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DIAGNOSIS OF ANTERIOR ABDOMINAL WALL DEFORMATION

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АННОТАЦИЯ

Представлен анализ клинико-антропометрических данных 104 пациенток с различными вариантами деформации передней брюшной стенки. В первую группу вошли 39 (37,5%) пациенток с послеродовым абдоминоптозом, причиной возникновения которого явилась деформация передней брюшной стенки вследствие перенесенной беременности и родов. Вторую группу составили 31 (29,8%) пациенток, причиной деформации передней брюшной стенки у которых явились последствия, связанные с локальным...
ojkirieniem. В третьу группу вошли 34 (32,7%) пациентки с послеоперационной рубцовой деформацией передней брюшной стенки.

Доказано, что оценка клинико-антропометрических данных у пациенток с различными вариантами деформации ПБС позволяет определить наиболее ключевые критерии разделно для алиментарного, послеродового и послеоперационного абдоминоптоза. В целом, оценка предлагаемых нами показателей на основании определения клинико-антропометрических данных и степени деформации передней брюшной стенки, на наш взгляд, будет способствовать повышению точности ее диагностики, выбору оптимального варианта хирургической коррекции, тем самым повысит эстетическую и функциональную эффективность результатов операций.

**ABSTRACT**

The analysis of clinical and anthropometric data of 104 patients with various variants of deformation of the anterior abdominal wall is presented. The first group included 39 (37.5%) patients with postpartum abdominoplasty, the cause of which was the deformation of the anterior abdominal wall due to pregnancy and childbirth. The second group consisted of 31 (29.8%) patients whose anterior abdominal wall deformation was caused by the consequences associated with local obesity. The third group included 34 (32.7%) patients with postoperative cicatricial deformation of the anterior abdominal wall.

It has been proven, that the assessment of clinical and anthropometric data in patients with different types of AAW deformation allows one to determine the most key criteria separately for alimentary, postpartum and postoperative abdominoplasty. In general, the assessment of the indicators we propose based on the determination of clinical and anthropometric data and the degree of deformation of the anterior abdominal wall, in our opinion, will improve the accuracy of its diagnosis, the choice of the optimal variant of surgical correction, thereby increasing the aesthetic and functional efficiency of the results of operations.

**Keywords:** abdominoplasty, white line, anterior abdominal wall, surgery, striae

**Introduction**

Existing diagnostic tests for abdominoplasty, such as ultrasound and dopplerography, allow one to obtain data about state of local zones of thinning of the skin with the appearance of stretch marks of more than one topographic area, the presence of pronounced differences in the thickness of subcutaneous fatty tissue (SFT), the width of the white line of the abdomen, etc. [7, 8, 9]. All of them are acceptable when performing various methods of aesthetic operations, however, with combined forms of deformation of the anterior abdominal wall (AAW), due to the presence of a rough postoperative scar or postpartum aponeurotic dissection of the white line of the abdomen, the criteria for choosing the optimal method of surgical intervention are not sufficiently developed, and the literature contradictory.

It seems to us, that this lack supplement in the field of aesthetic surgery is possible by studying the clinical anthropometric and laboratory instrumental data on the degree of deformation of AAW. This, in turn, will allow to develop a unified treatment and diagnostic algorithm for the use of specific types of surgical interventions aimed at increasing the effectiveness of the aesthetic correction of various options for the deformation of AAW.

**Material and research methods.**

A prospective retrospective analysis of 104 patients with various variants of AAW deformation, operated by surgeons of the Department of General and Pediatric Surgery at the clinic of the Tashkent Medical Academy from 2013 to 2018, showed that the average age of this group was 44.6 ± 5.8 years.

All patients were divided into 3 groups, depending on the etiological cause of AAW deformation.

The first group included 39 (37.5%) patients with postpartum abdominoplasty, the cause of which was the deformity of AAW due to pregnancy and childbirth.

The second group consisted of 31 (29.8%) patients, the cause of AAW deformation in which were the consequences associated with local obesity. This group included patients with non-progressive obesity of the II and III degree, i.e., those who received dietary and drug treatment and lost a significant amount of body weight as a result of taking "fat-burning" bioactive supplements. The third group included 34 (32.7%) patients with postoperative cicatricial deformation of AAW.

Along with general clinical methods, the complex of examination of patients with various variants of AAW deformation included the following mandatory diagnostic key links:

1. **Clinical examination:**
   - history taking and general examination - was the main method of obtaining information, which subsequently allows you to determine the entire phase of the activities. When collecting an amanensis, attention was drawn to the cause of the deformation of the AAW. They also found out for what purpose the patient is turning, what is most worrying: an aesthetic or functional defect. Patients were examined naked in a standing and prone position. The type of constitutional structure, proportionality, the severity of subcutaneous fatty tissue, the elasticity of the skin, the presence of scars and striae on the anterior abdominal wall were determined, and the severity of ptosis was measured by measuring the excess of soft tissues. Palpation determined the presence and degree of divergence of the rectus abdominis muscles. Auscultation and percussion of the organs of the abdominal cavity and chest, blood pressure, pulse, respiratory rate were performed.
     - anthropometric examination was performed using a height meter, medical scales and measuring tape. Measuring height and weight allowed the body
mass index (BMI) to be calculated using the following formula:

\[ \text{BMI} = \frac{\text{weight (kg)}}{\text{height (m)}^2} \]

Thus, depending on the value of BMI, patients were divided into: \( \text{BMI} = 20-25 \text{kg} / \text{m}^2 \) - healthy weight; \( \text{BMI} = 25-30 \text{kg} / \text{m}^2 \) - overweight; \( \text{BMI} = 30-40 \text{kg} / \text{m}^2 \) - obesity; \( \text{BMI} > 40 \text{kg} / \text{m}^2 \) - morbid obesity.

2. Instrumental investigations:
- ultrasonic examination of the abdominal organs in order to exclude pathology of internal organs and survey of the skin-fat, musculo-aponeurotic complex of the anterior abdominal wall in order to identify local zones of thinning of the skin beyond the stretch marks, visually determined on the abdomen.
- to assess the saturation of soft tissues of the anterior abdominal wall, its partial pressure (pO2) was visually determined on the abdomen.
- to identify local deformations of the anterior abdominal wall, its partial pressure (pO2) was determined percutaneously using a transcutaneous oxygen monitor TCM-2 (Radiometer, Denmark). This research method was performed by us at different stages of operations and in the postoperative period.

**Results and its discussion**

The division of patients depending on the value of BMI revealed their even distribution among the gradations of healthy weight (31.7%), overweight (30.8%) and obesity (37.5%). At the same time, patients with morbid obesity, as mentioned above, were not included in our research (Table 1).

A characteristic sign was an increase in the number of patients in the groups with postpartum and postoperative abdominoplasty as BMI increased. With postpartum abdominoplasty, the number of patients with BMI = 30-40 kg / m² was 22 (56.4%), and with postoperative - 14 (41.2%), respectively.

<table>
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<tr>
<th>Division of patients according to body mass index</th>
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<tr>
<td><strong>BODY MASS INDEX</strong> (KG/M²)</td>
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<td>TOTAL</td>
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Thus, deformation of AAW in patients with postpartum and postoperative abdominoplasty in most cases was accompanied by I-III degrees of obesity. At the same time, the patients with alimentary abdominoplasty had an opposite picture. Recall, that this group included patients with non-progressive obesity, that is, who received dietary and drug treatment and lost a significant amount of body weight.

In 54.8% of cases, the patients had diastasis of rectus abdominis muscles of varying degrees. In 59.6% of cases, the size of diastasis was over 3 cm, in 26.3% of cases - from 1 to 3 cm in combination with moderate atony of the musculo-aponeurotic complex and in 14.1% of cases up to 1 cm (table 2).

Diastasis of the white line of the abdomen in 79.5% of cases had patients with postpartum, in 64.5% with alimentary and in 17.6% of cases with postoperative abdominoplasty. In all the studied groups, patients with diastasis of the white line of the abdomen over 3 cm prevailed (58.1%, 55.5% and 83.3%, respectively).

<table>
<thead>
<tr>
<th>Division of patients depending on the degree of diastasis of rectus abdominis muscles</th>
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<tr>
<td><strong>DEGREE OF RECTUS ABDOMINIS MUSCLES’ DIASTASIS</strong></td>
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<td>Up to 1 cm</td>
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<td>From 1 to 3 cm</td>
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<tr>
<td>TOTAL</td>
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<td>Total number of patients</td>
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The study of the degree of ptosis in patients with various variants of AAW deformation revealed the prevalence of its distinct (45.2%) and moderate (37.5%) degree (table 3).
The average degree of ptosis was found in 18 patients (17.3%), mainly due to group postpartum and alimentary deformation of AAW. AAW signs were observed in 53.8% of cases (21 patients), in the second case - in 45.2% of cases (14 patients).

In the group with alimentary abdominoplasty, the number of patients with average and moderate AAW ptosis was almost the same (29.0% and 25.8%, respectively). It is noteworthy that we revealed the prevalence of patients with a moderate degree of abdominoplasty among those who applied with postoperative deformation of the AAW.

The results of ultrasound examination of the skin-fat and musculo-aponeurotic layer of AAW showed the following: the postpartum deformity of the PBS was characterized, in comparison with the data of 10 healthy volunteers, by a significant expansion of the white line of the abdomen from 0.98 ± 0.21 cm to 3.19 ± 0.93 cm (p <0.05), an increase in the thickness of the SFA from 2.55 ± 0.15 cm to 6.82 ± 0.52 cm (p <0.05) and skin thinning from 0.14 ± 0.04 cm to 0.12 ± 0.08 cm (p <0.05).

In cases with alimentary and postoperative abdominoplasty, changes in the width of white line of abdomen and the thickness of skin were not significant. Unlike postpartum abdominoplasty, they were characterized by skin thickening. With alimentary abdominoplasty, skin thickening averaged 0.21 ± 0.04 cm, and with postoperative abdominoplasty - 0.24 ± 0.05 cm.

Ultrasound examination of AAW skin thickness in the anatomical and topographic areas confirmed the general picture described above. In particular, it was found that in the case of postpartum abdominoplasty, the skin thickness is significantly thinned compared to that of healthy volunteers. In this case, the thinning of the skin goes beyond the location of stretch marks, which indicates a discrepancy between the visual data of the skin and changes in deeper tissue structures. The statement of the prevalence of stretch marks cannot be the final result of the skin assessment.

It should also be noted that in the case of postoperative abdominoplasty, a significant asymmetry was revealed between the right and left lateral, upper and lower regions of AAW. The same data were obtained by ultrasound examination of the thickness of AAW subcutaneous adipose tissue. This fact deserves some attention in terms of taking them into account when marking the operating field and planning the volume of surgical intervention [4,6].

Thus, the assessment of clinical and anthropometric data in patients with various types of AAW deformation made it possible to determine that the most key of them are BMI along with the degree of body weight loss (for alimentary abdominoplasty), the thickness and mobility of the skin fold, the thickness of the PFA, anatomical and topographic areas. PFA deposits, abdominal shape, body type, presence and prevalence of stretch marks (for postpartum abdominoplasty), state of the umbilical ring, state of the musculo-aponeurotic system and the presence of a scar on the PBS (for postoperative abdominoplasty).

The characteristics and preliminary analysis of the assessment of the degree of AAW deformation in patients with various types of abdominoplasty made it possible to determine the vector of strategic directions in the choice of methods of surgical correction. At the same time, we believe that the choice of the volume of surgical intervention depending on the degree of PBS ptosis cannot be justified due to the high probability of the subjectivity of this criterion. To increase the objectivity of assessing the degree of AAW deformation, an integrated approach is required in assessing the state of tissues of all areas of the abdomen, based not only on clinical and anthropometric, but also on instrumental: ultrasound and transcutaneous study of the partial pressure of skin oxygen.

In conclusion, we would like to note that the assessment of the indicators we propose based on the determination of clinical and anthropometric data and the degree of AAW deformation, in our opinion, will help to improve the accuracy of its diagnosis, the choice of the optimal variant of surgical correction, thereby increasing the aesthetic and functional efficiency of the results of operations.

List of references:

### Table 3.

<table>
<thead>
<tr>
<th>PTOSIS DEGREE</th>
<th>ETIOLOGICAL CAUSES OF AAW DEFORMATION</th>
<th>TOTAL</th>
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<td></td>
<td>Postpartum</td>
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<td></td>
<td>N. p.</td>
<td>%</td>
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<tr>
<td>Average</td>
<td>7</td>
<td>17.9</td>
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<tr>
<td>Moderate</td>
<td>11</td>
<td>28.3</td>
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<td>Distinct</td>
<td>21</td>
<td>53.8</td>
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<tr>
<td>Total</td>
<td>39</td>
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NERVOUS COMPONENT OF ARTERIAL HYPERTENSION. PROSPECTS FOR PREVENTION AND REHABILITATION

ABSTRACT

The article provides a theoretical analysis of the causes of arterial hypertension, describes a 3-month observation of the initial stage of the development of hypertension and experiments on non-drug normalization of blood pressure on a group of volunteers. It was shown that arterial hypertension is associated with spastic conditions of the intervertebral muscles in the lower thoracic spine, which lead to compression of sympathetic nerves that control the transport of water through the kidneys and disturb the balance of fluid circulation through the circulatory system.

Theoretical analysis and experimental data made it possible to formulate a hypothesis about the dominant role of disorders in the activity of the sympathetic part of the nervous system in the development of primary and persistent arterial hypertension. The possibility of prevention of arterial hypertension and non-drug rehabilitation of patients with this disease has been shown.

Key words: arterial hypertension, non-drug methods of treatment, rehabilitation, spine, muscles, kidneys.

Introduction

WHO experts believe that in 95% of cases the causes of primary arterial hypertension are unknown, and in 85% of cases the causes of persistent arterial hypertension are unknown [9]. Known causes of hypertension are chronic and acute inflammatory processes in the kidneys, which increase both upper and lower blood pressure. Another more rare condition is inflammation of the adrenal glands, which leads to an increase in pulse pressure - the difference between upper and lower pressure.

In recent publications devoted to arterial hypertension, the problems of the effectiveness of treatment of arterial hypertension, the possibility of intensifying treatment and the resulting safety issues of a significant decrease in blood pressure are discussed [4]. This is because, in clinical trials, the intensive treatment group had a higher incidence of serious