

Use of Progressive Neurodynamic Exercises in the Conservative Treatment of Acute Lumbar Radiculopathy



COLLEGE OF HEALTH PROFESSIONS

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INTRODUCTION TO RADICULOPATHY AND NEURAL MOBILIZATIONS

- Incidence of lumbar radiculopathy in the general population is ~2.2%¹
 - Common causes include disc herniation and degenerative joint disease
- Clinical presentation depends on involved nerve root¹
 - Dermatomal sensory loss, myotomal weakness, decreased deep tendon reflex¹
- Current evidence supports the use of traction or directional preference exercises in patient with lumbar radiculopathy^{2,3}
 - Patients with lumbar radiculopathy have been excluded from many subjects examining the effect of neural mobilizations⁴⁻⁷
 - Existing studies including patients with lumbar radiculopathy lack a specific protocol regarding neural mobilizations⁴⁻⁷

PURPOSE

The purpose of this case report is to describe the effect of Shacklock's specific neuromobility exercises in addition to manual traction-based treatment on pain and function in a patient with acute lumbosacral radiculopathy.

CASE DESCRIPTION

- 26 year-old female
- No significant comorbidities
- Initial onset of low back pain in December of 2019, receiving PT and chiropractic care until March 2020
- Acute exacerbation of low back pain with symptoms radiating to the right leg in June 2020
- Infection resolved with 6-week antibiotic treatment at SNF; neurological deficits persisted
- Independent in prior level of function

PROGNOSIS

Positive prognostic factors:

- Patient previously independent and active
- Patient highly motivated
- No significant PMH
- Prompt initiation of physical therapy

Poor prognostic factors:

- Not first episode of back pain

PHYSICAL EXAM FINDINGS

- Increased lumbar lordosis and right lateral shift
- Circumduction of the right lower extremity in swing phase of gait
- Right compensated Trendelenburg gait
- Limited and painful lumbar spine range of motion in all planes; reduction in pain with repeated flexion; no change in symptoms with repeated extension
- Hypomobility/tenderness right UPAs at L4/L5
- Impairments in L5 and S1 dermatomes and myotomes
- Absent deep tendon reflex in right Achilles tendon
- Positive slump test bilaterally (right>left)

NEUROMOBILITY INTERVENTIONS

Nerve Progression	Beginning Position	End Position
Progression 1: OFFLOAD		N/A
Progression 2: OFFLOAD & CONTRALATERAL Movement		
Progression 3A OR 3B: Out of offloading & CONTRALATERAL Movement		
Progression 4: IPSILATERAL Movement & CONTRALATERAL Protection		
Progression 5: IPSILATERAL Movement without CONTRALATERAL Protection		

OUTCOMES

	Initial visit	14th visit
Gait Speed (m/s)	0.71	1.1
Modified Oswestry Disability Index	60%	6% [^]
SLANSS	2	0
PSFS: Dressing	5	10*
PSFS: Sleeping	5	10*
PSFS: Driving	6	9*
PSFS: Bathing	5	10*
PSFS: Doing Dishes	6	10*

Normal gait speed for women aged 18-29 is ~1.11 m/s (95% CI 1.09-1.14)
 Minimum clinically important difference for the Modified Oswestry Disability Index is 12.8; [^] indicates meeting MCID
 Minimal detectable change (MDC) for Patient Specific Functional Scale (PSFS) for patients with low back pain is 1.0-2.5; *indicates meeting MDC

The patient demonstrated improvements in the S1 dermatome by the 7th session, resulting in improvements in toe off in gait. The patient then was able to begin a walking program at home. By the end of the 7th session, the patient also demonstrated symmetrical slump tests and improved sensation in the S1 dermatome. Regarding range of motion, the patient demonstrated full, pain-free range of motion in all planes by the 14th session.

By the 14th visit, the patient reported no limitations in ADLs and had progressed to 4-mile hikes and was able to return to yoga, swimming, and bike riding activities with minimal changes in symptoms.

CONCLUSION

Shacklock's neurodynamics for lumbar contributed to significant improvements in pain and function for the subject of this case report. Further research involving larger, randomized control trials is necessary to examine the benefits of utilizing Shacklock's neural progression for treatment of lumbar radiculopathy compared to alternative treatment methods in the general population.

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