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Rehabilitation of women after mastectomy - proposed procedure

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Abstract

Breast cancer is a leading cancer among women, high incidence of cancer is not synonymous with high mortality. Women subjected to radical or partial mastectomy after the surgery want to return to full fitness as soon as possible. Movement restrictions associated with surgery do not have a positive effect on the patients' psyche.

One of the complications of surgery in the axillary region is damage to the long thoracic nerve. An impairment of the blade mechanics affects the nonergic movement in the shoulder joint. Using the neurorehabilitation methods, the correct spatula pattern should be reconstructed. Facilitation, or traffic paving, is an effective method used also for peripheral nerve injuries. In each method, the movement is assisted by a therapist who can determine the direction of movement through resistance, or assist it.

The study presents examples of activities that can be used in therapy in its various phases. The method of using methods depends on the degree of structural damage and should be modified for the purposes of therapy.

A review of available literature and own experience were used for the work.

Keywords: breast cancer, thoracic nerve damage, physiotherapy

Introduction:

Breast cancer is the most common cancer found in women. In a large number of cases, it requires radical surgical treatment. The method of treating cancer depends on the severity of the disease. One of the most common postoperative complications, in addition to lymphatic flow disorder, is damage to the long thoracic nerve during mastectomy or surgery to save the mammary gland [1].

Stress associated with the disease affects the overlapping of physical ailments [2].

Due to surgery, we can distinguish [2-3] as side effects:

Change of attitude,

Restriction of mobility in joints of the upper limb rim,

Secondary swollen swelling,

Reduction in muscle strength of the operated side.

Lowering the mood is conducive to an even greater visualization of muscle weakness in the limb after surgery [2].

Due to the removal of lymph nodes, during the surgery, the lymph flow is impaired causing lymphatic edema [3]. Pathological edema decreases movement activity in itself and causes further weakening of muscular strength caused by immobility.

The next complication is damage to the long thoracic nerve, which is responsible for the innervation of the anterior toothed muscle. Its dysfunction is manifested by the so-called scapula of the so-called scapula alata (winged wing). This dysfunction, in addition to the visual effect, significantly affects the mechanics of the shoulder joint. The lack of a stable shoulder blade sliding on the posterior thoracic shearing affects the limitation of mobility in the brachial joint and the nonergergic work of the shoulder joint manifesting in pain.

During the rehabilitation of patients after surgical treatment of breast cancer, particular attention should be paid to the symptoms of the protruding shoulder blade, especially in patients who signal a reduction in the range of motion in the upper limb.

Therapeutic improvement should be adjusted so that it would act comprehensively on all side effects [3].

In the exercise programs available to patients, the main focus is on the problem of secondary lymphedema. Autodrallel training is used. It is not recommended to limit mobility in the joints of the upper limb, reduce muscle strength and change posture [4].

Post-mastectomy rehabilitation should take place at the earliest possible time to prevent muscle atrophies in the limb of the operated limb, which may also contribute to reduced lymphatic passage

Literature review

Neurorehabilitation methods are usually used in patients with central nervous system damage.

There are reports in the literature regarding the rehabilitation of shoulder plexus injury, which can also be used in women after surgical treatment of breast cancer, however, it should also be remembered about the surgical wound that limits the possibility of rehabilitation in the first phase after surgery.

Neurorehabilitation methods

From commonly known methods of neurological rehabilitation for adults, the PNF and IBITA Bobath methods are used. The concepts of methods are based mainly on the cooperation of the patient with the therapists. Therapy with neurological methods is task-oriented. The patient faces new challenges in the form of everyday activity.

The PNF concept uses complex movement patterns that are automatically performed by a human during the whole life. Patterns for the shoulder, pelvis, upper limb, lower limb, torso and head have been carefully developed and distinguished. Combined patterns create complex movements. There are also determined patterns for simultaneous movements of upper and lower limbs, depending on the movements performed, we can distinguish between symmetric and asymmetrical patterns [5-8].

The Bobath method for adults is intended for patients with impaired muscular tension, movement and function caused by malfunctioning of the Central Nervous System [9].

The key aspects of clinical practice that the Bobath concept assumes are [9-10]:

- investigation of causes along with traffic analysis;
- integration of movement and postural control aimed at the task;
- use of proprioceptive and sensory stimulus;
- strategies for treatment and treatment;
- measuring the results of therapy

The main assumption of this concept is to restore the patient's optimal function. The therapy takes into account the expectations and needs of patients. Therapists working according to the Bobath concept, in order to achieve the goal, evaluate the patient in terms of regaining mobility. Physiotherapy according to the Bobath concept is different depending on the phase of the disease [9-10].

In both concepts, the patient's comfort during exercise is the most important. This is particularly important in the case of central damage due to damage to the brain structures also responsible for concentration, memory and emotions. In the case of women after surgical treatment of breast cancer, there are no lesions in the central and peripheral nervous structures. However, rapidly created pathological movement patterns are recoded by the cerebral cortex as normal and the process of the appearance of bad motor habit occurs, which should be re-educated through rehabilitation.

The main goal of paving the correct movement patterns is to prevent the emergence of new pathological patterns that become fixed and habitual. Movement reeducation, consisting of facilitating the correct path of movement, through repetition, reproduction is aimed at not creating compensation, which is often unergonomic and causes a pathological movement pattern that causes pain. Paving simultaneously works towards normalization of muscle tone [5].

After surgery, the problem that limits mobility is also the postoperative wound. In the thought of building motor control, mobility is the first pillar. The development of a scar to reproduce the muscle slip is an indispensable element of rehabilitation. Obtaining the stability of the blade is another step. Mobility on the stability of this accident will mean the ability to move the remaining limbs using the limb on the operated side as a support point. Dexterity is associated with the performance of limb activities directly involved in this case on the operated side [8]

Nerve damage

The long thoracic nerve is one of the more frequently damaged peripheral nerves of the upper body. It is formed from the abdominal branches of the cervical spinal nerves (C5-C7), which, starting from the core, go towards the shoulder forming the brachial plexus. A long thoracic nerve, after leaving the plexus, passes through the mid-sloping muscle and, while running on the side of the chest, innervates the anterior toothed muscle. The muscle pushes the paddle forward, stabilizing it on the chest [11].

Breast anterior neuropathy causes a dysfunction called the winged blade. The symptom is the characteristic withdrawal of the spatula (Figure 1), particularly noticeable when the limb is extended and supported, eg on the wall. The checking test is the protrusion of the upper limb in the forward bend [12].



Figure 1. *Manifestation of right long thoracic nerve damage [12]*

Compared to other nerves of the brachial plexus, this nerve has a smaller size, less connective tissue and a relatively superficial position. The risk of damage is also greater due to the long distance the nerve travels (Figure 2) [13].

Isolated nerve injuries particularly affect mainly athletes. The cause may be damage due to repeatedly repetitive motion or excessive stretching of the nerve. Direct strokes around the neck less frequently lead to isolated damage to the long thoracic nerve. Damage caused by injury may occur in the case of unscheduled work of the humerus and shoulder blade during casting or other sudden movement of the arm. Due to the nerve's course, the middle-sloping muscle for nerve damage may occur during excessive muscle tension during physical activity. The discontinuity of the long thoracic nerve is also possible during operations in the axillary region [13].

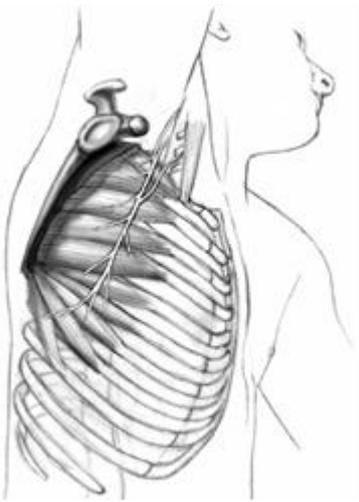


Figure 2. *The course of the long thoracic nerve on the chest wall and axillary [13]*

In nerve injuries, we distinguish the Seddon Classification [13]

- Neurapraxia - pressure on the nerve without interrupting the continuity.
- Axonotmesis - the nerve intact, but the axons are broken; such nerves can regenerate.
- Neurotmesis - interruption of nerve continuity causing its paralysis.

The decision about treatment should be supported by the assessment of the nature of nerve damage. In the case of nerve compression (neurapraxia), complete recovery should occur within a few days or weeks. In case the functional and anatomical continuity of the nerve fiber is partially interrupted (axonotmesis), however, the nerve maintains continuity, regeneration also occurs spontaneously, however, it lasts longer. The average recovery time of the long thoracic nerve is 8 months, in some cases it can be up to 2 years. In case of complete disruption of axons, myelin and connective tissue (neurotmesis), surgery is necessary [13].

Physiotherapy is an important place in conservative treatment. The improvement program depends primarily on the degree of nerve damage and the reason for its formation. In the case when the damage was created against the sum of micro-injuries by repeating one movement repeatedly, the basic thing is to temporarily stop training. In addition, the technique of movement in training and patient work should be corrected [13].

Rehabilitation plays a major role in nerve damage. Stimulation of the anterior kinesitherapy muscle is a key element that reduces muscle dysfunction. Paving nerve function also affects its faster regeneration. Another method of stimulating muscle to contraction is electrostimulation, however, due to the oncological past, stimulation with physical factors is inadvisable in women after mastectomy. An important element is maintaining proper mobility and work mechanics of the upper limb rim.

Therapy - rehabilitation proceedings

During therapy, its aim should first be determined. For this purpose, we can use the ICF classification. This classification requires objective tests to be performed both at the structural level and at the level of activity. In the structural context, measurement tests and tests are carried out, eg on the range of movable property of SFTR. Performing tests is aimed at hypothesizing the cause of the problem with performing everyday activities (ADL) (diagram 1). At the level of everyday activity, repeatable measurement tests are made that are described in a measurable manner [14].

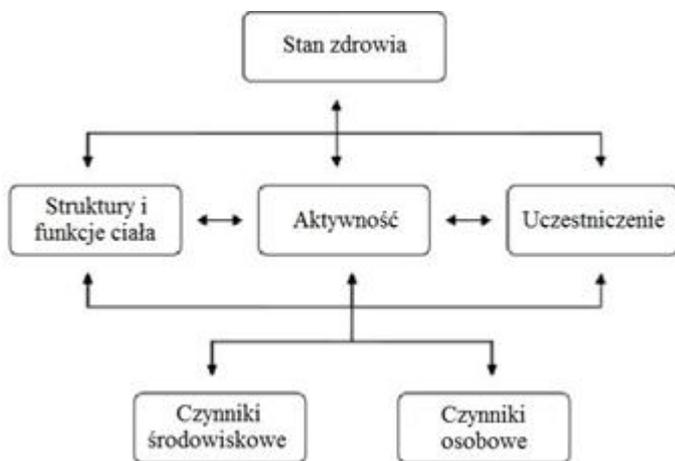


Diagram 1. ICF classification scheme

For women with chest nerve damage that is long as a result of mastectomy of ICF classification, it may look as follows:

At the structure level:

- Damage to nerve structures, muscle weakness or lack of force mm. toothed front

At the activity level:

- Limiting the bending of the upper limb, abduction and external rotation

At the level of participation:

- No way to reach the top shelf in the closet

Depending on the therapeutic program, we can start the therapy with a restriction related to the activity, affecting the damaged structure or the damaged structure, affecting the limitation of activity. In both procedures, it is important to achieve the patient's goal - reaching the top shelf. The task of therapists is to find the problem at the level of activity and structure.

In the first stage after the procedure it is recommended to use techniques in which there is only movement of isometric muscle tension. Work on distant structures and the transfer of tension from the pelvis, the second upper limb, lower limb shoulders, to the shoulder girdle, can equally well be used in therapy in the first stage.

At a later stage, while working on the stability of the shoulder blade, we can use supports on the forearm of the operated limb. We can use supports in the strength of lying on the side or lying on the back or stomach. The variety of methods makes it possible to change stimuli and constantly stimulate the nervous system.

During therapy, we can work as follows [5]:

- Starting with a stronger pattern,
- By changing the synergy for distal elements,
- Distant and proximal facilitation should apply to the same synergy,
- We use resistance
- Movement changes should precede verbal commands.

Objective: Obtaining the mobility of the blade [5, 10]

Starting position: Sitting with supported forearms,

End position: sit on your heels (figure 3)

Through the work of the lower torso, we transfer the work to the shoulder joint, the therapist facilitates the correct positioning of the shoulder against the chest wall, depending on the application of the method, directional resistance can be used or support the movement



Figure 3. *Work on the mobility and stability of the blade.*

During exercises that affect the stability of the spatula, attention should be paid to whether the ascending part of the trapezius muscle is stimulated. With proper support activity, active lower torso flexors. If the ridge rectifiers turn on during the exercise, it may mean that the patient is pulling the retraction blade.



Figure 4. *Support on the forearm of the left hand in the closed chain. Approximation of the shoulder to strengthen the stabilization of the shoulder blade. The other limb of the patient - an extension in the elbow to transfer the weight to the right leg*

Exercises at the activity level compared to structured level exercises are more complex because they require more structures to be implemented and interact with each other.

The patient is advised to reach forward with the other hand, it may be wiping the floor or touching the wall, so that the weight of the body has been transferred to the shoulder on the opposite side. The therapist stabilizes the vane giving a signal to the tension of the anterior gear muscles (Figure 5)



Figure 5. *Activation of supports in a closed chain. Transferring the body weight to the left upper limb. The therapist, by approximation, facilitates the stabilization of supports. The other hand facilitates depression of the back of the shoulder blade*

Support activity in a simple force to activate the front and widest dorsal muscle can be obtained by working in a force. The patient learns the stabilization of the spine with his palm and also can independently control the muscles of the widest back and the anterior tooth by lifting the hip on the same side (Figure 6). By stabilizing the blade, there is a change in the load transfer point. Movement of the pelvis transfers the load and motion to the joint with the stabilized shoulder blade.



Figure 6. *Activation of supports in a closed chain. Transferring the weight of the body to the upper right limb. The therapist, by approximation, facilitates the stabilization of supports.*

Conclusions

Widely used methods in the rehabilitation of patients with damage to the central nervous center can be successfully used in damage to peripheral nerves. During therapy, the reason for limiting a given activity should always be guided. Finding the cause of the limitation, working on the structure, joining the activity and therapy of the function results in the improvement of the joint mechanics and, consequently, in the patient's comfort.

During the therapy, important elements are commands that should be understood in a short and unambiguous manner. Before starting therapy, you should determine its purpose. Diagnostic tests should also be performed in order to be able to monitor the progress of the therapy.

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