

## **Changes in the Vertebral Column After Breast Surgery**

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**Abstract:** The review analyzes some aspects of the clinical morphology and pathogenesis of the vertebral column with signs of plexid after breast surgery. The main emphasis in the diagnosis and treatment of breast cancer is on maximizing the individualization of treatment and improving the quality of life.

**Keywords:** clinical morphology, etiology, pathogenesis, clinic of spinal osteochondrosis, breast cancer.

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## **Introduction**

Changes in the vertebral column. In the structure of cancer incidence among the female population, breast cancer (BC) occupies the first place. The incidence in our country is uneven. With this prevalence, even small percentages of complications are significant figures. Inevitably, the number of postoperative complications also increases. There is a steady increase in the number of patients and an increase in mortality rates [1].

This determines the strategy of combating this pathology, which is focused on reducing mortality, increasing the disease-free period and improving the quality of life of patients. The main stage of breast cancer treatment is surgery, especially in the initial stages of the disease [2].

Patients with cancer have always been at an increased risk of developing complications. This is due to the initial immunosuppression caused by the presence of the tumor process itself, and chemoradiotherapy.

The largest number of breast cancer patients is observed in postmenopause - this is the most dangerous age period, because against this background, there is a decrease in the adaptive capabilities and stability of the endocrine system of a woman. These women in the age range of 40-60 years have, as a rule, not one chronic disease, but a combination of two and three. The most common diseases were circulatory diseases that occurred in 12.3% of individuals, arterial hypertension-in 50.7%, and diabetes mellitus-in 9.6% [3].

Mayat V. S. et al. (1975) considered that a postoperative complication is a new pathological condition that is not characteristic of the normal course of the postoperative period and is not a consequence of the progression of the underlying disease. Since then, no better definition of complications has been found. The frequency of their development is a key parameter in evaluating the effectiveness of any medical procedure [4].

That is why it is very important to systematize the "consequences" of operations, and such attempts have been made for a long time.

Various scales and prognostic systems in urgent surgery have long been developed: Renson's, SOFA, APACH and others. Later, there were scales for oncologists: MPM for cancer patients, MPM (Mortality Probability Model), EUROSCORE (cardiac surgery), POSSUM (Physiological and Operative Severity Score for the enumeration of Mortality and Morbidity), SAPS, and others. The main thing in them is an attempt to accurately assess the severity of the patient's condition, which has a digital equivalent. In the future, the accumulated experience allowed researchers to move to an individual prognosis, because it more accurately determines the strategy and tactics of patient management. It included both clinical, biochemical, cyto-histological, and other features of pathology and was directly dependent on risk factors, but assessing their significance remained a difficult task.

P. A. Clavien et al. (1992) proposed a general classification of perioperative complications. However, the assessment of the consequences of surgical interventions remains limited due to the lack of consensus on the definition of complications and their distribution by severity [5].

In 2004, this classification was revised D. Dindo et al. [6]. The discussion on this topic continues to this day. The last revision was made in 2010, when the "Accordion" classification of the severity of surgical complications, described by Porembka M. R. et al. (2010) [7]. It is largely universal for general, gastrointestinal, cardiovascular, thoracic surgery, and urology. However, it has "limitations" for use in some "narrow" areas of surgery [8]. These include some areas of oncology.

These patients were always considered to be at an increased risk of developing complications, for example, postoperative infection due to the initial immuno- and myelosuppression caused by the presence of the tumor process itself and chemoradiotherapy [9; 10].

15-35% of cancer patients have clinically pronounced, often very severe, consequences in the form of thromboembolic complications. At the same time, patients with advanced thromboembolism have a 2-3-fold higher mortality rate compared to the same patients, but without thrombosis [11].

Among them, breast malignancies constitute the most complex and significant part of this group: they have long been the leading cause of death in women aged 35 to 56 years [12; 13].

This led some researchers [14; 15] to analyze the consequences of surgical interventions, taking into account possible risk factors, including obesity, diabetes mellitus, smoking, and preoperative radiation therapy. But the vector of analysis gradually shifted towards a deep study of the oncological changes in the breast and their effects on the woman's body. Some [16; 17] paid attention to the neglect. Many others point to the role of age-related features [18; 19].

Prerequisites for the development of complications after breast surgery should be sought in several areas: the first is the characteristics of the disease itself, for which the operation is performed, the second is the nature and scope of surgical intervention, and the third is general changes in homeostasis in these patients.

Radical mastectomy (RME) according to J. I. Madden (1965) is considered a classic of surgical aids for breast cancer. The technical features of such an operation clearly predispose to local complications: they are performed exclusively with a single-stage subclavian-axillary-subscapular lymphadenectomy. At the same time, there is a significant accumulation of fluid when peeling skin flaps from the chest, which causes discomfort in patients and increases the duration of hospital stay due to the need to perform multiple punctures. The development of scarring in the axillary vein area in the future can also lead to the development of edema of the upper limb.

In recent years, people are increasingly talking about organ-preserving breast surgery. This became possible due to the development of theoretical ideas about the nature of the disease, the improvement of adjuvant treatment methods.

Currently, in addition to therapeutic tasks, the achievement of an optimal aesthetic result is of great importance. This approach is particularly effective in the early stages of the disease. Organ-preserving operations are divided into 3 groups. The first group includes tumorectomy, lumpectomy, and sectoral breast resection. The second group is resection, which involves the removal of 1/8 to 2/3 of the gland, quadrantectomy, characterized by the removal of 1/4 of the gland, hemimamectomy, when 1/2 of the gland is removed. The third group consisted of subtotal resection, when 75-90% of the gland tissue is removed along with axillary, subclavian and subscapular lymph nodes [20; 21].

Moscow, Russia. Gosset et al. (2016), V. Strnad et al. (2016) [22; 23] performed organ-preserving surgeries in combination with radiation therapy in the early stages of breast cancer and obtained the same overall and безрецидивной disease-free survival rates as when performing simple RME.

Modern requirements for organ-preserving operations consist not only in preserving the organ, but also in obtaining a good cosmetic effect. And such results are obtained by introducing a

plastic component into standard technologies of organ-preserving operations. Currently, various methods are used for breast reconstruction using skin-muscle, skin-subcutaneous, muscle flaps, expanders/implants and their combinations. Nevertheless, auto-tissue reconstructive plastic surgery can be accompanied by a large number of complications (capsular contractures, lymphorrhea, seromas, inflammatory processes (20-29%)) that require repeated surgical interventions [22].

Breast reconstruction is performed both simultaneously and in a delayed period. The optimal time frame for delayed reconstructive plastic surgery is 6-12 months after RME, provided that adjuvant therapy is completed [23]. Radiation therapy increases the risk of postoperative complications in patients who have undergone delayed reconstructive plastic surgery, especially with implants. It should be noted that the risk of surgical complications in delayed reconstructive plastic surgery performed after RME in 6-12 months is lower than in RME with simultaneous reconstruction [20].

A.D.Zakiryakhodjaev et al. (2015) analyzed the results of treatment of 31 patients

after RME. Delayed reconstructive plastic surgeries using TRAM-flap (transverse skin-muscle flap of the anterior abdominal wall based on the rectus abdominis muscle) were performed in 22 patients, in 10 cases an endoprosthesis was additionally installed to give the necessary volume to the formed mammary gland.

Complications were observed in 8 (25.8%) patients. The greatest number of complications was observed in breast reconstruction with TRAM flap: 6 (27.3%) cases out of 22. The most serious complication was occlusive thrombosis of the inferior epigastric artery of the displaced TRAM flap with the development of its marginal necrosis. Marginal necrosis of the displaced TRAM flap was observed in 4 patients; in 1 case, diastasis of the wound edges on the anterior abdominal wall was recorded during reconstruction, in 1 patient - hematoma of the postoperative wound, and in 1 patient - infection of the endoprosthesis bed [12].

K. P. Laktionov et al. (2006) analyzed the results of treatment in 271 breast cancer patients who underwent reconstructive plastic surgery with a transverse rectoabdominal flap after radical treatment. In the structure of complications of the first stage of breast plastic surgery, the proportion of graft rejections was 2.9%, marginal necrosis of the displaced transverse rectoabdominal flap was observed in 4.4% of cases, and in 3.3% of cases there was a divergence of the wound edges on the anterior abdominal wall. Adverse outcomes, including skin necrosis, implant displacement, and capsular contracture, were observed in up to 14% of patients [28].

According to a number of authors [9; 10], 30-48% of patients after RME develop various local complications in the form of lymphorrhea, suture divergences, skin flap necrosis, hematoma, and wound infection. The frequency of such formations varies in a very wide range: from 3 to 85%. Seroma or lymphocele are the earliest and most common complications after RME. Лимфоррея On average, lymphorrhea lasts up to 8-14 days, but in some patients it persists much longer - 30-60 days.

Fluid accumulation in the wound after RME leads to wound infection, the frequency of which varies from 1 to 26%, skin necrosis-in 0.5%, divergence of the wound edges in 0.3% of patients, wound suppuration-in 1.9% of cases, and even general complications in the form of septicemia [31].

Later, profuse lymphorrhea leads to rough and chaotic growth of scar connective tissue in the

areas of lymphadenectomy and areas of detached skin flaps, which contributes to the development of "post-mastectomy" syndrome [8].

For the prevention of local postoperative complications: lymphorrhea and seroma, drains and a quilted suture were widely used. Some authors used glue on the wound surface for this purpose, and believed that a harmonic scalpel could reduce the number of seromas, intraoperative blood loss, and wound complications. However, all this did not solve the problem, since there were no prognostic tests that allowed us to form tactical actions in advance to prevent undesirable consequences of surgical intervention [3].

Prevention of skin necrosis after total mastectomy and immediate breast reconstruction with expanders is also of great importance, as it can lead to infection of the wound and repeated surgical intervention [4].

These postoperative complications lead to a delay in adjuvant therapy. Radiation or polychemotherapy performed in the preoperative period полихимиотерапия further worsens the course of the wound process, and the percentage of complications increases by another 2-3 times [5].

Upper limb edema was observed in 13-58% of breast cancer patients operated on [36]. The causes of their occurrence are again associated with mandatory wide axillary lymph dissection [7]. At the same time, patients experience pain in the injured shoulder and arm, limited movement, reduced muscle strength and functional capabilities of the upper limb. The progression of lymphatic edema increases these symptoms [8].

Complications such as wound edge necrosis, лимфэдема upper limb lymphedema, prolonged wound healing, upper limb contracture, and infectious complications usually develop against the background of gray postoperative wounds [39].

Common complications are sometimes referred to as "tragic or catastrophic accidents" and usually occur against an unfavorable background of concomitant diseases and age-related changes. They are associated with thrombohemorrhagic syndrome not in the mammary gland, but in other organs and systems.

Thromboembolic complications occur in 1-8% of breast cancer patients. The risk of developing PE in individuals with locally advanced breast cancer is even higher, it is 4.5%, and in the case of its generalization-17.5% [4].

Pathogenetic mechanisms that cause thrombotic complications in patients with malignant neoplasms include a complex interaction of the tumor, the patient and the hemostatic system.

Thrombophilia leading to myocardial infarction, pulmonary embolism, stroke, etc. is a very serious, although rare, problem in the surgical treatment of breast cancer. Disorders in the hemostatic system in cancer patients, including those with breast cancer, are aggravated by chemotherapy, which creates real prerequisites for the development of thrombotic and hemorrhagic complications at further stages of special treatment [41].

Women with breast cancer have a 3-4-fold increased risk of venous thromboembolism compared to women of the same age without cancer. The incidence of venous thrombosis in breast cancer is 2-8% [4].

Thrombosis usually affects the lower extremities, but in patients who have undergone RME with lympho dissection, thromboembolic complications in the upper extremities are also common [3].

### Conclusion

Thus, the occurrence of local complications of RME is mainly associated with the volume of surgery and lymph dissection, which are accompanied by severe diffuse bleeding and lymphorrhea, and general – with thrombophilia, which occurs against the background of age and concomitant diseases. The causes and mechanisms of their development are insufficiently studied, not systematized, and described in fragments.

In summary, a characteristic feature of breast cancer is heterogeneity. Therefore, there are difficulties in systematizing complications after surgical treatment. Two factors for the development of breast cancer and they are also factors for the development of postoperative complications coincide and have high prognostic significance: age (postmenopausal period), as well as concomitant diseases.

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