



Improved Motor Weakness at the L5 Nerve Root after a Single Treatment with Cox® Technic Flexion Distraction

submitted by
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Introduction

This case report represents an example of a thirty-three year old female with a history of chronic lower back pain with multiple disc protrusions, extrusions, and inferiorly tracking disc material who responded favorably to treatment with the Cox®7 Instrument. After experiencing an exacerbation of lower back pain and bilateral motor weakness of the lower extremities, she showed an immediate improvement while being treated with Cox® Technic Flexion Distraction.

History

Liza, a thirty-three year old female presented to my office on 3/29/11 with chief complaints of left-sided lower back pain and left lower extremity numbness and tingling of 1 ½ half days duration. She stated that the pain had been present since she had lifted something from the floor on 3/26/11. The patient said that she also felt weakness in both of her feet. She stated that her entire left leg felt numb to her also. When asked if she had a feeling of pins and needles or was she not able to feel her leg, she stated that the sensation was more closely related to the latter.

Aggravating factors for the lower back pain included any bending at the waist as well as prolonged sitting. She also had pain in her lower back and her left leg with coughing. She denied palliative factors for the lower back pain. She denied dysfunction of neither bowel nor bladder. She stated that she had worn her lumbar support brace at the onset of the lower back pain but began feeling soreness in her lower back while wearing it and thus discontinued the use of the brace. She had been using ice regularly since the onset of the pain at twenty minute intervals each hour.

The patient's past medical history consisted of recurrent lower back pain and left lower extremity pain and weakness with multiple disc extrusions including inferior tracking disc



material which were successfully treated in my practice (for further information on the patient's previous history, please see the Case Report titled "Cox® Distraction Manipulation Successfully Treats Multiple Disc Extrusions with Inferior Tracking Disc Material" Case #143).

Examination

Physical examination findings revealed the patient to be in noticeable discomfort with her posture slightly antalgic in right lateral flexion and flexion of the lumbar spine while standing.

There was pain with palpation over the midline at the L4-S1 regions. Palpation also revealed a tender point in the right piriformis.

Active range of motion testing of the lumbosacral spine revealed pain at the left lumbosacral region with extension at the end range, 15° of left rotation, and 15° of left lateral flexion. Ranges of motion were by a visual estimate.

Orthopedic testing of the lumbar spine revealed that Bechterew's test was negative bilaterally. Straight leg raise testing was negative for the right and on the left side caused tightness in her left posterior thigh at 40° of flexion. Kemp's test to the left also caused left-sided lumbosacral pain.

Neurological testing of the lower extremities revealed hyperflexia at the patellar and Achilles reflexes, 3/4 bilaterally (patient stated that this was normal for her). Vibration was intact as tested at the fifth distal interphalangeal joint. Light touch was intact over the L4-S1 dermatomal distributions. Muscle strength testing was 5/5 for foot dorsiflexors/inverters and foot plantar flexors/everters. Muscle strength testing of the great toe was 2-3/5 bilaterally (*Specifically while seated, the patient had trouble extending her great toe. When I placed any resistance on each toe, they both were immediately downgoing. Therefore the grading that I gave it was a 2-3 bilaterally. See table below*).

Muscle Function Level	Grade
No evidence of contractility	0
Slight contractility, no movement	1
Full range of motion, gravity eliminated	2
Full range of motion against gravity	3
Full range of motion against gravity, some resistance	4
Full range of motion against gravity, full resistance	5

1. *Mosby's Guide to Physical Examination, 4th edition p. 707*

Assessment

Findings were consistent with lumbar discogenic pain with an L5 radiculopathy.



Treatment Plan

Treatment would consist of Cox® distraction with protocol 1 to increase the disc height by up to 17% and provide up to a 28% increase in intervertebral foraminal surface area, as well as decrease the intradiscal pressure to as low as -192 mmHg (2,3). Treatment would be at a frequency of 3 times per week until there was a 50% decrease in pain as well as a decrease in neurological deficits. The patient would be referred for a neurosurgical consult if there was not a 50% decrease in her back pain after a one-month period or if the neurological deficits progressed.

The patient was treated with Cox® distraction protocol 1 with L4 contact with tolerance testing as well as active release to the quadratus lumborum. She was instructed to use cryotherapy over her lumbosacral spine at 20 minute intervals with a 40 minute rest between. The patient was also instructed to return for treatment the following day.

Results

Immediately following the treatment, I re-tested the muscle strength of the great toe extensors. The patient was able to extend her great toes and was able to maintain extension against minimal resistance. The great toe extensors were graded as 4/5 bilaterally. The patient stated that the numbness in her left leg had also improved.

She stated at her second appointment that she was no longer having any numbness in her left leg. She had been using ice on her back at twenty minute intervals each hour. She also had not noticed any weakness in her legs. Treatment consisted of Cox® distraction protocol 2 with L3 contact, tolerance tested as well as active release to the quadratus lumborum and post-isometric release of the piriformis. Prone manipulation to the left PSIS with a drop technique was also performed. The patient was treated 6 times over a three week period using Cox distraction with tolerance testing. On her 6th visit, she reported minimal lower back pain, no numbness in her leg, and no weakness in her feet. Her muscle strength testing of the lower extremities was 5/5 bilaterally for the great toe extensors, in addition to the foot dorsiflexors and inverters as well as the foot plantar flexors and everters.

Discussion

The patient's presentation of mid-line lumbosacral pain with weakness and numbness in the lower extremities suggested the presence of lumbar discogenic pain with radiculopathy.

When I formed my differential diagnoses, I assessed that two possibilities with the patient could be a central disc lesion compressing each of the right and left L5 nerve roots or a left posterolateral disc lesion which may have caused inflammatory changes leading to a chemical radiculitis that also affected the right L5 nerve root.

In Simmons's study of chemical radiculitis, with dorsal root ganglia stimulation, there were no nerve root tension signs present, just severe dermatomal pain (4). Liza did not have nerve root



tension signs present in the right lower extremity and did not complain of severe dermatomal pain in either leg but did have numbness in the left leg. However the fact that the motor weakness was resolved so quickly would seem to indicate that there was more likely a mechanical compression of each nerve root as opposed to intraneural inflammation leading to the right-sided motor deficit.

According to Rydevik's findings, 20-30 mm Hg of pressure on the nerve root caused intraneural edema thus resulting in ischemia which then caused numbness (5). Based on the patient's presentation of numbness in the left leg, it would then seem reasonable to assume that the patient had at least this amount of pressure being placed on the L5 nerve root or roots.

However with the objective findings of motor deficits with a trunk list of right lateral flexion and flexion, there may have been more pressure on the nerve root than 20-30 mm Hg pressure. Takahashi showed that 60mm Hg pressure may cause neurological deficits, while 100mm Hg pressure on the nerve root may cause severe neurological deficits and trunk listing (6). Based on Takahashi's findings and the patient's significant motor weakness and listing it would be reasonable to assume that, if the motor deficit was due to nerve root compression, that the patient may have had somewhere between 60-100 mm Hg pressure on her nerve roots.

Gudavalli, Cox, et al. has shown that Cox® distraction can effectively increase intervertebral foraminal surface area by 28% and reduce intradiscal pressure to as low as -192 mmHg (2,3). Thus, the distraction performed may have decreased both the intradiscal pressure as well as the pressure on the L5 nerve roots.

I typically do not re-test neurological deficits after a single treatment on the same day. However, I was pleased to find a considerable improvement after a single treatment with the Cox instrument and surprised that the improvement was immediate. I was also pleased to find that the patient's paresthesias had improved. It is not uncommon for me to see improvements with neurological deficits while using the Cox®7 instrument, however I did not expect to see an immediate improvement, such as with this patient.

A follow up MRI may have given more information as to the extent of further discogenic insult present as well as for use as a comparison to the prior MRI studies performed. However, with the patient showing such significant improvement in a short period of time, it was not indicated to have the patient pay out of pocket for the study.

Although this is a single case study, it is an exciting representation of the efficacy of Cox® Distraction for treating nerve root compression leading to radiculopathies of the lumbar spine.

References



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