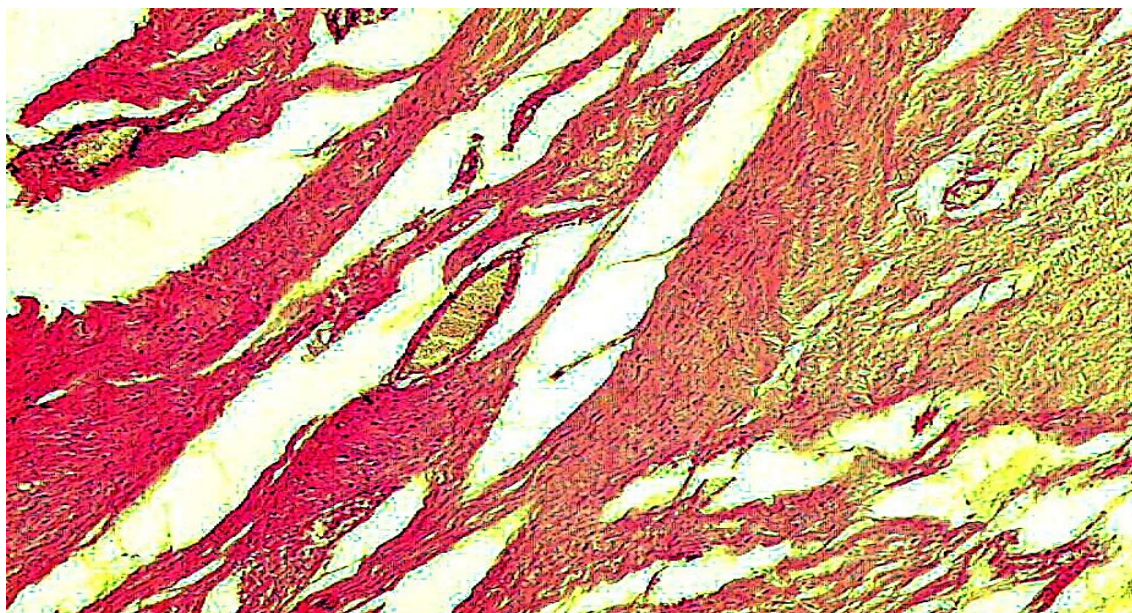


Figure 9. *Muscle tissue of the anterior abdominal wall.*

Wide gaps between the muscle bundles ("structureless" zones).

Vessels with dilated lumen and accumulated red blood cells.

Patient K. 65 years old (№ 15232/1031). G-E. 10×10.

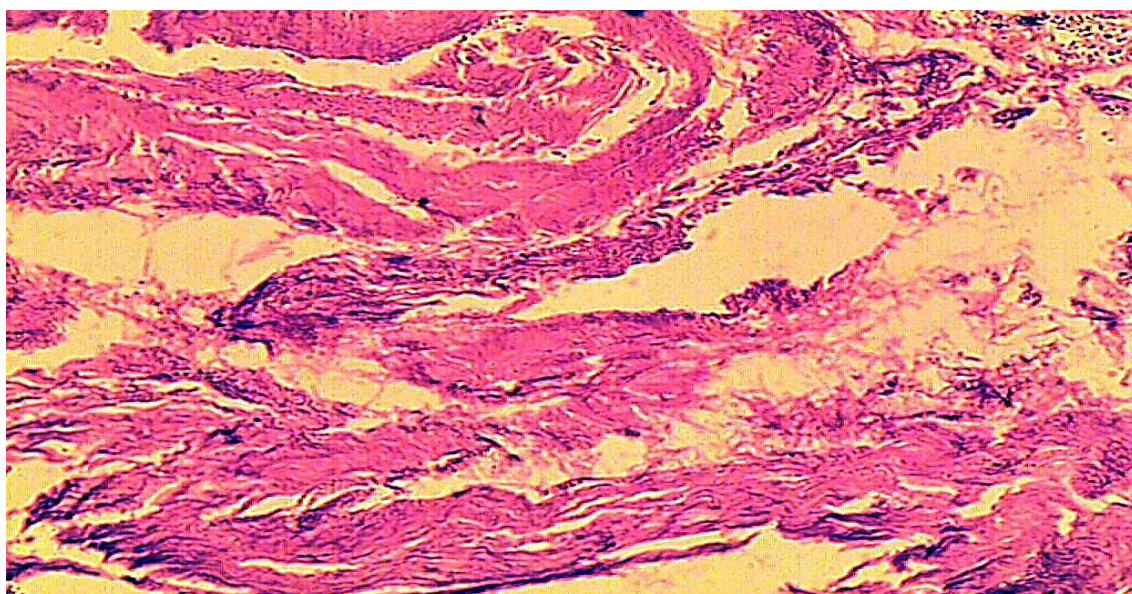


Figure 10. *Muscle tissue of the anterior abdominal wall.*

Wide gaps between the muscle bundles ("structureless" zones). Dilated lymphatic capillaries. Patient R. 70 years old (№ 1369/99). G-E. 10×10.

In the group of patients aged 75-90 years (senile period), along with vessels with dilated lumen, with numerous blood cells in the lumen, mainly

red blood cells, among which pathological forms predominate, extravascular red blood cells are also determined (Fig. 11, 12).

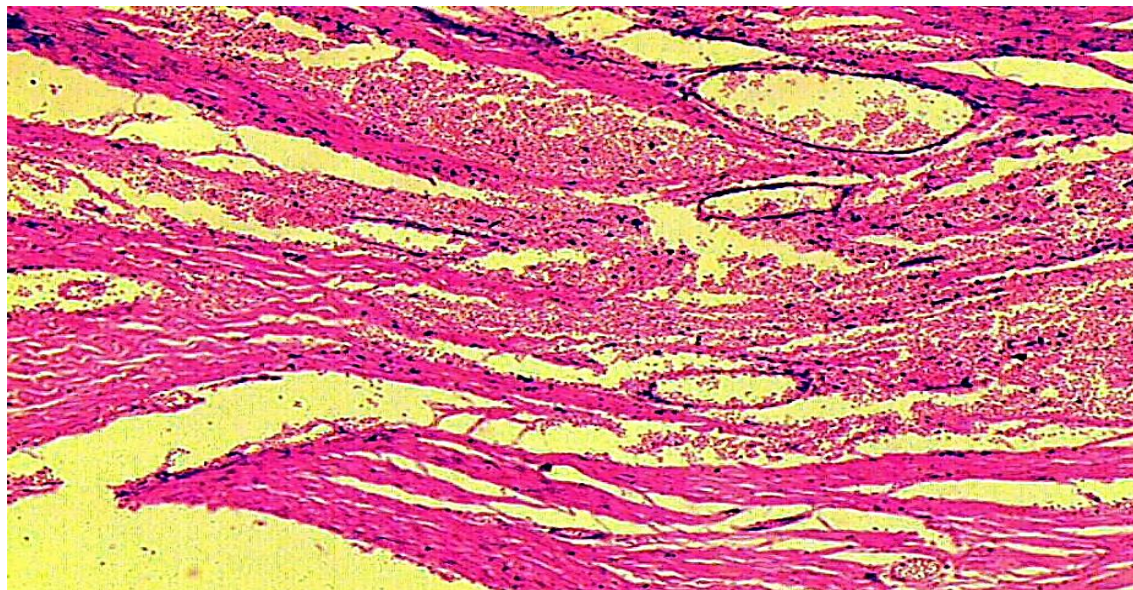


Figure 11. *Muscle tissue of the anterior abdominal wall.*

Wide gaps between the muscle bundles ("structureless" zones). Dilated blood vessels, extravascular red blood cells.

Patient M. 76 years old (№ 2912/201). G-E. 10×10.

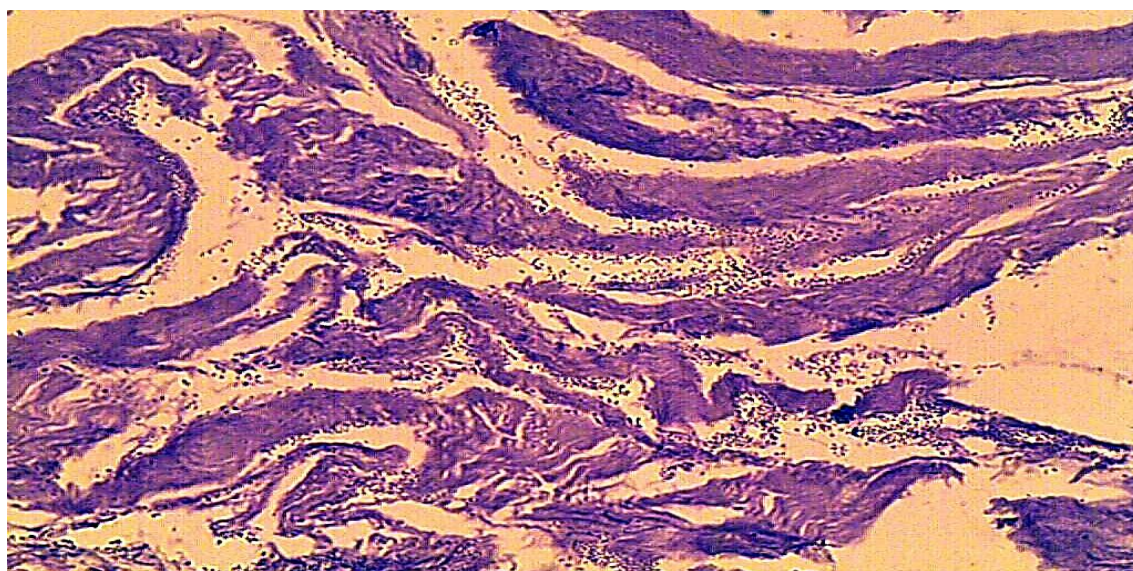


Figure 12. *Muscle tissue of the anterior abdominal wall.*

Wide gaps between the muscle bundles ("structureless" zones), extravascular red blood cells. Patient X. 76 years old (№ 6254/443). G-E. 10×10.

Studies have shown that with age, there are significant violations of the structure of the rectus abdominis muscles. The appearance of free red blood cells in the interstitial zones, as well as the expansion of the lumen of the vessels with clusters of red blood cells in them, indicates changes in the permeability of the vascular walls and microcirculation disorders. Wide gaps between the muscle bundles and extravascular red blood cells affect the strength of the anterior abdominal wall, which contributes to the formation of an anterior abdominal wall defect.

Study of age-related structural changes in aponeurosis of the rectus abdominis muscles

Aponeurosis of the anterior abdominal wall (rectus abdominis) is a broad tendon plate formed of dense collagen (fibrillar protein) and elastic fibers, with a small number of vessels. This aponeurosis is one of the most durable formations that determines the success of hernioplasty and prevents the occurrence of relapses.

However, with age, certain changes occur in the structure of aponeuroses that weaken it. In patients aged 25-44 years (*youth*), the bundles of collagen fibers are thick, closely attached to each other and arranged in several layers. They are undularly curved and run in one direction parallel to each other, along the long axis of the aponeurosis. They are quite monomorphic in shape and tinctorial properties (Fig. 13, 14).

The general histoarchitectonics of the collagen bundles of aponeurosis in individuals 45-59 years of age (*average age*) is preserved. The bundles of collagen fibers have the correct orientation. However, between the bundles of collagen fibers, quite wide gaps appear, in which free red blood cells are determined. There is a pronounced tortuosity of the bundles (Fig. 15).



Figure 13. *Aponeurosis of patient G. (№ 4592/327), 33 years old.*

*Dense arrangement of bundles of collagen fibers
with a characteristic tortuosity. G- E. 10×40.*

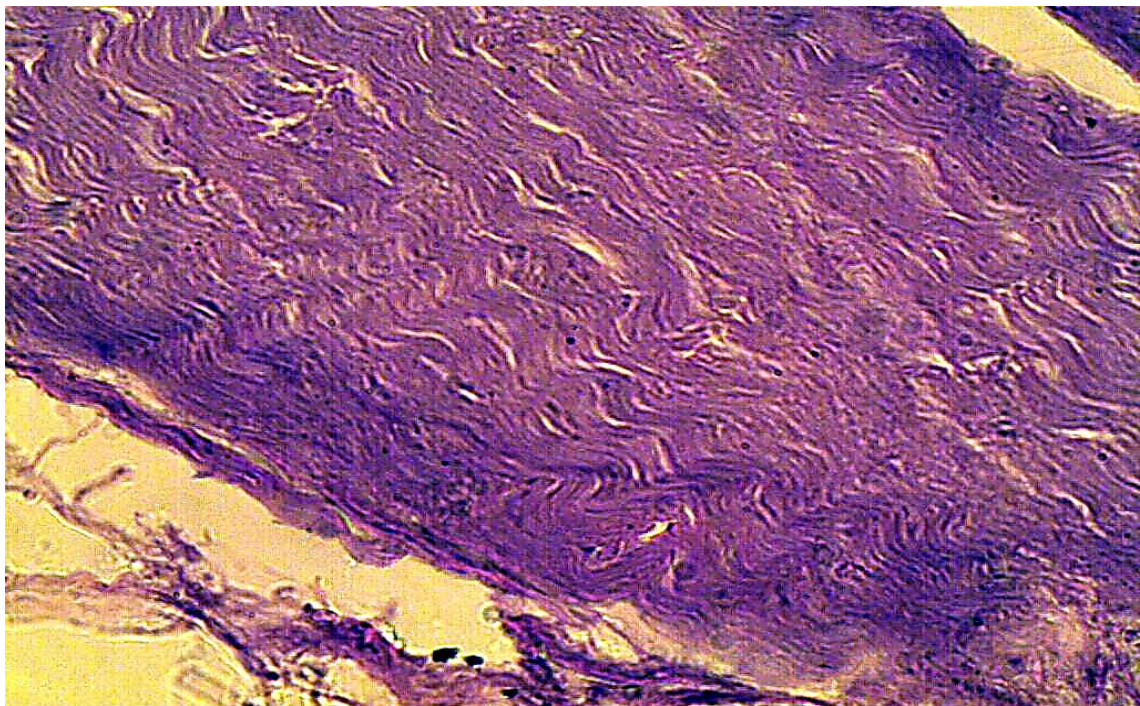


Figure 14. *Aponeurosis of patient B. 41 years old (№ 1332/96).*

*Dense arrangement of bundles of collagen fibers with characteristic tortuosity. G-
E. 10×40.*

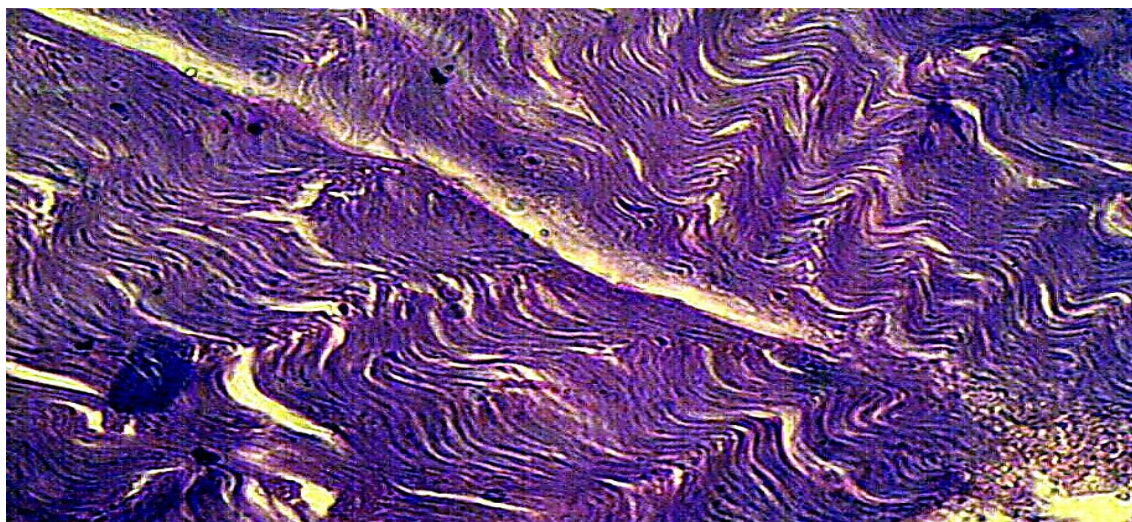


Figure 15. *Aponeurosis of a 57-year-old patient (№ 13911/1064). The appearance of gaps between the bundles of collagen fibers, the characteristic tortuosity is preserved. G- E. 10×40.*

In operated patients aged 60-74 years (*elderly*), more serious changes are detected in the aponeuroses, the bundles of fibers branch into separate fibers. The arrangement of the fibers is characterized by randomness. The pattern of the bundles changes, their characteristic tortuosity is smoothed out. In the expanded spaces, a large number of red blood cells are detected. The bundles of collagen fibers lose their connection with each other (Fig. 16, 17).

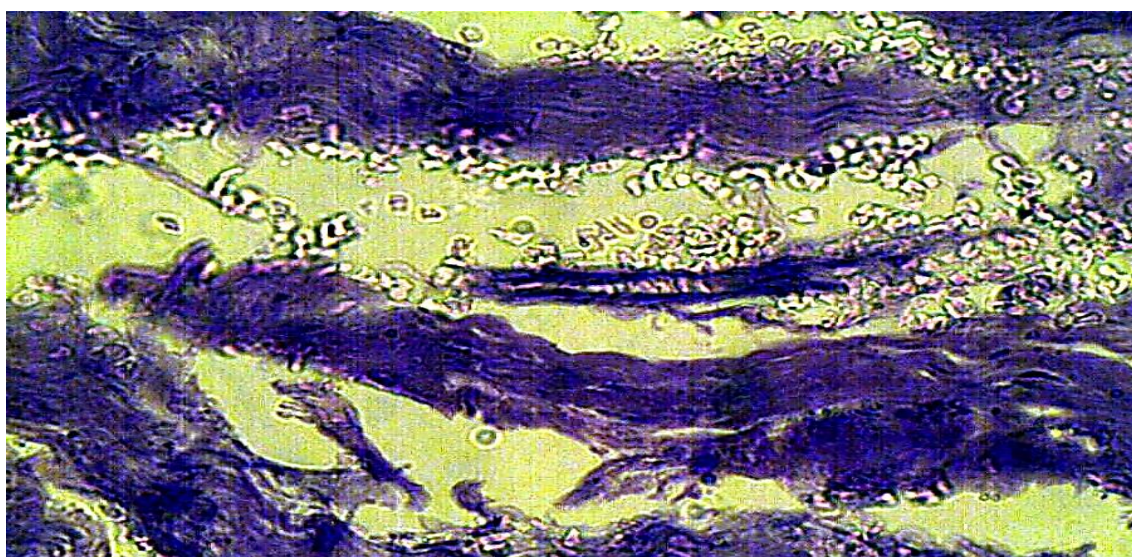


Figure 16. *Aponeurosis of patient K. 65 years old (No. 15232/1031). Large gaps between bundles of fibers with red blood cells in them. G-E. 10×40.*

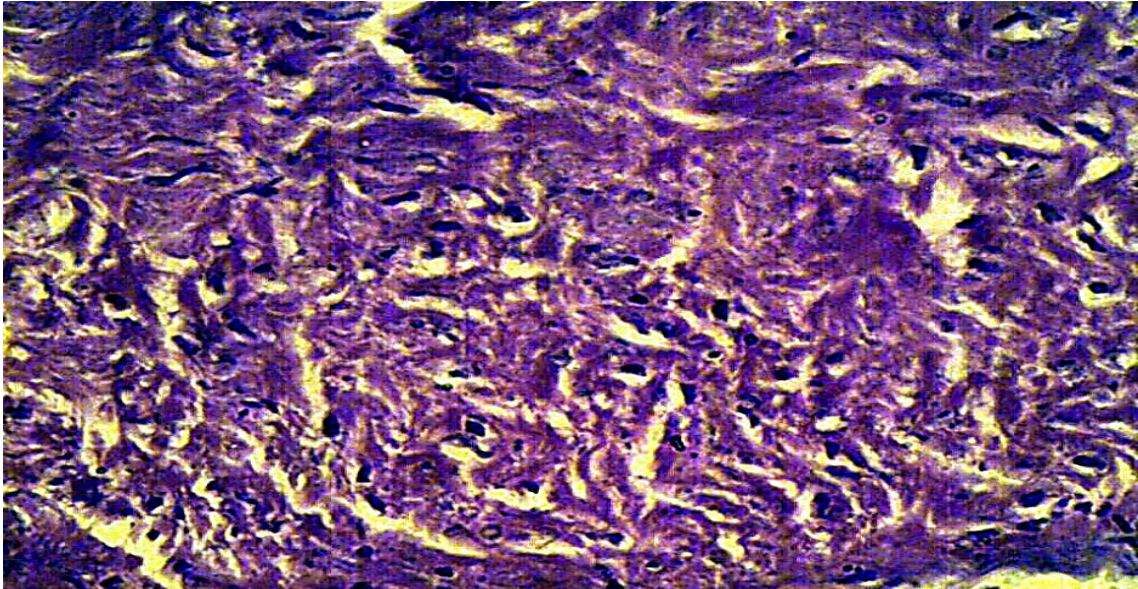


Figure 17. *Aponeurosis of patient N. 66 years old (№ 10/1).*

Chaotic arrangement of fiber bundles. G-E. 10×40.

The greatest changes in the structure of rectus abdominis aponeurosis were found in patients of the oldest age group (*senile period of 75-90 years*). Collagen fibers are usually scattered with a weak tendency to form bundles. In the expanded spaces between the fibers, free red blood cells are located (Fig. 18).

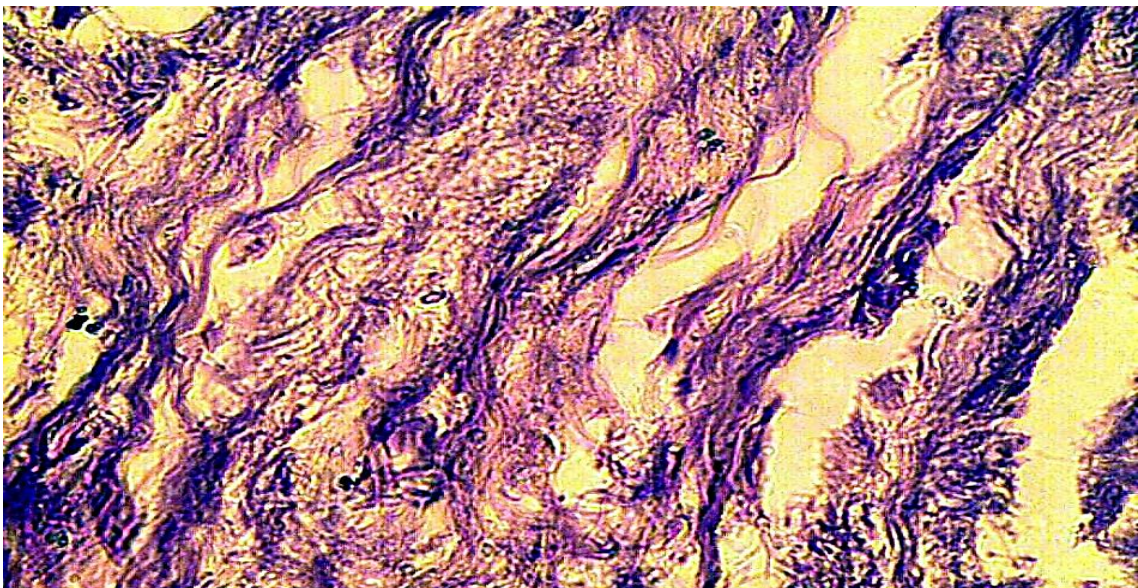


Figure 18. *Aponeurosis of a 76-year-old patient (№ 2912/201). Chaotic arrangement of disjointed fibers with expanded spaces between them, without pronounced formation of bundles. G- E. 10×40.*

Thus, in older age groups of patients with POVH in the structure of aponeurosis, muscle and connective tissue remodeling occurs as a result of dystrophic and regenerative processes. These changes are considered as compensatory replacement processes in response to the partial death of the aponeurosis tissue.

However, these patterns are still characteristic of the natural progression of age-related dystrophy of the musculoponeurotic layer of the anterior abdominal wall. In this connection, we studied these structures in groups of patients with grade 3 obesity and abdominal ptosis, as well as in the presence of a relapse of POVH. These factors, by their very nature, should also affect the state of the musculoponeurotic layer of the anterior abdominal wall, but regardless of the age of the patients. Thus, in the study of aponeurosis of the rectus abdominis in young patients with obesity of the 3rd degree and abdominal prolapse of the 2nd-4th degree, characteristic changes of older age groups were noted. Often, the formation of a kind of loose network with a large volume of "structureless" zones by disparate collagen fibers was observed (Fig. 19).

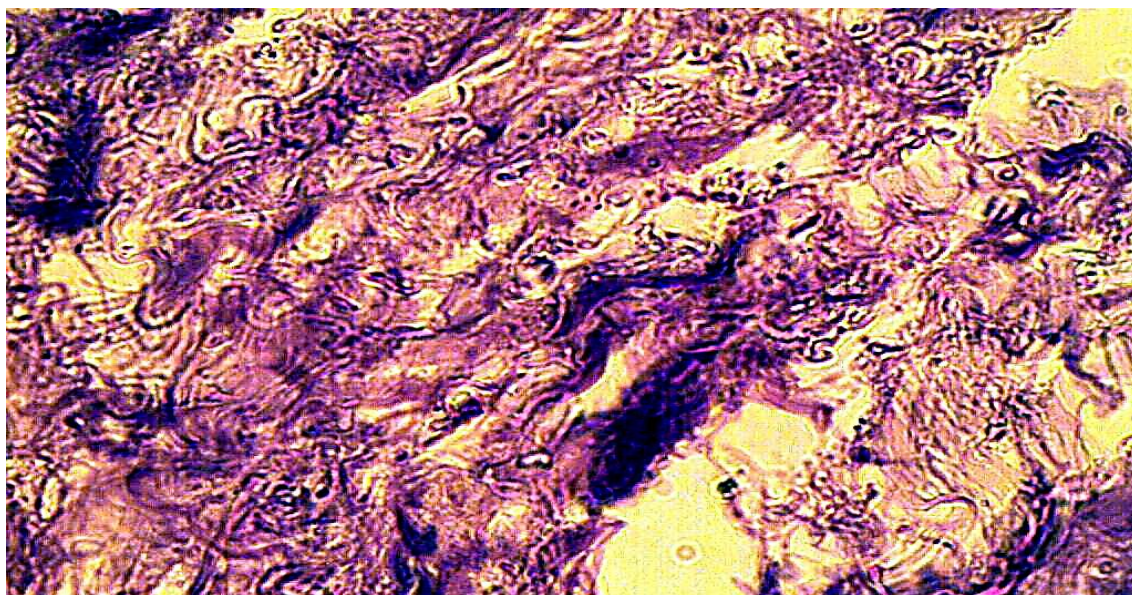


Figure 19. *Aponeurosis of a 36-year-old patient with obesity of 3 dg. and ptosis of the abdomen of 3 dg. (№ 6254/443). Chaotic arrangement of disjunct fibers with expanded spaces between them, without forming bundles. G- E. 10×40.*

In other cases, patients with recurrent POVH also showed variability in the size, location and shape of collagen fibers and their tinctorial

properties The sizes of inter-fiber spaces with a characteristic chaotic arrangement of fibers increased, which is especially pronounced in patients with recurrent POVH on the background of obesity (Fig. 20, 21).

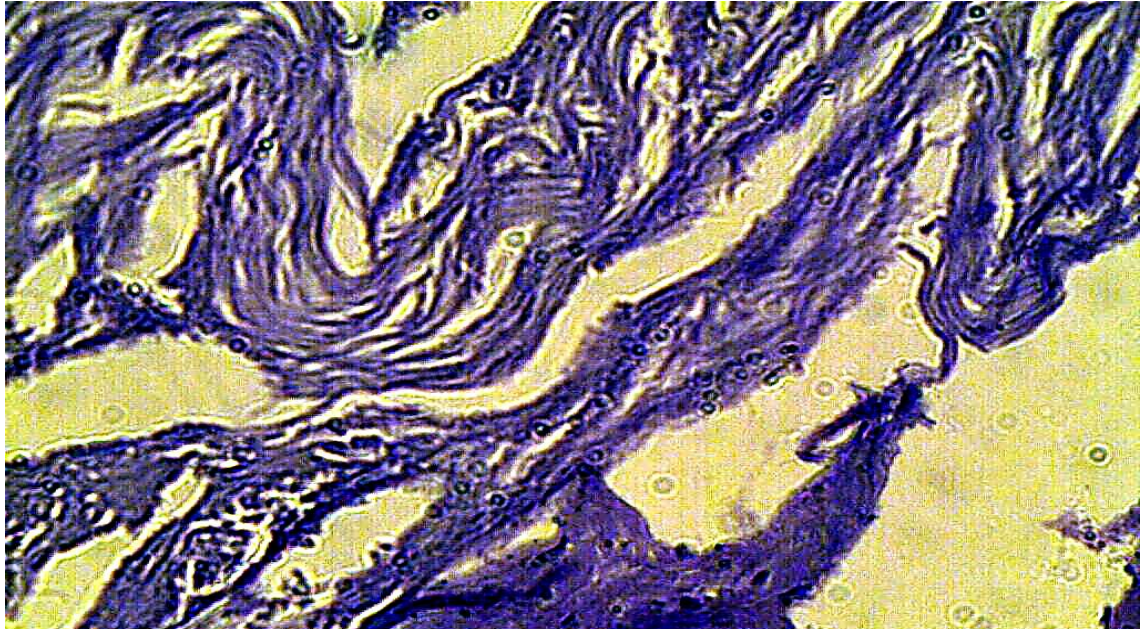


Figure 20. *Aponeurosis of patient F. 34 years old with recurrent POVH (№. 2353/165). Large gaps between bundles of fibers with loss of tortuosity. G-e. 10×40.*

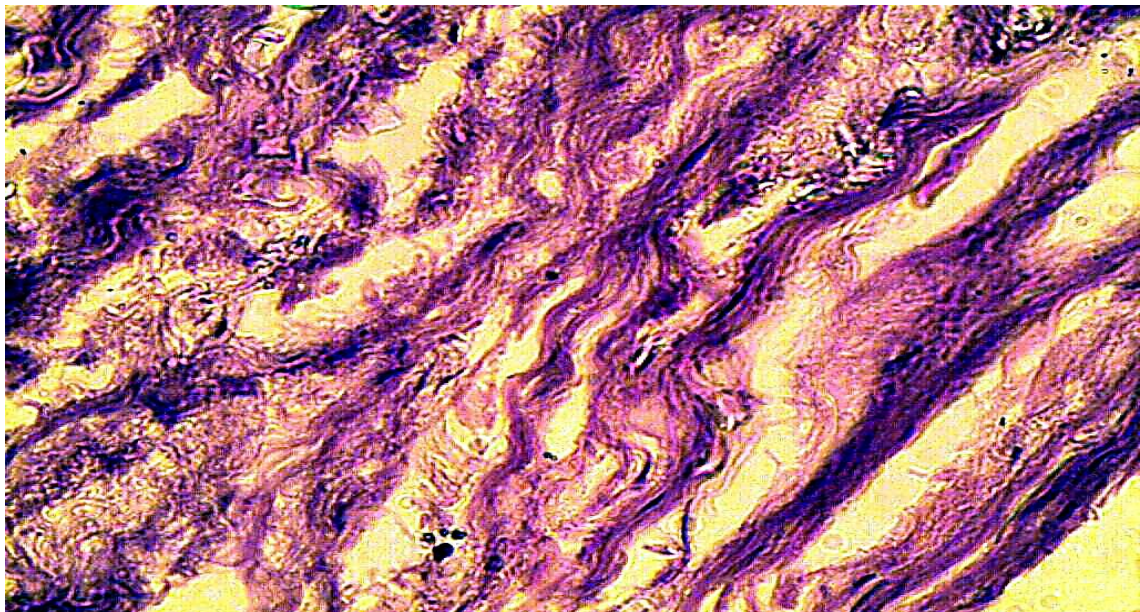


Figure 21. *Aponeurosis of a patient P. 40 years old with obesity of 2 st. and recurrent POVH (№ 1369/99). Chaotic arrangement of fiber bundles with expanded spaces between them. G-E. 10×40.*

As our postoperative observations have shown, it is in such patients that a relapse of hernias occurs at a late stage.

Conclusion on the chapter

The conducted studies allowed us to draw the following conclusion:

The conducted studies allowed us to draw the following conclusion:

With age, there are significant violations of the structure of aponeurosis and rectus abdominis muscles. The nature of these changes, namely, violations of the order of the arrangement of collagen fibers, suggests that these structural changes are the basis for the violation of the strength of aponeurosis.

The presence of factors that contribute to the overgrowth of the aponeurotic tissue (obesity, relapses of postoperative ventral hernias), regardless of age, can also lead to the formation of dystrophic remodeling of the muscular-aponeurotic layer with a decrease in its strength.

The above structural changes affect the strength of the anterior abdominal wall, reduce its adaptation to mechanical loads, and thus contribute to the formation of POVH.

Thus, it is proved that the change in the morphological structure of the anterior abdominal wall is characteristic not only for older age groups, but also for patients with the presence of factors that contribute to the overgrowth of the aponeurosis tissue, the detection of which, regardless of the age and size of the hernial defect, requires the use of synthetic grafts to strengthen the anterior abdominal wall during hernioplasty.

CHAPTER IV.

TACTICAL AND TECHNICAL IMPROVEMENT OF SURGICAL TREATMENT OF PATIENTS WITH POSTOPERATIVE VENTRAL HERNIAS

Features of preoperative preparation of patients with POVH in the main group

Preoperative preparation of patients of both groups was carried out according to the standard method. If necessary, treatment of concomitant diseases of the cardiovascular system, respiratory system and gastrointestinal tract was carried out, as well as cleansing enemas and laxatives were used according to individual indications. In the comparison group, preoperative banding was also performed with the use of traditional banding in 85 (63%) patients with the size of the hernia W_2 , W_3 and W_4 .

In the main group, 52 (63.4%) patients with a reversible hernia with a size of W_2 , W_3 and W_4 underwent preoperative preparation with the use of an improved pneumatic belt-bandage in order to adapt the cardiovascular and respiratory systems to the negative consequences of intraabdominal hypertension after surgery. The closest approach to the claimed method is the preoperative preparation of a patient with a large ventral hernia, including the reduction of hernial protrusion into the abdominal cavity and the subsequent application of a pelot equipped with a device that allows increasing the pressure in the bandage and thereby adapting the patient to an increase in intraabdominal pressure in the postoperative period [17].

The essence of our modification is that in the method of preoperative preparation of patients with large ventral hernias, including the reduction of hernial protrusion into the abdominal cavity and the subsequent imposition of a belt-bandage, which has a device for increasing pressure

by pumping air and another tube with a pressure gauge to determine the indicator of the created air pressure in the belt-bandage, a distinctive feature is that there is a mobile device on the inside of the bandage, it allows you to install it in the area of the hernial gate of any localization in order to prevent the release of hernial contents, and to secure the bandage, taking into account the size and volume of the waist, 2 rows of textile fasteners (Velcro) with a size of 80 mm are installed.

The method is carried out as follows.

In patients with a large ventral hernia from the risk group (elderly age, concomitant pathology of the cardiovascular and respiratory systems), when they are admitted to the hospital, artificial hypertension of the abdominal cavity is created by using a special belt-bandage. To do this, first determine the exact location of the hernial gate and make a reduction in the abdominal cavity of the hernial protrusion and to this place move the device for closing the gate and then fix the belt-bandage on the abdominal wall of the patient (Fig. 22), which is equipped with a special textile fastener (Velcro) for fastening on the patient's back (2, 3), which allows you to increase or decrease the diameter of the belt, depending on the size of the hernial protrusion. The belt-bandage is firmly connected to the pelot (6), which was directly applied to the area of the hernial protrusion after its reduction, to the hernial gate and with the help of a zipper (5), a device was brought to close the hernial defect. Further, during the day, the patient with a belt-bandage was regularly recorded (after 3 hours) pulse, Normal blood pressure, blood pressure, and subjective feelings of the patient.

With the stability of these parameters in the dynamics of the study, air was pumped into the belt-bandage with a pear through a pressure gauge and pressure was created up to 10-14 mm Hg. With the stability of the hemodynamic parameters, or their minor changes (heart rate increased by no more than 10 beats per 1; blood pressure-by no more than 5-10 mm Hg, normal blood pressure-by no more than 4 respiratory acts), the patient wore a belt-bandage during the day.

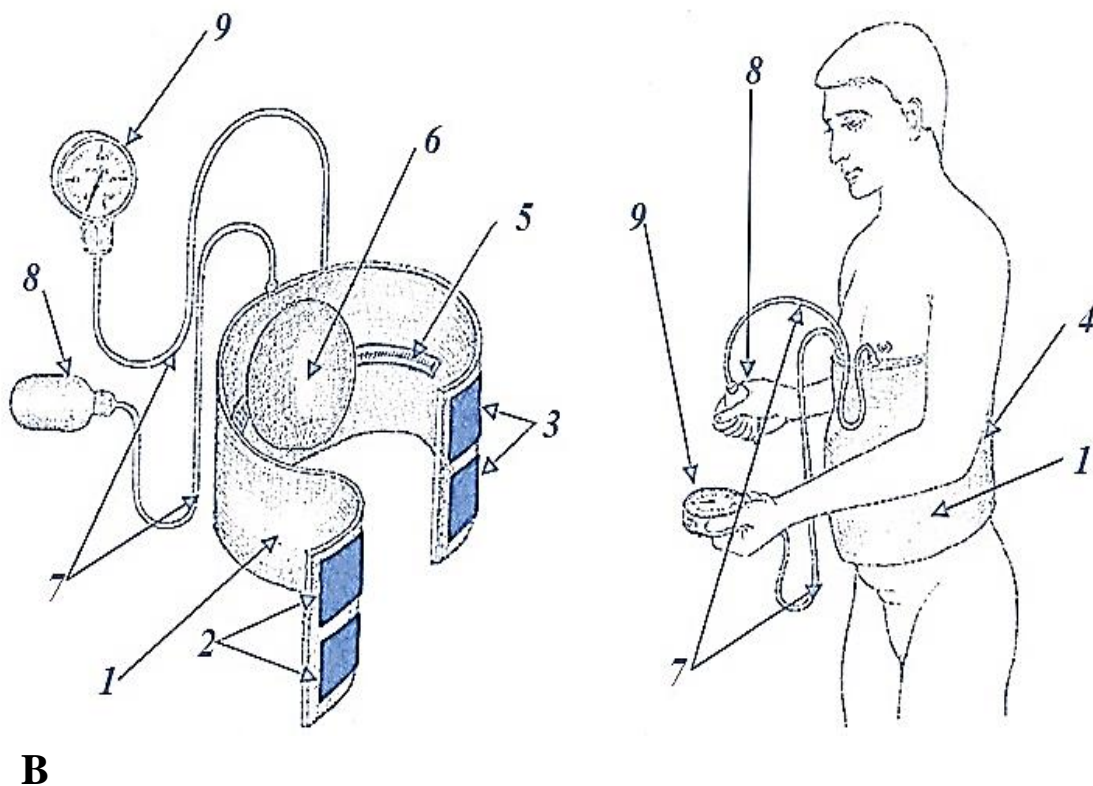
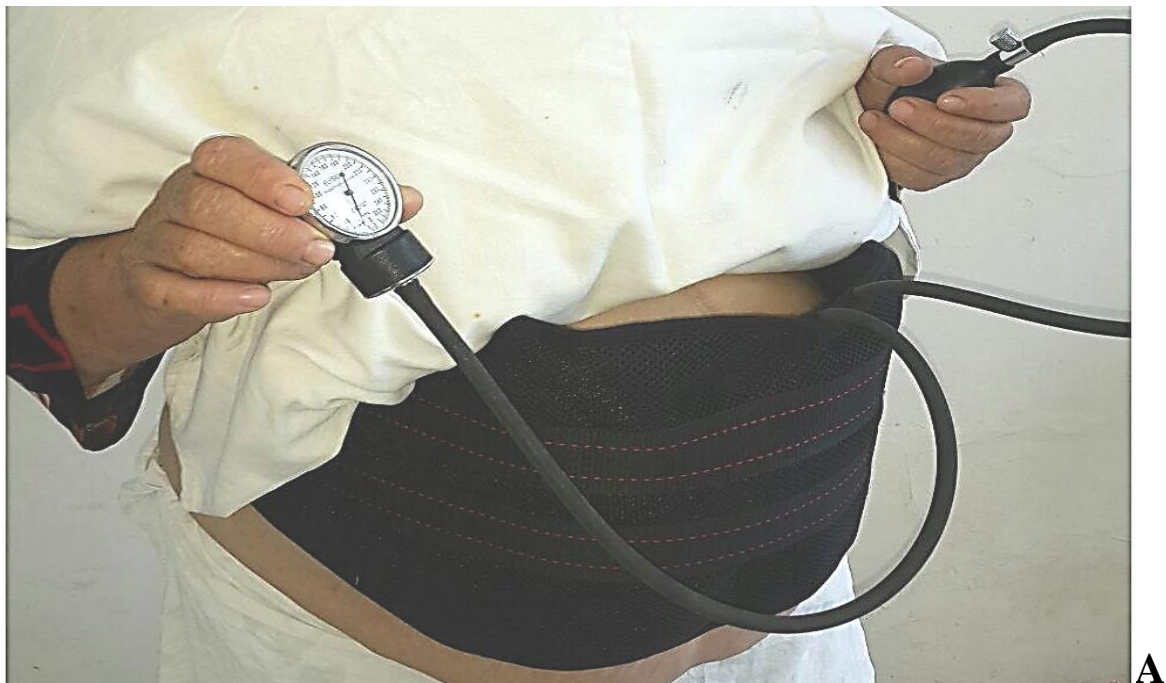


Figure 22. Artificial hypertension of the abdominal cavity using a special belt-bandage. A) A belt-bandage on the patient 10433/752; B) A schematic image: 1- a belt-bandage, 2- a textile glass-velcro side of the micro-hook, 3 – a textile clasp (side of the micro-loop), 4 - a place of fastening, 5- a zipper for moving the pellet, 6- pellet, 7 – a tube, 8- a pear, 9- a pressure gauge.

The next day, in the morning, in the same way, a belt-bandage was applied and hypertension was created within the values reached the day before. Gradually, the amount of pressure created in the bandage was increased by 3-5 mm Hg daily, with a favorable state of health of the patient and indicators of respiration and hemodynamics.

The preparation was carried out for 7-10 days. This contributed to the gradual adaptation of the patient and increased resistance of the cardiovascular and respiratory systems to intraabdominal hypertension.

Clinical example.

Patient T., age - 62 years. I. B. № 10433/752 Was admitted to the surgical department of the clinic of the Samarkand State Medical Institute on 17.10.2014. Complaints: the presence of a hernial protrusion along the midline above the navel, bloating and sometimes pain in it. Anamnesis: in 2009, the patient underwent an echinococcectomy from the VI-VII segment of the liver (upper-middle laparotomy), 1 year later, autoplasty was performed for a postoperative ventral hernia in the Samarkand City Hospital. After 6 months, a herniated protrusion appeared, which gradually increased. By the time of hospitalization in the clinic, the period of herniation was more than 4 years. He suffers from hypertension of the 2nd degree, chronic bronchitis. The condition at admission is satisfactory. BMI = 32. Pulse 76 beats / min, rhythmic, satisfactory filling. Blood pressure is 150/90 mm Hg. The abdomen is large due to the pronounced subcutaneous fat layer. Along the midline from the xiphoid process to the navel, there is an old postoperative scar measuring 25×1.0 cm, under which a hernial protrusion measuring 20×25 cm is palpated, which is set into the abdominal cavity. Hernia gates measuring 8×10 cm. Clinical diagnosis: Postoperative recurrent reversible large ventral hernia (M1W2R1). The patient was treated for 10 days with artificial hypertension of the abdominal cavity by using a special belt-bandage. Gradually, the amount of pressure created in the bandage was increased by 2-3 mm Hg daily. The training was carried out

for 10 days. This made it possible to gradually adapt the patient and increase the resistance of her cardiovascular and respiratory systems to intraabdominal hypertension. The patient underwent surgery: Herniolaparotomy. Resection of the altered part of the large omentum. Alloplasty of the anterior abdominal wall by the on-lay method. IAP before the operation was 12 mmHg. after the operation -14 mmHg.

The postoperative period was without complications. During the control ultrasound examination on day 6, no liquid formations were detected in the operation area. Skin sutures were removed on the 7th day. Wound healing by primary tension. The patient was discharged on day 10. It was examined after 1 year. There is no recurrence of the hernia. According to the questionnaire, rated the result of the operation as good. Continues his daily activities.

The advantages of the proposed method were:

- in the proposed pneumatic band, the end of the air blower is located directly in the belt band, that is, the air is pumped into the inside of the band, whereas in the prototype, the air is pumped into the storage air chamber;
- on the inside of the belt-brace there is a zipper for the movement of the pelot, which makes it possible to close the hernial gate of any localization, including lateral and lumbar abdominal hernias, while the prototype pelot (balloon) is immobile and is fixed only in one zone;
- depending on the size of the hernial gate, with the improved method of banding, it became possible to use a pelot corresponding to the hernia defect size, whereas in the prototype the pelot has the same size.

To determine the effectiveness of the proposed method of banding, the dynamics of indicators of the degree of IAP in the study groups was studied. In the comparison group, conventional banding was used in 85 patients out of 135, in the main group in 52 out of 82 patients with hernia sizes W_2 , W_3 and W_4 . At the initial application of the bandage, only 13 (14.1%) patients in the comparison group and 8 (12.5%) in the main group had a normal IAP index (< 8 mmHg). Ist degree (8-11 mmHg) was

determined in 38 (44.7%) and 24 (46.2%) patients, respectively, IInd degree (11-19 mmHg) in 23 (27.1%) and 13 (25%), IIIrd degree (9-26 mmHg) in 9 (10.6%) and 5 (9.6%), and IVth degree (>26 mmHg) in 2 (2.4%) and 2 (3.8%) patients (Table 4.1). To determine the effectiveness of the proposed method of banding, the dynamics of indicators of the degree of IAP in the study groups was studied. In the comparison group, conventional banding was used in 85 patients out of 135, in the main group in 52 out of 82 patients with hernia sizes W2, W3 and W4. At the initial application of the bandage, only 13 (14.1%) patients in the comparison group and 8 (12.5%) in the main group had a normal IAP index (< 8 mmHg). Ist degree (8-11 mmHg) was determined in 38 (44.7%) and 24 (46.2%) patients, respectively, IInd degree (11-19 mmHg) in 23 (27.1%) and 13 (25%), IIIrd degree (9-26 mmHg) in 9 (10.6%) and 5 (9.6%), and IVth degree (>26 mmHg) in 2 (2.4%) and 2 (3.8%) patients (Table 4.1).

Against the background of the use of the bandage for 7-10 days, a normal indicator of IAP was obtained in 19 (22.4%) patients in the comparison group and 18 (34.6%) in the main group Ist degree IAP was determined in 32 (37.6%) and 24 (46.2%) patients, respectively, IInd degree in 28 (32.9%) and 7 (13.5%), IIIrd degree in 5 (5.9%) and 3 (5.8%), and IV st in 1 (1.2%) patients in the comparison group (Fig.23).

Table 9

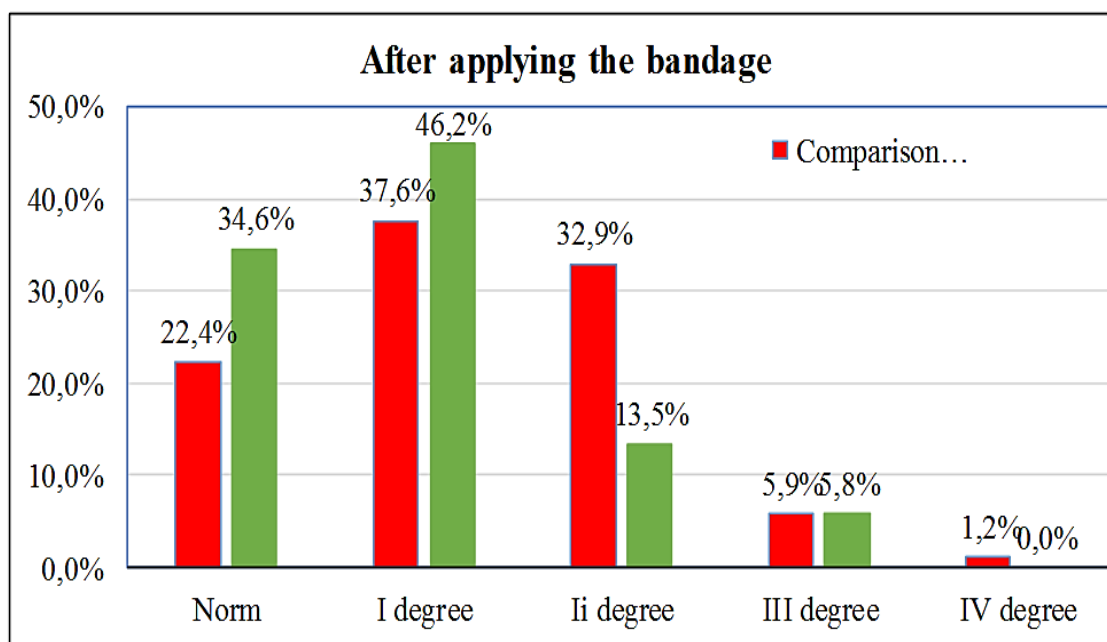
Distribution of patients according to the degree of IAP when applying a bandage

Degree of IAP	Comparison Group		Main group	
	absolute	%	absolute	%
Norm (< 8 mmHg.)	13	14,1%	8	12,5%
Ist degree (8-11 mmHg)	38	44,7%	24	46,2%
IInd degree(11-19 mmHg)	23	27,1%	13	25,0%
IIIrd degree (9-26 mmHg)	9	10,6%	5	9,6%
IVth degree (>26 mmHg)	2	2,4%	2	3,8%
Total	85	100,0%	52	100,0%

After allogernioplasty on the first day after surgery, the use of the proposed method of banding allowed us to obtain a normal index of IAP in 14 (26.9%) patients, while in the comparison group only in 11 (12.9%). Ist degree IAP was detected in 21 (40.4%) and 25 (29.4%) patients, respectively, IInd degree in 12 (23.1%) and 35 (41.2%), IIIrd degree in 5 (9.6%) and 12 (14.1%), and IVth degree was observed in 2 (2.4%) patients in the comparison group (Fig.23).

On 3-5 days after the operation, the use of the proposed method of banding allowed to increase the proportion of patients with normal IAP to 22 (42.3%) patients, while in the comparison group only to 24 (28.2%) patients. Ist degree IAP was detected in 16 (30.8%) and 28 (32.9%) patients, respectively, IInd degree in 12 (23.1%) and 26 (30.6%), IIIrd degree in 2 (3.8%) and 6 (7.1%), and IVth degree was preserved in 1 (1.2%) patient in the comparison group (Fig.23).

According to the presented data in general, the use of the proposed method of pneumobandage allowed to increase the proportion of patients with normal IAP or its increase to Ist degree during training for 7-10 days from 60.0% (51 patients in the comparison group) to 80.8% (42 patients in the main group), while II-IV degree was observed in 40.0% (34) and 19.2% (10) patients (Chi-square criterion=6.383; Df=2; p=0.042) (Fig. 24).



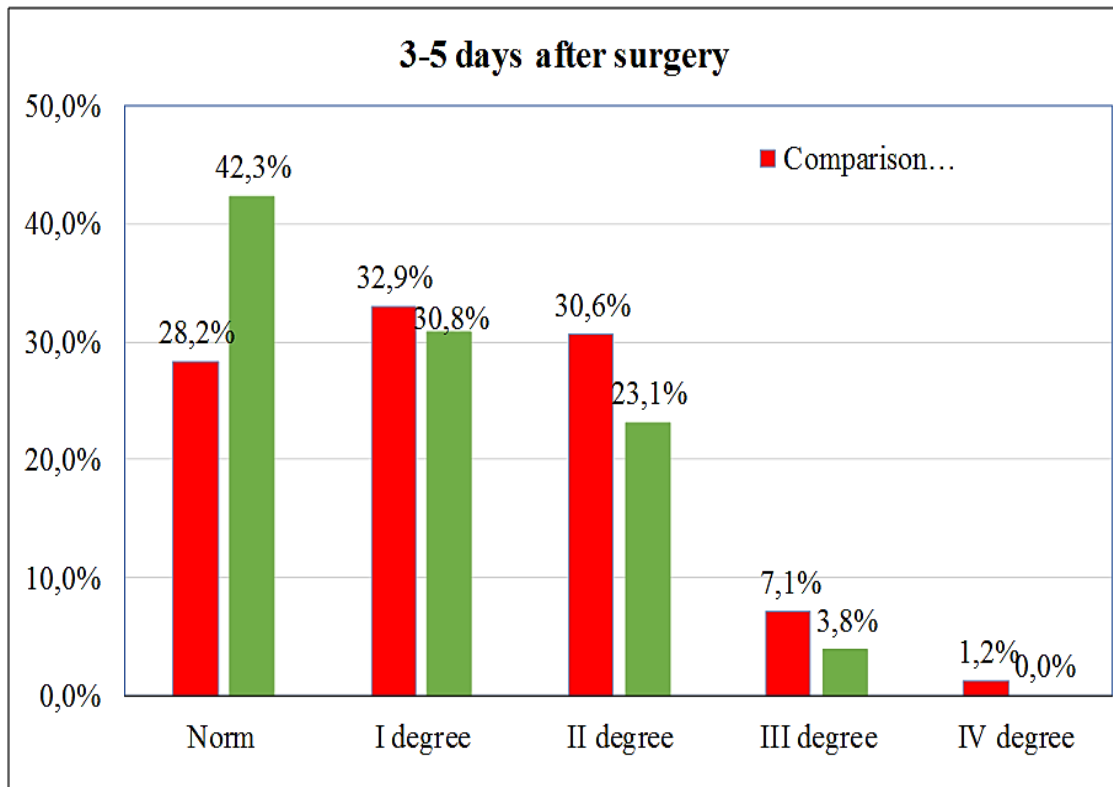
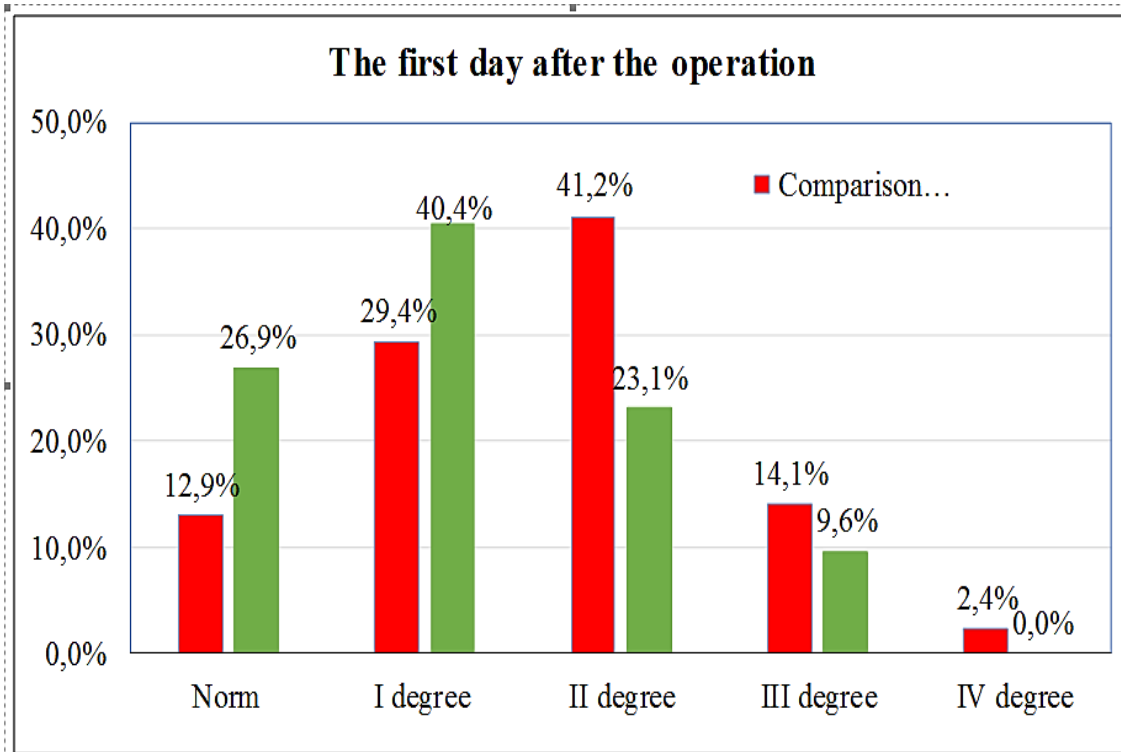


Figure 23. Distribution of patients according to the degree of IAP during preliminary banding before and after hernioplasty

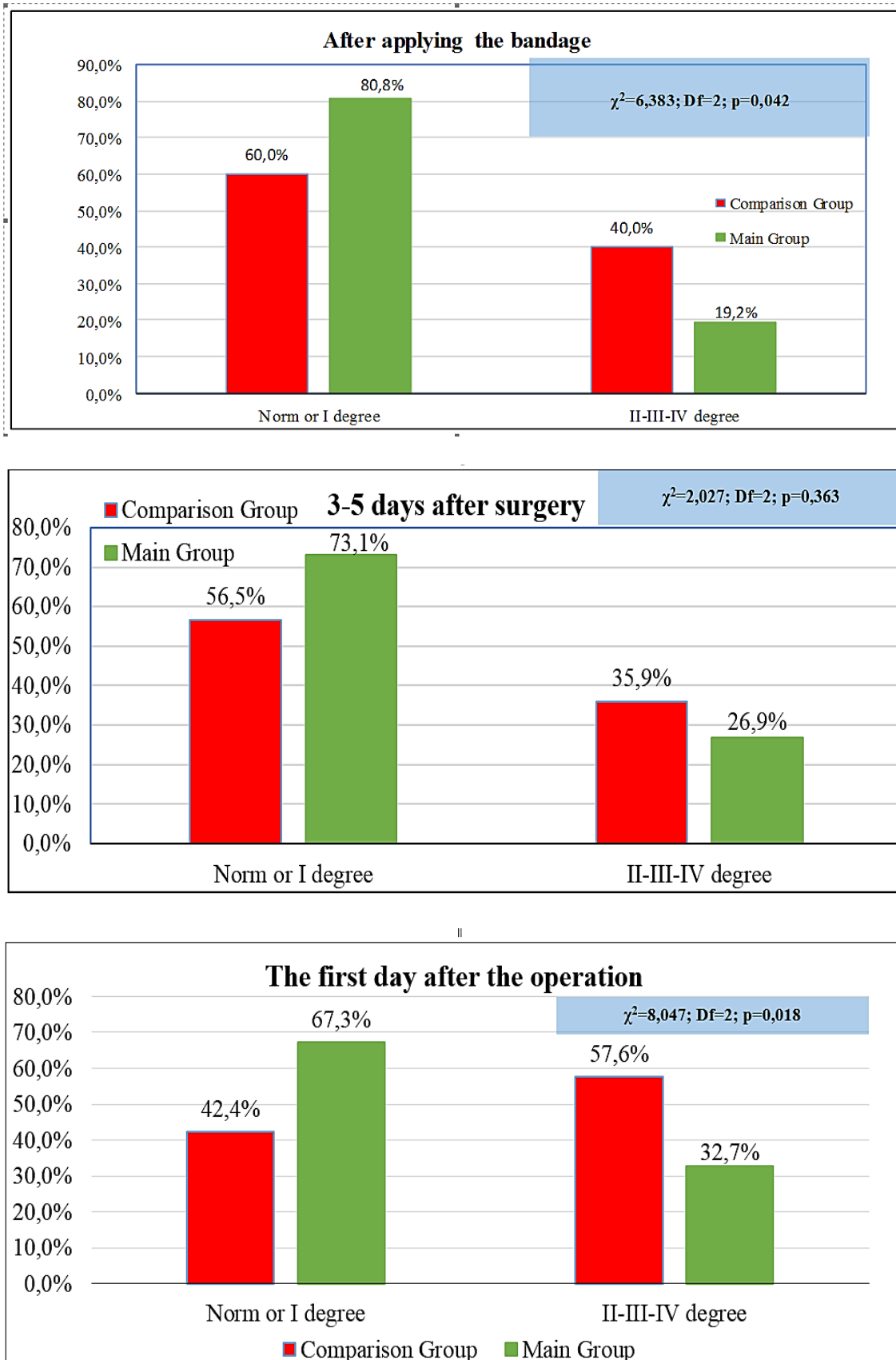


Figure 24. Summary dynamics of the degree of IAP in patients with hernioplasty, depending on the type of banding

In turn, on the first day after allogernioplasty in the comparison group, 36 (42.4%) patients received the norm or I st degree of IAP, and in the main group this indicator was 35 (67.3%), respectively, II-IV degree was determined in 57.6% (49) and 32.7% (17) (Chi-square criterion=8,047; Df=2; p=0.018). In the dynamics of only 3-5 days, the indicators became significantly indistinguishable: the norm or Ist degree of IAP was achieved in 73.1% (38) of patients in the main group and 56.5% (52) in the comparison group, and II-IV degree was determined in 26.9% (14) and 35.9% (33) (Chi-square criterion=2.027; Df=2; p=0.363).

The actual value of IAP in dynamics is shown in Fig. 4.4. Bandaging increased IAP in the comparison group from 6.5 ± 0.4 to 13.8 ± 0.7 mmHg, in the main group from 6.7 ± 0.3 to 14.3 ± 0.7 mmHg (T-criterion between the groups: initially-0.40; $P > 0.05$; at the time of bandaging – 0.51; $P > 0.05$). The use of the proposed method of pneumobandage allowed to reduce these indicators to 10.2 ± 0.5 mmHg, whereas in the comparison group only to 12.1 ± 0.6 mmHg ($t=2.43$; $P < 0.05$). On the first day after surgery, these values were 13.4 ± 0.7 versus 15.9 ± 0.8 mmHg ($t=2.35$; $P < 0.05$), and on 3-5 days after surgery, 8.6 ± 0.4 versus 10.5 ± 0.6 mmHg ($t=2.63$; $P < 0.05$) (Fig. 25).

Summarizing the results of the use of the improved method of preoperative preparation, we present the distribution of the frequency of postoperative complications in the comparison groups. It should be noted that this category of patients was the most difficult in terms of high risk of surgical treatment due to the size of hernias and concomitant diseases, respectively, the frequency of postoperative complications was higher than in other patients. Also, in some cases, surgical intervention was supplemented with abdominoplasty due to obesity. Bronchopulmonary complications in the form of exacerbation of chronic bronchitis, pneumonia were noted in 6 (7.1%) cases in the comparison group and 1 (1.9%) patients in the main group.

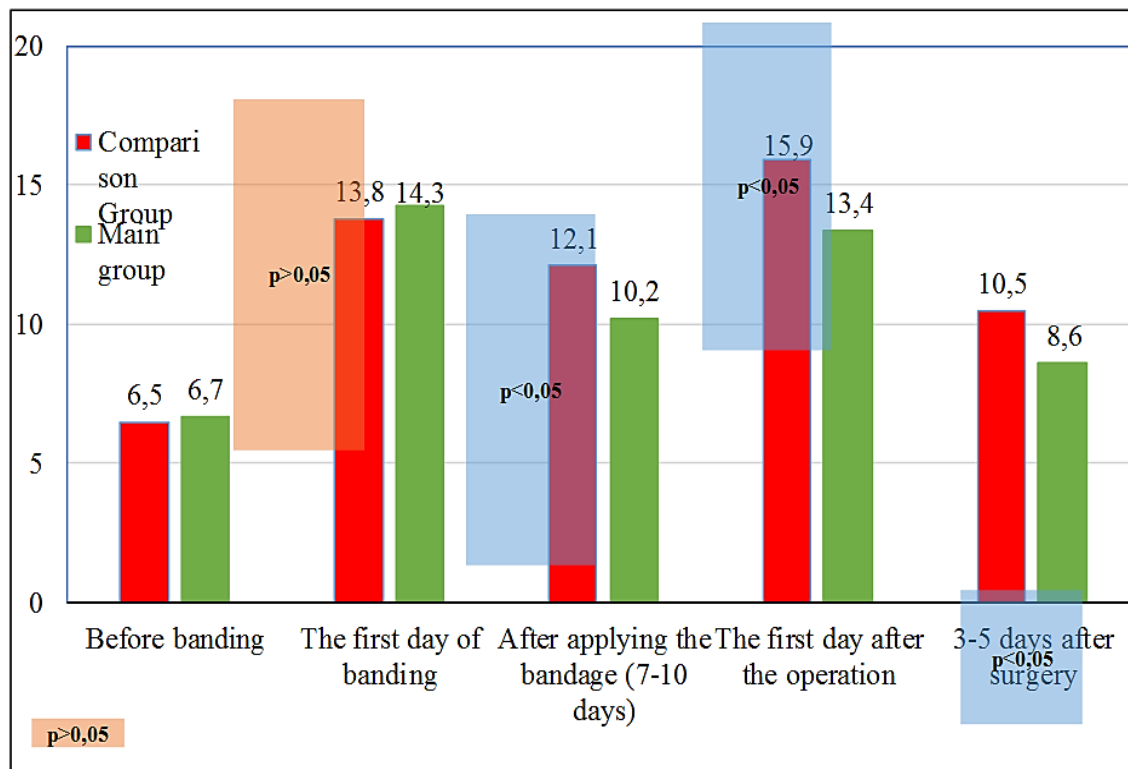


Figure 25. Dynamics of the IAP index in patients with hernioplasty, depending on the type of banding

The development of ACS (compartment) occurred in 2 (2.4%) patients of the comparison group, the patients required a long-term ventilator with breathing training. In both cases, the complication was successfully treated conservatively. Both respiratory and cardiovascular complications (in 4 patients of the comparison group and 1 patient in the main group) were also associated with abdominal compression due to hernioplasty of large ventral hernias. Wound complications in the form of hematoma, seroma, and lymphorrhea were also higher in the comparison group (Table 10).

It should be noted that on average, one patient in the comparison group had 2-3 complications in the form of a combination of bronchopulmonary or (and) cardiovascular with wound complications. In general, the comparison group included 20 (23.5% of 85) patients with various complications, of which 13 (15.3%) had wound complications and 7 (8.2%) had general extra – abdominal complications. In the main group there were 5 (9.6% of 52) patients with various complications, 3 (5.8%) – wound and 2 (3.8%) - general. According to the comparative

indicator of the number of complications, a significant improvement was obtained in the main group (Chi-square criterion=4.187; Df=1; p=0.041) (Fig. 26).

Table 10

Distribution of patients by the frequency of postoperative complications in groups with preparatory banding

Complications	Comparison Group (n=85)		Main group (n=52)	
	abs	%	abs	%
Bronchopulmonary complications	6	7,1%	1	1,9%
Intestinal paresis	3	3,5%	1	1,9%
Cardiovascular complications	4	4,7%	1	1,9%
Compartment syndrome	2	2,4%	0	0,0%
Hematoma	3	3,5%	1	1,9%
Seroma	9	10,6%	2	3,8%
Lymphorrhea	5	5,9%	2	3,8%
Suppuration of the wound	2	2,4%	0	0,0%
Necrosis of the edge of the skin flap	2	2,4%	1	1,9%

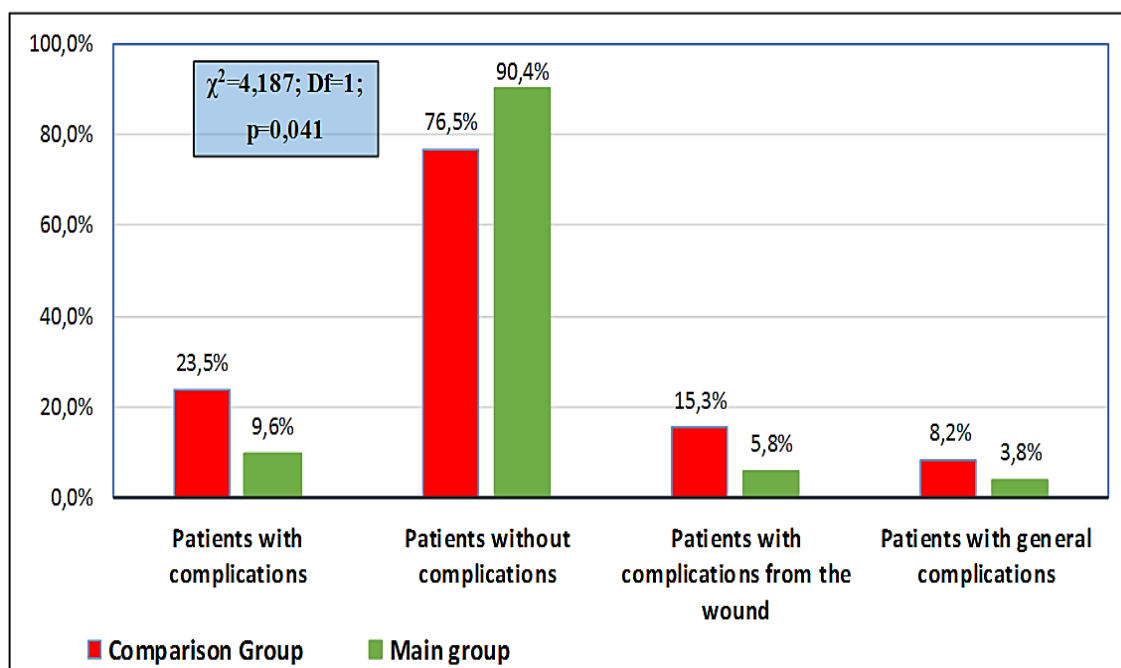


Figure 26. *Distribution of patients with preoperative banding by the frequency of complications after hernioplasty*

Thus, the use of the improved pneumobandage significantly improved the quality of preoperative preparation of patients with large POVH, reduced the risk of intra-abdominal hypertension after hernioplasty, achieved improvement in the patient's condition at an earlier time and, accordingly, reduced the frequency of postoperative complications, from 23.5% to 9.6% (extra-abdominal from 8.2% to 3.8% and wound from 15.3% to 5.8%).

Some technical aspects of performing hernioplasty

All patients in the study groups were operated on. Patients with combined surgical diseases were simultaneously corrected. Simultaneous operations were performed in 41 patients in the study groups. By volume, the simultaneous interventions were as follows: abdominoplasty for obesity and ptosis of the abdominal wall – 40 (17 in the comparison group and 23 in the main group), cholecystectomy – 6 (3 cases, respectively), supravaginal amputation of the uterus – 3 (2 and 1), viscerolysis for the prevention of adhesive intestinal obstruction in 21 patients in the main group.

In the main group, the choice of optimal hernioplasty was more differentiated. For this purpose, a quantitative assessment of risk factors for recurrent postoperative hernias was developed (Fig. 27).

The developed program, based on the clinical and ultrasound characteristics of the anatomical and functional state of the abdominal wall in the examined patients, as well as taking into account the size of the hernial gate, age, the functional state of the respiratory system, digestive and urinary systems, physical activity, and obesity, allows you to optimize the choice of treatment tactics for POVH.

These factors that affect the results of treatment were evaluated on a point scale (certificate of state registration of the computer program № DGU 03724, Agency for Intellectual Property of the Republic of Uzbekistan-2016). According to the results of the program, the patients of the main group were divided into 4 subgroups (Table 11).

ПРОГРАММА ДЛЯ ОПРЕДЕЛЕНИЯ ФАКТОРОВ РИСКА РЕЦИДИВОВ И ВЫБОРА ТАКТИКИ ГЕРНИОПЛАСТИКИ У БОЛЬНЫХ С ПОСЛЕОПЕРАЦИОННЫМИ ВЕНТРАЛЬНЫМИ ГРЫЖАМИ

<p>Состояние брюшной стенки по данным УЗИ и КТ</p> <p><input type="radio"/> норма</p> <p><input type="radio"/> слабость легкой степени</p> <p><input checked="" type="radio"/> слабость тяжелой степени</p>	<p>Физическая нагрузка</p> <p><input type="radio"/> отсутствует</p> <p><input checked="" type="radio"/> умеренная нагрузка</p> <p><input type="radio"/> тяжелая нагрузка</p>
<p>Размеры грыжевых ворот</p> <p><input type="radio"/> до 5 см <input type="radio"/> 11-15 см</p> <p><input type="radio"/> 6-15 см <input checked="" type="radio"/> более 15 см</p>	<p>Функциональное состояние дыхательной системы</p> <p><input type="radio"/> нарушений нет</p> <p><input checked="" type="radio"/> периодическое затруднение дыхания</p> <p><input type="radio"/> хроническая дыхательная недостаточность</p>
<p>Вес (индекс массы тела)</p> <p><input type="radio"/> норма</p> <p><input type="radio"/> ожирение I-II степени</p> <p><input checked="" type="radio"/> ожирение III степени</p>	<p>Функциональное состояние пищеварительной системы</p> <p><input type="radio"/> нарушений нет</p> <p><input checked="" type="radio"/> периодические запоры</p> <p><input type="radio"/> постоянные запоры</p>
<p>Возраст (в годах)</p> <p><input type="radio"/> 25-44 <input checked="" type="radio"/> 60-74</p> <p><input type="radio"/> 45-59 <input type="radio"/> 75-90</p>	<p>Функциональное состояние мочевыделительной системы</p> <p><input type="radio"/> нарушений нет</p> <p><input checked="" type="radio"/> периодическое затруднение мочевогоделения</p> <p><input type="radio"/> постоянное затруднение мочевогоделения</p>
<p>Давность возникновения грыжи</p> <p><input type="radio"/> до 1 года</p> <p><input type="radio"/> от 1 года до 3х лет</p> <p><input checked="" type="radio"/> более 3х лет</p>	<p>Выраженность спаечного процесса</p> <p><input type="radio"/> нет спаечного процесса</p> <p><input checked="" type="radio"/> спайки между грыжевым мешком</p> <p><input type="radio"/> спайки брюшной полости</p>
<p>Вид рекомендуемой пластики:</p> <p>Не натяжная аллопластика с мобилизацией влагалищ прямых мышц живота по Ramirez</p>	<p>Баллы:</p> <p>16</p> <p>Расчет</p> <p>Выход</p>

Figure 27. Program interface for determining the quantitative assessment of risk factors for relapse and indications for various types of plastic surgery of postoperative ventral hernias

Table 11

The point system of indications for the use of different methods of plastic surgery

№	Risk factors	Quantitative characteristics	Points
1	The state of the abdominal wall according to ultrasound, CT.	Norm	0
		Mild weakness	1
		Severe weakness	2
2	Dimensions of the hernial gate	Up to 5 cm	0
		6-10 cm	1
		11-15 cm	2
		More than 15 cm	3
3	Weight (body mass index)	Norm	0
		Grade I-II obesity	1
		Grade III obesity	2
4	Age	25-44 years old	0
		45-59 years old	1
		60-74 years old	2
		75-90 years old	3
5	Duration of herniation	Up to 1 year	0
		From 1 year to 3 years	1
		More than 3 years	2
6	Physical activity	Absent	0
		Moderate load	1
		Heavy load	2
7	Functional state of the respiratory system	There are no violations	0
		Periodic difficulty breathing	1
		Chronic respiratory failure	2
8	Functional state of the digestive system	There are no violations	0
		Periodic constipation	1
		Constant constipation	2
9	Functional state of the urinary system	There are no violations	0
		Periodic difficulty	1
		Constant difficulty urinating	2
10	The severity of the adhesive process	No adhesive process	0
		Adhesions between the hernial sac	1
		Abdominal adhesions	2

Patients of the 1st subgroup with a total number of points scored up to 5 (Table. 11) autoplasty of the abdominal wall was performed with local tissues (Table 12). This group consisted of young patients (25-44 years old), who, as a rule, had small defects and no pronounced changes in the tissues of the anterior abdominal wall, there were no concomitant diseases.

Table 12

Types of hernioplasty in the main group

Subgroups	Type of operation	Quantity	%
Tensioning methods of plastics			
1st subgroup	Plastic surgery with duplicate stitches in the clinic modification	24	29,3
2nd subgroup	Implantation of the "onlay" endoprosthesis with suturing of the defect	20	24,4
Non-strenuous methods			
3rd subgroup	Implantation of the "onlay" endoprosthesis without suturing the defect (+DLE)	27 (12)	32,9
4th subgroup	Implantation of the "onlay" endoprosthesis without suturing the defect with the mobilization of the vaginas of the rectus abdominis muscles according to Ramirez + DLE	11 (5)	13,4
	Total	82	100

In the 2nd subgroup with the number of points from 6 to 10, taking into account the risk of tissue tension, various constitutional features that affect the course of the postoperative period, we performed a combined plastic surgery-the aponeurosis defect was sutured edge to edge with an additional cover of the suture line with a polypropylene mesh, thereby eliminating the need for double-row sutures. This made it possible to create optimal conditions for the formation of a strong postoperative scar.

In the 3rd subgroup, patients with scores from 11 to 15 had a high risk of tissue tension. In order to increase the volume of the abdominal

cavity, to prevent the development of ACS, plastic surgery of the anterior abdominal wall was performed in a non-tensioning way, i.e., applying a mesh to the aponeurosis without suturing it.

In the 4th subgroup of patients with grade III obesity and a score of 16 to 22, there was also a high risk of tissue tension and increased IAP, while a significant factor preventing only non-tensioning alloplasty was excessive tissue tension during suturing and a high probability of suture eruption in the postoperative period. In such cases, we used non-tensioning alloplasty with the mobilization of the vaginas of the rectus abdominis muscles according to Ramirez (Fig. 28).

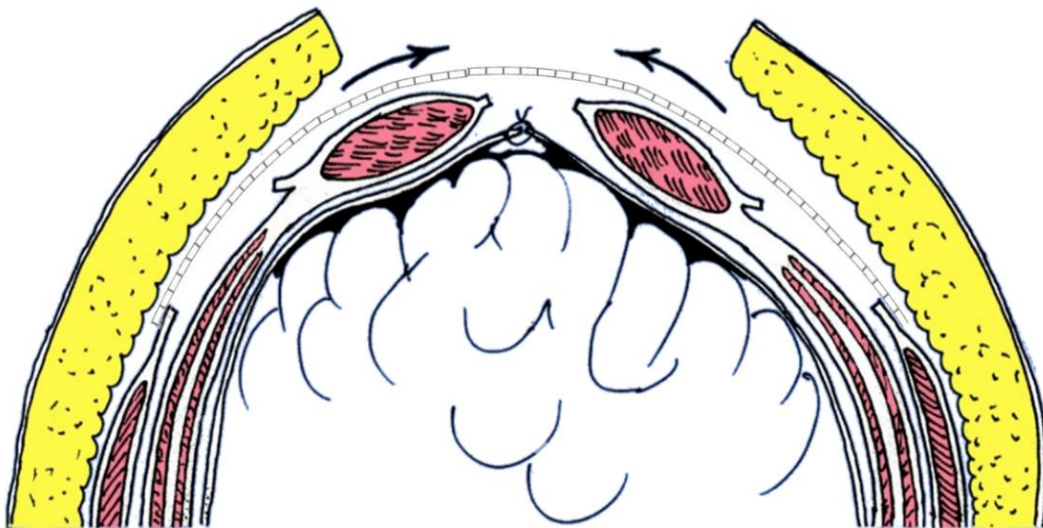


Figure 28. *Reconstruction of the anterior abdominal wall with the mobilization of rectus muscles according to Ramirez [177].*

The advantages of this technique are that the plastic is performed with a single-row suture (to a lesser extent reduces the volume of the abdominal cavity), the mobilization of the vagina of the rectus abdominis muscles allows you to evenly distribute and significantly reduce the pressure on the tissue when suturing. The use of an allograft helps to strengthen the suture line and creates optimal conditions for the formation of a full-fledged scar. Therefore, in the 4th subgroup, we preferred the implantation of the "onlay" endoprosthesis without suturing the defect

with the mobilization of the vaginas of the rectus abdominis muscles according to Ramirez (Table 13).

Table 13

Comparative results of autogernioplasty

Complications	Compaision Group (n=38)		Main Group (n=24)	
	absolute	%	absolute	%
Hematoma	1	2,6%	0	0,0%
Seroma	3	7,9%	1	4,2%
Lymphorrhhea	1	2,6%	0	0,0%
Suppuration of the wound	1	2,6%	0	0,0%
Necrosis of the edge of the skin flap	1	2,6%	0	0,0%

Patients of the 1st subgroup after suturing the peritoneum were given a duplicate suture on the aponeurosis in the modification of the clinic. The prototype of the proposed seam was the technique described by Abramov V. A. [2]. Just as in the prototype, capron №5 was used to apply an improved aponeurosis suture (Fig. 29).

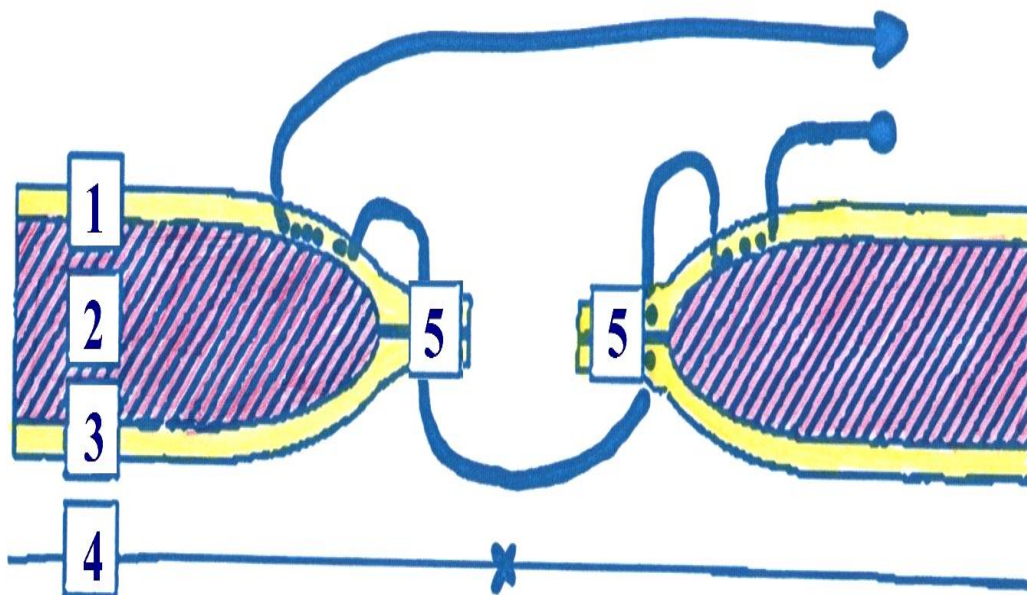


Figure 29. *The method of applying a duplicate suture [2]: 1 - the anterior leaf of the vagina of the rectus muscle, 2 - the right rectus muscle of the abdomen, 3-posterior leaf of the rectus muscle vagina, 4-peritoneum, 5 – white belly line.*

The distinctive essence of the technique was that one of the injections into the posterior leaf of the rectus abdominis aponeurosis was made at a distance of 0.5-1.0 cm from the edge of the wound and the injection at the same distance through the anterior leaf. Also, the last injection is made not through the back, as in the prototype, but through the front leaf of the vagina of the rectus abdominis muscle at a distance of 2.5-3.0 cm.

In other words, when performing the proposed suture, only the front wall and the entire edge of the aponeurosis are captured, and therefore a dense duplicate closure of the aponeurosis is formed, whereas in the prototype, on both sides of the aponeurosis, the suture covers its front and rear walls throughout, and the node is located on the front wall of the aponeurosis on one side. Also, with a modified duplicate suture, the blood supply to the muscular-aponeurotic framework is preserved, and with the prototype, due to the closing of the walls of the aponeurosis, a compression pressing of the blood vessels occurs. In addition, unlike the most common cases of Sapezhko or Mayo surgery, in which an aponeurosis duplicature is created with the possibility of creating an empty space, which in the early postoperative period can lead to fluid accumulation with the formation of an undrained hematoma or seroma, with the proposed suture, this probability is leveled due to a dense comparison of the walls of the aponeurosis.

To evaluate the effectiveness of the proposed method of autogernioplasty, the results of operations in the main group were studied in 24 patients, in the comparison group in 38 patients with Sapezhko or Mayo plastic surgery. After the operation, only wound complications were noted, and in the comparison group these were seromas in 3 (7.9%) patients and in one (2.6%) case, hematoma, wound suppuration, necrosis of the edge of the skin flap and lymphorrhea (Table 13). In total, wound complications were observed in 6 (15.8%) patients of the comparison group and 1 (4.2% - seroma) in the main group (Fig. 30). Accordingly, 32 (84.2%) and 23 (95.8%) patients were discharged without complications, respectively.

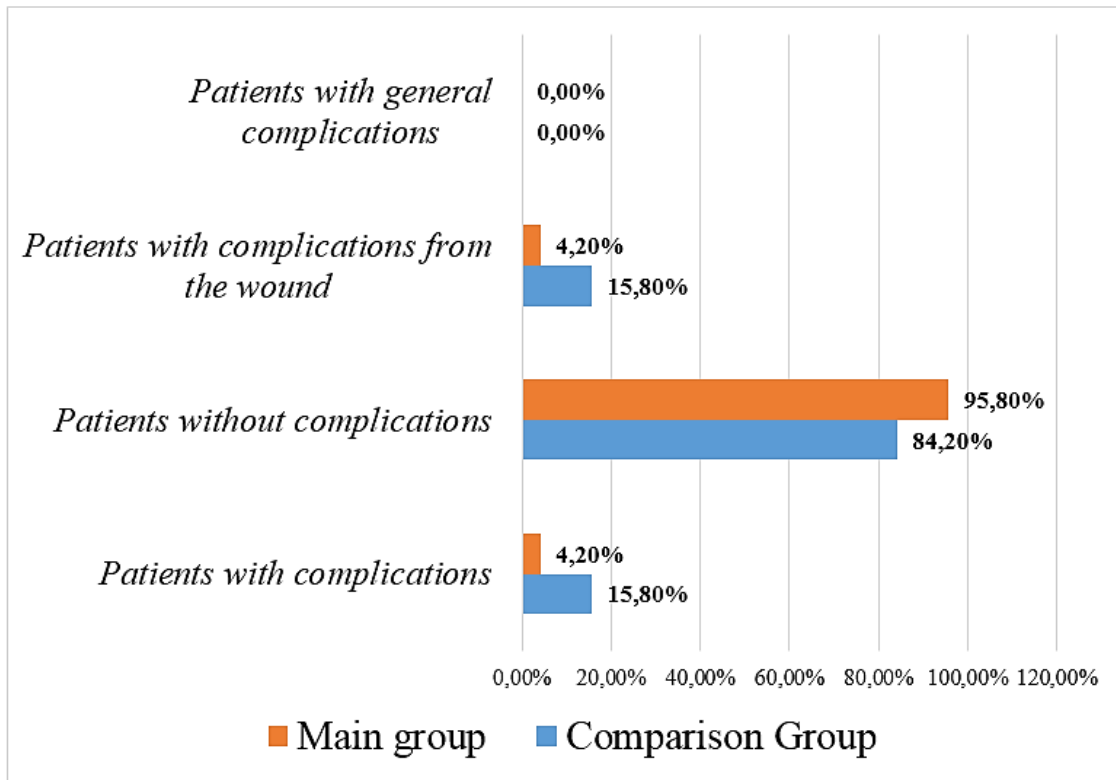


Figure 30. Structure and number of patients with complications after autogernioplasty

Clinical example 1.

Patient S., age 41 years, №. IB 15258/1032 was admitted to the surgical department of the clinic of the Samarkand State Medical Institute on 18.12.2015 with complaints: the presence of hernial protrusion along the midline of the abdomen above the navel, sometimes bloating and pain during physical exertion.

From the anamnesis: hernial protrusion appeared 8 years ago and is associated with the operation of cholecystectomy from the upper-middle laparotomy. The hernia gradually increased in size. When palpated in a standing position, on the anterior abdominal wall along the midline of the abdomen, above the navel, there is a hernial protrusion, of a soft-elastic consistency, 12×8 cm, painless, when palpated in a horizontal position, it is set into the abdominal cavity, hernial gates up to 3×4 cm. The "cough push" symptom is positive. The condition at admission is satisfactory, there is obesity of the second degree. Pulse 74 beats / min, rhythmic, satisfactory

filling. Blood pressure is 130/80 mm Hg. The abdomen is large due to the pronounced subcutaneous fat layer.

Clinical diagnosis: A reversible hernia of the white line of the abdomen. Grade II obesity. On 20.12.2015, the patient underwent an operation: Herniolaparotomy. Plastic surgery of the anterior abdominal wall by applying a developed duplicate suture. Postoperative period without complications. At the control ultrasound examination on the 4th day, no liquid formations were detected in the operation area. Skin sutures were removed on the 7th day. Wound healing by primary tension. The patient was discharged on day 8.

Examined after 3 years. There is no recurrence of the hernia. According to the questionnaire, the result of the operation was assessed as good. Continues his professional career.

In the long-term period, the relapse rate of POVH was 3 (9.1% of 33 followed-up patients) cases in the comparison group and 1 (4.5% of 22 followed-up patients) in the main group. In total, there were 4 (7.3%) relapses (Fig. 41).

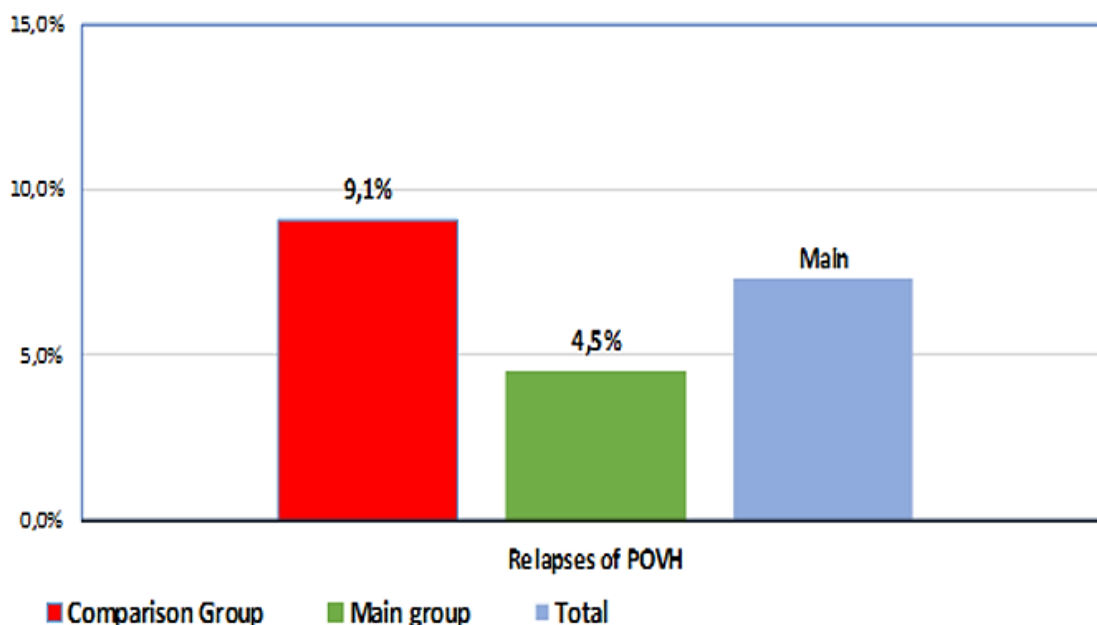


Fig. 41. *Frequency of relapse of POVH after autogernioplasty*

Thus, the improved method of prevention and treatment of ventral hernias through the use of a modified duplicate suture allowed to reduce the frequency of early wound postoperative complications from 15.8% to 4.2%, and hernia recurrence from 9.1% to 4.5%.

Patients of the 3rd and 4th subgroups had concomitant pathology in the form of grade III obesity. In these cases, after the completion of the anterior abdominal wall plastic surgery, DLE was performed, which was previously applied to the anterior abdominal wall before the operation (Fig. 42, 43), which borders the hernial protrusion, the old postoperative scar and the skin-fat fold. The weight of the excess skin-fat flap was from 4 to 12 kg.

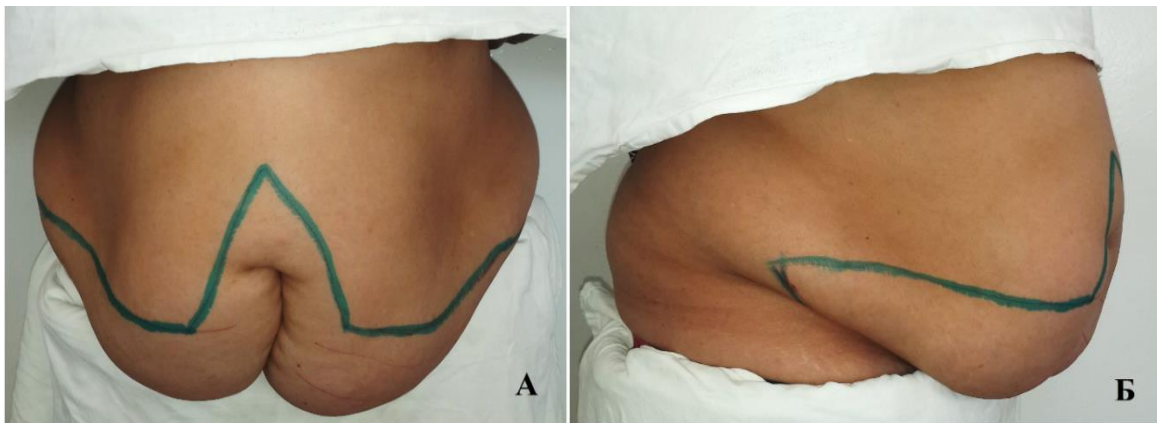


Figure 42. *Drawing of the "anchor" type (Castanares section). A-front view, B-side view*



Figure 43. *Final view of hernioalloplasty with abdominoplasty*

In the main group of patients with a pronounced adhesive process (21 cases), hernioplasty was supplemented with viscerolysis to prevent the development of adhesive obstruction. Accordingly, to assess the effectiveness of these interventions, 31 patients were selected from the comparison group, in which the presence of a pronounced adhesive process was also established according to the operating protocols. In the long-term period, episodes of adhesive intestinal obstruction were observed in 3 (9.7%) patients in the comparison group and only in 1 (4.8%) in the main group. At the same time, in 1 (3.2%) case in the comparison group, surgical treatment was required, in the remaining cases, the obstruction was resolved conservatively (6.5% - 2 patients in the comparison group and 4.8% - 1 patient in the main group) (Fig. 44).

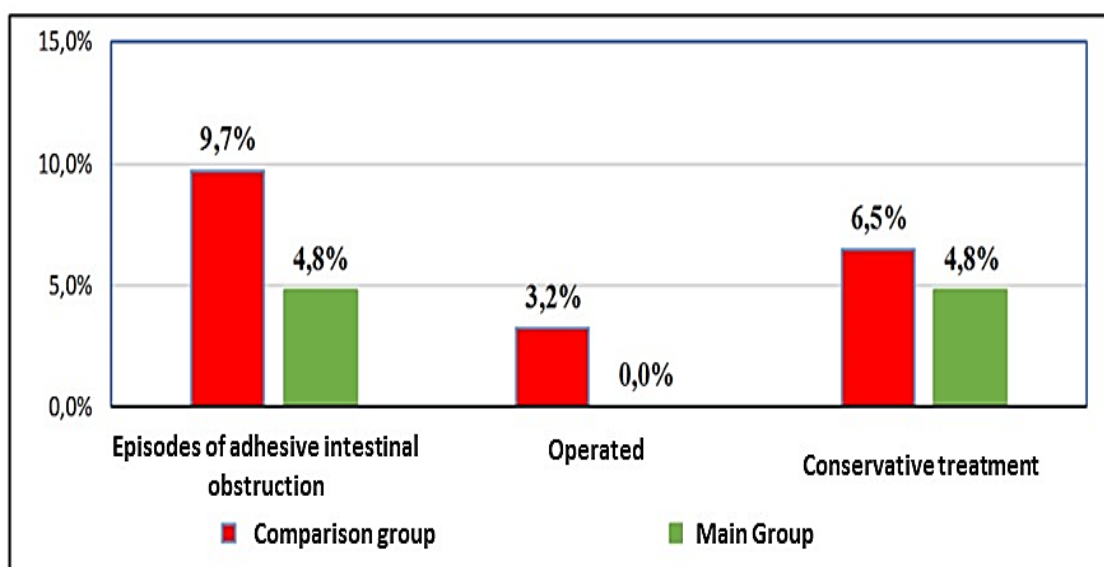


Figure 44. *Frequency of development of adhesive intestinal obstruction after allogenioplasty for recurrent POVH*

In addition, in the main group among patients with obesity of 2-3 degrees, a modified needle holder was used to fix the alloplant to the aponeurosis (Utility model patent - Medical Needle Holder № FAP 01325, 2018. The improved tool due to the curved branches up to 120 degrees makes it easier to manipulate when fixing the endoprosthesis. Modified medical needle holder (fig. 45) consists of two pivotally connected branches (1, 2) with rings (3, 4), a lock of the cremallera type

(5) and a working part made in the form of sponges (6, 7), characterized in that the working part is bent at an angle of 120° , on one of the rings of the main ring on both sides additional holes are made (8, 9).

Making the working part curved at an angle of 120° increases the convenience of using the needle holder. The presence of additional holes on one of the rings on both sides of the main ring increases the stability and ease of use for the surgeon.

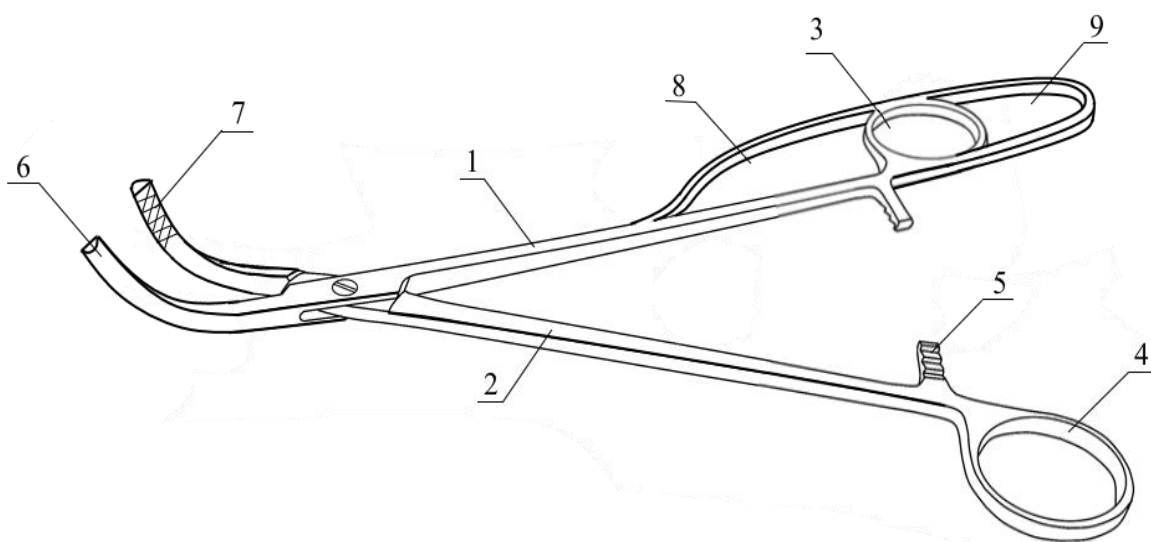


Fig. 45. *Modified medical needle holder:*

1, 2-articulated branches; 3, 4 – rings; 5-cremallery type lock; 6, 7-working parts, in the form of sponges; 8, 9-additional holes.

A medical needle holder for patients with ventral hernias was used as follows. The rings were put on the fingers, on the thumb 4 according to Fig. 45, on the other fingers 3, 8, 9. With the help of branches 1, 2, the needle was laid between the sponges 6, 7, so that the sponges tightly held the needle, closed them and fixed them with a cremallera 5. Then the polypropylene mesh was sewn with a thread of prolene size №3.0. At the same time, the edges of the polypropylene mesh were fixed every 1 cm, after each puncture, the procedure was repeated depending on the length of the defect.

The use of the proposed needle holder made it possible in the technical aspect to optimize the stage of fixing the prosthesis to the

aponeurosis by simplifying the stitching of tissues in the direction parallel to the horizontal plane in a deep wound due to pronounced excess body weight. This technical solution made it possible to significantly reduce the stage of fixation of the prosthesis from 27.4 ± 0.5 minutes to 21.6 ± 0.7 minutes (T-criterion = 6.74, $P < 0.001$) (Fig. 46).

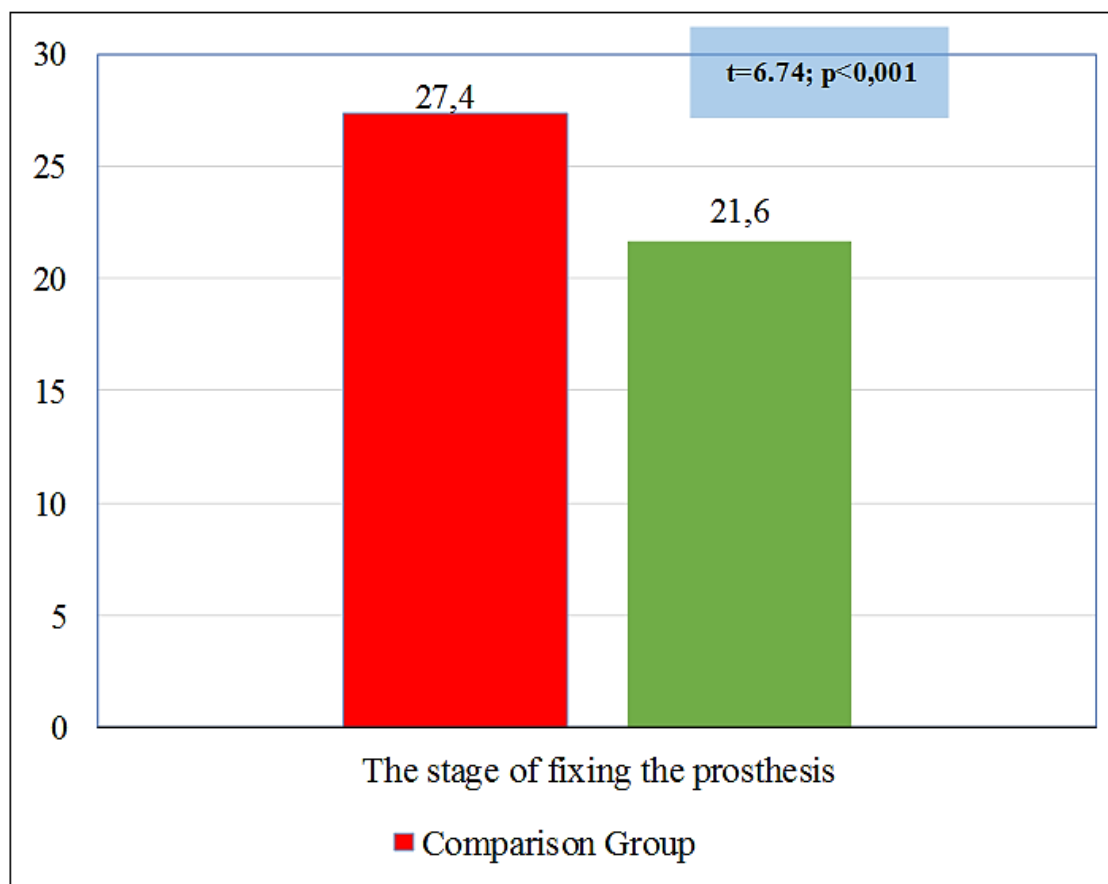


Fig. 46. *The time period of fixation of the prosthesis when using a modified needle holder*

Thus, the improvement of technical aspects made it possible: by using a modified duplicate suture to reduce the frequency of early wound postoperative complications of autogernioplasty in W_1 hernias from 15.8% to 4.2% and hernia recurrence from 9.1% to 4.5%; by supplementing the operation with viscerolysis with a pronounced adhesive process, to reduce the risk of developing episodes of postoperative intestinal obstruction from 9.7% to 4.8%; due to the modification of the needle holder, the technical difficulties in fixing the prosthesis for allogernioplasty in patients with

severe overweight are eliminated, with the reduction of this stage of the operation from 27.4 ± 0.5 to 21.6 ± 0.7 minutes ($P < 0.001$).

After the completion of hernioplasty, patients in the study groups were left with a perforated drainage tube along the Redon, the free ends of which were removed below the horizontal incision and fixed to the skin, according to the indications, depending on the volume of the operation on the aponeurosis.

In order to prevent infectious complications, all patients underwent standard antibiotic prophylaxis.

Optimization of the algorithm for choosing treatment tactics for patients with POVH

Based on a comparative analysis of the effectiveness of the proposed tactical and technical aspects in patients with postoperative ventral hernias, an algorithm for preoperative preparation and selection of the method of hernioplasty was developed (Fig. 47). For this program, a certificate of official registration of the computer program № DGU 06288 was obtained.

The algorithm was developed based on the satisfactory results of surgical treatment of patients in the main group. Based on this, it is necessary to consider the following:

- Presence or absence of concomitant cardiopulmonary pathology;
- Presence or absence of concomitant obesity and saggy abdomen;
- Preoperative preparation should include the use of a belt-bandage in order to adapt the cardiovascular and respiratory systems to the negative consequences of intraabdominal hypertension after surgery;
- When choosing the method of plastic surgery, it is necessary to take into account the size of the hernial gate (W);
- Taking into account the value of intra-abdominal pressure after the reduction of the hernial gate;
- The probability of atrophy of muscle-aponeurotic structures.

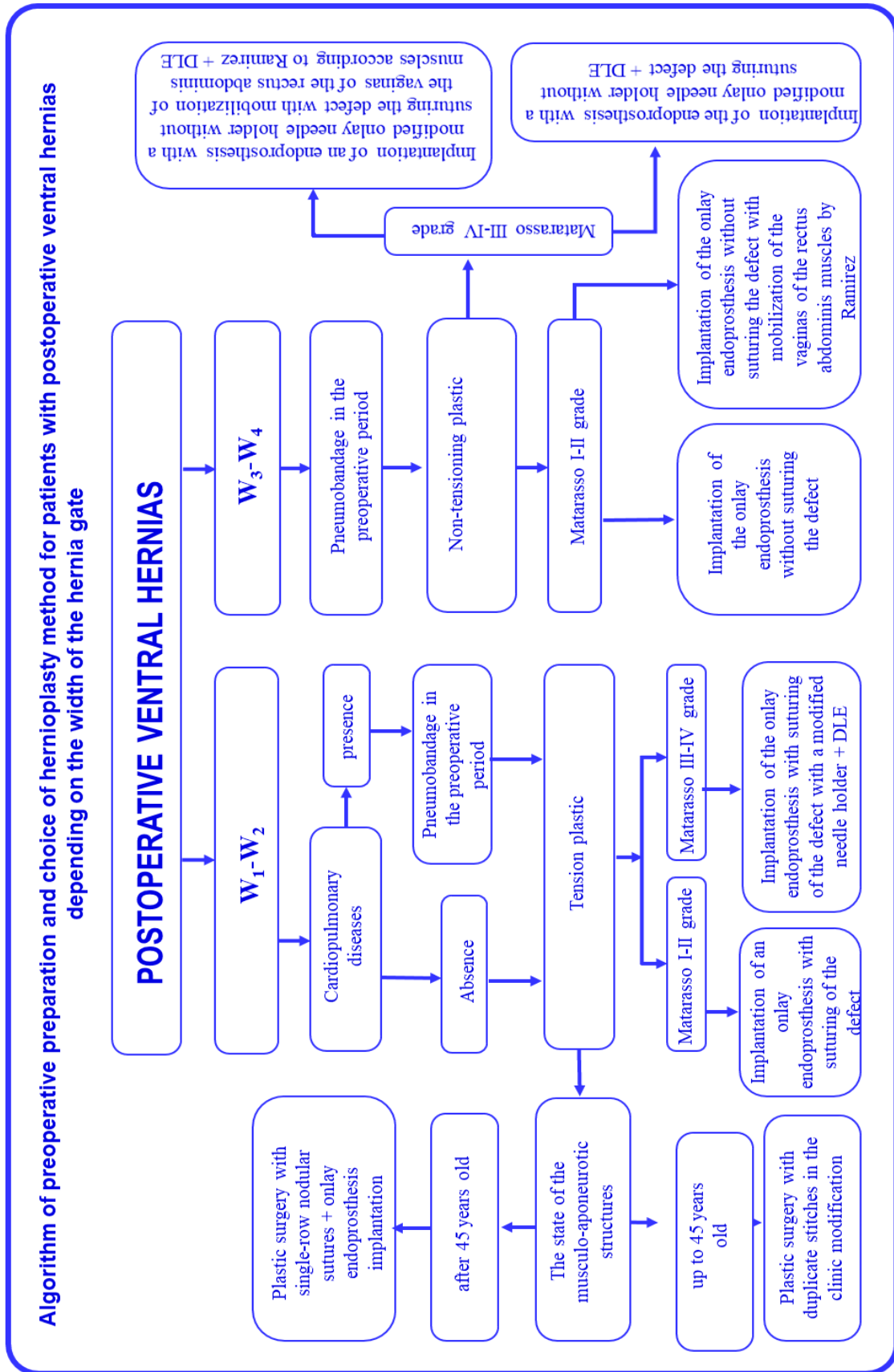


Fig. 47. Algorithm of preoperative preparation and selection of the hernioplasty method

Improving the program for assessing the quality of life of patients after hernioplasty

One of the priorities in modern medicine is the inclusion in the study of various methods for assessing the quality of life of patients after conservative or surgical treatment. Since 2012, our clinic has been determining the quality of life of patients who have undergone hernioplasty according to a developed program that includes objective and subjective signs, instrumental data that can be used to assess the physical, mental and social daily activities of patients who have undergone hernioplasty (Tables 14, 15, Fig. 48).

Table 14

Objective criteria for determining the quality of life of patients undergoing hernioplasty

№	Criteria	Characteristic criterion	Points
1.	The state of the postoperative area according to instrumental data (ultrasound, CT, MRI)	Microabscesses	3
		Infiltrate	7
		No pathologies were detected	10
2.	The nature of stool	Constant constipation	3
		Periodic constipation	7
		There are no pathologies	10
3.	Objective examination of the anterior abdominal wall	Non-healing of the wound, fistula or relapse	3
		Rough postoperative scar	7
		Thin, weak postoperative scar	10
4.	Palpation of the postoperative area	Severe pain	3
		Minor pain	7
		No pathology was detected	10
5.	Functional state of the respiratory system	Chronic respiratory insufficiency	3
		Periodic breathing difficulties	7
		No pathology was detected	10

Table 15

Subjective criteria for determining the quality of life of patients undergoing hernioplasty

№	Criteria	Characteristic criterion	Points
1.	How do you assess your overall health?	Badly	0
		Satisfactory	3
		Good	7
		Excellent	10
2.	Are you satisfied with the cosmetic result of the operation?	Badly	0
		Satisfactory	3
		Good	7
		Excellent	10
3.	How do you assess the overall result of the operation?	Badly	0
		Satisfactory	3
		Good	7
		Excellent	10
4.	How do you rate your physical activity?	Badly	0
		Satisfactory	3
		Good	7
		Excellent	10
5.	Feeling of discomfort in the postoperative area	Constant severe pain	0
		Minor pain	3
		Feelings of discomfort	7
		No complaints	10

ПРОГРАММА ДЛЯ ОПРЕДЕЛЕНИЯ КАЧЕСТВА ЖИЗНИ ПАЦИЕНТОВ ПОСЛЕ ПЕРЕНЕСЕННОЙ ГЕРНИОПЛАСТИКИ ПО ПОВОДУ ПОСЛЕОПЕРАЦИОННЫХ ВЕНТРАЛЬНЫХ ГРЫЖ

Рус Узб

<p>Объективные критерии:</p> <p>Состояние послеоперационной зоны по инструментальным данным (УЗИ, КТ, МРТ):</p> <p><input type="radio"/> Микроабсцессы <input checked="" type="radio"/> Патологий не выявлено</p> <p><input type="radio"/> Инфильтрат</p>	<p>Субъективные критерии:</p> <p>Как Вы оцениваете общее состояние своего здоровья?</p> <p><input type="radio"/> Плохо <input type="radio"/> Хорошо</p> <p><input type="radio"/> Удовлетворительно <input checked="" type="radio"/> Отлично</p>
<p>Характер стула:</p> <p><input type="radio"/> Постоянные запоры</p> <p><input checked="" type="radio"/> Периодические запоры</p> <p><input type="radio"/> Нарушений нет</p>	<p>Устраивает ли Вас косметический результат операции?</p> <p><input type="radio"/> Плохо <input checked="" type="radio"/> Хорошо</p> <p><input type="radio"/> Удовлетворительно <input type="radio"/> Отлично</p>
<p>Пальпация послеоперационной зоны:</p> <p><input type="radio"/> Сильные боли</p> <p><input type="radio"/> Незначительные боли</p> <p><input checked="" type="radio"/> Патологии не выявлено</p>	<p>Как Вы в целом оцениваете результат операции?</p> <p><input type="radio"/> Плохо <input checked="" type="radio"/> Хорошо</p> <p><input type="radio"/> Удовлетворительно <input type="radio"/> Отлично</p>
<p>Функциональное состояние дыхательной системы:</p> <p><input type="radio"/> Хроническая дыхательная недостаточность</p> <p><input type="radio"/> Периодические затруднение дыхания</p> <p><input checked="" type="radio"/> Патологии не выявлено</p>	<p>Как Вы оцениваете свою физическую активность?</p> <p><input type="radio"/> Плохо <input checked="" type="radio"/> Хорошо</p> <p><input type="radio"/> Удовлетворительно <input type="radio"/> Отлично</p>
<p>Объективный осмотр передней брюшной стенки:</p> <p><input type="radio"/> Незаживление раны, свищ или рецидив</p> <p><input type="radio"/> Грубый послеоперационный рубец</p> <p><input checked="" type="radio"/> Нежный послеоперационный рубец</p>	<p>Имеется ли дискомфорт в послеоперационной зоне?</p> <p><input type="radio"/> Постоянные сильные боли <input type="radio"/> Чувства дискомфорта</p> <p><input type="radio"/> Незначительные боли <input checked="" type="radio"/> Жалоб нет</p>

Баллы:

Оценка качества жизни:

Оценка

Очистить

Выход

Figure 48. Program for determining the quality of life of patients undergoing hernioplasty

For this program, a certificate of official registration of the computer program was obtained (№DGU 05632, Agency for Intellectual Property of the Republic of Uzbekistan, 2018 "Program for determining the quality of life of patients after hernioplasty for postoperative ventral hernias").

In the postoperative period, the quality of life of each patient was assessed by the presence of the collected points from the questionnaire on objective and subjective signs. Patients who scored from 81 to 100 points were rated as "excellent", from 61 to 80 points – "good", from 41 to 60 points – "satisfactory" and patients who scored below 40 points were rated as "unsatisfactory".

Conclusion on the chapter

The conducted research allowed us to make the following conclusion:

The method of preoperative preparation of patients with a large ventral hernia with the use of a modified pneumatic belt-bandage for the adaptation of the cardiovascular and respiratory systems to intraabdominal hypertension after hernioplasty has been improved. This made it possible to reduce the risk of developing intra-abdominal hypertension after hernioplasty, to achieve an improvement in the patient's condition at an earlier time and, accordingly, to reduce the frequency of postoperative complications, from 23.5% to 9.6%.

The method of prevention and treatment of ventral hernias has been improved by using a modified suture, which makes it possible to create a dense duplicate closure of the aponeurosis without forming an empty space while maintaining normal blood supply to the muscular-aponeurotic framework.

The surgical instrument "Medical Needle Holder" was modified for technical optimization of the stage of prosthesis fixation during

allogernioplasty in patients with concomitant obesity and abdominal ptosis.

The improvement of technical aspects allowed: by using a modified duplicate suture to reduce the frequency of early wound postoperative complications of autogernioplasty in W_1 hernias from 15.8% to 4.2% and hernia recurrence from 9.1% to 4.5%; by supplementing the operation with viscerolysis in severe adhesive process, to reduce the risk of developing episodes of postoperative intestinal obstruction from 9.7% to 4.8%; due to the modification of the needle holder, the technical difficulties in fixing the prosthesis for allogernioplasty in patients with severe overweight are eliminated, with the reduction of this stage of the operation from 27.4 ± 0.5 to 21.6 ± 0.7 minutes ($P < 0.001$).

CHAPTER V.

RESULTS OF SURGICAL TREATMENT OF PATIENTS WITH POSTOPERATIVE VENTRAL HERNIAS

Immediate results of hernioplasty

To evaluate the effectiveness of the treatment results of patients in the compared groups, the following parameters were used as the main criteria:

- Abdominal complications of the early postoperative period.
- Extra-abdominal complications of the early postoperative period.
- Wound complications in the early postoperative period.

The improvement of the choice of tactics of surgical treatment of ventral hernias, the technique of performing surgical intervention and other innovations developed and implemented in the framework of this study could not but affect the immediate results of the management of this category of patients. In 212 patients, normal gastrointestinal function was preserved after surgery, only 5 patients (4 and 1 patient in the study groups) had intestinal paresis, stopped by medication.

Bronchopulmonary complications were noted in 7 (5.2%) cases in the comparison group and in 2 (2.4%) patients in the main group. The development of ACS (compartment) occurred in 2 (1.5%) patients of the comparison group, which were described in the previous chapter. Cardiovascular complications were observed in 5 patients of the comparison group and 1 patient in the main group. Among wound complications, postoperative hematomas were noted in 4 (3.0%) and 1 (1.2%) cases, respectively, seromas in 12 (8.9%) and 3 (3.7%) patients, lymphorrhea in 6 (4.4%) and 2 (2.4%), wound suppuration in 2 (1.5%) patients in the comparison group, and necrosis of the skin flap edge in 3 (2.2%) and 1 (1.2%) cases (Table 16).

Table 16

Complications in the early postoperative period

Complications	Comparison Group (n=135)		Main group (n=82)		Total (n=217)	
	<i>abs</i>	%	<i>abs</i>	%	<i>abs</i>	%
Bronchopulmonary complications	7	5,2%	2	2,4%	9	4,1%
Intestinal paresis	4	3,0%	1	1,2%	5	2,3%
Cardiovascular complications	5	3,7%	1	1,2%	6	2,8%
Compartment syndrome	2	1,5%	0	0,0%	2	0,9%
Hematoma	4	3,0%	1	1,2%	5	2,3%
Seroma	12	8,9%	3	3,7%	15	6,9%
Lymphorrhhea	6	4,4%	2	2,4%	8	3,7%
Suppuration of the wound	2	1,5%	0	0,0%	2	0,9%
Necrosis of the edge of the skin flap	3	2,2%	1	1,2%	4	1,8%

It should be noted that on average, one patient in the comparison group had 2-3 complications in the form of a combination of bronchopulmonary or (and) cardiovascular with wound complications. In general, the comparison group included 25 (18.5% of 135) patients with various complications, of which 16 (11.9%) had wound complications and 9 (6.7%) had general extra – abdominal complications (Fig. 49).

In the main group there were 7 (8.5% of 82) patients with various complications, 4 (4.9%) – wound and 3 (3.7%) - general. According to the comparative indicator of the number of complications, a significant improvement was obtained in the main group (Chi-square criterion=4,043; Df=1; p=0.045).

At the stages of treatment, the level of intra-abdominal pressure was measured in dynamics. Based on the data obtained, there were revealed regular changes in intra-abdominal pressure indicators in the direction of their increase at the stages of the operation, associated with the immersion of the hernial contents and hernioplasty, as mentioned earlier.

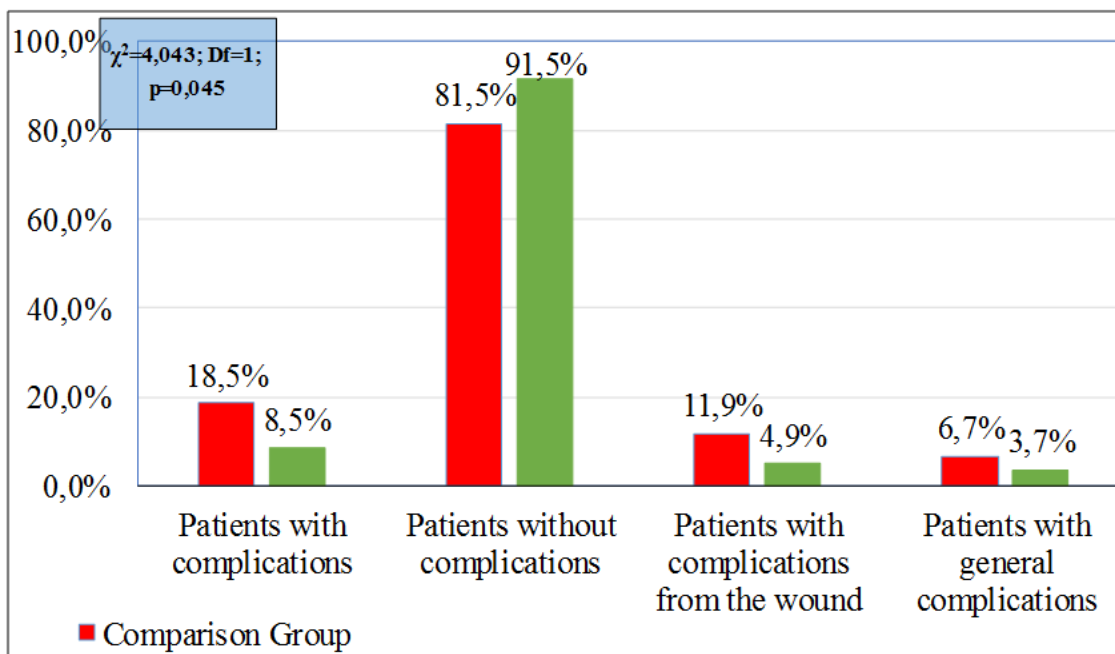


Fig. 49. *Distribution of patients by the frequency of complications after hernioplasty*

Non-tensioning hernioalloplasty and a combined technique with Ramirez rectus muscle mobilization, applied to 11 patients of the main group, allowed to avoid an increase in intra-abdominal pressure. The frequency of complications after various allogernioplasty variations is shown in Table 17 (these indicators for autogernioplasty were shown in Table 13).

Bronchopulmonary complications were noted in 7 of 97 (7.2%) cases in the comparison group and in 2 (3.4%) of 58 patients in the main group. The development of ACS (compartment) occurred in 2 (2.1%) patients of the comparison group. Cardiovascular complications were observed in 5 patients of the comparison group and 1 patient in the main group. Among wound complications, postoperative hematomas were noted in 3 (3.1%) and 1 (1.7%) cases, respectively, seromas in 9 (9.3%)

and 2 (3.4%) patients, lymphorrhea in 5 (5.2%) and 2 (3.4%), wound suppuration in 1 (1.0%) patient in the comparison group, and necrosis of the edge of the skin flap in 2 (2.1%) and 1 (1.7%) cases.

Table 17

**Complications in the early postoperative period after
allogernioplasty**

Complications	Comparison Group (n=97)		Main group[(n=58)	
	<i>abs</i>	%	<i>abs</i>	%
Allogernioplasty				
Bronchopulmonary complications	7	7,2%	2	3,4%
Intestinal paresis	4	4,1%	1	1,7%
Cardiovascular complications	5	5,2%	1	1,7%
Compartment syndrome	2	2,1%	0	0,0%
Hematoma	3	3,1%	1	1,7%
Seroma	9	9,3%	2	3,4%
Lymphorrhea	5	5,2%	2	3,4%
Suppuration of the wound	1	1,0%	0	0,0%
Necrosis of the edge of the skin flap	2	2,1%	1	1,7%

In general, after allogernioplasty in the comparison group there were 19 (19.6%) patients with various complications, of which 10 (10.3%) had wound complications and 9 (9.3%) – general extra-abdominal complications (Fig. 50). In the main group there were 6 (10.3%) patients with various complications, 3 (5.2%) patients with wound and general complications.

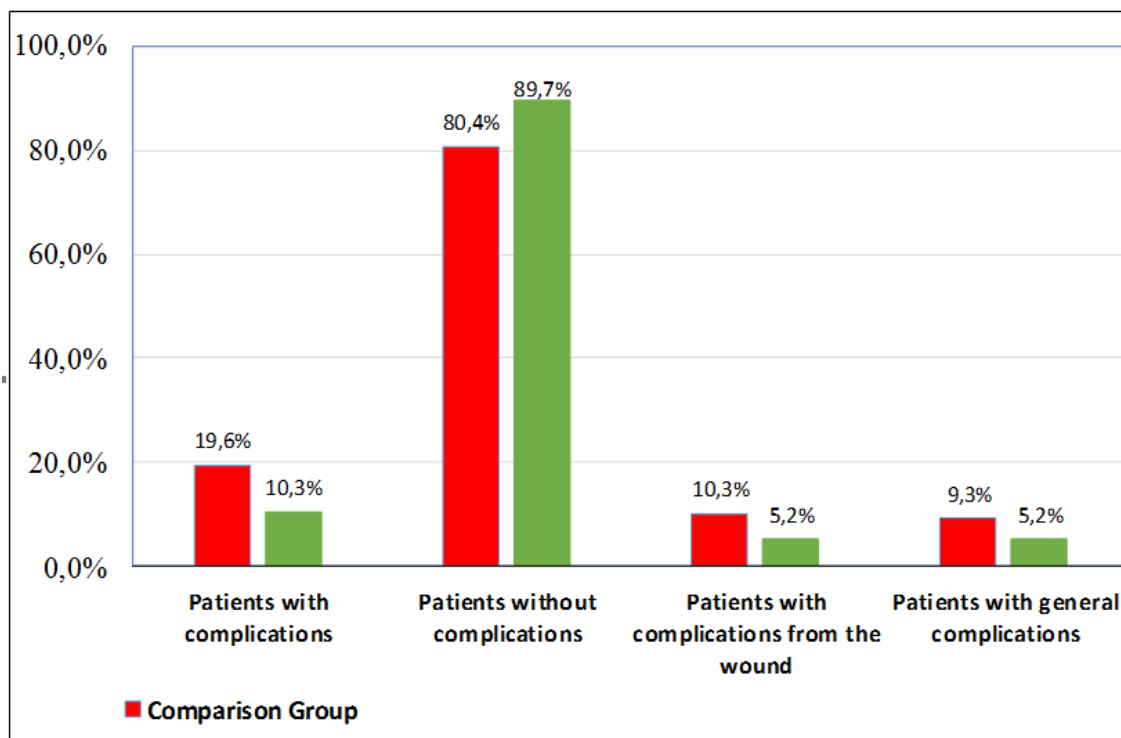


Figure 50. *Frequency of complications after allogenioplasty*

Thus, the greatest number of early postoperative complications was observed in patients in the comparison group. The lowest number of cardiopulmonary and local complications after surgery was observed in the main group of patients.

When comparing the time periods, it was noted that the improvement of tactical and technical aspects provided a reduction in all the main perioperative periods. Thus, in the department of resuscitation and intensive care, the patients of the comparison group were on average 1.7 ± 0.1 days versus 1.3 ± 0.1 days in the main group ($P < 0.01$); after surgery, 11.7 ± 0.5 days versus 6.7 ± 0.3 days ($P < 0.001$); in total, 15.7 ± 0.6 days versus 10.2 ± 0.4 days ($P < 0.001$). In turn, the average duration of the operation decreased from 63.4 ± 4.1 to 49.7 ± 3.4 minutes in the main group ($P < 0.05$), and the required drainage period from 5.9 ± 0.4 to 3.5 ± 0.3 minutes in the main group ($P < 0.001$) (Table 18).

Thus, the use of the algorithm, taking into account the improved tactical and technical aspects of the surgical treatment of POVH, allowed to reduce the overall frequency of postoperative complications from

18.5% to 8.5% ($p=0.045$), including wound complications from 11.9% to 4.9% and extra-abdominal complications from 6.9% to 3.7%, as well as significantly reduce the duration of surgical treatment, rehabilitation periods and the total duration of inpatient treatment after various options of hernioplasty.

Table 18

The course of the postoperative period of patients in the analyzed groups

Complications	Comparison Group	Main Group	T-criterion, P
Before the operation (day)	4,0±0,6	4,2±0,2	0,32; P>0,05
Department of resuscitation and intensive care (day)	1,7±0,1	1,3±0,1	2,83; P<0,01
After the operation (day)	11,7±0,5	6,7±0,3	8,57; P<0,001
Total (day)	15,7±0,6	10,2±0,4	7,63; P<0,001
Operation duration, min	63,4±4,1	49,7±3,4	2,57; P<0,05
Terms of drainage removal by Redon (day)	5,9±0,4	3,5±0,3	4,80; P<0,001

Long-term results of surgical treatment of patients with POVH

Проанализированы отдаленные результаты у 166 (76,5%) из 217 оперированных больных по поводу послеоперационной вентральной грыжи (табл. 19). Для оценки отдаленных результатов больные подвергались тщательному анкетированию, амбулаторному и стационарному обследованию. Отдаленные результаты изучались в сроки от 1 года до 5 лет. При этом судьбу 94 (93,1%) больных в группе сравнения и 52 (80%) в основной группе удалось проследить в сроки более 3-х лет, достаточных для окончательного формирования клинически значимого рецидива заболевания.

Table 19

Terms of the study of long-term results in operated patients

Group of patients	Total operated on	Long-term results were studied	Observation period, years		
			up to 1 year	1-3 years	3-5 years
Comparison (2009-2014)	135	101	7	64	30
		74,8%	6,9%	63,4%	29,7%
Main (2015-2017)	82	65	13	32	20
		79,3%	20,0%	49,2%	30,8%
Total	217	166	20	96	50
		76,5%	12,0%	57,8%	30,1%

One of the main indicators that characterize the effectiveness of surgical intervention in POVH is the frequency of relapses of the disease. When studying the nature of relapse, the timing of the occurrence of relapse, the features of previously used methods of surgical intervention were studied.

Of the 166 patients examined in the long – term period, 6 (3.6%) had a relapse of POVH, while in the comparison group this indicator was 5.0% (5 patients), and in the main group-1.5% (1 patient) (Table 20). These results were obtained through the use of the above-mentioned measures to prevent relapses of the disease with the transition to a differentiated choice of surgical intervention individually for each patient. The reduction in the number of relapses after autoplasty, in our opinion, was facilitated by the application of a duplicate suture in the modification of the clinic for the elimination of hernial gates, as well as the addition of the operation, if necessary, by performing a dermatolipidectomy in obese patients.

The frequency of recurrent POVH after autoplasty was 3 (9.1% of 33 followed-up patients) cases in the comparison group and 1 (4.5% of 22 followed-up patients) in the main group. In total, there were 4 (7.3%) relapses. After allogernioplasty in the comparison group, relapse was noted

in one (4.0% of 25 patients) case with suturing of the aponeurosis defect (tension plastic surgery) and in another (2.3% of 43 patients) case with non-tensioned allogernioplasty. In the main group, this complication was not observed among this category of patients.

Table 20

Recurrence rate of POVH

Study groups		Type of operation						Total, n=166	
		Tensioning methods of plastics				Non- tensioning methods of plastic surgery			
		Autoplasty		Autoplasty					
Comparison Group (n=101)	Traced	33		25		43		101	
	Relapse	3	9,1%	1	4,0%	1	2,3%	5	5,0%
Main group (n=65)	Traced	22		17		26		65	
	Relapse	1	4,5%	0	0,0%	0	0,0%	1	1,5%
Total (n=166)	Traced	55		42		69		166	
	Relapse	4	7,3%	1	2,4%	1	1,4%	6	3,6%

In general, the improved method of prevention and treatment of ventral hernias due to the use of a modified duplicate suture in autogernioplasty reduced the frequency of disease recurrence from 9.1% to 4.5%, while among patients with allogernioplasty, these indicators were leveled from 2.9% in the comparison group and 0 in the main group (Fig. 51).

In the main group of patients with a pronounced adhesive process (21 cases), hernioplasty was supplemented with viscerolysis to prevent the development of adhesive obstruction. In the long-term period, episodes of adhesive intestinal obstruction in the whole study group were observed in 7 (6.9%) patients in the comparison group and only in 2 (3.1%) in the main group (Fig. 52).

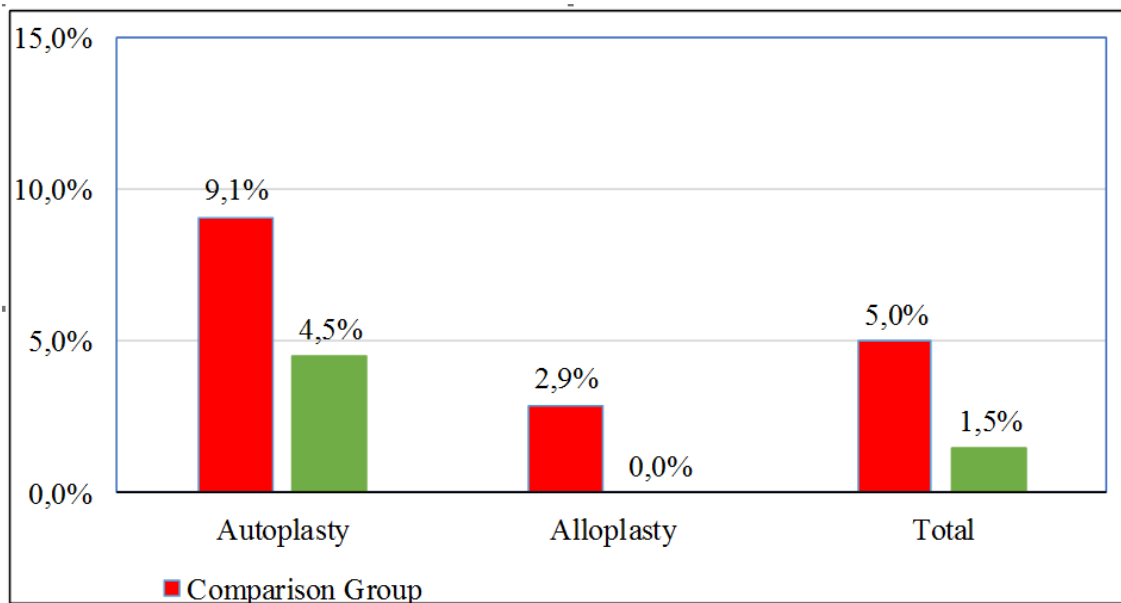


Figure 51. *Frequency of recurrent POVH after autogernioplasty*

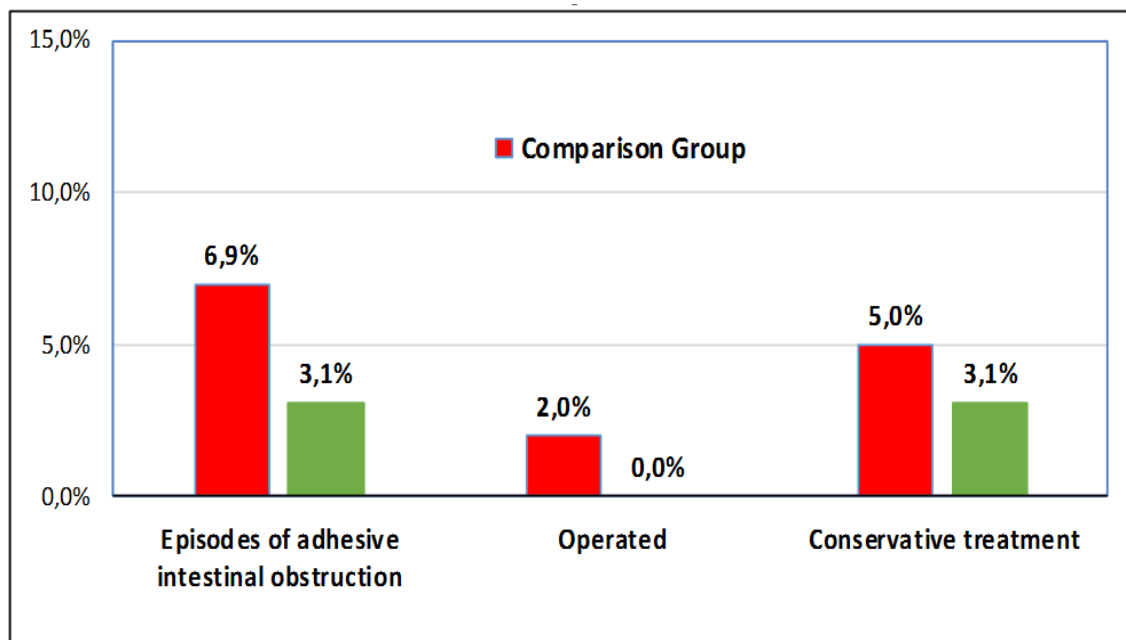


Figure 52. *Frequency of adhesive intestinal obstruction after hernioplasty for recurrent POVH*

At the same time, in 2 (2.0%) cases in the comparison group, surgical treatment was required, in other cases, the obstruction was resolved conservatively (5.0% - 5 patients in the comparison group and 3.1% - 2 patients in the main group).

During the dynamic observation of the patients of the comparison group with obesity, the body weight indicators did not undergo significant changes. However, the addition of hernioplasty with abdominoplasty has had a positive impact on future life prospects, since it is the abdominal type of adipose tissue distribution that is most associated with a high risk of cardiovascular diseases and diabetes of 2 type that is undergoing significant changes (Figure 53).



Figure 53. *View of the patient after hernioabdominoplasty in the long-term period*

In the study groups, 145 people (66.8%) initially had arterial hypertension of various degrees. Dynamic follow-up in the long-term postoperative period in patients of the comparison group showed the preservation of high blood pressure, with a tendency to transition to more severe degrees of arterial hypertension. In patients of the main group, there was a decrease in high blood pressure, with a tendency to transition to milder degrees of arterial hypertension (Table 21).

Table 21

Distribution of patients by concomitant pathology in the long-term postoperative period

Indicators	Study groups of patients							
	Comparison Group (n=101)				Main group (n=65)			
	before the operation		in the distant period		before the operation		in the distant period	
	<i>abs</i>	%	<i>abs</i>	%	<i>abs</i>	%	<i>abs</i>	%
Hypertension	71	70,3	73	72,3	44	67,7	28	43,1
Coronary heart disease	28	27,7	31	30,7	19	29,2	9	13,8
Chronic obstructive pulmonary disease	14	13,9	15	14,9	6	9,2	5	7,7
Diabetes mellitus	5	5,0	6	5,9	4	6,2	4	6,2
Varicose veins of the lower extremities	15	14,9	14	13,9	4	6,2	3	4,6

Thus, an integrated approach to the surgical treatment of POVH has reduced the frequency of specific long-term postoperative complications, as well as generally improved the objective and subjective criteria for assessing the quality of life of this category of patients, which will be discussed in the next sub-chapter.

Study of the quality of life of patients with POVH after surgical treatment

In the previous chapter, a modified scale for assessing the quality of life of patients was presented, the essence of which was aimed not just at

a general assessment of the patient's condition, but also taking into account specific criteria specific to patients with hernioplasty.

According to the developed program for determining the quality of life of patients who underwent hernioplasty, 156 (93.9%) of 166 patients who were observed in the long-term postoperative period were evaluated. Of these, 92 patients from the comparison group and 64 patients from the main group (table 22).

Table 22

Quality of life of patients in the postoperative period

Result	Comparison Group (n=92)		Main group (n=64)		Total (n=156)	
	<i>abs</i>	%	<i>abs</i>	%	<i>abs</i>	%
Excellent	30	32,6%	35	54,7%	65	41,7%
Good	44	47,8%	24	37,5%	68	43,6%
Satisfactory	13	14,1%	4	6,3%	17	10,9%
Unsatisfactory	5	5,4%	1	1,6%	6	3,8%
Total	92	100,0%	64	100,0%	156	100,0%

Thus, in the comparison group, excellent results were obtained in 30 (32.6%) patients, good in 44 (47.8%), satisfactory in 13 (14.1%) patients and unsatisfactory in 5 (5.4%) cases. In turn, in the main group, excellent results were obtained in 35 of 64 (54.7%) patients, good in 24 (37.5%), satisfactory in 4 (6.3%) patients and unsatisfactory only in 1 (1.6%) case (Fig. 54).

According to this criterion, a significant difference was obtained (the value of the χ^2 criterion was 8.961 with a significance level of $p=0.030$). Improvements in quality of life indicators were obtained for all domains of the school, taking into account the psycho-emotional background, as well as the physical activity of patients after various types

of hernioplasty. All cases of relapse, regardless of the general status of the patients, were reported as unsatisfactory results.

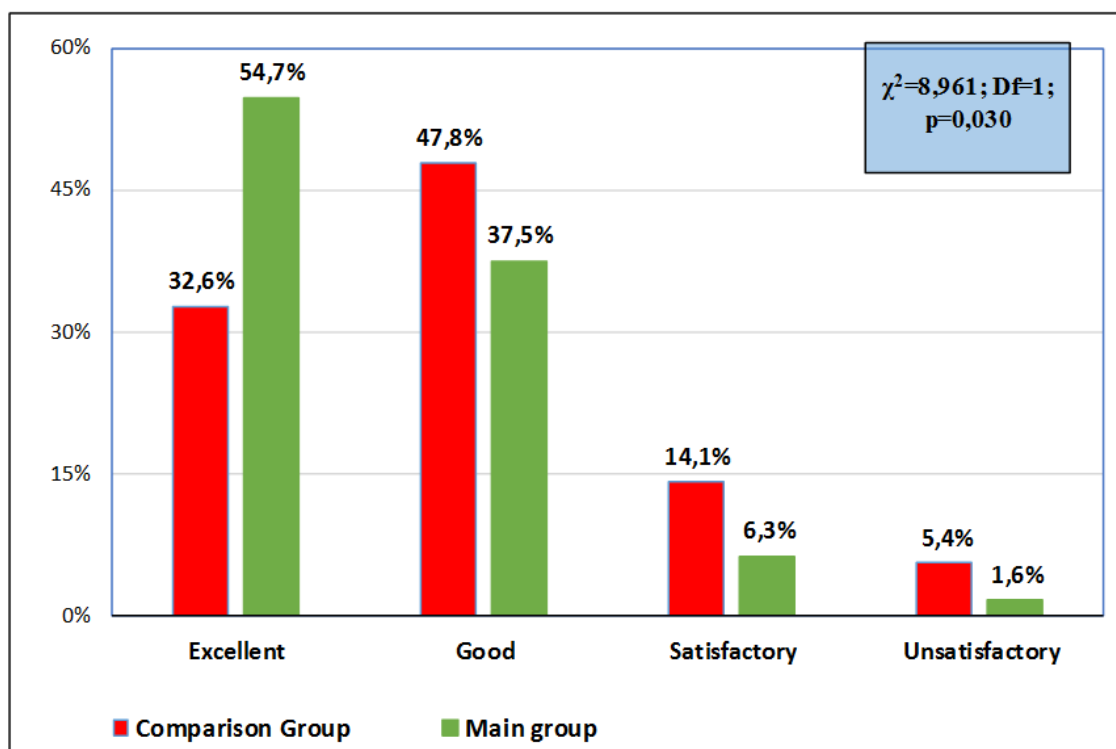


Figure 54. *Quality of life of patients depending on the results of hernioplasty*

Thus, the analysis of the quality of life of patients according to the improved scale showed that the use of the algorithm of an integrated approach to the choice of the optimal treatment strategy for POVH allowed to increase the share of "excellent and good" results from 80.4% (74 out of 92 patients in the comparison group) to 92.2% (59 out of 64 patients in the main group) and to reduce the frequency of unsatisfactory outcomes from 5.4% (5 out of 92 patients in the comparison group) to 1.6% (1 out of 64 patients in the main group) (p=0.030).

Conclusion of the chapter

The conducted research allowed us to make the following conclusion:

The use of the algorithm, taking into account the improved tactical and technical aspects of the surgical treatment of POVH, allowed to reduce the overall frequency of postoperative complications from 18.5% to 8.5% ($p=0.045$), including wound complications from 11.9% to 4.9% and extra-abdominal complications from 6.9% to 3.7%, as well as significantly reduce the duration of surgical treatment, rehabilitation periods and the total duration of inpatient treatment after various options of hernioplasty.

A comprehensive approach to the surgical treatment of POVH allowed to reduce the frequency of specific long-term postoperative complications, including relapse of POVH from 5.0% in the comparison group to 1.5% in the main group (from 9.1% to 4.5% in autogernioplasty and from 2.9% to 0% in allogernioplasty).

The analysis of the quality of life of patients on the improved scale showed that the application of the algorithm of an integrated approach to the choice of the optimal treatment strategy for POVH allowed to increase the share of " excellent and good " results from 80.4% to 92.2% and to reduce the frequency of unsatisfactory outcomes from 5.4% to 1.6% ($p=0.030$).

CONCLUSION

In order to improve the results of surgical treatment of patients with postoperative ventral hernias, we conducted a series of morphological and clinical studies.

The study is based on a survey of 217 patients with postoperative primary and recurrent ventral hernias who were operated on in the surgical departments of the 1st and 2nd clinics of the Samarkand State Medical Institute for the period from 2009 to 2017. The patients were divided into 2 groups:

1 - comparison group – 135 patients (2009-2014), who, depending on the type of hernioplasty, were divided into two subgroups: 1 subgroup consisted of 38 (28.1%) patients with minor aponeurosis defects who underwent tension autogernioplasty; 2 subgroup consisted of 97 (71.9%) patients who underwent allogernioplasty with aponeurosis defect suturing (tension) – 29 (21.5%) and without suturing (non – tension) - 68 (50.4%) patients. 2-the main group – 82 patients (2015-2017), divided into subgroups according to the same principle (autoplasty and alloplasty), but in the treatment of which an improved algorithm was used to select the optimal method of surgical treatment of POVH, taking into account the implemented tactical and technical aspects.

The complex of examination of patients included both general clinical laboratory and instrumental methods of research, and morphological studies of aponeurosis of the anterior abdominal wall.

Structural differences of aponeurosis were studied in 36 patients with ventral hernias in different age groups from 30 to 76 years. With age, there were significant violations of the structure of aponeurosis and rectus abdominis muscles. The nature of these changes, namely, violations of the order of the arrangement of collagen fibers, allowed us to assume that these structural changes were the basis for the violation of the strength of aponeurosis. The greatest changes were found in patients of the oldest age

group (the senile period of 75-90 years). Collagen fibers are usually scattered with a weak tendency to form bundles. In the expanded spaces between the fibers, free red blood cells are located.

It was also determined that the presence of factors that contribute to the overgrowth of the aponeurotic tissue (obesity, relapses of postoperative ventral hernias), regardless of age, can also lead to the formation of dystrophic remodeling of the muscular-aponeurotic layer with a decrease in its strength.

Changes in the morphological structure of the anterior abdominal wall are characteristic not only for older age groups, but also for patients with factors that contribute to the overgrowth of the aponeurosis tissue, the detection of which, regardless of the age and size of the hernial defect, requires the use of synthetic grafts to strengthen the anterior abdominal wall during hernioplasty.

In the main group, 52 (63.4%) patients with a reversible hernia with a size of W_2 , W_3 and W_4 underwent preoperative preparation with the use of an improved pneumatic belt-bandage in order to adapt the cardiovascular and respiratory systems to the negative consequences of intraabdominal hypertension after surgery. The advantages of the proposed method were: the end of the air blower is located directly in the belt-bandage, that is, the air is pumped precisely into the inside of the bandage; on the inside of the belt-bandage there is a zipper for the movement of the pelot, which makes it possible to close the hernial gate of any localization, including lateral and lumbar hernias of the abdomen; depending on the size of the hernial gate, with the improved method, it became possible to use a pelot corresponding to a hernial defect of size. The preparation was carried out for 7-10 days. To determine the effectiveness of the proposed method of banding, the dynamics of indicators of the degree of intra-abdominal pressure (IAP) in the study groups was studied.

In the comparison group, conventional banding was used in 85 patients out of 135, in the main group in 52 out of 82 patients with hernia sizes W_2 , W_3 and W_4 . The use of the proposed method of

pneumobandage allowed to increase the proportion of patients with normal IAP or its increase to I st during training for 7-10 days from 60.0% (51 patients in the comparison group) to 80.8% (42 patients in the main group), while II-IV st was observed in 40.0% (34) and 19.2% (10) patients ($p=0.042$). In general, the comparison group included 20 (23.5% of 85) patients with various complications, of which 13 (15.3%) had wound complications and 7 (8.2%) had general extra – abdominal complications. In the main group there were 5 (9.6% of 52) patients with various complications, 3 (5.8%) – wound and 2 (3.8%) - general. According to the comparative indicator of the number of complications, a significant improvement was obtained in the main group ($p=0.041$).

Next, we present the tactical and technical aspects of performing hernioplasty, taking into account the developed quantitative assessment of risk factors for relapse of postoperative hernias. The developed program, based on the clinical and ultrasound characteristics of the anatomical and functional state of the abdominal wall in the examined patients, as well as taking into account the size of the hernial gate, age, the functional state of the respiratory system, digestive and urinary systems, physical activity, and obesity, allows you to optimize the choice of treatment tactics for POVH. According to the results of the program, the patients of the main group were divided into 4 subgroups.

Patients of the 1st subgroup with a total score of up to 5 points underwent autoplasty of the abdominal wall with local tissues. This group consisted of young patients (25-44 years old), who, as a rule, had small defects and no pronounced changes in the tissues of the anterior abdominal wall, there were no concomitant diseases. In the 2nd subgroup (6-10 points), taking into account the risk of tissue tension, various constitutional features, a combined plastic surgery was performed - the defect of aponeurosis was sutured edge to edge with an additional cover of the suture line with a polypropylene mesh, thereby eliminating the need for double-row sutures. In the 3rd subgroup (11-15 points), in order to increase the volume of the abdominal cavity, to prevent the development of abdominal compression syndrome (ACS), plastic surgery was

performed in a non-strained way. In the 4th subgroup of patients with grade III obesity (16-22 points), non-tensioned alloplasty with mobilization of the vaginas of the rectus abdominis muscles was performed according to Ramirez.

Patients of the 1st subgroup after suturing the peritoneum were given a duplicate suture on the aponeurosis in the modification of the clinic. The distinctive essence of the technique was that when performing the proposed suture, only the anterior wall and the entire edge of the aponeurosis are captured, and therefore a dense duplicate closure of the aponeurosis is formed, whereas in the prototype, on both sides of the aponeurosis, the suture covers the anterior and posterior walls throughout, and the node is located on the anterior wall of the aponeurosis on one side. Also, with a modified duplicate suture, the blood supply to the muscular-aponeurotic framework is preserved, and with the prototype, due to the closing of the walls of the aponeurosis, a compression pressing of the blood vessels occurs. In addition, unlike the most common cases of Sapezhko or Mayo surgery, in which an aponeurosis duplicature is created with the possibility of creating an empty space, which in the early postoperative period can lead to fluid accumulation with the formation of an undrained hematoma or seroma, with the proposed suture, this probability is leveled due to a dense comparison of the walls of the aponeurosis. To evaluate the effectiveness of the proposed method of autogernioplasty, the results of operations in the main group were studied in 24 patients, in the comparison group in 38 patients with Sapezhko or Mayo plastic surgery. After the operation, only wound complications were noted, and in the comparison group these were seromas in 3 (7.9%) patients and in one (2.6%) case, hematoma, wound suppuration, necrosis of the edge of the skin flap and lymphorrhea. In total, wound complications were observed in 6 (15.8%) patients of the comparison group and 1 (4.2% - seroma) in the main group. Accordingly, 32 (84.2%) and 23 (95.8%) patients were discharged without complications. In the long-term period, the relapse rate was 3 (9.1% of 33 followed-up patients) cases in the comparison group and 1 (4.5% of 22) in the main group.

In addition, in the main group among patients with obesity of 2-3 degrees, a modified needle holder was used to fix the alloplant to the aponeurosis. The use of the proposed needle holder made it possible in the technical aspect to optimize the stage of fixing the prosthesis to the aponeurosis by simplifying the stitching of tissues in the direction parallel to the horizontal plane in a deep wound due to pronounced excess body weight. This technical solution made it possible to significantly reduce the stage of fixation of the prosthesis from 27.4 ± 0.5 minutes to 21.6 ± 0.7 minutes ($P < 0.001$).

Based on a comparative analysis of the effectiveness of the proposed tactical and technical aspects in patients with postoperative ventral hernias, an algorithm for preoperative preparation and selection of the method of hernioplasty was developed.

The next stage of the study was to improve the methodology for assessing the quality of life of patients after surgical treatment. A program was developed that includes objective and subjective signs, instrumental data on which it is possible to assess the physical, mental and social daily activities of patients who have undergone hernioplasty. In the postoperative period, the quality of life of each patient was assessed by the presence of the collected points from the questionnaire on objective and subjective signs. Patients who scored from 81 to 100 points were rated as "excellent", from 61 to 80 points – "good", from 41 to 60 points – "satisfactory" and patients who scored below 40 points were rated as "unsatisfactory".

It should be noted that on average, one patient in the comparison group had 2-3 complications in the form of a combination of bronchopulmonary or (and) cardiovascular with wound complications. In general, the comparison group included 25 (18.5% of 135) patients with various complications, of which 16 (11.9%) had wound complications and 9 (6.7%) had general extra – abdominal complications. In the main group there were 7 (8.5% of 82) patients with various complications, 4 (4.9%) – wound and 3 (3.7%) - general. According to the comparative indicator of the number of complications, a significant improvement was

obtained in the main group ($\chi^2=4,043$; Df=1; $p=0.045$). After allogernioplasty, the comparison group included 19 (19.6%) patients with various complications, of which 10 (10.3%) had wound complications and 9 (9.3%) had general extra – abdominal complications. In the main group there were 6 (10.3%) patients with various complications, 3 (5.2%) patients with wound and general complications. When comparing the time periods, it was noted that the improvement of tactical and technical aspects provided a reduction in all the main periods of hospitalization ($P<0.001$).

Further, the long-term results were analyzed in 166 (76.5%) of 217 operated patients. Relapse of POVH was noted in 6 (3.6%), while in the comparison group this indicator was 5.0% (5 patients), and in the main group – 1.5% (1 patient). The frequency of recurrent POVH after autoplasty was 3 (9.1% of 33 followed-up patients) cases in the comparison group and 1 (4.5% of 22 followed-up patients) in the main group. In total, there were 4 (7.3%) relapses. After allogernioplasty in the comparison group, relapse was noted in one (4.0% of 25 patients) case with suturing of the aponeurosis defect (tension plastic surgery) and in another (2.3% of 43 patients) case with non-tensioned allogernioplasty.

Further, according to the developed program for determining the quality of life of patients who underwent hernioplasty, 156 (93.9%) of 166 patients who were observed in the long-term postoperative period were evaluated. Of these, 92 patients from the comparison group and 64 patients from the main group.

The analysis of the quality of life of patients on the improved scale showed that the application of the algorithm of an integrated approach to the choice of the optimal treatment strategy for POVH allowed to increase the share of " excellent and good " results from 80.4% to 92.2% and to reduce the frequency of unsatisfactory outcomes from 5.4% to 1.6%.

References:

1. Abdullaev E. G. Postoperative ventral hernias after laparoscopic interventions / E. G. Abdullaev, V. V. Fedenko, V. V. Babygin // *Endoscope. surgery.* - 2005. - No. 4. - p. 11-13.

2. Abramov V. A. Duplicate suture for the prevention and treatment of postoperative ventral hernias: abstract of the dissertation of the Candidate of Medical Sciences: Abramov Vladimir Alexandrovich. - Nizhny Novgorod, 2009. - 24s.

3. Agaev B. A. Laparoscopic plasty of the abdominal wall in postoperative ventral hernias /B. A. Agaev, E. G. Rustamov, G. A. Rustamov // *Surgery.* - 2009. - No. 9. - pp. 74-78.

4. Agafonov O. I. Results of the use of a skin flap in the plastic of postoperative ventral hernias / O. I. Agafonov, V. G. Pleshkov, V. N. Afanasyev, A.V. Rodin // *Materials of the VII All-Russian Conference of General surgeons with international relations. participation (Krasnoyarsk, May 17-18, 2012) / Ed. by K. Gostischev; ed. by V. A. Kubyshkin [et al.]. - Krasnoyarsk: Verso, 2012. pp. 263-266.*

5. Aydemirov A. N. New technologies in the diagnosis and treatment of large and giant ventral hernias /A. N. Aydemirov, A. Z. Vafin, G. S. Chumanov, E. G. Mnatsakanian, R. M. laipanov, P. I. Chumakov // *the Medical Bulletin of the North Caucasus.* – 2012. – No. 1. – P. 38-42.

6. Alishev O. T., R. S. Shaimardanov current status and problems of treatment of large incisional ventral hernias // *prakticheskaya meditsina.* – 2013. – №. 2 (67). P. 16-21.

7. Alyautdinov P. P. Surgical treatment of patients with umbilical hernias / P. P. Alyautdinov, B. Sh. Gogia, A. A. Adamyan [et al.] // *Modern technologies and possibilities of reconstructive and aesthetic surgery: mater. III International Conference, Moscow, 17-18 April 2012 / ed. by V. A. Kubyshkin, A. A. Adamyan-pp. 130-132.*

8. Andriyashkin A.V. et al. Prevention of venous thromboembolic complications in patients with postoperative ventral hernias: results of an observational cross-sectional study. - 2017. - Vol. 11. - no. 1. - p. 17-20.

9. Anishchenko V. V. Complex hernias-classification possibilities / A.V. Anishchenko, S. A. Semenov// Proceedings of the IX Conference "Topical issues of Herniology". - Moscow. - 2012. - p. 24-26.

10. Antonyuk S. M. et al. Features of prevention of postoperative complications in alloplasty of large and giant postoperative ventral hernias //University clinic. - 2017. - Vol. 12. - no. 2. - p. 23-26.

11. Antropova N. V. Preoperative preparation and surgical treatment of patients with postoperative ventral hernias: Dis. dr. med. nauk / N. V. Antropova; - M., 1993. -341 p.

12. Aslanov A.D. Nanotechnologies in surgery of large and giant ventral hernias / A.D. Aslanov et al.]/Herniology. - 2011. - No. 1. - p. 5-6.

13. Outlev K. M. et al. Preventive aspects of the occurrence of postoperative ventral hernias in patients with morbid obesity //Medical science and education of the Urals. - 2016. - Vol. 17. - no. 3. - p. 60.

14. Outlev K. M. et al. Effect of metabolic syndrome on herniation in patients with morbid obesity //Medical science and education of the Urals. - 2017. - Vol. 18. - no. 2. - p. 140-142.

15. Akhtamov Zh. A. Prevention of infectious complications of alloplasty of pinched postoperative ventral hernias / Zh. A. Akhtamov [et al.] // Herniology. - 2008. - No. 3. - p. 6-7.

16. Babazhanov A. S. et al. Analysis of the results of hernioplasty methods for lateral myofascial abdominal defects //Priority directions of development of science and education. - 2018. - p. 137-140.

17. Baimakhanov B. B, Butabaev N. K. Method of preoperative preparation of a patient with a large ventral hernia: patent of the Russian Federation No. 21080// Committee on Intellectual Property Rights of the Ministry of Justice of the Republic of Kazakhstan. - 2009, Official Bulletin No. 4.

18. Balatsky E. R., Zhuravleva Yu. I. Features of treatment of postoperative ventral hernias after peritonitis //Peritonitis from A to Z (All-Russian school). - 2016. - pp. 105-108.

19. Baulin A. A. Esthetic component in herniology / A. A. Baulin and [others] // Gerniologiya. - 2011. - No. 1. - pp. 8-9.

20. Beloborodov V. A. Results of differentiated treatment of postoperative ventral hernias / V. A. Beloborodov, V. M. Tsmaylo, S. A. Kolmakov, K. P. Kuzmenko, / / Materials of the VII All-Russian Conference of general surgeons with international relations. participation (Krasnoyarsk, on may 17-18, 2012) / Ed. ed. by V. K. Gostishchev; redkol.: V. A. Kubyshkin [and others]. - Krasnoyarsk: Verso, 2012. P. 269-272.

21. Belosludtsev D. N. The choice of method of alloplastic in the treatment of postoperative ventral hernias: author. dis. Cand. med. Sciences: Belosludtsev Dmitri. - N. Novgorod, 2007. P. 32

22. Belokonev V. I. etc. Anterior prosthetic hernioplasty by a combined method for large and giant ventral hernias. Magazine named after him. NO Pirogov. - 2018. - No. 5. - p. 45-50.

23. Belyansky JI. S. Features of surgical treatment of abdominal wall defects in patients with massive injuries of functional muscle complexes / L. S. Belyansky, I. M. Todurov, N. V. Manoilo / / Gerniologiya. - 2007. - No. 3. pp. 29-31.

24. Bogdan V. G. Treatment of patients with postoperative hernias of large sizes: the first experience of transplantation of autologous mesenchymal stromal cells from adipose tissue /V. G. Bogdan, Yu. M. Gain, M. M. Zafranskaya, T. E. Ivanova, S. S. Bagatka// Proceedings of the IX Conference "Topical issues of Herniology". Moscow. 2012. - p. 39-41.

25. Bogdan V. G. Preoperative measures in the treatment of patients with large postoperative abdominal hernias // Military medicine. - 2013. - No. 3. - pp. 28-31.

26. Bondarev V. A. Influence of laser blood irradiation on the course of the wound process in prosthetic hernioplasty / V. A. Bondarev [et al.]

// XI Congress of Surgeons of the Russian Federation: materials of the Congress, Volgograd, May 25-27, 2011 / Volgograd, State Med. Volgograd: VolgSMU Publishing House, 2011. pp. 56-57.

27. Bondarev V. A. Relapses of prosthetic hernioplasty / V. A. Bondarev // Materials of the IX conference "Actual issues of herniology". - Moscow. – 2012.-p. 43-45.

28. Bordan N. S., Yashkov Yu. I., Ilchenko F. N. The concept of multi-purpose abdominoplasty in bariatric patients //Tavrichesky medico-biological bulletin. - 2017. - Vol. 20. - no. 4. - p. 33-38.

29. Borisova I. Yu., Slavin L. E., Allilulova R. R., Zimagulov R. T., Zamaleev A. Z. Evaluation of the frequency of relapses after hernia repair operations depending on the individual characteristics of the connective tissue of patients. - Moscow. – 2013. – P. 25-26.

30. Botezatu, A. A. Classification of incisional hernias of the abdominal wall /A. A. Botezatu, R. I. Raileanu // materials of the conference "Topical issues of herniology" Moscow on November 1-2, 2011. – 2011. – P. 37-39.

31. Bukharin A. N. The treatment of strangulated hernia of the anterior abdominal wall with the use of endogenous nitric oxide and mesh implants / A. N. Bukharin and [al] // Herniology. - 2011. - No. 1. - p. 10-11.

32. Vlasov A.V. Prevention of wound complications in abdominal wall prosthetics in the treatment of ventral hernias // Dissertation for the degree of Candidate of Medical Sciences. Nizhny Novgorod – 2013. p. 109.

33. Vlasov A.V. Prevention of wound complications during abdominal wall prosthetics in the treatment of ventral hernias. // Dissertation of the Candidate of Medical Sciences. Nizhny Novgorod-2013. p. 109.

34. Vlasov A.V., Kukosh M. V. The problem of wound complications in endoprosthesis of the abdominal wall for ventral hernias // Modern technologies in medicine. - 2013. - Vol. 5. - no. 2.

35. Garaev V. N. Experimental and clinical justification of the hardware method of treatment of postoperative events. // Dissertation for the Candidate of Medical Sciences. Nizhny Novgorod - 1999

36. Gasymov E. M. Influence of laser-magnetic irradiation on the course of the wound process in recurrent hernias of the anterior abdominal wall / E. M. Gasymov [et al.] // *Herniology*. - 2008. - No. 4. pp. 44-45.

37. Gain Yu. M., Alekseev S. A., Bogdan V. G. Abdominal compression syndrome in surgery // *Belorussky med. zhurnal*. - 2004. - Vol. 3. - pp. 20-31.

38. Gogia B. Sh. et al. Hybrid method of treatment of postoperative ventral hernia // *Surgery. Magazine named after him. NO Pirogov*. - 2018. - no. 4. - p. 24-30.

39. Golovin R. V. Combined allogenioplasty in postoperative ventral hernias of median localization // Dissertation for the Candidate of Medical Sciences. Kirov-2014. p. 108.

40. Gostevskoy A. A. Aneurysm of the abdominal aorta and hernia of the anterior abdominal wall as factors of manifestation of connective tissue disease / A. A. Gostevskoy, S. D. Tarbaev, I. S. Tarbaev // *Proceedings of the X conference "Actual issues of herniology"*. Moscow. - 2013. - p. 42-43.

41. Gostischev V. K. Tactics of perioperative management of elderly and senile patients with postoperative ventral hernias / V. K. Gostischev, M. A. Evseev, R. A. Golovin, N. M. Lazaricheva // *Materials of the VII All-Russian Conference of General surgeons with international relations. participation (Krasnoyarsk, 17-18 May, 2012) / Ed. V. K. Gostischev; ed.: V. A. Kubyskin [et al.]*. - Krasnoyarsk: Verso, 2012. pp. 292-295.

42. Gorsky V. A. et al. The use of the drug Kolgara for intra-abdominal plastic surgery of ventral hernias // *Bulletin of Surgery of Kazakhstan*. – 2016. – №. 1 (46).

43. Gorsky V. A. et al. A variant of the use of a collagen plate in ventral hernias // *Practical medicine*. – 2016. – №. 5 (97).

44. Grigoriev S. G. Method of operations without removal of the hernial sac in abdominal wall hernias. / S. G. Grigoriev, E. P. Krivoshchekov, T. S. Grigorieva [et al.] // Materials of the VII All-Russian Conference of general surgeons with international relations. participation (Krasnoyarsk, 17-18 May, 2012) / Ed. V. K. Gostischev; ed.: V. A. Kubyshkin [et al.]. - Krasnoyarsk: Verso, 2012. - p. 298-300.

45. Dedov I. I. et al. National clinical guidelines for the treatment of morbid obesity in adults. 3rd revision (treatment of morbid obesity in adults) // Obesity and metabolism. - 2018. - Vol. 15. - no. 1.

46. Demetrashvili Z. M. Treatment of postoperative ventral hernias / Z. M. Demetrashvili, R. D. Magalashvili, G. V. Lobzhanidze [et al.] // Surgery. - 2008. - No. 11. pp. 44-46.

47. Egiev V. N. Atlas of operative surgery of hernias / V. N. Egiev, K. V. Lyadov, P. K. Voskresensky // Textbook. - M.: Medpraktika-M., 2003. - 228 p.

48. Egiev V. N. Plastic surgery of large-sized postoperative hernias with separation of abdominal wall components and intraperitoneal placement of the implant / V. N. Egiev and [others] // Herniology. 2011. No. 1. p. 14.

49. Egiev V. N., Kuliyeв S. A., Evsyukova I. V. Results of posterior separation plastic surgery in patients with median ventral hernias // Clinical and experimental surgery. 2017. Vol. 5. - no. 2 (16).

50. Egiev V. N., Kuliyeв S. A., Evsyukova I. V. Assessment of the quality of life in patients who underwent anterior separation plastic surgery // Moscow Surgical Institute. - 2018. - Vol. 8. - p. 25.

51. Ermakov N. A. et al. The technique of partial releasing of the rectus abdominis muscles for the complete restoration of the white line after posterior separation plastic surgery for large and giant postoperative ventral hernias // Moscow Surgical Journal. – 2015. – № 4. – P. 22-25.

52. Ermolov A. S. On the modern classification of postoperative abdominal hernias./A. S. Ermolov, A.V. Upyrev, and V. A. Ilyichev/ / Gerniologiya. – 2006. – № 3. – P. 16-17.

53. Ermolov A. S., Khmel'nitsky A. I., Upyrev A. V. Quality of life of patients undergoing abdominal wall replacement for postoperative hernia abdominal // *Acta Biomedica Scientifica*. – 2011. no. 4-2.

54. Ermolov A. S. Morphological and functional changes of the abdominal wall in patients with postoperative ventral hernia as a criterion of the degree of failure /A. S. Ermolov, A. V. Upyrev, Y. V. Kamei, A. I. Khmel'nitsky, D. M. Vereshchagin, T. A. Draganov, E. L. Molozina, G. A. Platonov // proceedings of the IX conference "Actual problems of herniology". - Moscow. - 2013. - p. 44-45.

55. Zhanygulov A.D., Inyutin A. S., Muravyev S. Yu. Physical features of the white line of the abdomen from the position of a herniologist // *Endoskopicheskaya Khirurgia*. - 2018. - Vol. 24. - no. 1.

56. Zhebrovsky V. V. Prevention of inflammatory complications of hernioplasty in patients with postoperative hernia taking into account the severity of enterogenic toxemia and cytokine profile indicators /V. V. Zhebrovsky, F. N. Ilchenko, A. I. Gordienko // *Herniology*. -2007. - No. 1. - S. 30-34.

57. Zhebrovsky V. V. Surgery of abdominal hernia and eventration /VV Zhebrovsky // Moscow: NICE, 2009. - 440C.

58. Zhebrovsky Vladimir Violation collagen formation as the cause of postoperative ventral hernia and recurrence / V. Zebrowski, Kondratyuk E. R. // proceedings of the VII scientific and practical conference "Topical issues of herniology." Moscow. - 2010. - p. 118.

59. Zhukov B. N., Bystrov S. A., Shestakov E. V., Yarovenko G. V. Efficiency of laser therapy and mesh endoprotheses in pinched ventral hernias // Materials of the VII All-Russian Conference of General Surgeons with international participation (Krasnoyarsk, 17-18 May, 2012) / Ed. V. K. Gostischev; ed.: V. A. Kubyshkin [et al.]. - Krasnoyarsk: Verso, 2012. pp. 316-318.

60. Zagirov U. Z.. Anatomical and functional justification of a new method of combined plastic surgery of median ventral hernias / U. Z. Zagirov [et al.] // *Surgery*. - 2008. - No. 7. pp. 41-42.

61. Zohidova S. Kh., Akhmedov Yu. M., Karabaev Kh. K. Our experience in the treatment of impaired ventral hernias after surgery in elderly patients //Bulletin of Emergency Medicine. – 2013. – №. 3.

62. Ibadov R. A. et al. Abdominal compartment syndrome-features of respiratory therapy and prevention of bronchopulmonary complications //Bulletin of Emergency Medicine. – 2013. – №. 3.

63. Ivanov I. S. et al. Evaluation of the ratio of type I to type III collagen in the skin and aponeurosis in patients depending on the presence of ventral hernia //University science: a look into the future. - 2016. - p. 266-270.

64. Ivanov S. V. et al. Analysis of the structure of collagen fibers in the skin and aponeurosis in patients with ventral hernias and without hernia disease //University science: a look into the future. - 2016. - p. 275-278.

65. Ivachev A. S., The need for a combination of ventroplasty and dermolipsectomy / A. S. Ivachev, V. A. Andreev //Herniology. - 2011. - No. 1. - S. 19.

66. Izmailov, A. G., Dobrokvashina, S. V., wolf, D. E., Lucanica, E. E., Pyrkov, V. A., Zakirov, R. F., Davlet-Kildeeva, sh. a. a Device for puncturing a cavitory mass in the postoperative period in patients with ventral hernias //Practical medicine. – 2016. – №. 5 (97).

67. Izmailov A. G. et al. Improvement of technologies in the prevention of postoperative wound complications in patients with postoperative ventral hernias // Theory and practice of modern surgery. - 2018. - p. 176.

68. Isanturdiev U. I. et al. Modern principles of treatment of pinched large hernias of the anterior abdominal wall of the abdomen //Bulletin of Emergency Medicine. – 2013. – №. 3.

69. Kalish Yu. I., Laser technologies in the prevention of wound complications after allogernioplasty / Yu. I. Kalish [et al.] / / Gerniologiya. - 2006. - No. 45. p. 22.

70. Kalish Yu. I., The effect of an infrared laser on the wound process and the integration of prolene meshes after allogernioplasty / Yu.

I. Kalish [et al.] // Bulletin of experimental and clinical Surgery. - 2011. - Vol. IV, No. 4. pp. 697-700.

71. Kalish Yu. I., Ametov L. Z., Shay'usupov A. R. Pinched giant multicameral recurrent hernia // Bulletin of Emergency Medicine. – 2011. – №. 2.

72. Kalish Yu. I. et al. Morphological characteristics of the tissues surrounding the prosthesis in patients with skin-prosthetic fistulas and paraprosthetic hernias. - 2014. - No. 4. - p. 34-36-34-36.

73. Kalish Yu. I. and others. Recedive hernias after prosthetic plastic surgery // Advanced Studies in Science: Theory and Practice. - 2016. - pp. 224-228.

74. Karimov Sh. I. et al. Non-strenuous methods of hernioplasty as a choice of surgical correction of inguinal hernias // Journal of Theoretical and Clinical Medicine. - 2016. - No. 6. - pp. 68-72.

75. Kozhemyatsky V. M., The reasons for the recurrence of hernias after prosthetic abdominal wall plastics by the on lai method and ways to eliminate them / V. M. Kozhemyatsky // Materials of the VII conference "Actual issues of herniology". - M.: ZAO "publishing house IKAR", 2010. pp. 136-137.

76. Kolesnikov S. A. et al. Auto-and alloplasty in the surgery of ventral hernias (necessity, sufficiency, efficiency) // Bulletin of surgical Gastroenterology. - 2016. - No. 3. - pp. 162-162.

77. Kondrashkin A. S. et al. Treatment of postoperative ventral hernias in solid organ recipients. Magazine named after him. NO Pirogov. – 2018. – №. 12. - pp. 65-72.

78. Korolkov A. Yu. et al. Surgical treatment of giant ventral hernia complicated in the postoperative period by abdominal compartment syndrome // Bulletin of Surgery named after I. Grekov. - 2018. - Vol. 177. - no. 5. - p. 83-85.

79. Kochnev O. S., Izmailov S. G., Monograph "Methods of wound suturing". Kazan State University Publishing House, 1992, p. 85.

80. Kuznetsov Yu. V., Extracorporeal antibiotic-immunocorrection as prevention of infection in the field of surgical intervention when using

polypropylene mesh prostheses in patients with postoperative ventral hernias / Yu. V. Kuznetsov [et al.] // *Herniology*. - 2008. - No. 3. - pp. 24-25.

81. Kukosh M. V., Vlasov A.V., Gomošov G. I. Prevention of early postoperative complications in endoprosthetics of ventral hernias // *Surgery news*. - 2012. - Vol. 20. - No. 5.

82. Lavreshin P. M. et al. Predicting the development of primary postoperative ventral hernias // *Modern problems of science and education*. - 2015. - no. 3. - p. 63-63.

83. Lazarev S. M., *Vzglyad na surgicheskoe lechenie gryzh belaya linii zhizni s uchetom ee biomekhanicheskikh svoystv* [A view on surgical treatment of hernias of the white line of the abdomen taking into account its biomechanical properties]. - 2009. - T. 168, No. 1. pp. 41-44.

84. Lazarenko V. A. et al. The ratio of collagen types in the prognosis of postoperative ventral hernias. Magazine named after him. NO Pirogov. – 2017. no. 6. – P. 33-36.

85. Lazarieva N. M. the Choice of therapeutic tactics in patients of older age groups with extensive and giant postoperative ventral hernias: Diss. – VPO" Moscow medical Academy", 2011.

86. Laipanov R. M. long-term results of surgical treatment of patients with large and giant ventral hernias using mesh implants // Thesis for the degree of candidate of medical Sciences. Stavropol-2015. p. 132.

87. Lebedeva E. A., Information support of the system of preoperative forecasting of the state of structures in herniology: abstract of the dissertation of the Candidate of technical Sciences: 05.11.17 / Lebedeva Elena Aleksandrovna. - St. Petersburg, 2007. p. 19.

88. Lebedev S. N. et al. The role of operational factors in the development of incisional hernias in median laparotomies // *Theory and practice of modern surgery*. - 2018. - p. 192.

89. Lebedev S. N. et al. Analysis of nonoperative predictors of postoperative ventral hernias // *Perm Medical Journal*. - 2017. - Vol. 34. - no. 6.

90. Lebedev S. N. et al. Preventive endoprosthetics for median laparotomies //Science of the young-Eruditio Juvenium. - 2018. - Vol. 6. - no. 2.

91. Lelyanov A.D., Bazhenov S. M., Krylov A. A., Plastic of the abdominal wall with a mesh endoprosthesis using ozone and sodium hypochlorite (experimental study) // Materials of the VII All-Russian Conference of General surgeons with international cooperation. participation (Krasnoyarsk, 17-18 May, 2012) / Ed. V. K. Gostischev; ed.: V. A. Kubyshkin [et al.]. - Krasnoyarsk: Verso, 2012. - p. 333-336.

92. Lelyanov A.D. et al. Substantiation of the use of physico-chemical methods in the treatment of common peritonitis and plastic surgery of postoperative ventral hernias // Bioradicals and antioxidants. - 2016. - Vol. 3. - no. 3.

93. Lembas A. N., Complications of prosthetic hernioplasty in the treatment of primary and postoperative ventral hernias / A. N. Lembas [et al.] // Modern technologies and possibilities of reconstructive and aesthetic surgery: mater. V. A. Kubyshkin, A. A. Adamyan-p. 149-151.

94. Lukomsky G. I. Private aspects of surgical treatment of postoperative ventral hernias / G. I. Lukomsky, A.M. Shulutko, N. V. Antropov // Surgery. - 1995. - No. 1. - p. 51-53.

95. Lyadov V. K., Comparative evaluation of materials for intraperitoneal placement in the treatment of anterior abdominal wall hernias. Experimental and clinical research: abstract of the dissertation ... cand. med nauk: 14.01.17 / Lyadov V. K.-Moscow, 2010. - 18s.

96. Magomedov M. M., Imanaliev M. R., Ismailov G. M. Comparative evaluation of various methods of surgical treatment of postoperative ventral hernias //Bulletin of the Kyrgyz-Russian Slavic University. - 2016. - Vol. 16. - no. 11. - p. 43-45.

97. Magomedov M. M., Ismailov G. M. The choice of the method of treatment of recurrent postoperative ventral hernias and their results //Moscow Surgical Journal. – 2017. – №. 1. – P. 5-9.

98. Mayorov R. V., Naumov A.M., Zaikin A.V. Comparative characteristics of the effectiveness of various methods of hernioplasty in

postoperative ventral hernias // Bulletin of medical Internet conferences. The limited liability company Science and innovation, 2016. – V. 6. no. 6. – Pp. 1326-1328.

99. Maistrenko N. And. The predictive ability of the purulent-inflammatory complications in the surgical treatment of patients with nereidinae incisional ventral hernia / N. And. Maystrenko, Y. M. Bakhtin // News. Heer.-2000.-T. 159.-№1 .-P. 68-72.

100. Malkov I. S. etc. Experience of performing posterior separation plastic surgery for giant postoperative ventral hernias //Kazan Medical Journal. - 2017. - Vol. 98. - no. 4.

101. Meloyan A. K., The method of drainage of the residual cavity in allogernioplasty of postoperative ventral hernias by the on lay method / A. K. Meloyan, V. B. Bogdanovich //Herniology. - 2008. - No. 3. pp. 28-29.

102. Meloyan A. K., The choice of the method of tissue dissection in allogernioplasty of postoperative ventral hernias by the on lay method / A. K. Meloyan, V. B. Bogdanovich, E. A. Nadyrov // News of Surgery. - 2008. - Vol. 16, no. 3. - p. 53

103. Mirkhodzhaev I. A., Norov F. Kh., Hikmatov Zh. S. Studying the influence of allogernioprosthesis of ventral hernias on the indicators of the quality of life of patients // Biologiya i integrativnaya meditsina. – 2016. – №. 1.

104. Mirzabekyan Yu. R., Management of patients with postoperative ventral hernias after prosthetic plastic surgery: abstract of the dissertation of the Candidate of Medical Sciences: Mirzabekyan Yuri Rafaelovich. - Moscow, 2008. - 18c.

105. Mortin A.V., Prevention of postoperative ventral hernias by means of preventive endoprosthesis / A.V. Mortin, A. S. Mukhin // Materials of the VII All-Russian Conference of General surgeons with international cooperation. (Krasnoyarsk, 17-18 May, 2012) / Ed. V. K. Gostischev; ed.: A. Kubyshkin [et al.]. - Krasnoyarsk: Verso, 2012. - p. 343-345.

106. Moshkova T. A., New aspects of alloplasty of abdominal wall hernias: autoref. dis.. doctor of Medical Sciences: 14.00.27 / Moshkova T. A.-Moscow, 2009. - 34s.

107. Moshkova T. A., Evaluation of the methods of placement of polypropylene meshes in alloplasty of ventral hernias / T. A. Moshkova [et al.] // Bulletin of Surgery. 2007. - No. 2. pp. 78-81.

108. Moshkova T. A., Prosthetics of the anterior abdominal wall in the treatment of giant ventral hernias. - 2007. - No. 5. pp. 99-102.

109. Mutova T. V. et al. Features of reactive tissue changes during implantation of polypropylene light and ultralight endoprosthesis in the early stages of implantation //University science: a look into the future. - 2018. - Vol. 19. - no. 3. - p. 272.

110. Nasirov M. Ya. et al. Analysis of long-term results of simultaneous hernioallo- and abdominoplasty in patients with postoperative ventral hernias and obesity. Magazine named after him. NO Pirogov. - 2015. - No. 2. - pp. 70-74.

111. Nekrasov A. Yu., Istomin N. P., Alexandrovich V. E. Laparoscopic non-tensioning abdominal wall plastic surgery in postoperative ventral hernias //Bulletin of the Smolensk State Medical Academy. - 2018. - Vol. 17. - no. 1.

112. Nikolsky V. I. et al. Study of the quality of life of patients after prosthetic hernioplasty //Surgery news. - 2016. - Vol. 24. - no. 1.

113. Nikolsky V. I., New aspects of classification of ventral hernias / V. I. Nikolsky, A.V. Baulin, E. V. Titova / / Materials of the XIII Congress of the Society of Endoscopic Surgeons of Russia. Moscow, February 17-19, 2010. Almanac of the Institute of Surgery named after A.V. Vishnevsky. - 2010. - Vol. 5. - № 1(1). - P. 149.

114. Ovchinnikov V. A., Sokolov V. A. Abdominal compartment syndrome //Modern technologies in medicine. - 2013. - Vol. 5. - no. 1. - C. 122-129

115. Oleynichuk A. S. Features of surgical treatment of ventral hernias in patients with overweight and obesity. Abstract of the cand. diss. 2010 Moscow.

116. Pavlenko V. V., Postnikov D. G., Analysis of the results of prevention of wound complications in incisional hernias of large and medium sizes // XI Congress of Surgeons of the Russian Federation: materials of the Congress, Volgograd, May 25-27, 2011 / Volgograd, State med. Univ.; ed.: B. C. Savelyev [et al.]. - Volgograd: VolgSMU Publishing House, 2011. pp. 262-263.

117. Parshakov A. A., Gavrilov V. A., Samartsev V. A. Prevention of complications in surgery of postoperative anterior abdominal wall hernias: current state of the problem (review) //Modern technologies in medicine. - 2018. - Vol. 10. - no. 2.

118. Parshikov V. V., Loginov V. I. Technique of separation of abdominal wall components in the treatment of patients with ventral and postoperative hernias (review) //Modern technologies in medicine. - 2016. - Vol. 8. - no. 1.

119. Parshikov V. V., A new method of fixing the endoprosthesis when performing atension plasty of the anterior abdominal wall /V. V. Parshikov [et al.] // Herniology. - 2008. - No. 4. - p. 16.

120. Parshikov V. V. et al. Poluvekovoy put razvitiya preventatsii infektsionnykh oslozhneniy v posleoperatsionnykh ranakh [The half-century path of development of prevention of infectious complications in postoperative wounds]. - 2017. - Vol. 12. – №. 1 (67).

121. Parshakov A. A., Gavrilov V. A., Samartsev V. A. Prevention of complications in surgery of postoperative anterior abdominal wall hernias: current state of the problem (Review) //Modern technologies in medicine. - 2018. - Vol. 10. - no. 2.

122. Peter Omokkhetbele Evboeroan Oriaifo Forecasting and prevention of events after abdominal operations. // Abstract of the Candidate of Medical Sciences. Moscow-1990

123. Petrov E. S., Biomechanics of the abdominal press and abdominal respiration in the mechanism of hernia formation / E. S. Petrov, E. R. Timbakov // Herniology. -2011. - No. 1. pp. 36-37.

124. Petrushko S. I. et al. Assessment of the quality of life in patients with postoperative ventral hernias //Topical issues of modern surgery. - 2018. - pp. 87-91.

125. Pecherov A. A. et al. Score in the choice of the method of abdominal wall plastic surgery in patients with postoperative ventral hernias // Surgeon. – 2009. – №. 6. – P. 28-32.

126. Pecherov A. A. Perioperative criteria for choosing the method of plastic surgery of postoperative ventral hernias. // Dissertation for the degree of Doctor of Medical Sciences. Moscow-2012. - p. 209.

127. Plechev V. V., The use of a new type of polymer implant in hernioplasty in patients with postoperative ventral hernias / V. V. Plechev [et al.] // Modern technologies and possibilities of reconstructive and aesthetic surgery: mater. III International Conference, Moscow, April 17-18, 2012 / ed. V. A. Kubyskin, A. A. Adamyan-pp. 138-139.

128. Podergin A.V., Failures of hernia sections with plastic polypropylene mesh / A.V. Podergin, V. L. Khalzov // Gerniologiya. - 2007. - No. 2. - p. 22

129. Podoluzhny V. I., Karmadonov A.V., Perminov A. A., Chronic seromas in the supraponeurotic location of the prosthesis in patients with abdominal hernias //Herniology. - 2007. - No. 2. - p. 25-26.

130. Polevoy Yu. Yu. et al. Experimental justification of the use of a light reinforced endoprosthesis for hernioplasty //University science: a look into the future. - 2018. - p. 291.

131. Protasov A.V. et al. Tension-free plastic surgery of giant hernias of the anterior abdominal wall //Operative surgery and clinical anatomy. - 2017. - Vol. 1. - no. 2. - p. 21-29.

132. Protasov A.V., Kalyakanova I. O., Kaitova Z. S. The choice of an implant for hernioplasty of ventral hernias //Bulletin of the Peoples ' Friendship University of Russia. Series: Medicine. - 2018. - T. 22. - No. 3.

133. Pushkin S. Yu., Methods of examination of patients with hernia and control over the course of the wound process / S. Yu. Pushkin, V. I. Belokonev // Herniology. -2008. No. 2. pp. 29-31.

134. Pushkin S. Yu., The nature of morphofunctional changes in tissues during the formation of liquid formations in subcutaneous tissue in patients after herniation / S. Yu. Pushkin, V. I. Belokonev, G. I. Shifrin [et al.] // *News of Surgery*. - 2011. - Vol. 19, no. 2. p. 16-20.

135. Pushkin S. Yu., Surgical treatment of postoperative ventral hernias and pathogenetic justification of plastic surgery by a combined method: abstract. dis.. candidate of Medical Sciences: 14.00.27 / Pushkin S. Yu. - Samara, 1999. - 19s.

136. Raylianu R. I., Botezatu A. A., Podolinny G. I. Method of surgical treatment of extensive median hernias // *Bulletin of new medical technologies*. - 2018. - Vol. 25. - no. 2.

137. Raskatova E. V., Lebedev A. G., Il'ichev V. A. [et al.], Non-tensioning plastic surgery in postoperative ventral hernias with anatomical deficiency of anterior abdominal wall tissues. participation (Krasnoyarsk, May 17-18, 2012) / Ed. V. K. Gostischev; ed.: V. A. Kubyshkin [et al.]. - Krasnoyarsk: Verso, 2012. pp. 370-373.

138. Remizov A. S., Hernioplasty with the use of mesh allomaterials covered with autologous protein-platelet shell / A. S. Remizov [et al.] // *Modern technologies and possibilities of reconstructive and aesthetic surgery: mater. III International Conference, Moscow, 17-18 April 2012* / ed. V. A. Kubyshkin, A. A. Adamyan-pp. 115-117.

139. Rekhachev V. I. Postoperative ventral hernias. Diastases of the rectus abdominis muscles / V. I. Rekhachev. - Arkhangelsk: AGMA Publishing House, 1999. - 197s.

140. Romanov R. V., Parshikov, V. V., Degrees, V. P., Samsonov, A.V., Samsonov, A. A., Vasyagina, T. I., ... & Biryukov, Yu. V. (2008). Experimental and clinical justification of the use of synthetic material "Reperen" in the surgical treatment of hernias of the anterior abdominal wall. *Nizhny Novgorod Medical Journal*, 1, 53-59.

141. Sazhin A.V. et al. Endoscopic retromuscular alloplasty in primary and postoperative ventral hernias: our first experience. Magazine named after him. *NO Pirogov*. 2018. no. 6. pp. 62-65.

142. Samartsev V. A., Gavrilov V. A., Parshakov A. A. Experience of TAR hernioplasty in patients with postoperative hernias W3 //Theory and practice of modern surgery. - 2018. - p. 242.

143. Samoilov A.V., Complications of prosthetic ventroplasty / A.V. Samoilov //Herniology. - 2007. - No. 2. - pp. 39-41.

144. Sangadzhiev S. B. et al. Clinical justification of preventive operations for abdominal hernias and cholelithiasis in cardiac surgery patients //Kazan medical journal. – 2018. – Vol. 99. no. 2. – P. 345-349.

145. Sonis A. G., Stolyarov E. A., Grachev B. D., Bezrukova M. A., Analysis of postoperative infectious complications after non-tenacious hernioplasty of the anterior abdominal wall / / Materials of the VII All-Russian Conference of General surgeons with international Cooperation. participation (Krasnoyarsk, May 17-18, 2012) / Ed. V. K. Gostischev; ed.: V. A. Kubyshkin [et al.]. - Krasnoyarsk: Verso, 2012. - p. 384-386.

146. Sukovatykh B. S. et al. Indications and choice of abdominal wall prosthetics technology for prevention and treatment of postoperative ventral hernias // Bulletin of Siberian Medicine. – 2016. – Vol. 15. - no. 1.

147. Stupin V. A., The effectiveness of ultrasound in the diagnosis of retention complications in patients with postoperative hernias / V. A. Stupin and [others] // Herniology. - 2009. - No. 1. - p. 40.

148. Stupin V. A. Influence of connective tissue pathology on the clinical course and results of hernioplasty in patients with postoperative ventral hernias / V. A. Stupin, E. T. Jafarov, E. Krott, A. P. Ettinger // Proceedings of the VII scientific and practical conference "Actual issues of herniology". - Moscow. - 2010. - p. 220.

149. Styazhkina S. N., Abdullina E. F., Samigullina A. I. Postoperative hernias. clinical case //Synergy of Sciences. - 2018. - no. 19. - p. 966-970.

150. Togaev Sh. B. et al. Compartment syndrome after surgery of large and giant postoperative hernias //Bulletin of Emergency Medicine. – 2013. – №. 3.

151. Teshayev O. R., Khayitov I. B., Sapaev D. A., Dadazhonov E. M., Tavasharov B. N. Abdominoplasty of postoperative ventral hernias in

patients with obesity of the III-IV degree. - Samarkand. – 2011. - №3(66). - Pp. 124-127.

152. Teshaev O. R., Khayitov I. B. Surgical treatment of postoperative ventral hernias in obese patients //Doctor-graduate student. - 2011. - Vol. 47. - no. 4.2. - p. 346-351.

153. Teshaev O. R., Khayitov I. B. Experimental modeling of anterior abdominal wall hernia with abdominal-visceral obesity // Journal of Theoretical and Clinical Medicine. - 2016. - No. 4. - p. 23-25.

154. Timoshin A.D., Terminologiya v sovremennoy gerniologii [Terminology in modern herniology] / A.D. Timoshin, A. L. Shestakov, V. V. Titov // Surgiya. - 2009. - No. 1. - p. 79.

155. Timerbulatov V. M., Popov O. S., Popova O. V. et al. // Abdominoplasty in operations for ventral hernias. Surgery 2006; 4: pp. 24-27.

156. Timerbulatov M. V. et al. Postoperative ventral hernias: the current state of the problem // Medical Bulletin of Bashkortostan. - 2013. - Vol. 8. - No. 5.

157. Tolkachev K. S. et al. Visualization of anterior abdominal wall tissues in postoperative ventral hernias //Siberian Medical Review. – 2017. – №. 3 (105).

158. Trushin S. N., Romanov A. N., Polyakov A.V. the Problem of wound complications in the surgery of incisional ventral hernias //country doctor. – 2017. no. 1.

159. Fedorov I. V., Seroma as a complication of surgery of abdominal hernia / I. V. Fedorov [etc.] //Herniology. - 2007. - No. 2. - p. 27-29.

160. Fedoseev A.V. Vzgl'yad na etiologiyu i patogenez gryzheobrazovaniya v 21 veka / A.V. Fedoseev, S. Yu. Murav'ev, A. A. Chekushin, A. A. Inyutin // Gerniologiya. – 2009. – №2(22). – P. 9.

161. Fedoseev A.V. et al. Preventive endoprosthesis of the abdominal wall in risk groups for the development of postoperative ventral hernias. Magazine named after him. NO Pirogov. - 2019. - No. 1. - pp. 32-36.

162. Khayitov I. B. The role of abdominoplasty in prosthetic hernioplasty in patients with postoperative and ventral hernias with a sagging abdomen // Journal of Theoretical and Clinical Medicine. - 2016. - No. 6. - pp. 78-80.

163. Khamdamov Kh. Kh. et al. Prevention of complications after surgery for strangulated hernias in elderly and senile patients // Bulletin of Emergency Medicine. – 2013. – №. 3.

164. Khamraev A. Zh., Dzhililov N. A. Features of surgical treatment of inguinal hernias in children (literature review). - 2015. - No. 22. - p. 303-308.

165. Khakimov M. Sh. et al. Advantages of minimally invasive technologies in the surgical treatment of umbilical hernias // Endoscopic surgery. - 2017. - Vol. 23. - no. 4. - p. 29-32.

166. Chernykh A.V. et al. Clinical and anatomical study of a new method for reducing intra-abdominal pressure during prosthetic repair of median postoperative hernias of the anterior abdominal wall // Morphological statements. - 2017. - Vol. 25. - no. 3. - p. 26-31.

167. Cherednikov E. F. et al. The choice of a method of surgical treatment of patients with postoperative median recomposable hernias based on a non-invasive assessment of intra-abdominal pressure // Bulletin of Experimental & Clinical Surgery. - 2017. - Vol. 10. - no. 2.

168. Cherednikov E. F. et al. Results of the use of non-invasive assessment of intra-abdominal pressure in the surgical treatment of patients with postoperative median reversible hernias // System analysis and management in biomedical systems. - 2017. - Vol. 16. - no. 2. - p. 328-334.

169. Cherepanov D. F. et al. Possibilities and prospects of using the energy of high-temperature two-level plasma flow in the treatment of ventral hernias // Bulletin of Surgery named after I. Grekov. - 2017. - Vol. 176. - no. 4.

170. Shamin V. P., Etiology, prevention, treatment of wound complications after hernioplasty / V. P. Shamin and [others] // Herniology. - 2011. - No. 1. - pp. 48-49.

171. Shapovalyants S. G. Clinical and morphological features of inguinal hernias in the light of collagen metabolism disorders / S. G. Shapovalyants, A. P. Ettinger, S. V. Volny // Materials of the conference “Actual issues of herniology”. Moscow 20-21 October 2010". - 2010. - p. 266-268.

172. Shestopalova I. S., The optimal method of tissue dissection in herniation / I. S. Shestopalova [et al.] //Herniology. - 2008. - No. 4. - p. 20-21.

173. Shestakov A. L., Inakov A. G., Tskhovrebov A. T. Results of various variants of anterior abdominal wall plastic surgery in patients with ventral hernias and factors influencing them //Scientific Bulletin of the Belgorod State University. Series: Medicine. Pharmacy. - 2017. - Vol. 39. – №. 19 (268).

174. Shestakov A. L., Inakov A. G., Tskhovrebov A. T. Evaluation of the effectiveness of hernioplasty in patients with anterior abdominal wall hernias using the SF-36 questionnaire //Bulletin of the National Medical and Surgical Center. NO Pirogov. - 2017. - Vol. 12. - no. 3.

175. Shiranov A. B. et al. Tactics of management of patients with postoperative ventral hernias and obesity // Health and education in the XXI century. - 2017. - Vol. 19. - no. 11.

176. Shcherbatykh A.V., Comparison of the effectiveness of various methods of surgical treatment of postoperative ventral hernias / A.V. Shcherbatykh, S. V. Sokolova, K. V. Shevchenko // Bulletin of Experimental and Clinical Surgery. - 2012. - Vol. V, No. 1. - p. 80-82.

177. Yurasov A.V. et al. Modern concept of surgical treatment of patients with postoperative hernias of the anterior abdominal wall //Bulletin of Experimental and Clinical Surgery. - 2014. - Vol. 7. - no. 4. - p. 405-413.

178. Yanin E. L. et al. Occurrence of postoperative ventral hernias in obese patients undergoing cholecystectomy with biliopancreatic bypass surgery //Questions of dietetics. – 2015. – Vol. 5. no. 1. – P. 31-33.

179. Yatsentyuk M. N. The influence of a complex of preoperative training on respiratory function in patients with large and huge incisional

hernias belly yatsentyuk M. N., J. P. Pleschinski // Klin. Heer. -1989.- №2.-S6-9.

180. Ahmad M., Niaz W. A., Hussain A., Saeeduddin A. Polypropylene mesh repair of incisional hernia // J. Coll. Physicians Surg. Pak. - 2003. - Vol. 13, № 8. - P. 440-442.

182. Ahonen-Siirtola M. et al. Laparoscopic versus Hybrid Approach for Treatment of Incisional Ventral Hernia //Digestive Surgery. – 2017.

182. Anthony T., Bergen P. C., Kim L. T., Henderson M., Fahey T., Rege R. V., Turnage R. H. Factors affecting recurrence following incisional herniorrhaphy // World J. Surg. 2000. - Vol. 24, - P. 95-101.

183. Arita N. A. et al. Laparoscopic repair reduces incidence of surgical site infections for all ventral hernias //Surgical endoscopy. – 2015. – T. 29. – №. 7. – C. 1769-1780.

184. Bencini L., Sanchez L. J., Scatizzi M. [et al.] Laparoscopic treatment of ventral hernias: prospective evaluation // Surg. Laparosc. Endosc. Percutan Tech. - 2003. - Vol.13, № 1. - P. 16-19.

185. Bondre I. L. et al. Suture, synthetic, or biologic in contaminated ventral hernia repair //journal of surgical research. – 2016. – T. 200. – №. 2. – C. 488-494.

186. Bringman S., Heikkinen T. J., Wollert S. [et al.] Early results of a single blinded, randomized, controlled, internet-based multicenter trial comparing Prolene and Vypro II mesh in Lichtenstein hernioplasty // Hernia. - 2004. - Vol. 8, N 2. - P. 127-134.

187. Broman K. K. et al. Hidden Morbidity of Ventral Hernia Repair with Mesh: As Concerning as Common Bile Duct Injury? //Journal of the American College of Surgeons. – 2016. – T. 223. – №. 4. – C. S61.

188. Caulfield R., A large encapsulated seroma presenting as a mass 5 years post paraumbilical hernia repair / R. Caulfield [et al.] // J Plast Reconstr Aesthet Surg. -2009. - №62 (1) P. 105-107.

189. Chin K. J. et al. The analgesic efficacy of pre- operative bilateral erector spinae plane (ESP) blocks in patients having ventral hernia repair //Anaesthesia. – 2017. – T. 72. – №. 4. – C. 452-460.

190. Dietz U. A., Bingener-Casey J. Classification of Ventral and Incisional Hernias //Laparo-endoscopic Hernia Surgery. – Springer, Berlin, Heidelberg, 2018. – C. 273-282.

191. Doble J. A., Pauli E. M. Ventral Hernia Repair //Clinical Algorithms in General Surgery. – Springer, Cham, 2019. – C. 801-803.

192. Douglas RJ, de la Torrell, Gardner PM, Grant JH, Fix RJ, Vasconez LO. Abdominoplasty repair for abdominal wall hernias. *Ann Plast Surg*, 2003;1:85-86

193. Dubay D.A. Incisional herniation induces decreased abdominal wall compliance via oblique muscle atrophy and fibrosis / D.A. Dubay, W. Choi, M.G. Urbanchek // *Annals of surgery*. 2007. – Vol.245. – №1. – P.140-146.

194. Earle D. et al. SAGES guidelines for laparoscopic ventral hernia repair // *Surgical endoscopy*. – 2016. – T. 30. – №. 8. – C. 3163-3183.

195. Franklin M. E., Hernández M. A., Hamby P. M. Bridging Versus Closing the Defect During MIS Ventral Hernia Repair: Pros and Cons // *The SAGES Manual of Hernia Surgery*. – Springer, Cham, 2019. – C. 173-181.

196. Gillion J. F. et al. The economic burden of incisional ventral hernia repair: a multicentric cost analysis // *Hernia*. – 2016. – T. 20. – №. 6. – C. 819-830.

197. Gillion J. F. et al. Patient-reported outcome measures 2 years after treatment of small ventral hernias using a monofilament polypropylene patch covered with an absorbable hydrogel barrier on its visceral side // *International Journal of Abdominal Wall and Hernia Surgery*. – 2018. – T. 1. – №. 3. – C. 99.

198. Goodenough C. J. et al. Development and validation of a risk stratification score for ventral incisional hernia after abdominal surgery: hernia expectation rates in intra-abdominal surgery (the HERNIA Project) // *Journal of the American College of Surgeons*. – 2015. – T. 220. – №. 4. – C. 405-413.

199.Gurusamy K., Wound drains after incisional hernia repair / K. Gurusamy, K. Samraj // Cochrane Database Syst Rev. - 2007 - № (1) - CD005570.

200.Hartog D., Open surgical procedures for incisional hernias / D. den Hartog, A. Dur, W. Tuinebreijer, R. Kreis // Cochrane Database Syst Rev. - 2008 - № 16(3) - CD006438.

201.Hill B. et al. Single-Institution Experience With Component Separation for Ventral Hernia Repair: A Retrospective Review //Annals of plastic surgery. – 2018. – T. 80. – №. 6S. – C. S343-S347.

202.Heniford B. T. et al. Preperitoneal Ventral Hernia Repair: A Decade Long Prospective Observational Study with Analysis of 1023 Patient Outcomes //Annals of surgery. – 2018.

203.Holihan J. L. et al. Sublay versus underlay in open ventral hernia repair //Journal of Surgical Research. – 2016. – T. 202. – №. 1. – C. 26-32.

204.Holihan J. L. et al. Mesh location in open ventral hernia repair: a systematic review and network meta-analysis //World journal of surgery. – 2016. – T. 40. – №. 1. – C. 89-99.

205.Itani K.M., Hur K F., Kim L.T. et al. Comparison of laparoscopic and open repair with tpsH for the treatment of ventral incisional hernia // Arch.Surg. - 2010. - № 145 (4). - P. 322-328.

206.Ivanov Y. V. et al. Method of prevention of postoperative gray allohernioplasty in laparoscopic ventral hernia //Clinical Practice. – 2018. – T. 9. – №. 1. – C. 3-9.

207.Jensen K. K. et al. Enhanced recovery after giant ventral hernia repair //Hernia. – 2016. – T. 20. – №. 2. – C. 249-256.

208.Jin J., In vitro evaluation of the permeability of prosthetic meshes as the possible cause of postoperative seroma formation / J. Jin, S. Schomisch, M. Rosen // Surg Innov. - 2009. - № 16(2) - P. 129-33.

209.Kaafarani H., Predictors of surgical site infection in laparoscopic and open ventral incisional herniorrhaphy / H. Kaafarani [et al.] // J Surg Res. - 2010. - № 163(2)-P. 229-34.

210.Kaafarani H., Seroma in ventral incisional herniorrhaphy: incidence, predictors and outcome / H. Kaafarani, K. Hur, A. Hirter [et al.] // Am J Surg. - 2009. - № 198(5)-P. 639-44.

211.Kokotovic D. et al. Correlation between early surgical complications and readmission rate after ventral hernia repair //Hernia. – 2017. – C. 1-6.

212.Kingsnorth A., Open onlay mesh repair for major abdominal wall hernias with selective use of components separation and fibrin sealant / A. Kingsnorth [et al.] // World J Surg. - 2008. - № 32(1) - P. 26-30.

213.Klima D., Application of subcutaneous talc in hernia repair and wide subcutaneous dissection dramatically reduces seroma formation and postoperative wound complications / D. Klima, R. Brintzenhoff, V. Tsirlina [et al.] // Am Surg. -2011. - №77(7) - P. 888-94.

214.Klink C., Do drainage liquid characteristics serve as predictors for seroma formation after incisional hernia repair? / C. Klink [et al.] // Hernia - 2010 - № 14(2) - P. 175-9.

215.Klink C., Serum analyses for protein, albumin and IL-1-RA serve as reliable predictors for seroma formation after incisional hernia repair / C. Klink [et al.] // Hernia - 2011 - № 15 - P. 69-73.

216.Kumar N. G. et al. Using Quality Improvement Principles to Enhance Long-Term Completion of Patient-Reported Outcomes after Ventral Hernia Repair //Journal of the American College of Surgeons. – 2017. – T. 224. – №. 2. – C. 172-179.

217.Leonard J. et al. Delineation of factors associated with prolonged length of stay after laparoscopic ventral hernia repair leads to a clinical pathway and improves quality of care //Surgical endoscopy. 2016. T. 30. №. 4. – C. 1614-1618.

218.Liang M. K. et al. Ventral hernia management //Annals of surgery. – 2017. – T. 265. – №. 1. – C. 80-89.

219.Lopez-Cano M., Use of vacuum-assisted closure in open incisional hernia repair: a novel approach to prevent seroma formation / M. Lopez-Cano, M. Armengol-Carrasco // Hernia. - 2011. - Jun 12.

220.Madabhusi V. et al. Concomitant open ventral hernia repair: what is the financial impact of performing open ventral hernia with other abdominal procedures concomitantly? //Surgical endoscopy. – 2018. – T. 32. – №. 4. – C. 1915-1922.

221.Mercoli H. et al. Postoperative complications as an independent risk factor for recurrence after laparoscopic ventral hernia repair: a prospective study of 417 patients with long-term follow-up //Surgical Endoscopy. – 2016. – C. 1-9.

222.Morales-Conde S., A new classification for seroma after laparoscopic ventral hernia repair / S. Morales-Conde // Hernia. - 2012. - № 16(3). - P. 261-7

223.Mommers E. H. H. et al. Impact of hernia volume on pulmonary complications following complex hernia repair //Journal of Surgical Research. – 2017. – T. 211. – C. 8-13.

224.Mommers E. H. et al. A modified Chevrel technique for ventral hernia repair: long-term results of a single centre cohort //Hernia. – 2017. – C. 1-10.

225.Olsson A. et al. Impact of postoperative complications on the risk for chronic groin pain after open inguinal hernia repair //Surgery. – 2017. – T. 161. – №. 2. – C. 509-516.

226.Petro C. C. et al. Designing a ventral hernia staging system //Hernia. – 2016. – T. 20. – №. 1. – C. 111-117.

227.Prabhu A. S. et al. Preoperative Chlorhexidine Gluconate Use Can Increase Risk for Surgical Site Infections after Ventral Hernia Repair //Journal of the American College of Surgeons. – 2017. – T. 224. – №. 3. – C. 334-340.

228.Rath A.M. Classification of incisional hernias of the abdominal / A.M. Rath, J. Chevrel // Hernia. – 2000. – Vol. 4. № 1. – P.1–3.

229.Rosen M. J. et al. Multicenter, prospective, longitudinal study of the recurrence, surgical site infection, and quality of life after contaminated ventral hernia repair using biosynthetic absorbable mesh: the COBRA Study //Annals of surgery. – 2017. – T. 265. – №. 1. – C. 205.

230.Sabbagh C. et al. Progressive preoperative pneumoperitoneum preparation (the Goni Moreno protocol) prior to large incisional hernia surgery: volumetric, respiratory and clinical impacts. A prospective study // *Hernia*. – 2012. - Vol.16(1). – P.33-40.

231.Schwarz J., Reinpold W., Bittner R. Endoscopic mini/less open sublay technique (EMILOS)-a new technique for ventral hernia repair // *Langenbeck's archives of surgery*. – 2017. – T. 402. – №. 1. – C. 173-180.

232.Tandon A. et al. Meta- analysis of closure of the fascial defect during laparoscopic incisional and ventral hernia repair // *British Journal of Surgery*. – 2016. – T. 103. – №. 12. – C. 1598-1607.

233.Tsereteli Z., Chronic posterior seroma with neoperitoneum following laparoscopic ventral hernia repair: treatment algorithm / Z. Tsereteli, B. Ramshaw, A. Ramaswamy // *Hernia*. - 2008. - № 12(4) - P.363-6.

234.Vrijland W. Intraperitoneal polypropylen mesh repair of incisional hernia is not associated with enterocutaneous fistula / W. Vrijland, J. Jeekel, E. Steyerberg // *Br. J. Surg.* 2000. Vol. 87, № 3. P. 348-352.

235.Warren J. A. Cobb, W. S., Ewing, J. A., Carbonell, A. M. Standard laparoscopic versus robotic retromuscular ventral hernia repair // *Surgical endoscopy*. – 2017. – T. 31. – №. 1. – C. 324-332.

236.Weale A. R. The intact of mesh, repair of inguinal herniae on renal transplantation / A. R. Weale, S. J. Baynham, A. K. Pentlow // *Transplantation*. - 2007. - Vol. 84, № 7. P. 938.

237.Weber G. Results of ventral hernia repair: comparison of suture repair with mesh implantation (onlay vs sublay) using open and laparoscopic approach prospective, randomized, multicenter study / G. Weber, O. P. Horvath // *Magy Seb.* - 2002. - Vol. 55, № 5. - P. 285-289.

238.Zakurdaev E. I. et al. Topographic-Anatomic Justification of Various Methods Reducing Tissue Tension at Prosthetic Incisional Hernia Repair by «Sublay» // *Journal of Experimental and Clinical Surgery*. – 2017. – T. 10. – №. 1. – C. 26-31.

LIST OF ABBREVIATIONS:

ACS	abdominal compression syndrome
BMI	body mass index
BP	blood pressure
BPOVH	big postoperative ventral hernia
CT	computed tomography
DLE	dermatolipectomy
ECG	electrocardiography
IAH	intra-abdominal hypertension
IAP	intra-abdominal pressure
LTG	latex tissue glue
PE	pulmonary embolism
POVH	postoperative ventral hernia
RSH	relative size of the hernia

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POSTOPERATIVE VENTRAL HERNIAS

Monograph

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