Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEAL
Vol. XVII, ISSUE 2 Supplement, 2017, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST,
DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning, Cabell's Directori

Science, Movement and Health, Vol. XVII, ISSUE 2 Supplement, 2017
September 2017, 17 (2, Supplement): 280-284
Original article

KINETIC-PHYSICAL THERAPY TO ELDERLY'S RECOVERY FROM FEMORAL NECK FRACTURE

FIEROIU Ion Emil[1]

Abstract*

Aim. Locomotor system's injuries feature a very large etiological and morpho-pathogenic diversity, which explains the fact that several surgical – medical specialties intertwine in order to treat them.

Femoral neck fractures – are more common in the elderly, being characterized both by their frequency, and by their seriousness. They are serious, as they can lead to high mortality in the elderly; also, they are serious from a functional standpoint, since they are difficult to consolidate and are often complicated by ischemic necrosis of the femoral head; they are serious also with regard to the respective hip's functional future.

The aim in conducting the research was to demonstrate the immediate and over time effectiveness of kinesiotherapy's means to recover from femoral neck fracture.

Hypothesis Kinetic – physical means help stop the pain and hip's vicious positions, enhance joint mobility and coordination and increase muscle strength. A clinical case of femoral neck fracture was identified to conduct the experiment.

Research objectives. For a proper organization and experiment boost, my aim in carrying out this research was: To highlight the benefits from using kinesiotherapy's methods and means in recovery for the purposes of fighting off pain, restore muscle strength, restore hip's range of motion, relearn motor gestures and acts used in daily activity.

Research tasks. Consult the relevant literature to determine the theme's topicality and its research level; Establish research hypotheses and modalities whereby they will be verified; Select the experimental case in close connection with the research purpose and apply the necessary tests so as to determine the patient suffering from femoral neck fracture's functional state;

Methods. Research methodology – the following methods were used in order to conduct the research: bibliographic study method, survey method, interlocution method, observation method, case study method and graphical method.

After conducting the experiment, I have tried to achieve recovery as fast as possible, joint mobility, muscle strength and muscle mass from the level of hip joint and lower limb affected by the femoral neck fracture.

Conclusions revealed by the research conducted showed that kinetic- physical means cannot be replaced by another recuperative means, as they hold a key place in the patients suffering from femoral neck fracture's recovery.

Keywords: fracture, physical therapy, femoral neck, case study, recovery.

Introduction

The growing interest in traumatology over the past two decades has, due to high morbidity rates with prolonged or permanent incapacity for work, materialized in key changes of healthcare for the trauma-suffering persons, accent being laid on preserving and recovering the trauma-affected or harmed function. Thus, orthopaedic-surgical phase can be distinguished which, without neglecting the anatomical rehabilitation of the segments affected by trauma, aims especially at their functional future. The progress registered by the orthopaedic and surgical techniques was propelled especially by the functional desiderata (Sbenghe, 1981).

Limbs fractures occur particularly in older men and women. In USA, fractures stand for 10% of the total trauma.

Women up to 75 years old mainly suffer fractures of the distal radius epiphysis by the fragment's displacement posteriorly and over 75 years old, hip fractures become more frequent (Tache, 2001).

Locomotor system's injuries feature a very large etiological and morpho-pathogenic diversity, which explains the fact that several surgical – medical specialties intertwine in order to treat them.

Locomotor system's complex morphological structure (bone, joints, muscles, nerves, non-specialized connective tissue, skin), close connection with the nervous and peripheral central nervous system and last,

[1] Medical care and Kinesiotherapy Department, University of Piteşti, ROMANIA
E-mail address: fiero_emilius@yahoo.com
Received 26.03.2017 / Accepted 13.04.2017
* the abstract was published in the 17th I.S.C. "Perspectives in Physical Education and Sport" - Ovidius University of Constanta, May 18-20, 2017, Romania

but not least, the high exposure level to traumatic agents, justify the possibility to develop various seriousness impairments, irrespective of the lesion's etiology or topography in some or several components of the locomotor system (Kiss, 2004).

The locomotor system is made-up of the systems participating, on the one hand in supporting the body and, on the other hand, in locomotion or displacement of its various segments.

The locomotor system is also made up of bones and joints forming the osteoarticular system with a passive role in motion and the muscular system, made up of muscles representing active organs of motion. Bone is, by its architecture, adapted to the function of withstanding pressure and thrust, being submitted to the principle "gain maximum strength with little material" (Niculescu, Cârmaciu, Voiculescu, Sălăvăstru, Niță, Ciornei, 2014).

A fracture represents a complete or incomplete interruption of bone continuity, with or without bone fragments' displacement. If the tegument covering the fracture seat stays intact, this is a closed fracture; if at tegument level, in a direct or indirect relation to the fracture seat there is a continuity solution, this is an open fracture, exposed to contamination or infection. Sometimes, fractures occur following a smaller-degree trauma, acting on a bone which became fragile due to previous suffering (Niculescu, Moldoveanu, 2014).

Clinical signs

Local and general, probability and certainty-related.

The signs of probability are as follows:

- Vivid pain, localized at fracture level; pain is marked when attempting to immobilize or palpate;
- Functional impotence; region's deformation or volume enhancement;

Signs of certainty are:

- Abnormal mobility in the fracture's seat level;
- Lack of transmissibility of motion distal to the injury;
- Obvious interruption of bone continuity;
- Bone crackling in the fracture's seat;
- Limb shortening or abnormal rotation.

The elements of seriousness are represented by: age, time passed until first aid is given, bleeding, sensory or motor troubles, open fracture, related injuries (Georgescu, 2006).

Femoral neck fractures - – are more common in the elderly, being characterized both by their frequency, and by their seriousness. They are serious, as they can lead to high mortality in the elderly; also, they are serious from a functional standpoint, since they are difficult to consolidate and are often complicated by ischemic necrosis of the femoral head; they are serious also with regard to the respective hip's functional future.

Fracture track classifies them into:

- Subcapital femoral neck fractures, where the fracture line goes through the articular cartilage's junction to the femoral neck;
- Transcervical fractures in full femoral neck with oblique or vertical track;
- Basicervical fractures, when the fracture line is located at neck's junction to the greater trochanter (Sbenghe, 1981).

Purpose

The aim in conducting the research was to demonstrate the immediate and over time effectiveness of kinesiotherapy's means to recover from femoral neck fracture.

Research objectives

For a proper organization and experiment boost, my aim in carrying out this research was:

To highlight the benefits from using kinesiotherapy's methods and means in recovery for the purposes of fighting off pain, restore muscle strength, restore hip's range of motion, relearn motor gestures and acts used in daily activity.

- To analyse how the quality of life changed in patients to have practiced a complex and compete kinesiotherapy programme;
- Recovery stages are made up of a chain of kinetic means to regain patient's normal functionality after femoral neck fracture if one of these moments is not reached, the ones to follow can't be approached.

Research tasks

Consult the relevant literature to determine the theme's topicality and its research level;

Establish research hypotheses and modalities whereby they will be verified;

Select the experimental case in close connection with the research purpose and apply the necessary tests so as to determine the patient suffering from femoral neck fracture's functional state.

Hypothesis

The premise I started from in conducting the research was to make an accurate evaluation of how effective kinetic-physical therapy is for the recovery from femoral neck fracture, thus having the possibility to answer questions like:

Does kinetic- physical therapy lead to pain relief and hips' faulty position, to enhanced mobility and articular coordination and muscle strength' increase?

The kinetic programme plays a key part in functional status optimization in the patient suffering from a femoral neck fracture.

Methods

Bibliographic study method.

The bibliographic study method lies at the basis of this research; I used this method by gathering the information necessary both for theoretical foundation, and in practice.

Survey method

I used this method to carry out the anamnesis where I aimed to:

- Get to know the patient
- Find out his evolution dynamic
- Set out the causes to have led to the accident occurrence

The data gathered was compared and correlated to the results from evaluations.

Interlocution method

It is based on the direct dialogue between kinesiotherapist and patient with regard to their health status, the accident suffered and causes to have led to the accident, diagnosis made and treatment they underwent. This method helps get a positive feedback.

Observation method

To observe means to carefully examine a patient, process or state. It is a descriptive method which helps gather data about the person. I used this method in order to carry out patient's description and complex characterization. I also observed patients in non-specific conditions, monitoring their posture and whole-body coordination. Systematic observation helped me collect data aiming at the segment on which trauma occurred.

Case study method

I used this method to conduct and apply the kinetic- physical therapy, pursuing to approach the recovery from femoral neck fracture in several stages in the case study under research.

Graphical method

I used this method to highlight the differences between initial and final assessments to analyse research results.

The experiment

The experiment was conducted at a retirement home called "Casa Speranței" where I had identified a clinical case of femoral neck fracture. The research was conducted by stages as follows:

In the first stage I analysed the theme and started the theoretical documentation. I studied the relevant literature and I selected the methods to be used for the research.

In the second stage, I identified the subject. After having selected the subject, I prepared the material needed to test them and to apply treatment.

In the third stage I established the kinesiotherapy programme for patient's recovery following the individual evaluation.

In the fourth stage, I considered the evolution of patient's dynamic parameters; next, I interpreted the data obtained and subsequently I processed this data graphically.

Results

Upon conducting the experiment, I tried to achieve recovery as fast as possible of joint mobility, muscle strength and muscle mass on hip joint level and lower limb affected by femoral neck fracture.

Another important aspect of recovery is related to gait recovery following femoral neck fracture. Generally, pathological gait is due to lower limbs' inequality, joint mobility's limitation and joint instability. So, recovery aimed also at enhancing joint stability.

The kinetic – physical therapy was completed by adjuvant treatment: medication, massage and occupational therapy. The recovery session's duration took into account the breathing apparatus strain and sedentary patients. The physio-kinesiotherapy session took place with breaks so as to be better tolerated by the patient. Along with muscle strength's development, muscle groups resistance that will be more stressed during professional effort in some patients also need to be trained, using muscle contractions repeated for a longer period.

Choice of medical gymnastics exercises need to take account of how prepared the patient is for professional effort and potential presence of other related conditions.

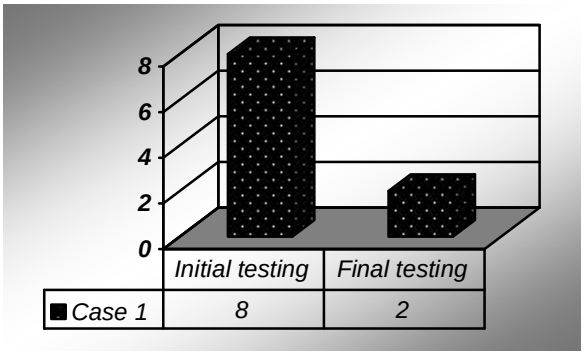
Evaluation of the kinetic exercises' role in the femoral neck fracture's recovery was made having regard to the following objectives:

1. Fight off pain
2. Enhance joint mobility
3. Enhance muscle strength
4. Increase muscle strength

Fighting off pain

I used the Visual Analogue Scale to measure pain.

Our patient registered in the initial testing a scale of 8, and at the final testing of the clinical case subjected to the experiment, the value achieved is 2.



Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEAL
Vol. XVII, ISSUE 2 Supplement, 2017, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST,
DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning, Cabell's Directori

Chart 1 – Comparative analysis of initial and final results in pain measurement

1.Enhance joint mobility

Hip mobility's assessment is made on a plane surface in ventral decubitus position. The goniometer is placed at trochanter level.

The following mobility degrees were registered in assessment of joint mobility at hip level:

Hip mobility	Flexion	Extension
Active	**35°**	**5°**
Passive	**42°**	**8°**

***Table 1* – Distribution of mobility degrees in the initial assessment.**

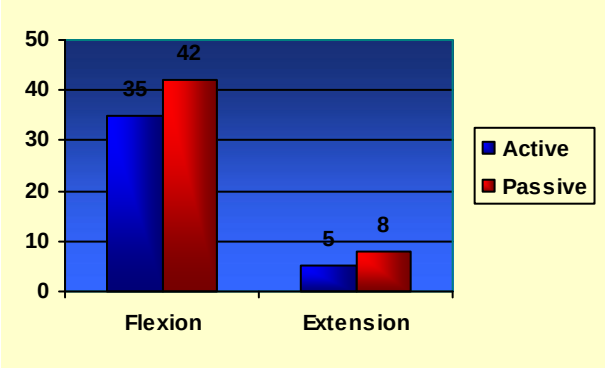


***Chart 2* – Hip mobility degrees in the initial testing.**

The following degrees of mobility were registered in the final testing of joint mobility assessment on hip level:

Hip mobility	Flexion	Extension
Active	**90°**	**13°**
Passive	**98°**	**15°**

***Table 2* – Distribution of mobility degrees in the final assessment**

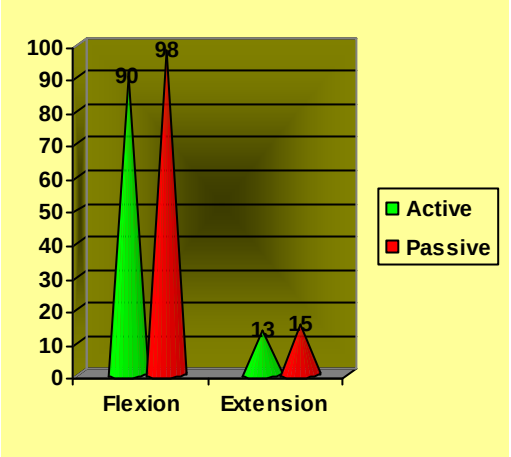


***Chart* 3 Hip mobility degrees in the final testing**

3. Enhance muscle strength

The kinesiotherapist should, when evaluating strength, take account of the following patient features: age, gender, motor ability to perform the movement requested, psychological profile with regard to the cooperation degree (there are patients attempting to cheat by trying to show higher muscle strength, and in contrast to them, there is the category of patient showing muscle strength lower than in reality).

In the initial testing to assess strength in our patient, an important muscle fibre mass was felt upon palpation on quadriceps level; the movement had insufficient strength and range of motion for the function. I assigned a rating of 2.

After the kinetic programme was carried out, our clinical case made remarkable progress, classifying on the assessment scale at level 5.

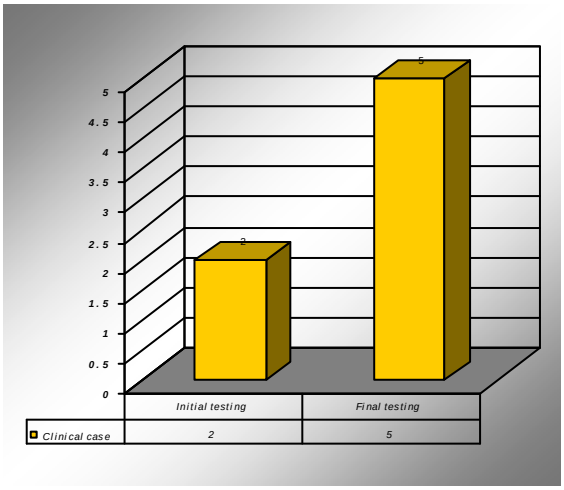


***Chart .4.* Comparative analysis of initial and final results in strength assessment**

4. Perimeter of thigh

I assessed the perimeter of thigh using metric tape and the following results were obtained:

The following results were reported in the initial testing:

Perimeter of thigh	Initial testing	Final testing
Contraction	**37^0**	**39^0**
Relaxation	**34^0**	**36^0**

***Table 3* – Distribution of perimeter of thigh**

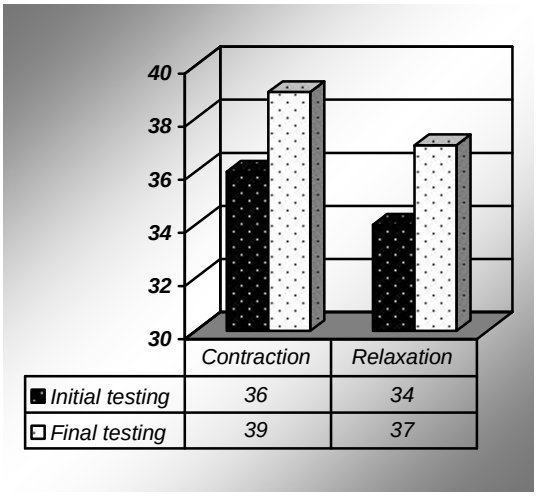


Chart 5. Comparative analysis of initial and final results at the assessment of the perimeter of thigh

Discussions

Magheru, 2007 in his doctoral thesis titled "Anatomo-functional study with regard to factors conditioning the recovery process after fractures of proximal extremity of the femur" makes a description of medical- surgical recovery following the femoral neck fracture. Also, the author approaches widely the problem of prophylaxis of fractures in general and proximal extremity of the femur especially by medical and kinetic means.

Beţişor, 2005 in his doctoral thesis "Hip replacement in the femoral neck displaced fracture and its outcome" conducts a study on hip arthroplasty for the femoral neck displaced fracture on a sample of 320 patients. This paper proposes to optimize the quality of life and restore the ability to work in persons suffering from femoral neck fracture.

Conclusions

Conclusions revealed by the research conducted showed that kinetic- physical means cannot be replaced by another recuperative means, as they hold a key place in the patients suffering from femoral neck fracture's recovery.

Training of subjects ever since the recuperative programme's beginning on the objectives pursued and effect of physical exercises over the body, forming strong motivations led to treatment's optimization via their aware and active participation.

Hip joint failure was improved via the means selected and early application of the kinesiotherapeutic treatment, giving it the strength needed for propulsion ensuring body's static and dynamic balance, giving the patient the possibility to return to their social and professional life.

Choice and application of physical exercises should take account of particularities relating to age, gender, degree of prior physical training and the type of sequalae after which the content of the patient's programme is structured and adequate kinetic-physical recovery therapy is applied.

Acknowledgments.

The researchers would like to thank the participants involved in this study.

References

Beţişor A, 2005, Artroplastia de şold în fractura deplasată de col femural şi consecinţele ei, lucrare de doctorat realizată sub îndrumarea profesor universitar, doctor Nicolae Testemiţanu

Georgescu L, 2006, Prim ajutor și traumatologie sportivă aplicată, Editura Universitaria Craiova, pag. 52-53

Kiss I, 2004, Fiziokinetoterapia și recuperarea medicală, Editura Medicală, București, pag. 8

Magheru C, 2007, Studiu anatomo-funcțional privind factorii care condiționează procesul de recuperare după fracturi ale extremității proximale a femurului lucrare de doctorat realizată sub îndrumarea academician profesor universitar Mircea Ifrim, Oradea

Niculescu M, Moldoveanu M, 2014, Ortopedie și traumatologie, Editura All, București, pag.141

Niculescu C, Cârmaciu R, Voiculescu B, Sălăvăstru C, Niță C, Ciornei C, 2014, Anatomia și fiziologia omului, Editura Corint, Bucureşti, pag.48

Sbenghe T, 1981, Recuperarea medicală a sechelelor posttraumatice ale membrelor, Editura Medicală, Bucureşti, pag. 7

Tache G, 2001, Ghid de medicină fizică și recuperare medicală, Editura Escripta, București, 43