Vasileva, D., & Andonovska,T. (2024). Functional recovery in patients with ulnar nerve injury, *MEDIS - Medical Science and Research, 3*(3), 19-21.
doi: 10.35120/medisij030319v UDK: 616.833.36-085.8

FUNCTIONAL RECOVERY IN PATIENTS WITH ULNAR NERVE INJURY

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Abstract: Painful sensations that occur after peripheral nerve injury are a major problem for patients. They occur most often in the acute phase of muscle denervation (denervation pain) or in the early phase of the regeneration process (regenerative pain). The pathophysiology of these painful conditions is complex and results in difficult differentiation of different types of painful conditions that are of crucial importance for the selection of an appropriate therapeutic approach. The place, the degree of the injury, the age of the patient, as well as the delay in starting the treatment significantly affect the outcome of the rehabilitation of injuries of the ulnar nerve. Ulnar nerve rehabilitation in elderly patients, high-level injuries, and delayed cases may result in a poor prognosis. For high-level lesions and lesions that are close to the elbow, the nerve transposition treatment is used. Immobilization in wrist flexion and/or elbow extension with carpal tunnel and release of Guyon's canal are necessary for lesions closer to the wrist. Cubital tunnel syndrome is the second most common compression syndrome of the upper extremities, after carpal tunnel syndrome. The type and severity of nerve injury determines the extent of pathological changes, the capacity for regeneration and the prognosis for recovery. The aim of the study is to shorten the duration of the rehabilitation process and increase the functionality of the affected limb by timely recognizing the symptoms and starting the rehabilitation treatment of the patients, so that the patient would return completely to the activities of everyday life. Material and methods: The study included 10 subjects (5 male subjects and 5 female subjects) in whom the ulnar nerve was diagnosed during the examination. They are treated at the Public Health Institucion University Clinic for physical medicine and rehabilitation in Skopje, for a period of 20 working days. The effect of the conducted physical and kinesitherapy procedures is evaluated. The following were used during the treatment: paraffin therapy, electrical stimulation, Transcutaneous Electrical Nerve Stimulation, galvanic current, diadynamic currents, kinesitherapeutic exercises (pastoral and actively assisted). Due to the number of studies, it is challenging to make a definitive recommendation before conducting research with a larger number of respondents.

Keywords: ulnar nerve paresis, cubital syndrome

Field: Public Health and Medicine

1. INTRODUCTION

There are several mechanisms of injury to the ulnar nerve: traumatic (fracture, cut) and mechanical, which occurs when n. ulnaris suffers prolonged pressure, usually in the back of the elbow area where it is placed most superficially under the skin. N. ulnaris emerges from the medial bundle of the plexus brachialis (C8 and Th1) and in the upper part of the upper arm lies medial to a. brachialis. Then it goes to the sulcus nervus ulnaris on the outside of the epicondyle of the humerus, and from there it goes to the forearm in the sulcus antebrachii medialis. On the forearm it goes together with the ulnar artery, and with final branches it divides on the medial part of the palm. N. ulnaris is a mixed nerve. Motor innervates m. flexor carpiulnaris, hypothenar muscles, part of the thenar muscles not innervated by n. medianus, all interosseous muscles and the two medial lumbrical muscles. It sensory innervates the skin of the hypothenar and partially the skin of the fingers.

2. MATERIAL AND METHODS

The study included 10 subjects (5 male subjects and 5 female subjects) who were diagnosed with a rupture of the ulnar nerve during the examination. They are treated at the Public Health Institucion University Clinic for physical medicine and rehabilitation in Skopje, for a period of 20 working days.

- Method of kinesitherapy:

During the treatment, physical procedures (heat procedures and electrical procedures) and kinesitherapeutic exercises were used in order to reduce pain, improve trophism and allow a faster return of the complete function of the affected limb. During the dosing of all the above-mentioned procedures, attention was paid to the patient's condition in terms of fatigue and load. The following methods were used during the treatment: paraffin therapy, electrical stimulation, TENS, galvanic current, diadynamic currents, kinesitherapeutic exercises (pastoral and actively assisted).

- Examination methods:

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In the course of the research, functional diagnostic methods were applied, summarizing the results obtained at the beginning of the treatment, on the tenth day and on the twentieth day of the treatment. The results and condition of the muscles (m. flexor carpi ulnaris and m. oponens digiti minimi) are registered and evaluated with the MMT and the mobility of the wrist with a goniometer.

Tab.1. Tabular presentation of subjects with injury of n. ulnaris

Group of respondents	Age	Duration of the problem
10 patients (5 men and 5 women)	36,5 ± 9,4	From 2 months to 6 months

Source: Authors' own research Vasileva, D. and Andonovska, T.

- Statistical methods:

For the purposes of the research, a program for qualitative data processing was used. They are processed with variation (Student-Fisher t-test) and alternative analysis, which summarize the changes during the therapy.

3. RESULTS

After finishing the treatment and summarizing the obtained results, a comparison was made of the achieved changes after two ie. four weeks. The obtained data are shown in tab.2, tab.3, figure 1. and figure 2. through which a significant improvement in the condition of the majority of patients was observed.

Tab.2. Tabular data display of changes in m.flexor carpi ulnaris and m. oponens digiti minimi

Musculus	Day 1, _ X ±SD	Day 10, _ X ±SD	Day 20, _ X ±SD
m. flexor carpi ulnaris	1.4 ± 0.62 **	2.27 ± 0.77 **	3.84 ± 0.93 **
m. oponens digiti minimi	0.63 ± 0.54 **	1.83 ± 0.67 **	2.82 ± 0.73 **

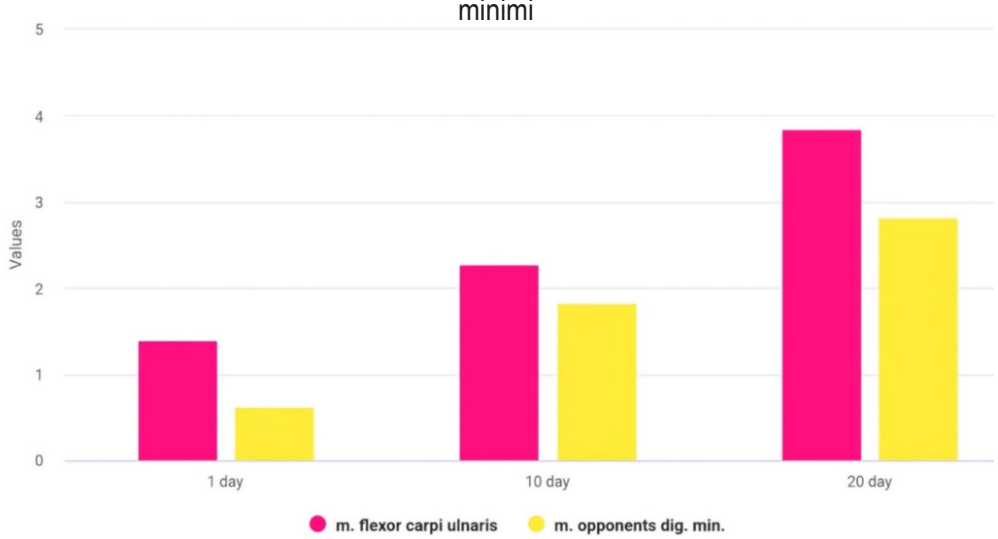
** p<0,05 – significant changes in movements in relation to the beginning and end of the treatments
Source: Authors' own research Vasileva, D. and Andonovska, T.

Tab.3. Tabular data display of changes in movements of the wrist

ROM	Day 1, _ X ±SD	Day 20, _ X ±SD
Dorsiflexion	42 ± 12.48 **	59 ± 10.44 **
Palmar flexion	48 ± 10.53 **	65.5 ± 12.93 **
Radial deviation	10 ± 3.87 **	17.5 ± 4.6 **
Ulnar deviation	1.5 ± 5.5 **	13.5 ± 6.72 **

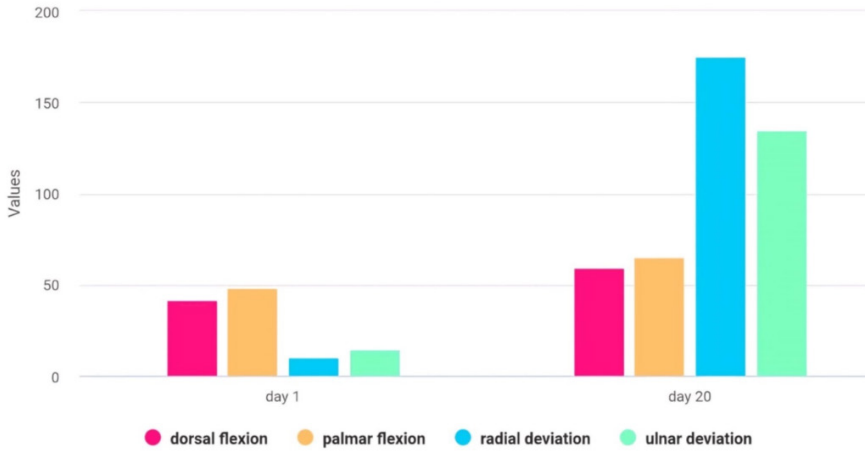
** p<0,05 – significant changes in movements in relation to the beginning and end of the treatments
Source: Authors' own research Vasileva, D. and Andonovska, T.

Figure 1. Results obtained by manual muscle test of m. flexor carpi ulnaris and m.oponens digiti minimi



Source: Authors' own research Vasileva, D. and Andonovska, T.

Figure2. Changes obtained by measuring movements of the wrist



Source: Authors' own research Vasileva, D. and Andonovska, T.

4. DISCUSSION AND CONCLUSION

Ulnar nerve impingement is a common occurrence in forearm bone injuries. Patients face difficulties in performing daily life activities and are dysfunctional in society. With timely recognition of the symptoms and starting the rehabilitation treatment of the patients, the duration of the rehabilitation process is shortened and the functionality of the affected limb is increased.

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