Ref: Ro J Neurol. 2021;20(2)
DOI: 10.37897/RJN.2021.2.20

LUMBAR RADICULOPATHY MANAGED WITH SPINAL MOBILIZATION WITH LEG MOVEMENT: A CASE STUDY

Varun Singh, Manoj Malik

Department of Physiotherapy, Guru Jambheshwar University of Science and Technology, Hisar, India

ABSTRACT

Purpose. This report describes the case of prolapsed lumbar intervertebral disc with radiating pain to leg managed with spinal mobilization with leg movement (SMWLM) combined with intermittent lumbar traction (ILT) and interferential therapy.

Case presentation. Twelve treatment sessions carried out over 4 consecutive weeks thrice weekly consisting of spinal mobilization with leg movement, intermittent lumbar traction and interferential therapy. Outcome measures were documented by using Visual analog score (VAS), Oswestry disability index (ODI) and range of straight leg raise (SLR) score. After 4 weeks, VAS improved by 7 points and ODI score improved by 19 points. Range of straight leg raise also increased significantly from 46.30 to 68.40.

Conclusions. Spinal mobilization with leg movement combined with intermittent lumbar traction and interferential therapy resulted in decrease in disability and pain as well as improvement in range of straight leg raise. Therefore, it may be used as a first line of treatment with massive disc prolapse before surgical intervention.

Keywords: lumbar PIVD; SMWLM; manual therapy; physiotherapy; intermittent lumbar traction; interferential therapy

INTRODUCTION

Prolapsed lumbar intervertebral disc is a common issue globally and mainly occurs due to either trauma or disc degeneration [1]. In chronic low back pain patients, 15% cases suffer from nerve root compression due to prolapsed disc [2]. Most commonly lumbar disc prolapse occurs at L4-5 or L5-S1 level and surgery is rarely required [2,3]. Prevalence of radiating leg pain is 25%-57% in low back pain patients that leads to economical burden, absenteeism from work and disability [4,5]. In 2013, estimated cost of back pain in the United States alone was between 119 to 238 billion dollars [6]. The aim of this study is to explain the successful management of prolapsed lumbar intervertebral disc by SMWLM combined with intermittent lumbar traction and interferential therapy.

CASE PRESENTATION

A 41 year old male suffering from severe low back pain that is predominantly radiated down to the left gluteal region and calf of left lower limb. Patient marks his back pain 6/10 and leg pain 9/10 on VAS. He reported that pain started 10 days back and increases with forward bending and leg raise. Forward bending, lifting weight, prolonged sitting or standing was reported as aggravating factors by patient. Extension was reported as relieving factor. Patient has no history of medications, trauma, surgeries or any associated medical condition.

Outcome measure

Outcomes were measured for pain on VAS, disability on ODI and range of motion by SLR. The measurement of outcome variable was done before

Corresponding author:
Varun Singh
E-mail: dr.varunpoonia@gmail.com

Article history:
Received: 19 April 2021
Accepted: 19 June 2021

the start of intervention followed by repeated measurement every week.

Examination and diagnosis

In physical examination it was found that flexion range of motion at lumbar was most limited followed by lateral bending and extension. Extension was comparatively a position of ease. Straight leg raise test was positive at 46.3^0 on left side. Loss of sensation was present over dorsum of foot and lateral side of leg. The diagnosis was a left sided postero-lateral massive disc prolapse at L4-L5 level with compression of L5 nerve root, as evidenced in MRI (Figure 1).

FIGURE 1. *MRI image showing disc prolapse at L4-L5*

Treatment

The plan of management included 12 treatment sessions carried out over 4 consecutive weeks thrice weekly, followed by a re-evaluation. Treatments included ILT (15 minutes) with traction force 30% of body weight, interferential therapy (15 minutes) 4 electrode crossed pattern and SMWLM.

Spinal mobilization with leg movement

Patient was side lying on right side. A firm transverse pressure at L4 toward right side was applied. An assistant was asked to move the left limb in SLR position to the point of no pain. In first treatment session, a set of three repetitions was delivered, followed by three sets of six repetitions with a thirty second rest interval between sets on consequent treatment sessions. Passive pain free overpressure to SLR was being given as progression.

Follow-up

A reduction in VAS during 4 weeks of treatment was reported and shown in Figure 2. Pain levels were 9/10 initially, 6/10 after 1st week and 2/10 after 3rd week and remain constant upto 4th week. Pain score were progressively reduced to 2/10 towards the end of treatment. Improvement in range of SLR from the initial evaluation to the end of treatment was reported as shown in Figure 3.

Range of SLR were 46.3^0 initially, 56.4^0 after 1st week, 61.6^0 after 2nd week, 65.3^0 after 3rd week and 68.4^0 after 4th week. Range of SLR was increased significantly from 46.3^0 to 68.4^0 by the end of treatment. Decrease in ODI score from the initial evaluation to the end of treatment was reported as shown in Figure 4. At initial evaluation, the ODI score was 32 that gradually decreased to 24 after 1st week, 17 after 2nd week, 15 after 3rd week and 13 after 4th week.

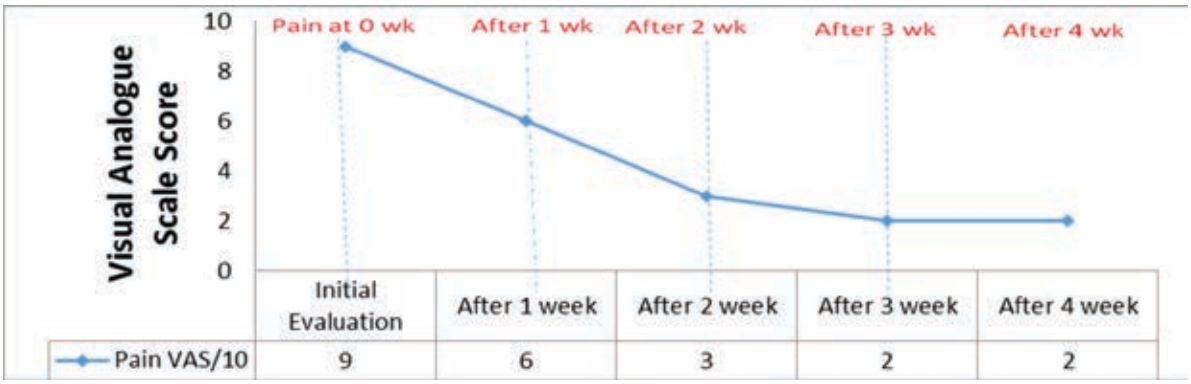

FIGURE 2. *Graph showing VAS evaluation of participant at 0 week (baseline), after 1 week, after 2, after 3, and after 4 week of intervention*

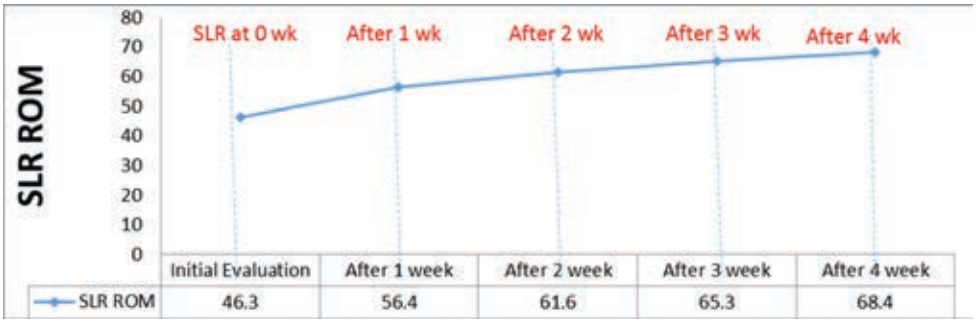

FIGURE 3. *Graph showing SLR evaluation of participant at 0 week (baseline), after 1 week, after 2, after 3, and after 4 week of intervention*

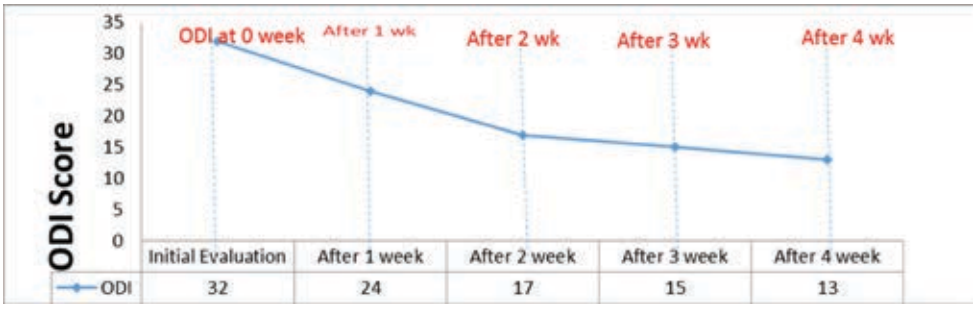

FIGURE 4. *Graph showing ODI score evaluation of participant at 0 week (baseline), after 1 week, after 2, after 3, and after 4 week of intervention*

DISCUSSION

In normal population, 20%-76% asymptomatic individuals have disc herniation/prolapse that can be detected on MRI. Physical exertion related job makes an individual more prone to work absenteism in long term [7,8]. Research evidence supports spontaneous resorption or reduction of prolapsed intervertebral disc by 20%-70% in size as evidenced on MRI [8-10]. Over one year prognosis, significant leg pain, disability and tenderness were associated in low back pain patients with radiculopathy [11]. Conservative and surgical procedures both are equally effective at midterm and long term [12]. During SMWLM, correction of positional fault leads to decompression of nerve root and other impinged structure that makes decreases pain [13]. Fujiwara et al. stated that with axial rotation, size of intervertebral foramen increases significantly on opposite side. At bending side, size of intervertebral foramen decreases significantly [14]. In SMWLM, when therapist pushes the spinous process away from painful side, it corrects the lateral bending and axial rotation that increases the foraminal dimensions. SMWLM in pain free available range, produce similar benefits as of neural mobilization [15]. Significant sympatho-excitatory response produced due to SMWLM leads to side specific hypoalgesia [16]. In long term, non-surgical treatment is comparable to surgical procedure for improvement in quality of life, pain relief and early return to work.

CONCLUSIONS

Patient responded favorably to the SMWLM. Study concludes decrease in VAS score, ODI score and improvement in SLR range of motion. SMWLM may be a viable non-surgical treatment for lumbar prolapsed intervertebral disc patients.

REFERENCES

1. Dang L, Liu Z. A review of current treatment for lumbar disc herniation in children and adolescents. *Eur Spine J.* 2010; 19:205-14.
2. Deyo RA, Tsui-Wu YJ. Descriptive epidemiology of low-back pain and its related medical care in the United States. *Spine.* 1987; 12:264-68.

3. Temraz K. The use of cold laser in conjunction with traction and lumbar extension exercises for treatment of lumbar disc herniation: case report. *Orthop Phys Ther Pract.* 2011;23:33-38.
4. Heliövaara M, Impivaara O, Sievers K, et al. Lumbar disc syndrome in Finland. *J Epidemiol Community Health.* 1987;41:251-58.
5. Selim AJ, Ren XS, Fincke G, et al. The importance of radiating leg pain in assessing health outcomes among patients with low back pain: results from the Veterans Health Study. *Spine*. 1998; 23:470-74.
6. Ma VY, Chan L, Carruthers KJ. Incidence, prevalence, costs, and impact on disability of common conditions requiring rehabilitation in the United States: stroke, spinal cord injury, traumatic brain injury, multiple sclerosis, osteoarthritis, rheumatoid arthritis, limb loss, and back pain. *Arch Phys Med Rehabil.* 2014;95:986-95.
7. Boos N, Semmer N, Elfering A, et al. Natural history of individuals with asymptomatic disc abnormalities in magnetic resonance imaging: predictors of low back pain-related medical consultation and work incapacity. *Spine.* 2000;25:1484-92.
8. Keskil S, Ayberk G, Evliyaoğlu C, Kizartici T, Yücel E, Anbarci H. Spontaneous resolution of "protruded" lumbar discs. *Minim Invasive Neurosurg.* 2004 Aug;47(4):226-9.
9. Melbye M. An adherent nerve root – classification and exercise therapy in a patient diagnosed with lumbar disc prolapse. *Man Ther.* 2009;15:126-29.
10. Cribb GL, Jaffray DC, Cassar-Pullicino VN. Observations on the natural history of massive lumbar disc herniation. *J Bone Joint Surg Br.* 2007;89:782-84.
11. Jensen OK, Nielsen CV, Stengaard-Pedersen K. One-year prognosis in sick-listed low back pain patients with and without radiculopathy. Prognostic factors influencing pain and disability. *Spine J.* 2010;10:659-75.
12. Gugliotta M, da Costa BR, Dabis E, et al. Surgical versus conservative treatment for lumbar disc herniation: a prospective cohort study. *BMJ Open.* 2016;6:e012938.
13. Mulligan BR. Spinal mobilisations with leg movement (further mobilisations with movement). *J Man Manip Ther.* 1995;3:25-27.
14. Fujiwara A, An HS, Lim TH, et al. Morphologic changes in the lumbar intervertebral foramen due to flexion-extension, lateral bending, and axial rotation: an in vitro anatomic and biomechanical study. *Spine.* 2001;26:876-82.
15. Satpute K, Hall T, Bisen R, et al. The effect of spinal mobilization with leg movement in patients with lumbar radiculopathy – a double-blind randomized controlled trial. *Arch Phys Med Rehabil.* 2019;100:828-36.
16. Vicenzino B, Paungmali A, Teys P. Mulligan's mobilization-with-movement, positional faults and pain relief: current concepts from a critical review of literature. *Man Ther.* 2007;12:98-08.