

**ФУНДАМЕНТАЛ ВА  
КЛИНИК ТИББИЁТ  
АХБОРОТНОМАСИ**

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**BULLETIN OF FUNDAMENTAL  
AND CLINIC MEDICINE**

**ФУНДАМЕНТАЛ ВА КЛИНИК  
ТИББИЁТ АХБОРОТНОМАСИ  
ВЕСТНИК ФУНДАМЕНТАЛЬНОЙ И  
КЛИНИЧЕСКОЙ МЕДИЦИНЫ**

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## AN INDIVIDUALIZED APPROACH TO PREOPERATIVE PREPARATION AND SURGICAL TECHNIQUE SELECTION IN POSTOPERATIVE VENTRAL HERNIAS

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**Resume.** Ventral hernias represent a significant proportion of surgical pathology of the abdominal wall and are associated with a high risk of postoperative complications, particularly in patients with obesity and concomitant cardiopulmonary diseases. The outcomes of hernia repair largely depend not only on the surgical technique but also on the quality of preoperative assessment and preparation. This study presents a retrospective analysis of surgical treatment outcomes in 149 patients with postoperative anterior ventral hernias treated between 2021 and 2024. Patients were divided into a main group, in which improved hernioplasty techniques and comprehensive preoperative preparation were applied, and a comparison group treated using conventional methods. Special attention was given to preoperative adaptation of the cardiovascular and respiratory systems to increased intra-abdominal pressure using a specialized pneumatic belt-bandage, along with respiratory training, thromboembolic prophylaxis, and ERAS-based perioperative measures. The implemented comprehensive approach to preoperative preparation allowed safe adaptation to elevated intra-abdominal pressure, reduced the risk of respiratory and cardiovascular complications, and improved postoperative recovery. No adverse effects related to the use of the pneumatic bandage were observed. The results demonstrate that an individualized, multidisciplinary preoperative preparation strategy is an essential component of successful surgical treatment of anterior ventral hernias and contributes to improved clinical outcomes and patient quality of life.

**Key words:** anterior ventral hernia, preoperative preparation, hernioplasty, intra-abdominal hypertension, pneumatic belt-bandage, respiratory adaptation, postoperative outcomes.

## ОПЕРАЦИЯДАН КЕЙИНГИ ВЕНТРАЛ ЧУРРАЛАРДА - ОПЕРАЦИЯДАН ОЛДИНГИ ТАЙЁРГАРЛИК ВА ЖАРРОҲЛИК УСУЛИНИ ТАНЛАШДА ИНДИВИДУАЛ ЁНДАШУВ

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**Резюме.** Вентрал чурралар қорин девори жарроҳлик патологияси таркибида салмоқли улушни эгаллаб, айниқса семизлик ва ҳамроҳ юрак-қон томир ҳамда нафас олиш тизими касалликлари мавжуд беморларда операциядан кейинги асоратлар ривожланиши хавфи юқори бўлиши билан тавсифланади. Чуррани жарроҳлик йўли билан даволаш натижалари фақат герниопластика усулигагина эмас, балки операция олдида беморни текшириши ва тайёрлаш сифатига ҳам боғлиқ. Ушбу тадқиқотда 2021–2024 йиллар давомида операциядан кейинги олд вентраль грижсалар билан даволанган 149 нафар беморда жарроҳлик даволаш натижаларининг ретроспектив таҳлили келтирилган. Беморлар 2 гуруҳга ажратилди: асосий гуруҳда такомиллаштирилган герниопластика усуллари ва комплекс операция олдида тайёргарлик қўлланилган, таққослаш гуруҳида эса анъанавий усуллар ишлатилган. Операция олдида юрак-қон томир ва нафас олиш тизимларини ошган қорин ичи босимига мослаштиришга алоҳида эътибор қаратилди, бунда махсус пневматик белбоғ-бандаж, нафас машқлари, тромбоемболик асоратларнинг профилактикаси ҳамда ERAS тамойилларига асосланган периоперацион чора-тадбирлар қўлланилди. Қўлланилган комплекс ёндашув операция олдида ошган қорин ичи босимига хавфсиз мослашишни таъминлади, нафас олиш ва юрак-қон томир асоратлари хавфини камайтирди ҳамда операциядан кейинги тикланишни яхшилади. Пневматик бандаждан фойдаланиши билан боғлиқ ҳеч қандай салбий таъсирлар кузатилмади. Олинган натижалар операция олдида индивидуал ва мультидисциплинар тайёргарлик олд вентраль грижсаларни муваффақиятли жарроҳлик йўли билан даволашнинг муҳим таркибий қисми эканлигини ҳамда клиник натижалар ва беморларнинг ҳаёт сифатини яхшилашга хизмат қилишини кўрсатади.

**Калим сўзлар:** вентрал чурра, операция олдида тайёргарлик, герниопластика, қорин ичи гипертензияси, пневматик белбоғ-бандаж, нафас тизимига мослашув, операциядан кейинги натижалар.

# ИНДИВИДУАЛИЗИРОВАННЫЙ ПОДХОД К ПРЕДОПЕРАЦИОННОЙ ПОДГОТОВКЕ И ВЫБОРУ ОПЕРАЦИИ ПРИ ПОСЛЕОПЕРАЦИОННЫХ ВЕНТРАЛЬНЫХ ГРЫЖАХ

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**Резюме.** Вентральные грыжи занимают значительное место в структуре хирургической патологии передней брюшной стенки и характеризуются высоким риском послеоперационных осложнений, особенно у пациентов с ожирением и сопутствующими сердечно-сосудистыми и дыхательными заболеваниями. Результаты хирургического лечения грыж во многом зависят не только от выбранной методики герниопластики, но и от качества предоперационного обследования и подготовки пациента. В работе представлен ретроспективный анализ результатов хирургического лечения 149 пациентов с послеоперационными передними вентральными грыжами, проходивших лечение в период с 2021 по 2024 годы. Пациенты были разделены на две группы: основную, в которой применялись усовершенствованные методы герниопластики и комплексная предоперационная подготовка, и группу сравнения, где использовались традиционные методы. Особое внимание уделялось предоперационной адаптации сердечно-сосудистой и дыхательной систем к повышенному внутрибрюшному давлению с применением специального пневматического пояса-бандажа, дыхательной гимнастики, профилактики тромбоэмболических осложнений и периоперационных мероприятий в соответствии с принципами ERAS. Реализация комплексного подхода к предоперационной подготовке обеспечила безопасную адаптацию к повышенному внутрибрюшному давлению, способствовала снижению риска респираторных и сердечно-сосудистых осложнений и улучшению послеоперационного восстановления. Побочных эффектов, связанных с применением пневматического бандажа, выявлено не было. Полученные результаты свидетельствуют о том, что индивидуализированная мультидисциплинарная предоперационная подготовка является важнейшим компонентом успешного хирургического лечения передних вентральных грыж и способствует улучшению клинических исходов и качества жизни пациентов.

**Ключевые слова:** передняя вентральная грыжа, предоперационная подготовка, герниопластика, внутрибрюшная гипертензия, пневматический пояс-бандаж, респираторная адаптация, послеоперационные результаты.

**Introduction.** Ventral hernias occupy a significant place in the structure of surgical pathology, accounting for up to 15–20% of all operations on the abdominal organs. Among them, anterior ventral hernias are one of the most common forms and may develop both as a result of weakness of the anterior abdominal wall and as a consequence of previously performed surgical interventions. Due to the high risk of defect progression, development of pain syndrome, impairment of internal organ function, and the potential for incarceration, surgical treatment remains the main and most effective method of correction for this pathology [2, 5, 9].

Assessment of the patient's health status prior to surgical intervention for anterior ventral hernias is a crucial stage that allows evaluation of operative risk, selection of the optimal surgical technique, and adequate preparation of the patient for surgery. This assessment includes a combination of clinical, laboratory, and instrumental diagnostic methods [1].

However, surgical outcomes largely depend not only on the choice of hernioplasty technique but also on the quality of preoperative evaluation and preparation of the patient [3]. Preoperative examination makes it possible to determine the degree of surgical risk, identify concomitant diseases, assess the functional reserve of the organism, and establish the need for correction of metabolic and hemodynamic disturbances. Patients with ventral hernias often present with obesity, metabolic syndrome, and chronic cardiovascular and respiratory diseases, which necessitates a careful and individualized selection of diagnostic measures and preoperative preparation strategies [4, 6, 8, 11].

An individualized approach to preoperative examination and preparation contributes to a reduction in recurrence rates, optimization of surgical technique selection, a decrease in infectious complications, respiratory disorders, and cardiovascular events, as well as improvement in the quality of postoperative recovery [10].

The aim of this study was to conduct a comprehensive analysis of the health status of patients with anterior ventral hernias at the preoperative stage and to identify key factors influencing the effectiveness and safety of surgical treatment.

**Materials and Methods.** A retrospective analysis was performed on the results of surgical treatment of 149 patients with postoperative ventral hernias who were treated in the surgical department of the Zafarabad District Medical Association of the Jizzakh region between 2021 and 2024. The patients were divided into two groups: the main group (n = 75), in which improved hernioplasty techniques were applied, and the comparison group (n = 74), where conventional surgical methods were used.

**Results.** One of the key factors determining surgical outcomes is the quality of preoperative preparation. It is well known that after excision of the hernia sac and repair of the hernia defect, intra-abdominal pressure increases significantly, leading to restricted diaphragmatic excursion and impaired external respiratory function and hemodynamics. Inadequate adaptation to these changes may result not only in postoperative intestinal paresis but also in acute cardiopulmonary insufficiency.

Therefore, in patients with ventral hernias, special importance is given to preoperative preparation aimed at adapting the cardiovascular and respiratory systems to increased intra-abdominal pressure expected in the postoperative period. Preoperative preparation was carried out with the participation of a cardiologist and a pulmonologist.

The following parameters of external respiration were assessed using standard methods: Stange test, respiratory rate (RR), tidal volume (TV), minute ventilation (MV), vital capacity (VC), and maximal voluntary ventilation (MVV).

In 46 patients (68.6%) of the main group with ventral hernias, preoperative training adaptation to increased intra-abdominal pressure was performed using an improved pneumatic belt-bandage (Figure 1).



**Figure 1. Artificial intra-abdominal hypertension induced using a specialized pneumatic belt-bandage. The belt-bandage applied to patient D., case No. 6302/518.**

By pumping air into the belt-bandage, controlled pressure was created and monitored using a manometer, ensuring constant and uniform compression over the entire surface of the anterior abdominal wall (20–30 mm Hg/cm<sup>2</sup>). Structurally, the bandage resembles a blood pressure cuff but is wider and fully encircles the waist, making it suitable even for patients with morbid obesity.

Prolonged use of this type of pneumatic bandage (from several hours up to 24 hours daily for 10–30 days before surgery) allowed effective training and adaptation of patients to increased intra-abdominal pressure in the postoperative period. No adverse effects, such as deterioration of respiratory function or intestinal motility, were observed during preoperative use. Importantly, even in obese patients, no signs of soft tissue ischemia were noted. The same bandages were subsequently used for 1.5 to 6 months postoperatively.

At the preoperative stage (1–2 days before surgery), all 121 patients were examined by a physical therapy specialist. Patients were trained in differentiated breathing techniques and other movements sparing the abdominal wall in the postoperative period, including coughing techniques, turning to the side, and transitioning from a lying to sitting and standing position.

To prevent thromboembolic complications, all patients received subcutaneous low-molecular-weight heparins (enoxaparin 80 mg) 12 hours before surgery, and elastic bandaging of the lower extremities was performed immediately prior to surgery. For the prevention of stress-induced gastrointestinal mucosal damage, proton pump inhibitors were administered intravenously.

A long history of smoking was identified in 39 patients (32.2%). Considering the well-known association between smoking and exacerbation of chronic obstructive pulmonary disease, patients were advised to abstain from smoking at least one week prior to surgery and to discontinue smoking thereafter.

Adequate patient preparation also included bowel cleansing using an enema to reduce postoperative meteorism. Overall, the implemented preoperative measures complied with modern Enhanced Recovery After Surgery (ERAS) recommendations and contributed to a reduction in postoperative complications (Kehlet & Wilmore, 2008).

**Conclusion.** Preoperative preparation of patients with postoperative anterior ventral hernias is a complex and multistage process aimed at optimizing functional reserves and reducing the risk of postoperative complications. The conducted analysis confirms the necessity of an individualized approach to each patient, taking into account comorbidities, physiological capacity, and anatomical and functional characteristics of the anterior abdominal wall. Integration of comprehensive preoperative preparation, including cardiopulmonary adaptation, complication prevention, patient education, and individualized surgical planning, forms the foundation for successful surgical treatment of ventral hernias. This approach improves functional and clinical outcomes, reduces complication rates, and enhances patients' quality of life in the postoperative period.

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