

## FOLLOW-UP OF SELF-SERVICE ABILITIES (OF LABOUR AND DAILY NEEDS NATURE) AMONG PATIENTS WITH DISTAL RADIUS FRACTURE

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The purpose of the research is to examine, follow and report on the improvement of abilities to do daily and labor activities among patients with distal radius fracture in early and late post-immobilization period.

**Materials and methods:** 106 patients who suffered from distal radius fracture were included in the study, they underwent a physio-rehabilitation program adjusted to each particular case which included sub-water gymnastics – local bath tub with water temperature 34-36° C, in the area of wrist joint and forearm, kinesitherapy, occupational therapy, impulse magnetic field – 15–20 min, 2 A, 1 – 100 Hz, interference currents – 5 min, 90 – 100 Hz; 10 min 1 – 100 Hz, 10 procedures daily.

**Results and analysis:** Comparative analysis of results shows that patients with injured non-dominant limbs have less difficulty in early post-immobilization period than patients with traumas in a dominant limb. In the end of the rehabilitation patients with injured dominant upper limbs have better test results.

**Conclusion:** in order to get good results in rehabilitating patients with distal radius fracture and improving their self-service abilities the due beginning of the rehabilitation process and including labour therapy and everyday life activities in the form of guidelines are of utter importance. The functional labour therapy stimulates patients' self-dependence and speeds up their return to professional and social activity.

**Keywords:** fracture, distal radius, self-service, rehabilitation, occupational therapy.

Conference participant, National championship in scientific analytics

### Introduction

Distal radius fracture is a common trauma, approximately 15% of all fractures among elderly people [2, 3, 4]. In case of traumatic wrist injury one loses first their ability for self-service, they become dependent on other people's help and last but not least, they lose their labour efficiency for a certain period of time [6, 7, 8].

The treatment of distal radius fracture is conservative – placement of plaster immobilization for 30-40 days after manual reposition or operatively – by means of needles, plates, hobs or external fixture [5, 11]. After the immobilization has been removed the patients are sent for rehabilitation at the specialized departments for physical and rehabilitation medicine [10, 12].

### Objectives and tasks of the survey

The objective of the survey is to examine, follow and report on the recovery of various daily and labour activities, made on a daily basis by patients with distal radius fracture in early or late post-immobilization period.

The tasks in front of us are:

1. To select the most appropriate test which would help us register with digital index the extent of self-service and daily activities performance before and after the rehabilitation course.

2. To report on the extent of self-service improvement as a result of the rehabilitation program immediately after removing the plaster immobilization and at the end of the rehabilitation process.

3. To analyze the results and make recommendations referring to the improvements in self-service and daily activities performance among patients with wrist traumas.

4. To analyze the connection between extent of self-service ability and injured limb – whether dominant or non-dominant.

### Materials and methodology

During the period July 2009 – October 2012 106 patients, 86 women and 20 men between 18 and 89 years old, diagnosed post distal radius fracture have passed through the Department for Hospital Rehabilitation at the Clinic for Physical Medicine and Rehabilitation in University Hospital „Dr. G. Stranski” – Pleven, Bulgaria.

Out of all patients 51 had traumatized dominant limbs (usually right ones) and 55 patients with non-dominant.

When starting the physiotherapeutic program all patients were put to the test on activities from everyday life, prepared in the Centre for Medical Rehabilitation in New York [1, 9]. This test consists of four parts – personal hygiene maintenance, activities connected to putting on shoes and clothes, food preparation and feeding activities, as well as other daily and labour activities.

The results from the first rehabilitation course were processed, the stage right after removal of plaster immobilization and upon finishing the rehabilitation process (usually after second and third rehabilitation course).

Usually this period lasts for 2-3 months, and init the time for immobilization is also included (an average of 33 days).

### The complex physiotherapeutic and rehabilitation program includes:

sub water gymnastics – local bath tub with water temperature 34-36° C, in the area of wrist joint and forearm, kinesitherapy, occupational therapy, impulse magnetic field – 15–20 min, 2 A, 1 – 100 Hz, interference currents – 5 min, 90 – 100 Hz; 10 min 1 – 100 Hz, 10 procedures daily.

For reaching the purpose of our research we focused only on the test of performing daily and labour activities. The assessment is a 6-grade one – from 0 to 5 – and patients assessed themselves the following basic activities no matter whether a dominant or a non-dominant limb was injured: *writing (only for the active hand), opening/closing of a door, opening/closing of a window, locking/unlocking with a key, turning over the pages of a book or a newspaper, lighting a match stick, dealing with a wallet and money, coins counting, using a handkerchief, switching on an electrical lamp, manual washing, hanging out the laundry, ironing, dialing (both a mobile phone and a stationary one).*

We tried to select activities that everybody who suffers from a hand trauma, encounters and finds difficult to handle.

For the performance of those elementary at first sight activities we gave guidelines to patients to ease

their self-service, to include the injured limb in without sparing it, but putting a moderate load on it.

The very first thing a patient should do is to sign a document and when the dominant hand is injured this becomes a complicated task (fig. 1). Turning over the pages of a book or a newspaper requires good coordination and fine finger movements (fig. 2).

Lighting a match stick is a difficult activity for an injured dominant or non-dominant limb. Dealing with wallet and money requires a precise clutch, especially when counting banknotes (fig. 3, 4).

When opening a door or a window we recommend that the injured limb is used, no matter whether dominant or non-dominant, in order to train the volume of motion in shoulder and radio-ulnar joint. Locking and unlocking using a key requires good side clutch of the dominant limb and enough motion in the radio-ulnar joint.

Switching on and off a desk lamp or another lighting fixture is an easy activity and is recommendable to be performed with the injured limb no matter whether the latter is dominant or non-dominant.

Every injured person has now and then to do some hand washing of underwear for instance – then they need

to be careful with the temperature of the water not to be too hot or too cold, and to mind not to load too much.

For hanging out the laundry one needs to have good volume of motion in the shoulder joints in case the wash-lines are stretched at a greater height.

Ironing is an energy-consuming activity, and patients should be cautious with their overall load. We recommend it to be performed on an ironing board while sitting and with a lighter iron, especially if a dominant limb has been injured, and if it is a non-dominant one, more attention should be paid on not burning the fingers as they are difficult to move.

Using a stationary phone with buttons is a comparatively easy activity, but if it is with a number dial it often impedes patients, which requires the assistance of the sound limb (fig. 5). Using a mobile phone hinders even more the activity, and then both hands are needed so that the injured holds the phone and the sound one pushes the buttons (fig. 6).

### Results and analysis

The results of the tests we put in a specially developed individual for each patient card and the data processing we did as per Wilcoxon rank test (a statistical method for analysis and distribution of

non-parametric data).

With activities usually performed by the dominant limb that require better coordination of the fingers, more strength in the clutch and enough motion in the radio-ulnar and wrist joints (writing, locking and unlocking with a key, lighting a match stick, turning over the pages of a newspaper, ironing, using a telephone) immediately after removing the plaster immobilization Wilcoxon's curve forms two peaks, but in the end of the rehabilitation process the peak remains only one and it moves to the right (fig. 7).

With activities that can be performed equally well by the dominant and the non-dominant limbs (opening/closing of a door or a window, using a handkerchief, switching on an electrical lamp, and hanging out the laundry) the curve forms one peak in the beginning and in the end of the rehabilitation process and it moves to the right (fig. 8).

### Conclusions

1. The two-peak curve immediately after removing the plaster immobilization shows that patients with injured dominant limbs have greater difficulty in performing some daily activities than those with injured non-dominant limb.
2. In the end of the rehabilitation the curve forms one peak no matter



fig. 1.



fig. 2.



fig. 3.



fig. 4.



fig. 5.



fig. 6.

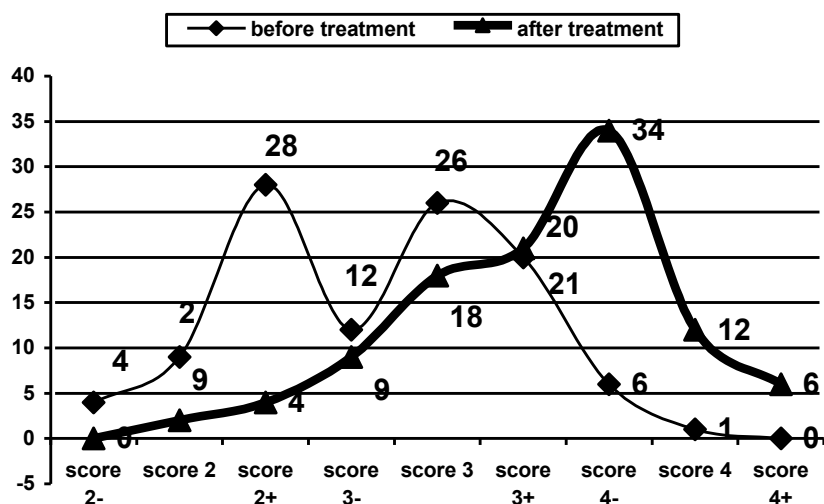


Fig. 7. Wilcoxon's curve of everyday life activities – daily and labour activities in the beginning and in the end of the rehabilitation process

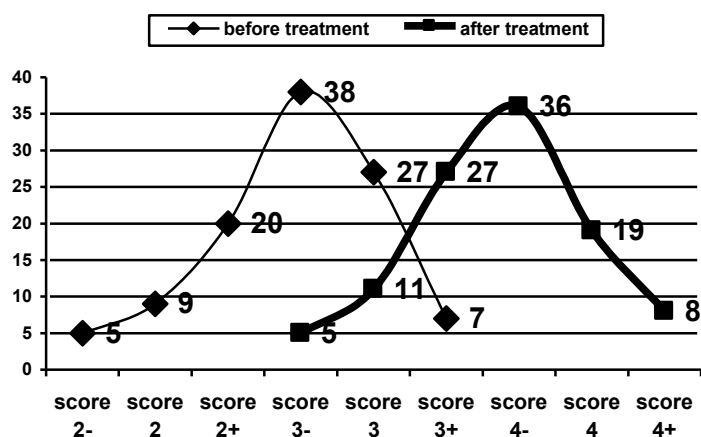


Fig. 8. Wilcoxon's curve of everyday life activities – daily and labour activities before and after rehabilitation

which limb has been injured, which we account for the genetically determined functional role of the dominant limb and its gradually unconscious involvement in everyday life activities.

3. In the end of the rehabilitation period Wilcoxon's curve moves to the right which proves improvement in the patients' self-dependence.

4. Activities that can be performed equally well by the dominant and the non-dominant limbs do not cause hinders to patients in the beginning of the rehabilitation process.

#### Summary

In order to get good results in rehabilitating patients with distal radius fracture and improving their self-service abilities the due beginning of

the rehabilitation process and including labour therapy and everyday life activities in the form of guidelines are of utter importance. The functional labour therapy stimulates patients' self-dependence and speeds up their return to professional and social activity.

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