

Standardised Physiotherapy Strategies For Chronic Repetitive Ulnar Nerve Compression Injury: A Case Report

Ketan Bhatikar¹, Satyam S. Bhodaji²

ABSTRACT

Introduction: This case report demonstrate the physiotherapy treatment strategies as a non-invasive functional treatment for chronic nerve degeneration due to repeated compression injury to the ulnar nerve.

Case report: A 29 year old athlete male patient with chronic repetitive compression nerve injury during weight lifting training. Patient specific physiotherapy treatment protocol was designed were high frequency, high intensity TENS (HIT) with specific functional strengthening and conditioning of upper limb muscles were taken to be the primary goal. Patient base line data was recorded with Patient Rated Ulnar Nerve Evaluation (PRUNE) scale.

Conclusion: Patient found complete relief from pain and was able to do his daily activities effectively.

Keywords: Ulnar Nerve Compression, Patient Rated Ulnar Nerve Evaluation (PRUNE) Scale, Neuro-Dynamic Mobilization

INTRODUCTION

Prevalence of ulnar nerve compression injury at elbow is only second to carpal tunnel syndrome¹. Repetitive nerve compression due to any repetitive motion or trauma can lead to breakdown of blood-nerve barrier causing leakage into the nerve and fluid accumulation. This gives swelling and pressure on the nerve tissue leading to inflammation, scarring and dysfunction of the nerve². However, little clinical data has been reported on high frequency, high intensity TENS (HIT) and standardised functional rehabilitation physiotherapy treatment protocols. The present studied aimed to test the standardised functional rehabilitation physiotherapy treatment protocol as a non-invasive treatment for chronic repetitive ulnar nerve compression injury.

CASE REPORT

A 29 year old male athlete with no specific medical or surgical history visited the department with pain. He gradually started experiencing weakness and numbness in his little finger of left hand. He neglected it and was continuing his gym training. He also noted that it was progressive in nature and did affect his daily activities. He had no control on the little finger and it try to attempt any movement it would cause him shivering and numbness of little finger of left hand (figure 1-3). Patient after 3 months consulted to a local doctor for the same who advised for X-Ray and prescribed some medications. Patient found no relief and the condition was worsening day by day. Patient then consulted to physiotherapy at our clinic.

Assessment: At baseline patient was assessed with Patient

Rated Ulnar Nerve Evaluation (PRUNE)⁴ scale and after 4 weeks of physiotherapy treatment program. PRUNE is a patient rated evaluation scale for ulnar nerve injury that include 4 main components i.e. Rating Pain (at rest, movement, morning and during seep), Symptoms (numbness, pins and needles sensation, control on finger and weakness), difficulty in fine movements (using fork, knife, typing, playing, lifting or handling small to heavy objects, turning key etc.) and usual activities (household, job, recreational and personal care activities). Patient has to rate on the scale of 10 were 0 is least pain or difficulty and 10 is the most pain or difficulty experienced.

Physiotherapy intervention: The therapeutic exercises were designed with the primary goal to reduce pain and shivering of the hand during initiation and continuation of any hand activities. The patient participated in 24 exercise sessions averaging 90 minutes each, ones a day, for 4 weeks. During the first week of the treatment, the therapeutic focus was on pain reliving and basic strengthening of the hand muscle. Neuro-dynamic mobilizations, including nerve tapping, sliding and tensioning techniques. Further exercises were purely based on strengthening and conditioning of the hand muscle with a greater emphasis on work conditioning³ and work simulation strategies for the more 2 weeks.

Result: At the 10th week of the physiotherapy patient had significant improvement in functional activity. Patient little finger to thumb distance of left hand reduced from 5.0cm to 0 cm. Patient could do all hand manipulative functions with less pain and shivering. Patient also reported easiness and increase in strength in mobility and during light precision works. On Patient Rated Ulnar Nerve Evaluation (PRUNE) patient showed positive improvement by reducing the score from 126 to 44 points at the end of the 10th week of the physiotherapy treatment (table-1).

DISCUSSION

In the present case patients had gradual ulnar nerve compression due to repeated faulty movement during the gym training like lifting weight for chest in supine and prone

¹Medical Director at Dr K.B. Sports Physiotherapy Aqua Rehabilitation Centre, ²Head of Research Department at Dr K.B. Sports Physiotherapy Aqua Rehabilitation Centre, India

Corresponding author: Dr. Satyam S. Bhodaji, Head of Research Department SPARC.

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Sr No	Scale items	Max score	Pre score	10 th week post score
1	Pain	60	28	6
2	Other symptoms	40	29	9
3	Difficulty performing some activities	60	41	17
4	Overall personal care activities	10	7	4
5	Overall household activities	10	7	3
6	Overall work activity	10	7	3
7	Overall recreational activity	10	7	2

Table-1: Patient Rated Ulnar Nerve Evaluation (PRUNE)



Figure-1: Rehab at 2 week



Figure-2: Rehab at 3 week



Figure-3: Rrehab at 4 week

position leading to gradual axonal injury of the ulnar nerve. Patient had signs of nerve injury like hand numbness and tingling in little finger, but due to neglect in the signs patient condition got more severe by increase in pain and other signs also developed weakness and was unable to make hand manipulation functions effectively. However in this case patient need regular exercise and follow-up till the complete recovery and strength of upper extremity takes place.

The first line of treatment for our patient was decided on the primary goals like reducing the pain and numbness in the upper extremity followed by strengthening the weaker muscles and additional treatment strategies to overcome the functional impairment that was caused due to repetitive micro trauma and compression to the ulnar nerve. The first 10 session's patient was treated by transcutaneous electrical nerve stimulator with the high frequency, high intensity TENS (HIT) has shown positive effect on neuropathic pain⁵ and static hand exercise⁶. From second week onwards patient was treated with Neuro-dynamic mobilizations, including nerve tapping, sliding and tensioning techniques, which are thought to enhance ulnar nerve gliding and restore neural tissue mobility⁷.

At the end of the 3rd week patient had complete reduction in pain and decrease in numbness and shivering. This might be the effect of high frequency, high intensity TENS (HIT) for both pain and to reduce fatigue-induced by specific region and adjacent connective tissues⁸. Further increase in strength is the result of static exercises and Handgrip exercises with an ergonomic hand exerciser which were performed at 20% of maximum voluntary contraction of the hand muscle⁹. Neural mobilization has also shown positive effect in releasing the tension of the nerve^{6,10}. Gradual increase in resistance exercise by strengthening and conditioning of the hand muscle increased the power of the hand muscle and had positive result in hand rehabilitation.

CONCLUSION

These findings demonstrate that a systematically designed functional rehabilitation program may be helpful for functional recovery in patients suffering from work related repeated compression injuries to nerve and to reduce physical symptoms that contribute to this disabled state. Patient need more follow-ups to get more strengthening of the hand grip. It should be performed as early as possible under the proper guidance of a physiotherapist by providing motivation, reducing impairment and increasing mobility.

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