

Lumbar Disc Herniation with Radiculopathy

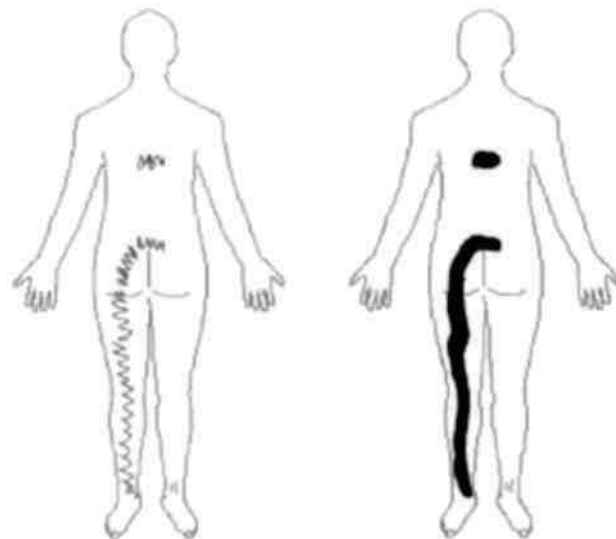
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“Mrs. Gaytri”, aged 57-year-old homemaker, resident of Udaipur city, had **low back pain and in recent times left leg pain history of 15 days, is presented.** Mrs. Gaytri approached me after an orthopedician from our own institute reviewed of her case and told for physiotherapy consultation. Pain is worsening day by day.

INJURY MECHANISM

Mrs. Gaytri **could not recall a solo incident recounting to the inception of her back pain.** Few weeks before developing back pain, she had been working in kitchen and did find strain on bending over tables. The pain began in her lower back centrally and then started transmitting straight down to the back of left thigh and into her ankle, foot, calf, and toes.



PRESENT SYMPTOMS

Pattern for 24 Hrs:

- **Very bad pain in the morning hours.** Mrs. Gaytri senses stiff and crooked in morning, she is bedridden and not capable to perform her day today activities on her own. Even to visit, toilet she needs aid of her family members.
- She is having, numbness or pins and needles in left leg and leg became heavy in night.

Factor which aggravates, ease her back, and leg pain:

- Lying down (Supine, Prone and Left side lying).
- Sitting down.

- No Movement for quite long time or getting cold
- Pain augments within 15 minutes of each persistent position. This pain takes about 2 hours to reduce up to easiness (mainly with help of posture change and walking).
- With only right side, lying posture patient gets reduction, easing in back and leg pain.

Identification of problem, corresponding medications & ongoing treatment:

- On Lumbar spine CT analysis, it was found that a L5-S1 disc protrusion with left S1 nerve root was being compressed.
- Orthopedician prescribed Lupiflex 8mg, Rabium 20mg and Axinac P. Out of those, Mrs. Gaytri continued usage of Lupiflex 8mg and Axinac P in their maximum possible daily quantity. Even with those, there was no sustained improvement in pain and function though she felt ok at the time of consumption of these.

Health & social account:

- Her health was normal and there were **no other red flags** in the subjective evaluation.
- Since Mrs. Gaytri was **incapable to move out of her bed**, was **anxious as to when she can handle her domestic work** in her present pain condition.
- Mrs. Gaytri spoken about her concerns about pain and the lack of progress, and above all was puzzled on the origin of her trouble.

SUBJECTIVE ASSESSMENT SCRUTINY

My **primary hypothesis for the cause of symptoms was a lumbar disc herniation linked with radiculopathy (LDHR)** after the subjective assessment. In particular as per CT scan results, L5/S1 disc protrusion with left S1 nerve root compression was found.

Reasoning adopted for the hypothesis is based on followings:

- Distribution of pain subsequent to S1 dermatome.
- High severity of 10/10 in the leg and 6/10 in the back i.e. **worse distally**.
- Moderate irritability (no position of easiness except right side lying, takes 2 hours to reconcile somewhat).
- **Strong provocative character** to own morning pain and stiffness.

There is **no single feature that provides the analysis of lower limb radiculopathy** (often referred to as sciatica), but extra research suggest a with a **amalgamation of the subsequent features** diagnosis of LDHR is better exact (Ford, Hahne, Chan, & Surkitt, 2012; Jacobs et al., 2011; Koes, Van Tulder, & Peul, 2007; Van der Windt, et al., 2010).

- **Distribution of symptoms**

- Unilateral leg pain is more compared to low back pain.
- Pain radiating in a dermatomal pattern, below the knee and into the foot or toes.
- Numbness and paraesthesia in the identical allocation,
- **Positive signs on neurodynamic and neurological examination**
- Straight leg raising test causes more leg pain.
- Neurological deficits which are limited to one nerve root.
- **Positive symbols on MRI and CT imaging** of lumbar disc herniation consequential in nerve root compression

TESTING OF HYPOTHESIS

With the aim for attestation of my principal hypothesis, it was crucial to agree on if there were positive signs on the straight leg raise test and neurological deficits on the physical examination. The secondary hypothesis, which required to be ruled out, was somatic referred pain, which could be implicated, or disregarded subsequent the neurological and physical examination (Van der Windt, et al., 2010).

PHYSICAL EXAMINATION

Observation of posture and function:

- Standing pattern was the first observation I made.
- In her standing position, her **shoulders shunted to the right side, her back extended and pelvis anteriorly tilted, and there was evident hyper-tonicity of the lumbar para-spinal muscles right side**.



Picture to exhibit the posture of Mrs. Gaytri on initial presentation. Occasionally it is not this observable and if I am not sure if there is a list present, I run my fingers down the spinous processes to double check. This is when I find the tiny lists, which are not noticeable but still medically pertinent and reply well to list-correction strategies

Above-mentioned shunted antalgic posture is generally referred to as a lumbar list. Observation of a lumbar list regrettably is a test lacking in trustworthiness (Clare, Adams, & Maher, 2003). Maitland (2005), though it teaches us that in case a person presents with a recognizable postural deformity, they will be more demanding to get better. In her case, she had a contralateral list (shoulders listed to the reverse side of back/leg pain), which is thought to react better to treatment than an ipsilateral list.

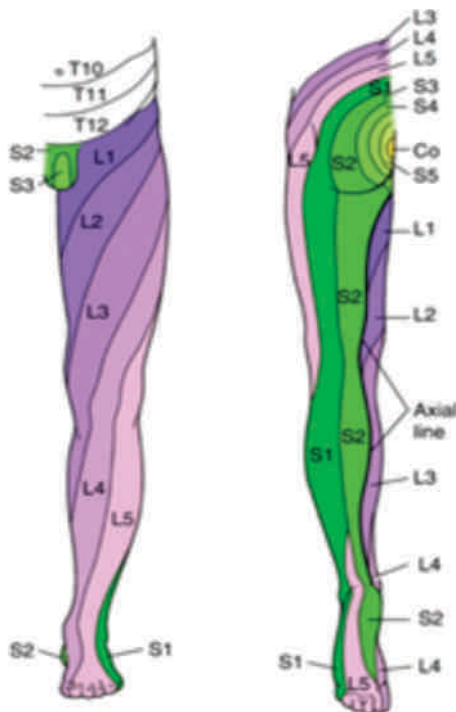
With my experience antalgic postures are extremely vital to spot since they indicate a protective position; mechanism which is being adopted by body (often subconsciously) in the acute phase of injury to guard the injury, and if the antalgic posture is not cautiously examined and cautiously corrected, it can make the patient a lot worse.

Active range of movement:

- Lumbar flexion limited due to left-sided back pain.
- Extension limited due pain left buttock and leg.
- Other actions not examined day 1 due to severity and irritability.

Neurological Aspect of Examination:

- Weak single leg calf raise (SLCR) and was only capable to carry out three assisted raises to 50% range. Gr 3(-) strength of left leg SLCR.
- Other myotomal weakness was not detected.
- The S1 reflex on the left side was not present, with other lower limb reflexes preserved.
- Sensory changes were distinguished along with S1 dermatome.



Neurodynamic Aspect of Examination:

- The *straight leg raise test (SLR)* was positive for reproduction of Patient's posterior thigh pain and restricted at 20 degrees on the left side.
- Her right SLR was limited by hamstring tightness at 50 degrees.

The research proposes the SLR steadfast re-assessment asterisks for patient advancement. It has shown to be 91% sensitivity and 26% specificity in identifying lumbar disc pathology (Jensen, et al., 1994). Deville et al. (2012) recognized that **more than an 11-degree divergence** in hip flexion range among sides was a **clinically noteworthy result**. Compared to MRI, the SLR test has meagre diagnostic correctness, and as a result is again and again used in conjunction with these imaging.

Manual palpation:

- With applying pressure only to the onset of pain, Palpation conducted in the left side lying position.
- The occurrence of generic hyperalgesia made it difficult to ascertain an analogous finding day 1.

ANALYSIS OF PHYSICAL ASSESSMENT & MAIN PRIMARY HYPOTHESIS

The main hypothesis of L5/S1 lumbar disc herniation with linked S1 radiculopathy was **acknowledged** based on the following observation:

1. Existence of pain allocation along the S1 dermatome,
2. Restricted S1 reflex,
3. S1 Myotome Weakness,
4. Positive left side SLR,
5. Relationship among these physical observations and the results of the lumbar CT scan.

TREATMENT

Treatment Day 1:

- Listing of restructuring with right side gliding exercises in standing. This was marked during the physical test as a valuable pain plummeting technique.
- The result of this treatment was abridged LBP and amplified Lumbar ext AROM, condensed list in standing, and less pain with walking.

McKenzie method has been used to derive Directional preference mechanical loading strategies (MLS). These are general approach used in the treatment of discogenic low back pain (Ford, Surkitt, & Hahne, 2011). The centralisation phenomenon, i.e. abolishment of distal symptoms because of recurring movements of the lumbar spine are key trait of using MLS in assessment and cure. By application of this principle of MLS, I gone ahead with right side glide as my direction of treatment as it resulted in concentrated of Patient's leg pain.

With placement of elbow against the wall, it supports the trunk and allows the side gliding movement to be limited to a small area to the lumbar spine. Request the patient to move their hips near the wall stopping at the first point or uneasiness or pain. Habitually on Day 1 this is only ended on one side.

On second action day of one, Taping was provided. This was warranted as a means of maintaining the improved spinal pose, dipping load through the disc and eventually reducing inflammation (Ford, et al., 2012; Ford, et al., 2011).

When she complained of particularly painful movement direction, I limit that movement on the first day. So, move into the directions in which she feels good and try avoiding from aggravating pain in the movement that hurts. With limitation to range, all forward bending must be avoided.



Taping with vertical strips will disable lumbar flexion. This taping to add to proprioception and patient knowledge about their lumbar flexion throughout functional movements.

Advice was the concluding constituent of the day 1 treatment, which was as follows:

- To avoid long-standing bed rest and sitting, & to go for habitual small walks to help supervise the stiffness.
- Education for the desired timeframes for recovery (months) and probable prognosis (identified by advancement and reassessment Day 2/3) to augment self-management and to diminish the likelihood of re-aggravation.

Application of **three different treatment** strategies for the very first treatment may be reasonable with the following

consideration:

- The persistent pain nature,
- Deteriorating symptoms,
- Lack of reply to preceding treatment
- The patient's poor thoughtful of the issue

Main purpose of the day 1 treatment was to determine **if any change could be made with physiotherapy**, or the patient was required to refer for a neurosurgical consult.

DAY 2 ASSESSMENT AND TREATMENT

SUBJECTIVE ASSESSMENT

- Patient has shown improvement in LBP with back pain 4/10 and leg pain 7/10 – approximate improvement of around 30%.
- Morning stiffness sustained but Patient was capable to get out of bed and move around on her own
- Heaviness in leg not reported.

PHYSICAL ASSESSMENT

- The trail physical parameters/characteristics were re-assessed:
 - Contralateral lumbar list in standing – enhanced but was still there (somewhat),
 - Lumbar AROM – Flex (left LBP) R (mid-thigh) and extension (left LBP) R (10 degrees).
 - SLCR and SLR - unaffected.
- **New assessment – Motor control of Transversus Abdominus (TrA).**
 - With understanding that taping helped to boost the sense of solidity roughly the lumbar region, I was fascinated to discover if activation of stabilising muscles could display the similar treatment effect.
 - This was examined in standing, with the augmentation of TrA activation before and all the way through lumbar active movements and in supine as a difference of the active straight leg raise test.
- **Second Assessment - Lumbar passive physiological intervertebral movements (PPIVMS).**
 - Evaluation exposed a deficit in rotation movement between L5 and S1 segments on the left side, restricted by pain.
 - In above case, patient was given Gr III- rotation mobilisations at 30-second gap.
 - On re-evaluation, there was a reduction of pain at 10 degrees of lumbar extension AROM and diminution of thigh pain on walking.
- As patient had better, **day 1 session was repeated with reassess of the list of exercise and re-application the**

lumbar tape.

PROGNOSIS AND PROGRESSION OF TREATMENT

With a **number of neurological deficits**, patient had been **symptomatic of problem for at least last 15 day**. After providing two cures and treatment, there were encouraging signs of improvement (in pain and function, not neurological signs) in patience. In case the improvement continued she will probably have the same prognosis of pain reduction and recovery of disability & function, with conservative treatment, when compared to lumbar micro discectomy at 1-2 years post injury (Jacobs, et al., 2011; Peul, et al., 2008).

Ford, et al. (2012) suggests that a **functional rehabilitation program is the most suitable treatment for Mrs. Gaytri's problem**, which will include the below mentioned characteristics:

- Daily living as well as work activities capacity restoration
- Meaningful goals negotiation.
- In order to achieve increase psychological and physical tolerances, Development of graded exercise schedule of functional tasks.
- Focused intend to increase cardiovascular fitness, flexibility and strength and,
- For getting targeted results cognitive-behavioural approach to deal with psychosocial barriers.

CONCLUSION

- A grouping of physical assessment findings, and correlation with the results of CT/MRI scan shall be used for the primary hypothesis of lumbar disc herniation with associated radiculopathy.
- The patient has an adequate amount of signs of compressive radiculopathy that hints for a neurosurgical review in case Patient's condition deteriorated.
- A functional restoration program is probably the best suited treatment approach for this problem subsequent to the initial phase of treatment and resolution of the lumbar list.
- It is expected that patient will probably have a good prognosis for recovery, and in the long-term get back her pre-morbid level of function in view of improvement shown within the first two sessions, and in light of the substantiation.

BIBLIOGRAPHY

Boyd, B. S., & Villa, P. S. (2012). Normal inter-limb differences during the straight leg raise neurodynamic test: a cross sectional study. *BMC musculoskeletal disorders*, 13(1), 245.

Clare, H., Adams, R., & Maher, C. (2003). Reliability of detection of lumbar lateral shift. *Journal of manipulative and physiological therapeutics*, 26(8), 476-480.

Devillé, W., van der Windt, D., Dzaferagic, A., Bezemer, P.,

&Bouter, L. (2000). The test of Lasegue: systematic review of the accuracy in diagnosing herniated discs. *Spine*, 25(9), 1140-1147.

Ford, J. J., &Hahne, A. J. (2013). Pathoanatomy and classification of low back disorders. *Manual therapy*, 18(2), 165-168.

Ford, J. J., &Hahne, A. J. (2013). Pathoanatomy and classification of low back disorders. *Manual therapy*, 18(2), 165-168.

Ford, J. J., Hahne, A. J., Chan, A., &Surkitt, L. D. (2012). A classification and treatment protocol for low back disorders Part 3-Functional restoration for intervertebral disc related disorders. *Physical Therapy Reviews*, 17(1), 55-75.

Ford, J. J., Surkitt, S. L., &Hahne, A. J. (2011). A classification and treatment protocol for low back disorders Part 2-Directional preference management for reducible discogenic pain. *Physical Therapy Reviews*, 16(6), 423-437.

Hahne, A., Ford, J., Surkitt, L., Richards, M., Chan, A., Thompson, S., et al. (2011). Specific treatment of problems of the spine (STOPS): design of a randomised controlled trial comparing specific physiotherapy versus advice for people with subacute low back disorders. *BMC musculoskeletal disorders*, 12(1), 104.

Hahne, A. J., Ford, J. J., &McMeeken, J. M. (2010). Conservative management of lumbar disc herniation with associated radiculopathy: a systematic review. *Spine*, 35(11), E488-E504.

Jacobs, W. C., van Tulder, M., Arts, M., Rubinstein, S. M., van Middelkoop, M., Ostelo, R., et al. (2011). Surgery versus conservative management of sciatica due to a lumbar herniated disc: a systematic review. *European Spine Journal*, 20(4), 513-522.

Jensen, M. C., Brant-Zawadzki, M. N., Obuchowski, N., Modic, M. T., Malkasian, D., & Ross, J. S. (1994). Magnetic resonance imaging of the lumbar spine in people without back pain. *New England Journal of Medicine*, 331(2), 69-73.

Koes, B. W., Van Tulder, M. W., &Peul, W. C. (2007). Diagnosis and treatment of sciatica. *BMJ: British Medical Journal*, 334(7607), 1313.

Maitland, G. D., Hengeveld, E., Banks, K., & English, K. (2005). *Maitland's vertebral manipulation*: Elsevier Butterworth-Heinemann Edinburg.

Peul, W. C., Brand, R., Thomeer, R. T., &Koes, B. W. (2008). Improving prediction of "inevitable" surgery during non-surgical treatment of sciatica. *Pain*, 138(3), 571-576.

Van der Windt, D. A., Simons, E., Riphagen, I. I., Ammendolia, C., Verhagen, A. P., Laslett, M., et al. (2010). Physical examination for lumbar radiculopathy due to disc herniation in patients with low-back pain (Review). *Cochrane Database Syst Rev*, 2(2).