

The Interplay Between the Biomechanics of Neurogenic Claudication, Pain, and Rollators: A Case Report.

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Introduction

- Lumbar spinal stenosis is a condition in which there is diminished space available for the neural and vascular elements in the lumbar spine ⁽¹⁾.
- Most commonly due to degenerative osteoarthritis of the spine and can be furthered by disc protrusions, disc degeneration, facet arthropathy, and ligamentum flavum hypertrophy.
- Symptomatic lumbar stenosis presents with characteristic provoking and palliating features of neurogenic claudication; pain is positionally-induced and worsened with upright exercises such as walking and alleviated with forward flexion or recumbency ⁽¹⁾.
- Distinguished from vascular claudication pain which is not affected by position so much as it is by metabolic demand.

Case Description

- A 74-year-old female with a history of lumbar stenosis status post remote L4-L5 hemilaminectomy and recent spinal-cord-stimulator (SCS) presented as a new patient for evaluation of her chronic lower back pain.
- She was overweight (BMI 28), 70 kg, and 5'2".
- Experienced 10/10 daily pain in bilateral low back pain with intermittent radiation down to her glutes.
- Pain worsened with prolonged walking and limited her ambulation to 1 to 2 city blocks.
- She reported little relief from prior physical therapies, current medications (gabapentin 800 mg three times daily and oxycodone 5 to 10 mg daily as needed), prior fluoroscopic epidural spinal injections, and her SCS.

Assessment

- Review of her prior Lumbar MRI was notable for multilevel spondylosis, moderate disc protrusions, and moderate to severe foraminal and canal stenosis most pronounced at the L3-L4, L4-L5 levels.
- Notably, patient was observed ambulating with her four-wheel rollator in the office with the handlebars set high above the level of her iliac crests so that she could appear to "walk normally with [her] back straight".

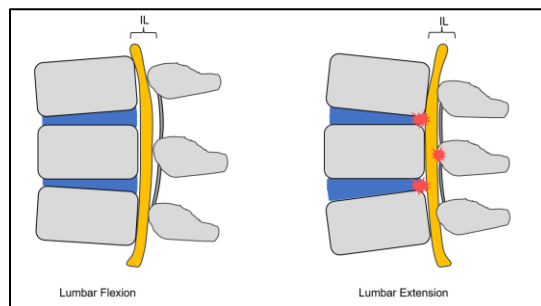


Figure 1: Illustration of effects of lumbar flexion and lumbar extension on interlaminar space (IL).

Results

- She immediately noted increased comfort ambulating with her rollator in the office.
- At two week follow-up post-adjustment, she reported reduced pain and less medication use; specifically, she endorsed 8/10 low back pain as opposed to her usual 10/10 pain and was able to decrease her gabapentin usage from three to two times daily.
- At eight week follow-up post-adjustment, she noted low back pain scores varied from 8-10/10 but continued to use her rollator at the adjusted height given increased tolerance for ambulation, walking 2 to 3 city blocks. No further medication changes.

Intervention

- The handlebars of her rollator were lowered approximately 6" to the proper height at the level of her greater trochanters as a quick in-office intervention.
- The handle height of most gait assistive devices such as straight canes and walkers, are often set at the level around the greater trochanter with 15-20 degrees of elbow flexion when gripped to allow for improved comfort by reducing amount of stress on shoulders (if too high) and on lower back (if too low) ^(2,3).

Discussion

- Given the degree of her lumbar stenosis on imaging and pain relief with lumbar flexion, the patient likely had a component of neurogenic claudication that contributed to her pain.
- By adjusting the patient's rollator handlebars to a proper height, she was allowed to assume a more comfortable walking position with more forward trunk lean, less elbow flexion, and less shoulder extension.
- Relief was likely achieved through the increased lumbar flexion which opened her interlaminar space; additionally, there likely was a reduction in the forces transmitted to her anterior shoulders.

Conclusion

- In cases of complicated, multifaceted pain, attention to equipment ergonomics can act as another valuable tool in addressing pain.

References

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