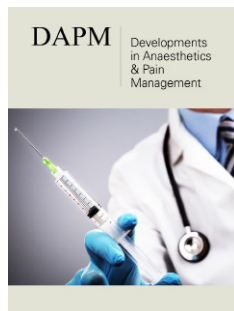


# The Treatment of an Older United States Military Veteran with Chronic Lumbar Spinal Stenosis Utilizing Flexion-Distraktion Spinal Manipulative Therapy

ISSN: 2640-9399



**\*Corresponding author:** Casey J Rogers, Birmingham VA Health Care System Department of Physical Medicine and Rehabilitation, Birmingham, AL USA

**Submission:** 📅 December 18, 2023

**Published:** 📅 March 06, 2024

Volume 2 - Issue 5

**How to cite this article:** Casey J Rogers\*. The Treatment of an Older United States Military Veteran with Chronic Lumbar Spinal Stenosis Utilizing Flexion-Distraktion Spinal Manipulative Therapy. Dev Anesthetics Pain Manag. 2(5). DAPM. 000548. 2024.  
DOI: [10.31031/DAPM.2024.02.000548](https://doi.org/10.31031/DAPM.2024.02.000548)

**Copyright@** Casey J Rogers, This article is distributed under the terms of the Creative Commons Attribution 4.0 International License, which permits unrestricted use and redistribution provided that the original author and source are credited.

**Casey J Rogers<sup>1,2\*</sup>**

<sup>1</sup>Birmingham VA Health Care System Department of Physical Medicine and Rehabilitation, USA

<sup>2</sup>Keiser University College of Chiropractic Medicine, USA

## Abstract

Lumbar Spinal Stenosis (LSS) is a condition of the lower back resulting in a variety of pathological symptoms such as pain, weakness, and/or paresthesia that impacts millions of people worldwide. Several conservative treatment options are available for LSS as an alternative to surgery or spinal injections including physical therapy, Spinal Manipulative Therapy (SMT), and acupuncture. The purpose of this case report was to describe the treatment of an older Veteran with lumbar spinal stenosis utilizing one of these conservative interventions: flexion-distraktion SMT. A 68-year-old male Veteran of the US military presented to the chiropractic clinic with several years of lower back pain and lower extremity pain. Prior interventions such as injections and pharmaceutical medications had minimal positive changes. Imaging demonstrated central canal and neural foraminal stenosis along with extensive degenerative changes in the lumbar elements. The patient had poor mobility and limited range of motion in the lumbar region. Physical exam concluded the pain and symptoms were a result of lumbar spinal stenosis. A trial of conservative SMT including flexion-distraktion was initiated. After 6 treatments the patient demonstrated reduced pain, increased mobility, and felt the condition was overall improved. For mobility measurement, the University of Alabama at Birmingham Life Space Assessment was utilized. This assessment has novel use for investigating mobility and manual therapy and this case report may serve as starting point for future investigations. In conclusion, flexion-distraktion SMT was a beneficial conservative treatment option for an older Veteran with lumbar spinal stenosis that prevented the need for surgical or further pharmaceutical interventions.

**Keywords:** Chiropractic; Low back pain; Lumbar spinal stenosis; Spinal manipulation; Veteran; Conservative care

**Abbreviations:** CTFD- Cox Technic Flexion Distraktion; FD- Flexion-Distraktion; LBP- Low Back Pain; LE's- Lower Extremities; LSA- Life Space Assessment; LSS- Lumbar Spinal Stenosis; MRI-Magnetic Resonance Imaging; N/A- Not Available; NRS- Numerical Rating Scale; PT-Physical therapy; SMT- Spinal Manipulative Therapy

## Introduction

Lumbar Spinal Stenosis (LSS) is a condition of the lower back resulting in a variety of pathological symptoms such as pain, weakness, and/or paresthesia [1]. LSS impacts over an estimated 100 million persons worldwide and results in approximately 600,000 surgical interventions in the United States annually [2]. Clinically, LSS is characterized by narrowing in any of the 3 anatomical vertebral sites: the central canal or either neural foramen. The spinal canal houses the spinal cord while the neural foramen are regions where the nerve roots exit to the peripheral body. There are various common causes of this narrowing including herniated or bulging spinal discs or a hypertrophic ligamentum flavum. Other causes include degenerative spondylosis, usually from aging, "wear-and-tear," and/or trauma. Degenerative spondylosis often leads to joint arthropathy and osteophyte formation with an overgrowth of bone formation surrounding the facet joints that make up the neural foramen [1,3].

Spondylolisthesis, or movement of one vertebral body on another, is another cause of LSS seen often clinically [4]. Less commonly, space-occupying lesions such as synovial or neural cysts, neoplasms, or lipomas can be a cause of LSS [3]. Among other symptoms, LSS may cause an event known as neurogenic claudication; a result of central canal narrowing potentially leading to aching, numbness, pain, or balance issues among other symptoms [5,6].

Several conservative treatment options are available for LSS including Physical Therapy (PT) and active care, Spinal Manipulative Therapy (SMT), and acupuncture. Pharmaceutical interventions generally include anti-inflammatories, over-the-counter pain medicine, prescription pain medicine, and anti-inflammatory or numbness injections to the lumbar region. If conservative and pharmaceutical options have failed to manage the condition, surgical interventions are often performed. Some of these procedures include laminectomy's, spinal fusions, or minimally invasive laser surgeries [2,6,7]. Unfortunately, surgical costs can be staggering. One recent study found a single lumbar fusion can cost upwards of \$70,000 [8]. There are also risks involved in surgery such as prolonged or increased pain, infection, bleeding, blood clots, revisions, or death [9,10]. Given these risks, it is understandable why some patients with LSS would choose to avoid the surgical route.

The following case report focuses on one of the conservative options mentioned above: SMT. There are a variety of case reports and reviews addressing SMT for the treatment of LSS, but gaps continue to exist [11]. Due to the structural changes within the spinal elements for many of those with LSS, an SMT approach known as Flexion-Distract (FD) may be utilized [12]. This technic generally has the patients in a prone (face-down) position and with the assistance of a specialized table, the practitioner can apply forward flexion and cephalic distraction resulting in reduced intradiscal pressure of up to a measured 192mmHg, increase intervertebral disc height, and increase the neural foraminal region

[13,14]. Though no current study exists singularly addressing the safety of FD, many case reports and cohort studies report only mild adverse events such as temporary soreness to the region of application [15-17]. The purpose of this case report is to review the treatment of an older United States (US) military Veteran with LSS utilizing FD that led to reduced pain and paresthesia and, interestingly, resulted in increased mobility and deferred surgical intervention.

## Case Presentation

### Presentation and PMHX

A 68-year-old male Veteran of the US military presented to the chiropractic clinic with several years of Lower Back Pain (LBP) that was worsening over the previous 2 months. The pain also was reported into the posterior of Lower Extremities (LE's) and wrapped to the top of the feet. The pain was constant and fluctuated depending on activities and body position. The LBP was sharp while the pain into the LE's was a dull ache. Prolonged stationary positions such as sitting and standing made the pains worse, as did prolonged walking. Leaning forward after walking relieved this pain. He also reported that stretching, heat, and some muscle relaxers were helpful in reducing the pain. He notes previous interventions with PT and nerve blocks in the lower back that had little to no benefit towards the symptoms. Past medical history included chronic pain throughout multiple body regions, hypertension, prediabetes, glaucoma, and coronary artery disease.

### Physical examination

Patient entered with a forward lean antalgic posture. His gait demonstrated a shortened stride length. Patient was alert, attentive, oriented and cooperative. Speech was clear and fluent. He had a positive attitude and was excited about additional treatment options for his chronic pain. Table 1 outlines an extension review of the remainder of the physical exam at the consultation and findings on follow-up exam.

**Table 1:** Physical Exam Findings at Consult and Six Week Follow-up.

Exam	Result- Consult	Result- Follow up (6 weeks)
Palpation	Severe tenderness along the facet planes of L2-L5. Significant tenderness reported in the midline of L4-L5.	Mild tenderness along the facet planes of L2-L5. Moderate tenderness reported in the midline of L4-L5.
Active Lumbar Range of Motion*	Flexion- Reduced to 20°	Flexion- 35°
	Extension- Reduced 5° with pain	Extension- 10°
	Rotation- 5° Bilaterally	Rotation- 5° Bilaterally
	Lateral flexion- 20° Bilaterally	Lateral flexion- 20° Bilaterally
Orthopedic Testing		
Facet Loading	Pain and obstruction bilaterally in the lower lumbar segments	Pain and obstruction bilaterally in the lower lumbar segments
Straight leg raise (right)	90° with local LBP	90° without pain
Straight leg raise (Left)	90° with local LBP	90° without pain
Slumps test	Local LBP with reduced ache to the LEs	No pain reported
Neurological Testing		
Myotomes:	5/5 bilaterally with hip flexion, knee flexion/extension, ankle plantarflexion/dorsiflexion	5/5 bilaterally with hip flexion, knee flexion/extension, ankle plantarflexion/dorsiflexion
Sensation:	Light touch was reduced throughout the left L4-S1 dermatomes compared to the right	Light touch equal and even throughout the L4-S1 dermatomes

Reflexes	Patellar +1 and symmetrical	Patellar +1 and symmetrical
	Achilles +1 and symmetrical	Achilles +1 and symmetrical
*Active ranges of motions subjective to provider measurement without measuring instruments.		

**Diagnostic imaging**

Prior to the consult the patient had extensive imaging done on

his lumbar spine including radiographs and MRI. Findings are as follows in Table 2 and images are included in Figures 1-4.

**Table 2:** Radiographic Imaging.

Modality	Radiologist Interpretation
Radiograph	No lumbar spinal fracture is seen. There is grade 1 anterolisthesis L4 on L5 which appears to be degenerative in nature. Lumbar spinal alignment otherwise appears within normal limits. There is mild to moderate multilevel degenerative disease, most prominent at L4-5 and L5-S1. Mild to moderate multilevel facet arthropathy is seen, most prominent in the lower lumbar spine at L3-4, L4-5, and L5-S1. Imaged portions of the pelvis appear intact.
Magnetic Resonance Imaging (MRI)	There is trace retrolisthesis of L2 on L3 and grade 1 anterolisthesis of L4 and L5. The vertebral body heights are maintained. There are multilevel degenerative discogenic changes with anterior marginal osteophytosis, and degenerative Modic endplate changes, disc desiccation, and disc space narrowing, which is mild to moderate at T10-11 and T11-12, mild posteriorly at L1-2 and L2-3, and moderate posteriorly at L4-5 and L5-S1. There are degenerative Modic type 2 endplate changes, asymmetric to the right, at L4-5 and L5-S1, most prominent at L5-S1. There is no suspicious marrow signal abnormality.
	Impression: Multilevel degenerative changes and epidural lipomatosis resulting in spinal canal and neural foraminal as above, most prominent at levels spanning L3-S1, where there is moderate narrowing of the thecal sac with crowding of cauda equina at L4-5 and possible exiting nerve root impingement on the left at L3-4 and bilaterally at L4-5 and L5-S1.



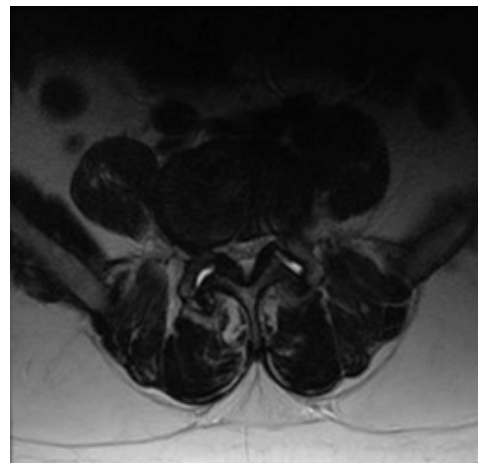
**Figure 1:** AP Lumbar Spine Radiograph.



**Figure 3:** MRI Lumbar Mid-sagittal View.



**Figure 2:** Lateral Lumbar Spine Radiograph.



**Figure 4:** MRI L4-L5 Axial View.

## Interventions

The patient began a trial of care that included Cox Technic Flexion-Distraction (CTFD) Protocol 1 that incorporated 3 sets of 5 flexion-distraction motions. Between sets the practitioner applied manual trigger point therapy to lumbar musculature with an analgesic gel. This treatment was performed 1 time per week for 6 weeks until follow-up.

## Assessments and outcomes

Outcome assessments utilized included the Numeric Pain Rating Scale where the patient noted current pain, lowest pain,

**Table 3:** Outcome Measures at Consult and 6-week Follow-up.

Outcome measure	Consult	Follow-up (6 weeks)	Change
NRS	Current 10/10 Best 5/10 Average 10/10 Worst 10/10	Current 7/10 Best 5/10 Average 7/10 Worst 10/10	Total Consult-Total Follow-up/ Total Consult x 100%= 17% improvement
UAB LifeSpace	24	48	Increase activity within the home and neighborhood regions.
Global Rating of Change Questionnaire *	N/A	(+2) A little bit better	
*Global Rating of Change only performed at follow-up.			

## Discussion

After thorough examination and review of imaging, the patient was diagnosed with LSS and was treated with CTFD and manual trigger point therapy. After 6 treatments there was a reduction in pain and symptoms as well as an increase in mobility, improved sensations, and improved functional movement. This is a case where conservative care was beneficial as an intervention and prevented surgical consultation or further injections to lumbar spine for a patient suffering with LSS. Further investigations such as a case series and cohort studies would be beneficial to measure the impact CTFD may have on this condition. Future studies would also be beneficial to assess the utility of the LSA in regard to manual therapy and mobility as limited studies using this assessment exists. This report may be a useful start for this type of investigation.

## Limitations

The author notes limitations of this report including subjective findings on exam and outcomes may not necessarily be clinically meaningful. The LSA has never had published study with chiropractic care and it is difficult to know if changes are clinically relevant to care without a baseline study, though future investigations may have interesting findings. The patient also was taking gabapentin which may or may not have influenced how he was feeling at the times of exam.

## Conclusion

The use of FD for an older adult male US Veteran was beneficial in management of his LBP associated with LSS. He demonstrated functional improvements including mobility and also had improves

highest pain, and average pain over a 1-week period on a 0-10 scale. The University of Alabama at Birmingham Life Space Assessment (LSA) was also used to measure mobility. Mobility, in terms of LSA, can be defined by distance extending from the location where a person sleeps and dependency on assistance. Outcomes at consult and follow-up can be found in Table 3. At the end of the trial and on follow-up exams there were measurable objective and subjective findings. The patient overall felt improvement and had pain and symptoms in the LSP and LE as well as demonstrated increase mobility. He desired to continue this therapy in lieu of a surgical consult or further injections.

symptoms of pain reduction and improved sensation. Though some level of pain persists, the patient notes managing well and increasing activities. This report may serve as a base for further investigation into the association of LSS, FD SMT, and mobility improvement as seen on the LSA.

## Acknowledgment

The author acknowledges the Birmingham VHA Department of Physical Medicine and Rehabilitation clinic for the use of their facility for treatment in this case.

## References

- Raja A, Hoang S, Patel P, Mesfin FB (2023) Spinal Stenosis. In: Stat Pearls. Treasure Island (FL): Stat Pearls Publishing, USA.
- Katz JN, Zimmerman ZE, Mass H, Makhni MC (2022) Diagnosis and management of lumbar spinal stenosis: A review. *JAMA* 327(17): 1688-1699.
- Munakomi S, Foris LA, Varacallo M (2023) Spinal stenosis and neurogenic claudication. In: StatPearls. Treasure Island (FL): StatPearls Publishing, USA.
- Drury T, Ames SE, Costi K, Beynnon B, Hall J (2009) Degenerative spondylolisthesis in patients with neurogenic claudication effects functional performance and self-reported quality of life. *Spine (Phila Pa 1976)* 34(25): 2812-2817.
- Messiah S, Tharian AR, Candido KD, Knezevic NN (2019) Neurogenic claudication: A review of current understanding and treatment options. *Curr Pain Headache Rep* 23(5): 32.
- Bussières A, Cancelliere C, Ammendolia C, Comer CM, Zoubi FA, et al. (2021) Non-surgical interventions for lumbar spinal stenosis leading to neurogenic claudication: A clinical practice guideline. *J Pain* 22(9): 1015-1039.

7. Kirker K, Masaracchio MF, Loghmani P, Torres-Panchame RE, Mattia M, et al. (2023) Management of lumbar spinal stenosis: A systematic review and meta-analysis of rehabilitation, surgical, injection, and medication interventions. *Physiother Theory Pract* 39(2): 241-286.
8. Beckerman D, Esparza M, Lee SI, Berven SH, Bederman SS, et al. (2020) Cost analysis of single-level lumbar fusions. *Global Spine J* 10(1): 39-46.
9. Lange N, Stadtmüller T, Scheibel S, Reischer G, Wagner A, et al. (2022) Analysis of risk factors for perioperative complications in spine surgery. *Sci Rep* 12(1): 14350.
10. Saleh A, Thirukumaran C, Mesfin A, Molinari RW (2017) Complications and readmission after lumbar spine surgery in elderly patients: An analysis of 2,320 patients. *Spine J* 17(8): 1106-1112.
11. Stuber K, Sajko S, Kristmanson K (2009) Chiropractic treatment of lumbar spinal stenosis: A review of the literature. *J Chiropr Med* 8(2): 77-85.
12. Schneider MJ, Ammendolia C, Murphy DR, Glick RM, Hile E, et al. (2019) Comparative clinical effectiveness of nonsurgical treatment methods in patients with lumbar spinal stenosis: A randomized clinical trial. *JAMA Netw Open* 2(1): e186828.
13. Gudavalli MR, Olding K, Joachim G, Cox JM (2016) Chiropractic distraction spinal manipulation on postsurgical continued low back and radicular pain patients: A retrospective case series. *J Chiropr Med* 15(2): 121-128.
14. Gudavalli MR, Cox JM, Baker JA, Cramer GD, Patwardhan AG (1998) Intervertebral disc pressure changes during the flexion-distraction procedure for low back pain. Abstract from the Proceedings of the International Society for the Study of the Lumbar Spine, Singapore.
15. Smith DL, Olding K, Malaya CA, McCarty M, Haworth J, et al. (2022) The influence of flexion distraction spinal manipulation on patients with lumbar spinal stenosis: A prospective, open-label, single-arm, pilot study. *J Bodyw Mov Ther* 32: 60-67.
16. Manison AM (2011) Chiropractic management using Cox cervical flexion-distraction technique for a disk herniation with left foraminal narrowing in a 64-year-old man. *J Chiropr Med* 10(4): 316-321.
17. Chow NW, Southerst D, Wong JJ, Giles DK, Ammendolia C (2019) Clinical outcomes in neurogenic claudication using a multimodal program for lumbar spinal stenosis: A study of 49 patients with prospective long-term follow-up. *J Manipulative Physiol Ther* 42(3): 203-209.