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RECOVERY OF BRAWN BY INNERVATION OF VENTRAL MUSCULARITY IN CASE OF PARIETAL FLAWS SUBJECT TO SURGERY

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Abstract: *Kinotherapy, both pre and post surgery, is important for the patients operated at the abdominal wall level, it sights out more areas: resipratory, pheriferic circulation and trunk muscules kinotherapy, mainly the flexural musculatury, namely ventral muscularity. It is particular from one case to another, and it is possible not to show all elements already described. The main principle guiding ventral muscularity physiology comes out from the fact that such muscles, starting from the thorax, connect it with the basin, inferior limbs being its continuation.*

Key words: *muscularity innervation, respiratory kinotherapy, dorsal decubitus, flexure, exetnsion.*

1. Introduction

In order to perform the study, 257 patients showing volume flaws of anterior-lateral ventral wall, hospitalized with Level were at our disposal.

Patients were divided in two batches:

- 139 of them belong to Batch A, they were operated under a scheduled condition;
- 115 of them belong to Batch B (initially, the Batch was made up of 118 people, three of them deceased post-surgery during the first 48 hours), patients subject to emergency surgery condition.

Exercise schedules were customized depending on:

- patient pathology and his co/morbidity;
- Coding of parameters;
- pre-surgery specific preparation;
- Post-surgery general condition, right-away after leaving the ATI Ward.

2. Post-surgery recovery programs

An early immobilization is secured for the patients of the two batches for the first 2-4 post-surgery hours when a compressive bandage was applied to them in order to mitigate complications.

Resumption of household activities was allowed to them after 3-5 post-surgery days, physical effort was allowed within 30 days after surgery.

Subjects started recovery programs after 5-7 days, depending on immediate post-surgery evolution.

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Post-surgery recovery program is customized for those 254 de patients, kynotherapits trained and tracked patients to perform:

- Respiratory re-education starting exercises, controlled coughing and expectoration;
- Active mobilization of the limbs, coordinated along with respiration;
- Izometric exercises meant to streng-hten muscles of upper and lower limbs;
- Exercises for innervations of thorax and ventral muscularity.

Exercises for innervations of ventral muscularity may be divided in three groups:

1. Exercises meant to stabilize lower limbs on the thorax;
2. Exercises meant to stabilize the thorax on the lower limbs;
3. Lateral exercises.

2.1. Mobilization of lower limbs on the thorax

Because of lower limb weight and ventral muscularity lack of efficiency, on more than 30° flexure of hips, iliac psoas muscle becomes efficient in the favor of ventral muscles action whose performance increases, thus making the thorax to tilt.

It comes out that innervations of ventral muscularity is carried out starting from a 30° hip flexure amplitude, having the legs stretched and the knees bended.

Therefore, the kynotherapits recommends the following exercises to the patients:

Exercise 1. Patients, starting with dorsal decubitus, knees bended, legs on the wall and the thorax tilted:

- actively bend the knees on the thorax and hips on the abdomen; during such period, they will keep the thorax on tilted position, allowing it to only lift articulation L5-L4; as much as possible, they will consider coordination of a quite normal respiration: breathe -in during starting moment, breathe-out during the active phase of the exercise;

- the same bending exercise is carried out but the head and the high dorsal region are lifted (fig.1.1).

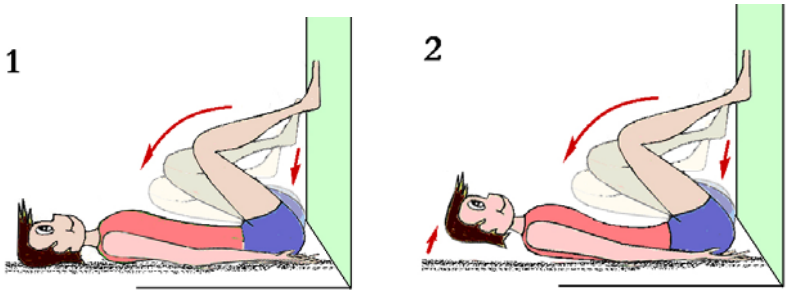

Fig.1. *Exercise for lower limbs on the thorax*

Exercise 2. Starting from dorsal decubitus and legs streched against the wall on a 80° angle, than 70° angle, thorax tilted, patients bend legs – to the possible extent- streched on the thorax, (fig. 1.2.).

Exercise 3. Starting from dorsal decubitus and legs streched against the wall and mobilizing them on the vertical. From this very position, patients perform movements of the legs in the form of lateral ablations or shearings.

Exercise 4. Starting from resting on the ground position but having the the forearms as support, the thorax tilted,

patients alternatively bend the knees on the thorax.

Exercise 5. From dorsal semi- suspension position, against the trellis, the patient lifts one or both knees without bending the body.

2.2. Mobilization of the thorax on the lower limbs

After the previous exercise, mobilization of the thorax on the lower limbs represents the second stage of the ventral muscularity innervation that can be performed if muscularity became stronger and the patient does not show pains.

Exercise 1. From down-to-earth position, feet firmly fixed under the trellis, knees bended, palms clanched with the trellis, patients will:

- Roll backwards against the trellis bars until arms are stretched on prolongation of the thorax, therefore until horizontal position, they will afterwards revert to the starting position;
- Perform the same exercise without having the hands as support;
- Increase difficulty in movement by leaning the thorax back 60°-45°;

Exercise 2. From dorsal decubitus, feet engaged under the trellis, knees bended, the thorax tilted and „locked", patients move to „seating" position curving their backside, holding the trellis with their hands.

2.3. Lateral exercises

During the all three exercises, the target is the thorax to be kept tilted, breathing to be done rhythmic, breathing-out during the exercise and breathing-in during the break.

Exercise 1. From lateral decubitus, legs in prolongation of the thorax, thorax tilted with abdominal retraction, patients are bending the knees to the abdomen and are reverting to the starting position, namele legs elongated.

Breating-in will be freely, breating-out during flexure (fig.2.1.).

Exercise 2. Starting from previous position, patients perform flexure of the legs (fig.2.2.).

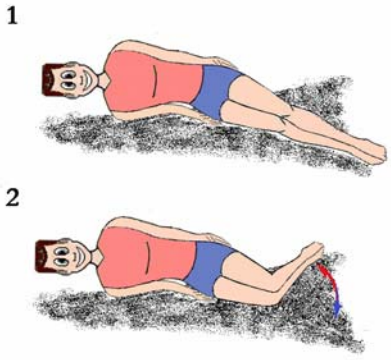

Fig.2. *Exercise for lateral exercises*

Exercise 3. From the same position, patients perform:

- Shearing of the stretched legs;
- Lifting of both legs having them cleaved one close to the other, legs initially 15 cm above the ground, gradually higher and higher.

2.4. Kabat method

Innervation of ventral muscularity by Kabat method assumes the following exercises to be performed from dorsal decubitus:

Exercise 1 – knees bended, arms rotated externally, 30º from the body, patients press the limb on the ground, without lifting the buttock; (fig.3.1.);

Exercise 2 – knees bended, arms forwards, patients keep in their hand a wooden stick and press the limb on the ground, contract the buttlocks; lift the head and the shoulders from the ground, push strongly and move forwards the wooden stick, keep in that position for few seconds, than relax slowly; (fig.3.2.).

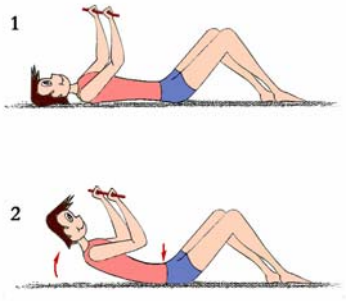

Fig.3. *Exercise from Kabat method*

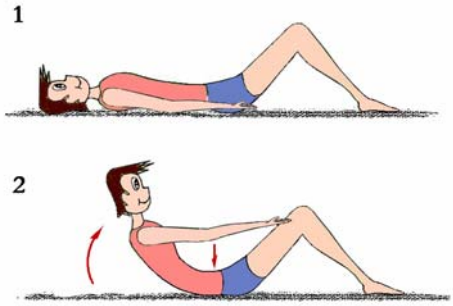

Fig. 4. *Exercise from Kabat method*

Exercise 3 – knees bended, arms rotated externally and stretched close to the hips; patients press the leg on the ground, contract the buttlock muscles, head and shoulders lifted, hands up near the knees, keep there for few seconds, than relax slowly; (fig.4.1.);

Exercise 4 – knees bended, arms forwards, patients hold a wooden stick in their hands: press the lomb on the ground, contract the buttlocks, lift the head and shoulders from the ground; stay there for few seconds, than relax slowly; repeat the same movements with the other hip;(fig.4.2.);

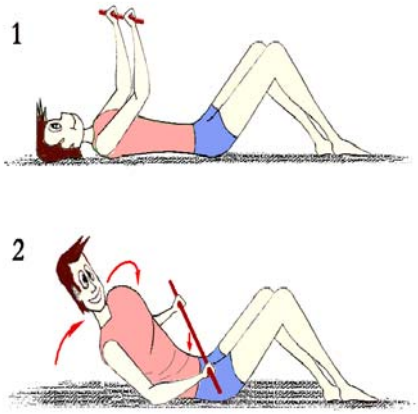

Fig.5.

Exercise 5 – one knee lifted towards the abdomen, the other one stretched, opposite hand press the bended knee, opposite arm is lifted close to the head, patients press the lomb, contract the buttlocks, press the hand on the bended knee (the one that stands resistance against), the other inferior limb is extended strongly, keep there for few seconds than relax slowly; (fig.5).

Exercise 6 – both knees lifted in upwards position and rotated externally, legs close, through the soles, one to another, arms in upwards position above the chest and external rotation, elbows bended, patients press the lomb on the ground; contraction of buttlocks lifting the head and the shoulders; keep there for few seconds, than relax slowly; (fig.6.).

Exercise 7 – patients are resting with the knees bended towards the chest, hands rotated externally and the arms stretched near the body, then press the lomb on the ground, keep there for few seconds, than relax slowly (fig.7.)

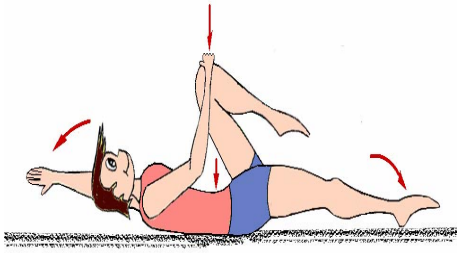

Fig. 6. *Exercise 6*

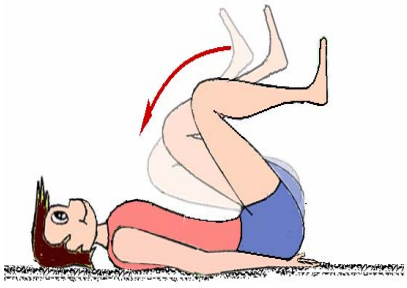

Fig.7. *Exercise 7*

3. Conclusions

An outlook of the two batches shows the importance of locomotors preparation for the patients showing massive ventral parietal flaws and large trans-shipment of visceral mass, for the reparatory surgery of the patients.

Comparative analyses of the two batches allowed some useful conclusions to be drawn, conclusions related to evolution of the patients showing massive eventrations of the ventral wall whose visceral mass reintegration into eventration pocket generates heavy complications most of the times.

Briefly, find below some conclusions resulted from the study:

- Secondary, parietal flaws, mainly the massive ones, make up invalidating impairments restricting the social life of the patients most of the time; known from around 20 years as impairments difficult to be repaired by surgery due to their relapsing feature, surgery of such defects is subject to a revolution when protein bio-degradable materials, more and more performing, were designed;
- Nevertheless, experience of the 20 years when such surgery was implemented points out, once more, a justified relapsing rate by existence of a high percentage of lack of knowledge regarding surgery techniques, a surgeon wrong choice for selection of protein materials, as well, especially in the case of patient co-morbidities, mainly respiratory and cardiac ones;
- Post-surgery complications of such pathology are mainly connected to lack of adaptation between content and container, phenomena generated when visceral herniation mass is reintegrated into the ventral cavity;

- Respiratory deficiencies generated by them are dramatic sometimes, thus cardio-respiratory correction movements are imposed, physico-therapeutics procedures are highly the most famous of them;
- By codification of the physical-kinotherapeutics exercises indicated for loco-motor recovery, it was found out an evolution for the benefit of the such patients;
- Late post-surgery evolution is subject to influences generated by getting over respiratory re-education procedures thus around 80% out of quasi-complete social reintegration was performed during the first 21 days for the patients in Batch A. Good results have been recorded for the patients in Batch B, yet in a lower percentage, 65%, and in a longer time (more than 40 days after the surgery);
- Comparing the evolution parameters, a post-surgery progress is found out, it is much favorable for the patient in Batch A, a satisfactory evolution for the patients in Batch B, as well;
- A mortality of 1,17%, represented by the three deceased people, refers to the patients with major respiratory problems in Batch B, subject to an emergency surgery. Two of them deceased because of intra-abdominal hyper-tension (PIA between 16-20 mm Hg) and one deceased after the abdominal compartment sindrome (PIA higher than 20 mm Hg).

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