
PHYSIOTHERAPY MANAGEMENT FOR TENNIS ELBOW: A CASE STUDY

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Abstract

Introduction: In daily life, people with activities or work that involves repetitive hand movements can lead to complaints in the arms, especially the elbows, one of the risk factors for tennis elbow. *Tennis elbow* is a disorder involving joint mobility and range of motion, muscle performance associated with tendonitis inflammation of the wrist extensor tendon attached to the lateral epicondyle that can cause pain and disability. Tennis elbow happens in about 40% of the population and mainly occurs in men and women aged 35 to 54. In addition, 50% of tennis players also experience pain in the elbow, with 75-80% due to tennis elbow. The physiotherapy modalities used are SWD (Short Wave Diathermy) and exercise therapy in the form of active and strengthening exercises.

Case Presentation: A 40-year-old woman works as a private employee in print media in Yogyakarta with pain in her right elbow. The pain has been felt since September 2021, after the patient painted his house. Currently, the pain is felt during daily activities such as personal hygiene, carrying loads, riding a motorcycle, and typing in the office.

Management and Outcome: The patient undergoes three physiotherapy treatments, 60 minutes for each session, in the form of TENS, SWD, and exercise therapy. The evaluation consists of pain measurement using NRS, muscle strength measurement using MMT, Range of Motion measurement using a goniometer, and functional ability measurement using PRTEE.

Discussion: The aim of the physiotherapy program for tennis elbow patients is to reduce pain and improve muscle strength, joint range of motion, and functional ability. The exercise therapy was also performed on tennis elbow patients, which was aimed to help the muscles contract and relax to control specific movements.

Conclusion: Physiotherapy program in the form of TENS, Short Wave Diathermy, and Exercise therapy for patient with diagnosed tennis elbow gave several improvements such as decreasing pain, increasing range of motion, muscle strength, and functional ability.

Keyword: Tennis Elbow, Pain, SWD, Physiotherapy Program, Exercises

Introduction

In everyday life, someone who does activities or work that involves repetitive hand movements can cause complaints in the hands, especially the elbows. This incident is one of the risk factors for tennis elbow or lateral epicondylitis. Tennis elbow is a disorder of joint mobility, muscle performance, joint range of motion disorders associated with inflammation of the tendonosis of the wrist extensor tendon that attaches to the lateral epicondylus so that it can cause pain and disability (Brumit et al, 2013).

About 40% of people experience tennis elbow, which the average occurs in men and women between the ages of 35 to 54 years. In addition, 50% of tennis players also experience pain in the elbow with 75-80% due to tennis elbow (Bisset et al, 2015). The twisting and repetitive motion of tennis players is also a factor in the number of tennis players who suffer from tennis elbow.

In handling tennis elbow cases, physiotherapy plays a role in the healing process. The physiotherapy modality used is SWD (Short Wave Diathermy) and exercise therapy in the form of active exercise and strengthening exercise. Shortwave diathermy (SWD) is heating carried out using a frequency of 27.12 MHz with an intensity of 40-70 W and a time of 15 minutes (Bababei et al, 2019).

Active and strengthening exercises are exercises used for patients with tennis elbow complaints. In active exercise, the patient actively stretches the hand to the wrist (Weber et al, 2015). Then, for strengthening exercise, the patient performs pronation, supination, palmar, and dorsi flexion movements using weights held in his hands. Both therapies This exercise is performed 8 times with 3 repetitions.

Case Presentation

Subjective Examination

A 40-year-old woman who works as a private employee in print media in Yogyakarta complains of pain in her right elbow. The patient has complained of pain since September 2021 after the patient carried out activities to paint his house. Currently, the pain is felt during daily activities such as personal hygiene, carrying loads, riding a motorcycle, and typing in the office. Then the patient decided to go to the Condong Catur Hospital and start doing therapy on December 7, 2021.

Physical Examination

Prior to intervention, the physiotherapist conducts a first examination of the patient. The examination includes examination of vital signs, inspection, palpation, examination of basic movements, measurement of pain, measurement of muscle strength, measurement of joint range of motion, edema measurement, and examination of functional activity.

Based on the examination of vital signs, blood pressure: 120/90 mmHg, height: 161 cm, weight: 68 kg, pulse: 80 x/minute, breathing: 20 x/minute. Then, on static and dynamic inspection, it was found that

there was edema in the upper arm of the right elbow. The patient also complained of pain when bending the right hand and the patient had not been able to perform strenuous activities using the right hand. On palpation, there was no pitting edema, spasm of the extensor carpi radialis muscle and tenderness in the lateral epicondyle.

Pain measurement using NRS (Numeric Rate Scale) found a value of 1 when the patient was resting which indicated mild pain, a value of 6 when pressed which indicated motion pain and a value of 8 when moved indicated moderately severe pain. Further examination of edema, there is a difference of 1 cm between the right arm and left arm.

Basic movement examinations carried out include examination of active motion, passive motion, and isometric. On examination of active and passive motion, there is a limitation of motion in the elbow and wrist followed by pain. Then, on isometric examination there was no pain but the patient could only resist minimal resistance. Then, on the examination of muscle strength using MMT (Manual Muscle Testing) found that there was a decrease in muscle strength in some elbow and hand movements with a muscle strength score of 4.

On examination of the range of motion, especially in the elbow with a limited range of motion, the values of S = 0°-0°-100° and T = 50°-0°- 80° indicated limitations in elbow extension flexion and pronation supination of the patient's right hand.

For functional examination use Patient-Rated Tennis Elbow Evaluation (PRTEE). This measuring tool includes an examination of pain intensity and functional limitations. In this examination, a total score of 78 was obtained with the interpretation of the results showing an unfavorable value.

Management and Outcome

The patient does therapy at the Condong Catur Hospital, 2 times a week. The interventions given by physiotherapy include TENS, SWD and exercise therapy.

Table 1. Intervention Plan

Intervention	Dosage
TENS	<ul style="list-style-type: none"> - 2x/week - Frequency 40 Hz - Intensity: according to the patient's threshold - Time: 15 minutes
SWD (Short Wave Diathermy)	- 2x/ week

	<ul style="list-style-type: none"> - Frequency: 27,12 MHz - Intensity 40 W - Type: Continuous
Exercise Therapy	<ol style="list-style-type: none"> 1. Active exercise <ul style="list-style-type: none"> - 3 sets of 8 counts. 2. Eccentric exercise <ul style="list-style-type: none"> - Using a bottle that has been filled with water (held) - 2 sets of 8 count
<ul style="list-style-type: none"> • Active Exercise (elbow flexion-extension, pronation-supination, palmar-dorsi flexion of wrist, radial-ulna deviation) • Eccentric Exercise (pronation-supination, palmar-dorsi flexion) 	

After conducting a physiotherapy program at the Condong Catur Hospital with 3 interventions, the following results were obtained.

Pain Measurement Results with NRS

After doing an examination of Pain using NRS (Numerical Rating Scale) the following results were obtained:

Table 2. Pain Measurement

	T1	T(last)
Static Pain	1	0
Pressure Pain	6	4
Motion Pain	8	6

From the results obtained on pain measurements, the initial value of silent pain was 1, tenderness 6 and motion pain 8. After 3 physiotherapy interventions were carried out, the final results were silent pain 0, tenderness 4 and motion pain 5.

Muscle Strength Measurement Results

Result of measuring muscle strength using Manual Muscle Testing :

Table 4. Muscle Strength Measurement

REGIO	Field of	T1	T(Last)
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	Motion	Dx	Dx
ELBOW	Flexion	4	5
	Extension	5	5
	Pronation	4	4
	Supination	4	4
WRIST	Radial deviation	4	5
	Ulnar deviation	4	5
	Palmar Flexion	4	4
	Dorsi flexion	4	5

The results obtained in the measurement of muscle strength before and after the intervention showed an increase in elbow flexion, radial-ulna deviation and wrist flexion dorsi from 4 to 5 values.

Range of Motion Measurement Results

Result of measuring the Range of motion in patient using goniometer :

Table 5. Range of Motion Measurement

Regio	T1	T(Last)
Elbow	S= 0°-0°-100°	S= 0°-0°-110°
	T = 50°-0°- 80°	T = 50°-0°- 80°
Wrist	S= 70°-0°-80°	S= 70°-0°-80°
	F= 20°-0°-30°	F= 20°-0°-30°

The results obtained in measuring the range of motion of the joints in the elbow and wrist before and after being given physiotherapy intervention, it was found that there was a slight increase in the range of motion of the joints from the value of S= 0°-0°-100° to S= 0°-0°-110° there was an increase 10 degrees in elbow flexion.

Functional Ability Check Results

Result of measuring functional ability using Patient-Rated Tennis Elbow Evaluation

Table 6. Functional Ability Measurement

	T₀	T(last)
Total score	78	77

The results of functional measurements using the Patient-Rated Tennis Elbow Evaluation (PRTEE) showed a slight decrease in the total value which indicated that there was an increase in terms of functional activity.

Edema measurement results with Metline

After 3 treatments, the results showed that there was no decrease in the measurement of edema between the right arm and left arm in the patient.

Discussion

Physiotherapy programs in patients with a diagnosis of tennis elbow are often difficult to do and do not rule out the possibility that the patient's complaints can reappear after therapy (Coombes (Coombes, B K; Bisset, L; Vicenzino, B; 2013) et al., 2013). This study aims to determine the effect of giving therapeutic modalities such as TENS, Short Wave Diathermy, and exercise can reduce pain, increase muscle strength, increase joint range of motion and increase functional activity. In this study, it was observed that after 3 therapy treatments were obtained some quite good effects such as pain reduction, increased muscle strength, increased joint range of motion, and increased functional activity. This is due to the provision of physiotherapy modalities such as Transcutaneous Electrical Stimulation (TENS) and Short Wave Diathermy (SWD) as well as several exercises that patients can do at the hospital or at the patient's home.

The TENS modality is given 2 times a week for 15 minutes. There was a decrease in pain in this study after being given TENS. According to other studies, giving TENS aims to stimulate nerves, increase local blood circulation and improve muscle function (Emad, 2021). In addition, according to (Johnson, 2013) tingling caused by stimulation can increase the strength of the body's resistance to pain thereby increasing the secretion of endorphins in the body and can reduce the pain felt by the patient.

After being given Short Wave Diathermy (SWD) the patient felt that the hand was more comfortable to move and the pain was decreasing. The routine use of heating modalities in physiotherapy programs in tennis elbow will affect cellular permeability and chemical exchange in deeper tissues to increase the inflammatory process. The biological effects of using SWD are increased blood flow, increased tissue elasticity, decreased joint viscosity, and increased cell metabolism (Belanger, 2015). Giving SWD with an average moderate intensity of about 30-40 W for 20 minutes can reduce pain and improve function

more than a placebo (Fukuda, 2011).

The first exercise therapy is active exercise including elbow flexion-extension, pronation-supination and palmar-dorsi flexion of the wrist can help improve the functional status of the patients in this study. Extensor exercises have the effect of relieving pain and improving patient function (Tyler et al, 2010). In addition, concentric exercises such as pronation-supination and palmar dorsi flexion are also given. Concentric exercise also has a good effect on the patient's functional activity (Viswas et al, 2012).

Conclusion

Physiotherapy program in the form of TENS, Short Wave Diathermy and Exercise therapy in patients with Ms. S diagnosed tennis elbow and performed therapy three times and showed several improvements such as decreased pain, increased range of motion, increased muscle strength and functional activity. There are some improvements that are not too significant and there are also those that have not increased. This is probably because the patient has never done therapy according to the schedule and still has to carry out his work.

Researchers suggest the importance of further research on physiotherapy interventions in patients with tennis elbow. It aims to obtain more accurate and accountable results.

Acknowledgments

References

- Alain Y. Belanger. (2014). Therapeutic Electrophysical Agents : Evidence Behind Practice.
- Babaei-Ghazani, Arash; Shahrami, Banafsheh ; Fallah, Ehsan; Ahadi, Tannaz; Forough, Bijan ; Ebadi, Safoora;. (2019). Continuous shortwave diathermy with exercise reduces pain and improves function in Lateral Epicondylitis more than sham diathermy:A randomized controlled trial. *Journal of Bodywork and Movement Therapies*.
- Bisset, Leanne M; Vicenzino, Bill;. (2015). Physiotherapy management of lateral epicondylalgia. *Journal of physiotherapy*.
- Brummit, et al. (2013). Physical Therapy Case File: Orthopaedics: Orthopedics. *McGraw Hill Professional*.
- Coombes, B K; Bisset, L; Vicenzino, B;. (2013). Effect of Corticosteroid injection, physiotherapy, or both on clinical outcome in patient with unilateral lateral epicondylalgia : a randomized controlled trial. *Jama journal*.
- Emad Eldin Mohamed Abdelatief. (2021). Effect of Transcutaneous Electrical Nerve Stimulation and Cupping Therapy in The Treatment of Tennis Elbow: A Randomized Controlled Trial. *International Journal Physiotherapy*.
- Fukuda, Thiago Yukio; Cunha, Ronaldo Alves; Fukuda, Vanessa Ovanessian; Rienzo, Fabio Albanez; Cazarini, Claudio;. (2011). Pulsed Shortwave Treatment in Women With Knee Osteoarthritis : A Multicenter, Randomized, Placebo-Controlled Clinical Trial. *Journal of the American Physical Therapy Association* .
- Sluka, K., & Walsh, D. (2013). Transcutaneous Electrical Nerve Stimulation: Basic Science. *The Journal of Pain*.

- Tyler, Timothy F; Thomas, Gregory C; Nicholas, Stephen J; McHugh, Malachy P;. (2010). Addition of isolated wrist extensor eccentric exercise to standard treatment for chronic lateral epicondylitis: A prospective randomized trial. *Journal of Shoulder and Elbow Surgery*.
- Viswas, Rajadurai; Ramachandran, Rejeeshkumar; Anantkumar, Payal Korde;. (2012). Comparison of Effectiveness of Supervised Exercise Program and Criax Physiotherapy in Patients with Tennis Elbow (lateral Epicondylitis) : A Randomized Clinical Trial . *The Scientific World Journal*.
- Weber, C., Thai, V., Neuheuser, K., Groover, K., & Christ, O. (2015). Efficacy of physical therapy for the treatment of lateral epicondylitis: a meta-analysis. *BMC MUSculoskeletal Disorders*.