

ISSN: 2321-5690

**IJOPT**  
INDIAN JOURNAL OF PHYSICAL THERAPY  
AN INTERNATIONAL JOURNAL

**INDIAN JOURNAL OF  
PHYSICAL THERAPY**  
AN INTERNATIONAL JOURNAL

editor.ijopt@gmail.com

## IMMEDIATE EFFECTIVENESS OF STRAIN – COUNTERSTRAIN TECHNIQUE IN PATIENTS WITH LATERAL EPICONDYLITIS - A PILOT STUDY

**Dr. Girija Murugan (PT)<sup>1\*</sup>, Skanda Prakash<sup>2</sup>, Dr. A K Vijay Krishnakumar (PT)<sup>3</sup>**

<sup>1\*</sup> Assistant Professor, Dr. B. R. Ambedkar College of Physiotherapy

<sup>2</sup> Intern, Dr. B. R. Ambedkar College of Physiotherapy

<sup>3</sup> Principal, Dr. B. R. Ambedkar College of Physiotherapy

**\*Corresponding Author:** girijamurugan2106@gmail.com

DOI: <https://doi.org/10.63299/ijopt.0701113>

### ABSTRACT

**Background:** Lateral epicondylitis, or tennis elbow is a common condition that presents with pain and tenderness around common extensors origin of the elbow. It affects 1-3% of adult population annually, mainly in dominant hand. Tennis elbow is described by pain, discomfort and tenderness across the lateral epicondyle of the humerus. Strain counterstrain technique is a positional technique aimed at relieving musculoskeletal pain and dysfunction through indirect manual manipulation.

**Objective:** To investigate the immediate effectiveness of strain counterstrain technique on pain in patients with lateral epicondylitis.

**Methodology:** In this study, 11 patients with lateral epicondylitis were selected based on inclusion criteria and exclusion criteria. All the patients received strain counterstrain technique on tenderpoint around lateral epicondyle of elbow. Informed written consent was taken before starting the treatment. Pre and post intervention assessment was taken by Numeric pain rating scale (NPRS).

**Results:** Based on comparison of pre post mean measures of NPRS of the patients, this study proves that strain counterstrain technique was significantly effective in reducing pain in patients with lateral epicondylitis.

**Conclusion:** The conclusion of this study is based on the comparison of pre post mean of Numerical Pain Rating Scale of the patients which concluded that there is significant reduction in-terms of pain in patients with Lateral Epicondylitis.

**Keywords:** Strain counterstrain, Lateral epicondylitis, Tennis elbow, Tender point, Pain.

### INTRODUCTION

Lateral epicondylitis is characterized by pain, discomfort, and tenderness across the humeral lateral epicondyle as well as pain with resisted wrist, middle finger, or both dorsiflexion.<sup>1</sup> It may manifest as an acute injury or as an overuse injury brought on by persistently extending the wrist against resistance.<sup>1</sup> Every year, it affect 1-3% of individuals, mostly in the dominant hand.<sup>2</sup> Gender did not appear to be related.<sup>2</sup> The age range of 35 to 55 years old for 75% of the occurrences.<sup>3</sup> The lateral epicondyle has a seven-fold higher frequency of epicondylitis disease than the medial epicondyle.<sup>2</sup> Vascular hyperplasia, disordered collagen, and dense fibroblast populations predominate in this histological image. This has been referred to as angiofibroblastic hyperplasia and occur in tendon damaged by repetitive micro trauma.<sup>2</sup> Frequently seen in racquet sports and sports associated with functional overload of the elbow, such as tennis, squash, gymnastics, acrobatics, fitness, and weight lifting and other professions requiring frequent repetitive movements in the

elbow and wrists are also affected.<sup>3</sup> It is generally thought that the condition develops from repeated overuse, leading to small tears and gradual degeneration caused by an insufficient healing response.<sup>4</sup> The extensor carpi radialis brevis (ECRB) is the muscle most often impacted. Other muscles, such as the pronator and other extensor carpal muscles, are also frequently involved. Besides the influence of excessive mechanical forces, the distinct origin of the ECRB on the lateral side of the capitellum makes the tendon vulnerable to repeated friction and wear on its underside during elbow extension and flexion.<sup>5</sup> Patients commonly report pain or a burning sensation around the lateral epicondyle of the humerus, which often spreads down the forearm and can occasionally radiate upwards to the upper arm. This discomfort is typically provoked or worsened by activities that require wrist extension against resistance, such as gripping objects or wringing out towels.<sup>5</sup> Mill's test and Cozen's test are done for assessment with excellent reliability was found for Mill's test and good reliability was found for Cozen's test.<sup>6</sup>

There is obviously no one best treatment for tennis elbow because over 40 different approaches have been reported, several of which are utilized frequently.<sup>1</sup> The mainstay of treatment for this disorder is local injections of a corticosteroid combined with a local anaesthesia. NSAID's in oral and topical form<sup>3</sup>, injection of autologous blood injections<sup>1</sup>, orthotics such as elbow clamps or lateral epicondyle braces<sup>1</sup>, Injections of platelet rich plasma<sup>1</sup>, Treatment with extracorporeal shock wave therapy<sup>1</sup>, Botox<sup>1</sup>, acupuncture works well. Release of the common extensor origin percutaneously, ECRB tendon lengthening, icing, electrotherapeutic modalities like ultrasound, LASER and high frequency galvanic stimulation, massage and trigger point releases<sup>1</sup>, iontophoresis, deep transverse frictions.<sup>3</sup>

An osteopathic manipulative technique of Strain Counter Strain is a high velocity, low amplitude thrust that comes after soft tissue treatments.<sup>7</sup> Positional release, or SCS for short, is a passive positional treatment that uses indirect manual manipulation to relieve musculoskeletal pain and dysfunction.<sup>7</sup> A key component of SCS is accurate palpation of diagnostic sensitive spots called tenderpoint. Tender points and myofascial trigger points are usually associated in the literature, although both have different features.<sup>8</sup> Tenderpoints are similar to trigger points in that they are located in taut bands of musculotendinous tissue; however, they are characterized as being small (less than 1 cm), round, edematous, and painful to the touch.<sup>8</sup> In order to relieve tension and pain, strain counterstrain aims to position the painful area in a position of comfort. Strain counterstrain is especially used in treating individuals with chronic pain who prefer gentle osteopathic techniques or do not respond to other treatments. Strain counterstrain technique contraindications are few and they include fractures and significant ligamentous tears in the affected area or when the patient cannot relax.<sup>10</sup> In osteopathy, it is said "fold and hold", to describe SCS technique as folding the segment 4 to shorten the muscles and then holding the position for atleast 90 seconds.<sup>10</sup>

In clinical practice, it is well known that pain is one of the biggest obstacles for patients with lateral epicondylitis to carry out their everyday tasks. Lateral epicondylitis significantly affects the ability to execute job and reduces level of satisfaction with everyday activities. Most studies done on lateral epicondylitis focuses on long term management to reduce pain and restore functional performance. There are hardly any studies done on immediate effectiveness with respect to pain in patients with lateral epicondylitis.

**OBJECTIVES:** To investigate the immediate effectiveness of strain counterstrain technique on pain in patients with lateral epicondylitis.

## METHODOLOGY

**STUDY DESIGN:** Pilot study.

**STUDY SETTING:** Department of Physiotherapy, Dr. B. R. Ambedkar Medical College and Hospital, Bengaluru - 560045.

**CRITERIA FOR SAMPLE COLLECTION:**

**INCLUSION CRITERIA:**

- Age: 25-55 years.
- Gender: male and female.
- Onset of symptoms: > 4 months
- Patients who experienced pain during resisted wrist extension.
- Patients who experienced tenderness on palpation around the lateral epicondyle.

- Patients who were tested positive for Mill's test and Cozen's test.
- Patients who had pain unilateral lateral epicondyle.

#### EXCLUSION CRITERIA:

- History of trauma, surgery, acute infections at elbow.
- Ossification and calcification of soft tissues around elbow.
- Malignancies around elbow.

SAMPLE SIZE: 11

SAMPLING METHOD: Convenient sample.

STUDY DURATION: 6 months.

TREATMENT DURATION: 2 minutes

OUTCOME MEASURES: Numeric pain rating scale (NPRS)

**PROCEDURE AND TREATMENT:** In this study, 11 patients with lateral epicondylitis received treatment using the strain-counterstrain (SCS) technique. Informed written consent was obtained prior to the beginning of treatment. Pre and post intervention assessment (2 minutes later) was taken by Numeric Pain Rating Scale (NPRS). SCS technique was delivered by identifying the tenderpoints near the lateral epicondyle. The patient was asked to be in supine lying while one hand of the therapist palpated the area of tenderness on the lateral epicondyle. The other hand held the wrist as the elbow was placed into extension with side-bending and rotation towards the side of the palpated tender point (i.e. externally rotated). Then the therapist assessed changes of palpated tone and reported pain with the arm in this position, and then introduced side-bending and rotation internally (still in extension). Then flexion was introduced, followed by internal and then external rotation with side bending. Then the therapist identified the position in which the greatest reduction in sensitivity is achieved and this position was held for 90 secs.



THERAPIST IDENTIFYING  
THE TENDERPOINT



THERAPIST HOLDING  
THE POSITION OF COMFORT

#### DATA ANALYSIS AND RESULTS

The statistical analysis was done using SPSS 23.0. The categorical variables were represented in frequency and percentage. Numerical variables were presented using mean and standard deviation. Pre - Post Comparison was done using Paired t test. A p value <0.05 was considered statistically significant.

**Table 4.1: Age distribution**

		Frequency	Percentage
Age	25-34 years	2	18.2
	35-44 years	7	63.6
	45-55 years	2	18.2
	Total	11	100.0

The above table 4.1 presents the age distribution of 11 sample population. The majority of participants (63.6%) fall within the 35-44 years age group, while 18.2% belong to the 25-34 years age group and 18.2% are categorized as 45-55 years. Mean age was found to be  $39.727 \pm 8.15$  years.

**Table 4.2: Gender distribution**

		Frequency	Percentage
<b>Gender</b>	<b>Female</b>	7	63.6
	<b>Male</b>	4	36.4
	<b>Total</b>	11	100.0

The above table 4.2 represents the gender distribution of a sample of 11 individuals. It shows that the majority (63.6%) are female, while 36.4% are male.

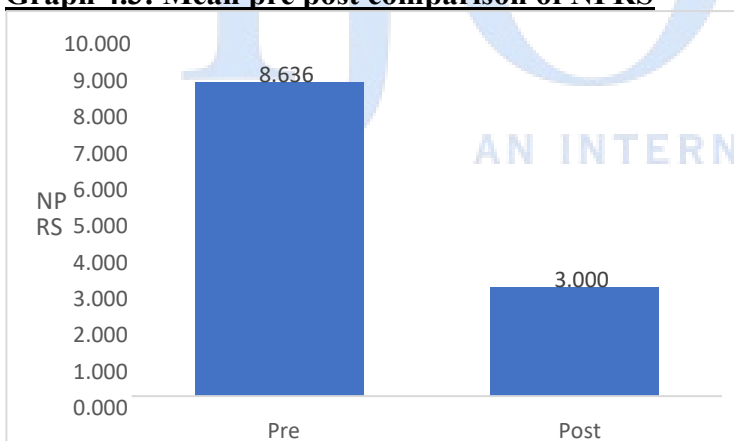
**Table 4.3: Pre post comparison of NPRS**

		Mean	Std. Deviation	Difference	t value	p value
<b>NPRS</b>	<b>Pre</b>	8.636	1.120	5.636	9.284	p<0.001*
	<b>Post</b>	3.000	1.789			

The table presents the mean and standard deviation of NPRS scores before and after an intervention. The pre-intervention mean score was  $8.636 \pm 1.120$ , while the postintervention mean score decreased to  $3.000 \pm 1.789$ . The reduction in pain was 5.636.

The obtained t-value of 9.284 and a p-value of <0.001\* indicate a statistically significant improvement in pain levels post-intervention.

**Graph 4.3: Mean pre post comparison of NPRS**



## DISCUSSION

The aim of this study was to examine the immediate changes on pain, resulting from SCS Technique in participants with Lateral Epicondylitis. As per pre-post difference comparison strain counterstrain technique showed significant reduction of pain over TPs of patients with lateral epicondylitis. The pre-intervention mean score was  $8.636 \pm 1.120$ , while the post-intervention mean score decreased to  $3.000 \pm 1.789$ . The mean score of reduction in pain was 5.636. The histological image in lateral epicondylitis is usually dominated by dense populations of fibroblasts, vascular hyperplasia and disorganised collagen. This has been termed angiofibroblastic hyperplasia and is believed to occur in tendon that has been damaged by repetitive micro trauma. The possible physiology of SCS technique could be that, it might have increased local circulation thereby promoting nutrient supply and metabolic waste removal in living tissue and ameliorate ischemic pain.



Enhanced circulation would reduce swelling that otherwise inhibits muscle function and reverse ischemia that can manifest as painful TP's or sustain dysfunction. A study measuring cytokines released by fibroblasts during the treatment found that 1 minute of SCS had a potential reduction in IL-6 production in the tenderpoint, indicating local vascular effects.

## CONCLUSION

The conclusion of this study is based on the comparison of pre post mean of Numerical Pain Rating Scale of the patients which concluded that there is significant reduction in-terms of pain in patients with Lateral Epicondylitis. As per data analysis and interpretation, the study proves that strain counterstrain technique was significantly effective in reducing pain in patients with lateral epicondylitis.

**LIMITATIONS AND RECOMMENDATIONS:** This study was conducted with small sample size and in future, studies with a larger sample size can be conducted for better results. This study proved the immediate effectiveness of the SCS Technique. Thus, in future to study the long-lasting effects of the treatment, a study of longer duration can be conducted. A comparative study design can be opted in future studies.

**IMPLICATIONS TO PRACTICE:** As this study has shown significant improvement in participants who received Strain Counter Strain Technique in terms of pain, it can be used in the treatment protocol of Lateral Epicondylitis as with its immediate effectiveness, and it may also increase the patient therapist adherence and can improve one's activities of daily living.

## REFERENCES

1. Cutts S, Gangoo S, Modi N, Pasapula C. Tennis elbow: A clinical review article. *Journal of orthopaedics*. 2020 Jan 1;17:203-7.
2. Dhanavandhini P, Alagesan J, Buvanesh A. Effectiveness of Active Release Technique and Myofascial Release Technique on Pain and Functional Performance in Lateral Epicondylitis. *Indian Journal of Physiotherapy & Occupational Therapy*. 2024 Jan 2;18.
3. Karabinov V, Georgiev GP. Lateral epicondylitis: New trends and challenges in treatment. *World Journal of Orthopedics*. 2022 Apr 18;13(4):354.
4. Walz DM, Newman JS, Konin GP, Ross G. Epicondylitis: pathogenesis, imaging, and treatment. *Radiographics*. 2010 Jan;30(1):167-84.
5. Ma KL, Wang HQ. Management of lateral epicondylitis: a narrative literature review. *Pain Research and Management*. 2020;2020(1):6965381.
6. Soares MM, Souza PC, Ribeiro AP. Differences in clinical tests for assessing lateral epicondylitis elbow in adults concerning their physical activity level: test reliability, accuracy of ultrasound imaging, and relationship with energy expenditure. *International Journal of Environmental Research and Public Health*. 2023 Jan 18;20(3):1794.
7. Wong CK, Abraham T, Karimi P, Ow-Wing C. Strain counterstrain technique to decrease tender point palpation pain compared to control conditions: a systematic review with meta-analysis. *Journal of bodywork and movement therapies*. 2014 Apr 1;18(2):165-73.
8. Wong CK. Strain counterstrain: current concepts and clinical evidence. *Manual therapy*. 2012 Feb 1;17(1):2-8.
9. Perreault A, Kelln B, Hertel J, Pugh K, Saliba S. Short-term effects of strain counterstrain in reducing pain in upper trapezius tender points: a pilot study. *Athletic Training & Sports Health Care*. 2009 Sep 1;1(5):214-21.
10. Fritz K, Krupa KN, Sina RE, Carr Jr CL. Physiology, counterstrain and facilitated positional release (FPR). *InStatPearls [Internet]* 2023 Nov 13. StatPearls Publishing.
11. Somprasong S, Mekhora K, Vachalathiti R, Pichaiyongwongdee S. Effects of strain counter-strain and stretching techniques in active myofascial pain syndrome. *Journal of Physical Therapy Science*. 2011;23(6):889-93