- Eliminating some subjective choices, at the final testing, most data showed a "positive" percentage increase or decrease, which demonstrates that the determination of the students' sources of anxiety is a necessity and should be inserted as a requirement at the beginning of each theoretical or practical –methodological course.

References

1. Dean, O. (2004). *Basketball on paper: Rules and tools for Pperformance analysis*, US, Brassey's, Inc.
2. Dominic, O.L. (2006). *The relationship between physical characteristics and shooting ability of Kwara State basketball players*-Journal of Education Research and Development Vol.1 (2):167-172.
3. Epuran M., Holdevici I., Tonița, F. (2001). Psihologia sportului de performanță- București: FEST, p.93.
4. Niculescu M., (2000). Psihologia sportului-Constanța: Ex Ponto, 2000, p. 61
5. Sisodiya, A.S., Yadav M. (2010). Relationship Of Anthropometric Variables To Basketball Playing Ability,Journal of Advances in Developmental Research 1 (2) 2010: 191-194
6. Știr C.C. (2003) *Psihologia sportulu*i-Galați: Fundației Universitare „Dunărea de Jos", p. 88.

ROLE OF THE KINETIC THERAPY IN POSTTRAUMATIC HAND INJURIES

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Abstract

Regardless of the type of injury and the initial form of treatment, the posttraumatic hand requires specific programs of functional rehabilitation.

Material and Methods. The study was conducted over a period of 6 months on an important case which presented a complex trauma to the right hand. I applied tests to assess for pain, mobility, strength, global motor assessment and functionality. Kinetic therapy was performed daily in the first month and 3 times / week for the next months. The objectives targeted reliving pain and muscles atrophy, restoring mobility and strength, sensitivity rehabilitation and recovery of the gesture coordination.

Results. The evolution of the pain on VAS scale recorded significant decreases in all testing times. Mobility deficiency existing in the wrist and fingers diminished showing at the end of the second stage mobility closer to normal values. The strength testing was found to increase to the next evaluation, improving visible in the second stage of treatment. Overall assessment done on the three periods of treatment shows a favorable evolution, the patient managed to achieve major ADLs. At the end of treatment functionality recorded a percentage of 93.33% of normal.

Conclusion. A well-developed kinetic therapy treatment restores normal range of motion, combats existing deficits and enhances the functionality of the hand with an increase in quality of life.

Keywords: hand, trauma, peripheral nerve injury, kinetic therapy.

1. Introduction

The hand is the most complex segment of the body member. Both structure and function are adapted to human activity. Hand enormous area represented in the cortex is really showing the importance of this organ in the body.

The traumatic hand, regardless of the type of injury and the initial form of treatment requires functional rehabilitation specific programs. Results of recovery programs are influenced by the complexity and type of trauma, type of the orthopedic treatment, orthopedic surgery or plastic surgery rehabilitation, treatment initiation, patient's genetic predispositions and its medical history.

2. Material and Methods

Because of the importance of the hand as an organ in the body, I selected an interesting case with a complex trauma to the right hand presenting the lesions of the cubital and median nerves of the right forearm, lesion of the tendon of the flexor pollicis longus (FPL), lesion of the tendon of the flexor digitorum superficialis (FDS) and the tendon of the flexor digitorum profundus (FDP) fingers II-V, lesion of the tendon of the flexor carpi radialis (FCR) and the tendon of the flexor carpi ulnaris (FCU).

The study was conducted over a 6 month period from January 6th, 2014 to July 30th 2014, and the applied kinetic treatment for recovery in that period was structured into two phases due to the fact that after 3 months of treatment it was requested a surgical intervention to remove the scars adhesions which impeded nerves recovery and dragging of the tendons in their sheath.

There were made four evaluations to the patient in the first stage of treatment and after the second surgery has been reviewed for 4 more times applying VAS for pain, wrist and fingers joints range of motion, by applying goniometry measurements for fingers-palm distance, manual muscle testing and dynamometry for the muscles of the fist joint, global motor assessment of the wrist and hand joints and functional index of the hand(1).

The kinetic Treatment started 4 weeks after surgery while the patient wore a type of forearm-hand brace to keep the hand in flexion position. The kinetic therapy was performed daily during the first month; 3 times / week in the second month and the in the third month, with the same algorithm after the second surgery.

The main objectives were target by kinesiology sessions:

- Relieve of pain and strains by wearing the night splint and adoption of resting relaxed positions Local and general relaxation massage to relieve pain on the hand and on entire upper limb;
- Prevention of the muscle atrophy with electrical muscle stimulation devices for muscles innervated by the median and cubital nerves by passive, passive-active exercises, exercises for stretch-reflex promoting support and maintains normal strength for unaffected muscles(2).
- Restore the range of motion (ROM) through passive analytical movements of flexion-extension, abduction-adduction of the fist, metacarpophalangeal (MCP), proximal interphalangeal (PIP), distal interphalangeal (DIP) flexion-extension,, fingers abduction -adduction; light stretching movements for fist and finger flexors; active exercises for fingers-flexion and the closure of the fist. No wrist extension was associated with fingers extension; fingers extension exercises were done one by one for each of them.
- Rebalancing mechanical joints with active and active resistance mobilizations to the wrist and healthy hand; analytical active exercises of gravitational postures of the wrist and fingers flexion and extension, flexion of MCP + PIP + DIP, flexion of MCP + PIP with DIP extension, flexion of MCP + PIP + DIP extension, flexion PIP, flexion DIP, extension PIP+DIP from MCP flexion; active flexion-extension mobilizations of the fingers in water after complete healing of scars.
- Increase muscle strength through active-resistive analytical light movements for wrist and finges flexors, abductors, adductors and opponens pollicis, lumbricals, interosseous palmaris; proprioceptive neuromuscular facilitation techniques for specific force (IL, ILO, SR, SI, IA, CR) in the fingers and wrist strength; global exercises soliciting distally-proximally and vice versa; Kabat- diagonals for upper limb; exercises with elastic bands, dumbbells, manual resistive exercises and with water resistance(2).
- Reeducation of touch, pain, proprioceptive, kinesthetic, thermal, discriminative sensitivity by progressive stimulation of non-enervated areas for 5-10 minutes 3 times/day.
- Gestural coordination recovery and the ability to grip, multi-fingers gripping, multi-fingers and palmar gripping, opposition, analytical exercises and using objects (balls, bows, elastic bands, rods); active mobilization on the Canadian plate, fist flexion-extension, fingers flexion-extension, for strength and complete griping reeducation.

The combat of wrong specific motions schemes of the median and cubital nerve palsy.

3. Results

The evolution of the pain VAS (visual analogue scale) recorded significant decreases in all testing times. At the first assessment the patient had an intensity of 6 on VAS and after three months of treatment the pain disappeared. At the beginning of phase II of kinetic treatment, the pain intensity was 4 on VAS scale, and then pain diminished until her disappearance in a much shorter period compared to the first stage.

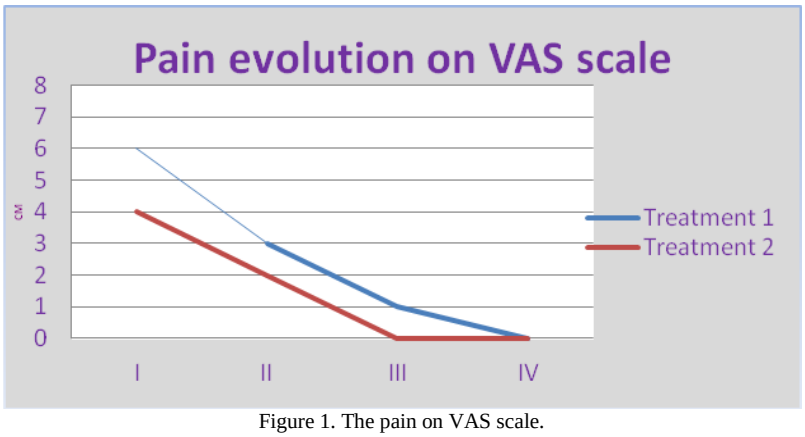
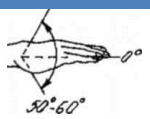
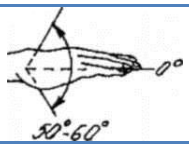
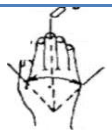


Figure 1. The pain on VAS scale.

In the chart above we can observe the evolution of mobility on the two stages of treatment and at what level reached at the end of treatment.

Due to the immobilization the values were low at the beginning of treatment but with after the removal of brace and healing of scars the mobility in the wrist increased closer to normal values at the end of the second stage of treatment.

Table 1. Wrist joint assessment.

Right wrist	Joint Assessment	Flexion	Extension	Right fist.	Abduction	Adduction
	Ia	5	8		3	**1**
	IIa	20	25		8	**6**
	IIIa	43	42		15	**8**
	IVa	50	52		25	**12**
	Ib	10	10		10	**5**
	IIb	40	35		15	**7**
	IIIb	65	65		27	**12**
	IVb	**75**	**65**		**35**	**15**

In the table below you can see the MCP mobility deficiency PIP and DIP and patient progress made during the two phases (stages) of treatment. The interphalangeal joints can be seen a shortage of extension to the initial assessment. During the treatment the deficit decreased and by the end of the second stage of treatment the deficit disappeared.

Table 1. Fingers joints assessment

Deficiency Fingers-extension	Assessment	Thumb	Index	Middle-finger	Ring-finger	Little finger
I.a MCP	Ia	30	45	40	40	35
	IIa	15	25	20	20	30
	IIIa	5	10	10	10	13
	IVa	0	0	0	0	0
I.a PIP	Ia	20	50	60	67	30
	IIa	5	30	35	40	0
	IIIa	0	0	15	10	0
	IVa	0	0	5	0	0
I.a DIP	Ia		30	45	35	0
	IIa		0	30	7	0
	IIIa		0	30	5	0
	IVa		0	15	5	0
II.b MCP	Ib	15	15	18	15	15
	IIb	10	8	14	10	10
	IIIb	0	4	6	0	0
	IVb	0	0	0	0	0
II.b PIP	Ib	5	23	20	30	20
	IIb	0	12	13	23	7
	IIIb	0	0	5	8	0
	IVb	0	0	0	0	0
II.b DIP	Ib		20	25	12	0
	IIb		6	14	3	0
	IIIb		0	8	0	0
	IVb		0	0	0	

The figure below show the evolution finger flexion mobility measurements using hand-finger distance. In the first stage of treatment the distance was 2.4 cm and at the end of stage I to 0, the fingertips touching the palm. In the second phase of treatment the patient started at 4 cm- distance, but favorable development was faster, leading to 0 after the III rd evaluation.

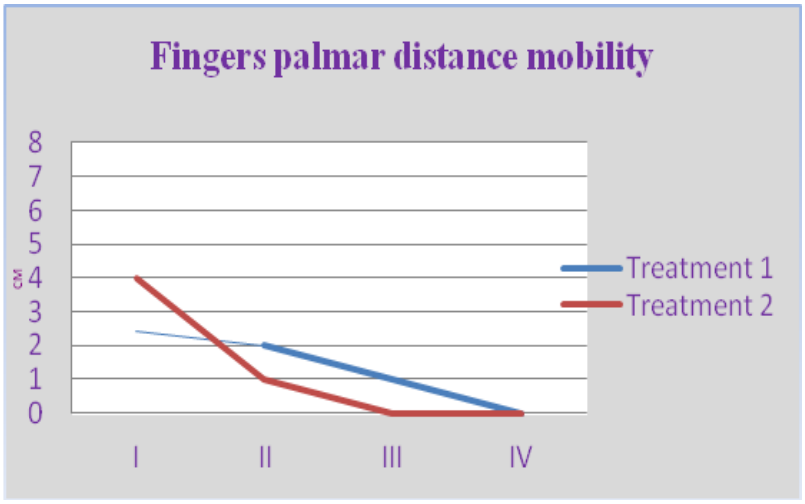


Figure 2. Fingers-palmar distance mobility

At the onset of recovery program the muscle strength was undermined by prolonged immobilization period and paralysis of muscles innervated by the cubital and medial nerves (palmaris longus, palmaris brevis, cubital anterior, flexor digitorum profundis, flexor digitorum superficialis, interossei, lumbricals, flexor pollicis longus, flexor pollicis brevis, adductor pollicis, flexor digiti minimi, abductor digiti minimi, opponens digiti minimi) and taking in consideration the existing muscles atrophy on the right hand and forearm. After the first treatment was possible the movement against gravity, without being able to perform resistance exercises. At the end of the second stage of the treatment the muscle strength approached the normal values, although with little difficulty making resistive movements on certain muscles groups.

Using the dynamometer for testing the strength there were visible improvements of strength from one evaluation to the other evaluation.

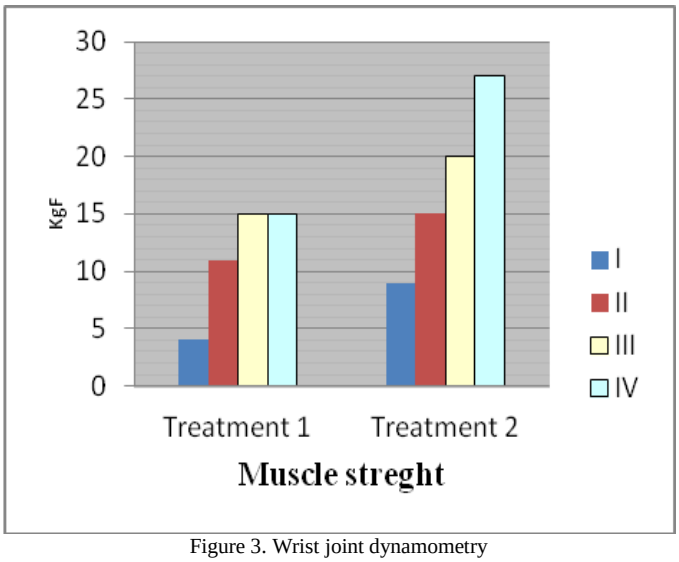


Figure 3. Wrist joint dynamometry

From the overall evaluation done on the three treatment periods show that the patient had a favourable evolution, managing to achieve the main ADL near normal. At the end of the treatment, the global motor assessment of the patient has a super net value compared to the first assessment.

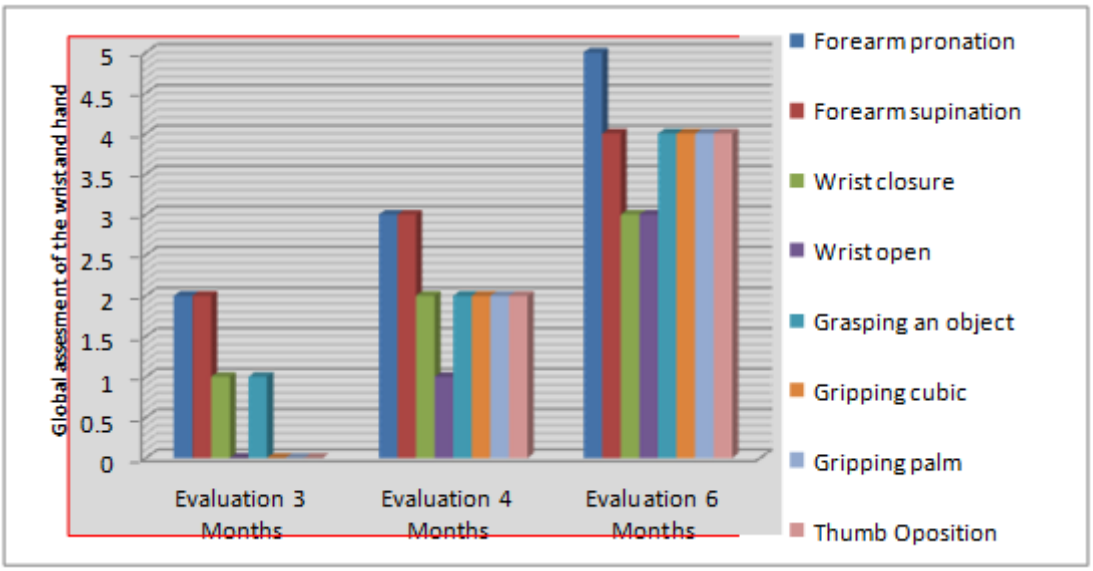


Figure. 4 Global motor assessment

Functional index showed a significant increase after three months of treatment. In the first stage of treatment the level of functionality of the affected segment was half less of the normal functional capacity, leading to a final functional index of 93.33% and the patient could perform normal movements relatively easy but with no motor control.

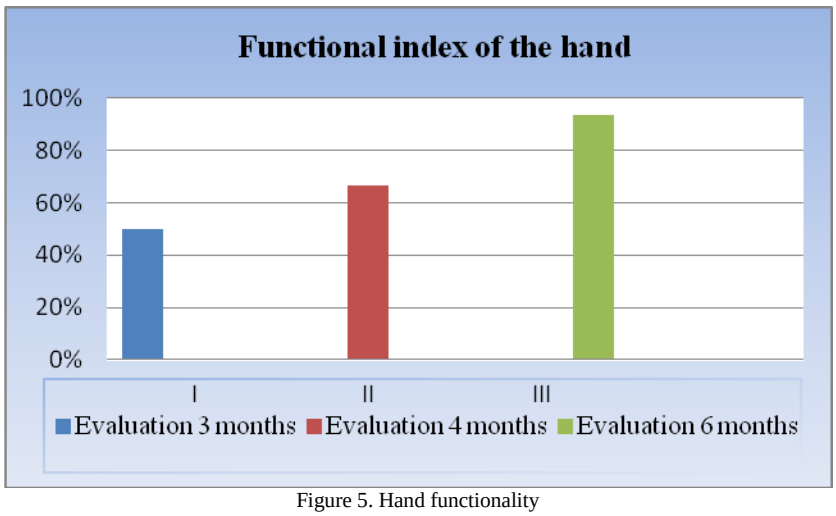


Figure 5. Hand functionality

4. Discussions

Trauma of the hand can reach major functional disorders by installing vicious postures, stiffness of joints with limitation of the range of motion. Nerve palsy compromise needs of everyday life.

In the case of a peripheral nerve surgery it is important to take in consideration the joint angle degree at which the sutures were made. Increasing of the range of motion was done gradually in 20-30 days, as the scars healed they were mobilized gently, without pain and without jerky movements not to compromise breaking the sutures. (4).

Nerve regeneration is performed depending on location and type of the lesion, the rhythm of regeneration of motor fibers of the median nerve is 1.5 mm \ day and of the cubital nerve is 1,2 - 1,5 mm / day. Restoring the overall sensitivity is achieved after approximately 1 year (3,5).

In general, spontaneous recovery takes 1 year - 1 year and 6 months and about as if it was necessary and nerve suture.

The positions to prevent deformities are used most often in injuries of nerves, tendons and muscles, in order to avoid deformations that are caused by an imbalance of power between the forces agonists, which are reduced or diminished by antagonists, which remained intact(5,6).

Active kinesiology supposed the existence of voluntary muscle contraction.

Of great importance is the prevention and treatment of the vascular and trophical phenomena in the case of damage peripheral nerves, especially the median nerve showing more pronounced those phenomena.

Restoration of hand movement ability is the final stage of any motor and sensory reeducation. It uses compound exercises, complex (proximal-distal and distal- proximal), and various processes of occupational therapy(7,8).

Results depend on the degree of stabilization of the disorder and rational classification of occupational therapy in the clinics of rehabilitation functional recovery.

5. Conclusions

Following the development and application of an appropriate kinetic treatment the clinical symptoms and the functionality improved. A well appropriate kinetic treatment rebuilts the normal range of motion and combats the existing deficits.

According as the nerve recovers it was possible the improvement of the muscle strength at the affected segment, the electrical stimulation having an incontestable role achieving the objective.

In trauma of the hand with nerve palsy, sensitivity reeducation is very important, starting three months after the trauma, when the patient is able perceiving the tactil stimuli – „under the lesion".

The earlier kinetic recovery applied after the second surgical intervention determined the combat of adhesions formation and the combat of complications appearance.

Through adapted and individualized early kinetic techniques it was obtained a rapid reintegration in the social and professional life.

The increasing of the hand functionality determined an improvement of the life quality.

References

1. Miller A., Heckert Di Cuccio K., Davis B., (2009).*The 3-minute musculoskeletal & peripheral nerve exam Demos* Medical Publishing, 3: 143-167
2. Kiss Jaroslav – *Fizio-kinetoterapie şi recuperare medicală în afecţiunile aparatuluib locomotor*, Ed. Medicală, 2012: 39-54
3. Sbenghe T.,(1987). *Kinetologie profilactică, terapeutică şi de recuperare*, Ed. Medicală, 2: 28-87, 7:445- 478, 9: 589-608
4. Antonescu D.(2006) . *Patologia aparatului locomotor vol. I* , Editura Medicală Bucureşti.
5. Ring D., Cohen M., (2010) *Fractures of the hand and wrist*, Informa Healthcare, 2: 52-74, 7: 134-156
6. Cooper C**.,** (2006). *Fundamentals of Hand Therapy Clinical Reasoning and Treatment Guidelines for Common Diagnoses of the Upper Extremity*, Elsevier Health Sciences, 201-251, 320-348
7. Tomoaia G., (2008). *Traumatologie osteoarticul*ară, Ed. Medicala Universitară Iuliu Hateganu, Cluj Napoca, 5: 398-412
8. Niculescu M., Raveica G, Oiaga F., (2008). *Tratamentul ortopedico-chirurgicalşi kinetoterapie în afectiuni ale aparatului locomotor,* Ed. Alma Mater, Bacau 2008, 2: 27-37

LONGITUDINAL STUDY ON THE EFFECTIVENESS OF THE GAME ACTIONS AT THE EUROPEAN MEN'S HANDBALL CHAMPIONSHIP SENIORS (1998-2014)

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Abstract
During the 11 editions of the European Handball Championships the competition format has suffered some changes in the number of teams participating, number and structure of the group, the number of games played of the participating teams. This study may lead to the identification of evidence indicating trends of men's handball for the period 1998-2014, thus creating the conditions for the establishment of principles for achieving preparation and participation in high level competitions. As a result of comparing the data obtained from the analysis performed should be reconsidered margins effectiveness of actions to be monitored useful landmarks in training and competition, imposing to reconsider the role model of the performance handball game for seniors.

Keywords: handball, analysis, European Championships, men

1. Introduction

Handball is a relatively young sport, appeared at the end of the 19th century and quickly spread worldwide. Ancestors of this game are found in ancient cultures of Europe (Greece, the Roman Empire) and Asia (China).

The widespread it enjoys led to his inclusion among the Olympic sports as demonstration sport at the 1936 edition and is constantly in the Olympic program since the 1972 edition.

At the continental level in Europe, upon the establishment the European Handball Federation in 1991, it was decided to organize the first European championships. The first edition of the European Men's Handball Championship seniors held in 1994 in Portugal. The competition takes place from 2 to 2 years, during two weeks in January and February (from the 2000 edition).