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Management of Mechanical Neck Pain in A College Student using Cervical Traction: A Case Study

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ABSTRACT
Mechanical neck pain is a common musculoskeletal disorder among young adults, particularly college students, due to prolonged screen exposure, poor posture, and sedentary habits. Cervical traction is a commonly used physiotherapeutic modality aimed at reducing pain and improving cervical mobility through spinal decompression.
This case study presents a 25-year-old college student with a 3-week history of non-radiating cervical pain associated with prolonged laptop use. Clinical examination revealed moderate pain, reduced cervical range of motion, and muscle spasm without neurological involvement. The intervention consisted of a structured cervical traction program administered over 3 weeks without adjunct strengthening exercises.
Outcome measures included the Visual Analog Scale (VAS), Neck Disability Index (NDI), and cervical range of motion (CROM). Post-intervention findings showed marked reduction in pain (VAS reduced from 7/10 to 2/10), significant improvement in functional disability (NDI reduced from 38% to 10%), and restoration of near-normal cervical mobility.
The results indicate that cervical traction as a standalone intervention can effectively reduce pain, improve mobility, and enhance functional outcomes in acute mechanical neck pain.
Keywords: Mechanical neck pain, Cervical traction, Physiotherapy, Neck Disability Index, Range of motion

INTRODUCTION
Mechanical neck pain is one of the most common musculoskeletal disorders encountered in clinical practice and is a major cause of disability among young adults and working populations. It is defined as pain arising from cervical musculoskeletal structures such as muscles, ligaments, facet joints, intervertebral discs, and surrounding soft tissues without the presence of serious pathological conditions. Mechanical neck pain is typically aggravated by cervical movements or sustained postures and relieved by rest or changes in position.
Neck pain has become increasingly prevalent in recent years due to the widespread use of computers, laptops, smartphones, and other digital devices. College students are particularly

vulnerable because of prolonged study hours, poor ergonomic practices, sedentary lifestyle, and sustained forward head posture. Epidemiological studies have reported that the lifetime prevalence of neck pain ranges from 30% to 70% in the general population, while the annual prevalence among young adults and students ranges from 20% to 50%. Mechanical neck pain accounts for the majority of these cases.

The etiology of mechanical neck pain is multifactorial. Common contributing factors include poor posture, prolonged cervical flexion, repetitive neck movements, muscle imbalance, physical inactivity, psychological stress, inadequate workstation ergonomics, and prolonged use of electronic devices. Sustained loading of cervical structures can result in muscle fatigue, ligamentous strain, joint dysfunction, and increased mechanical stress on the cervical spine, leading to pain and functional limitations.

Patients with mechanical neck pain commonly present with localized neck pain, stiffness, restricted cervical range of motion, muscle spasm, tenderness over cervical musculature, postural abnormalities, and difficulty performing activities requiring prolonged neck positioning. In some cases, symptoms may interfere with occupational, educational, and recreational activities, thereby reducing quality of life.

Among the various conservative treatment approaches available, cervical traction remains a widely utilized modality in physiotherapy practice. Cervical traction involves the application of a distractive force to the cervical spine with the aim of reducing compressive forces on spinal structures, increasing intervertebral space, relieving muscle spasm, improving circulation, and reducing pain. The therapeutic effects of traction are believed to result from spinal decompression, relaxation of cervical musculature, and restoration of normal biomechanical alignment.

Although several studies have investigated cervical traction in combination with exercise therapy and other physiotherapeutic interventions, limited evidence exists regarding the effectiveness of cervical traction as a standalone treatment modality in patients with acute mechanical neck pain. Therefore, documenting individual clinical outcomes can contribute valuable information to the existing literature.

Aim of the Study

To evaluate the effectiveness of cervical traction in the management of mechanical neck pain in a college student.

Objectives of the Study

1. To assess the effect of cervical traction on pain intensity using the Visual Analog Scale (VAS).
2. To evaluate changes in functional disability using the Neck Disability Index (NDI).
3. To assess improvement in cervical range of motion following intervention.
4. To evaluate the reduction in cervical muscle spasm after traction therapy.
5. To document the clinical outcomes of cervical traction as a standalone treatment modality in mechanical neck pain.

Therefore, this case study aims to evaluate the effectiveness of cervical traction alone in managing mechanical neck pain in a young adult and to highlight its potential role as an initial conservative treatment strategy.

Patient Information

A 25-year-old male college student presented to the Physiotherapy Department with complaints of neck pain for the previous three weeks. The pain had an insidious onset and gradually increased in intensity. The patient reported spending approximately 6–8 hours daily attending online classes, studying, and using a laptop and smartphone. The pain was localized to the posterior cervical region and bilateral upper trapezius muscles without radiation to the upper limbs.

The patient described the pain as a dull aching discomfort with occasional episodes of stiffness, particularly during the morning hours and after prolonged sitting. Symptoms were aggravated by prolonged neck flexion, studying, computer work, and mobile phone use. Relief was obtained with rest and changes in posture.

There was no history of trauma, fall, whiplash injury, fever, unexplained weight loss, dizziness, headache, upper limb numbness, tingling, or weakness. No previous episodes of cervical pain were reported. The patient had no significant medical or surgical history and was not taking any medications.

The patient reported difficulty in maintaining concentration during studies due to pain and discomfort. Activities requiring sustained neck posture were significantly affected.

CLINICAL EXAMINATION FINDINGS

Clinical Presentation

Upon observation, the patient demonstrated a forward head posture with rounded shoulders and mild thoracic kyphotic tendency. Guarding of the cervical musculature was evident during active movements.

Pain Assessment

- Location: Posterior cervical region and bilateral upper trapezius
- Nature: Dull aching pain
- Severity: 7/10 on Visual Analog Scale
- Duration: Continuous throughout the day with intermittent exacerbations
- Aggravating Factors:
    - Prolonged laptop use
    - Studying
    - Mobile phone use
    - Sustained neck flexion
- Relieving Factors:
    - Rest

- Postural correction

Palpatory Findings

Palpation revealed:

- Tenderness over cervical paraspinal muscles
- Tenderness over upper trapezius muscles bilaterally
- Increased muscle tone and muscle spasm
- No localized swelling
- No trigger points suggestive of myofascial pain syndrome

Range of Motion Examination

Movement	Pre-Treatment
Flexion	35°
Extension	40°
Right Lateral Flexion	30°
Left Lateral Flexion	30°
Right Rotation	50°
Left Rotation	50°

Pain was reproduced at the end range of flexion and extension.

Neurological Examination

- Dermatomes: Intact
- Myotomes: Normal
- Deep Tendon Reflexes: Normal
- Sensory Examination: Normal
- Motor Examination: Normal

Special Tests

Test	Result
Spurling Test	Negative
Cervical Compression Test	Negative
Cervical Distraction Test	Pain Relief
Upper Limb Tension Test	Negative

The findings were suggestive of mechanical neck pain without neurological involvement.

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Pre-Treatment Findings

Parameter	Findings
VAS	7/10
NDI	38% (Moderate disability)
Flexion	35° (Reduced)
Extension	40° (Painful)
Lateral Flexion	30° bilaterally
Rotation	50° bilaterally
Muscle Spasm	Present

INTERVENTION PROTOCOL (CERVICAL TRACTION – 3 WEEKS)

The patient was treated using mechanical cervical traction in a supine position with the cervical spine maintained in approximately 15–20 degrees of flexion to target lower cervical segments.

Technique

- Type: Intermittent cervical traction initially, progressing to a combination of intermittent and sustained traction
- Mode: Mechanical traction
- Patient Position: Supine with head supported

Parameters and Progression

- **Week 1:**
  - Force: 8–10% of body weight
  - Duration: 10 minutes
  - Cycle: 10 seconds hold, 10 seconds rest
  - Frequency: 5 sessions per week
- **Week 2:**
  - Force: 10–12% of body weight
  - Duration: 12–15 minutes
  - Cycle: 15 seconds hold, 10 seconds rest
  - Frequency: 5 sessions per week
- **Week 3:**
  - Force: 12–15% of body weight
  - Duration: 15–20 minutes
  - Mode: Combination of intermittent and sustained traction
  - Frequency: 5 sessions per week

No strengthening, stretching, or electrotherapy modalities were administered during the study period to isolate the effect of traction.

Treatment Goals

Short-Term Goals:

- Pain reduction
- Reduction of muscle spasm
- Improvement in cervical mobility

Long-Term Goals:

- Restoration of functional activities
- Prevention of recurrence

RESULTS

The patient demonstrated significant clinical improvement following 3 weeks of cervical traction therapy.

Post-Treatment Findings (After 3 Weeks)

Parameter	Findings
VAS	2/10
NDI	10% (Mild disability)
Flexion	50°
Extension	60°
Lateral Flexion	45° bilaterally
Rotation	70° bilaterally
Muscle Spasm	Absent

Type of Improvements Observed

- **Pain Reduction:** VAS decreased from 7/10 to 2/10 indicating substantial pain relief
- **Functional Improvement:** NDI score improved from 38% (moderate disability) to 10% (mild disability)
- **Range of Motion:** Cervical movements improved to near-normal ranges in all directions
- **Muscle Spasm:** Completely resolved post-treatment

Pain Reduction Trend

Week	VAS Score
Week 0	7
Week 1	5
Week 2	3
Week 3	2

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Functional and Mobility Outcomes

Parameter	Pre	Post
NDI	38%	10%
ROM	Restricted	Near Normal

Functional Improvement

Parameter	Pre	Post
NDI	38%	10%
ROM	Reduced	Near Normal

DISCUSSION

The results of this case study demonstrate that cervical traction alone can significantly reduce pain and improve functional outcomes in patients with acute mechanical neck pain. The observed reduction in pain and muscle spasm may be attributed to the decompressive effect of traction, which reduces pressure on cervical structures and improves circulation.

These findings are consistent with previous studies. Graham et al. (2006) reported that mechanical traction is effective in reducing neck pain when applied appropriately. Similarly, Raney et al. (2009) highlighted the role of traction in improving outcomes in patients with cervical spine disorders.

However, most existing literature supports the use of traction in combination with exercise therapy. In contrast, this study highlights the potential effectiveness of traction as a standalone intervention in acute cases, which is relatively less explored.

The uniqueness of this study lies in isolating cervical traction as the only intervention, thereby demonstrating its direct therapeutic effect without confounding variables such as strengthening exercises.

Despite positive short-term outcomes, the absence of strengthening exercises may limit long-term benefits, particularly in preventing recurrence related to postural dysfunction.

CONCLUSION

Cervical traction is an effective short-term intervention for mechanical neck pain. It can significantly reduce pain and improve function when applied appropriately. However, for long-term management, a comprehensive rehabilitation program should be considered.

LIMITATIONS

- Single patient study
- Short duration (3 weeks)
- No long-term follow-up

- Lack of control group

FUTURE SCOPE

- Larger sample size studies
- Comparative studies with exercise therapy
- Long-term follow-up research

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