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Surgical Aspects of Ventral Hernia Treatment

Abduraxmanov Diyor Shukurullayevich

Samarkand State Medical University, Uzbekistan

Abstract The results of treatment of 107 patients with postoperative ventral and recurrent hernias, which were performed plastic hernial defect With using onlay And sublay methods, A Also With using separation plastics With restoration normal topographic anatomy. The results of perioperative monitoring of intra-abdominal pressure at W 3- W 4 ≥ 11 justify the priority of posterior separation hernioplasty, at <11 it is possible to perform anterior separation plastic surgery. The algorithm for choosing the method of standard (onlay, sublay) or separation (anterior, posterior) plastic surgery for postoperative ventral hernias W 2, W 3, W 4 is based on the state of the muscular-aponeurotic structures of the anterior abdominal wall and the indicator of intraoperative monitoring of intra-abdominal pressure.

Keywords Postoperative ventral hernia, Surgical treatment, Separation prosthetic plastic surgery

1. Relevance

Despite the fact that in recent years All more often steel be used minimally invasive methods operational interventions in surgical diseases of the abdominal organs, The incidence of postoperative hernias remains high [10,16]. According to data rows authors, frequency development postoperative The incidence of ventral hernia (VH) after laparotomy reaches up to 20% of cases. After conducting emergency operations, the incidence of POVG development ranges from 18.1 to 58.7% of cases, with this celebrated prevalence median hernias [3,5,8,11,15].

On today day questions use alloplasty at postoperative ventral hernias more and more attention is being paid to And conditioned by necessity conducting more deep research V in this direction. First of all, it is concerns questions relatively choice Togo or other method plastics And warnings development complications with sides postoperative wounds [1,4,6,12,17].

It is worth noting that today there is no universal method surgical interventions. So at open methods hernioplasty results surgical treatments And frequency development postoperative complications vary And depend from places establishments synthetic material V fabrics abdominal walls, So called methods «sublay», «inlay», "onlay". Except Togo, frequency development postoperative complications depend Also And from size hernial gate, states local fabrics And working with them [2,7,9,13,14].

Target research. To optimize the tactical and technical aspects of the use of anterior and posterior separation prosthetic hernioplasty in patients with postoperative ventral hernias.

* Corresponding author:
sammi-xirurgiya@yandex.com (Abduraxmanov Diyor Shukurullayevich)
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2. Material and Methods of the Study

The results of treatment of 107 patients operated on at the Department of Surgery of the Faculty of Postgraduate Education of the Samarkand State Medical University were studied. period With 2018 By 2022 years. In patients With postoperative ventral and recurrent hernias was produced plastic hernial defect With using onlay And sublay methods, A Also With using separation plastics.

All patients were divided into 2 groups depending on the method used operations.

IN the first group entered 51 sick, at which hernioplasty was carried out open ways With using separation plastic surgery and was divided into 2 subgroups: - 1.1 group of 29 patients who underwent anterior separation prosthetic plastic surgery and 1.2 group with the use of back separations muscles abdominal walls. The second one group (comparative) compiled 56 sick, at which were used standard methods hernioplasty By type onlay (n=38) And sublay (n=18).

All patients were divided into separate subgroups according to classifications European societies herniologists (EHS, 2009) table 1).

Table 1. Dimensions hernias by classification EHS

Groups	W2		W3		W4	
	A6c	%	Abs.	%.	Abs.	%.
1.1 group (n=29)	7	24.1	20	68.9	2	6.9
1.2 group (n=22)	6	27.3	14	63.6	2	9.1
2 group (n=56)	34	60.7	19	33.9	3	5.3
Total (n=107)	47	43.9	53	49.5	7	6.5

The age of the observed patients ranged from 23 to 76 years, with an average its value is 51.3±1.2 years. Female patients amounted to 64 (59.8%) people, patients male gender was 43 (40.2%) Human.

Most often, POVGs were formed after surgical interventions on gallbladder and bile ducts – 26.2% of observations. In the anamnesis of 21.6% sick noted carrying out 2 surgical interventions V within 12 months.

Duration hernias at observed us sick ranged from 2 months to 10 years. Large Part patients were subjected to surgical treatment V period from 12 to 60 months after the detection of signs of hernia formation.

IN 36 (33.6%) cases at sick V anamnesis noted development complications in the immediate postoperative period. In 10 (9.3%) patients healing operating wounds wore secondary character. Education ligature fistulas noted at 11 (10.3%) patients.

Among those identified accompanying diseases at observed patients noted prevalence cardiovascular pathologies - 62 (57.9%) cases, availability obesity noted at 34 (31.7%) patients, diseases Gastrointestinal tract - at 49 (45.8%) sick And sugar diabetes - at 10 (9.3%) patients, 50 (46.7%) patients had more one accompanying pathologies.

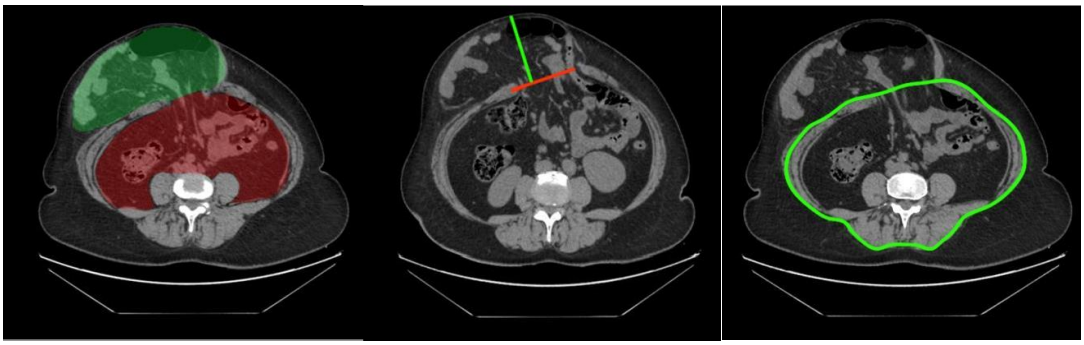
Grade anesthesiology and surgery risk was carried out By scale American Society of Anesthesiologists (ASA). In most cases, observed us sick there was III degree risk By ASA scale. Among patients in group 1.1, in 14 (48.3%) cases the degree of risk according to the scale ASA corresponded to II, and III degree of anesthesiological and surgical risk was established in 15 (51.7%) patients. In group 1.2 patients II the degree of surgical-anaesthetic risk was established in 10 (45.5%) patients, and 12 (54.5%) patients were diagnosed with stage III of this disease. risk. In group 2 II degree of operational anesthesiology risk was installed at 27 (48.2%) patients, A at 29 (51.8%) patients installed III degree of this risk.

U majority sick (n=54, 36.5%) was celebrated overweight. On average, the body mass index in patients of group 1.1 amounted to 33.4±3.5 kg/m2, in patients of group 1.2 - 34.1±2.2 kg/m2, in patients 2 groups - 32.2±2.2 kg/ m2.

Ultrasound of the abdominal organs, including ultrasound The study of hernial formation was performed in all 107 patients. During the ultrasound examination, the size of the hernial defect, the size of the hernial bag And character his contents. In the postoperative period was produced at 26 (24.3%) sick For monitoring And ratings complications. In the postoperative period Ultrasound was carried out on 3rd, 7th And 10th day.

CT scan of organs abdominal cavity was performed at 7 (6.5%) patients, which hernias had giant dimensions (over 15 cm).

WITH with help CT studies We determined ratio sizes hernial bag To volume abdominal cavities With purpose forecasting V preoperative period risk development compartment syndrome after conducting hernioplasty.



a b v

Figure 1. Scheme for measuring CT dimensions: a – volumes of the hernial sac and abdominal cavity, b - the size of the hernial orifice and hernial bag, V - circles abdominal walls

U patients of the main group (n=51) in 29 patients of subgroup 1.1 was carried out hernia repair With using front separation techniques divisions muscles abdominal walls. For this after execution laparotomy was produced adhesiolysis. Then was carried out dissection rear leaflet sheaths of the rectus abdominus muscles with a deviation from their edges of 0.5-1 cm.

When separating the rectus abdominis muscles from the posterior leaflet aponeurosis succeeded save passing V this areasperforating vessels And nerve. Also With right And left sides operating wounds performed mobilization front abdominal walls by means of intersections muscular aponeurosis M. oblique external abdominal, starting from the edge of the costal arch and up to the inguinal canal (Fig. 2).

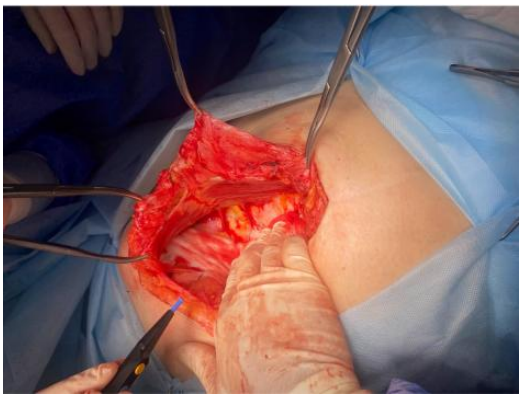


Figure 2. Stage of separation of the rectus muscle

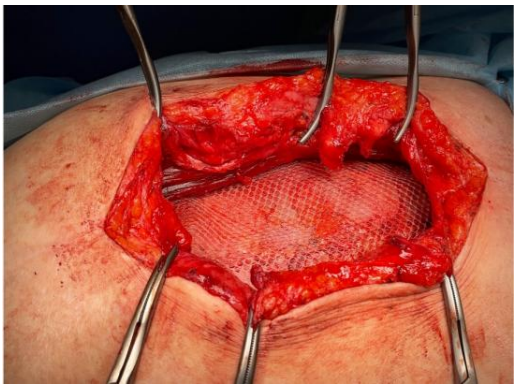


Figure 3. Positioning of the mesh implant

On the educated like this way platform installed easy reticulate endoprosthesis, made from polypropylene, which sewed transdermally V 6 areas With using monofilament suture material, possessing properties long lasting resorption (Fig. 3).

Sewing aponeurosis front abdominal grids was produced continuous seam With using such same monofilament suture material BySmall technologies byte 4:1.

The subcutaneous fat tissue areas were treated drainage tubes for drainage according to Redon, outer ends of tubes were taken out on front surface belly through separate punctures. Operation was ending suturing skin. Duration operations V first group sick V averaged 134.4±41.2 min.

U patients 1.2 groups (n=22) at conducting hernioplasty was used methodology back separation plastics. At conducting This method involves sequentially performing laparotomy and dissection of adhesions. After this produce opening rear leaflet vagina direct abdominal muscles With indent from her edges on 5–10 mm. Necessary consider, What on border transition front leaflet aponeurosis V rear are located twigs thoracoabdominal nerves, they should be preserved. Retreating 5 mm medially from the area of junction of the two layers aponeurosis over transverse muscle produce opening rear leaflet vagina (Fig. 4).

Most optimal counts execution of this stages operations V areas top thirds belly, So How V this areas muscle is the most developed and is located closer to the midline of the abdomen. Next, the fibers of the transverse muscle are separated from the muscle of the same name. fascia, after which the fibers of the transverse muscle are dissected (Fig. 5).

Like this in this way, is formed access To space between transverse fascia And lateral edge of the transverse muscle. Mobilization is performed fabrics V top side to level costal arcs And xiphoid process, and below, the selection was carried out to the Retzian space and Cooper's ligaments. Only after such a separation of tissues on both sides can it be done without tension to suture the posterior wall of the vagina of the rectus abdominis muscles.

After this are being laid down reticulate endoprosthesis (Fig. 6) under straight muscles belly And are being sewn up his transdermally V 6 areas With using monofilament suture material with long-lasting properties resorption.

Figure 4. Stage of separation of the rectus muscle

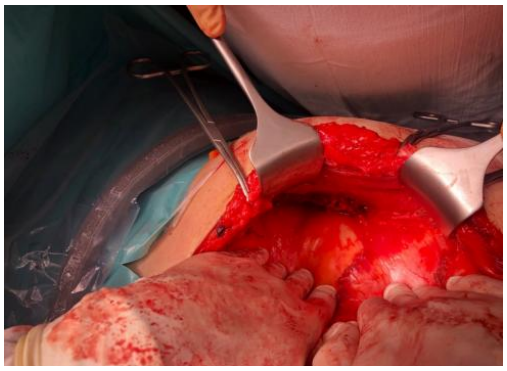


Figure 5. Stage of intersection of the transverse muscle

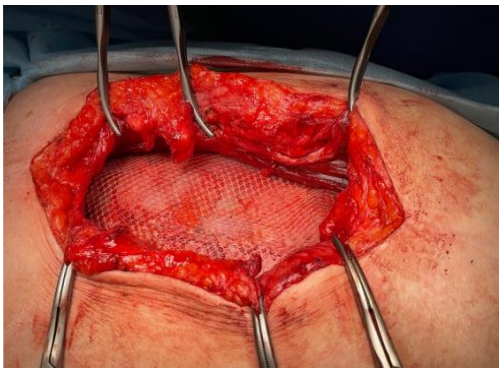


Figure 6. Positioning of the mesh implant

Two drainage tubes are brought to the area of the endoprosthesis, external ends which are being taken out on surface belly through separate punctures. Then is produced stitching edges aponeurosis With with help for a long time absorbable monofilament suture materials, at this is superimposed continuous seam By method Small byte 4:1. Duration surgical interventions V average composed 148.6± 38.4 min. Statistically significant differences between two mainin groups By duration operations not was ($p<0.05$).

In group 2 sick (n=56) was carried out hernioplasty standard methods (onlay And sublay) by way autoplastics without techniques tissue separation. The onlay method was used in 38 (67.8%) patients.

In a way sublay were operated 18 (32.1%) patients.

The duration of surgical intervention in this group was on average 81.7±21.4 minutes.

3. Results and Their Discussion

The main point influencing the choice of the method of operation in patients all 3-x observed groups, were indicators intraoperative studies of the level of intra-abdominal pressure.

At measurement original indicators intra-abdominal pressure at the patients we observed had a direct relationship between these indicators and the size of the hernial orifice ($p<0.05$). In this case, the achievement of these values of the threshold level of the first degree was not observed intra-abdominal hypertension (12-15 mm rt. Art.), average meanings VBD compiled 10.8±1.3 mm Hg At measurement VBD after intelligence edges hernial gate at patients With hernias W2 was observed some increase in IBP indicators relative to their initial values - up to 8.5±0.8 mm Hg, while the resulting difference in the indicators had no statistical significance significance ($p>0.05$). U patients With hernias dimensions W3 at information a reliable increase in IAP indicators was observed at the edges of the hernial orifice to a level corresponding to stage I intra-abdominal hypertension, which V average were composed 12.8±1.9 mmHg ($p<0.05$), A at patients With hernias dimensions W4 level intra-abdominal pressure after intelligence edges hernial gate turned out to be reliably higher, how at patients With hernias W3, And V average They were composed 14.7±1.7 mm Hg ($p<0.05$), What corresponded top border I degrees intra-abdominal pressure.

Results control research level VBD, conducted V postoperative period, showed, What By measure termination actions muscle relaxants funds And departures sick from actions anesthesia was observed significant increase level VBD. So, at patients With hernias of size W3, the level of intra-abdominal pressure on the first day after surgery on average increased to 15.2±1.5 mm rt. Art., preserving To 3rd per day observations on level 14.8±1.8 mm rt. Art. ($p<0.05$), What corresponds I degrees intra-abdominal hypertension. U patients With hernias dimensions W4 V 1st day postoperative period noted increase level VBD to 16.7±4.2 mm rt. Art., What corresponded II degrees intra-abdominal hypertension, and by the 3rd day after the operation, some decrease was observed level VBD to 14.6±2.8, What corresponded I degrees intra-abdominal hypertension. Only in patients with hernias of W2 size, regardless of used method hernioplasty, Not were observed statistically significant differences in IAP parameters measured on the first day after surgery And after intelligence edges hernial gate ($p>0.05$), at this To 3rd per day postoperative period, a return of IAP indicators was noted closer To original values.

Some other painting observed at monitoring level VBD V postoperative period at sick With big hernias, corresponding to W3 and W4, which used separation methods hernioplasty. At measurement intra-abdominal pressure after intelligence a reliable increase in IAP indicators was observed at the edges of the hernial orifice relatively its original values. In the 1st day of the postoperative period, some decrease in IAP indicators was observed, which by the 3rd day after operations already were approaching To original values ($p<0.05$).

Like this in this way, according to results research level VBD V perioperative period, when choosing the standard method of hernioplasty in patients With hernias W3 And W4 it is forbidden rely on indicators VBD, measured after the edges of the hernial orifice are brought together. This is due to the fact that in in the postoperative period, the IBP indicators will be significantly higher, since sick in time conducting operations located under anesthesia And under action muscle relaxants funds. Results perioperative monitoring intra-abdominal pressure testify O tension character onlay And sublay methods hernioplasty, V connections With how their usage at hernias dimensions W3 And W4 not recommended. IN That same time confirmed non-tension character separation ways hernioplasty.

Based on the results we obtained research we proposed our algorithm for choosing a method of hernioplasty in patients with median hernias dimensions W2-W4.

IN case applications separation methods hernioplasty the condition of the tissues was assessed, primarily the rectus abdominis muscles, which had an effect influence on choice method plastics By degrees reconstruction normal anatomy front abdominal walls.

There is a great danger when performing operations on patients with ventral hernias represents development syndrome intra-abdominal hypertension (SIAG), emerging By reason So called "non-accommodation". At this complication V the first queue arise disorders with sides respiratory And caridovascular systems.

For prevention SIAG after execution plastics, establishments endoprosthesis, intra-abdominal pressure is measured. In case of increased IAP up to II-III degree to reduce it during surgical intervention produce total intubation thin intestines by way transnasal And transanal introductions probes. WITH with help such methods succeededachieve reductions level VBD to lower borders norms. At this preference should give oneself up back separation hernioplasty.

After the operation, the level of intra-abdominal pressure was examined, after which the patient was dressed bandage. IN 1.1 group sick indicators intra-abdominal pressure varied from 4 to 23 mm Hg, averaging 8.6±1.4 mm Hg. In patients of group 1.2, IAP indices ranged from 6.8 to 17 mm Hg, with average value of 8.2±0.7 mm Hg. In patients of group 2, the data The indicators ranged from 7.2 to 19 mm Hg, averaging 9.4±1.8 mm Hg. r t. Art. ($p<0.05$).

Analysis results surgical treatments sick With POG V in the immediate postoperative period was carried out within 30 days after surgical interventions, distant results surgical treatments at data patients were studied V term from 12 to 36 months.

U patients 1.1 groups V nearest postoperative period after surgery using anterior separation plastic surgery of wounds complications arose V 4 (13.8%) cases. IN 1.2 group sick, at which was used back separation plastic, similar wounded complications were noted in 2 (9.1%) patients over 60 years of age with epigastric hernia of large size and the presence of obesity. In patients 2 groups, at which were used standard

tension methods hernioplasty, wound complications were observed in 9 (16.1%) cases. Thus, thus, wound complications less often were observed V 1.2 group of patients, where posterior separation plastic surgery was used – in 9.1% of cases (table 2).

Table 2. Analysis complications V postoperative period, abs (%)

Complications	1.1 group (n=29)	1.2 group (n=22)	Group 2 (n=56)	r
Wounds complications				
Seroma	2 (6.9%)	1 (4.5%)	4 (7.1%)	>0.05
Hematoma / bleeding	1 (3.4%)	1 (4.5%)	2 (3.6%)	>0.05
Infection operating wound	1 (3.4%)	-	3 (5.3%)	>0.05
General number complications **	4 (13.8%)	2 (9.1%)	9 (16.1%)	<0.05
General somatic complications				
Thrombosis vessels of the extremities	1 (3.4%)	1 (4.5%)	2 (3.5%)	>0.05
Pneumonia	1 (3.4%)	-	4 (7.1%)	>0.05*
General number complications **	6 (20.7%)	3 (13.6%)	15 (26.8%)	<0.05
Lethal Exodus	-	-	1 (1.8%)	>0.05*
Relapse, n (%)	2(6.9%)	1 (4.5%)	6 (10.7%)	<0.05

Note: r - statistical significance differences indicators between in groups (By criterion χ^2 For arbitrary tables; *By precise criterion Fisher), **y one The patient may experience several complications, which is why the total number of patients with complications lower than number complications themselves

The fatal outcome in the second group of patients was 1 (1.8%) and 1 (2.8%) cases, the main cause of death was development multi-organ insufficiency. Necessary note, What age This patient was over 65 years old and also had stage III obesity, this at him was in anamnesis sugar diabetes.

Statistically significant differences for individual species postoperative complications between in groups Not were observed (p>0.05), However, when analyzing the total number of complications that arose in the near future in the postoperative period their prevalence was noted in 1.1 and 2 groups of patients – 6 (20.6%) and 15 (26.8%), respectively, in group 1.2 patients where posterior separation plastic surgery was used, these complications were observed V 3 (13.6%) cases. Frequency relapses diseases turned out to be most high in o 2 and 1.1 groups sick - 10.7% And 6.8%, respectively, whereas in group 1.1 of patients, where the back was used separation plastic, given indicator compiled 4.5% cases.

4. Conclusions

1. The results of postoperative monitoring of intra-abdominal pressure at W 3- W 4 ≥ 11 justify the priority of posterior separation hernioplasty; at <11, anterior separation hernioplasty can be performed.
2. The algorithm for choosing a method of standard (onlay, sublay) or separation (anterior, posterior) plastic surgery for postoperative ventral hernias W 2, W 3, W 4 is based on the state of the muscular-aponeurotic structures of the anterior abdominal wall and the intraoperative monitoring indicator of intra-abdominal pressure.
3. Optimization of the tactical and technical aspects of surgical treatment of patients with postoperative ventral hernias made it possible to reduce the frequency of immediate postoperative complications from 16.1% to 9.1% and recurrence from 10.7% to 4.5% (p<0.05).

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