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THE KINETIC APPROACH OF LATERAL EPICONDYLITIS RECOVERY

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Abstract: *We conducted a study of 10 patiets affected by lateral epicondylitis, 5 woman and 5 men, aged between 20 and 38. In the initial evaluation, I applied 2 tests: VAS Scale, for pain assessment and Oxford Questionnaire to assess the functional deficit. Initial testing showed a very high value of the pain scale, an average of 8,5 out of 10 and the Oxford questionnaire demonstrated that the deficiencies caused by epicondylitis make the usual activities very difficult, as evidenced by an average of 21,3 out of 48. After 20 days of the rehabilitation treatment, meanwhile I worked on improvingin the analgesia andrestoring mobility and stability within the functional limits, I obtained a final assessment of the improvement of Pain Scale and Oxford Questionnaire scores.*

Key words: *lateral epicondylitis, kinetic programs, evaluation tests*

1. General Aspects

The elbow is a complex hinge joint formed by other three joints: the humerocutaneous joint, a trochler-arthrosis with a role in the flexion-extension movements, the humeroradial joint and the superior radiocutaneous joint that plays a role in the pronation and supination [3].

Considering the articulation of the elbow as a morphological unit, it is composed of troley, humeral condylum, the sigmoid cavity of the cubitus and the articular capsule covering the entire structure formed as a sleeve.

To ensure stability, the joint capsule is strengthened by the ligament device formed by the medial and lateral collateral ligament [8].

Epicondylitis is an inflammatory condition of the tendons that serve the extensor muscles of the hand. The condition is caused by repeated overload of the arm implicitly of the elbow, the symptoms being: elbow inflammation, persistent pain, swelling and functional deficit.

The patient presents pain at the insertion of the tendon and tenderness in the lateral area of the elbow, the most sensitive area being located previously and distally to the lateral epicondyle of the humerus. In this case the pain can radiate to the forearm and, very rarely, to the arm.

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2. The Purpose and Hypothesis of the Paper

We decided to address this issue to help people who suffer from lateral epicondilitis by improving ADL's, reducing pain and increasing the strength and mobility of the elbow, forearm and fist joint.

Researching this topic is a real interest among tennis players through the development of a complex recovery scheme [6].

We want to exemplify the best method of treatment, the hypothesis from which we started is to prove that the recovery of lateral epicondylitis through kineto-therapy by approaching it with a complex protocol.

The objectives pursued in this paper were the following:

- exemplifying the theoretical framework for epicondylitis;
- shaping and applying a rehabilitation program based on physical therapy techniques;
- analyzing and evaluating patients involved in research;
- tracking certain indicators such as pain and function.

3. Materials and Methods

In this paper we conducted a research study on a group of 10 athletes tracking the symptoms, deficiencies and problems caused by lateral epicondylitis and aiming to exemplify the recovery of them through physical therapy.

We used the Oxford questionnaire as the main method of evaluating the functional deficit, and the pain was evaluated using the VAS scale. The subjects participated in two trials, initial testing, and then final testing at the end of the treatment.

3.1. Pain Assessment

The pain VAS is a unidimensional measure of pain intensity, which has been widely used in diverse adult populations [10].

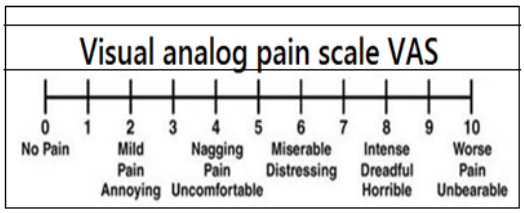

Fig.1. *Vizual analog pain scale VAS*

The VAS scale is divided into 10 pain stages, from 0 to 10. Pain is measured taking into account that the minimum pain level is "0" and the maximum level is "10".

3.2. Assessment of Functional Deficit

The Oxford Questionnaire (OES) assesses health and functional deficiency in the shoulder [7]. The questionnaire contains 12 questions, marked from 0 to 4 and scored as the following:

-Score: 0 to 19: extreme damage
-Score: 20 to 29: moderate impairment
-Score: 30 to 39: slight damage
-Score: 40 to 48: normal function

4. Presentation of Subjects

The research was conducted on a group of 10 athletes affected by lateral epicondylitis, 5 female and 5 male, ages 20 to 38, 4 athletes, 2 tennis coaches and 4 amateur players. The table below shows the detailed situation of each patient.

Presentation of subjects Table 1

Name	Sex	Age	Occupation	Affection
E.R.	M	25	Performance athletes	Left side epicondylitis
T.Z.	F	31	Coaches	Right lateral epicondylitis
O.P.	M	26	Performance athletes	Left side epicondylitis
D.C.	M	33	Performance athletes	Left side epicondylitis
G.M.	M	20	Performance athletes	Right lateral epicondylitis
P.E.	F	31	Amateur players	Right lateral epicondylitis
S.B.	M	26	Amateur players	Right lateral epicondylitis.
M.A.	F	29	Jucător amator	Left side epicondylitis
P.P.	F	26	Coaches	Right lateral epicondylitis.
S.R.	F	38	Amateur players	Left side epicondylitis

5. Targets and Recovery Treatment

In the recovery of the elbow, the main objectives pursued are the following:

- analgesia;
- restoring mobility within the functional and normal limits;
- restoring muscle strength;
- restoring stability, controlled moves and ability [1].

The most important treatment techniques are distraction as well as radial and ulnar springing, in combination with relaxation of the muscles that insert at the elbow. Distraction is performed with the patient supine and the arm to be treated flexed at the elbow, with the supinated forearm supported against the shoulder [4, p. 191].

The theory behind this program is to load the muscle, to induce hypertrophy and increase traction strength. This reduces pressure on the tendon during activities. Eccentric contractions can create a larger stimulus for tendon cells, producing collagen and making the tendon resist more.

Physical therapy starts with analgesia because no kinetic protocol is applied on painful backgrounds. This goal is accomplished by postures within the functional limits, then autopasive exercises from sitting and passive - active exercises performed from orthostatism and dorsal decubitus.

As soon as the pain is gone, there are performed exercises to strengthen the forearm muscles to start protection for the injured tendon and prevent the recurrence of the lesion. Also, 2 days after the pain disappears, we start the stretching exercises for the muscles that are attached to the lesioned tendon using the elastic band. Pronation and supination are practiced with resistent exercises, light movements of the arm with a dumbbell in the hand and forearm placed on the thigh, repeating twice a day for 20 minutes.

The restoration of mobility is accomplished by toning exercises performed either from sitting, orthostatic or dorsal decubitus, active exercises and active with resistance. Muscle strength is restored solely through strength-based exercises and skillful exercises.

Patients should also be advised to avoid the overhanded lifting technique. The primary mode of lifting should be a bilateral underhanded or neutral forearm approach [5, p. 147]. It is recommended to continue the exercises in the form of warming up before practicing any sport

that requires the concerned anatomical part.

The clinician must thoroughly evaluate risk versus benefit before initiating the treatment. Additionally, the patient should be educated regarding side effects and recommended safety precautions [9].

6. Subjects Testing

The 10 patients were initially evaluated and tested at the beginning of the kinetic treatment and at the end of the treatment.

Subjects testing

Table 2

		Pain testing		Functional deficit testing	
Name	Sex	Initial testing	Final testing	Initial testing	Final testing
E.R.	M	8	3	18	40
T.Z.	F	7	0	21	48
O.P.	M	9	1	25	46
D.C.	M	10	3	15	38
G.M.	M	7	0	24	48
P.E.	F	8	1	22	41
S.B.	M	9	2	21	42
M.A.	F	8	0	27	47
P.P.	F	9	0	25	48
S.R.	F	10	1	15	37
Average		8,5	1,1	21,3	43,5
Favorable values		0		48	

7. Interpretation and analysis of results

The initial analysis of the group showed that the greater share was in between the age group of 20-30 years, 6 patients, which proves that the occurrence of this disease appears also at younger people.

Initial test showed a very high pain scale value, an average of 8.5 / 10, and the questionnaire demonstrated that the deficiencies caused by epicondylitis makes the everyday chores difficult as shown by an average of 21.3 / 48. Final test, performed after recovery treatment, shows very good values of applied tests, demonstrating the effectiveness of kinetotherapy in treating this condition.

Share of recorded results

Table 3

Score type	*40 - 48 normal function*	*30 - 39 easy affection*	*20 - 29 moderate impairment*	*0 -19* extreme damage
Number of baseline cases	0	0	0	10
Initial weight	0 %	0 %	0 %	100 %
Number of final cases	8	2	0	0
Final weight	80 %	20 %	0 %	0 %

Following the test results, we found 3 cases that reached the maximum values: patient T.Z. of 31 years, patient G.M. of 20 and P.P. for 26 years.

In addition to these 3, all patients resumed their sport activity, making sure that before performing any of the activities they perform some stretching moves and warm-up exercises.

Below we present the subjects according to the score obtained in the Oxford questionnaire both at the initial and the final examination.

8. Interpretation of the Results

The graph below shows two key moments of the research study, the results of the two tests, the initial test and the final test, both for pain testing and for functional deficit testing.

The charts exemplify the obvious improvement in the quality of life of patients.

In the pain test chart (Figure 2), we will exemplify the course of pain intensity in the 10 patients and in the graph of the functional deficit (Figure 3) we will notice the improvement of the elbow function.

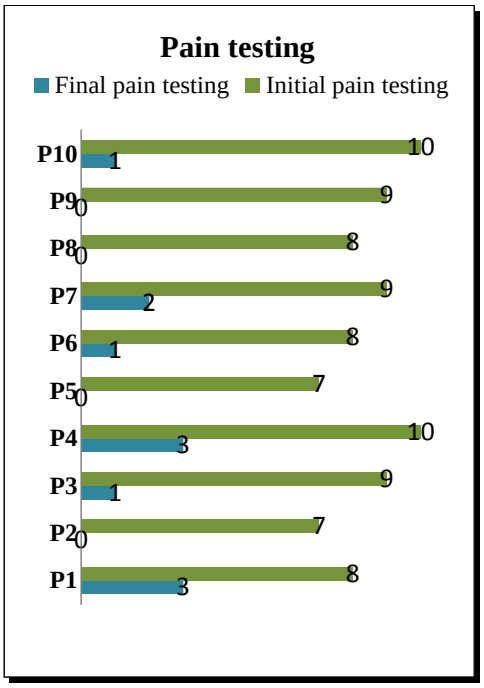

Fig.2. *Pain testing chart*

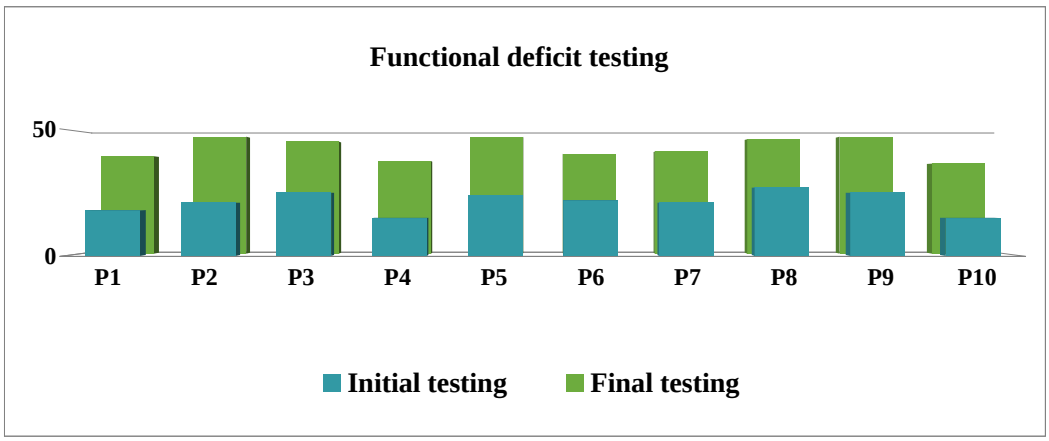

Fig.3. *Functional deficit testing chart*

9. Conclusions

Lateral epicondilitis is a condition that describes the pain and sensitivity localized to the lateral epicondyle of the distal of the humerus [2]. In this article we discussed the elbow pathology, assessment of the patient's joint and the kinetotherapy program recommended in this situation on a group of 10 athletes.

After an anatomical description of the joint, the entire study focused on step-by-step recovery of this condition quite frequently to tennis players.

It can be noticed that epicondylitis is a condition requiring special attention due to the complexity of recovery methods, being a chronic condition whose incidence increases with age and time of performance.

Creating the recovery program for the lateral epicondylitis involves the integration of shoulder joint, arm, elbow joint, forearm, fist and hand joint, since the elbow is an intermediate joint and requires recovery of the entire upper limb.

Due to the anatomical and functional complexity of the elbow recovery requires a long recovery time, as demonstrated in this study, in which we showed an improvement in the symptomatology. Being a chronic condition, elbow recovery with epicondylitis requires a long time.

Research has shown us that this inflammatory condition is often only partially treated, requiring a long-lasting physical therapy program.

Following the treatment plan, some improvements were observed on all plans of movement. Differences between initial and final results were not very high, but an improvement in functionality in the affected arm could be observed in all patients.

The best results in pain and functional scale after treatment were observed on the following patients: T.Z., G.M. and P.P.

In conclusion, the application of physical therapy on patients with epicondylitis has positive results, especially in regaining the functionality of the entire superior member.

The obtained results highlight the effectiveness of applied programs and implicitly improve the quality of life of patients.

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