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Neurodynamic with cervical lateral glide in cervical radiculopathy: A Single case study

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Abstract

Case study presents effectiveness of neurodynamic with cervical lateral glide, physiotherapy management of 28-year-old female patient name XYZ diagnosed with cervical radiculopathy. The aim of the study was to examine the effectiveness of neurodynamic with cervical lateral glide physiotherapy management to reduce pain intensity, improve range of motion and improve the quality of life or functional status of patient with cervical radiculopathy. Baseline assessment data found severe pain, limited and painful range of motion difficulty in activity of daily living that is reduce quality of life. Management having neurodynamic with cervical lateral glide and home exercises, are cervical isometric exercise with postural correction education. Through outcome measure seen significant improvement in reduction of pain and increase range of motion with pain free and increase functional status or quality of life.

Aim of study: The aim of study is to provide evidence proved analysis of neurodynamic with cervical lateral glide in patient with cervical radiculopathy. Through this assessment, we formulate the goal of management, implementation of manual techniques, analysis of outcomes and reach on conclusion. The aim of this case study was to see the effectiveness of neurodynamic with cervical lateral glide by reduce the pain intensity, increase limited painful range of motion and increase the quality of life. The case study helps as a resource for health care provider, physiotherapist, and research interested in understanding the neurodynamic with cervical lateral glide treatment in cervical radiculopathy.

Keywords: Cervical radiculopathy, neurodynamic, cervical lateral glide, Neural mobilization

Introduction

Neck pain and arm pain is a clinical condition that may be caused by cervical radiculopathy affects the sensory-motor function of the cervical nerve root ^[1]. Characteristics are an inability to complete movement of the neck and arm, neck pain that may radiate to shoulder pain, arm pain, and forearm pain ^[1]. Sensory loss is also seen in cervical radiculopathy that is common in complete hands ^[1]. Weakness is seen in complete hand, extending the elbow, and movement of the shoulder away from the body ^[1]. In cervical radiculopathy, symptoms are reduced by overhead activity of the shoulder. Cervical radiculopathy is most common in the age of 50 to 54 and most predominantly in males (Radhakrishnan *et al.*).

Causes of cervical radiculopathy are the following

As we know, cervical radiculopathy is caused by compression or inflammation of the nerve, so these factors are responsible for the pinching of the nerve.

Any trauma or injury: In a car road traffic accident, whiplash injury is the most common condition that may be associated with structural compression or nerve compression that leads to symptoms of compression of the nerve ^[2].

Formation of bone spur: Due to increasing age, there is abnormal growth of bone that causes compression of nerve ^[3].

Degenerated disc disease or herniated disc: When the nucleus pulposus is exited out of the intervertebral foramen—can lead to compression of the nerve ^[4].

Spinal stenosis: Spinal stenosis caused by the first central canal, reduction of anteroposterior diameter can lead to nerve compression ^[5]. Second is neural foramen, reduce diameter of neural foramen can compress the nerve.

Facet joint spondylosis—this is progressive degenerative changes that have been seen. This is mostly seen in pathology that leads to cervical radiculopathy, resultant pain, and numbness in the dermatomal region of the affected or compressed nerve [6].

Diagnosis of cervical radiculopathy

For the diagnosis of cervical radiculopathy, we will take the present, past, and medical history; physical examination; manual special tests; and radiological diagnostic findings.

- **Medical history:** In medical history, the doctor will take complete information about prior diseases or medical conditions that persist along with this condition, the duration of the medical condition, the severity, the medication for the disease, and the name of the drug.
- **On physical examination:** In physical examination on observation, we observe the posture of the patient, on palpation assess tissue texture on examination, and assess active range of motion of the neck, muscle strength, reflex examination and functional capacity.
- **Radiological diagnostic finding:** By seeing X-ray, MRI, and CT scan, may visualise the abnormality of the cervical spine related to tissue and bone.

Materials and Methods

Case presentation

Patient name—XYZ

Age: 28 Year old / female

Occupation – Student

Diagnosis: cervical radiculopathy

Assessment

The assessment of XYZ involves gathering information about her medical history, conducting a physical examination, and utilising relevant diagnostic imaging such as X-ray and MRI scans. The aim of the assessment is to clear out underlying causes, determine the severity of symptoms, and establish the baseline measurement of of treatment planning.



Fig 1: X-ray cervical spine

- **Medical history:** The physiotherapist conducted a detailed interview with Riya Singh. To collect the information about her complete medical history, which includes previous injury, surgery, and medical conditions that are prone to the development of cervical radiculopathy.
- **Physical examination:** In physical examination, we assess the posture, range of motion, muscle strength, sensation, and mobility of the joint.
- **Postural assessment:** The physiotherapist evaluated

standing and sitting posture, looking for any deviations or imbalances that may cause her symptoms.

- **Range of Motion Assessment:** Active and passive range of motion in the cervical spine was assessed. The physiotherapist measured the degree of movement in flexion, extension, lateral flexion, and rotation to identify any restrictions or limitations.
- **Muscle Strength Testing:** The strength of the muscles in the upper limb, including the neck, shoulder, arm, and hand, was evaluated. Manual muscle testing was performed, grading the strength on a scale of 0 to 5.
- **Sensory Examination:** Sensory function was assessed by testing his ability to perceive light touch, pinprick sensation, and proprioception in specific dermatomes corresponding to the affected spinal nerves. And ask about abnormal sensation, pins and needle sensation, and numbness.
- **Reflex Testing:** checked the deep tendon reflexes, such as the bicep and triceps reflex, to assess the completeness of the spinal cord and associated nerve roots.
- **Diagnostic Imaging:** To confirm the diagnosis and determine the underlying cause of cervical radiculopathy, diagnostic imaging tests such as X-rays or MRI scans may be done. These imaging studies provide detailed visualisation of the cervical spine, including the intervertebral discs, spinal cord, and nerve roots, helping to identify disc herniation, degenerative changes, or spinal stenosis.
- **Special Tests:** Spurling test, cervical distraction test, Shoulder abduction test, Active quick test (median nerve compression test)



Fig 2: Foraminal compression test



Fig 3: cervical distraction test



Fig 4: Shoulder abduction test



Fig 5: Active quick test

Active quick test

Which involves extending and rotating the neck to reproduce symptoms, can help confirm nerve root compression. Manual Special tests are used for accurate or confirm diagnosis.

Baseline measurement

- **Numeric pain rating scale:** The numeric pain rating scale of Riya is 7 out of 10, which means pain is severe by the NPRS scale. We are assessing the intensity of pain.
- **Active range of motion (cervical):** When assessing neck range of motion, got restricted flexion, extension, and rotation range of motion. Severe pain in flexion of the cervical spine.
- **Neck disability index:** through NDI, assess functional status or quality of life. The score was 48 out of 100.

Outcome Measure	Baseline Value
NPRS Scale	7 Out of 10
Range of Motion	Painful Limited
NDI Scale	48

Treatment goals

Treatment was dependent on the baseline measurement score, and the goals of treatment are
 Reduce the intensity of pain.
 Improve range of motion of cervical spine.
 Improve functional status or quality of life.

Intervention: Physiotherapy management includes a combination of neurodynamic with cervical lateral glide.



Fig 5: Technique of cervical lateral glide



Fig 5: Techniques of neuro dynamics for median nerve

- Home exercise and postural correction
- Educate about correct posture.
- Take rest during prolonged desktop work.
- As home exercise, prescribe cervical isometric exercise.
- Evaluation and outcome

Discussion

This case study focused on the physiotherapy management of a 27-year-old female patient diagnosed with cervical radiculopathy. The discussion will delve into the findings, treatment plan, and outcomes observed in the management of his condition. In the assessment, we found that presented xyz

with severe pain (rated 7/10), limited cervical range of motion (severe flexion of the cervical spine), reduced muscle strength (grade 3/5), decreased sensation in the dermatomal distribution (shoulder, arm mainly, and palm of hand), and significant functional limitations (high NDI and EQ-5D scores). These baseline measurements provided a comprehensive understanding of his condition, highlighting the need for effective physiotherapy interventions to alleviate pain, improve mobility, and improve functional capacity.

The treatment goals were established based on the assessment findings, aiming to reduce pain intensity, improve range of motion, increase muscle strength, restore sensation, and enhance overall functional capacity and quality of life. The physiotherapy interventions consisted of pain management techniques, manual therapy, exercise therapy, and education/self-management strategies.

Outcomes showed better results. She feels a main reduction in pain intensity (7/10 to 2/10) and improvement in cervical range of motion, reaching near-normal levels. Muscle strength increased from grade 3/5 to grade 4/5, indicating improved muscle function and activation. Sensation was restored in the affected dermatomes, suggesting nerve recovery and decreased irritation. Functional capacity and quality of life also showed improvement, as demonstrated by lower NDI and EQ-5D scores, indicating a reduction of disability.

The positive outcomes present in the case study support the effectiveness of physiotherapy management in cervical radiculopathy. The combination of strategies addressed the specific needs of XYZ, resulting in significant improvement in neurodynamic with cervical lateral glide in pain, mobility, numbness, abnormal sensation, and functional capacity. Neurodynamic with cervical lateral glide proved beneficial in restoring function and enhancing the patient's quality of life.

This case study underscores the importance of a comprehensive assessment, individualised treatment planning, and regular outcome evaluation in physiotherapy management. It highlights the potential of physiotherapy interventions to improve the outcomes of patients with cervical radiculopathy and emphasises the significance of a multidisciplinary approach in the management of cervical radiculopathy.

Conclusion

This case study highlights the effective physiotherapy management of cervical radiculopathy in a 27-year-old female patient. Through a comprehensive approach including pain management techniques, manual therapy, exercise therapy, and education, significant improvements were achieved in pain levels, range of motion, sensation, and overall functional capacity. Physiotherapy interventions can play a crucial role in the treatment of cervical radiculopathy, promoting recovery and improving the quality of life for patients.

Outcomes of management explain remarkable improvements in XYZ condition. decrease intensity of pain, improved daily functioning. Free movement of cervical range of motion, reaching near-normal levels and enhancing mobility. Sensation was restored in the affected dermatomes, suggesting nerve recovery. The patient's functional capacity and quality of life showed substantial enhancement, as reflected by lower Neck Disability Index (NDI) and EuroQol-5D (EQ-5D) scores, indicating reduced disability and improved overall well-being.

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