

**Pre and Post MRI Study of a  
10mm Lumbar Disc Extrusion  
Treated with the Cox® Technic**

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## INTRODUCTION

This case is as interesting as it common: The patient is in pain and wants it gone. Surgery is not certified by the insurance company nor necessary. The disc herniation is well established clinically and radiologically. Following well-defined Cox® protocols which incorporate rehabilitation exercise bring about a good result for the patient who comes to understand that back pain is not cured, but it is controlled via lifestyle adaptations and chiropractic care.

## PRESENTATION & EXAM FINDINGS

**Background:** The patient is a 34 year-old Hispanic male who presented for an evaluation on November 3, 2004. This patient reported that he was experiencing constant low back pain with intermittent radiation of pain down his left leg to the foot. The patient reported that at times the pain was “severe” (a “9” on the Numeric Pain Scale). The patient also reported numbness and tingling in his left calf and foot. The patient denied any bowel or bladder incontinence. These symptoms began early in June of 2004 after the patient lifted several heavy objects.

**History of Previous Care:** Initially the patient was managed medically from the time of the injury (June 2004). He was examined by a medical doctor and x-rays of his spine were performed. No abnormalities were apparent on the x-rays. He was diagnosed with a lumbosacral spine strain with radiculopathy, was given an injection of Toradol and then was prescribed ibuprofen, acetaminophen with codeine, Methocarbamol (a muscle relaxant), and physical therapy. The patient began a course of physical therapy and attended ten (10) sessions without improvement and at times the therapy worsened his back and left lower extremity pain. At the end of June 2004 the patient returned to that medical doctor and reported continued low back pain with pain radiating down his left leg. He was then referred to another medical doctor for an orthopedic evaluation. An MRI of the lumbar spine was performed on October 11, 2004. The MRI showed a 10mm left paracentral disc extrusion at the L4-L5 level causing marked deformity of the anterior thecal sac and moderately severe central stenosis as well as bilateral foraminal stenosis due to the disc extrusion. No disc displacement, central stenosis or foraminal stenosis was seen at L1-L2, L2-L3, L3-L4, and L5-S1. Surgery was recommended.

On October 27, 2004 the patient wanted another opinion and was further evaluated by a second orthopedic surgeon. That medical doctor recommended a lumbar discectomy. Surgery was pending the approval of his insurance. As of November 3, 2004, that approval had not been reached, and the patient presented to our office for care.

**Examination Findings (Nov. 3, 2004):** The patient is a well nourished Hispanic male aged 34 who suffers from asthma. The patient presents with an antalgic lean to the right. The patient reports tenderness upon palpation of the lumbar region. Supine Straight-leg Test was positive on the left at 35 degrees with an increase in left leg pain, (Bragard’s Sign was also present on the left side), Kemp’s Test was positive when the patient was directed to lean to the left. Examination of the dermatomes of the lower extremity revealed an awareness of decreased sensation of the left medial and lateral calf. The Patellar and Achilles deep tendon reflexes were intact bilaterally (“2” on the Wexler’s Scale). Clonus was not apparent and Babinski’s Sign was not present.

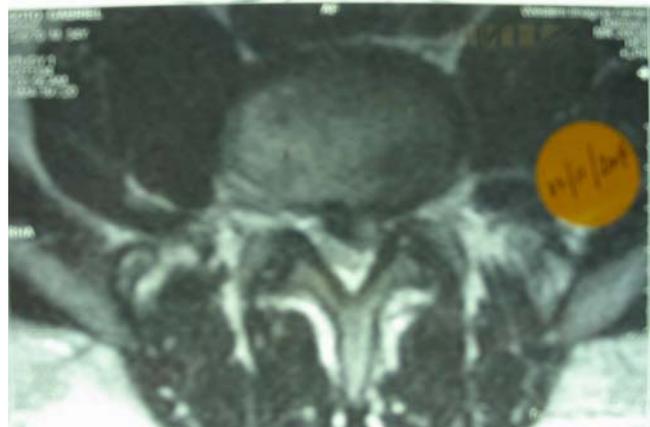
No weakness of the lower extremities was apparent bilaterally, nor was there any apparent atrophy of the musculature of the lower extremities. The patient reported no change in pain intensity while in either the seated or standing position other than an increase in discomfort when he attempted to lean to the left. The patient's pain free active range of lumbar flexion was evaluated on a MedX Lumbar device and was measured at 48 degrees of flexion ("normal" is considered 72 degrees of pain free lumbar flexion; thus the patient's current capacity for pain free lumbar flexion is measured at 67% of expected normal).

On November 3, 2004, the Modified Oswestry completed by the patient showed a Disability index score of 50% (severe level of disability).

**Pre-Chiropractic Treatment MRI Findings:** The MRI performed on the lumbar spine on October 11, 2004, showed a 10mm left paracentral disc extrusion at the L4-L5 level causing marked deformity of the anterior thecal sac and moderately severe central stenosis as well as bilateral foraminal stenosis due to the disc extrusion.



October 11, 2004 Sagittal T2 Weighted



October 11, 2004 Axial T2 Weighted  
L4-L5 Level

## DIAGNOSIS

The patient presented for care with Dr. LeMarr and Dr. Gangemi on November 3, 2004. After the thorough examination and history, the patient is diagnosed with a 10mm left paracentral disc extrusion at the L4-L5 level.

## TREATMENT

**Chiropractic Course of Care:** Cox® Flexion-Distraction Decompression Manipulation Technic Protocol 1 with a modified contact point at the T12-L1 level was initiated on the presenting visit. The patient was tolerance tested and the ankle straps were not applied nor was a Dutchman's Roll used. It should be noted that Protocol 1 followed the application of 15 minutes of moist heat applied to the thoracic and lumbar spine and hamstring region. Following this initial procedure the patient reported no ill effects. The patient then began a regular course of care in which Cox® Technic Protocol 1 was applied following the application of moist heat and iontophoresis for 15 to 25 minutes per visit. The iontophoresis was applied to the left side of the lumbar spine (active pad) and on the left lateral calf (dispersive pad). It should also be noted that axial traction was applied to the spine (to patient tolerance) via the Cox® table (without the ankle straps being fastened) as the iontophoresis and moist heat were being applied. Throughout the course of care the contact point remained at the L1 level for patient comfort and the Dutchman's Roll was not used. Also, the patient was tolerance tested before each application of Protocol 1 and ankle straps were applied on subsequent visits. Visits also included the application of PNF (proprioceptive neuromuscular facilitation) stretching to the hamstring group with the patient in the supine position and to his tolerance. From the initial visit on November 3, 2004 through July 5, 2005 the patient attended sixty (60) such visits. Of these sixty visits, from December 29, 2004 through July 5, 2005, the treatment also included the application of seventeen (17) MedX lumbar exercise sessions performed to the patient's tolerance. The patient kept his appointments (approximately one per month) with the second orthopedic surgeon he saw. That surgeon recommended that he continue attending the chiropractic treatment sessions (*as described*) as the surgery was not approved by the patient's insurance through this time period (November 3, 2004 through July 5, 2005).

An EMG/NCV Study of the lower extremities was requested and was performed on January 5, 2005.

A second MRI of the lumbar spine was requested and was performed on July 8, 2005.

**EMG/NCV Study Findings:** An EMG/NCV study of the lower extremities was performed on January 5, 2005 and was interpreted by a medical doctor. The electromyographic findings were supportive of the L5 nerve root irritations on the left side with no electrophysiologic evidence to support distal peripheral neuropathy on the lower extremities and no electrophysiologic evidence of entrapment neuropathy on peroneal nerves.

## CASE OUTCOME

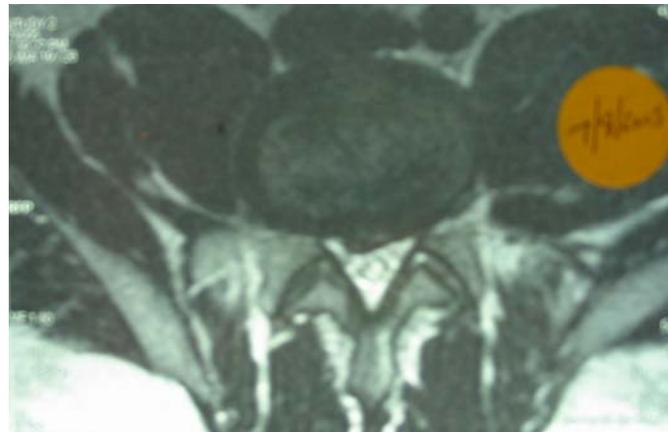
**Objective Results:** During the course of chiropractic care the patient's active pain-free range of lumbar flexion (as measured on the MedX Lumbar device) improved to 69 degrees of flexion (a 44% improvement) by April 20, 2005. Reflexes of the lower extremities remained unchanged. By December 2004 the supine straight leg raise was measured as 80 degrees on the right and 70 degrees on the left. By the time of the second MRI on July 8, 2005 there was no evidence of an antalgic lean and the left foot and leg symptoms were no longer present. During the course of care no atrophy of the lower extremities occurred nor were there any signs of weakness of the lower extremities.

**Second MRI Findings:** The second MRI performed on the lumbar spine on July 8, 2005 showed a 3mm broad based disc bulge at the L4-L5 level minimally narrowing the bilateral neural foramina with a 5-6mm right paracentral disc herniation effacing the epidural fat anterior to the nerve roots and touching and posteriorly displacing the right L5 nerve root in the lateral recess. The L1-L2, L2-L3, L3-L4, and L5-S1 levels remained unremarkable with widely patent spinal canal and neural foramina.

*It should be further noted that the second lumbar MRI was performed at the same facility and on the same MRI scanner operated by the same technologist as the first lumbar MRI study.*



**July 8, 2005 Sagittal T2 Weighted**



**July 8, 2005 Axial T2 Weighted  
L4-L5 Level**

**Subjective Results:** Subjectively, following this course of care, the patient reported an absence of left foot pain or pain below the left knee. The patient reported the pain regressed to the left gluteal region and left lumbar region primarily as treatment progressed. The patient never reported any right leg symptoms. The patient reported that he did experience intermittent episodes of lower back discomfort (not exceeding a “6” on the Numeric Pain Scale) and tightness but not at the same level of intensity or duration as when he started his care. He did make lifestyle changes to avoid aggravating his condition (no excessive lifting) whenever possible.

## **CONCLUSION**

**Discussion And Conclusion:** It is our opinion that this application of the Cox® Decompression Manipulation Technic contributed to the changes apparent on the subsequent MRI. The patient did continue to receive medical co-treatment and continued with prescribed

amounts of Naproxen and Methocarbamol (muscle relaxant). Certainly, the patient's condition did not worsen through this course of care and in fact his symptoms were reduced despite the recommendation for surgical intervention. Gallucci (1) reported that patients diagnosed with intervertebral disc syndromes that might otherwise require surgical intervention reported improvement in the frequency and severity of symptoms when treatment included the utilization of the Cox® Distraction Technic. It is also apparent on the post-treatment MRI axial view at the L4-L5 level that the amount of spinal canal occupied by the disc has been reduced. Beira et al. (2) reported that Flexion Distraction (McManis Table) helped reduce the amount of spinal canal that was occupied by disc herniation. Of further interest is the possible role that the posterior longitudinal ligament plays with the application of the Cox® Technic in regards to such large disc injuries. Protocol One was continued throughout the described time period because of the significant size of this disc disruption. We hypothesized that the application of axial decompression combined with flexion would potentially tauten the posterior longitudinal ligament and thus aid with the reduction of the large disc injury. Gudavalli et al. (3) reported that intradiscal pressures at the L4-L5 level decreased significantly in unembalmed cadavers during the flexion-distraction procedure. Therefore a decrease in intradiscal pressures at the L4-L5 level *and* a tautening of the posterior longitudinal ligament may partly explain the mechanism of the reduction of the disc disruption in regards to this particular case.

**References:**

1. Gallucci G: The effectiveness of chiropractic treatment for disc syndrome. A study by Blue Cross and Blue Shield of Ohio and Physicians First, Inc. 1996.
2. Beira B, Peers A: A study of the effects of chiropractic therapy on the diameter of the spinal canal in patients with low back pain and radiculopathy. *J Of The Neuromusculoskeletal System* 1998; 6(3):114-126.
3. Gudavalli MR, Cox JM, Baker JA, Cramer GD, Patwardhan AG: 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 1998.