Recovery of Ankle Dorsiflexion Weakness Following unilateral MILD ® Procedure in a Patient with Severe Spinal Stenosis.



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Background

- Lumbar spinal stenosis (LSS) is a spinal canal narrowing in one or multiple segments due to a herniated disc, ligamentum flavum thickening, facet arthropathy, or a combination of such degenerative change
- Although there is no consensus on the definition of lumbar spinal stenosis, an anteroposterior spinal canal diameter of less than 10mm is frequently used to diagnose absolute or severe LSS
- LSS is associated with severe disability in adults over 65 and is the most common cause of spinal surgery in this population.
- Conservative treatment of lumbar spinal stenosis involves progressing from physical therapy (PT), analgesics, and NSAIDs to procedures such as an epidural steroid injection.
- In cases of instability (spondylolisthesis), or failure of conservative management, classic surgical correction with laminectomy or, in some cases, laminectomy and fusion would be considered.
- In the past 10 years, several minimally invasive interventions have become available to treat spinal stenosis, including the MILD® procedure (Minimally Invasive Lumbar Decompression

Case

- 70-year-old woman with a history of prediabetes, osteopenia, and depression who reported 10 months of tripping and falls and developed unsteady gait and standing difficulty. She subsequently developed lumbar pain radiating down the left lateral leg with tingling in both shins
- Patient was admitted and spine decompression was recommended but patient deferred.
- Lumbar MRI revealed severe L4-5 and severe L2 central spinal stenosis and severe L4-5 foraminal stenosis, ligamentum flavum thickening of 5.2mm
- Laboratory work-up was negative and patient was discharged with an AFO and PT.
- She presented to our outpatient spine center four months after developing a left foot drop with continued pain in the lumbar spine with neurogenic claudication in the left distal leg, triggered by standing and walking compatible with L4-5 spinal stenosis
- On physical exam, patient had left ankle dorsiflexion weakness (1/5) and left EHL weakness (2/5). Right leg strength was normal in all myotomes. Agreed to Left L4-L5 MILD Decompression. Post-op follow up at 2, 6, and 12 weeks.
- **2-week follow-up:**no longer required an AFO to ambulate. Her neurogenic claudication had improved, and she doubled her standing and walking time to 20 minutes.
- **6-week follow-up:** walking and standing tolerance improved to 40 minutes, and she had complete resolution of her left ankle dorsiflexion weakness.
- **12-week follow-up:** in conjunction with PT, she reported a near symptom-free state. She had normal left ankle dorsiflexion and EHL strength and could tolerate 40 minutes of walking and standing.
- **Ten months after the MILD® procedure:** she had an EMG at an outside facility, which showed normal motor studies, normal H-reflex, and +1 chronic small amplitude fibrillation potentials in her left tibialis anterior with mild chronic reinnervation features

Imaging

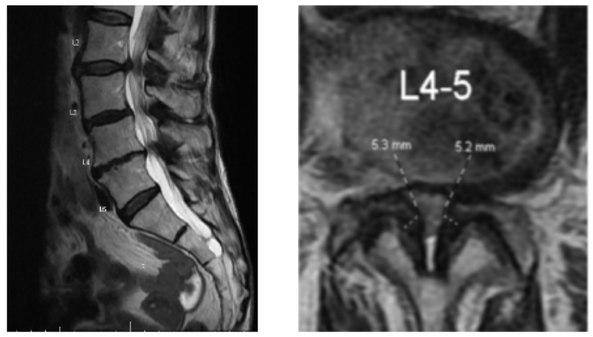


Figure 1. Sagittal and Axial view of the Lumbar spine in our patient with L2 and L4 spinal stenosis. Ligament flavum measurement of 5.2mm on the left side, which was symptomatic side with left foot drop

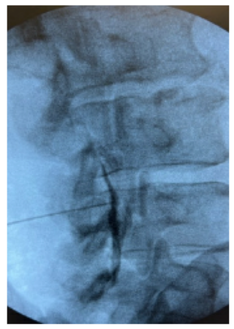


Figure 2. Left paramedian L4/5. Showing anterior displacement of the dura compatible with posterior element Epidurogram degeneration and ligamentum flavum thickening noted on MR.

Intervention



Figure 3. Left L4-5 MILD® procedure. Removal (debulking) of ligamentum flavum from Left L4-5 epidural space to decompress thecal sac and traversing nerve roots

Discussion

- Lower extremity weakness, including foot drop, requires expedited imaging, PT, a course of oral steroids, an epidural steroid administration, and in persistent cases, decompression.
- Traditional decompression options are open hemilaminectomy, full laminectomy, or combination laminectomy and fusion when instability exists.
- MILD® is a low-risk procedure with a safety profile similar to epidural steroid injections. Studies show statistically significant improvement in VAS scores , function and 74% patient satisfaction in those undergoing Mild procedure for spinal stenosis
- In a five-year durability study, 88% of patients undergoing MILD® did not require open surgical intervention
- In addition to this reported case, we treated two other patients with focal foot drops, both of whom achieved full-strength recovery (one had thickening of ligamentum flavum and a synovial cyst which was decompressed with MILD®
- Based on the impressive motor recovery achieved after the MILD® procedure in this case, we propose an early adoption of MILD® in the treatment algorithm of spinal stenosis with focal weakness

Conclusion

In carefully selected patients, early introduction of the MILD® procedure in the treatment algorithm of spinal stenosis with focal dorsiflexion weakness has the potential for complete motor strength recovery alongside previously established statistically significant improvement in neurogenic claudication, disability, and quality of life metrics

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