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THE WAYS TO ELIMINATE POSTOPERATIVE COMPLICATIONS IN PLASTIC SURGERY OF VENTRAL HERNIAS IN PATIENTS WITH CONCOMITANT OBESITY

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ABBREVIATIONS:

ACS – abdominal compartment syndrome

HBP – high blood pressure

HD – hypertonic disease

IAP – intra-abdominal pressure

IH – incisional hernia

LIH – large incisional hernia

PP – polypropylene

PTFE - polytetrafluoroethylene

VTC – venous thromboembolic complications

CONTENTS:

INTRODUCTION

Relevance of the research problem.

Despite the rapid development of minimally invasive endovideosurgical technologies in abdominal surgery, the number of surgical procedures using conventional laparotomy remains high, after which in 4-18% of the cases develop incisional hernias (IH), and in the general statistical structure of ventral hernias IH makes up 20-26% [37]. In the structure of the abdominal hernias large incisional hernias (LIH) occupy a special place, and they account for between 3 and 14% [54, 105, 106]. About 60% of patients with IH - aged from 21 years to 60 years, i.e., they are a significant part of the working population [34].

Results of IH treatment characterized by a fairly high number of recurrences (from 4.3 to 46%), while in LIH recurrences reach 60% of the cases [48, 77, 116].

The causes of IH in 31,4-63,4% are infectious processes in the wound [7, 16, 22, 23, 43, 65, 72, 130, 162], in 35.1% - drainage and tamponade of abdominal cavity through the major wound, and in 40.7% of cases - eventration [80, 139]. Only in 18% of cases, development of hernias occurs in a favorable postoperative period. But even with a favorable current of wounds IH develop in patients with imbalance of collagen type III, which results to progressive tissue morphofunctional deficiency that is most characteristic of patients with recurrent hernias, with the subsequent development of their «hernia disease» [54, 128, 124, 144].

A large number of hernia repair methods and modifications, the appearance of publications on all new elaborations are on the one hand, the undeniable fact of dissatisfaction with the results incisional hernia repair, the other - evidence of an ongoing search for solutions to this problem [9, 20, 96, 119, 126]. The frequency of recurrences after laparotomy is 3-13%, while in morbid obesity it is 28% [4, 8, 12, 28, 51, 122, 123, 159].

Most physiological methods are undoubtedly autoplastic ways of closing the hernia defect. However, the possibility of their application in practice is often

limited because of large hernia defect and the development of postoperative complications [54, 57, 62, 82, 85, 136, 161].

Mesh implants made from polypropylene (PP) and polytetrafluoroethylene (PTFE) are now widely used [24, 88, 98, 104, 135].

Abdominoplasty (dermolipectomy of the anterior abdominal wall) in all cases allows to reduce the effect of ongoing efforts needed to match the edges of the defect in the muscular-aponeurotic layer of the anterior abdominal wall. This reduction in the maximum (15-70%) in a range of areas generated by defects in the abdominal wall from 32 to 150 cm^2 and the thickness of the subcutaneous fat layer of the anterior abdominal wall more than 3 cm [10, 31, 46, 55, 60, 141, 156].

Thus, abdominoplasty, performed by indications and complementing with herniotomy about ventral hernia of the anterior abdominal wall may be an additional factor that reduces the strain of tissue of the anterior abdominal wall and the degree of increased intra-abdominal pressure, which occurs during the closing of hernial orifice, and as a result of this method recurrences of ventral hernias are prevented [31, 121, 129, 149].

An important problem of ventral hernia repair is early postoperative complications, because it is a major cause of prolonged postoperative period, more moral and physical suffering of patients and possible deaths [35, 42, 49, 53, 74, 83, 90, 157].

One of the significant problems of large and giant ventral hernias repair, besides the technical aspects, is increased IAP, which leads to the development of intra-abdominal hypertension syndrome, respiratory and cardiac failure. An easily accessible way to monitor IAP is to measure the pressure in the bladder [32, 51, 155, 164].

A number of authors for the prevention of intra-abdominal hypertension offer original methods. S.G. Izmailov et al. (2003) developed a special apparatus for the metered edges to close hernia defect controlled by IAP.

Researchers note that wound complications are observed both at using different types of implants (PP, PTFE), and methods for various locations in the tissue [126, 127, 132, 138, 149, 158].

The most frequent complications are seroma, infiltrate, long exudation from the wound, more rarely - festering, necrosis of the skin edge, infarction of subcutaneous tissue, fistula, meshoma and granuloma. The frequency of wound complications after prosthetic mesh repair according to Y.R. Mirzabekyan, S.R. Dobrowolskiy (2008) is 67%; T. White et al. (1998) - 44%; J. McGreevy et al. (2003) - 21%; A. Bazaeva, I.A. Tsverova (2011) - 12%.

Local complications of early postoperative period include: disruption of the wound, the formation of infiltrates, hematomas, seromas, ligature fistulas, long chylorrhea, festering wounds, etc.. The frequency of inflammatory wound complications, according to different authors, reaches impressive numbers - 20.9 - 49.2% [19, 21, 40, 52, 59, 112, 117, 145, 160].

Thus, the presence of many ways to prevent wound complications for prosthesis of the abdominal wall in the ventral hernia repair and relevance of the problem dictates the need to develop techniques and tactics of patients care after prosthesis to reduce the frequency of wound complications.

Aim of the research:

To improve the results of surgical treatment of patients with ventral hernias with concomitant obesity.

Research objectives:

- To study the clinical features of IH in patients with obesity.
- To prove the necessity to complement hernia repair with abdominoplasty in patients with IH and obesity.
- To develop a scheme of preoperative preparation and methods of surgical treatment of these patients.

- To carry out a comparative assessment of the immediate and long-term results of the treatment of the patients with IH and obesity, operated by traditional method and with abdominoplasty.

Scientific novelty.

- For the first time given a logical, based on clinical studies, the explanation of the need and advisability to complement ventral hernia repair by abdominoplasty.
- The scheme of preoperative preparation, the methods of surgical treatment and optimal postoperative management of patients with IH and obesity have been developed.

Practical significance:

- Use in patients with IH and obesity stage III-IV, abdominoplasty reduces the load on the line of stitches sutured hernia defect that reduces the number of recurrences.
- Complement hernia repair by abdominoplasty can improve the performance of comorbidity in the postoperative period.
- The proposed method allows to eliminate aesthetic inconvenience, which contributes greatly to the psychological and social rehabilitation of patients with obesity and is a good incentive for the development of motivation for weight loss.

Application of the results:

The main provisions of the master's work applied in the practical work of the surgical department in the clinic №1 of Samarkand State Medical Institute. According to the materials of the work was published 9 scientific papers, including 4 publications in journals recommended by Higher Attestation Commission of the Republic of Uzbekistan and 1 methodical recommendation, agreed by Director of the Center of Medical Education of the Ministry of Health of the Republic of Uzbekistan and approved by the Chief of the Department of Science and Education of the Ministry of Health of the Republic of Uzbekistan. The Certificate for

rationalization proposals № 128 - «A method for preventing wound complications after incisional hernia repair using mesh implant» was received.

Volume and structure of the dissertation.

The dissertational work stated in the 83 pages of computer text, font «Times New Roman» №14, it consists of introduction, 4 chapters, summary, conclusions, practical recommendations and bibliography. The work is illustrated with 13 figures, 3 diagrams, 8 tables and 1 application. The bibliography includes 164 sources, including 123 in Russian and 41 in foreign languages.

CHAPTER I. LITERATURE REVIEW

Despite the rapid development of minimally invasive endovideosurgical technologies in abdominal surgery, the number of surgical procedures using conventional laparotomy remains high, after which in 4-18% of the cases develop incisional hernias (IH), and in the general statistical structure of ventral hernias IH makes up 20-26% [37]. In the structure of the abdominal hernias large incisional hernias (LIH) occupy a special place, and they account for between 3 and 14% [54, 105, 106]. About 60% of patients with IH - aged from 21 years to 60 years, i.e., they are a significant part of the working population [34].

Results of IH treatment characterized by a fairly high number of recurrences (from 4.3 to 46%), while in LIH recurrences reach 60% of the cases [48, 77, 116].

The causes of IH in 31,4-63,4% are infectious processes in the wound [7, 16, 22, 23, 43, 65, 72, 130, 162], in 35.1% - drainage and tamponade of abdominal cavity through the major wound, and in 40.7% of cases - eventration [80, 139, 157]. Only in 18% of cases, development of hernias occurs in a favorable postoperative period. But even with a favorable current of wounds IH develop in patients with imbalance of collagen type III, which results to progressive tissue morphofunctional deficiency that is most characteristic of patients with recurrent hernias, with the subsequent development of their «hernia disease» [54, 128, 124, 144, 149].

The increasing incidence of IH associated with the increase in the number of elderly patients with their characteristic severe concomitant somatic diseases - chronic diseases of the respiratory, circulatory, urinary system, as well as chronic constipation and metabolic diseases (diabetes mellitus, obesity, hypothyroidism) [25, 40, 69, 73, 107].

In the pathogenesis and recurrences of IH an important role belongs to obesity. In cases of morbid obesity risk of ventral hernias after uncomplicated laparotomy increased 2-fold, reaching 28-30%. Among all patients with LIH overweight or obesity is found in 70-90% of cases [44, 55, 100, 115]. According to the literature, most of IH occur after gynecological surgery (26 to 50% of cases),

operations in the bile ducts (20 to 30%), over the stomach and duodenum (approximately 12%), appendectomies (6 to 14%), abdominal wounds and injuries (about 9%). The mortality after surgical interventions on the LIH reaches 10% [2, 12, 13, 19, 29, 63, 111, 142, 159].

The mechanism of hernia formation is complicated and varied. The main etiological point is a violation of the dynamic balance between the intra-abdominal pressure (IAP) and the ability of the abdominal wall to counteract. Significant factors for the formation of hernias are patient's weight and fat metabolism disorders [4, 18, 36, 67, 68, 100, 103, 129, 159], the patient's age [66, 73, 84, 86, 91, 97], pregnancy and childbirth in women [5, 15, 45, 59].

Investigations of biomechanical properties of the anterior abdominal wall showed that in patients with hernia of linea alba mechanical strength of tissues within the linea alba in the longitudinal direction is 40.8% and in the transverse direction is less than 38.7% compare to those, who have a healthy abdominal wall. «Risk zone» for the formation of a hernia is located in the projection of the linea alba of the abdomen in the umbilical area [5, 6, 30, 56, 79, 143, 163].

At the present stage of herniology development it’s believed that ventral hernia is a disease, not only local, but also systemic one. In patients with hernias disorder of the synthesis of collagen and reduction the ratio of collagen types I and III were detected. In addition, the specific enzymes are important - metalloproteinase, which regulate the balance and synthesis of collagen [128, 144, 146, 148, 154].

A separate and actual problem of modern surgery is IH with large and giant sizes accompanied by dysfunction of the respiratory, cardiovascular and digestive systems, changes in the abdominal wall muscles [30, 39, 47, 87, 108, 110, 156]. The entire history of abdominal surgery strongly supports the position according to which the IH is an inevitable consequence of surgery.

It does not change the statement and application of modern videolaparoscopic operations on the abdominal organs. It was assumed that with their use, if not disappear; it will sharply decrease the problems relevance.

However, the percentage of IH, for example, after videolaparoscopic cholecystectomies, according to various authors [14, 80, 151], is proved to be not less than after laparotomic operations (2.5% - 7.6%). Surgical treatment of those hernias is by not a simple matter [11, 27, 92, 155].

Etiological factors leading to IH, are divided into general and local.

General: 1) predisposing factors - linked to depression of reparative processes and the reduction of general non-specific reactivity (glucocorticoids, antibiotics, diabetes, etc.);

2) producing factors - linked to the weakening of the abdominal wall, and the morphological and functional impairment of tissues (age-related changes in the tissues, the crossing of the nerve trunks, etc.).

Local: 1) factors related to the operation (traumatic access, violation of art suturing the wound, holding through a wound drainage and tampons, relaparotomy etc.);

2) factors associated with wound complications (abscess, incomplete hemostasis, eventration etc.) [12, 33].

L.M. Nyhus (1995) on a different principle has formulated the factors that lead to the formation of IH, dividing them into controlled - obesity, type of cutting, sutures and suture equipment, wound infection; and uncontrolled - age, SIRS, systemic diseases, postoperative pneumonia and bronchitis, steroids and other causes.

V.I. Belokonev et al. (2000) developed a biomechanical concept of the IH pathogenesis: during the formation of the hernia defect discrepancy of rectus muscles gradually increases and as a result the lateral abdominal muscles lose their medial point of attachment, change shape, structure, position and lose the ability of contraction, and stretchability. Similar changes occur in the rectus muscle. Some authors concluded that the reduction of the hernial orifice edges leads to muscle ischemia in the fascial sheath, a decrease in abdominal volume and early postoperative complications, and later - to the recurrence of hernias [12, 13, 50, 61, 85].

In addition, according to some researchers important factors for the formation of IH are the body types [96, 109, 119], the position of the abdominal organs [120], increased IAP in the postoperative period due to intestinal paresis, cough, urinary disorders, vomiting, mental excitation [32, 40, 114, 134], the pathology of wound healing and inhibition of wound healing [1, 85, 137].

Despite the abundance of hernia repair methods (there are about 150) [75, 89, 133], recurrence is still high and reaches 18-30% [26, 41, 87]. In hernia repair using autodermotransplant recurrences occur in 7-27.2% [3, 91, 99].

Currently, a single and universal classification of ventral hernias does not exist [33, 70, 147, 163]. Classification of IH by J.P. Chevrel, A.M. Rath, (2000) takes into account three parameters – the site, width and recurrence rate after primary surgery.

S – the site of the IH:

1. M – medial IH:

M_1 – supraumbilical IH

M_2 – juxtaumbilical IH

M_3 – subumbilical IH

M_4 – xipho-pubic IH

2. L – lateral IH:

L_1 – subcostal IH

L_2 – transverse IH

L_3 – iliac IH

L_4 – lumbar IH

3. ML – combined IH.

W – the width of IH:

W_1 – <5 cm

W_2 – 5 - 10 cm

W_3 – 10 -15 cm

W_4 – >15 cm.

R – the recurrences:

R_0 – no reccurence

R_1 – first reccurence

R_2 – second reccurence

R_3 – third reccurence, etc.

The methods of hernia repair performed earlier

RA – simple suturing of the defect

MP – myoplastics

PR – implantation of a synthetic prosthesis.

The classification by K.D. Toskin and V.V. Zhebrowskiy is widespread because it's easy to use (1990), takes into account the size of the hernia in relation to the anatomical regions of the anterior abdominal wall. Also, the classification developed by the Institute of Surgery by A.V. Vishnevskiy, which is determined by the arithmetic mean value between the minimal and maximal size of the hernia (small - up to 10 cm, average - from 10 to 20 cm, large - 20 to 30 cm, giant - more than 30 cm) [70].

In 2009, the European Herniology Society (EHS) has proposed a separate classification of primary hernias and IH [147]. By the classification of primary ventral hernias (EHS 2009) followings are distinguished:

1) medial hernia - epigastric and umbilical;

2) lateral hernia – Spiegel's line and lumbar;

3) it takes into account the diameter of the hernia;

4) and by the defect size it is divided into small (<2 cm), medium (2-4 cm) and large (> 4 cm).

A large number of hernia repair methods and modifications, the appearance of publications on all new elaborations are on the one hand, the undeniable fact of dissatisfaction with the results incisional hernia repair, the other - evidence of an ongoing search for solutions to this problem [9, 20, 96, 119, 126]. The frequency

of recurrences after laparotomy is 3-13%, while in morbid obesity it is 28% [4, 8, 12, 28, 51, 122, 123].

Mesh implants made from PP and PTFE are now widely used [24, 88, 98, 104, 135].

There are four variants of the implant location: supraaponeurotic fixation of the implant - «onlay»; subaponeurotic fixation of the implant (preperitoneal and retromuscular) - «sublay»; plastic of the abdominal wall defect partially or completely - «inlay»; intraabdominal fixation of the implant - «intraabdominal» [110].

The «onlay»-method is the closure of a defect in the musculo-aponeurotic layer over the implant with fixation of the aponeurosis. In this method an implant is in contact with the subcutaneous tissue, which is previously peeled out from the aponeurosis with cutting the blood and lymph capillaries. According to some authors, it is accompanied by the frequent formation of liquid accumulations (seroma, hematoma), the formation of infiltrates and fistulas [23, 99, 131, 140].

Some authors consider that the «onlay»-method is pathogenetically and functionally unreasonable, irrational, in which there is a risk of so-called «subprosthetic recurrent hernias» [24, 92, 94]. From the standpoint of biomechanics of the abdominal wall in the literature there is the opposite point of view on the effectiveness and functionality of the «onlay»-method. Comparative biomechanical analysis of the use of abdominal wall hernia repair over the linea alba using mesh implants in different positions and using their own tissue were carried out on the basis of computer modeling. The results showed that the use of implants can significantly reduce the stress-strain state in the area of the hernial orifice seam, and therefore, reduce the probability of recurrence. The optimal parameters of ceteris paribus is supraaponeurotic location of the implant [57, 58, 133].

There is an opinion that one of the causes of hernia recurrence after «onlay» technique is tissue interposition and gapping of the mesh [51]. In addition, for

preventing recurrence two rows of stitches to fixate the mesh are suggested, one of which is the so-called «tambour» or «stalk» and has high strength [78].

The advantages of the «onlay»-method are the technical simplicity of implementation and the absence of contact with the endoprosthesis and the abdominal cavity [99, 108]. Other authors point to the absence of life-threatening complications such as involvement of the endoprosthesis in purulent process [134]. Some researchers are also supporters of the «onlay»-technology, noting the universality of this method and the possibility of its use in any anatomical region of the anterior abdominal wall [142, 158, 160].

The «sublay»-method is the stitching of a defect in the musculo-aponeurotic layer with fixing the endoprosthesis under the aponeurosis. This method is considered to be more reliable due to the fact that the prosthesis is pressed against the abdominal wall. At placing the endoprosthesis under the aponeurosis the frequency of seromas decreases and the problem of ligature fistulas occurrence is eliminated [69, 95, 158]. There are two versions of fixing endoprosthesis under the aponeurosis - preperitoneal and retromuscular [110, 133].

In the «sublay with preperitoneal location of the implant»- method the last must be separated from the abdominal wall by hernial sac and parietal peritoneum, or greater omentum [67, 69, 115, 122, 158, 164]. Technically difficult stage of the operation is the formation of the lodge in the preperitoneal tissue, especially in recurrent hernias and large defects of the aponeurosis.

Taking into account the anatomical features of the abdominal wall structure, peritoneum is easier mobilized in the lower parts; therefore, this method is ideal for the hypogastrium and suprapubic hernias [66, 121]. At the mobilization the peritoneum and fascia are often opened, and bleeding with the formation of hematomas in the preperitoneal space may occur. There is a risk of tissue deficiency necessary for demarcation of organs in the abdominal cavity from the implant [71, 81, 95].

In the «sublay with retromuscular location»-method prosthesis is fixed to the back leaf of the combined rectus muscles sheath. Retromuscular location of the

endoprosthesis is technically more difficult than other methods, but excludes mobilization of the subcutaneous tissue and the prosthesis, better isolated from the abdominal cavity, thus reduces the risk of complications in the postoperative period. According to some authors, for the implantation of a synthetic endoprosthesis optimally it is suited only in retromuscular space [133, 135]. Other authors consider that retromuscular implantation should be carried out differentially. At the width of defect W_1 (by Chevrel-Rath) this technique is complex and irrational, with the sizes W_{3-4} leads to an increase of IAP and only in patients with a defect W_2 it is the method of choice [75, 77].

Also, the methods with intermuscular location of the endoprosthesis are methods of total prosthesis of the abdominal wall by Rives and Stoppa, which are used in large and giant ventral hernias [36, 37]. The disadvantages of the Rives and Stoppa methods include high trauma; the risk of the liquid accumulations formation in the area of the implant; prolonged pain after surgery; the risk of hernia defects along the Douglas and Spigel's lines; risk of the upper and lower epigastric arteries damages with development of muscle atrophy and direct subsequent scarring [134, 151, 160].

«Inlay»-method is aimed to close the hernia defect with endoprosthesis in the form of patches. This option was designed for situations where to reduce the edge of hernial orifice is not possible because of the risk of a significant increase in IAP and the development of intra-abdominal hypertension syndrome [17, 38, 69]. In the literature, there is an evidence that the use of «inlay»-technology is accompanied by a high rate of recurrences and the formation of external intestinal fistulas. In connection with this the «inlay»-method is not recommended, especially in the absence of a significant defect in the aponeurosis as possible any other prosthetic mesh repair method [64, 76, 102, 142].

In the «intraabdominal»-method prosthesis is fixed to the peritoneum without demarcation of the internal organs. The main condition of «intraabdominal» hernia repair is the use of non-adhesive multi-layer mesh implants [110, 118].

The advantages of the method include the technical simplicity of implementation [78, 125]. Intra-abdominal location of the endoprosthesis assumes contact with the bowel loops and the risk of intestinal fistulas formation [39]. The literature describes cases of intestinal fistula 14 years after implantation of PP mesh [131].

Above described variants of prosthetic hernia repair methods in an isolated form do not fully satisfy modern herniology. In this regard, some authors offer combined techniques. V.I. Belokonev et al. (2000) on the basis of the biomechanical pathogenesis of IH concept developed a combined «inlay-sublay»-method; two versions for the abdominal wall plastic repair over the large and giant ventral hernias [13].

In 1990 O.M. Ramirez et al. proposed a method of hernia repair with a gradual separation of the components of the anterior abdominal wall («components separation») [153]. Despite the trauma, the technology allows us to reduce the edges of large hernia defects without increasing IAP. Therefore, a number of herniologists combine the technology of «components separation» with the prosthetic techniques. V.N. Egiev et al. (2011) combine with intraperitoneal hernia repair [29], A. Kingsnorth et al. (2008) combine with the «onlay»-method [141], T. Satterwhite et al. (2012) in the treatment of combined and recurrent IH recommend to combine the «sandwich»-type hernia repair with the dual endoprosthesis placement [155].

In addition to the open methods ventral hernia repair, laparoscopic techniques are actively used. For this purpose implants with a release coating are implanted. The advantages of laparoscopic abdominal prosthetic mesh-repair are mild postoperative course, early rehabilitation of patients, and reduction of the incidence of postoperative complications. Negative sides: the maximum size of a defect in the muscle-aponeurotic layer, according to the recommendations of the majority of authors, should not exceed 10 cm; the high risk of intestinal damage in the separation of adhesions by electrocoagulation; and there is the problem of fixing the endoprosthesis [142, 152].

Thus, the guidance in the literature on many techniques and methods of abdominal wall prosthetic surgery on ventral hernias with a variety of immediate and long-term results say about the absence of a single, universal method [76, 93].

Abdominoplasty (dermolipectomy of the anterior abdominal wall) in all cases allows to reduce the effect of ongoing efforts needed to match the edges of the defect in the muscular-aponeurotic layer of the anterior abdominal wall. This reduction in the maximum (15-70%) in a range of areas generated by defects in the abdominal wall from 32 to 150 cm^2 and the thickness of the subcutaneous fat layer of the anterior abdominal wall more than 3 cm [10, 31, 46, 55, 60, 141].

Thus, abdominoplasty, performed by indications and complementing with herniotomy about ventral hernia of the anterior abdominal wall may be an additional factor that reduces the strain of tissue of the anterior abdominal wall and the degree of increased intra-abdominal pressure, which occurs during the closing of hernial orifice, and as a result of this method recurrences of ventral hernias are prevented [31, 121, 129].

An important problem of ventral hernia repair is early postoperative complications, because it is a major cause of prolonged postoperative period, more moral and physical suffering of patients and possible deaths [35, 42, 49, 53, 74, 83, 90].

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Local complications of early postoperative period include: disruption of the wound, the formation of infiltrates, hematomas, seromas, ligature fistulas, long chylorrhea, festering wounds, etc.. The frequency of inflammatory wound complications, according to different authors, reaches impressive numbers - 20.9 - 49.2% [19, 21, 40, 52, 59, 112, 117, 145, 164].

For LIH, when dissection of tissues of anterior abdominal wall and extensive surgical trauma combined with the presence of a foreign body (alloplasty), frequency of seromas at preperitoneal and subaponeurotical location of implant reaches 6.9 - 17%, and at supraaponeurotical version from 21.3 to 31.8% [27, 146, 152].

Currently, there are numerous ways to prevent and treat seromas. These include intraoperative prevention measures (closure of «free spaces» over the aponeurosis) [47], various types of drainage, early bandaging, puncturing, probing, antibiotic therapy [64, 76, 101, 113], physiotherapy. These multiple forms of treatment have their own characteristics and weaknesses and indicate an absence of a single effective method for the prevention and treatment of this complications.

According to A.B. Laricheva et al. (2012), the appearance of infiltration in the wound area caused by a local inflammatory response of the body to the prosthesis as a foreign body, which usually has the character of an aseptic and self-treated, so the infiltration should be removed from the category of complications [113, 158].

According to A.V. Podergin, V.L. Halzova (2007), the problem of ligature fistulas with prosthesis of abdominal wall in ventral hernias is associated only with

the use as suture polyester (lavsan, nylon) and is solved by using a PP suture material for fixing the same prosthesis [82].

S.Y. Pushkin and others (2011) examined the nature of the morphological and functional changes in tissues during the formation of liquid effusions in the surgical wound in patients after prosthetic plastics. Results of morphological studies have shown that the reason for the formation of residual cavities in the subcutaneous adipose tissue and the appearance in these fluid buildup - exudates is a disorder of the blood supply in the deep layers (below the superficial fascia), due to its considerable detachment from the fascia and the absence of its closing after the operation [85].

Some authors offer minimally invasive treatment of long-existing seromas, which are not relieved by conservative treatment. With the laparoscope seroma cavity is examined, the liquid content is removed, fibrinous bridges are destroyed, then wall is scarified by argon-plasmatic coagulator, and talc is injected into the cavity as a sclerosant [143].

According to T. Satterwhite et al. (2012), statistically significant risk factors for complications in the postoperative period, both general and local are obesity, diabetes mellitus, high blood pressure (HBP), the presence of ligature and intestinal fistulas, two hernia repair in the anamnesis, three previously performed surgery in the abdominal cavity, staying at a hospital 14 days or more, the size of the hernia defect 300 cm^2 and the use of autotransplant for hernia repair [155].

According to other researchers, initiating factors of local complications, regardless of localization of the implant are morbid genesis of obesity and long-term expansion of the giant hernia sac in subcutaneous adipose tissue with the cavities formation [11, 150] (V.A. Beloborodov et al., 2012.).

According to S. Klink et al. (2011), a major risk factor of seroma in IH repair is a high body mass index; however gender, nicotine dependence and the nature of hernia (recurrence) are not critical. The authors also studied the nature of the fluid in drains after the prosthesis to determine predictors of seroma formation [145].

Currently, the majority of authors believe that the prevention of wound complications in prosthetics should be based on an efficient drainage of plastics endoprosthesis zone. As the main method of preventing the wound festering timely removal of wound fluid is recommended [61, 62, 64, 109, 113, 115, 150, 164]. The authors recommend to drain the wound by Redon no more than one day; do not use passive drainage and preferring simultaneously emptying through a puncture or directly through the wound.

One of the main ways to prevent infection is antibioticotherapy. The use of antibiotics in the perioperative period significantly reduces the frequency of festering wounds in the treatment of IH [53]. There are five main schemes of antibiotic prophylaxis. Injection of an antibiotic for 20-30 minutes before the operation, re-injection, if the intervention lasts more than three hours; «Ultrashort prevention» - additional 2-3 doses after surgery; «Short-term prevention» - after surgery for two days and «prolonged prophylaxis» - within a few days [63].

In order to prevent wound complications and improve implant integration processes in the tissue, some authors offer a variety of physicochemical methods to influence on the wound in the perioperative period. The efficiency of the use of low-intensity laser radiation through the drainage in the implant area in patients in the perioperative period has been improved [22, 38]. Other authors in the experiment noted a positive effect of ozone and sodium hypochlorite on the course of wound healing [58]. Some researchers propose to carry out the processing of the low-energy injury of air-plasma jet in the NO-therapy mode [17, 146].

One of the traditional directions of wound complications prevention is to reduce the surgery trauma.

Another focus in the prevention of wound complications is to fix the subcutaneous fat flaps and to eliminate the residual cavities in the tissues. Several authors fix the subcutaneous tissue at the wound suturing of the prosthesis to the location area [2, 49, 74]. I.I. Kotov et al. (2006) offer an original way of fixing the subcutaneous fat. Subcutaneous fat flaps fixed to the aponeurosis by a counter, constant sutures across the length of the wound. According to the authors, the

method eliminates the space between the fiber and the aponeurosis that prevents the accumulation of fluid and blood clots, the formation of seromas and suppuration of postoperative wounds. Nevertheless, the authors at the first, drain the wound, and then use the proposed method of suturing.

Other authors to eliminate voids in the subcutaneous fat propose imposing U-shaped sewing perpendicularly the axis of the wound through the skin and subcutaneous tissue with a space from the skin edge of the wound by 5-7 cm and tying threads on gauze balls [115].

Thus, the presence of many ways to prevent wound complications for prosthesis of the abdominal wall in the ventral hernia repair and relevance of the problem dictates the need to develop techniques and tactics of patients care after prosthesis to reduce the frequency of wound complications.

CHAPTER II. MATERIAL AND METHODS

2.1. General characteristics of the clinical material.

The work is based on the analysis of the results of hernia repair in 164 patients with IH, recurrent ventral hernias and primary hernias and suffering from obesity. All the operations were performed in the surgical department of I - SAMMI Clinic in the period from 2006 to 2015.

The patients were divided into two groups: the control group (72 - 43.9%) and the main group (92 - 56.1%) (Diagram 1).

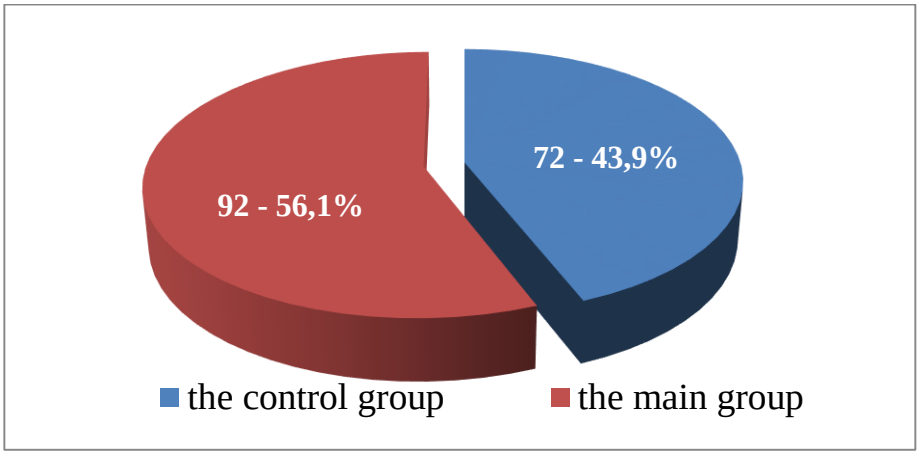

Diagram 1. Distribution of the patients by the research groups

Patients in the control group were undergone the classical hernia repair with local tissues and prosthetic materials by indications. In the main group patients were undergone hernia repair using mesh implants with the additional dermolipectomy. Among the 164 patients men were - 50 (30.5%), women - 114 (69.5%) (Diagram2).

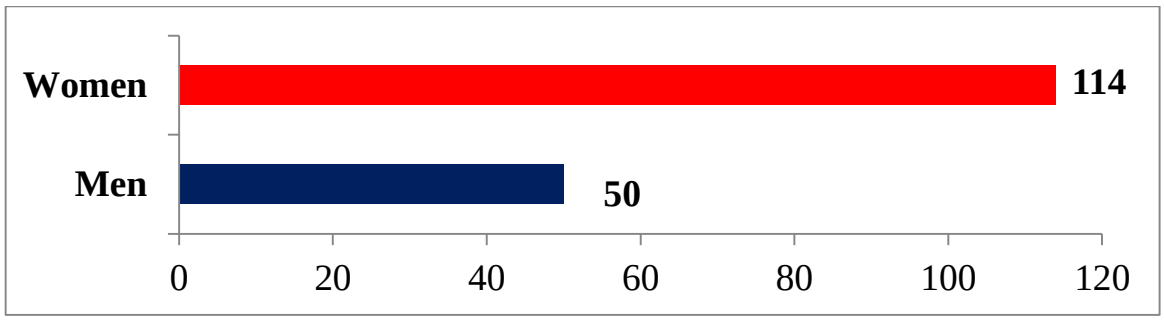

Diagram 2. Distribution of the patients by gender

Age distribution: under 45 years - 35 (21.3%), 46-59 years - 87 (53.0%), 60-74 years - 39 (23.8%), 75-90 years - 3 (1.8%) (Table. 1).

Table 1.

Distribution of the patients by age groups in comparison

A group of patients	*The patients' age*								*Total*
	45		46-59		60-74		75-90		
	abs.	%	abs.	%	abs.	%	abs.	%	
The main group	21	12,8	46	28,0	23	14,0	2	1.2	92
The control group	14	8,5	41	25,0	16	9,8	1	0,6	72
Total	35	21,3	87	53,0	39	23,8	3	1,8	164

Comorbidities slightly more common occurred in the patients of the main group (Table. 2) (Figure 3).

Table 2.

Distribution of the patients according to comorbidities

Indexes	*The groups of the patients*			
	The control group		The main group	
	Quan.	%	Quan.	%
Hypertonic disease	43	59,7	56	60,9
Heart coronary disease	17	23,6	24	26,1
Chronic obstructive pulmonary disease	8	11,1	7	7,6
Diabetes mellitus	3	4,2	5	5,4
Varicose veins of the lower extremities	9	12,5	4	4,3

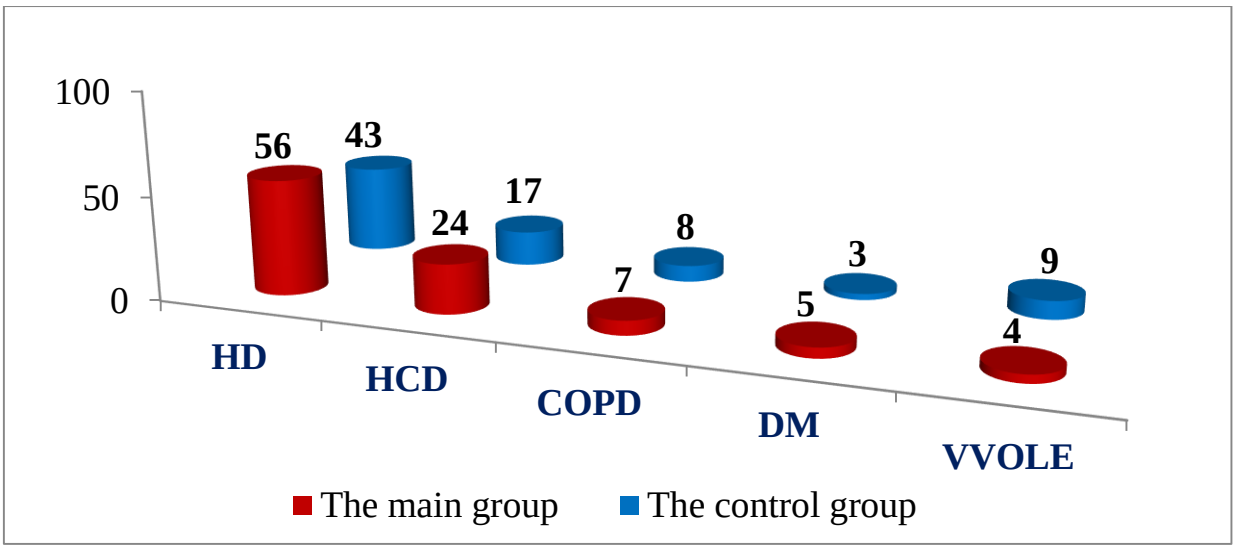

Diagram 3. Distribution of the patients according to comorbidities in comparative groups

Patients in degrees of ptosis of the anterior abdominal wall were distributed by A. Matarasso classification (1989). Minimum and medium ptosis (I-II level) were observed in 36 and 42 patients with obesity I-II and III-IV degree respectively. Moderate to severe ptosis (III-IV degree) were observed in 51 and 35 obese patients I-II and III-IV degree respectively (Table 3).

Table 3.

Distribution of the patients according to the degree of obesity and abdominal ptosis

Ptosis / Obesity	Groups of the patients			
	The control group		The main group	
	I-II	III-IV	I-II	III-IV
I-II	12	21	24	30
III-IV	19	20	23	15

The most important factors in determining the surgical tactics are the site of hernia, defect width and the presence of recurrences history. According to the J.P. Chervel and A.M. Rath (1999) classification, in 53 (32.3%) patients large (W3) and giant (W4) hernias were observed. The vast majority of patients (118 - 71.9%)

had supraimbilical (M1) and umbilical (M2) hernias. The lowest number of patients had ventral hernia of lateral (L) and combined (M + L) positions. Among 164 patients, 115 (70.1%) had primary (R0) and 49 (29.9%) patients had recurrent (Rn) hernias. Schematic distribution of the patients according to the site of the hernia, the width of the defect and the number of recurrences is shown in Table 4.

Table 4.

Distribution of the patients according to the site of the hernia, the width of the defect and the number of recurrences

The width of defect / The site of hernia	W_1	W_2	W_3	W_4	Total		
M_1	R_0-11	R_0-22	R_0-10	R_0-	R_0-43		54
	R_1-	R_1-4	R_1-2	R_1-1	R_1-7	11	
	R_2-	R_2-1	R_2-2	R_2-1	R_2-4		
M_2	R_0-15	R_0-22	R_0-5	R_0-	R_0-42		64
	R_1-1	R_1-9	R_1-1	R_1-1	R_1-12	22	
	R_2-	R_2-1	R_2-2	R_2-5	R_2-8		
	R_3-	R_3-	R_3-	R_3-2	R_3-2		
M_3	R_0-2	R_0-19	R_0-5	R_0-	R_0-26		41
	R_1-1	R_1-2	R_1-4	R_1-2	R_1-9	15	
	R_2-	R_2-	R_2-	R_2-6	R_2-6		
L	-	R_0-1	R_0-2	-	R_0-3		3
M+L	-	-	-	R_0-1	R_0-1		2
				R_1-1	R_1-1		
Total:	R_0-28	R_0-64	R_0-22	R_0-1	R_0-115		
	R_1-2	R_1-15	R_1-7	R_1-5	R_1-29	49	
	R_2-	R_2-2	R_2-4	R_2-12	R_2-18		
	R_3-	R_3-	R_3-	R_3-2	R_3-2		
	30	81	33	20			164

2.2. The research methods.

The clinical method. Ventral hernias are characterized by herniation of the defect in the muscular-aponeurotic layer of the anterior abdominal wall, manifested by pain syndrome and dyspeptic disorders, which lead to a decrease in physical activity and patient disability.

Patients were examined in a vertical or horizontal positions (fig. 1, 2), determination of the width of hernia formation, its contents, the degree of reduction, the presence of old scars, ligature fistulas, maceration and dermatitis was carried out. In reducible ventral hernias the orifices thoroughly were investigated, and their sizes in the longitudinal and transverse directions were determined.

Fig. 1. Examination of the patient with incisional hernia in an upright position

Collecting anamnesis we found out the duration of the disease, whether the hernias had infringements, the nature and number of previous operations, the presence of postoperative complications, the method of previously made hernia repair in cases of recurrent hernias and the onset of the recurrence period.

Fig. 2. Examination of the patient with incisional hernia in the horizontal position

Anthropometries, including measurement of body weight, height, body mass index calculation, were carried out in all the patients

The immediate results of the ventral hernias repair were retrospectively and prospectively studied in all the patients. Clinical evaluation of the early postoperative period flow was performed.

The laboratory method. General blood tests (hematological analyzer «the Abacus junior B», Switzerland), urine tests, determination of blood group and Rh factor, Wasserman blood tests, hepatitis «B» and «C », the HIV-infection tests were performed in all the patients.

The following biochemical parameters were determined: total blood protein (indication - protein fractions), bilirubin, transaminase, urea, creatinine, blood electrolytes (biochemical analyzer «Stat Fax 3300», the United States).

Evaluation of coagulation and anticoagulation systems was carried out by the number of platelets, fibrinogen indicators, international normalized ratio, and

the time duration of clotting and bleeding; on indications coagulogram was performed.

Blood glucose level was measured in all the patients with diabetes mellitus; further determined by the presence of sugar and acetone in urine, conducted daily monitoring of blood glucose.

Functional methods of research. Electrocardiography (ECG) was carried out in the patients in the Clinic. In the hospital before the surgery repeated ECG was performed on indication in patients who received medical therapy for the correction of concomitant cardiovascular disease (Electrocardiograph « ECG EK-1T-07»). A study of respiratory function was used according to indications on an outpatient basis in patients with the width of hernia W3 and W4 and the presence of severe cardiovascular and pulmonary pathologies.

X-ray method. X-ray examination of the chest was carried out in all patients at the outpatient examination. At the phenomena of «chronic» intestinal obstruction in patients with ventral hernias W3 and W4 by the indications X-ray examination of the gastrointestinal tract was carried out (plain X-ray of the abdomen and contrast X-ray). According to the indications computer tomography was carried out («Siemens»).

The endoscopic method. We performed the following endoscopic examinations: fibrogastroduodenoscopy, sigmoidoscopy, fibrocolonoscopy. We used the fibrogastroduodenoscope «Olympus» company (Japan) and fibrocolonoscope «Pentax» company. An indication for endoscopic studies were complains of patients on various dyspeptic disorders during the hospitalization.

Ultrasound method. In the preoperative period in an outpatient examination ultrasound was carried out in virtually all th patients to identify other surgical pathologies of abdominal organs. Postoperatively, ultrasound was used according to indications in order to evaluate the process of wound healing and to identify complications. We used «Aloka-500» devises and «Sim 7000 ICFM CHALL».

Intravesical pressure measurement. When the width of the hernia was W3 and W4 intraoperative IAP monitoring was carried out indirectly by measuring the

pressure in the bladder. The measurement method is as follows. A Foley catheter is let into the bladder and its complete emptying is performed. Then 50-100 ml sterile physiological solution is injected into the bladder, distally from the place of measurement catheter is blocked and measuring point system for infusion is attached. Using a ruler from the level of the pubic symphysis the measurement of fluid column on urinary catheter is performed. We measured the initial pressure after suturing fascia and after suturing the skin. Normally, IAP is 5-6.5 mmHg (8.8 cm of water column).

The level of IAP was measured in cm of water column, the value of digital data was transferred to mmHg by using the formula - «P mmHg = P cm of water column / 1.36». Results of IAP above 12 mmHg are considered to be abdominal hypertension (Fig. 3).

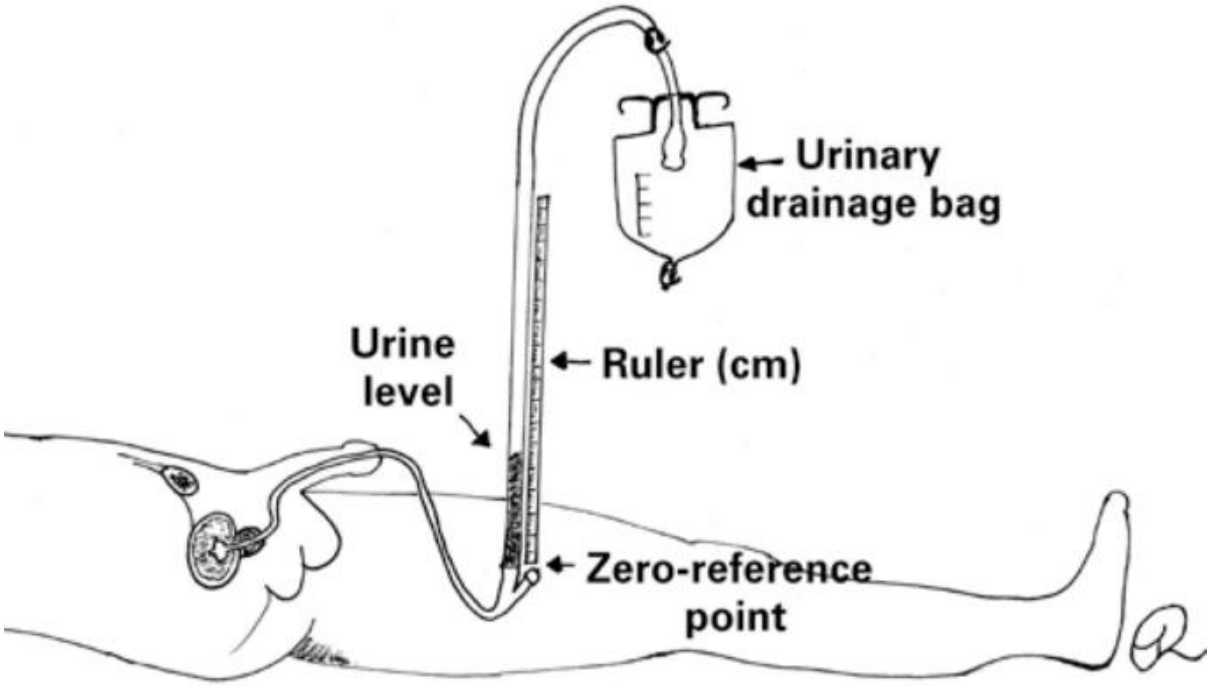

Figure 3. Scheme of intra-abdominal pressure measurement.

Identifying intra-abdominal hypertension, we supported the J. Burch classification.

J. Burch classification of the «abdominal compartment syndrome»:

Norma ≤8 mmHg

I degree – IAP = 8–11 mmHg

II degree – IAP = 11–19 mmHg

III degree – IAP = 19–26 mmHg

IV degree – IAP ≥26 mmHg.

Digital materials of the dissertation were processed by methods of variation statistics difference. For all variables arithmetic mean values (x) and the average error (Sx) were defined. Differences were considered to be reliable if the probability of possible error as determined by Student's table was less than 0.05%.

CHAPTER III. SURGICAL TREATMENT OF VENTRAL HERNIAS IN PATIENTS WITH ACCOMPANYING OBESITY

3.1. Preoperative preparation of patients with ventral hernias

Preoperative preparation of the patients in the prehospital phase included a complex of procedures aimed at reduction of body weight in cases of obesity, the correction of comorbidities, including therapeutic and surgical diagnosis of other diseases in the abdominal cavity. At the hospital stage in the preoperative period, patients were undergone training of the gastrointestinal tract and sanitation of the surgical field.

All the patients were undergone the routine of prevention of venous thromboembolic complications (VTC):

- Nonspecific prevention: elastic compression of the lower extremities, early activation and physiotherapy in the postoperative period;

- Drug prevention under the risk of VTC: anticoagulants were prescribed one day prior to surgery and then for 7-10 days under the control of the laboratory parameters; low molecular weight heparin - fraxiparine 0.4 ml was used.

Patients with the width of the hernia W3 and W4 were undergone preoperative preparation with a purpose to adapt the cardiovascular and respiratory systems to increased IAP: pneumobandage modified by the method of S.D. Popov, the Trendelenburg position by gradually raising the foot end of the bed to an angle of 45°, diet with elimination of slags. Modified pneumobandage allows you to increase the degree of the IAP gradually. At the same time the patient's state of health, hemodynamic and respiratory functions were assessed.

The Trendelenburg position with a hernia reposition into the abdominal cavity also promotes the development of adaptation mechanisms to abdominal hypertension. Prescription of the diet free of slags increases the volume of the abdominal cavity and facilitates manipulation during the surgery. In addition to the above activities, in some patients a few days before surgery cleansing enemas and laxatives by individual indications were used.

3.2. Surgical treatment of ventral hernias.

All the patients in the research groups have been operated. In patients with concomitant surgical diseases at the same time their correction were carried out. Simultaneous operations were performed in 10 patients in both treatment groups. The volumes of simultaneous interventions were: cholecystectomy – 7; supravaginal amputation of uterus with appendages – 1; viscerolysis about the «chronic adhesive intestinal obstruction» -2.

The first stage of hernia repair - after processing of the surgical field on the skin of the anterior abdominal wall «anchor» pattern was applied (incision by Fleisch), skirting the hernial protrusion, old postoperative scar and skin-fat fold (Figure 4).

Figure 4. Pattern of «anchor» (cutting by Fleisch).

Further separation and excision of the hernia sac were performed according to the standard conventional method. At IH during the surgery in the anterior abdominal wall tissues ligature microabscesses, granulomas and fistulas were often identified. Excision of these pathologies was performed within the healthy tissues with subsequent washing of the wound by antiseptics and changing of surgical tools and gloves. Separation of adhesions in the hernial sac and the abdominal

cavity was made by blunt and sharp ways with checking the hemostasis and integrity of tissues.

The second stage of hernia repair began with the mobilization of the aponeurosis from subcutaneous fat not more than 5 cm from the edge of the hernial orifice. This spacing is sufficient for the subsequent fixing of the mesh implant and that eliminates excessive detachment of subcutaneous fat (Fig. 5).

Figure 5. The step of fascia mobilization from subcutaneous fat.

The hernia repair with local tissues and prosthetic materials was performed in patients of the control, depending on the site and width of the hernia defect. In prosthetic plastics transplant was fixed by «onlay»-method (fig. 6, 7).

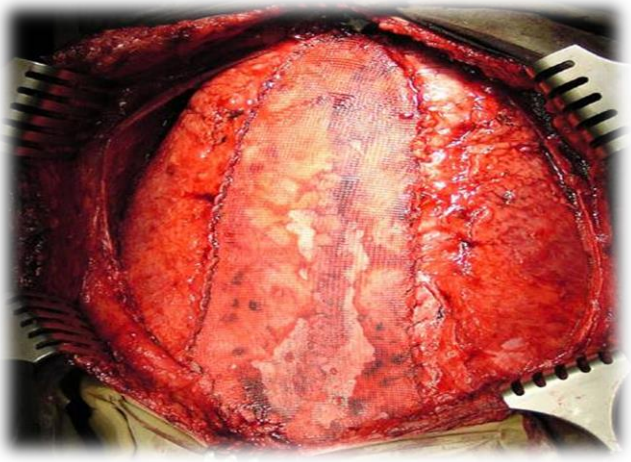

Fig. 6, 7. Fixing the prosthesis over the aponeurosis. The final view of endoprosthesis.

If necessary, in order to increase the volume of the abdomen, to prevent the development of ACS, free of tension hernia repair of the anterior abdominal wall was performed, i.e. mesh in overlay on the apouneurosis without suturing, as well as in a combined way - with the addition of abdominal rectus muscle sheaths mobilization by Ramirez (Fig 8) (Table 5).

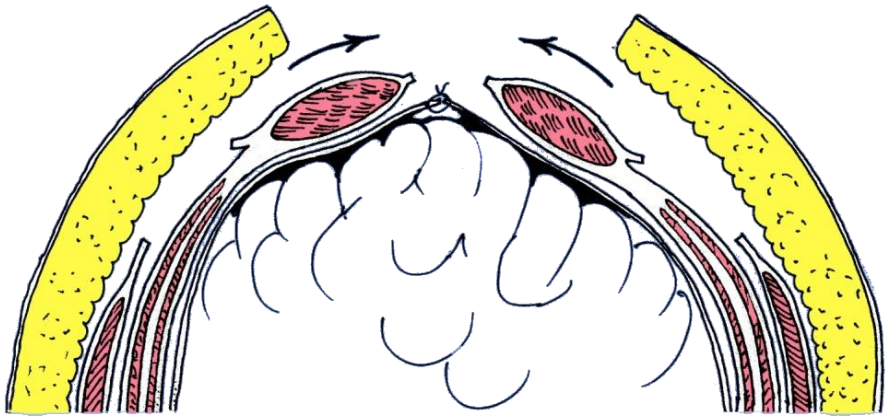

Figure 8. Reconstruction of the anterior abdominal wall with the mobilization of the rectus muscles by Ramirez

Table 5.

Hernia repair methods in the control group

Type of surgery	*Amount*	*%*
Tension repair methods		
Sapezhko method	29	40,3
Meio method	16	22,2
«Onlay»-mesh repair and suturing the defect	17	23,6
Tension-free repair methods		
«Onlay»-mesh repair without suturing the defect	4	5,5
Combined method		
Reconstruction of the abdominal wall by Ramirez with «Onlay»-mesh repair	6	8,3
Total	72	100

In the main group the skin incision was performed over the hernia. Then the subcutaneous fat was widely separated toward the fascia around the hernia sac. After this hernia sac was removed, repair of hernia defect, elimination of diastases of rectus muscles were performed. The mesh implant was used in all the patients of the research group. To prevent «small stomach» syndrome and respiratory failure on the indications tension-free repair was performed without suturing the fascia or reconstruction of the abdominal wall by Ramirez (tab. 6). After completion of the hernia orifice repair dermolipectomy was performed by the line previously applied on the anterior abdominal wall, which borders the hernial protrusion, old postoperative scar and skin-fat fold. Weight of excess skin and fat flap ranged from 4 to 12 kg.

Table 6.

Types of hernia repair in the main group

Type of surgery	*Amount*	*%*
Tension repair methods		
«Onlay»-mesh repair and suturing the defect + dermolipectomy	34	36,9
Tension-free repair methods		
«Onlay»-mesh repair without suturing the defect + dermolipectomy	44	47,8
Combined method		
Reconstruction of the abdominal wall by Ramirez with «Onlay»-mesh repair + dermolipectomy	14	19,4
Total	92	100

After the hernia repair in all the patients of the control and main groups drainage tubes were left over the left aponeurosis, the free ends of which are exposed below the horizontal section, fixed to the skin and drained by Redon (Fig. 9).

Figure 9. The prosthesis fixation and drainage

3.3. Prevention of wound complications in the abdominal wall prosthesis in the treatment of ventral hernias.

In order to prevent infectious complications in the control group all patients received antibiotics: cephalosporin II and III generations intravenously 20-30 minutes before the surgery. Since 2009, patients of the main group received antibiotics, cephalosporin II and III generations, but by intravenous drop infusion for 20-30 minutes before the skin incision. For this purpose, antibiotic was diluted with 200 ml of saline. The duration of infusion was an average of 20-30 minutes. The method, based on the intravenous administration of an antibiotic, has a number of advantages: optimal distribution of the antibiotic in the tissues, prolonged maintenance of the minimum inhibitory concentration in the blood and tissues.

In addition, procedures were taken to help reduce the risk of local suppurative complications. These are: careful preparation of the surgical field, especially with maceration of the skin and dermatitis, removal of hair on the day of surgery, a maximum reduction of preoperative bed days, strict adherence to the rules of aseptic and antiseptic.

To prevent hematomas of surgical wounds along with a «gentle technique» surgical intervention different coagulation methods were used.

Only non-absorbable monofilament (PP) is used to prevent fistula ligature to fix the endoprosthesis.

In the formation of the bed for the prosthesis detachment of subcutaneous fat with the intersection of the set of lymph, blood capillaries and the formation of «dead space» and «residual cavities» inevitably occur. Also itself endoprosthesis is a foreign body, creating more space between the aponeurosis and subcutaneous fat. As a result, these two factors lead to the formation of liquid accumulations, complicating the course of wound healing.

In the control group (n = 72) after hernia repair and fixation of the implant, in 81.4% of patients draining with active aspiration was performed, and then the wound is sutured by layers.

In the main group (n = 122) for fixing the prosthesis tight fit it to the aponeurotic structures was considered to be fundamentally important, since the presence of folds and areas of folded endoprosthesis is formed over the aponeurosis space where fluid can accumulate. In addition, in the main group, for the prevention of wound complications suturing subcutaneous fat with fixation to the prosthesis and wound bottom was applied.

The process of detachment of subcutaneous fat can be minimized, but cannot be completely excluded. Therefore, one of the directions to prevent the formation of liquid accumulations is the elimination of the periprosthetic space and «residual cavities», where there is accumulation of fluid occurs.

For this purpose, we used vertical U-shaped stitching with wide capture of subcutaneous fat and the fixation to the implants and wound bottom. Subcutaneous fat is sewn over 4-5 cm with both edges of the wound, the distance between the vertical U-shaped sutures was 2-3 cm (Fig. 10).

With this method of suturing of the surgical wound two positive effects are observed. First - fixing subcutaneous fat grafts and the absence of their displacement towards to the endoprosthesis in the postoperative period. The second effect is related to the capture of subcutaneous fat. The seam gets superficial fascia, which is due to the wide capture deformed and acts as a «block»

for tying ligatures during the node. As a result, tying a ligature two forces are formed: the first - from the «block» to the center of the wound (force vector A), the second - from the «block» to the wound bottom (force vector B), and the resultant force has a direction to the endoprosthesis and aponeurosis (force vector R), pressing the subcutaneous fat grafts (Fig. 11).

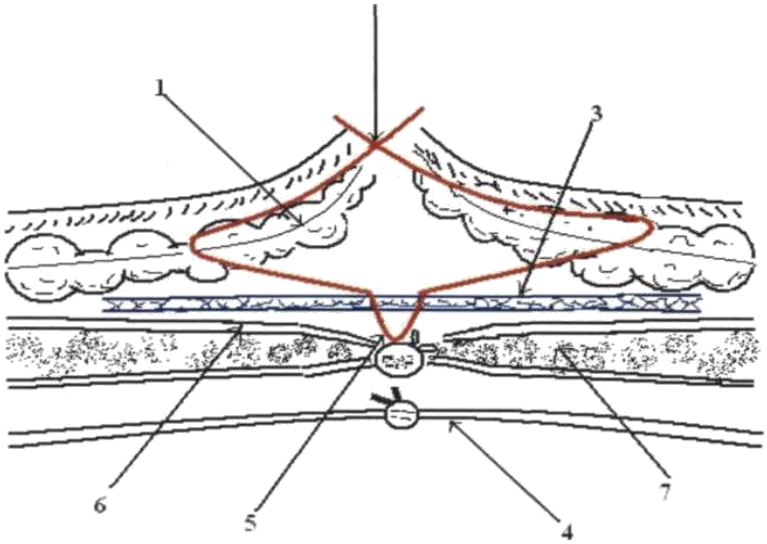

Figure 10. The suture of subcutaneous fat. Superficial fascia - 1, vertical U-shaped steaching (2) with a wide capture of subcutaneous fat and fixation to the endoprosthesis (3) and the bottom of the wound (5), the peritoneum - 4, aponeurosis - 6, muscle - 7.

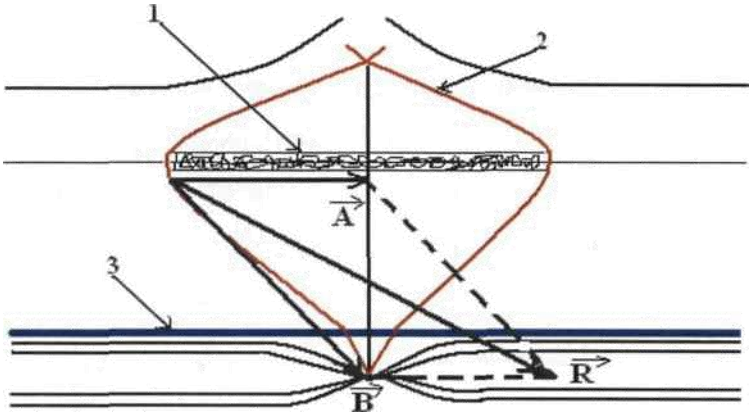

Figure 11. The current strength in tying ligatures. Deformation zone of the superficial fascia and subcutaneous fat («unit» for ligatures) - vertical U-shaped seam - 2, on the top of the fascia prosthesis - 3.

When a large detachment of subcutaneous fat (more than 5 cm) and larger sizes of «residual cavities» was developed a second version of the vertical U-shaped seam was used. Differently from the first variant, the fixation to the bottom of the wound and the endoprosthesis is performed in two points, laterally spaced on either side of the center of the wound. In this fixation force vector «B» has the vertical direction; hence the force vector R has a more vertical direction, pressing the subcutaneous fat grafts with greater force (Fig. 12).

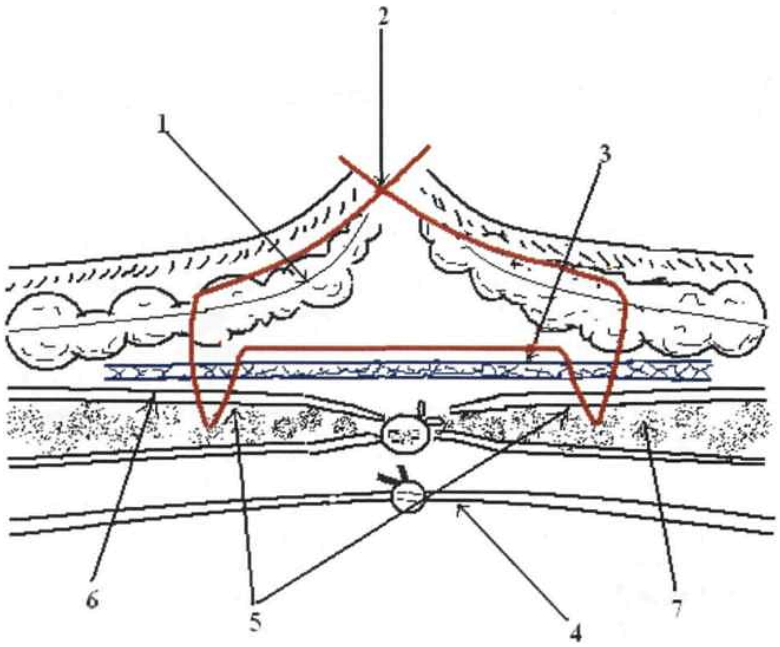

Fig. 12. The suture of subcutaneous fat (the second version of the U-shaped seam). Superficial fascia - 1, the vertical U-shaped seam (2) with a wide capture of the subcutaneous tissue and the fixation to the endoprosthesis (3) and wound bottom (5) at two points arranged laterally on either side of the wound center, peritoneum – 4, aponeurosis - 6, muscle - 7.

Thus, in the process of performing of mesh repair total number of stitches can be up to a hundred or more (suturing fascia «edge to edge», fixation of the implant with two rows of stitches, stitching of subcutaneous fat by the developed method). It is also in the process of suturing less trauma tissue is noticed, which is important in hernia repair when minimum operational trauma of tissues is required.

3.4. The principles of patients care in the postoperative period.

Patients with the width of the hernia W3 and W4 in the early postoperative period were staying in the intensive care unit. The complex of intensive care after prosthetic mesh repair included:

- adequate analgesia;
- prevention of the VTC;
- infusion therapy;
- antibiotic prophylaxis, antibiotic therapy by indications;
- prolonged ventilation by individual indications;
- drugs that stimulate peristalsis (Neostigmine, Reglan, Ubretid).

The adequate analgesia was provided by injection of promedol solution 2% - 1.0 and non-narcotic painkillers - 50% solution of analgin -2.0, intravenous forms of non-steroidal anti-inflammatory drugs (paracetamol). In addition, in some patients of the main and control group prolonged epidural anesthesia was used.

In the early postoperative period, adequate hydration of patients was carried out. The amount of infusion therapy for hemodilution was determined taking into account the individual parameters of the patients. Also drug correction of comorbidities was performed.

The course of wound healing was assessed by clinical data, laboratory parameters and ultrasound examinations.

Clinical evaluation of wound healing process was carried out on the basis of examination of the surgical wound. It detects the presence or absence of swelling, redness, tissue infiltration in the area of the wound edges, as well as the severity of pain. In the presence of drains or getting wet bandages, the volume and nature of exudates were assessed. All patients were undergone measurement of body temperature 2 times a day (morning and evening), in auxiliaries by mercury thermometer.

The degree of inflammation was assessed by changes in the level of white blood cells, and the formula in the general analysis of blood.

During the ultrasound of the surgical wound after hernia repair thickness of the anterior abdominal wall, the echo structure and echogenicity of the tissues in the operation area, the presence of additional structures and inclusions were estimated. To remove liquid accumulations either one-stage evacuation through the puncture wound or a US-guided evacuation were used. Small accumulations of fluid subjected to dynamic observation. In some cases, in the absence of the effect of puncture and evacuation through the wound and signs of infection the partial withdrawal of wounds were used (1-2 removing sutures from the skin), and keeping wound opened with gauze turundas installation and napkins with antiseptic applications.

CHAPTER IV. COMPARISON AND ANALYSIS OF RESULTS OF TREATMENT IN THE RESEARCH GROUPS

4.1. Analysis of the results of treatment in the early postoperative period

To evaluate the effectiveness of the treatment results of the patients in discussion groups as the main criteria, the following comparison options were used:

1. Abdominal complications of early postoperative period.
2. Extraabdominal complications of early postoperative period.
3. Wound complications in the early postoperative period.
4. Long-term results of the surgical treatment.

The level of IAP in the dynamics was measured in patients of the both groups during the treatment. Based on the data, we revealed regular changes in abdominal pressure indicators in the direction of their increase in the operation stages, associated with reduction of hernia contents and hernia repair. Tension-free hernia repair and combined method with the mobilization of the rectus muscles by Ramirez applied to 10 patients in the control group and 58 patients in the main group, which increases the volume of the abdominal cavity, thus avoids increasing IAP.

The majority of patients after surgery remained normal gastrointestinal function, only in 3 patients in the control and in 1 patient in the main group who had been undergone hernia repair over a giant ventral hernia intestinal paresis was observed, relieved by medication. In 4 patients in the control group and in 2 patients in the main group urinary retention was observed.

In the control group bronchopulmonary complications were observed in 6 patients, events of heart failure in 5 patients, the latter showed low rates of blood pressure, increased heart rate, shortness of breath.

In the main group extraperitoneal complications were observed in 3 patients. Bronchopulmonary complications were observed in 2 patients, heart failure in 1 patient aged 59 years, who was suffering from post-infarction cardiosclerosis.

Wound postoperative complications were observed in 11 patients in the control group. In the main group - in 3 patients (tab. 7).

Table 7.

Complications in the early postoperative period

Complications	The control group			The main group			Total
	Tension hernia repair	Tension-free hernia repair	Combined method	Tension hernia repair	Tension-free hernia repair	Combined method	
	Without dermolipectomy			With dermolipectomy			
Abdominal complications							
Enteroplegia	2	-	1	1	-	-	4
Urinary retention	2	1	1	1	-	1	6
Extraabdominal complications							
Bronchopulmonary complications	5	-	1	2	-	-	8
Cardiovascular failure	4	1	-	1	-	-	6
Wound complications							
Infiltrate	1		2		1	-	4
Hematoma		1					1
Seroma	1	1	-	1	1		4
Chylorrhea			1	-			1
Festering wounds	1	1	-				2
Necrosis of graft of skin edge	1		1				2
Total	29 (40,3%)			9 (9,8%)			38(23,8%)

Thus, the largest number of early postoperative complications were observed in patients of the control group. The smallest amount of cardiopulmonary and local complications after surgery observed in the main group of patients.

4.2. Analysis of the results of the treatment in the late postoperative period.

In the long-term period after surgery from 72 patients in the control group 49 were observed (68.0%) and from 92 patients of the main group 76 were observed (82.6%) in the period from 1 year to 3 years.

In dynamic observation of the patients in control group body weight was not changing significantly. In patients of the main group indicators of abdominal obesity sustained global changes.

This had a positive impact on the future prospects of life, because it is the type of abdominal fat distribution, most associated with high risk of cardiovascular disease and type 2 diabetes mellitus, was undergoing significant changes.

In the study of blood glucose levels in the control group no significant changes were detected. There was a significant decrease in blood glucose after the treatment at the level of the study in patients of the main group. The elevation of blood glucose, with the level of 6.1 mmol/L, wasn’t found in the main group.

In both groups, initially 99 patients (60.4%) had hypertension of varying degrees. Dynamic observation in the late postoperative period in patients of the control group noted continued high blood pressure numbers, with a tendency to move in a more severe hypertension. Patients of the main group decreased high blood pressure numbers, with a tendency to move in a lighter degree of hypertension (Table. 8).

Table 8.

Distribution of the patients according to comorbidities in the late postoperative period

Indexes	***Groups of the patients***					
	The control group			The main group		
	Amount	%		Amount	%	
		Before	Long time after		Before	Long time after
Hypertonic disease	38	59,7	77,5	23	60,9	30,3
Heart ischemic disease	16	23,6	32,6	11	26,1	14,5
Chronic obstructive pulmonary disease	8	11,1	16,3	2	7,6	2,6
Diabetes mellitus	3	4,2	6,1	1	5,4	1,3
Varicose veins of the lower extremities	7	12,5	14,3	1	4,3	1,3

Analysis of the results of the study, which evaluated the quality of life in patients of the main group after 3 months after surgery showed improvement in the quality of life in all aspects of research (Fig. 13).

Figure 13. The view of a patient after hernioabdominoplasty in the long term postoperative period.

Thus, in performing hernia repair the frequency of postoperative complications is significantly higher than in using dermolipectomy. This fact is of fundamental importance because the characteristics of patients at comparable groups lipoabdominoplasty application has considerable advantages, on both objective and subjective parameters for patients.

SUMMARY

Despite the rapid development of minimally invasive endovideosurgical technologies in abdominal surgery, the number of surgical procedures using conventional laparotomy remains high, after which in 4-18% of the cases develop incisional hernias (IH), and in the general statistical structure of ventral hernias IH makes up 20-26% [37]. In the structure of the abdominal hernias large incisional hernias (LIH) occupy a special place, and they account for between 3 and 14% [54, 105, 106]. About 60% of patients with IH - aged from 21 years to 60 years, i.e., they are a significant part of the working population [34].

Results of IH treatment characterized by a fairly high number of recurrences (from 4.3 to 46%), while in LIH recurrences reach 60% of the cases [48, 77, 116]

The causes of IH in 31,4-63,4% are infectious processes in the wound [7, 16, 22, 23, 43, 65, 72, 130], in 35.1% - drainage and tamponade of abdominal cavity through the major wound, and in 40.7% of cases - eventration [80, 139]. Only in 18% of cases, development of hernias occurs in a favorable postoperative period. But even with a favorable current of wounds IH develop in patients with imbalance of collagen type III, which results to progressive tissue morphofunctional deficiency that is most characteristic of patients with recurrent hernias, with the subsequent development of their «hernia disease» [54, 128, 124, 144].

A large number of hernia repair methods and modifications, the appearance of publications on all new elaborations are on the one hand, the undeniable fact of dissatisfaction with the results incisional hernia repair, the other - evidence of an ongoing search for solutions to this problem [9, 20, 96, 119, 126]. The frequency of recurrences after laparotomy is 3-13%, while in morbid obesity it is 28% [4, 8, 12, 28, 51, 122, 123].

Most physiological methods are undoubtedly autoplastic ways of closing the hernia defect. However, the possibility of their application in practice is often limited because of large hernia defect and the development of postoperative complications [54, 57, 62, 82, 85, 136].

Mesh implants made from PP and PTFE are now widely used [24, 88, 98, 104, 135].

Abdominoplasty (dermolipectomy of the anterior abdominal wall) in all cases allows to reduce the effect of ongoing efforts needed to match the edges of the defect in the muscular-aponeurotic layer of the anterior abdominal wall. This reduction in the maximum (15-70%) in a range of areas generated by defects in the abdominal wall from 32 to 150 cm^2 and the thickness of the subcutaneous fat layer of the anterior abdominal wall more than 3 cm [10, 31, 46, 55, 60, 141].

Thus, abdominoplasty, performed by indications and complementing with herniotomy about ventral hernia of the anterior abdominal wall may be an additional factor that reduces the strain of tissue of the anterior abdominal wall and the degree of increased intra-abdominal pressure, which occurs during the closing of hernial orifice, and as a result of this method recurrences of ventral hernias are prevented [31, 121, 129].

An important problem of ventral hernia repair is early postoperative complications, because it is a major cause of prolonged postoperative period, more moral and physical suffering of patients and possible deaths [35, 42, 49, 53, 74, 83, 90].

One of the significant problems of large and giant ventral hernias repair, besides the technical aspects, is increased IAP, which leads to the development of intra-abdominal hypertension syndrome, respiratory and cardiac failure. An easily accessible way to monitor IAP is to measure the pressure in the bladder [32, 51, 155].

A number of authors for the prevention of intra-abdominal hypertension offer original methods. S.G. Izmailov et al. (2003) developed a special apparatus for the metered edges to close hernia defect controlled by IAP.

Researchers note that wound complications are observed both at using different types of implants (PP, PTFE), and methods for various locations in the tissue [126, 127, 132, 138, 149].

The most frequent complications are seroma, infiltrate, long exudation from the wound, more rarely - festering, necrosis of the skin edge, infarction of subcutaneous tissue, fistula, meshoma and granuloma. The frequency of wound complications after prosthetic mesh repair according to Y.R. Mirzabekyan, S.R. Dobrowolskiy (2008) is 67%; T. White et al. (1998) - 44%; J. McGreevy et al. (2003) - 21%; A. Bazaeva, I.A. Tsverova (2011) - 12%.

Local complications of early postoperative period include: disruption of the wound, the formation of infiltrates, hematomas, seromas, ligature fistulas, long chylorrhea, festering wounds, etc.. The frequency of inflammatory wound complications, according to different authors, reaches impressive numbers - 20.9 - 49.2% [19, 21, 40, 52, 59, 112, 117, 145].

The work is based on the analysis of the results of hernia repair in 164 patients with incisional, recurrent and primary ventral hernias as well as obesety. All operations were performed in the surgical department of the clinic 1 - SamMI in a period from 2006 to 2015. The patients were divided into two groups: a control group (72 - 43.9%) and the main group (92 - 56.1%). Patients in the control group were performed the classical hernia repair with local tissues and prosthetic hernia repair by indications. In the main group patients were undergone hernia repair using mesh implants with the addition dermolipectomy. Among 164 male patients were - 50 (30.5%), female - 114 (69.5%). Age distribution: under 45 years - 35 (21.3%), 46-59 years - 87 (53.0%), 60-74 years 39 (23.8%), 75-90 years - 3 (1 8%).

Comorbidities slightly more common occurred in patients of the main group.

Patients were distributed by the degree of ptosis of the anterior abdominal wall by A. Matarasso classification (1989). Minimum and medium ptosis (I-II degree) were observed in 36 and 42 patients with obesity I-II and III-IV degree, respectively. Moderate to severe ptosis (III-IV degree) were observed in 51 and 35 obese patients I-II and III-IV degree respectively.

The most important factors determining the surgical approach is the site of hernia, defect width and the presence of a history of recurrences. According to the

classification of Chervel J.P. and Rath A.M. (1999) 53 patients (32.3%) had large (W_3) and giant (W_4) hernias. The vast majority of patients (118 - 71.9%) had supraumbilical (M_1) and umbilical (M_2) hernias. The lowest number of patients with ventral hernias had lateral (L) and combined (M + L) positions. Among 164 patients, 115 (70.1%) had primary (R0) and 49 (29.9%) patients had recurrent (Rn) hernias.

The patients were examined in the vertical and horizontal positions, determination of the size of hernia formation, its contents, the degree of reduction, the presence of old scars, ligature fistulas, maceration and dermatitis was carried out. In reducible ventral hernias the orifices were investigated, and their size in the longitudinal and transverse directions was determined.

Collecting anamnesis we found out the duration of the disease, whether the hernias had infringements, the nature and number of previous operations, the presence of postoperative complications, the method of previously made plastics in cases of recurrent hernias and the onset of a period of recurrence.

Anthropometries, including measurement of body weight, height, body mass index calculation were performed in all the patients.

The immediate results of treatment of ventral hernias were retrospectively and prospectively studied in all the patients. Clinical evaluation of the flow of early postoperative period was performed.

The laboratory method. General blood tests (hematology analyzer «the Abacus junior B», Switzerland), urine tests, determination of blood group and Rh factor, Wasserman blood tests, hepatitis «B» and «C», the HIV-infection tests were performed in the patients.

The following biochemical parameters were determined: total blood protein (indication - protein fractions), bilirubin, transaminase, urea, creatinine, blood electrolytes (biochemical analyzer «Stat Fax 3300», the United States).

Evaluation of coagulation and anticoagulation systems was carried out by the number of platelets, fibrinogen indicators, international normalized ratio, and the time duration of clotting and bleeding; on indications coagulogram was

performed.

Blood glucose was measured in all patients with diabetes mellitus; further determined by the presence of sugar and acetone in urine, conducted daily monitoring of blood glucose.

Functional methods of research. Electrocardiography (ECG) was performed in patients in the clinic. In the hospital before the surgery repeated ECG was performed on indication in patients who received medical therapy for the correction of concomitant cardiovascular disease (Electrocardiograph «ECG EK-1T-07»). A study of respiratory function was used according to indications on an outpatient basis in patients with the size of hernia W3 and W4 and the presence of severe cardiovascular and pulmonary pathology.

X-ray method. X-ray examination of the chest was performed in all patients at the outpatient examination. At the phenomena of «chronic» intestinal obstruction in patients with ventral hernias W3 and W4 by the indications X-ray examination of the gastrointestinal tract (plain radiography of the abdomen and contrast X-ray) was carried out. According to the indications computer tomography was performed («Siemens»).

The endoscopic method. We performed the following endoscopic examinations - fibrogastroduodenoscopy, sigmoidoscopy, fibrocolonoscopy. We used the fibrogastroduodenoscope «Olympus» company (Japan) and fibrocolonoscope «Pentax» company. An indication for endoscopic studies were complains of patients on various dyspeptic disorders during the hospitalization.

Ultrasound method. In the preoperative period in an outpatient examination ultrasonography was performed in virtually all patients to identify other surgical pathology of abdominal organs. Postoperatively, ultrasound was used according to indications in order to evaluate the process of wound healing and identify complications. We used «Aloka-500» devises and «Sim 7000 ICFM CHALL».

Intravesical pressure measurement. When the size of the hernia was W_3 and W_4 intraoperative IAP monitoring was carried out indirectly by measuring the pressure in the bladder. The measurement method is as follows. A Foley catheter is

let into the bladder and its complete emptying is performed. Then 50-100 ml sterile physiological solution is injected into the bladder, distally from the place of measurement catheter is blocked and measuring point system for infusion is attached. Using a ruler from the level of the pubic symphysis the measurement of fluid column on urinary catheter is performed. We measured the initial pressure after suturing fascia and after suturing the skin. Normally, IAP is 5-6.5 mm Hg (8.8 cm of water column).

The level of IAP was measured in cm of water column, the value of digital data was transferred to mmHg by «P mmHg = P cm of water column / 1.36». Indicator of IAP above 12 mmHg was considered to be abdominal hypertension.

Preoperative preparation of patients in the prehospital phase included a complex of procedures aimed at reducing body weight in case of obesity, the correction of comorbidities, including therapeutic and surgical diagnosis of other diseases of the abdominal cavity. At the hospital stage in the preoperative period, patients were undergone training of the gastrointestinal tract and sanitation of the surgical field.

All the patients were undergone the prevention of venous thromboembolic complications (VTC):

- Nonspecific prevention: elastic compression of the lower extremities, early activation and physiotherapy in the postoperative period;

- Drug prevention under the risk of the VTC: anticoagulants were prescribed one day prior to surgery and then for 7-10 days under the control of the laboratory parameters; low molecular weight heparin - fraxiparine 0.4 ml was used.

Patients with the width of the hernia W_3 and W_4 were undergone preoperative preparation with a purpose to adapt the cardiovascular and respiratory systems to increased IAP: pneumobandage modified by the method of S.D. Popov, the Trendelenburg position by gradually raising the foot end of the bed to an angle of 45°, diet with elimination of slags. Modified pneumobandage allows you to increase the degree of the pressure of the abdomen gradually. At the same time the patient's state of health, hemodynamic and respiratory functions were assessed.

The Trendelenburg position with a hernia reposition into the abdominal cavity also promotes the development of mechanisms of adaptation to abdominal hypertension. Prescription of the diet free of slags increases the volume of the abdominal cavity and facilitates manipulation during the surgery. In addition to the above activities cleansing enemas and laxatives by individual indications in some patients a few days before surgery were used.

All the patients in the research groups has been operated. In patients with concomitant surgical diseases at the same time their correction was carried out. Simultaneous operations were performed in 10 patients in both treatment groups. The volumes of simultaneous interventions were: cholecystectomy – 7, supravaginal amputation of uterus with appendages – 1; viscerolysis about the «chronic adhesive intestinal obstruction» -2.

The first stage of hernia repair - separation and excision of the hernia sac were performed according to standard conventional method. At IH during the surgery in the anterior abdominal wall tissues ligature microabscesses, granulomas and fistulas are often identified. Excision of these pathologies was performed within the healthy tissues with subsequent washing of the wound with antiseptics and changing of surgical tools and gloves. Separation of adhesions in the hernial sac and the abdominal cavity was made by blunt and sharp ways with checking the hemostasis and integrity of tissues.

The second stage of hernia repair begins from the mobilization of the aponeurosis from subcutaneous fat not more than 5 cm from the edge of the hernial orifice. This spacing is sufficient for the subsequent fixing of the mesh implant and that eliminates excessive detachment of subcutaneous fat.

The hernia repair with local tissues and prosthetic materials was performed in patients of the control, depending on the location and size of the hernia defect. In prosthetic plastics transplant was fixed by «onlay»-method.

If necessary, in order to increase the volume of the abdomen, to prevent the development of ACS, free of tension hernia repair of the anterior abdominal wall was performed, i.e. mesh in overlay on the apouneurosis without suturing, as well

as in a combined way - with the addition of abdominal rectus muscle sheaths mobilization by Ramirez.

In the main group the skin incision was performed over the hernia. Then the subcutaneous fat was widely separated to the fascia around the hernia sac. After this hernia sac was removed, repair of hernia defect, elimination of diastases of rectus muscles were carried out. The mesh implant was used in all the patients in the studied group. To prevent small stomach syndrome and respiratory failure on the indications tension-free hernia repair was performed without suturing the fascia or reconstruction of the abdominal wall by Ramirez. After completion of the plastics of the anterior abdominal wall dermolipectomy was performed by the line previously applied to the anterior abdominal wall, which borders the hernial protrusion, old postoperative scar and skinfold. Weight of excess skin and fat flap ranged from 4 to 12 kg.

After the hernia repair in all patients in the control and main groups drainage tube was left over the left aponeurosis, the free ends of which were exposed below the horizontal section and fixed to the skin and drained by Redon.

In order to prevent infectious complications in the control group all patients received antibiotics: cephalosporin II and III generations intravenously 20-30 minutes before the surgery. Since 2009, patients of the main group received antibiotics, cephalosporin II and III generations, but by intravenous drop infusion for 20-30 minutes before the skin incision. For this purpose, antibiotic was diluted with 200 ml of saline. The duration of infusion was an average of 20-30 minutes. The method, based on the intravenous administration of an antibiotic, has a number of advantages: optimal distribution of the antibiotic in the tissues, prolonged maintenance of the minimum inhibitory concentration in the blood and tissues.

In addition, procedures were taken to help reduce the risk of local suppurative complications. These are careful preparation of the surgical field, especially with maceration of the skin and dermatitis, removal of hair on the day of surgery, a maximum reduction of preoperative bed days; strict adherence to the rules of aseptic and antiseptic.

To prevent hematomas of surgical wounds along with a «gentle technique» surgical intervention different coagulation methods were used.

Only non-absorbable monofilament (PP) suture was used to fix the endoprosthesis to prevent fistula ligature.

In the formation of the bed for the prosthesis detachment of subcutaneous fat with the intersection of the set of lymph, blood capillaries and the formation of «dead space» and «residual cavities» inevitably occur. Also itself endoprosthesis is a foreign body, creating more space between the aponeurosis and subcutaneous fat. As a result, these two factors lead to the formation of liquid accumulations, complicating the course of wound healing.

In the control group (n = 72) after hernia repair and fixation of the implant, in 81.4% of patients draining with active aspiration was performed, and then the wound is sutured by layers.

In the main group (n = 122) for fixing the prosthesis tight fit it to the aponeurotic structures was considered to be fundamentally important, since the presence of folds and areas of folded endoprosthesis is formed over the aponeurosis space where fluid can accumulate. In addition, in the main group, for the prevention of wound complications suturing subcutaneous fat with fixation to the prosthesis and wound bottom was applied.

The process of detachment of subcutaneous fat can be minimized, but cannot be completely excluded. Therefore, one of the directions to prevent the formation of liquid accumulations is the elimination of the periprosthetic space and «residual cavities», where accumulation of fluid occurs.

For this purpose, we used vertical U-shaped stitching with wide capture of subcutaneous fat and the fixation to the implants and wound bottom. Subcutaneous fat is sewn over 4-5 cm with both edges of the wound, the distance between the vertical U-shaped sutures was 2-3 cm.

With this method of suturing of the surgical wound two positive effects are observed. First - fixing subcutaneous fat grafts and the absence of their displacement towards to the endoprosthesis in the postoperative period. The

second effect is related to the capture of subcutaneous fat. The seam gets superficial fascia, which is due to the wide capture deformed and acts as a «block» for tying ligatures during the node. As a result, tying a ligature two forces are formed: the first - from the «block» to the center of the wound (force vector A), the second - from the «block» to the wound bottom (force vector B), and the resultant force has a direction to the endoprosthesis and aponeurosis (force vector R), pressing the subcutaneous fat grafts.

When a large detachment of subcutaneous fat (more than 5 cm) and larger sizes of «residual cavities» was developed a second version of the vertical U-shaped seam was used. Differently from the first variant, the fixation to the bottom of the wound and the endoprosthesis is performed in two points, laterally spaced on either side of the center of the wound. In this fixation force vector «B» has the vertical direction; hence the force vector R has a more vertical direction, pressing the subcutaneous fat grafts with greater force.

Thus, in the process of performing of mesh repair total number of stitches can be up to a hundred or more (suturing fascia «edge to edge», fixation of the implant with two rows of stitches, stitching of subcutaneous fat by the developed method). It is also in the process of suturing less trauma tissue is noticed, which is important in hernia repair when minimum operational trauma of tissues is required.

Patients with the width of the hernia W3 and W4 in the early postoperative period were staying in the intensive care unit. The complex of intensive care after prosthetic plastics included:

- adequate analgesia;
- prevention of the VTC;
- infusion therapy;
- antibiotic prophylaxis, antibiotic therapy if indicated;
- prolonged ventilation for individual indications;
- drugs that stimulate peristalsis (Neostigmine, Reglan, Ubretid).

The adequate analgesia was provided by injection of promedol solution 2% - 1.0 and non-narcotic painkillers - 50% solution of analgin -2.0, intravenous forms of non-steroidal anti-inflammatory drugs (paracetamol). In addition, in some patients of the main and control group prolonged epidural anesthesia was used.

In the early postoperative period, adequate hydration of patients was carried out. The amount of infusion therapy for hemodilution was determined taking into account the individual parameters of the patients. Also drug correction of comorbidities was performed.

The course of wound healing was assessed by clinical data, laboratory parameters and ultrasound examinations.

Clinical evaluation of wound healing process was carried out on the basis of examination of the surgical wound. It detects the presence or absence of swelling, redness, tissue infiltration in the area of the wound edges, as well as the severity of pain. In the presence of drains or getting wet bandages, the volume and nature of exudates were assessed. All patients were undergone measurement of body temperature 2 times a day (morning and evening), in auxiliaries by mercury thermometer.

The degree of inflammation was assessed by changes in the level of white blood cells, and the formula in the general analysis of blood.

During the ultrasound of the surgical wound after hernia repair thickness of the anterior abdominal wall, the echo structure and echogenicity of the tissues in the operation area, the presence of additional structures and inclusions were estimated. To remove liquid accumulations either one-stage evacuation through the puncture wound or a US-guided evacuation were used. Small accumulations of fluid subjected to dynamic observation. In some cases, in the absence of the effect of puncture and evacuation through the wound and signs of infection the partial withdrawal of wounds were used (1-2 removing sutures from the skin), and keeping wound opened with gauze turundas installation and napkins with antiseptic applications.

To evaluate the effectiveness of the treatment results of the patients in discussion groups as the main criteria, the following comparison options were used:

1. Abdominal complications of early postoperative period.
2. Extraabdominal complications of early postoperative period.
3. Wound complications in the early postoperative period.
4. Long-term results of the surgical treatment.

The level of IAP in the dynamics was measured in patients of the both groups during the treatment. Based on the data, we revealed regular changes in abdominal pressure indicators in the direction of their increase in the operation stages, associated with reduction of hernia contents and hernia repair. Tension-free hernia repair and combined method with the mobilization of the rectus muscles by Ramirez applied to 10 patients in the control group and 58 patients in the main group, which increases the volume of the abdominal cavity, thus avoids increasing IAP.

The majority of patients after surgery remained normal gastrointestinal function, only in 3 patients in the control and in 1 patient in the main group who had been undergone hernia repair over a giant ventral hernia intestinal paresis was observed, relieved by medication. In 4 patients in the control group and in 2 patients in the main group urinary retention was observed.

In the control group bronchopulmonary complications were observed in 6 patients, events of heart failure in 5 patients, the latter showed low rates of blood pressure, increased heart rate, shortness of breath, of these two cases (1.2% of total patients) were fatal.

In the main group extraperitoneal complications were observed in 3 patients. Bronchopulmonary complications were observed in 2 patients, heart failure in 1 patient aged 59 years, who was suffering from post-infarction cardiosclerosis.

Wound postoperative complications were observed in 11 patients in the control group. In the main group - in 3 patients.

In the long-term period after surgery from 72 patients in the control group 49 were observed (68.0%) and from 92 patients of the main group 76 were observed (82.6%) in the period from 1 year to 3 years.

In dynamic observation of the patients in control group body weight was not changing significantly. In patients of the main group indicators of abdominal obesity sustained global changes.

This had a positive impact on the future prospects of life, because it is the type of abdominal fat distribution, most associated with high risk of cardiovascular disease and type 2 diabetes mellitus, was undergoing significant changes.

In the study of blood glucose levels in the control group no significant changes were detected. There was a significant decrease in blood glucose after the treatment at the level of the study in patients of the main group. The elevation of blood glucose, with the level of 6.1 mmol/L, wasn't found in the main group.

In both groups, initially 99 patients (60.4%) had hypertension of varying degrees. Dynamic observation in the late postoperative period in patients of the control group noted continued high blood pressure numbers, with a tendency to move in a more severe hypertension. Patients of the main group decreased high blood pressure numbers, with a tendency to move in a lighter degree of hypertension.

Analysis of the results of the study, which evaluated the quality of life in patients of the main group after 3 months after surgery showed improvement in the quality of life in all aspects of research.

Thus, in performing hernia repair the frequency of postoperative complications is significantly higher than in using dermolipectomy. This fact is of fundamental importance because the characteristic of patients at comparable groups, lipoabdominoplasty application has considerable advantages, on both objective and subjective parameters for the patient.

CONCLUSIONS:

The particularity of clinical course in patients with ventral hernias and obesity stage III-IV is the presence of concomitant diseases that require special preoperative preparation for the prevention of early postoperative complications.

The best way of hernia repair in patients with obesity stage III - IV is a combination of it with abdominoplasty, augmented mobilization of rectus abdominal muscles by Ramirez. Reliability of hernial orifice plastic is provided by PP prosthesis and mobilization of rectus muscle ensures the original values of IAP.

As a result of abdominoplasty to reduce the number of complications in the immediate and late postoperative period is possible. Wound complications has fallen from 29% to 9%. From the cardio-vascular system - 54 (72.6%) and 34 (44%). Disease recurrences and death were not observed.

The developed method of prevention of wound complications in the abdominal wall prosthesis based on a wide sewing and fixing subcutaneous fat grafts to the prosthesis and the bottom of the wound using a vertical U-shaped seams significantly reduced the incidence from 15.7% to 3.3%.

Mesh hernia repair combined with dermolipectomy improves the quality of life of such patients in all aspects. The aesthetic component of the operation contributes to the emergence of motivation for weight loss.

PRACTICAL RECOMMENDATIONS:

Patients with obesity grade III - IV coming in surgical hospitals with IH, should be separated in a special category by surgeons because of the increased operational and anesthetic risk and the risk of postoperative complications. The operation should be done after careful preoperative preparation of the patient.

In order to prevent wound complications after «onlay» hernia repair in the treatment of ventral hernias the developed method is preferable to use. When suturing the surgical wound subcutaneous fat stitched for 4-5 cm on both sides and is fixed to the prosthesis and the bottom of wounds with a vertical U-shaped seams. The distance between the seams 2-3 cm. In cases of detachment of subcutaneous fat more than 5 cm it is necessary to apply a second type of the vertical U-shaped seam where the fixation to the prosthesis and the bottom the wound is performed in two points located laterally on either side of the center of the wound.

The developed method of suturing wounds allows refusing from different types of drainage of operating wounds at «onlay»-prosthetics of abdominal wall.

Hernia repair operation with abdominoplasty gives a good aesthetic effect in patients with large, coarse postoperative hernias of the anterior abdominal wall and the obesity III-IV degree.

In order to avoid the development of «compartment» syndrome in the postoperative period in patients with a high risk of increasing IAP need additionally mobilize rectus muscles by Ramirez.

In a comprehensive assessment of the effectiveness of hernia repair with abdominoplasty it is advisable to consider not only the presence of hernia recurrence, the degree of reached aesthetics of the anterior abdominal wall, but also the result of the medical and social rehabilitation

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Application 1.

УДОСТОВЕРЕНИЕ
НА РАЦИОНАЛИЗАТОРСКОЕ ПРЕДЛОЖЕНИЕ

№ 1814 18 апреля 2016 г
(Дата подачи)

В соответствии с пунктом Постановления "О развитии изобретательской и рационализаторской деятельности" принятое Кабинетом Министров РУз от 28.12.1992 г. № 596, настоящее удостоверение выдано

Курбаниязову З.Б., Давлатову С.С., Хан С.А., Усарову Ш.Ж.
(фамилия, имя, отчество)

На предложение, признанное рационализаторским и принятое

Самаркандским Государственным медицинским институтом
(Наименование предприятия, организации, когда)

к исполнению

Под наименованием: Способ профилактики раневых осложнений после пластики послеоперационной грыжи с использованием сетчатого эндопротеза

Ректор СамМИ, проф. ШАМСИЕВ А.М.

М.П. «18» апреля 2016 год.