

*Case Report*

## **Shoulder Subluxation in Cervical Spondylotic Myelopathy: Effective Physiotherapy Treatment with Kinesio Taping - A Case Report**

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### **ABSTRACT**

Cervical myelopathy is a disorder most commonly seen in the elderly population due to spondylosis with resultant cord compression. There is a growing trend towards successful conservative (nonsurgical) treatment for shoulder subluxation. There is a limited amount of literature describing kinesio taping as an effective treatment option. A participant with shoulder subluxation was included in this single case design which was conducted in a neurological physiotherapy outpatient department. The aim of this study was thus to document that kinesio taping can be effective in the treatment of shoulder subluxation in cervical spondylotic myelopathy. This case study describes the initial assessment, treatment progression leading to positive outcomes of a patient with CSM. A combination of kinesio taping and conventional therapy was used effectively to treat the patient. There was also a large emphasis on patient education and rehabilitation. Numerical Pain Rating Scale (NPRS) & Sulcus sign were taken pre and post intervention and analysed. The patient had marked reduction in pain complaints and had good recovery in outcomes and there was significant change in scores of NPRS and Sulcus sign following 5 weeks of intervention. This case study concluded that kinesio taping and conventional therapy was effective in the shoulder management of this patient's subluxed shoulder.

**Key Words:** Cervical myelopathy, spondylosis, canal, stenotic, Subluxation, Numerical Pain Rating Scale (NPRS), Sulcus sign.

### **INTRODUCTION**

Cervical myelopathy is a disorder most commonly seen in the elderly population due to spondylosis with resultant cord compression (William Young, 2000).<sup>[1]</sup> There are many causes of myelopathy that include trauma, tumors, infection, vascular disease, degenerative conditions and demyelinating disorders.<sup>[2]</sup> Myelopathy can be seen in younger patients when central disc herniations

compress the spinal cord. Most typically, however, there are osteophytic changes and ligament thickening that makes the canal stenotic. Patients typically present with weakness and clumsiness of the hands, paresthesias in the hand and gait disturbances.

Physical examination findings of cervical spondylotic myelopathy (CSM) vary quite a bit, depending on the level and degree of cord compression. In general,

lower motor neuron findings are seen at the level of the lesion, while upper motor neuron findings are seen below the level of the lesion/cord compression (i.e., hyporeflexia in the upper extremities and hyperreflexia in the lower extremities). Another feature of CSM is that it will involve the axial skeleton and skip the head and face. [3]

Clark suggested that sensory findings usually include preservation of touch, loss of pain and temperature, loss of proprioception and vibration below the level of lesion. [4] A subtle gait abnormality may often be seen in the legs before upper extremity involvement. Clinical gait findings can include loss of balance; stiffness; unsteadiness; and loss of power in the legs. A “myelopathic gait” occurs with a broad based shuffled gait with the disruption in a smooth, rhythmic function. Bowel and bladder dysfunction is rare and in some studies was seen in only 15-18% of the patients seen. [5] “Myelopathy hand” was coined by Ono and associates, which is characterized by a loss of power in adduction and extension of the ulnar fingers. [6]

People with cervical myelopathy symptoms frequently avoid activity. Decreased activity reduces flexibility, strength and cardiovascular endurance. CSM patients often present with a combination of muscle weakness or muscle imbalance, decreased postural control, muscle spasticity, poor voluntary control and body alignment. The ability of the adult with CSM to functionally use the affected arm may be diminished due to all of the above problems and lead to shoulder subluxation. Regaining functional use of the upper extremity after a CSM is one of the most challenging tasks for the patient and for the therapist working with the patient. Its result has a significant impact on the individual’s physical, psychological and emotional well being. There are several, equally important factors contributing to the problem with the

functional use of the Upper extremity. Post CSM Shoulder subluxation is relatively a complication affecting the use of the upper extremity and it inhibits the functional recovery by limiting the Range of motion. [7]

With the patient's arm in a neutral position, if the examiner pulls downward on the elbow or wrist while observing the shoulder area for a sulcus or depression lateral or inferior to the acromion. The presence of a depression indicates inferior translation of the humerus and suggests inferior glenohumeral instability, termed positive sulcus sign.

Various treatment techniques have been adapted to be used clinically in the rehabilitation centers for patients who presented with shoulder subluxation, shoulder pain and non functional upper extremity due to Cervical Spondylotic myelopathy. Faghri et al suggest that FES helps in decreasing shoulder pain and subluxation and improves motor function of the Upper extremity. [8]

Kinesio taping is a treatment method used in conjunction with other therapeutic techniques in the treatment of various musculoskeletal and neuro muscular deficits. Kinesio taping has a long history of use by occupational therapists, physical therapists, athletic trainers and other trained health professionals to achieve improvement in the treatment of joint sprains and joint instability, subluxation, soft tissue inflammation, muscle weakness and pain.

However, no information exists on the effectiveness of kinesio taping in conjunction with other therapeutic activities to facilitate improvement in restoring functional use of the upper extremity in Cervical Myelopathy. So, the purpose of this study was to determine the efficacy of kinesio taping with conventional physiotherapy in shoulder subluxation on pain, and sulcus sign in a single participant with Cervical Spondylotic Myelopathy.

## **MATERIALS AND METHODS**

This Pre-Post Interventional Study was done in a Physiotherapy OPD for 5 weeks. Prior to the baseline assessment, the participant was asked for his consent to volunteer in this single case study. He reviewed the entire study process and agreed to volunteer in this study. This study was approved by the Institutional ethical committee.

## **CASE DESCRIPTION**

A 64 year old Gujarati male, normotensive, diabetic since 14 years, belongs to mid socio economic status was referred to neurological physiotherapy department with the diagnosis of Cervical spondylotic Myelopathy and presented with imbalance in gait & significant UE weakness. He was unable to perform fine motor tasks such as buttoning & unbuttoning, writing, etc. His examination showed brisk reflexes in both lower and upper limbs with positive Babinski & Hoffmann signs respectively.

He underwent Posterior cervical laminectomy from C2 to C4 and C4-C5 intervertebral disc with hypertrophy and ossified post longitudinal ligament extending from tip of odontoid process to C1-D1 level. After Decompression, his post operative MRI showed excellent decompression & removal of all compressing elements. Although he had neurological deterioration, he showed recovery and regained ambulation with walker support at 6 months post-op, partial functional recovery in both hands, with residual proximal weakness and having Inferior Shoulder Subluxation [Bilaterally][Right > Left].

This case report highlights the effectiveness of Kinesio taping in shoulder subluxation in this patient.

## **EXPERIMENTAL PROCEDURE**

This patient had Shoulder subluxation [B/L] [Rt > Lt] with pain and positive sulcus sign. Along with Functional Re education, Kinesio taping for Right Shoulder was applied. Kinesio tape was applied over his Right Shoulder to correct Subluxation and to relieve pain. The participant received 5 treatment sessions of 1 session per week for 5 weeks.

The participant was initially positioned in sitting with hand resting comfortably on the Ipsilateral thigh. This position kept the shoulder in horizontal adduction and it was ensured that it does not fall backwards and this position was maintained throughout the taping procedure. The skin was washed and dried, and checked for cuts, abrasions or sensitive areas. Measurements were taken from upper trapezius to inferior angle of the scapula. The base of the tape was placed on upper trapezius without stretch and taping was done along the medial border of the scapula to inferior angle of the scapula. Another tape was applied from deltoid tuberosity to spine of the scapula. The tape was cut in 'Y' shape, and the base was placed on the deltoid tuberosity without stretch. One stripe of the 'Y' was placed on the spine of the scapula, and another stripe of the 'Y' was placed on the lateral border of the scapula. After the procedure, the tape was rubbed in the elongated muscle position. <sup>[9]</sup>

Conventional physiotherapy in the form of moist heat, stretching exercise and strengthening exercises were also given for Upper limb, Lower Limb and trunk accordingly.

Pre and post scores of NPRS and Sulcus sign were taken as outcome measures. <sup>[10, 11]</sup>

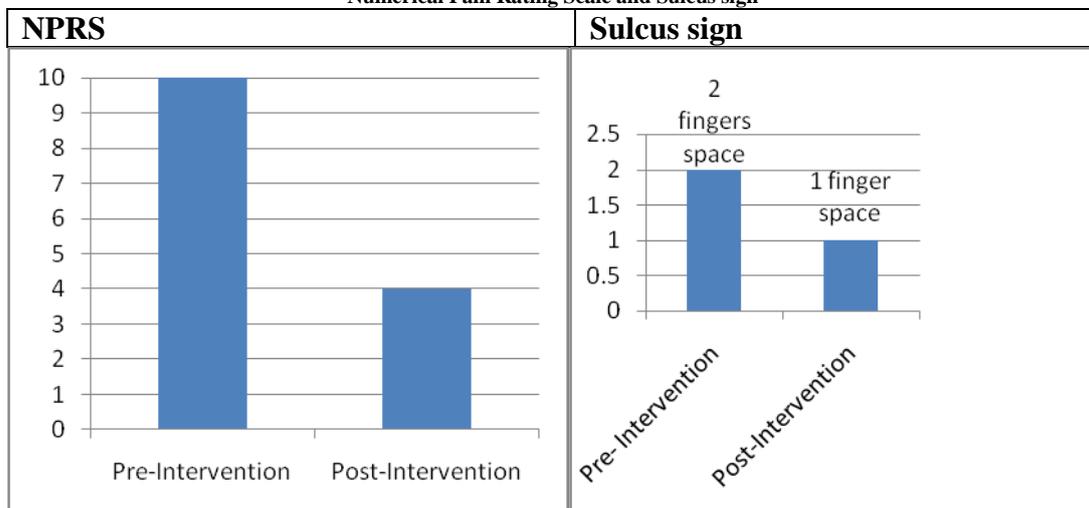
## TAPING TECHNIQUE FOR SHOULDER SUBLUXATION



**Figures:** (A) Shoulder Subluxation (Before Intervention),  
 (B) Sulcus sign (Before Intervention, 2 fingers space),  
 (C) After taping (Lateral view),  
 (D) After taping (Posterior view),  
 (E) Sulcus sign (Post Intervention, 1 finger space)

### RESULTS

Numerical Pain Rating Scale and Sulcus sign



The scores of NPRS and Sulcus sign at pre and post intervention showed significant changes in terms of pain and reduction in the subluxation space and thus proving Kinesio taping as an effective treatment method for shoulder subluxation.

## DISCUSSION

The purpose of this single case study was to investigate the effectiveness of kinesio taping which was provided for 5 sessions over 5 weeks duration and was found to be an effective management strategy to reduce sulcus sign and pain in shoulder subluxation in Cervical spondylotic myelopathy. There was marked reduction in the pain level to 4 point from 10 point at the end of the treatment program.

Yasukawa et al 2006 conducted a study with 15 neurological patients, who had muscle weakness or mild to moderate spasticity, no cognitive, motivation or sensory issues. In this single group Pre-test post-test design, effect on function was measured immediately after KT application and 3 days post. Authors studied the results of the Kinesio taping application in improving upper extremity control and function in the acute pediatric rehabilitation setting. Based on a clinical evaluation, Kinesio Tex Tape was applied to facilitate a functional upright position of the trunk, to assist with positioning the shoulder in neutral alignment, and to provide palmar stability and arch support for the involved hand. Authors concluded that the use of Kinesio Taping method appeared to have improved purposeful movement and provide needed stability of the shoulder and hand and found that the application of the Kinesio Tex Tape provided the proper body alignment to allow performance of reach, grasp, release and manipulation tasks. There was statistically significant difference between pre-test and post-test scores in the Melbourne Assessment of Unilateral Upper Limb Function and concluded that

KT was helpful with facilitating goal oriented task performance. <sup>[12]</sup>

Kinesio tape might have helped to support or inhibit muscle function, support joint structure, reduce soft tissue inflammation, and reduce pain. It could have provided feedback to the muscles to maintain preferred postural alignment. Also it might have had an effect on sensori motor and Proprioceptive systems that is helpful in shoulder subluxation. Kinesio tape may improve the position of the glenohumeral joint and may provide the Proprioceptive feedback to achieve proper body alignment. <sup>[13]</sup>

The current study had certain limitations, as any other single case study design. If the treatment sessions are prolonged, there could have been more improvement in pain relief and reduction in sulcus sign and improvement in functional regain. The result of this study could not be generalized as a management of shoulder subluxation in cervical myelopathy as it was conducted in a single participant.

Future randomized controlled studies with larger sample size are necessary to prove the efficacy of Kinesio taping in shoulder subluxation in various neurological conditions.

## CONCLUSION

The results of this single case experimental study concludes that kinesio taping along with conventional physiotherapy may be an effective strategy in the management of shoulder subluxation in relieving pain and reduction in subluxed joint space in cervical spondylotic myelopathy.

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