



WAYS TO IMPROVE ANTERIOR ABDOMINAL WALL PLASTY FOR ABDOMINAL HERNIA AND ABDOMINOPOTOSIS

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| Article history: | Abstract: |
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| Received: September 4 th 2023 | The results of examination and treatment of 121 operated patients with ventral hernia and abdominopotosis are presented. In patients with ventral hernia and abdominopotosis the adequate preoperative preparation and the use of the recommended algorithm of hernioallo- and alloplasty method selection allowed to reduce the frequency of postoperative complications from 14,8% to 8,9% ($p=0,045$), as well as wound complications from 11,5% to 4,5%. |
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INTRODUCTION. One of the causes of ventral hernia is obesity. While patients with obesity of various degrees of severity make from 50 to 70% of all patients with ventral hernia, morbid obesity is observed in 34% of patients. Obesity, on the one hand, leads to hernia formation, on the other- aggravates its symptoms, and thus it is undeniably recognised that obesity is an etiological factor in the development and recurrence of ventral hernias. "The recurrence rate after hernioplasty is 3-13%, reaching 28% in morbid obesity". The physiologically most acceptable method is undoubtedly the autoplasty method of hernia defect closure. "Currently, mesh endoprostheses made of polypropylene and polytetrafluoroethylene are widely used". However, the possibilities of their application in practice are often limited due to various factors, including the development of postoperative complications.

Reduction of body weight in patients with ventral hernia and obesity is the main etiopathogenetic factor in preventing hernia recurrence, as indicated by most authors. The magnitude of the share of unsatisfactory results, impossibility to choose the optimal treatment stimulate further research in this field. The above-mentioned determines the necessity of development and practical application of optimal approaches to surgical treatment of ventral hernia in obese patients, especially from the point of view of the preparatory stage with the assessment of the reserve capabilities of the organism.

THE AIM OF THE STUDY IS to improve the results of surgical treatment of patients with ventral hernia and abdominopotosis by optimising the tactical and technical aspects of hernioallo- and abdominoplasty.

CLINICAL MATERIAL AND APPLIED RESEARCH METHODS

The study is based on the results of examination and treatment in surgical departments of the multidisciplinary clinic of Samarkand State Medical University of 121 patients with ventral hernia and morbid obesity who underwent surgical treatment in the period from 2012 to 2021. All patients underwent planned surgical treatment. Depending on the choice of treatment tactics, the patients were divided into two groups. The first, comparison group included 54 patients who underwent only hernioalloplasty. 67 patients of the second, main group underwent alloplasty in combination with abdominoplasty.

Of the 121 patients, 37 (30.6%) were male and 84 (69.4%) were female. The distribution of patients by age: up to 45 years-22 (18.2%), 46-59 years-67 (55.4%), 60-74 years-29 (23.9%), 75-80 years-3 (2.5%).

All patients underwent anthropometry by measuring body weight. All patients were morbidly obese due to alimentary causes and low physical activity related to dietary patterns. Excess body weight was assessed according to the classification recommended by bjsst experts. Patients A. Matarasso (1989) were categorised according to the degree of ptosis of the anterior abdominal wall. Minimal and moderate ptosis (degree I-II) was observed in 34 and 42 patients with III-IV degree obesity, respectively, in the study groups. Moderate and severe ptosis was observed in 20 and 25 patients with III-IV degree obesity (Table 1)



Table 1
Distribution of morbidly obese patients by degree of abdominopotosis

| Obesity Level I III-IV | Comparison group (n=54) | | Main group (n=67) | | Total (n=121) | |
|---------------------------|-------------------------|----------------|-------------------|----------------|----------------|----------------|
| | Abdominopotosis | | | | | |
| | I-II | III-IV | I-II | III-IV | I-II | III-IV |
| | 34 (62,9 %) | 20 (37,1 %) | 42 (62,7 %) | 25 (37,3 %) | 76 (62,8 %) | 45 (37,2 %) |

Out of 121 patients with ventral hernia and morbid obesity, 90 (74.4%) had associated comorbidities. Of these, 49 had 1 concomitant disease, 29 had 2, and 12 had 3 concomitant pathologies of other organs and systems. Among the comorbidities, cardiovascular diseases were most commonly observed in 82.6%, respiratory system diseases in 9 (7.4%), leg varicose veins in 20 (16.5%), and diabetes mellitus in 32 (26.4%) patients.

Chervel J.P. and RAT A.M. (1999)), the majority of patients (85 - 70.2%) were classified as having hernias of the umbilical region (M1) and the area around the umbilicus (m2). The least number of patients were those with lateral (L) 9 (7.4%) and articular (M+L) 3 (2.5%) ventral hernias. Large (W3) and giant (W4) hernias were observed in 46 (38.0%) of the emurs. Out of 121 patients, 40 (33.0%) had primary hernias, 50 (41.3%) had postoperative ventral hernias (R0) and 31 (25.6%) had recurrent (RN) hernias.

Of the instrumental investigations, the most informative method was computed tomographic hernioabdominometry (CTG) performed in 58 patients of the main group. CT scanning allowed to determine the topography of the defects of the anterior abdominal wall, the ratio of the hernia volume to the abdominal cavity volume, as well as to choose an adequate preoperative preparation and the optimal method of plasty. According to our studies, in cases where the ratio of hernia volume to abdominal cavity volume is up to 14%, it is possible to use tension hernioalloplasty methods - that is, when the aponeurosis defect is sutured and an endoprosthesis is implanted over it using the "online" method. For volumetric hernias greater than 14.1%, non-tensioned methods of plasty were preferred.

In patients in the comparison group (N=54) hernioalloplasty was performed tense in 37 (68,5%) patients and non-tense in 17 (31,5%) patients. The choice of the hernioalloplasty method in the patients of the main group was differentiated and supplemented with abdominoplasty according to the programme

recommended by us. In patients of subgroup 1 with the sum of scores up to 5 points, as well as with the hernia bulge volume up to 14% of the abdominal cavity volume according to CT hernioabdominometry, the hernia defect was sutured and an online endoprosthesis was implanted. This group included 24 (35.8%) patients with morbid obesity and abdominopotosis of III-IV degree, in whom hernioalloplasty was performed in combination with abdominoplasty.

In patients of subgroup 2 with the sum of scores from 5 to 10 and hernia bulge volume more than 14.1% of the abdominal cavity volume according to CTG, we used the method of tension-free hernioplasty. Increased abdominal volume was achieved by placing a mesh implant over the anterior abdominal wall plasty after the abdominal cavity was restricted by the hernia sac clot, without suturing the aponeurosis to prevent reflection. Fixation of the endoprosthesis was performed using P-Simon sutures. These sutures were placed by removing all layers of the peritoneum before the peritoneum was closed by the hernia sac clot.

Hernioalloplasty was performed using the "only + sublay" technique in a tension-free combination in 12 (17.9%) patients in subgroup 3 with a hernia defect greater than 10 cm and a hernia bulge volume greater than 18% of the abdominal cavity volume, that is, after one implant was confined to the hernia sac clot in the abdominal cavity, muscle-aponeurotic plasty was performed by laying under the floor, and the second implant was placed over the aponeurosis.

In 13 patients of subgroup 4 with abdominopotosis of III-IV degree and a sum of scores from 16 to 20 with increased risk of tissue stretching and increased internal pressure in the abdominal cavity, we used tension-free alloplasty by mobilising the vagina of the rectus abdominis muscle in accordance.

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In 13 patients of subgroup 4 with abdominopatosis of III-IV degree and a sum of scores from 16 to 20 with increased risk of tissue stretching and increased internal pressure in the abdominal cavity, we used tension-free alloplasty by mobilising the vagina of the rectus abdominis muscle in accordance.



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Figure 1: Anchorage-type skin markings (Castanares incision) (1) and appearance of the anterior abdominal wall after abdominoplasty (2)

The nutritive blood vessels were taken into account when planning the abdominoplasty to avoid cutting them. If these blood vessels are cut, necrosis of the wound edges may occur. Scars on the anterior abdominal wall from previous various surgeries disrupt the blood supply to the skin and subcutaneous fat layer, so we excised scarred skin with impaired circulation, which subsequently led to local complications. Due to the geometric shape of the anchor incision, perpendicular tension is only observed in the centre after suturing the wound edges. As the operation moves away from the centre of the wound, gravity is distributed more transversely, thus preventing complications such as suture opening as well as necrosis of the wound edges.

RESULTS AND THEIR DISCUSSION

It should be noted that patients in the comparison group had an average of 2 to 3 types of complications in the form of a combination of bronchopulmonary or (and) cardiovascular complications with trauma-related complications. Overall, in the comparison group, various complications were observed in 8 patients (14.8% of 54), of whom 6 (11.1%) had trauma-related complications and 4 (7.4%) had common extra-abdominal complications. In the main group, 6 (8.9% of 67 patients) patients had various complications, including 3 (4.5%) had trauma-

related complications and another 3 (4.5%) had general complications, respectively. When comparing the number of complications, there was a significant improvement in the rates in the main group. ($\chi^2 = 4.043$; $Df=1$; $R=0.045$).

Long-term results were analysed in 93 (76.8%) of the 121 operated patients, with ventral hernia recurrence found in 5 (12.5%) patients in the comparison group. It was found out that the hernia recurrence occurs due to the increase of intra-abdominal pressure after hernioalloplasty and leaving a large amount of skin-fat apron, which under the influence of gravity shifts the implant downwards, exposing the weak points of the anterior abdominal wall in the upper areas of the prosthesis. Also in patients with pronounced abdominopatosis of III-IV degree the cause of hernia recurrence was wound suppuration and implant displacement. Improvement of technical aspects of hernioalloplasty by the "only+sublay" method with combined implantation of the endoprosthesis without tension in combination with abdominoplasty made it possible to exclude the recurrence of the disease.

The clinical efficacy of hernioallo- and abdominoplasty has been shown to be due to a significant reduction in obesity, improvement of external respiratory indices, reduction of high blood pressure and symptoms of diabetes mellitus.



Using the developed programme, quality of life was assessed in 87 (93.5%) of the 93 patients monitored during the long postoperative period. They had 36 in the comparison group and 51 in the main group. In the comparison group, excellent results were observed in 11 (30.5%), good 17 (47.2%), satisfactory 5 (13.9%) and unsatisfactory 3 (8.3%) patients. In the main group, on the other hand, excellent results were observed in 28 (54.9%) out of 51 patients, good in 19 (37.2%), satisfactory in 3 (5.9%) and unsatisfactory in only 1 (1.9%).

CONCLUSION

1. CT hernioabdominometry allows to determine the topography of anterior abdominal wall defects, to calculate the hernia volume to abdominal cavity volume ratio, to choose an adequate preoperative preparation, as well as the optimal method of plasty.
2. Improvement of technical aspects of hernioalloplasty by the "only+sublay" method with combined endoprosthetic implantation without tension in combination with abdominoplasty allowed to exclude recurrences of the disease (recurrences in the comparison group 12,5%).
3. Application of adequate preoperative preparation and the recommended algorithm of hernioalloplasty and alloplasty method selection in patients with abdominal hernias and abdominopthosis allowed to reduce the rate of postoperative complications from 14,8% to 8,9% (n=0,045), as well as complications related to trauma from 11,5% to 4,5%.
4. The performance of hernioalloplasty combined with abdominoplasty in morbidly obese patients with advanced ventral hernia and abdominopthosis of III-IV degree allowed to significantly improve aesthetic and functional condition of patients, increasing the quality of life of patients, increasing the proportion of excellent and good long-term results from 77,7% to 92,1%, increasing the proportion of unsatisfactory results from 8,3% to 1,9% ($P=0,030$).

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