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EFFECTIVENESS OF MANUAL THERAPY IN MANAGING OCCUPATIONAL CERVICAL RADICULOPATHY: A CASE STUDY OF A UNIVERSITY STUDENT

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ABSTRACT

Background: *Prolonged sedentary postures and increased screen time among university students have led to a rising prevalence of cervical radiculopathy. This case study evaluates the efficacy of a segmented, phase-specific manual therapy protocol in managing occupational cervical radiculopathy.*

Case Description: *A 23-year-old male undergraduate student presented with right-sided C6 radiculopathy secondary to prolonged desk work and thesis writing. The therapeutic intervention spanned four weeks, divided into two distinct phases. Phase 1 prioritized soft tissue mobilization and isometric stabilization, whereas Phase 2 incorporated Maitland articular mobilization, neural sliding techniques, and manual cervical traction.*

Outcomes: *Post-intervention assessments revealed significant clinical reductions in the Visual Analogue Scale (VAS) for pain and substantial functional restoration, as evidenced by improved Neck Disability Index (NDI) scores.*

Conclusion: *A structured, phase-wise manual therapy regimen presents an effective, conservative strategy for mitigating radicular symptoms and restoring functional capacity in young adults experiencing academic-related postural strain.*

Keywords:

INTRODUCTION

Cervical spine disorders represent a substantial global epidemiological challenge, serving as a primary contributor to chronic musculoskeletal disability and imposing a heavy burden on healthcare infrastructures worldwide (Global Burden of Disease, 2018). While historically categorized as a degenerative condition typical of older populations, cervical spondylosis and related radiculopathies are increasingly diagnosed in younger cohorts, particularly university students

(Mashabi, 2025).

The modern academic landscape mandates extensive interaction with digital interfaces, including laptops, tablets, and smartphones. This shift toward prolonged digital engagement induces sustained ergonomic faults, such as forward head posture (FHP) and protracted shoulder girdles. The resulting biomechanical stress places unequal, chronic loads on the cervical motion segments, paravertebral musculature, and neural elements. Chronic neck pain and radiculopathy fundamentally impair a student's quality of life, leading to decreased concentration, compromised academic performance, and absenteeism, which collectively threaten future career trajectories. Therefore, identifying targeted, non-pharmacological interventions is crucial for this population.

Case Presentation

Patient Information

* **Age/Gender**: 23-year-old male.
* **Occupation**: Final-year undergraduate student.
* **Chief Complaint:** Persistent, aching pain originating in the right cervical region, radiating down the lateral aspect of the forearm into the ipsilateral thumb and index finger, corresponding to the C6 dermatomal pathway.
* **History of Present Illness**: Symptoms manifested insidiously over a three-month period, correlating with an escalation in daily laptop use dedicated to his undergraduate thesis. The patient reported accompanying paresthesia ("pins and needles") and intermittent weakness during heavy gripping tasks.Clinical Findings

Physical examination and structural assessment revealed the following:

* **Postural Analysis**: Pronounced forward head posture (FHP) accompanied by bilateral scapular protraction.
* **Provocative Special Tests:**
* Spurling's Test: Positive, replicating sharp, radicular pain down the right upper extremity.
* Upper Limb Tension Test (ULNT1 - Median Nerve Bias): Positive, provoking peripheral symptoms.
* Cervical Distraction Test: Positive, achieving a prompt reduction of peripheral arm pain by approximately 50%.
* Neurological Examination: Myotomal weakness (4/5) noted in right elbow flexion (Biceps brachii); diminished deep tendon reflex of the right brachioradialis muscle (Young et al., 2009).

Therapeutic Intervention

Phase 1: Weeks 1–2 (Muscular Relaxation and Stabilization)

* **Soft Tissue Mobilization (STM)**: Deep, targeted ischemic compression and petrissage were directed to the hypertonic upper trapezius and levator scapulae muscles. This aimed to decrease protective muscle guarding, alleviate localized myofascial trigger points, and optimize local microcirculation.

* **Cervical Isometrics**: The patient performed sub-maximal isometric contractions into cervical flexion, extension, and lateral flexion. These exercises were designed to enhance neuromuscular control and stabilize the cervical segments without overstressing irritated articular structures.

* **Passive & Active-Assisted Stretching**: Static stretching was applied to the upper, middle, and lower bands of the trapezius, alongside the sternocleidomastoid (SCM) muscle. Stretches were sustained for 20–30 seconds per repetition to recover physiological muscle length and lower postural tensile stress.

Phase 2: Weeks 3–4 (Joint Mobilization and Nerve Decompression)

* **Maitland Articular Mobilization:** Grade II and III unilateral postero-anterior (PA) oscillatory glides were delivered to the right C5-C6 and C6-C7 zygapophyseal joints. The objective was to restore normal accessory joint arthrokinematics, reduce localized articular stiffness, and facilitate neuromodulatory pain relief (Kiouloukiotis, 2025).

* **Neural Mobilization (Sliders):** To address peripheral nerve root irritation, median nerve "sliding" configurations were introduced. These oscillations promoted longitudinal excursion of the nerve within its connective tissue bed without

generating excessive neural tension, thereby controlling intraneural edema and avoiding protective guarding (Porretto-Loehrke, 2020).

* **Manual Cervical Traction:** Sustained manual traction was administered for 10 minutes per session. This mechanical separation targeted the widening of the neural foramina, decreasing intradiscal pressure and reducing mechanosensitivity of the C6 nerve root (Cleland, 2005).

Outcomes and Follow-up

Following the completion of the 4-week physical therapy protocol, the patient demonstrated major clinical improvements across all objective measures:

* **Pain Intensity:** The Visual Analogue Scale (VAS) score dropped from an initial baseline of 7/10 (severe, constant pain) to a mild 2/10 during functional movements at the conclusion of Week 4.

* **Functional Capacity:** The Neck Disability Index (NDI) score shifted from 42% (moderate disability) down to 12% (mild to no disability). This quantified change indicates that the patient could resume full academic work without significant physical restriction (Young et al., 2009).

* **Range of Motion (ROM):** Assessment at week 4 demonstrated a recovery of full, non-irritable cervical rotation and extension, resolving the physical blocks that limited laptop-based work.

* **Ergonomic Adaptations:** The intervention concluded with personalized ergonomic counseling, focusing on monitor height adjustments, supportive lumbar seating, and the implementation of scheduled micro-breaks to minimize risk of symptom recurrence.

Discussion

The findings of this case study show that an integrated manual therapy framework—comprising Maitland joint mobilizations, targeted manual traction, and neural sliders—presents an effective conservative strategy for university students dealing with radicular issues due to prolonged academic sitting (Borrella-Andrés et al., 2021). Extended periods of desk work during thesis writing encourage forward head posture, which alters normal cervical spine biomechanics (Mashabi, 2025). This postural shift increases the mechanical load on the intervertebral discs and posterior elements, narrowing the neural foramina and predisposing the nerve roots to compression and inflammation. In this report, the patient's symptoms were successfully resolved through a manual protocol, avoiding the need for pharmaceutical interventions.The clinical utility of Maitland Grade II and III PA glides can be explained by neurophysiological and mechanical pathways. These mobilizations stimulate low-threshold mechanoreceptors, which can suppress nociceptive signaling via the spinal gate control mechanism and activate descending pain inhibitory pathways (Courtney, 2016; Sharma, 2024). Mechanically, passive joint movement helps mobilize intra-articular structures and reduce joint capsule tension.

Furthermore, implementing neural 'sliding' techniques instead of high-tension neural stretches proved essential given the sensitivity of the C6 nerve root. Sliding maneuvers encourage longitudinal excursion of the median nerve without generating excessive strain, helping restore neural axoplasmic flow and reduce intraneural swelling without triggering protective muscle spasms (Porretto-Loehrke, 2020; bin Khalid, 2024).

The concurrent reductions in both pain scores and NDI percentages (42% to 12%) support the clinical strategy of addressing articular restrictions and neural mechanosensitivity together rather than in isolation (Borrella-Andrés et al., 2021). As 'tech-neck' and postural syndromes become more prevalent among students, this phase-wise manual therapy approach offers a viable, non-invasive option to help students resume academic routines comfortably.

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