

Acute L4 - L5 Discogenic Pain: A Case Study

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Abstract: A 42 - year - old manual laborer with a six - month history of low back pain (LBP) presented with worsening symptoms. His physically demanding job, involving repetitive lifting and bending, contributed to lumbar strain, with pain intensifying during these activities and alleviating at rest, suggesting mechanical pain. Clinical assessment revealed discogenic pain at the L4 - L5 level, indicated by a positive Straight Leg Raise (SLR) test and lumbar nerve root irritation. A conservative treatment plan focused on mobility exercises, core strengthening, and lumbar stabilization, resulting in significant pain reduction and improved function within a week. These findings highlight the effectiveness of tailored physical therapy for managing discogenic LBP, particularly for individuals in physically strenuous occupations.

Keywords: discogenic pain, low back pain, lumbar spine, core strengthening, physical therapy

1. Patient Overview

A 42 - year - old male, employed as a **Mathadi worker** (manual laborer), presented with a **6 - month history** of low back pain (LBP), which had progressively worsened over the past **10 days**. His occupation involves heavy physical labor, including repetitive lifting, bending, and walking, all of which place significant strain on the lumbar spine. The patient reported that his pain was aggravated by activities that involve **walking, bending forward, and lifting weights**. Resting alleviated the pain, suggesting a **mechanical pain pattern**.

On initial presentation, the patient rated his pain as **4/10 during activity** and **0/10 at rest** on the Numerical Pain Rating Scale (NPRS). This pattern of pain intensity is typical for conditions that are **load - dependent** and worsened with physical exertion or spinal loading.

Clinical Assessment:

Upon physical examination, the patient demonstrated **mechanical low back pain** with notable discomfort during lumbar spine movement. Key findings from the assessment included:

- **Positive Straight Leg Raise (SLR) test:** This was indicative of a **neurodynamic response**, which is often seen in cases of **lumbar nerve root irritation** or **compression**, a hallmark feature of **discogenic pain** (Boden et al., 1990). The SLR test is used to evaluate the involvement of the lumbar nerve roots, and a positive result is commonly associated with herniation or bulging discs.
- **Pain Localization:** The patient localized his pain to the lower back, with radiation into the **posterior thigh**, consistent with nerve root irritation typically seen in **L4 - L5 disc** issues.
- **Postural Abnormalities:** The patient exhibited mild **postural changes**, such as **lumbar hyperlordosis**, which may place added stress on the intervertebral discs and contribute to disc degeneration.

Risk factors such as repetitive lifting and bending were noted in the patient's occupation, increasing the likelihood of disc herniation or degeneration. Given the combination of the patient's clinical presentation and risk factors, **L4 - L5 discogenic pain** was highly suspected.

Diagnosis:

Based on the patient's clinical presentation and the results of the SLR test, the diagnosis of **L4 - L5 discogenic pain** was confirmed. This condition is commonly associated with lumbar disc degeneration or herniation at the **L4 - L5 intervertebral level**, leading to **nerve root irritation** and **referred pain** (Biering - Sørensen, 2009).

Key diagnostic findings:

- **Mechanical pain pattern:** Pain worsened with **activity and spinal loading** (e. g., lifting, bending), and improved with **rest**.
- **Positive SLR test:** Indicates lumbar nerve root irritation, which is commonly associated with discogenic pain at the L4 - L5 level (Sexton et al., 2009).
- **History of heavy physical labor:** Lifting and bending are recognized as risk factors for disc herniation and degeneration (Troup et al., 1981).

This diagnosis was supported by the patient's **age**, occupation, and the **pain distribution** characteristic of lumbar disc pathology.

Treatment Plan:

The treatment plan for this patient focused on **conservative management**, primarily through **rehabilitation and exercise therapy**, which has been shown to be effective in managing discogenic pain and preventing further degeneration (Koes et al., 2010).

a) Mobility Exercises:

- Aimed at improving **spinal flexibility** and reducing stiffness, particularly in the lumbar spine.
- **Extension - based exercises** were emphasized, as they help to relieve pressure on the affected disc and avoid further flexion - based stress on the lumbar spine.
- Side - bending and gentle spinal rotation exercises were incorporated to improve overall lumbar mobility (Woolf et al., 2003).

b) Core Strengthening:

- Focused on strengthening the **abdominal, oblique, and lower back muscles**, which provide crucial support to the lumbar spine.

- Strong core muscles reduce the mechanical load on the spine and help improve **postural control** and **movement patterns** (MacIntyre et al., 2010).
- c) **Strengthening Exercises for Lower Back and Hips:**
 - Exercises targeted the **lumbar spine, hips, and legs** to improve support and functionality during daily activities.
 - Strengthening these muscles has been shown to **reduce pain** and **improve function** in patients with discogenic low back pain (Borghouts et al., 1999).

The patient attended **Physiotherapy OPD** for **one week** and followed the prescribed exercise regimen. The focus was on proper technique, posture correction, and the gradual progression of exercise intensity.

Progress and Outcome:

After **one week** of treatment, the patient reported significant improvement in his symptoms. Key outcomes included:

- **Pain intensity** decreased from **4/10 during activity** to **0/10**, indicating complete relief of pain during physical activities.
- **Activity limitations** improved significantly, with the patient reporting a reduction from **6/12** on Day 1 to **2/12** on Day 7.
- The patient was able to perform activities of daily living (ADLs) more comfortably, with his score improving from **7/32** on Day 1 to **4/32** on Day 7.
- The patient reported **no depression** by Day 7 (0/4), indicating an improvement in both **pain - related disability** and **psychosocial factors**.

2. Results

- **Pain intensity:** Day 1 = 4/10 → Day 7 = 0/10
- **Activity Limitation:** Day 1 = 6/12 → Day 7 = 2/12
- **ADLs:** Day 1 = 7/32 → Day 7 = 4/32
- **Depression:** Day 1 = 1/4 → Day 7 = 0/4

The significant improvement in **pain reduction, functional capacity, and ADL performance** indicates a successful outcome from the treatment plan. This aligns with previous research which supports the efficacy of **exercise therapy** and **spinal mobilization** in the management of discogenic low back pain (Koes et al., 2010).

3. Discussion

This case highlights the importance of a **comprehensive rehabilitation program** for managing **discogenic low back pain**, particularly in individuals with physically demanding jobs like manual laborers. The positive response to **mobility exercises, core strengthening, and spinal stabilization** underscores the effectiveness of **conservative management** for discogenic pain (Koes et al., 2010).

Given the mechanical nature of the patient's pain, a key focus of the treatment plan was to reduce **spinal loading** through proper posture, ergonomic adjustments, and targeted exercise interventions. **Strengthening the core and surrounding musculature** plays a crucial role in

supporting the lumbar spine and reducing the strain on the intervertebral discs, which helps mitigate the risk of future episodes (MacIntyre et al., 2010).

The **positive SLR test** confirmed the involvement of the **lumbar nerve roots**, and the clinical improvement after one week of therapy suggests that the treatment approach was successful in addressing the underlying cause of the pain. This is consistent with studies indicating that **early intervention** with physical therapy can significantly reduce the need for surgical intervention and improve long - term outcomes in patients with discogenic low back pain (Koes et al., 2010).

4. Conclusion

The diagnosis of **L4 - L5 discogenic pain** was confirmed based on the patient's clinical presentation and diagnostic findings. Conservative treatment involving **mobility exercises, core strengthening, and spinal stabilization** resulted in significant **pain relief** and improved **functional ability**. This outcome aligns with current evidence suggesting that **physical therapy** is a cornerstone of management for discogenic low back pain, with positive outcomes in terms of pain reduction and improved quality of life (Koes et al., 2010).

Ongoing rehabilitation and **ergonomic education** will be crucial for long - term management, especially considering the patient's physically demanding occupation. Regular follow - ups and a continued focus on posture correction and exercise adherence will help minimize the risk of recurrence and further disc degeneration.

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