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Effectiveness of McKenzie Back Extension Technique in Reducing Pain and Improving Functional Ability in a Patient with Chronic Lumbar Disc Bulge: A Case Study

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ABSTRACT

Introduction: Lumbar disc bulge is a common spinal disorder characterized by the radiating pain and functional disability, often associated with radicular symptoms. Mechanical Diagnosis and Therapy (MDT), commonly known as the McKenzie Technique, is widely used to manage discogenic pain by promoting pain centralization and improving spinal mobility. However, there are limited case-based reports that document the effectiveness of McKenzie techniques in chronic disc bulge conditions.

Aim: To evaluate the effectiveness of McKenzie back extension technique in reducing pain and improving functional ability in a patient with chronic lumbar disc bulge.

Materials and Methods: A 36-year-old male patient diagnosed with chronic lumbar disc bulge was selected for the case study. The study intervention consisted of McKenzie back extension techniques performed regularly for a duration of seven weeks. The patient was assessed pre- and post- intervention using the Visual Analogue Scale (VAS) for pain and the Oswestry disability index (ODI) for functional disability.

Results: At the end of seven weeks, the patient demonstrated significant reduction in pain scores and improvement in functional ability. Pain was centralized from distal region to lumbar spine, and ODI scores indicated marked improvement in daily activities.

Conclusion: McKenzie back extension techniques proved effective in reducing pain intensity, centralizing symptoms, and improving functional disability in a patient with chronic lumbar disc bulge.

Keywords: McKenzie Back Extension Technique, low back pain, centralization, Visual Analogue Scale, Oswestry Disability Index

INTRODUCTION

Lumbar disc bulge refers to the displacement of the nucleus pulposus of an intervertebral disc through its outer fibrous ring, most commonly in the posterolateral region. Depending on the extent of the bulging material, it may compress or irritate the lumbar nerve roots and the dural sac, resulting in clinical symptoms such as sciatica. Although sciatic pain has been recognized since ancient times, its association with disc pathology was first identified in the early twentieth century by

William Jason Mixter and Joseph Seaton Barr.[1]

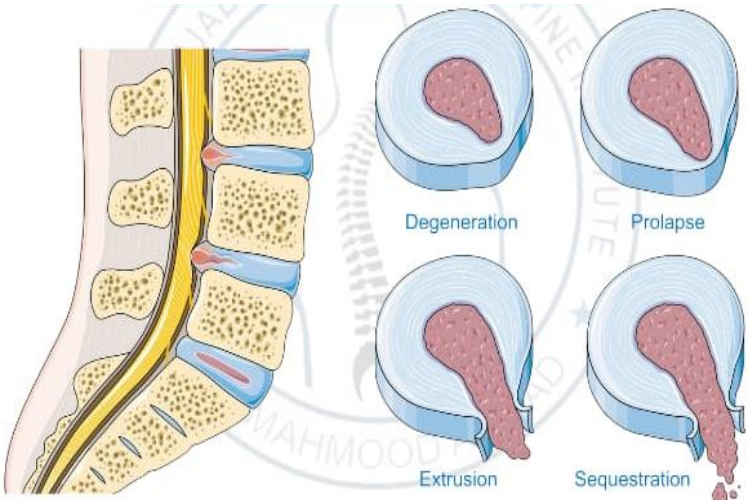

Figure 1

Disc bulge has a prevalence of 60–80% in the general population. About 10% of cases present with sciatica, and the lifetime prevalence of sciatica ranges from 13% to 40%.[2] Degenerative disc disorders are a leading cause of lower back pain (LBP). Approximately 95% of disc bulges occur in the lumbar spine, most commonly at L4–L5, and about 90% of symptomatic cases involve nerve root compression.[3]

Disc bulge is associated with intervertebral disc degeneration, particularly disc dehydration. Risk factors include smoking, repetitive loading, prolonged vibration exposure, reduced lumbar lordosis, aging, heavy lifting, poor posture, genetic predisposition, and other biomechanical stress. Lumbar disc pathology may also coexist with facet joint arthrosis, spinal canal stenosis, and nerve root compression.[4]

Clinically, disc pathology often begins with chronic, deep low back pain that is mild in the morning and worsens during the day, particularly with activities that load the lumbar spine. In the acute stage, patients may develop localized lumbar pain, radiating pain or numbness along the sciatic nerve distribution, reduced joint mobility, and muscle weakness. Lumbar disc herniation (LDH) may cause central low back pain and/or radiating pain to the buttock and leg in the distribution of affected lumbar or sacral nerve roots, often accompanied by neurological deficits due to nerve root compression.[4,5]

Core stability exercises, PNF, and electrotherapy are commonly used to manage low back pain. Core stabilization exercises aim to restore trunk muscle function and maintain lumbar stability during daily activities. Proprioceptive neuromuscular facilitation (PNF) enhances proprioception in lumbar muscles and tendons, improving trunk muscle activity and coordination. However, PNF stretching combined with core stabilization alone may be insufficient for rapid or significant improvements, highlighting the need for a structured treatment protocol with appropriate modalities to achieve optimal outcomes.[6]

Previous studies show that transcutaneous electrical nerve stimulation (TENS) and interferential (IF) current are commonly used electrotherapy modalities. However, when included in multimodal treatment programs, their individual contribution to pain relief cannot be clearly isolated.[7]

The McKenzie Method of Mechanical Diagnosis and Therapy (MDT), developed by Robin McKenzie in the 1950s, is used to treat back and extremity pain. MDT classifies low back pain into three categories: postural, dysfunction, and derangement syndromes. Postural syndrome arises from

prolonged tissue overload due to poor posture, causing pain. Dysfunction syndrome results from loading of impaired tissue. Derangement syndrome, the most common MDT diagnosis, involves a mechanical obstruction that limits motion and produces pain.8 McKenzie Technique, based on passive and active lumbar extension, are used for the diagnosis and treatment of disc bulge.

The nucleus pulposus can migrate posteriorly, anteriorly, or laterally depending on spinal position, and lumbar extension has been shown to reduce posterior migration. Studies report improvements in pain and functional ability in patients with acute disc bulge, but evidence for their effectiveness in chronic disc bulge remains limited.3

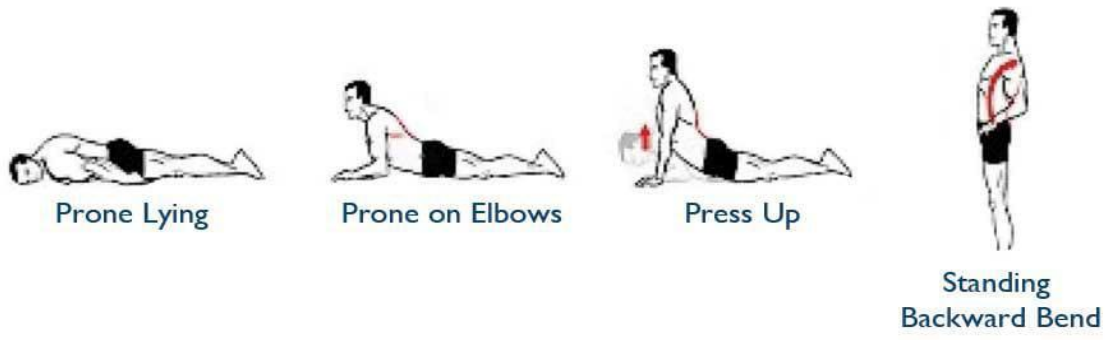

Figure 2

Hence, there is a need to investigate the effectiveness of McKenzie-based technique in the management of chronic disc bulge among patients presenting with diverse pain characteristics.

CASE PRESENTATION

A 36-year-old male presented with complaints of radiating pain in the left leg associated with difficulty in prolonged standing, walking, and sleeping on the left side for the past 6 years. The condition was diagnosed as a posterior disc bulge on MRI. Conservative and ayurvedic treatments did not provide significant relief.

There is no significant past medical or surgical history. The patient follows a mixed diet with normal bowel and bladder habits and has no history of alcohol or smoking.

On assessment, pain intensity was 6/10 on VAS. ODI score was 40%, indicating moderate disability. Neurological examination was intact. Special tests showed SLR positive at 70° and Slump test was positive. Reflexes were normal (Grade 2+). Gait parameters were within normal limits, and Berg Balance Sale was 54/56(low risk of fall).

MATERIALS & METHODS

Selection criteria

- Patient diagnosed with chronic lumbar disc bulge.
- Middle aged adults.
- Presence of radiating pain to the lower limb rather than localized low back pain.
- No prior history of spinal surgery.
- Medically stable and able to participate in a structured 7-week physiotherapy program.

Intervention

- Duration: 7 weeks
- Patient received daily education about the treatment plan
- Progress, limitation, and goals were explained regularly
- Focus: pain centralization and functional improvement.

Procedure

The patient was scheduled for Physiotherapy 7 days per week for total seven weeks. The exercise was given for 45 minutes per day. Treatment consists of:

1. Prone lying

This position was maintained for 5 minutes to facilitate lumbar relaxation and promote centralization of symptoms.

Figure 3

2. Prone on elbow

This position held for 5 minutes to initiate controlled lumbar extension.

Figure 4

3. Prone press- up

Repeated prone press -ups performed for 3 sets of 10 repetitions to improve lumbar extension and reduce posterior disc stress.

Figure 5

4. Prone press -ups with over pressure

Prone press -ups with over pressure using a towel for 3 sets of 10 repetitions to improve lumbar extension and reduce posterior disc stress.

Figure 6

5. Standing back extension

This exercise is performed for 3 sets of 10 repetitions to maintain lumbar extension in functional position.

Figure 7

RESULT

The patient reported an overall improvement in VAS and ODI. The patient underwent physiotherapy session for 7 consecutive Week and there was significant improvement in pain and functional ability after 7weeks.

Scale	Pre Treatment Data	Post Treatment Data
VAS	6/10	2/10
ODI	18/45	6/45

DISCUSSION

The study aimed at assessing the effectiveness of McKenzie back extension technique in a patient with chronic lumbar disc bulge . The result of the study is based on a single case study. The data were collected based on ODI questionnaire and VAS scale. Experimental study design intended to assess the effectiveness of McKenzie technique in a 36 year old male

patient. In this study the patient underwent McKenzie back extension technique such as prone for 5 mins,prone on elbow for 5 mins, prone press up for 3 sets of 10 repetition, prone press up with over pressure for 3 sets of 10 repitation, standing back extension 10 sets of 30 sec for 45 minutes duration for 7 weeks.

VAS and ODI were assessed after completion of the 7-week protocol, the result indicating a significant difference in the pain after the session. In VAS scale result shows that the pre test score was 6/10 and post test score was 2/10 and the result in ODI shows that the pretest score of was 18/45 (40%) and post test score was 6/45 (13.3%). It showed that there was a significant difference exist between the pre-test and post-test.This indicated a significant reduction in the intensity of pain, improvement in functional ability and also centralization of pain after providing the exercises.

In this study, McKenzie back extension technique had a positive effect on pain, reduce the functional disability and increase the quality of life. The findings of this study are in line with previous research. J. Sharma et al. (2018) compared McKenzie Extension Exercise and Core Strengthening Exercises in patients with lumbar PIVD and concluded that McKenzie exercises were more effective in reducing pain and disability.[9] Similarly, Ramzi A. Al-Horani et al. (2020**)** reported that McKenzie-type exercise significantly improved disability, pain, range of motion, and lower limb strength in a case of recurrent herniated disc. These studies support the outcomes observed in the present case, reinforcing the effectiveness of McKenzie-based interventions.[3]

Further evidence was provided by Mohammad N. Selim et al. (2022)**,** who compared Spinal Mobilization with Leg Movement, McKenzie technique, and TENS therapy in lumbar disc herniation. Their study concluded that McKenzie back extension was more effective in reducing pain and disability, which closely aligns with the results of this case study.[10] Additionally, Varun Deopa et al. (2024) compared PNF stretching with core stabilization exercises versus McKenzie technique and found that although both interventions reduced pain, McKenzie technique was more effective in centralizing pain after 6 weeks of therapy.[6]

The present findings are also consistent with Gaurav Bhatnagar et al. (2024), who reported that McKenzie Technique was more beneficial than Neural Mobilization in patients with chronic low back pain with radiculopathy, leading to greater pain reduction and improved functional ability.[11]

Recent case evidence by Surla Ravi et al. (2025) demonstrated the effectiveness of McKenzie exercises in treating lumbar radiculopathy associated with a lateral shift, further extending the scope of McKenzie therapy to more complex clinical presentations [(12)]. Likewise, Ashis Kumar Deo et al. (2025) compared McKenzie exercises with an intensive spinal strengthening program in chronic low back pain patients and concluded that McKenzie protocol was superior in reducing pain and disability.[13]

Hamidreza Nemati et al. (2024) also highlighted that McKenzie exercises, along with core stabilization, were effective in reducing pain and disability while improving range of motion in patients with mechanical low back pain.[14]

Taken together, the findings of the present case study are strongly supported by the existing literature. McKenzie back extension technique consistently demonstrates positive effects on pain reduction, functional recovery, and centralization of symptoms in patients with lumbar disc pathology and distal pain.

Prior to the initiation of treatment, the patient reported distal pain radiating into the left lower limb, consistent with radicular symptoms associated with lumbar disc herniation. Following two weeks of conservative management, the intensity of symptoms increased, suggesting a possible transient exacerbation or inflammatory response to the mechanical intervention. However, by the seventh week of physiotherapy treatment, the pain had

centralized to the lower back, indicating a positive mechanical response and supporting the hypothesis of discogenic symptom resolution. This pattern of centralization aligns with established prognostic indicators in the management of lumbar disc pathology.

CONCLUSION

McKenzie back extension techniques proved effective in reducing pain intensity, centralizing symptoms, and improving functional ability in chronic lumbar disc bulge patient.

Declaration by Authors

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REFERENCES

1. Vialle Lr, Vialle En, Henao Je, Giraldo G. Lumbar Disc Herniation. Revista Brasileira De Ortopedia (Rev Bras Ortop). 2015;45(1):17–22. Doi: 10.1016/S2255-4971(15)30211-1. Collection 2010 Jan.
2. Singh V, Malik M. Efficacy of manual therapy interventions in management of lumbar prolapsed intervertebral disc: a pilot randomized controlled trial. Ro J Neurol. 2021 Jul 1;20(3):373-8
3. Al-horani RA, Batainah AS, Shamroukh N, Abumoh'd MF. McKenzie-type exercises improve the functional abilities of a patient with recurrent herniated discs: A Case Report. The Open Sports Sciences Journal. 2020 Aug 19;13(1).
4. Antohne, B., Rață, M., Rață, B. C., & Rață, G. (2023). Efficiency Of McKenzie Exercises and Manual Therapy in Disc Herniation. In E. Soare, & C. Langa (Eds.), Education Facing Contemporary World Issues - EDU WORLD 2022, vol 5.
5. Erdogmus CB, Resch KL, Sabitzer R, Müller H, Nuhr M, Schöggl A, Posch M, Osterode W, Ungersböck K, Ebenbichler GR. Physiotherapy-based rehabilitation following disc herniation operation: results of a randomized clinical trial. Spine (Phila Pa 1976). 2007 Jan 15;32(2)
6. Deopa V, Kumar N, Thapliyal S, Sharma S. To Compare the Effect of PNF Stretching and Core Stabilizing Exercise Versus McKenzie Technique in Subjects with Low Back Pain. Physiotherapy and Occupational Therapy Journal Volume 17 Number 1, Jan - March 2024
7. Ariel E, Levkovitz Y, Goor-Aryeh I, Motti R. The effects of TENS, interferential stimulation, and combined interferential stimulation and pulsed ultrasound on patients with disc herniation-induced radicular pain. Journal of Back and Musculoskeletal Rehabilitation.Issue published: March 2022
8. Meyer S, Harrison D. The McKenzie method and treatment of low back pain.Harrison de, meyer sj. The McKenzie method and treatment of low back pain. Jmu scholarly commons physician assistant capstones. December 12, 2018.
9. Sharma J, Kumar N, Kumar S. Comparison of the Effectiveness of Core Strenghting Exercise and McKenzie Extension Exercise on the Pain Functional Disability in lumbar PIVD Condition. Physiotherapy Occupational JournalVolume 11 Number 2018;11:67-79.
10. Selim mn, mokhtar mm, mohamed mh, abonour aa, abdelmutilibe sm, essa mm. Comparison between efficacy of spinal mobilization with leg movement versus McKenzie technique in patients with lumbar disc herniation. Sport tk-revista euroamericana de ciencias del deporte. 2022 apr 30:23
11. Bhatnagar g, tadmare s. Comparative study of McKenzie technique versus neural mobilization in chronic low back pain with radiculopathy. african journal of biological sciences May 2024 6(9)
12. Nemati H, Niknam H, Kalantari KK, Baghban AA, Jalili N. Effects of Core Stability and McKenzie Exercises in Low Back Pain with Extension Preference. Journal of Modern Rehabilitation.2024 Jan; 18(4)
13. Surla Ravi, Dr. Somsankar Mukherjee.An Approach of McKenzie Exercise with a Lateral Shift on Lumbar Radiculopathy: A Case Study. International Journal of Novel

Research and Development (IJNRD), March 2025 Vol. 10, Issue 3,

14. Ashis Kumar Deo, Priyabrata Dash, Jagatjoy Sharma, Amitav Nayak , Smruti Ranjan Sahu , Bhagyalaxmi Jena, Dwarikanath Rout. Effectiveness of McKenzie's Exercises and Intensive Spinal Strengthening Program on Patients with Subacute or Chronic Low Back Pain-A Comparative Study. International Journal of Medical Science and Diagnosis Research (IJMSDR) June 2025 9(3).

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