Specific Exercise for Spine can Improve Lumbar Spondylosis: A Case Report

Ruchika Zade¹, Priyanka Sahu¹, Gunjan Shende¹, Tejaswini Fating² and Pratik Phansopkar¹*

¹Department of Musculoskeletal Physiotherapy, Ravi Nair Physiotherapy College, Datta Meghe Institute of Medical Sciences, Wardha, Maharashtra, India.
²Department of Community Health Physiotherapy, Ravi Nair Physiotherapy College, Datta Meghe Institute of Medical Sciences, Wardha, Maharashtra, India.

Authors’ contributions

This work was carried out in collaboration among all authors. All authors made best contribution for the concept, evaluation and assessment, interpretation of the data analysis and data acquisition. All authors read and approved the final manuscript.

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(1) Dr. Sawadogo Wamtinga Richard, Ministry of Higher Education, Scientific Research and Innovation, Burkina Faso.
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ABSTRACT

Background: At some stage in their lives, between 60-85% of adults suffer from low back pain (LBP). Fortunately, symptoms are mild and intermittent for the vast majority of people, with 90 percent subsidization within six weeks. An approximate 15-45 percent of the individuals affected by chronic back pain, defined as symptoms such as pain that last beyond 3 months. The effect on the livelihoods and economic results are significant for the minority with intractable symptoms. Considering the high incidence of low back pain, the diagnostic strategy and treatment options are complex and sometimes conflicting and within the general population. Rising the expense and inconsistency of management throughout the nation. In fact, this is because it is impossible for most patients to establish a particular etiology, with established axial spine-wide nociceptive pain generators identified.

Clinical Finding: Patient having complaint of pain in lower back region and Radiated in the posterior part of the thigh, as well as lower limb numbness. Morning stiffness was present. On examination active movement (Range of Motion) of lumbar flexion, lumbar Extension and

*Corresponding author: E-mail: drpratik77@gmail.com;
lumbar lateral flexions lightly restricted and painful at the end of range of motion. **Diagnosis:** MRI was done, it shows posterior annulus tear on the level of L4-L5, L4-L5 – Diffuse disc bulge with right-sided bulge subarticular is disc protrusion causing indentation on anterior thecal sac with moderate to severe narrowing of bilateral neural foramina with propensity toward right side with compression of traversing and exiting nerve roots. **Conclusion:** This case report provides patient with inclusive recovery which helped her to relieve pain.

**Keywords:** Lumbar spondylosis; activity specific spine stabilization exercises; spine; rehabilitation.

**ABBREVIATIONS**

PSIS : Posterior superior iliac spine
TENS : Transcutaneous Electrical Nerve Stimulation

**1. INTRODUCTION**

At a certain point in their lives, around 60-85% of adults complain about low back pain (LBP). Fortunately, symptoms are mild and intermittent for the vast majority of people, with 90 percent subsiding within 6 weeks. An approximate 15-45 percent of the population is affected by chronic low back pain. Pain symptoms are characterized as those that extend beyond 3 months. For such a community with intractable symptoms, there is a significant influence on quality of life and economic consequences [1].

The diagnostic method and therapeutic choices are varied and sometimes contradictory, In view of the high prevalence in the general population of low back pain, the costs and heterogeneity of management throughout the nation are rising. This is partly due to the difficulty with proven generators of nociceptive pain recorded around the axial spine in determining a clear etiology for most patients. Back pain is also being referred to it as a condition in search of a disease” [1,2]. In addition, once the diagnosis of cancer and fracture has been reduce, There are still large differential causes of low back pain, This includes the wide domain of axial spine degenerative changes for The radiological analysis is unspecific, though there are preliminary causal correlations. These degenerative mechanisms and their clinical effects will be expanded on [3].

The subject of this article, Spondylosis of the lumbar spine, is a concept with many meanings. It has been used in literature in many different forms, used interchangeably with spondylitis, osteoarthritis, hypertrophic arthritis, and arthrosis. Along with most other circumstances [4,5]. The neighboring vertebral bone's hypertrophic response to disc degeneration is mechanistically recognized as spondylosis. (In the absence of diseased discs, however, osteophytes-rarely form). Finally, spondylosis can be generalized in a non-specific manner for all and any degenerative situations involving discs, vertebral bodies, and/or associated lumbar spine joints. This final will be used by us, For the purposes of this study, That broad concept of spondylosis, Given the High occurrence of changes in degenerative that coincide, and The complex relationship of neighboring discs, vertebrae, and nerves that produce syndromes of Severe pain and associated nerves inside the axial spine [6].

In adults with chronic pain, exercise therapy tends to be marginally effective in pain relief and job enhancement, especially in health care populations. Much research indicates that a curriculum of graded activities enhances the effects of absenteeism in sub-acute low back pain populations, although evidence remains uncertain for many other exercise types. Regular exercise is as successful with either no care or other conservative therapies in severe low back pain communities [7,8].

**2. PATIENT INFORMATION**

A 30-year-old housewife experiencing severe pain in her low back since 3 year and that aggravated now because she is having a history of travelling in bus due to that force the pain increased. She was complaining of severe low back pain with radiating pain in posterior aspect of thigh. It aggravated in morning and relieving during rest.
MRI also showed posterior annulus tear on the level of L4-L5, disc desiccation that was noted at the L4-L5 and L5-S1 level. L4-L5 – there is diffuse disc bulge with right sided subarticularis disc protrusion causing indentation on anterior thecal sac with moderate to severe narrowing of bilateral neural foramina with propensity toward right side with compression of traversing and exiting nerve roots.

3. CLINICAL FINDING

Patient having complaint of pain in lower back region and radiated in the posterior part of the thigh, as well as lower limb numbness.

On observation, the body type is mesomorphic, gait appears to be normal, posture is normal. There is no shortening of limb present.

On examination active movement (Range of Motion) of lumbar flexion, lumbar Extension and lumbarlateral flexions lightly restricted and painful at the end of range of motion. Which is shown in Table 1 (before and after treatment range was taken). Manual Muscle Testing (MMT) was evaluated in available ROM, which is shown in Table 2 (before treatment and after treatment grading was taken).

The gaenslen’ sandfaber’s test was performed. Gillet’s test was also performed. The PSIS and Sacroiliac joint are on same level. Straight leg raising test is positive with radicular symptoms are precipitated on the same side on 60 degree of elevation. Slump test is positive.

Outcome measure VAS (visual Analogue Scale) was on 8.

Pain Assessment:

Pre-rehab VAS: 7/10 at rest, 8/10 on slight movement.

Post-rehab VAS: 2/10 at rest, 4/10 on slight movement.

Neurologic Examination was done where Dermatomes and myotomes was evaluated and there were no diminished or absent sensation, nerve roots were intact. Reflexes were intact.

| Movement      | Pre-rehab active ROM | Pre-rehab passive ROM | Post-rehab Active ROM | Post-rehab passive ROM |
|---------------|----------------------|-----------------------|-----------------------|------------------------|
| Lumbar Flexion| 0-30                 | 0-35                  | 0-55                  | 0-60                   |
| Lumbar Extension| 0-10               | 0-15                  | 0-20                  | 0-25                   |
| Left lateral flexion | 0-10            | 0-15                  | 0-20                  | 0-25                   |
| Right Lateral flexion | 0-10           | 0-15                  | 0-20                  | 0-25                   |
| Hip Flexion   | 0-80                 | 0-90                  | 0-100                 | 0-120                  |
| Hip Extension | 0-10                 | 0-15                  | 0-20                  | 0-25                   |
| Hip abduction | 0-30                 | 0-40                  | 0-40                  | 0-50                   |
| Hip adduction | 0-20                 | 0-30                  | 0-25                  | 0-30                   |
| Knee Flexion  | 0-120                | 0-140                 | 0-130                 | 0-140                  |

| Muscles          | Pre-rehab grade | Post-rehab grade |
|------------------|----------------|-----------------|
| Lumbar Spine Flexor | 3             | 4+              |
| Lumbar Spine Extensor | 3            | 4+              |
| Lumbar Spine rotator | 3             | 4               |
**Intervention:** The medications were given and physical therapy also started, we took the patient’s follow-up regularly.

**Description:**

**Week 1-2**

On the initial period we gave hot pack, it reduce pain and spasm, it induces muscle relaxation and increase efficiency of muscle action. Moist heat was applied for 10 minutes. Ask patient to take excessive bed rest as much as possible to avoid spine movement, appropriate deformity and minimize mechanical forces.

Transcutaneous electrical nerve stimulation (TENS) is was used for pain relief. The influence of TENS on treatment of acute pain in lower back is helpful. TENS with 100-150 Hz frequency, 12-30 milliampere amplitude and 100-500 microsecond pulse width.

Lumbar traction: Sustained traction is given to the axial spine using a longitudinal force while using a lower rib cage and brace secured to the iliac crest to reduce chronic low back pain. Pressures that hold open intervertebral space and minimize spinal lordosis are updated in terms of both degree and length and can be closely measured in testing and bed rest schemes. Provisional Realignments in the spine likely improve health complications associated with degenerative discs disease by healing mechanical stress, Compartment syndrome and adhesion of both the facet and annulus, and even disrupting symptoms of nociceptive pain. It also relieves the pressure on the nerve roots [8].

**Week 2-4**

All above modalities were continued in this week. Exercise was taught for lumbar spondylosis such as muscle strengthening exercises to reduce pain. Core exercise are prescribed and is performed under the observation initially such as Abdominal draw in, kegal exercise, cat and camel, extension exercise, cervical-abdominal curl up, side plank, core stability exercises in sitting. Exercise therapy seems to have been marginally successful in decreasing discomfort and improving the function of depressive symptoms. The fitness program begins with stationary exercise followed by movements and concludes with workouts that cause discomfort. The stretching was performed for tight muscle such as piriforms. Hamstring, adductor stretching to reduce the radiating pain and tightness. Extension exercise reduces neural tension [2]. Flexion exercise decreases articular weight bearing resistance to the facet joint and elongate the dorsolumbar membrane. Ultrasound therapy could promote collagen extensibility. Initially start with isometric then with isotonic exercise with effort directed at concentric strengthening. Dynamic activity maximizes synchronized muscle cohort movements contributing to locomotion as well as the
integration of muscle control with spine flexibility. Enhancements of specific coronary heart disease, patient were also advised to remain healthy and to start aerobic walking program and use of static bicycles. Spine manipulation were performed in low velocity, Beyond the accustomed, long lever joint manipulation,, but not range of motion anatomical [9].

**Week 4-6**

Lumbar support the lumbar belt was given. It is aimed at reducing spine movement, stabilize, completely accurate deformity and decrease compressive load. Lumbar traction is found good to improve lumbar motion.

**Result:** Patient found relief after 6 week of treatment. The radiating pain was reduced and advised for regular exercise at home.

**Limitation:** X-ray was not available so treatment protocol made very lengthy.

4. **DISCUSSION**

Application of moist heat, lumbar traction and TENS application starts on the first day of physiotherapy session. After applying TENS, reduction in pain was seen. Gradually she progressed to muscle strengthening exercises, stretching exercises that contributed to reducing pain. Later on, she was prescribed a lumbar belt to correct the deformity to reduce any mechanical forces [8]. In this patient, lumbar traction enhanced the symptoms associated with spine disease. There is use of brace attached to the iliac crest when traction is applied along longitudinal force, which relieves low back pain. Exercise therapy found a graded exercise regimen incorporated within the occupational settings of patients with varying duration of symptoms [10,11]. Those regimes requiring an individually tailored workout regimen emphasizing stretching and muscle strengthening with high frequency and low adherence tend to be the ideal approach to exercise therapy [1]. Trunk stabilizing exercises has a beneficial impact on spondylosis and spondylolisthesis-related low-back pain. Research has also suggested that the combined exercise of extension, extension bracing and awareness was effective, although the individual results of this combined program cannot be distinguished [1,12].

**Effect on pain and spinal stability in lumbar spondylosis of activity-specific spine protective measure are vital.** It should be concluded that activities for activity-specific spinal stabilization have seen significant change in spinal mobility and discomfort. In individuals with lumbar spondylosis, complex spinal stabilization exercises have shown pain relief and recovery [13,14].

Few of the related studies were reported [15-17]. Studies on related musculoskeletal issues and exercises were reported by Bhaisare et al. [18], Gaidhane et al. [19] and Khanam et al. [20].

5. **CONCLUSION**

Lumbar spondylosis is difficult diagnosis. It is a degenerative disease of the spine, but within the literature, meanings differ. This case study offers an inclusive recovery for the patient that has helped her to alleviate pain. She was eventually able to perform simple everyday life tasks. Exercise therapy has had a significant impact on pain relief, increasing spinal mobility. The activities and programmes were of varying intensity, duration and frequency. It will increase her quality of life as she progresses to a particular type of exercise.

**CONSENT**

Proper consent was taken from patient for writing case report.

**ETHICAL APPROVAL**

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

**COMPETING INTERESTS**

Authors have declared that no competing interests exist.

**REFERENCES**

1. Middleton K, Fish DE. Lumbar spondylosis: clinical presentation and treatment approaches. Curr Rev Musculoskelet Med. 2009;2(2):94–104.

2. Hayden JA, van Tulder MW, Malmivaara A, Koes BW. Exercise therapy for treatment of non-specific low back pain.
1. Ahmed B, Alam S, Rashid I, Rahman N, Rahman A, Uddin T, et al. Effects of transcutaneous electrical nerve stimulation (Tens) on patients with acute low back pain. J Armed Forces Med Coll Bangladesh. 2011;7(2):29–32.

2. Goyal C, Naqvi W, Sahu A. Xia-Gibbs Syndrome: A rare case report of a male child and insight into physiotherapy management. Cureus [Internet]. 2021;12(8). [Cited 2021 Mar 14] Available:https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7478925/

3. Goyal C, Naqvi WM, Sahu A. An atypical case of febrile infection-related epilepsy syndrome following acute encephalitis: impact of physiotherapy in regaining locomotor abilities in a patient with neuroregression. Pan Afr Med J [Internet]. 2020;36. [Cited 2021 Mar 14] Available:https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7392866/

4. Ali MN, Sethi K, Noohu MM. Comparison of two mobilization techniques in management of chronic non-specific low back pain. J Bodyw Mov Ther. 2019;23(4):918–23.

5. Wane M, Naqvi WM, Vaidya L, Kumar K. Kinesiophobia in a Patient With Postoperative Midshaft Fracture: A Case Report of Its Impact on Rehabilitation in a 16-Year-Old Girl. Cureus [Internet]. 2020;12(11). [Cited 2020 Dec 11] Available:https://www.cureus.com/articles/42869-kinesiophobia-in-a-patient-with-postoperative-midshaft-fracture-a-case-report-of-its-impact-on-rehabilitation-in-a-16-year-old-girl

6. Ng JK, Kippers V, Richardson CA, Parnianpour M. Range of motion and lordosis of the lumbar spine: reliability of measurement and normative values. Spine. 2001;26(1):53–60.

7. Hides JA, Jull GA, Richardson CA. Long-term effects of specific stabilizing exercises for first-episode low back pain. Spine. 2001;26(11):E243-248.

8. Virat Nizom. Medication case scenario development and intervention from a counseling perspectives. International Journal of Intensive Care. 2019;15(1):08–11.

9. Khanam Najnin, Vasant Wagh, Abhay Motiramji Gaidhane, Zahiruddin Quazi Syed. Assessment of work-related musculoskeletal morbidity, perceived causes and preventive activities practiced to reduce morbidity among brick field workers. Indian Journal of Community Health. 2019;31(2):213–19.

10. Vaidya L, Kumar K, Naqvi W, Narang S, Pisulkar G, Dadlani M. Revision of total hip replacement surgery in elderly patient and its recovery based on periprosthesis fracture rehabilitation. 2020;11.

11. Gupta VK, Attry S, Vashisth N, Gupta E, Marwah K, Bhargav S, et al. Lumbar degenerative disc disease: Clinical presentation and treatment approaches. IOSR J Dent Med Sci. 2016;15(08):12–23.

12. Bhamra1 JK, Naqvi1 W. A study protocol for checking validity of evaluation of temporal parameters of gait using Microsoft Kinect Azure in normal healthy population. Indian J Forensic Med Toxicol. 2021;15(1):1718–21.

13. Madavi, Sheetal K., Vivek Chakole, Jayashree Sen, Amol Singam, Saranya Rallabhandi, and Neeta Verma. Comparison of lumbar transforaminal epidural dexamethasone and triamcinolone for lumbar radiculopathy. Journal of Evolution of Medical and Dental Sciences-JEMDS. 2020;9(42):3133–38. Available:https://doi.org/10.14260/jemds/2020/687

14. Sinha, Saumi, Rakesh Kumar Sinha, Pratik Phansopkar, Sachin Chaudhary. Effect of psychomotor physiotherapy with individualized physiotherapy program on pain, kinesiophobia and functional outcome following transforaminal interbody lumbar fusion (TLIF): A case report. Medical Science. 2020;24(106):4091–97.

15. Dulani R, Shrivastava S, Singh P. A rare case report: Tubercular spondylodiscitis following lumbar disc surgery. Asian Pacific Journal of Tropical Medicine. 2010;3(6):496–98. Available:https://doi.org/10.1016/S1995-7645(10)60120-4.

16. Bhaisare, Roshan, Bhavna Kamble, and Kisan Patond. Long-Term Results of Endoscopic Lumbar Discectomy by ‘Destandau’s Technique. Asian Spine Journal. 2016;10(2):289–97. Available:https://doi.org/10.4184/asj.2016.10.2.289.
19. Gaidhane, Abhay M, Anju Sinha, Mahalaqua Nazli Khatib, Padam Simkhada, Prakash B. Behere, Deepak Saxena, Bhaskaran Unnikrishnan, Mahafroz Khatib, Mahjabeen Ahmed, and Zahiruddin Quazi Syed. A systematic review on effect of electronic media on diet, exercise, and sexual activity among adolescents. Indian Journal of Community Medicine. 2018;43:56–65. Available:https://doi.org/10.4103/ijcm.IJCM_143_18.

20. Nike Zoneroz. Therapeutic Intervention in a Client Case Scenario. International Journal of Intensive Care. 2019;15(1):04–07.

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