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POSTOPERATIVE RECOVERY OF SPYROID TIBIA FRACTURE

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Abstract: *This paper is a topical issue among people diagnosed with spiral fracture third diaphyseal tibia, because following the survey conducted by the College of Physiokinetotherapists in Romania over 50% of athletes licensed to sports clubs are suffering from pathologies in the lower limbs, 20% of these at the tibia. In this paper are found some methods and ways of early and methodical application of kintetotherapy means and processes through which to restore as much as possible the functionality or loss of the patient diagnosed with spiral fracture middle third diaphyseal tibia. This paper aims to demonstrate that the proposed physiotherapy model helps to improve the functional capacity and quality of life in people with spiral fracture average third diaphyseal tibia.*

Key words: *kinetoterapy exercises, spyroid tibia fracture, child.*

1. Introduction

Kinetology is an interdisciplinary biological science, which deals with the study of the movement of the human body, the anatomical and functional elements that contribute to its realization and ways to correct or compensate for reversible, partially reversible or irreversible disturbances [4].

Physical therapy is a form of movement therapy, which aims to restore impaired functions through static and / or dynamic exercise programs, with the aim of improving the patient's life and self-service abilities [3], [6], [7], [11].

Fractures represent the total or partial disruption of bone continuity. The fracture is a solution of continuity in the bone produced by a trauma. The bone on which the fracture occurs can be healthy [5].

The spiroid tibia fracture occurs when a force acts by twisting on the bone, the result being a spirally shaped fractured line, similar to the steps of a ladder. Depending on the size of the force applied to the tibia, the spiroid fracture can be both stable (without displacement) and unstable (with displacement). The fracture occurs as a result of the action of a high-intensity force that the bone cannot withstand.

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Fractures in children are very different from those in adults. There are certain types of fractures to which children are more exposed than adults due to the different characteristics of the bone structure at this age [12].

Considering the importance of a good functionality of the lower limb and its use in daily activities, it is also understood the concern of physiotherapists and specialists in the field for this condition. A man whose social and professional life is endangered, suddenly increases his interest in finding as many solutions for healing. Starting from this idea, the professional involvement of the physiotherapist for solving these cases can be deduced.

2. The Elements of Anatomy and Biomechanics of the Lower Limbs

Biomechanics is the science that studies the movements of living things, taking into account their mechanical characteristics. It can be considered a mechanics applied to the statics and dynamics of living things in general and of humans in particular. He has a field of research close to that of anatomy, physiology and mechanics. Biomechanics studies how muscle forces arise, analyzing them mechanically and how they relate to external forces acting on the body [13].

Osteology is part of the anatomy of bone. The bones are hard, sturdy, white-yellow organs. Their whole is the skeleton. In humans, the bones are located inside the soft parts, which serve as support; sometimes they form cavities to house delicate organs. They serve the muscular insertions thus becoming levers actuated by various muscular forces (passive component of the musculoskeletal system) [4].

The bones, although so resistant, suffer from the influence of neighboring organs: muscle traction, pressure of organs, pulsations of arteries and the action of gravity. Therefore, their outer surface can be decomposed into a number of morphological elements called: faces, edges and angles, which in turn include important details from a morphological and applicative point of view [8].

The myology is part of the anatomy that deals with the study of muscles and all the formations attached to them. The muscles have the property of performing contraction, a function by which they reduce their length, thus performing movements. They represent the active component of the locomotor system, figure 1 [10].

Three types of muscle can be differentiated: striated, smooth and cardiac muscle. The striated (skeletal) muscle makes up most of the body's muscle mass.

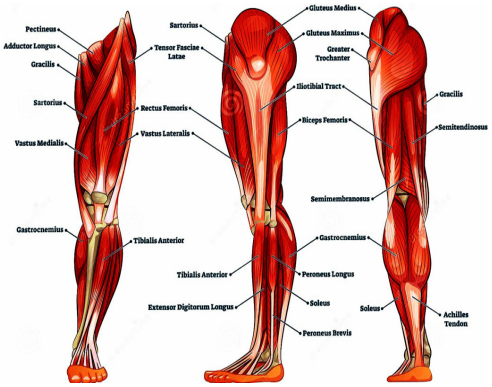

Fig. 1. *The lower limb muscles (anterior, posterior and lateral view)* [14].

As a mechanical effector element of the movement, the joint can be the basis of the joint deficit by losing the stability and / or the degree of mobility of the

two adjacent segments. All joint and periarticular structures can be the basis of these two functional disorders (stability and mobility). The effects of these mechanisms lead to stiffness or joint ankylosis, difficulties in maintaining a posture and proper body alignment [9].

a) The articular balance of the lower limbs

The articular balance represents the measurement of the articular amplitude of movement. Joint amplitude is the objective sign of great importance in examining motor deficiencies, to assess the present condition and to be able to scientifically monitor the therapeutic results and to determine the necessary recovery time. In laboratories you can use complex devices adapted to each joint and movements, but in some cases you can use the gometer [9].

b) Muscle balance of the lower limbs

Muscle balance is a system of manual examination techniques to assess the strength of each muscle or muscle group. The evaluation of the condition of the muscle, with mechanical, electrical, electronic devices, is not included in the balance sheet.

The evaluation is global, when exploring muscle groups with common main actions, and analytical when, through specific positions and maneuvers, the isolated action of a muscle is highlighted [15].

2.1. Diagnosis

The paper is based on an 8-year-old patient, diagnosed last year with a spiroid fracture of the middle third of the left tibial shaft, following an injury.

At the time of the injury, the patient was skiing. She has been practicing this sport for about 2 years. The rupture was produced when she wanted to avoid another child, but entered a mound, braking was impossible and thus fell, leaving all the weight of the body on the left leg.

3. Kinetic Treatment

The recovery program includes: physiotherapy, hydrokinetotherapy, massage and the application of kinetic bands. It consisted of 4 weekly sessions of physiotherapy, 2 weekly sessions of hydrokinetotherapy, daily massage and kinesio taping to facilitate recovery.

The final somatoscopic evaluation has the role of highlighting the applicability of the recovery program, through the positive results obtained in the end.

3.1. The evaluation by inspection and palpation

This assessment is based on the palpation of the main muscle groups, the palpation of the joints that were affected by the trauma and at the same time the observation of the differences in amplitude of the movements. All this is done by comparing the healthy limb with the diseased one.

In this evaluation we found the following:

– hypotonia in the muscles calf, both on the front and on the back;
– difficulty in making movements from the knee joint, respectively from the ankle joint;
– amplitude of limb movements affected were very different compared to the healthy limb.

3.2. The pain assessment

For this evaluation, a visual analog scale (VAS) was used to detect the intensity of pain. It consists of a horizontal or vertical line ending in: "No pain" = level 0 and "Maximum pain" = level 10. The patient will indicate on the line the level of her painful sensation: the distance from end 0 to the indicated level of the patient represents the analogous level of pain [16].

3.3. The articular balance

The articular balance, fig.1, was made with the help of a goniometer, which helps to measure the angle of movement of the joints, the measurement being accompanied by a subjective evaluation ("from the eye"). The balance was applied to both the affected limb and the healthy limb, so we were able to compare the differences in aplitidine according to the movements mentioned above.

At the time of the initial joint assessment, the internal and external rotational movements of the knee, respectively eversion and inversion, could not be performed, due to the patient's contraindications, she could not lie in a prone position and could not bend the knee initial joint. These measurements were performed during recovery.

3.4. The muscle balance

The muscle balance, fig. 2, was applied to both the affected limb and the healthy limb, so we noticed much more easily the differences in tone, which vary depending on the muscles that realize the movement.

The muscle balance was rated on a scale indicating forces from F0 to F5.

3.5. Evaluation tests

a) *Waldron's test* - The patient is lies in supine position. While she performs slow knee flexions, the therapist palpates the patella. If the subject complains of pain and crackles in the joint, the test is considered positive [17].

b) Tibio-fibular compression test - The patient is lying on her back.

The examiner applies pressure to the middle leg, trying to join the two bones. If pain occurs in the lower limb, the test is considered positive. This can be a trauma to the tibio-fibular syndesmosis [1].

c) *The Cotton Test* - The patient is in lying on his back. The therapist stabilizes the distal end of the tibia by applying a lateral force to the leg. The translation of the foot indicates an instability of syndesmosis [1].

Following the application of the recovery program, the results are highlighted by evaluating the patient at the beginning, end and during recovery, which are finally centralized to more easily observe the patient's progress during the application of physical therapy program.

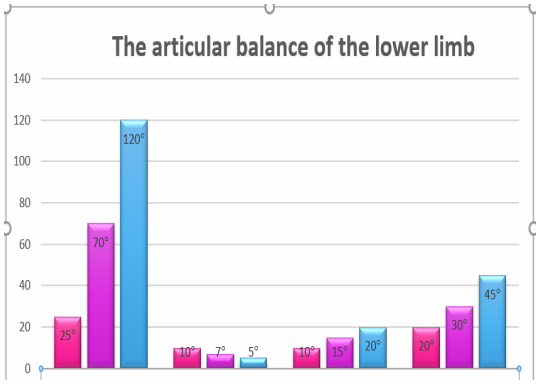

Fig. 1. *The articular balance of the lower limb*

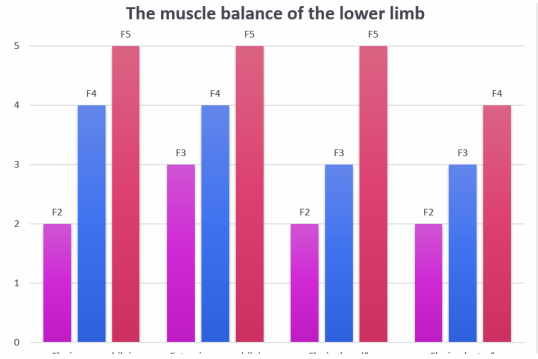

Fig. 2. *The muscle balance of the lower limb*

4. Discussion

After the application of the kinetic program, the patient showed a significant progress, which is highlighted by comparing the initial assessment with the intermediate one and then with the final one. In this case the results were positive regarding the functional parameters (pain, posture, strength, mobility) that were tested.

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