

Case Report

Correction of Lateral Trunk Shift in Lumbar Disc Herniation Using Positional Opening and McKenzie Lateral Principle: A Case Report

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Abstract

Background: Lateral trunk shift is a posture deformity that is often related to lumbar disc herniation (LDH). This deformity will continue to cause pain, functional impairment, or delayed recovery if left untreated. The evidence related to lateral trunk shift using mechanical concepts of diagnosis and conservative treatment is still limited.

Case Presentation: A 42-year-old male patient reported with sudden onset pain in the lower back, as well as pain in the left lower extremity, with evident right-sided lateral shift. His condition was confirmed on X-rays and MRI with left posterolateral disc herniation at the L4-L5 level. The treatment plan included a six-week protocol using McKenzie lateral principles and positional opening in physiotherapy.

Intervention: The patient underwent physiotherapy according to the principles of Mechanical Diagnosis and Therapy (MDT), specifically McKenzie lateral principles and positional opening techniques, for 6 weeks. The physiotherapy routine was supervised twice a week, in addition to daily home exercises.

Results: At the end of 6 weeks, lateral trunk shift resolved, pain intensity reduced from 8/10 to 2/10 (NPRS), pain in the legs reduced from 7/10 to 1/10, Oswestry Disability Index reduced from 48% to 14%, and functional mobility was normalized with no adverse effects.

Conclusion: Integrating the positional opening procedure with the McKenzie lateral approach successfully addressed lateral trunk shift in LDH patients, providing relief from pain while maximizing functional outcomes. Such treatments are thus highly beneficial for patients.

Keywords: Lumbar disc herniation; lateral trunk shift; McKenzie technique; positional opening; physiotherapy; case report

1. Introduction

Lumbar disc herniation is a prevalent musculoskeletal condition and a major contributing factor to the onset of lower back pain and radiculopathy, often resulting in functional impairment, decreased quality of life, and reduced productivity. Lumbar disc herniation develops when weakening or tearing of the anulus fibrosus permits the nucleus pulposus to protrude or extrude beyond the intervertebral disc margin, causing the compression of the adjacent nerve roots, manifesting in pain, neurological deficits, and weakness in the dermatomal distribution. Conservative care, in the form of physiotherapy, is projected as the primary avenue for treatment in the absence of severe neurological deficit and red flags, effectively resolving the pain, restoring

functions, and preventing recurrences [3]. It has been observed that there can be a lateral trunk shift in patients suffering from LDH. It involves the lateral direction of the trunk in the frontal plane. The shift usually occurs away from the affected side. It is thought to alleviate the compression of the nerve roots along with mechanical pains. However, it can further add to the functional impairments. The condition needs to be corrected to bring effective relief. Mechanical Diagnosis and Therapy (MDT) or McKenzie Therapy involves a physiotherapy approach that classifies spine disorders based on their responses to repeated movements and sustained positions. In cases involving shifts to the side, MDT provides corrective strategies that work on the

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frontal plane and may include side glide exercises to relocate the spine and reduce irritation to the nerve root [5]. Alongside lateral correction procedures according to McKenzie, other opening positions involving sustained side-lying positions along with lateral movement of the pelvis and torso are used to reduce mechanical compression forces, enhance alignment, and minimize painful stimuli in the early phase of rehabilitation [6]. Although the existence of lateral trunk shifts in LDH has been acknowledged in literature, evidence is scarce for the practical use of both opening and lateral techniques in LDH. In this case study, the benefit for a patient showing a lateral trunk shift in LDH, confirmed by MRI, treated using specific conservative approaches, is presented.

2. Patient Information & History

The patient was a 42-year-old male office worker.

Patient complaint and symptoms

The patient presented with complaints of low back pain that radiated to the posterior-lateral surface of the left lower limb for the past 3 weeks. The pain has been sharp, constant, worsened by standing, walking, and bending forward, but relieved with sitting.

Medical, Family, & Psychosocial History

The patient had never undergone spinal surgery or had any systemic illness. The patient's family had never had any neurological or musculoskeletal conditions. The psychosocial evaluation indicated some work-related stress, but no signs of fear-avoidant behavior or depression were found.

Findings in physical examination

The postural examination during standing showed a marked right lateral deviation of the spine, with the tops of the shoulders deviated to the right of the pelvis. The lumbar active movements of flexion, extension, rotation, left lateral flexion, and left forward flexion were limited. The neurological examination was noted to have decreased SLR on the left, with reproduction of radicular pain at 35 degrees. The sensory examination

assessed the hypoesthesia of the left L5 dermatome. The muscle strength and reflexes were normal.

Relevant past intervention and outcomes

Before his admission for presentation, he used Non-Steroidal Anti-Inflammatory drugs without significant relief. He has not undergone either formal physiotherapy or surgical procedures.

Diagnostic Assessment

Diagnostic Methods

Clinical diagnosis was verified through physical examination, neural tension tests, and Magnetic Resonance Imaging (MRI) studies.

Imaging

The MRI study of the lumbar spine showed a left posterolateral disc herniation at the level of L4–L5 associated with nerve root compression.

Diagnosis

The diagnosis was left posterolateral herniation of the lumbar disc L4–L5 with associated lateral trunk shift (sciatic scoliosis). toward the right side

Diagnostic Challenges

Lack of red flags, maintenance of strength, and quick centralization of symptoms suggested favorable outcomes with conservative care.

3. Therapeutic Intervention

Overview of Intervention

The therapeutic intervention was based on the principles of Mechanical Diagnosis and Therapy (MDT). It primarily focused on positional opening techniques to reduce mechanical loading on the involved lumbar structures, followed by the application of lateral corrective strategies, specifically the McKenzie lateral principle, to facilitate correction of the lateral trunk shift and symptom centralization.

Positional Traction Techniques

Positional traction was used during the initial stage of the treatment for the purpose of pain relief and minimizing the mechanical stress on the involved lumbar segments. The patient was positioned on the side with the affected side facing up. This enabled the concerned structures to be relieved because of the pull of gravity. Additionally, a gentle glide of the pelvis laterally away from the painful side was applied by the therapist. Bolster and pillow supports were placed appropriately under the trunk and pelvis to maintain the corrective position comfortably. Supporting bolsters also aided in keeping the lumbar side-gliding position and preventing guarding. The patient was instructed to relax fully in the position, allowing passive decompression without active effort. The corrective posture was maintained for longer periods, beginning with brief intervals and incrementing with advancing symptom tolerance.

McKenzie Lateral Principle

Following symptom reduction through positional traction, the McKenzie lateral principle was introduced to address the persistent lateral trunk shift. The McKenzie lateral technique's principle was incorporated to correct the persistent lateral shift of the patient's trunk. Correction of the patient's position was done with the help of the therapist, helping the patient maintain a corrected position when standing and when prone on the side. Force direction was closely observed based on the patient's symptoms. As soon as tolerability increased, the patient was taught self-correction techniques with special emphasis on repeated lumbar side glides towards the direction of symptom centralization. Such exercises should always be done in the patient's pain-free or pain-reducing ranges with special focus on maintaining end-range correction. The patient was educated to avoid movements and postures that increased radiating leg pain, especially sustained flexion or asymmetrical loading. The progression of exercise was done based on MDT concepts that entailed constant assessment of whether lateral correction had led to an improvement in posture and reduction of pain.

Administration Details

- Frequency: Twice weekly face-to-face physiotherapy
- Duration: 6 weeks
- Home Exercise Program: Daily lateral glides, positional holds, and core exercises

Changes in Therapeutic Interventions

Exercises were progressed from passive positional holds to active self-correction and trunk control as symptoms permitted. Pain intensity guided progression; movements that increased distal leg pain were modified or temporarily suspended.

4. Results

Follow-Up and Outcomes

Measure	Baseline	Week 6
NPRS (Back Pain)	8/10	2/10
NPRS (Leg Pain)	7/10	1/10
Lateral Shift	Present	Absent
SLR	45° (positive)	70° (negative)
Oswestry Disability Index	48%	14%

Patient-Assessed Outcomes

The patient reported:

- Marked reduction in symptoms
- Improved ability to stand and walk without pain
- Return to normal daily activities and work tasks

Intervention Adherence and Tolerability

The patient adhered well to the home exercise program and reported no difficulty tolerating the intervention.

5. Discussion

Lateral trunk shift is a well-recognized but often under-addressed clinical presentation in patients with lumbar disc herniation (LDH). It is commonly interpreted as an antalgic posture adopted to reduce mechanical stress and nerve root compression caused by disc pathology. If left uncorrected, this frontal-plane deformity can perpetuate pain, restrict spinal mobility, delay recovery, and compromise functional outcomes. The present case demonstrates that a structured conservative physiotherapy program integrating positional opening techniques with the McKenzie lateral principle can effectively correct lateral trunk shift, reduce pain, and restore function in a patient with MRI-confirmed LDH.

In this case, the patient presented with a marked right-sided lateral trunk shift associated with left posterolateral L4–L5 disc herniation and radiculopathy. The rapid improvement in posture and symptom centralization following lateral correction supports the concept that the shift was mechanical and antalgic rather than structural. Previous studies have suggested that lateral shifts frequently occur away from the side of disc herniation as a compensatory strategy to unload the affected nerve root, and that correction of this posture is essential for symptom resolution and functional recovery [3].

The Mechanical Diagnosis and Therapy (MDT) approach provided a clear clinical framework for assessment and intervention in this case. MDT emphasizes classification based on symptom behavior and directional preference, allowing targeted correction of mechanical derangements. The McKenzie lateral principle, which involves frontal-plane correction through therapist-assisted and patient-generated side-glide movements, has been shown to promote symptom centralization and postural realignment in patients with LDH and lateral shifts [7]. In the present case, gradual lateral correction resulted in normalization of trunk alignment and substantial reduction in both back and leg pain, consistent with earlier case reports and clinical observations.

Importantly, this case highlights the complementary role of positional opening techniques in the early phase

of rehabilitation. Sustained side-lying positions with controlled pelvic and trunk translation were used to reduce mechanical compression, decrease muscle guarding, and allow symptom relief before progressing to active correction. Emerging evidence suggests that sustained positioning and repeated movement strategies can effectively reduce nerve root irritation and improve outcomes in disc-related radiculopathy when applied in a symptom-guided manner [8] [9]. The use of positional opening likely enhanced patient tolerance to lateral correction and facilitated smoother progression toward active self-management.

The clinical outcomes observed in this case including significant reductions in NPRS scores, improvement in Oswestry Disability Index, normalization of straight leg raise, and resolution of the lateral shift are consistent with contemporary literature supporting conservative management of LDH. Systematic reviews and clinical trials published after 2020 have reported favorable short- and medium-term outcomes with McKenzie-based and exercise-oriented physiotherapy interventions compared with passive or generalized treatment approaches [10, 11]. The absence of adverse effects and high adherence further support the safety and feasibility of this combined approach.

Strengths of this case include the use of MRI confirmation, standardized outcome measures, clear documentation of intervention progression, and integration of patient-reported outcomes. However, limitations include the single-case design, lack of long-term follow-up, and absence of post-intervention imaging to assess structural disc changes. While imaging changes are not always necessary for clinical recovery, future studies incorporating longer follow-up and larger samples would strengthen evidence for this combined intervention strategy.

In summary, this case supports the clinical value of combining positional opening techniques with the McKenzie lateral principle in the conservative management of LDH accompanied by lateral trunk shift. Early identification and correction of the shift, guided by mechanical assessment, can lead to rapid

symptom improvement, postural normalization, and functional restoration without surgical intervention.

Conclusion:

This case points out the importance of using positional opening approaches in association with the McKenzie lateral principle in the management of LDH with lateral trunk shift. This is supportive evidence in terms of correcting posture, pain relief, and functional recovery.

Patient Perspective:

The patient was happy to report the correction of his posture alleviated his leg pain and gave him confidence in his movements. He was satisfied with the active approach to his care, which enabled him to return to work without apprehension.

Informed Consent

Written informed consent for publication was obtained from the patient for publication of this case report and accompanying clinical information.

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