

Combined Cervical Traction and Scapular Retraining for Mechanical Neck Pain in Cervical Spondylosis: A Physiotherapy Case Report

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Abstract:

Cervical spondylosis is a common degenerative condition of the cervical spine frequently associated with chronic mechanical neck pain, restricted cervical mobility, muscular tightness, and functional disability (Binder, 2007; Childress & Becker, 2016). Prolonged sitting posture, repetitive computer-based work, poor ergonomics, and reduced physical activity may contribute to altered cervical biomechanics and scapular dysfunction in occupational populations (Szeto et al., 2005). Scapular dyskinesis and weakness of cervicoscapular stabilizers may further increase mechanical stress on cervical structures and perpetuate pain (Kibler & Sciascia, 2010). The purpose of this case report was to evaluate the effectiveness of combined cervical traction and scapular retraining in a middle-aged office worker with cervical spondylosis and mechanical neck pain. A 42-year-old male software engineer presented with chronic neck pain, postural dysfunction, reduced cervical mobility, and difficulty performing prolonged computer work for approximately eight months. Baseline pain intensity measured using the Visual Analog Scale (VAS) was 7/10, while Neck Disability Index (NDI) score was 46%. The patient underwent a six-week physiotherapy rehabilitation program consisting of intermittent cervical traction, scapular stabilization exercises, deep cervical flexor training, postural correction exercises, stretching, and progressive strengthening interventions (Blanpied et al., 2017; Jull et al., 2008). Following intervention, pain intensity improved from 7/10 to 2/10, NDI improved from 46% to 12%, cervical flexion improved from 35° to 55°, and cervical rotation improved significantly. Functional improvements were observed in prolonged sitting tolerance, occupational activities, and postural alignment. The findings suggest that combined cervical traction and scapular retraining may effectively improve pain, cervical mobility, postural control, and functional performance in patients with cervical spondylosis and mechanical neck pain.

Keywords: Cervical spondylosis, Mechanical neck pain, Cervical traction, Scapular retraining, Scapular stabilization, Deep cervical flexor training, Physiotherapy rehabilitation, Cervical mobility, Neck Disability Index, Postural correction, Forward-head posture, Occupational neck pain, Cervicoscapular dysfunction, Therapeutic exercise, Ergonomic retraining.

I. INTRODUCTION

Cervical spondylosis is a degenerative disorder involving progressive changes in cervical intervertebral discs, facet joints, vertebral bodies, and surrounding soft tissues (Binder, 2007). It is one of the most common causes of chronic mechanical neck pain among middle-aged and elderly individuals and is frequently associated with prolonged occupational stress, poor posture, repetitive cervical movements, and sedentary lifestyle habits (Childress & Becker, 2016). Office workers and computer professionals are particularly susceptible due to prolonged sitting posture, sustained cervical flexion, forward-head posture, and inadequate ergonomic practices (Szeto et al., 2005). Mechanical neck pain associated with cervical spondylosis may result in muscular tightness, reduced cervical mobility, postural imbalance, headaches, and functional limitations affecting occupational performance and quality of life (Blanpied et al., 2017). Scapular musculature contributes significantly to cervical stability and upper-quarter biomechanics. Weakness of lower trapezius, serratus anterior, and rhomboid muscles may contribute to scapular dyskinesis and compensatory overactivity of cervical musculature (Kibler & Sciascia, 2010). Altered scapular mechanics may increase mechanical loading on cervical structures and perpetuate chronic pain. Physiotherapy remains one of the primary conservative interventions for cervical spondylosis management (Gross et al., 2015). Evidence supports the use of cervical traction, deep cervical flexor training, scapular stabilization exercises, stretching, and postural correction interventions for reducing pain and improving functional outcomes (Blanpied et al., 2017; Jull et al., 2008).

Cervical traction may reduce compressive loading on cervical structures, decrease muscle spasm, improve joint mobility, and provide symptomatic relief (Colachis & Strohm, 1965). Scapular retraining exercises improve neuromuscular coordination, scapulothoracic stability, and postural alignment, thereby reducing mechanical stress on the cervical spine (Ludewig & Reynolds, 2009). Although these interventions independently demonstrate beneficial outcomes, evidence regarding their combined effectiveness in occupational cervical spondylosis remains limited. Therefore, the purpose of this case report was to evaluate the effectiveness of combined cervical traction and scapular retraining in a middle-aged office worker with mechanical neck pain associated with cervical spondylosis.

II. NEED OF THE STUDY

Mechanical neck pain associated with cervical spondylosis is increasingly prevalent among office workers and individuals involved in prolonged computer-based occupations. Persistent cervical pain, reduced mobility, forward-head posture, and scapular dysfunction may significantly impair occupational performance and quality of life (Szeto et al., 2005). Conventional physiotherapy interventions frequently focus on symptomatic pain relief; however, persistent cervicoscapular dysfunction and postural imbalance may continue to contribute to recurrence of symptoms.

Previous literature supports the effectiveness of cervical traction for pain reduction and mobility improvement (Graham et al., 2008), while scapular stabilization and deep cervical flexor training have demonstrated positive effects on cervical biomechanics and postural correction (Jull et al., 2008; Kibler & Sciascia, 2010). However, limited evidence exists regarding the combined use of cervical traction and scapular retraining in occupational cervical spondylosis populations. Therefore, this case report was undertaken to evaluate the effectiveness of combined cervical traction and scapular retraining in improving pain, cervical mobility, posture, and functional performance in a patient with cervical spondylosis and chronic mechanical neck pain.

III. CASE DESCRIPTION

A 42-year-old male software engineer presented to the physiotherapy outpatient department with complaints of chronic neck pain, stiffness, postural discomfort, and intermittent occipital headache for approximately eight months. The patient reported gradual onset of symptoms without any history of trauma, fall, or road traffic accident. He experienced difficulty maintaining prolonged sitting posture during computer-based work and reported increased discomfort during prolonged laptop usage and cervical movements, particularly extension and rotation. Occupational history revealed prolonged computer work for 9–10 hours daily, poor workstation ergonomics, limited physical activity, and frequent forward-head posture during work-related activities (Szeto et al., 2005).

The patient had no history of cervical surgery, neurological disorder, inflammatory arthritis, or vestibular dysfunction. On observation, the patient demonstrated forward-head posture, rounded shoulders, mild thoracic kyphosis, and scapular protraction. Palpation revealed tenderness and tightness over the upper trapezius, levator scapulae, and cervical paraspinal muscles. Clinical examination demonstrated restricted cervical range of motion, particularly extension and rotation movements. Baseline pain intensity measured using the Visual Analog Scale (VAS) was 7/10, while Neck Disability Index (NDI) score was 46% (Vernon & Mior, 1991). Cervical flexion was limited to 35°, extension to 38°, right rotation to 45°, and left rotation to 42°. Manual muscle testing revealed weakness of deep cervical flexors and scapular stabilizers. Radiographic findings demonstrated degenerative changes at C5–C6 and C6–C7 levels suggestive of cervical spondylosis (Binder, 2007). Based on subjective complaints, clinical findings, postural assessment, and imaging findings, the patient was clinically diagnosed with cervical spondylosis associated with chronic mechanical neck pain and cervicospicular dysfunction. The patient was subsequently referred for structured physiotherapy rehabilitation consisting of combined cervical traction and scapular retraining exercises.

IV. INTERVENTION

The patient underwent a structured physiotherapy rehabilitation program for six weeks consisting of five treatment sessions per week, with each session lasting approximately 45–50 minutes. During Phase I (Week 1–2), moist heat therapy and intermittent cervical traction were applied to reduce pain and muscle spasm (Colachis & Strohm, 1965). Gentle cervical range of motion exercises and stretching exercises targeting the upper trapezius, levator scapulae, and pectoralis muscles were performed to improve mobility and reduce muscular tightness (Page, 2012). Chin tuck exercises and deep cervical flexor activation exercises were initiated to improve cervical stabilization and postural control (Jull et al., 2008). Scapular setting exercises including scapular retraction and depression were incorporated to improve neuromuscular activation and cervicospicular alignment (Kibler & Sciascia, 2010). Phase II focused on scapular retraining and restoration of cervical mobility. Scapular stabilization exercises, serratus anterior activation drills, rhythmic stabilization exercises, and cervical isometric strengthening exercises were introduced to improve scapulothoracic stability and movement coordination (Ludewig & Reynolds, 2009). Theraband scapular retraction exercises and wall posture correction drills were incorporated to improve postural endurance and upper-quarter alignment. Intermittent cervical traction was continued based on patient tolerance and symptom response. Phase III focused on functional strengthening and occupational reintegration. Resistance band strengthening exercises targeting scapular stabilizers and cervical musculature were progressively introduced to improve muscular endurance and dynamic stability (Kisner et al., 2017). Functional desk simulation activities, ergonomic retraining, thoracic extension exercises, and

postural correction exercises were incorporated to facilitate return to occupational activities and reduce recurrence of mechanical stress. The patient was also educated regarding workstation ergonomics, monitor positioning, sitting posture, scheduled breaks, and home exercise compliance

Table 1
Structured Six-Week Combined Cervical Traction and Scapular Retraining Rehabilitation Protocol for Cervical Spondylosis

Phase	Weeks	Main Goal	Key Exercises / Intervention	Cervical / Scapular Component	Frequency & Duration
Phase I	Week 1–2	Pain reduction and mobility restoration	Moist heat therapy, intermittent cervical traction, stretching exercises	Chin tuck exercises, deep cervical flexor activation, scapular setting exercises	5 sessions/week, 45–50 min/session
Phase II	Week 3–4	Scapular retraining and cervical stabilization	Cervical isometrics, rhythmic stabilization, wall posture correction drills	Scapular stabilization exercises, serratus anterior activation, theraband retraction	5 sessions/week, 45–50 min/session
Phase III	Week 5–6	Functional strengthening and occupational reintegration	Resistance band strengthening, ergonomic retraining, desk simulation	Postural correction exercises, thoracic extension, scapular endurance training	5 sessions/week, 45–50 min/session

V. OUTCOME MEASURES

Pain intensity was measured using the Visual Analog Scale (VAS), while functional disability was assessed using the Neck Disability Index (NDI) (Vernon & Mior, 1991). Cervical range of motion assessment was performed using universal goniometry (Norkin & White, 2016). Postural assessment was performed using craniocervical angle analysis to assess forward-head posture (Ruivo et al., 2014).

VI. RESULTS

Following six weeks of physiotherapy rehabilitation, clinically meaningful improvements were observed in pain intensity, cervical mobility, postural alignment, and functional performance. Pain intensity measured using VAS improved from 7/10 to 2/10, while NDI improved from 46% to 12%. Cervical flexion improved from 35° to 55°, extension from 38° to 60°, right rotation from 45° to 72°, and left rotation from 42° to 70°. Improvement in craniocervical angle indicated reduction in forward-head posture and enhanced postural alignment. The patient also reported improved tolerance to prolonged sitting, reduced headache frequency, and improved occupational performance during computer-based activities.

Table 2
Clinical Outcome Progression

Outcome Measure	Pre-treatment	Post-treatment
VAS	7/10	2/10

Outcome Measure	Pre-treatment	Post-treatment
NDI	46%	12%
Cervical Flexion	35°	55°
Cervical Extension	38°	60°
Right Rotation	45°	72°
Left Rotation	42°	70°

VII. DISCUSSION

The present case report demonstrated clinically meaningful improvements in pain intensity, cervical mobility, postural alignment, muscular endurance, and functional performance following combined cervical traction and scapular retraining in a patient with cervical spondylosis and mechanical neck pain. Pain reduction and mobility improvement may be attributed to reduced compressive loading on cervical structures, decreased muscle spasm, and restoration of normal cervical biomechanics following cervical traction (Colachis & Strohm, 1965). Stretching exercises and cervical mobility interventions likely improved muscular extensibility and reduced nociceptive tension (Page, 2012).

Deep cervical flexor activation exercises improved cervical stabilization and postural control, which may have contributed to reduction of forward-head posture and mechanical stress on cervical structures (Jull et al., 2008). Scapular retraining exercises improved scapulothoracic stability, scapular alignment, and neuromuscular coordination, thereby reducing compensatory overactivity of upper trapezius and cervical musculature (Kibler & Sciascia, 2010; Ludewig & Reynolds, 2009). Progressive strengthening and ergonomic retraining improved occupational tolerance and functional performance during prolonged computer-based activities. The findings are consistent with previous literature supporting multimodal physiotherapy rehabilitation for chronic mechanical neck pain and cervical dysfunction (Blanpied et al., 2017; Gross et al., 2015).

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