A COMPLEX PHYSIOTHERAPEUTIC APPROACH TO LATERAL EPICONDYLITIS

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ABSTRACT

Introduction. Lateral epicondylitis is a common problem in a diverse group of people (computer workers, heavy physical laborers, and athletes). The patients complain of elbow pain in certain wrist positions. As the problem continues over time, some limitations in motor activity are observed, caused by pain and grip weakness. Conservative treatment includes various methods (medications, therapeutic exercises, kinesiotape applications, etc.), but there are a few articles with specific physiotherapeutic programs and presented results. The aim of the paper is to present our complex physiotherapeutic approach and its results. Methodology. We worked with 17 patients with lateral epicondylitis. The average duration of complaints was 5.2 months. We applied instrumental-assisted soft tissue mobilization and therapeutic exercises to advise on modifying the activities of daily living. The procedures continued until the pain symptoms decreased or disappeared (average of 5.4 procedures). We followed up our patients with the visual analog scale for pain, the questionnaire "Disabilities of the arm, shoulder, and hand" (DASH), and dynamometry. All tests were performed at both the initial and final procedures. Results. At the beginning of the therapeutic course, the average VAS value in provoking activities was 5.1, which is considered moderate pain. At the last procedure, we observed a statistically significant reduction in pain, an average of 2.1 ($p < .001$). The DASH score at the beginning showed an average of 25.9 points, and after completion of the procedures, it decreased significantly to an average of 15.5 points ($p < .001$). Grip strength also showed positive changes, increasing from 32.2 kg to 33.0 kg ($p < .001$). Conclusion. Our comprehensive physiotherapeutic approach yields effective and rapid results in managing the acute symptoms of patients with lateral epicondylitis. Compliance, combined with an individual approach and a close relationship with the attending physician, provides good functional recovery of patients with this condition.

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INTRODUCTION

Lateral epicondylitis, also known as tennis elbow, is a common problem in a diverse group of people. Their occupations range from computer work to heavy physical labor (construction workers, electricians, etc.) and active sports. The most characteristic symptom of this condition is elbow pain in certain wrist positions (Popov, 2006; Popov & Dimitrova, 2007; Bozentka & Lopez, 2011). As the problem continues over time, limitations in motor activity are observed, caused by pain and weakness of the grip. Conservative treatment includes various methods, but most likely as follows:

- *Medications* (Bonczar et al., 2023; Kamien, 1990; Karabinov & Georgiev, 2022; Nirschl & Sobel, 1981; Behrens et al., 2012; Kinov, 2019);
- *Application of physical factors* (Bonczar et al., 2023; Duncan et al., 2019; Kamien, 1990; Karabinov & Georgiev, 2022; Kim et al., 2021; Nirschl & Sobel, 1981; Chen et al., 2023; Uttamchandani & Phansopkar, 2024; Trudel et al., 2004; Behrens et al., 2012; Pathan, Sharath, 2023; Kinov, 2019);
- *Therapeutic exercises* (Bonczar et al., 2023; Duncan et al., 2019; Karabinov & Georgiev, 2022; Yoon et al., 2021; Kim et al., 2021; Nirschl & Sobel, 1981; Chen et al., 2023; Uttamchandani & Phansopkar, 2024; Trudel et al., 2004; Behrens et al., 2012; Croisier, J. et al. 2007; Radpasand, 2009; Popov & Dimitrova, 2007; Popov, 2006; Kinov, 2019)

- *Soft tissue and joint mobilizations* (Pathan & Sharath, 2023; Radpasand, 2009; Papa, 2012; Nagore et al., 2023);
- *Kinesiotape applications* (Popov & Dimitrova, 2007; Giray et al., 2019; Cho et al., 2018).

Without a doubt, physiotherapy is the basis of the nonoperative treatment of lateral epicondylitis. However, in the available literature reviewed, publications with specific physiotherapeutic methodology and monitored results for this condition are rare.

Therefore, this report aims to present our complex physiotherapeutic approach for lateral epicondylitis and its results.

Material and methods. The study cohort consists of 17 patients with lateral epicondylitis (14 men and 3 women, with a mean age of 42.8 years). All patients had given informed consent for the study. The average duration of their complaints was 5.2 months. As for professional engagement, 11 work mainly on computers, 5 work in construction, and 1 is a musician. The primary focus of our physiotherapeutic program was the application of instrumental-assisted soft tissue mobilization (IASTM) using the Ergon technique (Figure 1) and therapeutic exercises.

Figure 1. *An instrumental set for the Ergon® technique*

We used some basic and advanced Ergon technique strokes, adapted to the patient's condition (Figures 2-8).

Figure 2. *"Rub" desensitization stroke*

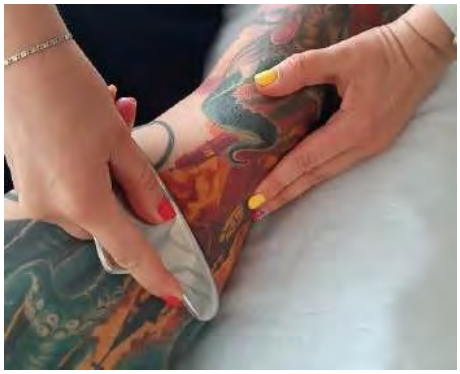

Figure 3. *"Razor" stroke for the lateral side of the arm*

Figure 4. *"Wave" stroke for the triceps muscle.*

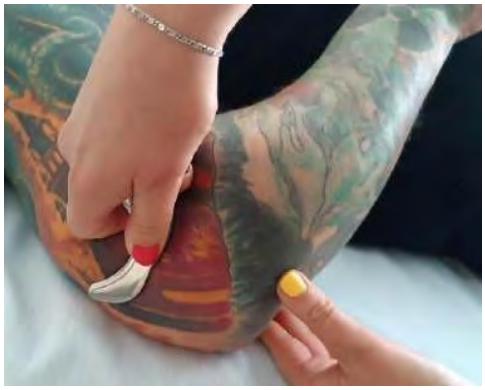

Figure 5. *"Sculpt" stroke for the insertions of the wrist extensors*

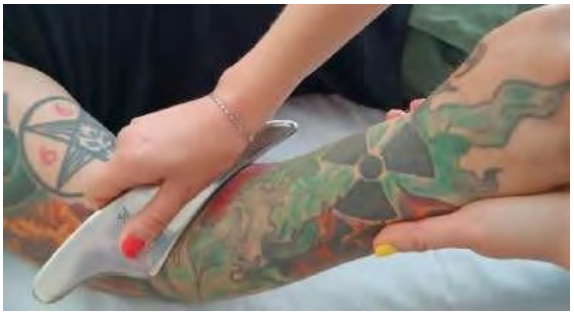

Figure 6. *"Wave" stroke for the forearm*

Figure 7. *"Sculpt" stroke combined with stretching of the wrist extensors*

Figure 8. *"Wave" stroke combined with resistive active wrist extension*

The therapeutic exercises were focused on maintaining the neutral wrist position against different kinds of resistance (manual, free load, elastic, etc). Initially, the exercises are performed in the physiological planes in a series of 8-10 repetitions, with a hold in the final position for 2-3 seconds (Figure 9 and 10). Depending on the therapeutic response, combined movements against resistance with a flexbar are added - one series, 6-8 repetitions (Figure 11).

Figure 9. *(A and B).Wrist extension from full flexion to neutral wrist position*

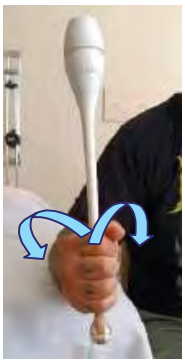

Figure 10. *Forearm resistive rotations*

Figure 11. *(A and B). Exercises with Flexbar*

Together with the patients, we also discussed how to modify their activities of daily living to reduce complaints. The procedures were carried out one to two times a week, and instructions were provided

for self-performing exercises. The therapeutic course continued until the pain symptoms decreased or disappeared. We achieved that for an average of 5.4 procedures. We followed up our patients using the visual analog scale (VAS) for pain in provoking activities, the Bulgarian version of the questionnaire "Disabilities of the arm, shoulder, and hand" (DASH), and dynamometry with a Jamar Hydraulic Hand Dynamometer (Figure 12). All tests were performed at both the initial and final procedures.

Figure 12. *Grip testing with Jamar Hydraulic Hand Dynamometer*

RESULTS

The results were processed on IBM SPSS 23. To test the statistical reliability of the results, we used Student's T-test for dependent samples. At the beginning of the therapeutic course, the average VAS value in provoking activities was 5.1, which is considered moderate pain. At the last procedure, we observed a statistically significant reduction in pain – an average of 2.1 ($p < .001$)- as shown in Table 1.

Table 1. *Results of the VAS scale.*

VAS	First procedure		Last procedure		d	*t*	*p*
	Mean 1	*SD 1*	*Mean 2*	*SD 2*			
	5.1	1.3	2.1	1.8	3	3.367	< .001

The DASH common score at the beginning showed an average of 25.9 points, and after completion of the procedures, it decreased significantly to an average of 15.5 points ($p < .001$). Before starting the procedures, the pain symptoms significantly hindered the work and sports activities of our contingent, respectively, 26.5 points from the DASH work module and 73.8 points from the DASH Sports/Music module. At the final procedure, all of those scores are improved by 9.2 points ($p < .002$) from the work module and 45.2 points ($p < .007$) from the Sports/Music module (Table 2).

Table 2. *Results of the DASH.*

	First procedure		Last procedure		d	*t*	*p*
	Mean 1	*SD 1*	*Mean 2*	*SD 2*			
DASH common score (points)	25.9	9.29	15.5	7.83	18.1	6.053	< .001
DASH work module	26.5	25.14	9.2	12.91	17.3	3.787	< .002
DASH Sports/ Music Module	73.8	2.61	45.2	28.23	28.6	3.495	< .007

At the first procedure, the pain (average 32.2 kg) limited the grip strength. The final measurement showed an increase in grip strength to 33.0 kg ($p < .001$) (Table 3).

Table 3. *Results of the measurement of the grip strength.*

Grip strength (kg)	First procedure		Last procedure		d	*t*	*p*
	Mean 1	*SD 1*	*Mean 2*	*SD 2*			
	32.2	8.03	33.0	8.23	0.8	4.440	< .001

DISCUSSION

In the available literature, a significant amount of attention is given to the combination of various therapeutic agents for the nonoperative treatment of lateral epicondylitis. Therapeutic exercises have a significant contribution to reducing pain symptoms (Yoon et al., 2021; Kim et al., 2021; Giray et al., 2019; Croisier et al., 2007; Radpasand, 2009; Papa, 2012; Nagore et al., 2023). Nowadays, IASTM is widely used for treating various muscle and joint injuries, with promising results (Gupta et al., 2024; Tasheva, 2019). Regarding the application of the IASTM in patients with tennis elbow, we found two clinical cases described by Papa J. (2012). The author applied various physiotherapeutic agents (including IASTM using the Graston® technique and therapeutic exercises) in two women with lateral epicondylitis. At the end of the treatment course, both patients' complaints were minimized or disappeared. After an 8-month follow-up, neither of them reported a recurrence of the complaints. Our results also confirm the beneficial effect of combining IASTM with therapeutic exercises in lateral epicondylitis.

CONCLUSIONS

Our comprehensive physiotherapeutic approach yields effective and rapid results in managing the acute symptoms of patients with lateral epicondylitis. With the reduction of pain, patients improve the complex function of the upper limb, which is crucial for their return to work, sports, and playing musical instruments. Compliance, combined with an individual approach and a close relationship with the attending physician, provides good functional recovery of patients with this condition.

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