"Assessing The Impact Of Cervical Lateral Glide On Cervical Spondylosis With Unilateral Radiculopathy"

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ABSTRACT

Background: Unilateral radiculopathy with cervical spondylosis is a prevalent musculoskeletal disorder that produces pain, limited movement in the neck, and disability. Manual therapy interventions like Maitland Cervical Lateral Glide have been suggested to reduce symptoms but require more evidence for their clinical effectiveness.

Objective: To determine the effect of Maitland Cervical Lateral Glide on cervical range of motion, pain severity, and disability in subjects with cervical spondylosis with single radiculopathy.

Methods: A pre-test and post-test experimental design was used with 30 participants randomly divided into two groups: an experimental group receiving combined conventional physiotherapy and Maitland Cervical Lateral Glide, and a control group receiving conventional physiotherapy alone. Participants aged 30-60 years with clinically and radiologically diagnosed cervical spondylosis and unilateral radiculopathy were included. Outcome measures included cervical range of motion (ROM), Numeric Pain Rating Scale (NPRS), and Neck Disability Index (NDI). Data were analyzed using paired t-tests to compare pre- and post-treatment results within groups.

Results: The experimental group indicated considerable enhancement in cervical flexion ($p < 0.0001$), extension ($p < 0.0001$), levels of pain ($p < 0.0001$), and disability levels ($p = 0.0154$). The control group did not show any significant alteration in any of the outcome measures. The results suggest that Maitland Cervical Lateral Glide, used along with traditional physiotherapy, greatly enhances cervical mobility and alleviates pain and disability.

Conclusion: Maitland Cervical Lateral Glide, when employed as an adjunct to standard physiotherapy, is effective in enhancing clinical outcome in patients with cervical spondylosis with unilateral radiculopathy. Its application in the clinical setting can potentially hasten recovery and enhance quality of life. Further research with larger sample sizes and longer follow-up is advocated to verify these results.

Keywords: Cervical spondylosis, Unilateral radiculopathy, Maitland Cervical Lateral Glide, Manual therapy, Cervical mobility, Pain relief, Neck disability, Physiotherapy

INTRODUCTION

Cervical spondylosis is a chronic, inexorable degenerative condition of the cervical spine that is most often due to aging and cumulative mechanical stressors. The disorder is characterized by a cascade of structural and functional alterations in the intervertebral discs, facet and uncovertebral joints, vertebral endplates, and surrounding ligamentous and capsular tissues. The pathophysiologic process is usually clinically significant in the fourth decade of life and is intensified by occupational stress, repetitive cervical motion, prolonged poor postural attitudes, previous cervical trauma, or genetic predisposition. Central to its development is intervertebral disc degeneration, which is the loss of water content and proteoglycans within the nucleus pulposus. These alterations decrease the elasticity and shock-absorbing function of the disc, leading to disc desiccation, loss of disc height, and annular fissuring. With compromised axial load distribution, adjacent structures compensate, which hastens osteophyte formation, especially on the vertebral borders and uncovertebral joints. The bony projections add to foraminal narrowing and can impinge on contiguous neurovascular structures.

Simultaneously, hypertrophy and ossification of spinal ligaments, particularly the posterior longitudinal ligament and ligamentum flavum, can also add to spinal canal stenosis or lateral recess compromise. Due to such degenerative cascades, neural structures become affected, resulting in either radiculopathy with compression of nerve roots or myelopathy due to direct compression of the spinal cord. The clinical presentation of cervical spondylosis is heterogeneous and can range from axial neck pain, limited range of motion, cervicogenic headache, or radicular manifestations like numbness, paresthesia, and weakness in a dermatomal and myotomal pattern. In severe stages, upper motor neuron signs like hyperreflexia, spasticity, and gait impairment can develop, especially with cervical spondylotic myelopathy.

Unilateral cervical radiculopathy is the most frequent of the neurological complications secondary to cervical spondylosis, with mechanical compression or chemical irritation of one cervical spinal nerve root, with most cases occurring at the C5 to C7 levels. The pathologic etiology is most commonly degenerative in nature, including intervertebral disc herniation, osteophyte encroachment into the intervertebral foramina, or ligamentous hypertrophy—events all of which lead to foraminal stenosis and subsequent impingement upon the nerve root. The clinical picture is usually characterized by unilateral axial neck pain that radiates along a specific dermatomal pattern into the shoulder, arm, forearm, or hand. Paresthesia (tingling), hypoesthesia (decreased sensation), or dysesthesia (disturbing abnormal sensations) corresponding to the sensory distribution of the involved nerve root may be described by patients. Associated motor deficits can encompass myotomal weakness, decreased grip strength, and impaired fine motor function, especially in activities requiring upper limb dexterity. Neurological testing typically yields diminished or absent deep tendon reflexes, for example, biceps (C5–C6), brachioradialis (C6), or triceps (C7), demonstrating segmental nerve root involvement. Aggravation of symptoms is usually produced on cervical extension, lateral flexion, or ipsilateral rotation, secondary to augmented mechanical tension or reduction of the neuroforamina—often ascertained by a positive Spurling's test. Symptomatology can be insidious or acute, and clinical severity depends on the extent and chronicity of neural compression.

The diagnostic testing of unilateral cervical radiculopathy due to cervical spondylosis requires a multimodal strategy, starting with a complete clinical examination to detect motor, sensory, and reflex changes. A complete neurological examination serves to determine the involved spinal nerve root on the basis of segmental deficits including dermatomal sensory loss, myotomal weakness, and reflex asymmetries. Clinical examinations, such as the Spurling's maneuver, distraction test, and shoulder abduction relief sign, can help establish the radicular nature of the symptoms. After clinical suspicion, imaging studies become the key confirmatory methods. Plain radiography of the cervical spine is usually the first step, helpful for demonstrating disc space loss, anterior and posterior osteophytes, intervertebral relationship, and evidence of spondylotic arthropathy. Yet, magnetic resonance imaging (MRI) is still the 'gold standard' because it has a better ability in defining intervertebral disc disease, nerve root entrapment, spinal cord impingement, and soft tissue alteration, such as ligamentous hypertrophy or disc herniation. In situations where MRI is contraindicated or does not yield adequate anatomical information, computed tomography (CT), especially with myelographic contrast, may be used to determine bony encroachment and the degree of foraminal or canal stenosis.

Also, electrodiagnostic tests like electromyography (EMG) and nerve conduction velocity (NCV) tests are useful in determining the functional integrity of the peripheral nervous system. These modalities quantify the extent of axonal loss or demyelination, validate radiculopathy, and separate it from conditions that mimic it, such as peripheral neuropathies, brachial plexopathies, or motor neuron disorders. Altogether, this integrative diagnostic strategy not only localizes the pathological segment but also directs therapeutic planning by delineating the severity and chronicity of neural compromise.

The treatment of cervical spondylosis and related radiculopathy is tiered, with conservative treatment being followed by surgical intervention only if absolutely required. Conservative treatment continues to be the first line of treatment and consists of both pharmacological and physiotherapeutic measures. Pharmacologically, the patients are usually given nonsteroidal anti-inflammatory drugs (NSAIDs) to control inflammation and relieve pain, as well as muscle relaxants to manage accompanying muscle spasms. In neuropathic involvement, neuropathic pain modulators gabapentin or pregabalin can be utilized to dampen pathologic neural excitability. No less important is the physiotherapeutic aspect, which targets biomechanical disturbances and facilitates neuromuscular re-education.

Physiotherapy treatment protocols are holistic and can incorporate manual therapy procedures such as Maitland's mobilizations and Maitland Sustained Natural Apophyseal Glides (SNAGs) for the restoration of segmental mobility and mitigation of mechanical irritation. Neurodynamic mobilizations, including sliders and gliders to the involved cervical nerve roots, are designed to enhance mobility of neural tissue and decrease mechano-sensitivity. Cervical traction, either manual or mechanical, is also employed to expand the intervertebral foramina and decompress pinched nerve roots. Therapeutic exercises are individualized to target isometric and dynamic strengthening of deep cervical flexors and scapular stabilizers, thus strengthening postural control and biomechanical efficacy. Postural re-education is crucial to alleviate forward head posture and rounded shoulders, both frequent compensatory patterns that increase mechanical stress on the cervical spine. Adjunct modalities such as TENS, IFT, or therapeutic ultrasound can be used to reduce pain and promote healing of soft tissues.

Surgical options are entertained if conservative therapy does not yield significant improvement within a 6–12-week time frame or if patients develop progressive neurological deficits, intractable radiculopathy, or manifestations of spinal cord compression indicative of cervical myelopathy. The decision to proceed with surgery hinges on the anatomical pathology and may involve anterior cervical discectomy and fusion (ACDF), posterior cervical foraminotomy, or cervical disc arthroplasty, each with their individual indications and biomechanical considerations.

Although a chronic and potentially progressive disorder, cervical spondylosis can be well controlled by early diagnosis and a thorough, multi-disciplinary treatment plan. Physiotherapy continues to play a central role in maximizing functional results, the establishment of neuromuscular balance, and preventing recurrence. With proper tailoring, most patients can enjoy a high degree of daily functioning and quality of life without surgical intervention.

The Maitland Cervical Lateral Glide is a commonly known manual therapy procedure used in the treatment of numerous cervical spine conditions, most notably cervical radiculopathy, unilateral neck pain, and cervicobrachial syndrome. The procedure is based on the Maitland Concept of Mobilization, which is centered on applying gentle, passive, and rhythmical

oscillatory movements specifically with reference to the patient's individual symptoms and irritability level. The cervical lateral glide precisely entails the use of a passive side-to-side mobilization of single cervical vertebrae, with the patient in a preferred supine (lying face-up) position. The head and neck are stabilized by the therapist while administering a horizontal glide at the specific segmental level of the cervical spine. The major objective of this mobilization is pain relief, the restoration of normal joint biomechanics, and mechanical tension on the cervical nerve roots, which are usually irritated or compressed radiculopathy.

It is usually done in a gradated way, according to the Maitland classification system. Grade I and II mobilizations are small-amplitude oscillations in the initial part of the range of motion and are chiefly geared towards pain control and decreasing muscle guarding. Grade III and IV mobilizations are bigger amplitude movements given at the terminal portion of the range and are directed to enhance joint stiffness, increase mobility, and reinstate functional range. Notably, the lateral glide direction is most commonly used from the non-painful side to the painful or symptomatic side to permit graded exposure of the involved structures without causing discomfort. For cervical radiculopathy, the mobilization can be combined with active movement of the arm on the affected side, a modification that augments neurodynamic mobilization and increases mobility of the nerve by lessening adhesions and mechanical irritation along the nerve root.

The mechanisms of treatment of Maitland cervical lateral glide are both neurophysiological and mechanical. Neurophysiologically, mobilization provokes mechanoreceptors in the soft tissues and cervical joints, modulating the nociceptive input (pain signals) at the spinal level, ultimately decreasing the perception of pain. Mechanically, the procedure allows for joint decompression, enhanced synovial fluid circulation, and minimized nerve root impingement, leading to general symptom alleviation. Many clinical studies and anecdotal reports substantiate the immediate effectiveness of this technique in enhancing neck range of motion, reducing radicular symptoms, and increasing patient-reported functional outcomes.

Yet application of the Maitland cervical lateral glide must be done with clinical acumen. There are various contraindications and precautions to abide by before using this technique. They include cervical spine instability, vertebrobasilar insufficiency (VBI), fractures, inflammatory joint diseases, malignancies within the cervical region, and osteoporosis of high severity. It is advisable to have a proper clinical examination, neurological screening, and safety tests (e.g., assessment of VBI) before mobilization. When provided by an experienced and trained physiotherapist, the Maitland cervical lateral glide is a harmless, non-surgical, and efficient technique that accompanies other physiotherapeutic modalities like postural correction, neural tissue mobilization, and therapeutic exercises in the full management of cervical spine dysfunctions.

METHODOLOGY

This research will utilize a pre-test and post-test experimental design to compare the therapeutic effectiveness of Maitland Cervical Lateral Glide in patients with cervical spondylosis complicated with unilateral cervical radiculopathy. The study will be done within the outpatient physiotherapy department of The Royal Orthopaedic Hospital and Sports Injury Centre which is equipped to deal with spinal musculoskeletal diseases. 30 participants will be recruited through purposive sampling, on pre-defined inclusion and exclusion criteria.

Eligible participants will be between 30 and 60 years of age, clinically and radiologically diagnosed with cervical spondylosis with unilateral radicular symptoms like radiating pain, numbness, or paresthesia of one upper limb. Clinical confirmation will be positive provocative tests like Spurling's test

Exclusion factors include patients with cervical spine surgery history, bilateral radiculopathy, presentation of severe disc herniation with myelopathy, systemic neuromuscular or musculoskeletal diseases, or steroid treatment or recent cervical injections.

After registration, participants will receive a standardized intervention protocol. The primary intervention will be Maitland Cervical Lateral Glide technique, performed with the patient in a comfortable supine or sitting position. The therapist will apply a prolonged lateral glide at the symptomatic cervical level, concurrently with active cervical movements by the patient (e.g., rotation or side-bending), so that mobilization is pain-free.

Intervention Protocol

Group A (Experimental group) - Conventional Physiotherapy + Cervical Lateral Glide (15 subjects)
Group B (Control group)- Conventional Physiotherapy (15 subjects)

Procedure

Procedure for Cervical Lateral Glide (Passive Mobilization Technique) (Experimental group- Group A)

Patient Position

- The patient lies supine on a firm, stable treatment table for cervical support and spinal alignment.
- The neck and head are positioned in neutral or slightly flexed to decrease neural tension and allow access to the cervical vertebrae.
- The head is held by the therapist's hands, headrest, or towel roll for relaxation and minimized unnecessary guarding.

Therapist Position

- Therapist positions at the head-end or side of the treatment table depending on access preference.
- The stabilizing hand (in most cases the radial border of the index finger or thumb) comes in contact with the spinous process or articular pillar of the involved segment on one side of the cervical spine.

- The stabilizing force must be firm but gentle to provide segmental control without causing discomfort.

Mobilization Technique

- The mobilizing hand rests upon the contralateral articular pillar or the same vertebral segment's spinous process or articular pillar.
- There is a gentle lateral glide horizontally in the frontal plane, with care taken not to move the head and cervical spine throughout.
- No rotation, extension, or lateral flexion should take place—there is a neutral spine during mobilization.

Repetitions

- Normally done for 10 reps and 3 sets with interchanging rest periods between applications.

Standard Physiotherapy Program for CSUR (Control group – Group B)

Modalities

- TENS (Transcutaneous Electrical Nerve Stimulation): Dermatomal pain modulation
- Thermotherapy: According to the irritability level, heat for stiffness
- Ultrasound Therapy: 1 MHz continuous for deep tissue repair and neural decompression

Postural Corrections

- Education regarding desk ergonomics and sleep posture
- Cervical roll, lumbar support, and monitor height correction
- Cervical Traction: Intermittent, 10–15 min/sitting (7-10% of total body weight)

Therapeutic Exercises

- Isometric Neck Exercises: All directions to support dynamic stability
- Scapular Stabilization: Rows, wall slides, serratus punches
- AROM Exercises: Gentle ROM in pain-free arcs
- Chin Tucks + Deep Neck Flexor Activation: For cervical segmental control

Outcome Measures

Assessed at baseline and 4 weeks later:

- Neck Disability Index (NDI) – measures functional impairment
- Numerical Pain Rating Scale (NPRS) – measures pain intensity
- Cervical Range of Motion (ROM) – Using a Universal Goniometer

The Universal Goniometer is a hand-held instrument for assessing joint angles.

1.Preparation

- Have the patient sit up straight in a firm, back-supported chair, feet flat on the floor.
- Have the head and neck in neutral position, eyes ahead.
- Describe the process and avoid trunk or shoulder compensation during movement.
- Employ anatomical landmarks (e.g., tragus, acromion, external occipital protuberance) to ensure consistent placement of the goniometer.

2. Neck Flexion and Extension (Sagittal Plane)

-Flexion:

- Position the fulcrum of the goniometer on top of the external auditory meatus.
- Position the stationary arm perpendicular to the floor.
- Place the moving arm along the base of the nose or tip of the chin.
- Have the patient flex the head forward without moving the trunk. Measure the angle of flexion.

-Extension:

- Return to neutral position.
- Ask the patient to extend the neck backward.
- Keep the same goniometer positioning and measure the extension angle.

3.Measuring Lateral Flexion (Frontal Plane)

- Place the fulcrum above the spinous process of C7.
- Place the stationary arm perpendicular to the spine.
- Place the moving arm parallel to the midline of the head (occipital protuberance).
- Ask the patient to tilt the head to the side (ear toward shoulder) without elevating or rotating the shoulders.
- Take measurements and record right and left lateral flexion angles.

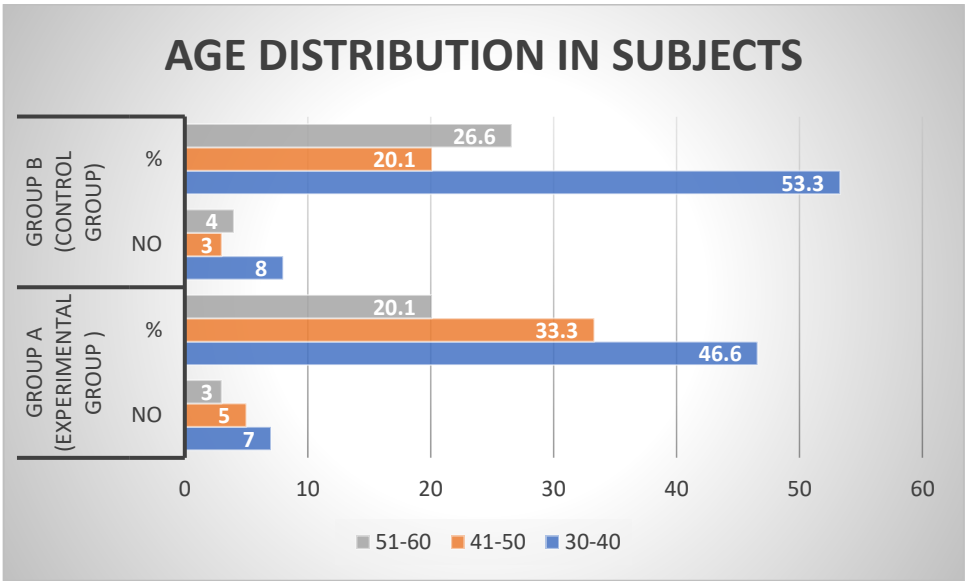
4. Measuring Rotation (Transverse Plane)

- Position the patient with shoulders relaxed and head in neutral.
- Position the fulcrum of the goniometer over the centre of the cranium (top of the head).
- Position the stationary arm along an imaginary line between the acromion processes.
- Position the moving arm along the tip of the nose.

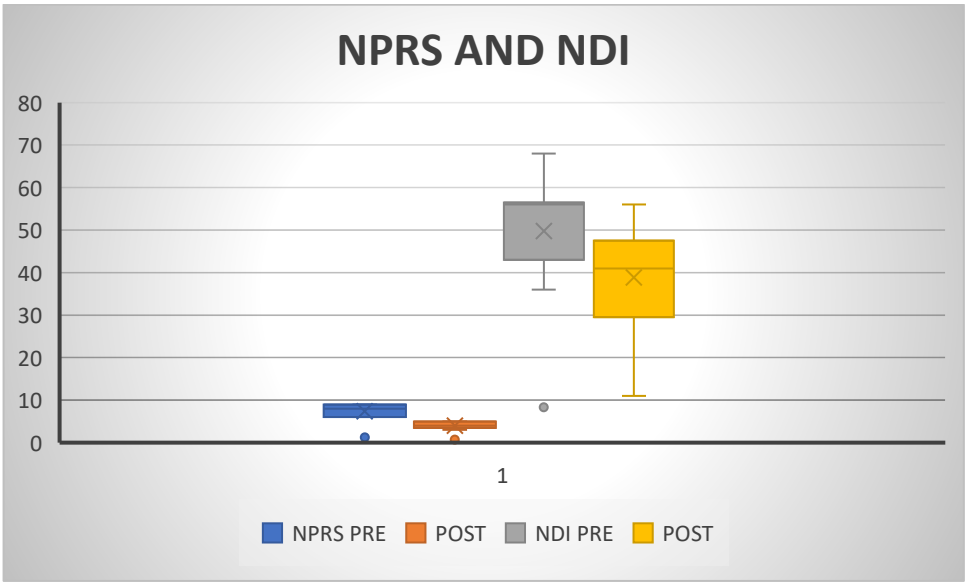
- Have the patient rotate the head to the right and left as far as possible.
- Take the angle of rotation for both directions down.

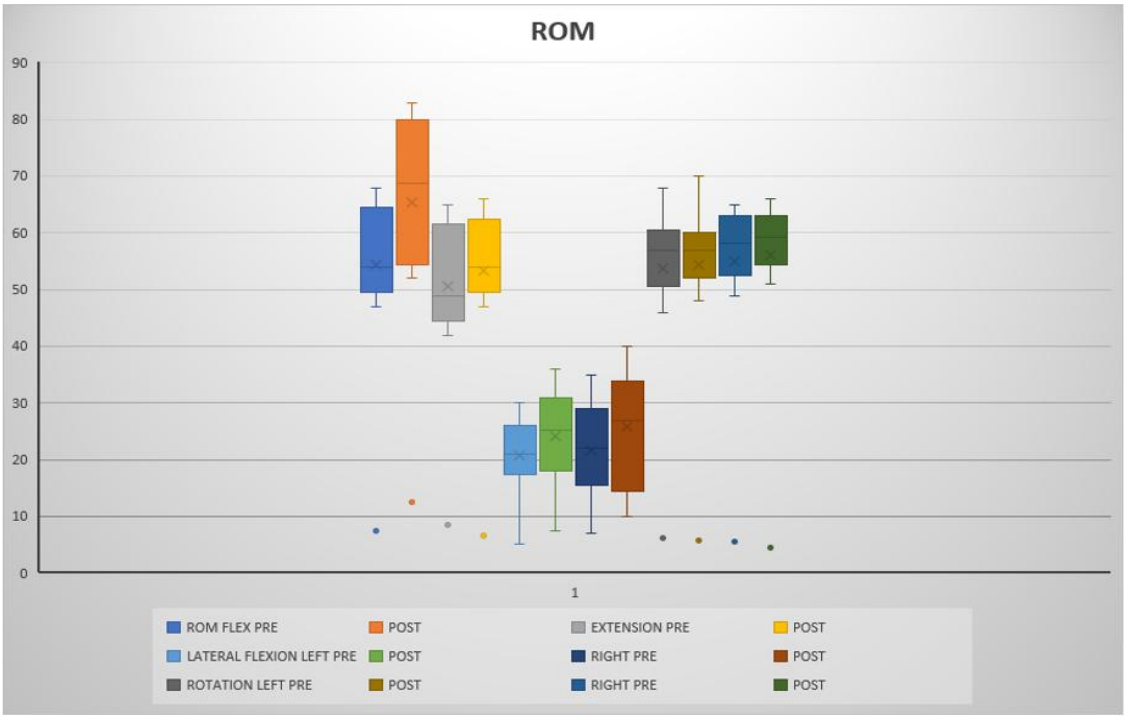
RESULTS

AGE DISTRIBUTION IN SUBJECTS					
		GROUP A (Experimental Group)		GROUP B (Control Group)	
S. No	Age in years	No	%	No	%
1	30-40	7	46.6	8	53.3
2	41-50	5	33.3	3	20.1
3	51-60	3	20.1	4	26.6
MEAN		5		5	
SD		1.632993162		2.160246899	

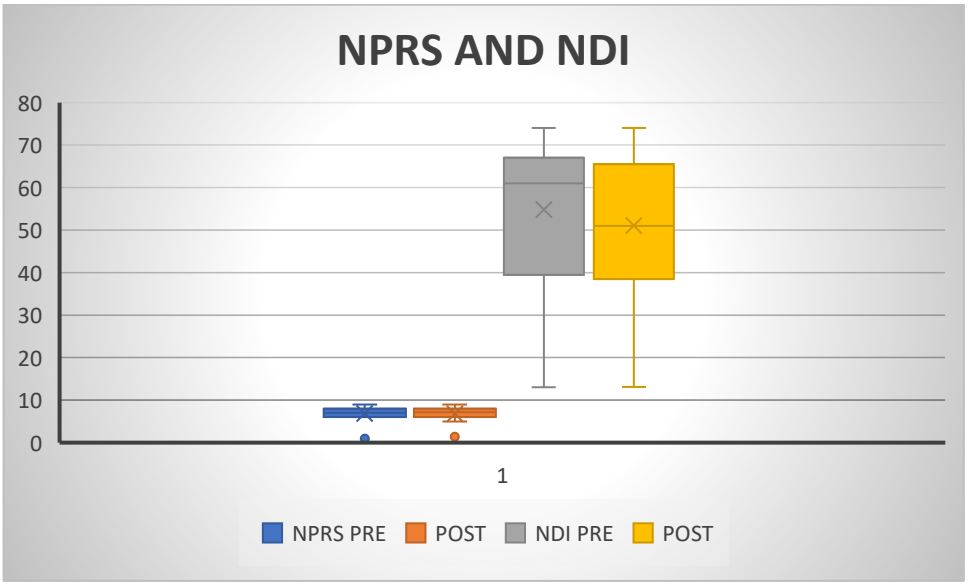


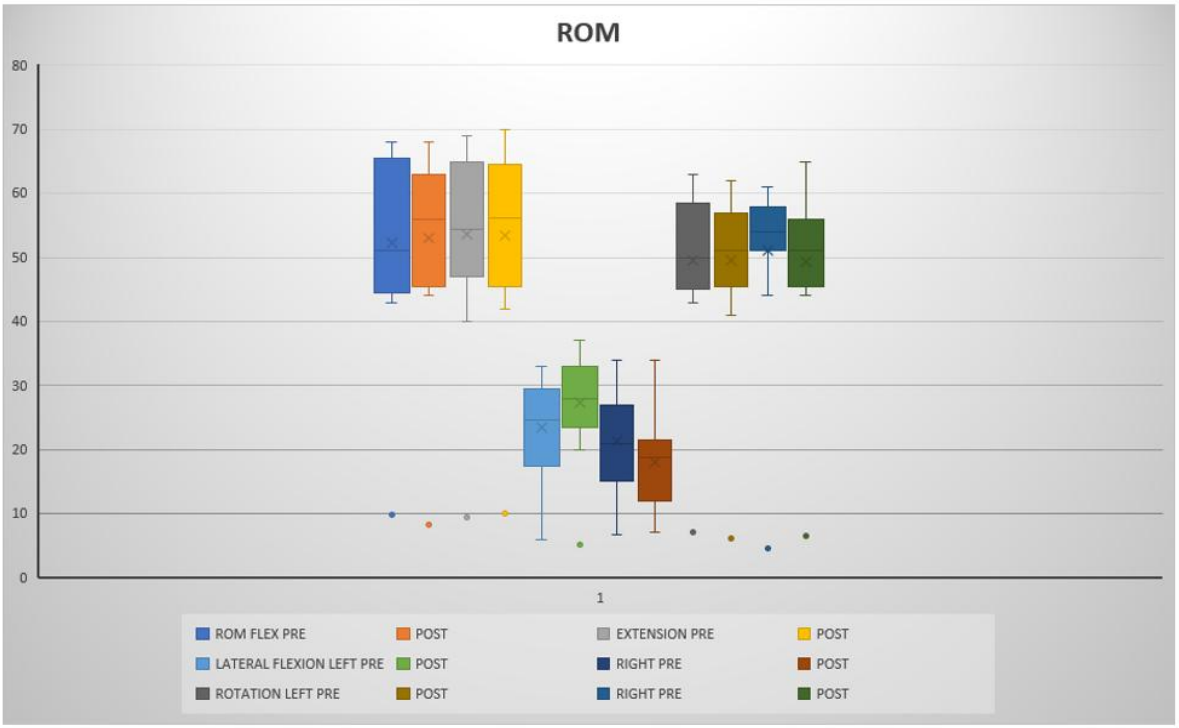
Sno	Outcome measures	GROUP A (Experimental Group)				Paired t-test/ Wilcoxon test	p-value
		Pre test		Post test			
		Range	Mean ±SD	Range	Mean ±SD		
1	Flexion ROM	47-68	57.26 ±7.54	52-79	68.66 ±12.5	-5.76	<0.0001
2	Extension ROM	42-63	53.2±8.51	47-64	56.33±6.59	-5.779	<0.0001
3	Left lateral flexion ROM	19-27	21.86±5.0	18-36	25.33±7.56	-1.2887	0.1284
4	Right lateral flexion ROM	19-27	22.66±26.8	11-39	26.8 ± 9.94	-1.0056	0.3317
5	Right rotation	49-53	58.2±5.6	52-61	59.2 ±4.3	-0.6307	0.5384
6	Left rotation	46-68	56.73±6.31	51-70	57.46 ± 5.80	-0.3307	0.7458
7	Pain (NPRS)	6-9	7.733±1.23	3-4	4.2±0.74	8.5656	<0.0001
8	Neck Disability Index (NDI)	40-68	52.4±8.31	20-56	40.6 ±11.03	2.7579	0.0154





Sno	Outcome measures	GROUP B (Control Group)				Paired t-test/ Wilcoxon test	p-value
		Pre test		Post test			
		Range	Mean ±SD	Range	Mean ±SD		
1	Flexion ROM	43-66	54.86 ±9.749301969	45-62	55.96± 8.249983165	-0.3715	0.7158
2	Extension ROM	40-69	54.46 ±9.464788546	42-70	56.2 ± 9.994665	0.0589	0.9538
3	Left lateral flexion ROM	16-18	24.53 ± 5.93	20-34	28.8 ± 5.16	-1.9127	0.0765
4	Right lateral flexion ROM	12-23	22.26 ± 6.796	11-25	18.73 ± 7.103	1.5357	0.1469
5	Right rotation	50-61	53.93 ± 4.666	44-57	51.93 ± 6.56	1.2381	0.236
6	Left rotation	43-63	52.13 ± 7.17	46-61	52.2 ± 4.66	-0.0272	0.9787
7	Pain (NPRS)	6-9	7.2 ± 0.9798	4-6	7.13 ± 1.407	0.1683	0.8687
8	Neck Disability Index (NDI)	37-74	57.14 ± 13.011	37-58	53.46 ± 13.09	1.0568	0.3085





Paired t-Test Results Interpretation for Group A and Group B

Paired t-tests were conducted in the current study to determine the pre- and post-intervention within-group differences in outcome measures for the experimental group (Group A) and the control group (Group B).

Group A (Experimental Group):

The findings revealed statistically significant improvements in some parameters. Ranges of motion (ROM) for cervical flexion ($p < 0.0001$) and extension ($p < 0.0001$) significantly increased after treatment. In addition, there was a highly significant decrease in intensity of pain, as scored using the Numeric Pain Rating Scale (NPRS) ($p < 0.0001$), and a significant reduction in neck-related disability, as measured by the Neck Disability Index (NDI) ($p = 0.0154$). Nevertheless, left and right lateral flexion and left and right rotation ROM changes were not statistically significant but with some improvement in mean values. The findings indicate that the experimental intervention was useful in enhancing cervical mobility, pain reduction, and function improvement in participants.

Group B (Control Group):

The control group, on the other hand, that received standard physiotherapy did not exhibit statistically significant alterations in any of the outcomes measured. Cervical flexion ($p = 0.7158$), extension ($p = 0.9538$), lateral flexion, and squatting ROM did not significantly change after intervention. Furthermore, pain intensity (NPRS; $p = 0.8687$)

significantly decrease and disability (NDI; p = 0.3085) also did not significantly decrease. The findings of this study imply that the traditional treatment regimen employed by the control group was not as effective in achieving significant functional recovery or pain relief among participants.
Based on the outcomes, the experimental intervention utilized in Group A turned out to be more effective in enhancing cervical ROM, alleviating pain, and ameliorating disability, which suggests its clinical significance and therapeutic efficacy in treating conditions related to cervical dysfunction.

DISCUSSION
This study aimed to determine the effectiveness of Maitland Cervical Lateral Glide in enhancing cervical function, alleviating pain, and limiting disability in subjects with cervical spondylosis complicated by unilateral radiculopathy. The results showed that the experimental group (Group A), which underwent combined conventional physiotherapy and cervical lateral glide, significantly benefited from cervical range of motion (ROM), pain reduction, and neck disability. The control group (Group B), receiving traditional physiotherapy only, had no statistically significant improvement in these measurements.

Cervical Range of Motion (ROM):
The significant improvement in cervical flexion and extension ROM in the experimental group is in line with previous research highlighting the advantage of manual therapy techniques for increasing joint mobility. For example, Kasaki et al. (2012) noted that Maitland mobilization strategies, such as the cervical lateral glide, significantly enhance ROM by lessening joint restrictions and improving lubrication within the joints. While improvements in lateral flexion and rotation were not found to be statistically significant, the noted mean gains indicate a beneficial trend that may be significant with larger samples or longer intervention times.

Pain Reduction
The marked reduction in pain scores (as quantified by NPRS) in the experimental group supports existing literature regarding Maitland methods. Han et al. (2017) reported cervical mobilization maneuvers to reduce pain severity and enhance functional status among patients with cervical radiculopathy significantly. The mechanism put forward entails relief of joint hypomobility, alleviation of nerve compression, and modulation of pain using gate control pathways.

Disability Improvement
The decrease in neck disability index (NDI) scores reflects functional improvement after the intervention. This is consistent with results by Vicenzino et al. (2004), who showed that manual treatment integrated with exercise yields reduced disability among patients with disorders of the cervical spine. The fact that the control group did not show significant changes only further emphasizes the additional advantage of Maitland lateral glide over standard physiotherapy in isolation.
The findings of this research align with current literature. A systematic review by Chan et al. (2019) found mobilization and manipulation techniques, such as the Maitland technique, to be effective in enhancing cervical ROM and alleviating pain in patients with cervical radiculopathy. Likewise, O'Connell et al. (2013) found manual therapy techniques, like the cervical lateral glide, to have a beneficial effect on symptom severity and functional status, consistent with our findings.

Clinical Implications:
The proven effectiveness of Maitland cervical lateral glide justifies its place as a useful adjunct to standard physiotherapy in managing cervical spondylosis with radiculopathy. The procedure seems to yield prompt relief from pain, increase mobility, and improve functional capacity, which are essential outcomes in the management of cervical spine pathologies. Finally, the findings of the current study indicate that the combination of Maitland Cervical Lateral Glide with the routine physiotherapy is more beneficial in improving cervical mobility, alleviating pain, and diminishing disability than routine physiotherapy itself. These findings support the essence of the manual therapy skills in integrated cervical spine care and emphasize the necessity for future large-scale research.

CONCLUSION
This research proves that Maitland Cervical Lateral Glide, when used alongside standard physiotherapy, is far better than standard physiotherapy on its own in enhancing cervical range of motion, alleviating pain, and lowering disability among patients suffering from cervical spondylosis complicated by unilateral radiculopathy. The results emphasize the treatment value of manual mobilization procedures in the management of cervical spine disorders and justify their implementation in clinical practice to deliver better patient outcomes. Future studies with larger sample sizes and extended follow-up durations are indicated to substantiate these findings and elucidate the long-term advantages of this intervention

SUMMARY
The present study was designed to assess the therapeutic effect of Maitland's Cervical Lateral Glide in patients with cervical spondylosis with unilateral radiculopathy. The investigation involved a pre-test and post-test design conducted at the outpatient department of physiotherapy of The Royal Orthopaedic Hospital and Sports Injury Centre, which is well-equipped to manage spinal musculoskeletal disorders.

30 participants aged between 30 and 60 years fulfilling certain inclusion criteria—e.g., clinical and radiological diagnosis of cervical spondylosis with unilateral radicular symptoms and positive provocative tests like Spurling's test—were purposively sampled. Those patients who had undergone previous cervical spine surgery, bilateral radiculopathy, severe disc herniation with myelopathy, systemic neuromuscular or musculoskeletal diseases, or recent cervical injections and steroid treatments were excluded to ensure participant homogeneity.

Participants were randomized into two groups:
Group A (Experimental Group): Underwent conventional physiotherapy along with Maitland's Cervical Lateral Glide (15 participants).
Group B (Control Group): Underwent only conventional physiotherapy (15 participants).
Intervention in Group A consisted of a precise manual therapy maneuver where the therapist provided a sustained lateral glide at the symptomatic cervical level with the patient doing active cervical movement (side-bending or rotation). The intervention was designed to relax joint restriction and remove neural compression, and the intervention was adapted to be pain-free.

Results:
Group A (Experimental): The statistical analysis by paired t-tests determined that there were significant increases in cervical ROM, especially flexion ($p < 0.0001$) and extension ($p < 0.0001$). There was also a highly significant decrease in pain severity as assessed by the Numeric Pain Rating Scale ($p < 0.0001$) and a significant reduction in neck disability scores ($p = 0.0154$). While improvements in lateral flexion and rotation were not statistically significant, mean values were positive trending.
Group B (Control): No noteworthy changes were found in cervical ROM, pain, or neck disability post-treatment, suggestive of poor effectiveness of normal physiotherapy alone in the study duration.
The results conclude that the incorporation of Maitland's Cervical Lateral Glide to regular physiotherapy appreciably improves cervical mobility, alleviates pain, and functional capacity in patients with cervical spondylosis and radiculopathy.

Comparison with Existing Literature:
The beneficial effects seen are consistent with earlier studies, e.g., those of Kasaki et al. (2012), Han et al. (2017), and Vicenzino et al. (2004), that favor manual therapy procedures such as Maitland's for enhancing cervical function and reducing radicular symptoms. These studies emphasize the mechanistic advantages of joint mobilizations, such as relief from pain by modulation of nociceptive pathways as well as enhancement of joint mobility.

Clinical Significance
This study emphasizes the clinical value of Maitland's Cervical Lateral Glide as a successful, non-surgical treatment, which is capable of generating measurable changes in pain, mobility, and disability. Its integration into physiotherapy would potentially yield quicker recovery, improved functional capacity, and improved quality of life for patients with cervical spine degenerative conditions.

Limitations
Limitations of the study are small sample size and brief follow-up duration, which can impact on generalizability. Future studies should target larger numbers of participants, longer follow-up duration, and objective neurophysiological measures in order to uncover more about underlying mechanisms.

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