Failed back surgical syndrome - L1-L2 and L5-S1 disc herniations following L4-S1 spinal fusion: a case report

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Abstract

Purpose

Spinal surgery and fusion procedures for spinal stenosis, disc herniation, and instability increase consistently. Patients are often left with equal or worsening post surgical pain. This case report presents a failed back surgical patient who was successfully treated with specialized flexion distraction and decompression chiropractic manipulation. Such failed back surgical cases are an increasing challenge to chiropractic practitioners due to their increasing number and severity seeking chiropractic care.

Methods

Cox® flexion distraction decompression spinal manipulation, electrical stimulation, back school training and ergonomic exercises were used as the treatment of a large subligamentous and lateral recess L1-L2 disc herniation and an L5-S1 central disc protrusion subsequent to a rod and bolt and intertransverse process fusion from L4-S1 for sciatic radiculopathy . Also following the lumbar spine surgery, the patient developed bilateral radicular arm pain which was confirmed on MRI to show three level cervical disc herniation. This also required flexion distraction and decompression spinal manipulation at the same period of clinical care for the lumbar disc herniations. Visual analogue scale and Oswestry low back disability questionnaire were used as the subjective evaluators of clinical outcome.

Result

Total relief of bilateral sciatic radiculopathy, right upper extremity radiculopathy, and greater than fifty percent relief of low back pain was attained in this failed back surgical case. Only moderate left arm radiculopathy persisted depending upon patient work load and failure to continue spinal manipulation and home exercises.

Conclusion

This failed back surgical patient gained total relief of bilateral lower extremity radiculopathy and over 50% relief of low back pain subsequent to lumbar spine surgical fusion. She also escaped a cervical spine discectomy for bilateral upper extremity radiculopathy due to MRI confirmed three level disc herniations. Flexion distraction decompression spinal adjustment, electrical modalities, back school and exercises were the treatment methods employed.

Background

There has been a 20 fold increase in lumbar surgical fusion rates among Medicare enrollees from 1992-3 to 2002-3, representing the largest coefficient of variation seen with any surgical procedure. [1] Washington State Worker's Compensation reports that lumbar cage fusion rates increased from 3.6% in 1996 to 58% in 2001 and the result was increased complication risk without improving disability or reoperation rates. [2]

Long term follow up of surgical and non surgical care of spinal stenosis and disc herniation patients report up to 50% of patients are not benefited and often are worse. [3][4]

The aging population with spinal stenosis in the United States increases the incidence low back pain and radiculopathy leading to spine surgery with fusion devices. The rates of lumbar disc surgery for sciatica patients with and without low back pain in a multidisciplinary spine clinic showed the rate of elective, first-time disc surgeries decreased by approximately two thirds when non surgical treatment care was added. [5] Lumbar spinal stenosis patients improved by 76% and disability improved in 73% in 57 patients treated with Cox® distraction and/or neural mobilization. [6] Spinal manipulation is recommended by the American Pain Society and the American College of Physicians for primary care of low back pain. Epidural steroid injections was reported to give short term but not long term relief of pain; surgery for leg pain (radiculopathy) caused by herniated lumbar disc and symptomatic spinal stenosis is associated with short-term benefits compared to nonsurgical therapy, though benefits diminish with long-term follow-up; and patients with no leg pain (non radicular back pain) due to disc degeneration find that fusion is no more effective than intensive rehabilitation, but associated with small to moderate benefits compared to standard nonsurgical therapy. [7]

This paper is presented to document the potential benefit of chiropractic flexion distraction spinal manipulation in treating the increasing numbers of failed back surgical syndromes. The studies cited above suggest strong need for non surgical and post surgical spinal manipulation procedures to cope with this ever increasing health care problem. The success of this case report encourages further study. Future clinical outcome studies are necessary to document the contribution of spinal manipulation for failed back surgical syndrome as described in this case report.

CASE REPORT

HISTORY

The patient is a 48-year-old white, single female seen in January, 2009 for the following chief complaints:

1. Low back pain, extending to the right lower extremity to the foot, with a visual analogue scale (VAS) pain scale of 10 (0 = no pain and 10 = worst pain of the patient's life). Her low

back pain started several years ago due to a fall from a horse. Following lumbar spine surgical fusion in 2006, the low back and leg pain recurred and exacerbated in 2008.
2. Left thigh pain and pelvic pain, again at a VAS of 10.
3. Cervical spine pain, extending to the right upper extremity to the right middle digit, again at a VAS of 10. Left upper extremity pain started in March, 2009. Surgical cervical discectomy is recommended by the surgeon who performed the low back surgery.
4. Headaches at a VAS pain score of 10.

Past surgeries:

Figure 1

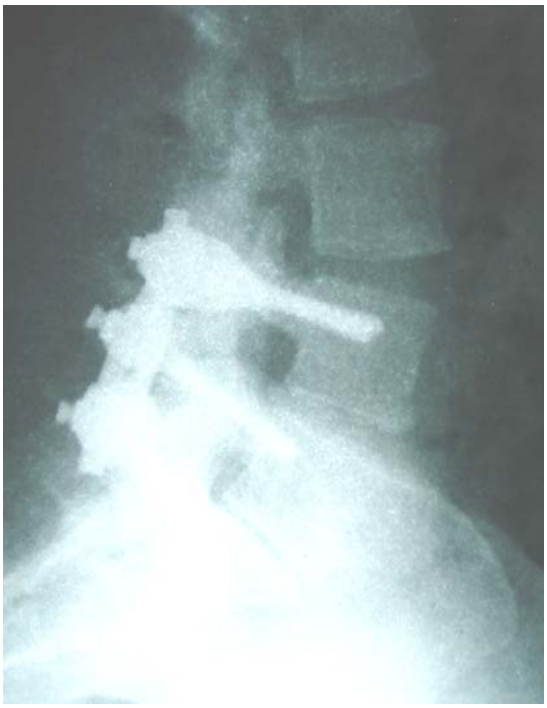

Figure 2

Figure 1 and 2 . Surgical rod and bolt fusion from L4 to sacrum with intertransverse process bone fusion

Figure 3. Flexion study. The L3 vertebral body shows stability on flexion movement

1. A surgical fusion with plate and bolt fusion, as well as intertransverse process fusion from the L4 through S1 segments was performed in January 2006. The ligamentum flavum had been removed at the L4-L5 level. See figures 1, 2 and 3.
2. A transforaminal epidural steroid injection at the L5-S1 level was given in November 2005, and this was followed with left lower extremity pain. She also had a C6-C7 transforaminal epidural steroid injection for right arm pain at the C6-C7 level in May 2005.
3. Carpal tunnel syndrome was performed in January 2005 on the right wrist.
4. In August 2006, left carpal tunnel syndrome surgery was performed.
5. Repair of a right rotator cuff tear repair was performed in September 1999.
6. Left ankle surgery was done in December 1999

Return of pre surgical pain:

Following her spinal fusion in January 2006, she had relief of her low back and lower extremity pain for approximately 2 years, at which time the right lower extremity pain returned. She takes Naprosyn and Vicodin for pain relief. She also swims 4-5 times a week and performs gentle spinal exercises for relief. In the past year, she has had an increase in her neck pain, headaches, and right and left arm pain. All of these pains have been increasing in intensity over the past year. She does not wish to have further low back surgery nor the recommended cervical spine discectomy surgery. She has been referred to our clinic by her gynecologist following a hysterectomy for a fibroid tumor, and persistent low back and lower extremity pain following the surgery.

Examination:

The patient's vital signs are normal. She is oriented times three. She appears to be in much distress and pain as she ambulates and talks. She is particularly distressed that upon revisiting her spinal surgeon, he offered no further help for her recurrent low back and right lower extremity

pain, which now also involves the left lower extremity, but rather offered to do spinal surgery for disc herniation at the C6-C7 level which was diagnosed as the cause of her upper extremity pain.

Cervical spine examination revealed the range of motion at 40 degrees flexion, 35 degrees extension with pain, and 20 degrees right and left lateral bending, Range of motion of the thoraco-lumbar spine is 40 degrees flexion with marked pain and pulling in the low back, 15 degrees extension, and 10 degrees right and left bilateral lateral bending. Cervical compression intensifies the cervical spine and arm pain, most marked in the right arm, but also into the left upper extremity. The Soto-Hall test is positive for pain in the upper thoracic spine bilaterally. The deep tendon reflexes of the upper extremities at the biceps, brachioradialis, and triceps are grade 2/2. The patella, hamstring, and Achilles reflexes are grade 2/2. No sensory changes are noted. The muscle strengths of the upper extremities at the deltoid, biceps, and triceps are 5/5 and of the lower extremities at the foot, ankle and toes are also grade 5/5. The pain distribution into the right lower extremity is the S1 dermatome and the upper extremities C5, 6, and 7 dermatomes, most marked on the left side.

Diagnostic Imaging:

The following figures are an MRI study performed in 2008 prior to starting flexion distraction decompression manipulation in January, 2009. Figure 4 is an axial MRI showing the large left subligamentous and lateral recess L1-L2 disc herniation. Figure 5 is a sagittal image showing the L1-L2 disc herniation. Also, note the L5-S1 degenerative disc disease with endplate sclerosis. Figure 6 is an axial image showing the L5-S1 central disc hernia, which barely contacts the cauda equina and spares the nerve roots.

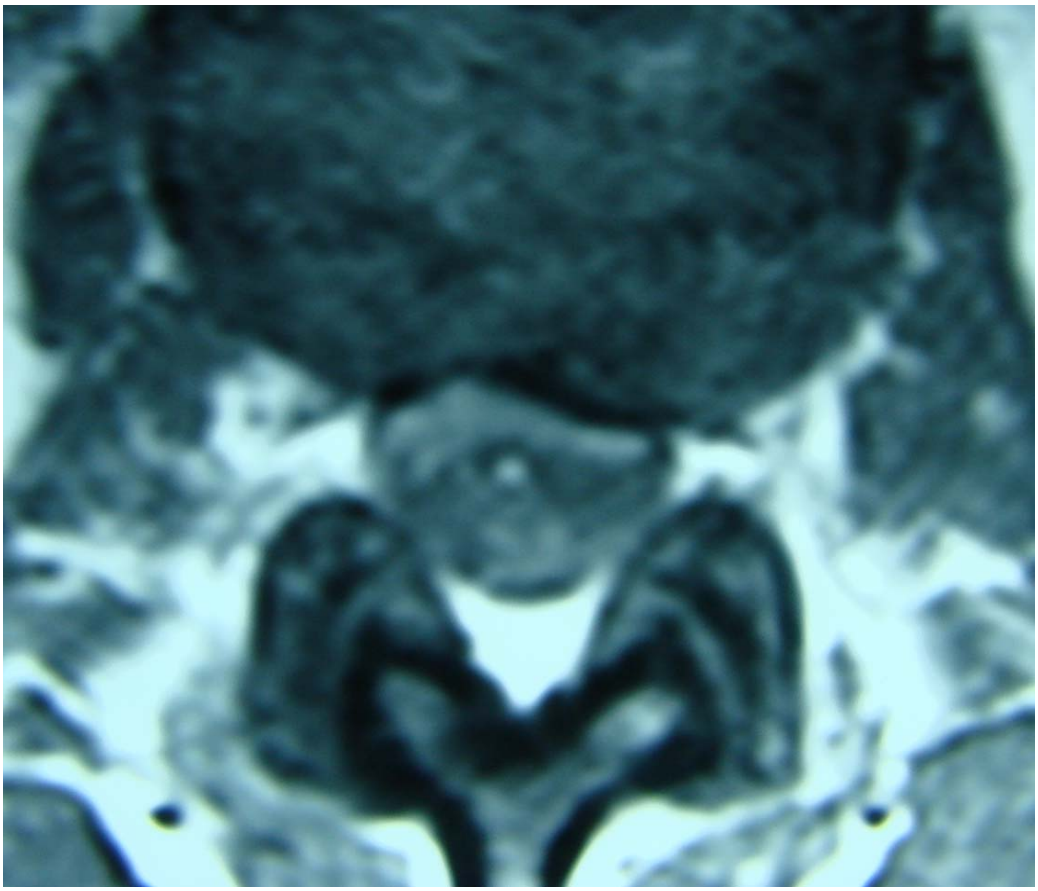

Figure 4. Axial T1 weighted MRI image shows a large left subligamentous and lateral recess disc herniation at the L1-L2 disc level before flexion distraction and decompression adjustment is given.

Figure 5. Sagittal MRI image shows the L1-L2 disc protrusion both anteriorly and posteriorly and L5-S1 Modic Type I disc degeneration. This is imaging prior to flexion distraction decompression adjusting is performed.

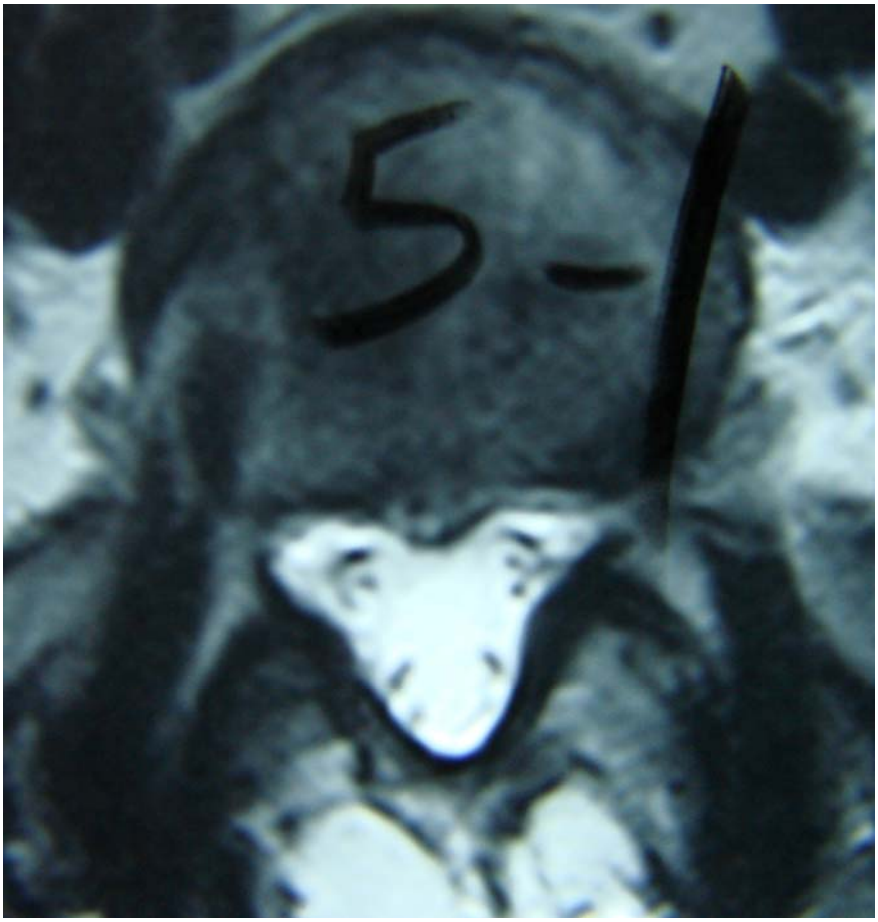

Figure 6. Axial L5-S1 image shows a central L5-S1 disc protrusion with a high intensity zone. This image is prior to beginning flexion distraction decompression adjusting.

Lumbar spine diagnosis:

The lumbar spine diagnosis based upon the above examination and imaging was:

1. L5-S1 central focal disc herniation with advanced disc degeneration
2. L1-L2 left central subligamentous and lateral disc herniation that does contact the spinal cord.
3. T11 through L2 degenerative disc disease.
4. Surgical fusion L4-S1

Diagnostic imaging of the cervical spine is shown next.

Figure 7.
This is the sagittal MRI of the cervical spine showing C3-C4 and C5-C6 disc protrusions.

Figure 8. The C6-C7 disc protrusion is seen on sagittal image.

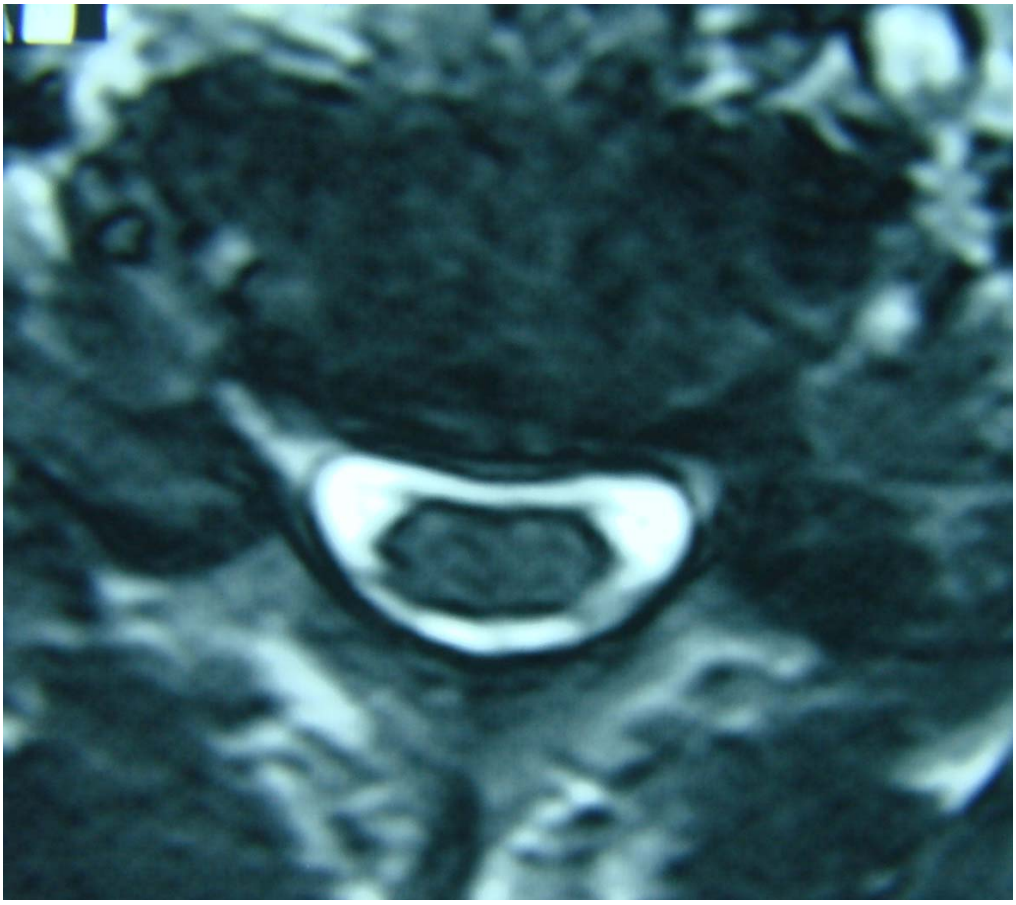

Figure 9. This is the axial C6-C7 disc showing minimal disc bulging not contacting the spinal cord.

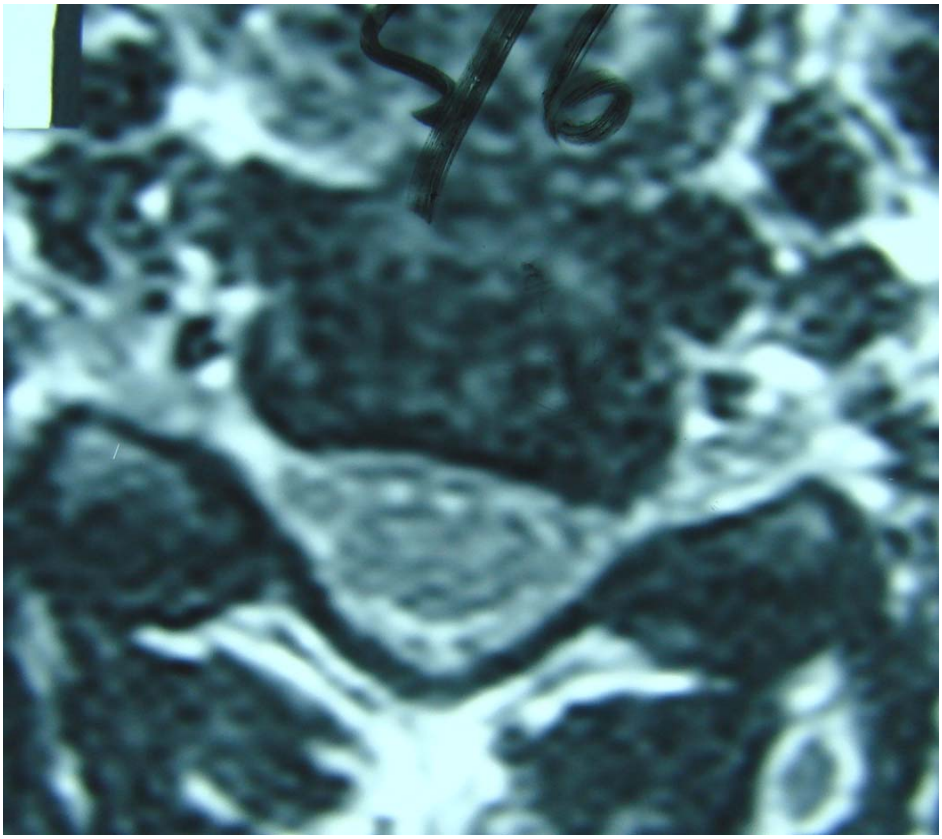

Figure 10. This is the axial image showing the C5-C6 far lateral disc herniation into the left osseoligamentous canal producing foraminal stenosis.

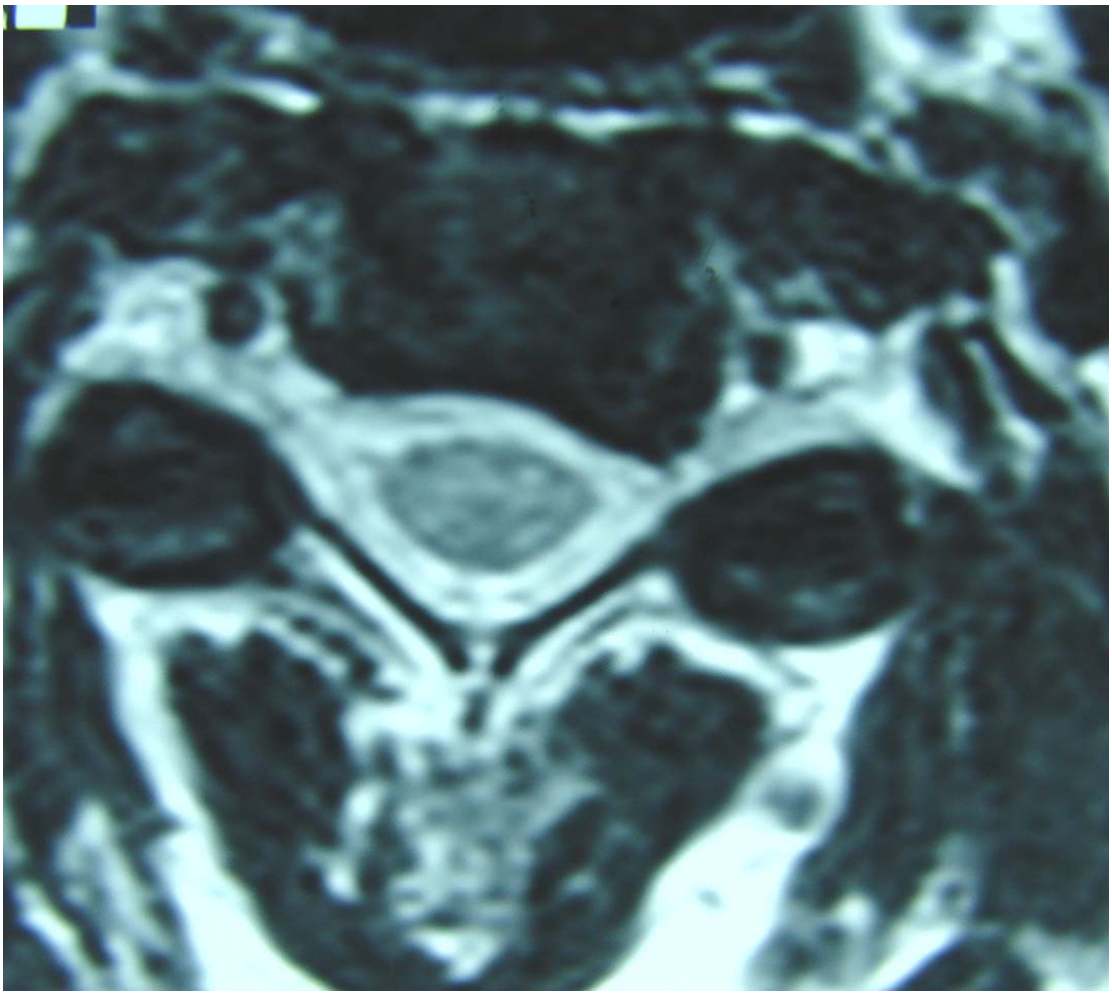

Figure 11. This shows the C3-C4 disc herniation into the left osseoligamentous canal producing foraminal stenosis.

Cervical spine diagnosis:
1. C3-C4 and C5-C6 left far lateral osseoligamentous disc herniation creating foraminal stenosis.
2. C6-C7 central disc bulge that does not contact the spinal cord or create foraminal stenosis.

TREATMENT PLAN:
Flexion distraction and decompression manipulation was administered to the L1-L2 level under careful tolerance testing. At the onset, this treatment was isolated to the L1-L2 level. Following patient evidence of pain relief, flexion distraction and decompression at the L3-L4 and L5-S1 levels was carefully tolerance tested and administered per tolerance. Discussion of this treatment methodology will be discussed later in this paper.

Flexion distraction and decompression spinal manipulation was administered to the C6-C7, C3-C4 and C5-C6 disc levels. Electrical stimulation in the form of positive galvanism, followed by tetanizing currents, was administered to the C5-C6 and C6-C7 levels and right and left upper extremities as well as the L1-L2 level and L5-S1 central disc. The patient was instructed to apply ice to her neck and low back for 30 minutes duration, twice a day. She was instructed to wear a

lumbo-sacral brace at her work which involved lifting tires. If the work was causing further pain, the decision would be made to take her off her job duties. Our goal was to attain 50% relief within 4-6 weeks of treatment administered at least 3 times per week.

Treatment Outcome:

Following the above treatment plan, following two visits, the right lower extremity pain had centralized to the knee joint with a drop in the VAS pain from 10 to 7. The right upper extremity pain decreased to a VAS of 7 and the neck pain to 8 from 10. At that time, the patient missed 3 weeks of treatment and upon returning had now included left lower extremity pain as a chief complaint. On the fifth visit, the right lower extremity pain was isolated to the buttock and upper thigh, as well as the left lower extremity pain. On the tenth visit, the headaches were absent, and there was no right lower extremity pain. There was left buttock and upper thigh pain. The right arm pain continued at a VAS of 7. On the twelfth visit, the left lower extremity pain was 75% diminished, the right lower extremity pain was 100% absent, the headaches were totally relieved and the right upper extremity pain was 25% reduced. On the seventeenth visit, there was no lower extremity pain, no headaches, and the low back pain was at a VAS of 6. Following 20 visits, the patient had no headaches, no lower extremity pain nor upper extremity pain, and her low back pain was rated at a VAS of 5 and neck pain at a VAS of 7. Re-examination on August 4, 2009 showed The Oswestry low back disability questionnaire was scored at 14 while in January, 2009 it was 25. The VAS for the low back and leg pain in January, 2009 was 8 and in March, 2009 there was no leg pain and the low back VAS pain score was reported at 3. The cervical spine VAS rating for neck pain and upper bilateral arm pain was 10 in January, 2009 and in August, 2009 the VAS was zero for right arm pain, and 7 for neck and left arm pain.

In summation of the treatment outcome, the patient was able to receive total relief of the lower extremity pain, greater than fifty percent relief of her low back pain, total relief of right upper extremity pain and fifty percent relief of the left upper extremity and neck pain when treated with Cox® flexion distraction and decompression spinal manipulation of the lumbar and cervical spines. At the time of preparation of this paper, August, 2009, her only complaint is left upper extremity numbness in the distribution of the C6 and C7 nerve roots, depending on her activity level. Her cervical spine pain, headaches, and left arm pain return upon work and failure to undergo cervical spine long y axis decompression spinal manipulation. When she is treated at approximately 2-week intervals, these pains are tolerated well; meaning there is no lower extremity pain, low back pain is at a VAS level of 3, neck pain and left upper extremity pain being the most pain at a maximum VAS of 7, no headache or right arm pain, The entering chief complaint in January, 2009 was low back and right leg pain at a VAS pain score of 10. This recurred following surgical fusion of the L4-S1 lumbar segments. Flexion distraction and decompression spinal manipulation totally relieved the lower extremity pain and only mild low back remained depending upon use. As stated in this paper, fifty percent relief for cases such as this can be a good clinical outcome. Ongoing home exercise, proper ergonomic use of the spine, and supportive chiropractic spinal flexion distraction manipulation are required to maintain the accomplished relief. The patient is very happy with her pain relief and adapts her life style to complement her ability to perform her activities of daily living. This is the type of case that is increasingly seen in chiropractic offices. It demands exact diagnosis and specialized spinal manipulation as part of interdisciplinary care. It is a condition that is controlled, but not cured and flexion distraction spinal adjusting, as described in this paper, has exacting tolerance testing performed prior to spinal manipulation to prevent iatrogenesis. Further clinical studies are

needed to exactingly align this form of spinal manipulation into interdisciplinary care of spinal stenosis and failed back surgery syndromes and to compare its clinical outcomes to other forms of spinal manipulation.

Figure 12.This is a post treatment sagittal lumbar MRI following flexion distraction decompression reduction of the L1-L2 left subligamentous and lateral recess disc herniation. Note the reduction in the L1-L2 disc herniation posteriorly at the conus medullaris region of the spinal cord compared to the same sagittal view seen in Figure 5. The reading radiologist reported on May 13, 2009 that the MRI shown here is now small and minimal compared to the previous study shown in figure 5 which was reported as moderate to large in size.

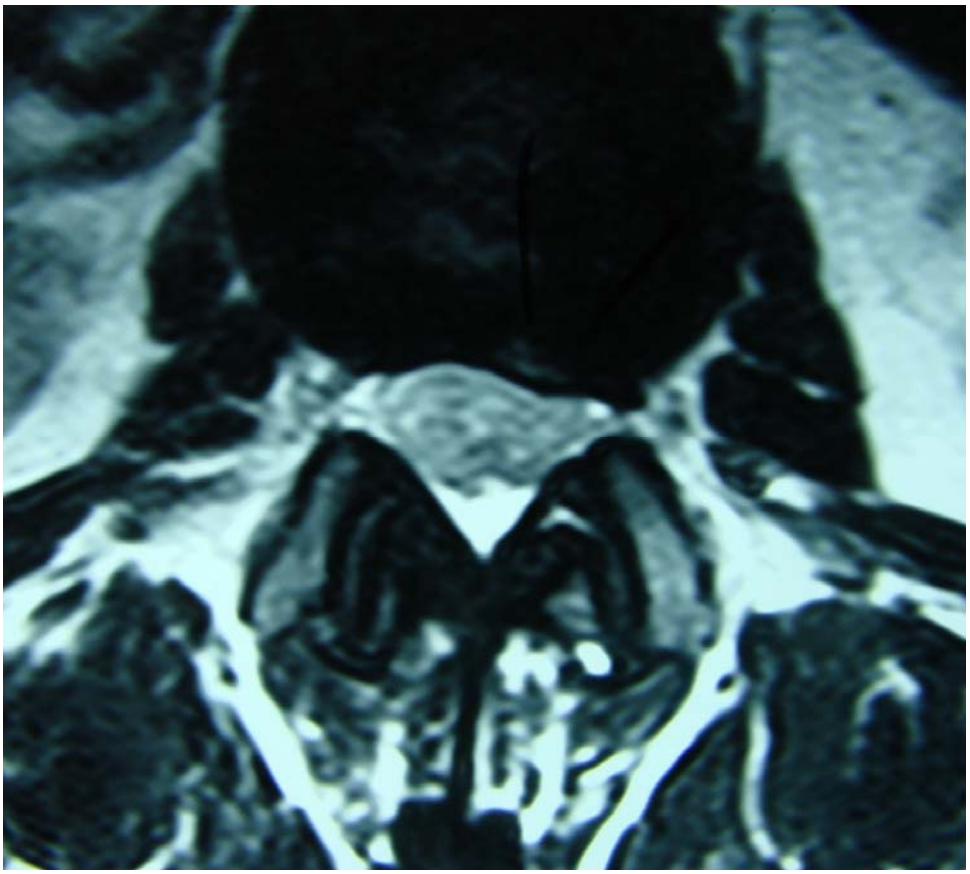

Figure 13. This is the post treatment axial MRI study of the L1-L2 left subligamentous and lateral recess disc herniation. The reading radiologist states that the moderate to large disc herniation originally seen in figure 4 is now smaller in this MRI taken post treatment. The radiologist did not know of our treatment. Compare figure 13 to figure 4 taken prior to flexion distraction adjusting.

MRI studies following flexion distraction spinal manipulation

With the absence of both upper and lower extremity pain and headache following 22 visits over a 3 month period, the patient returned to her orthopedic surgeon on May 13, 2009. He ordered new MRI studies of the cervical and lumbar spine. The new images for comparison with those taken prior to flexion distraction decompression adjusting are shown. Figure 12 is a gadolinium enhanced sagittal image showing reduction of the L1-L2 disc herniation and figure 13 is the axial image, which again shows reduction of the L1-L2 disc herniation size. Compare to figures 4 and 5 which are MRI's of the same level prior to flexion distraction manipulation. The radiologist report of this May 13, 2009 lumbar MRI states that the left lateral recess partial subligamentous L1-L2 disc protrusion is now small and minimal compared to the previous study where it was moderate to large in size.

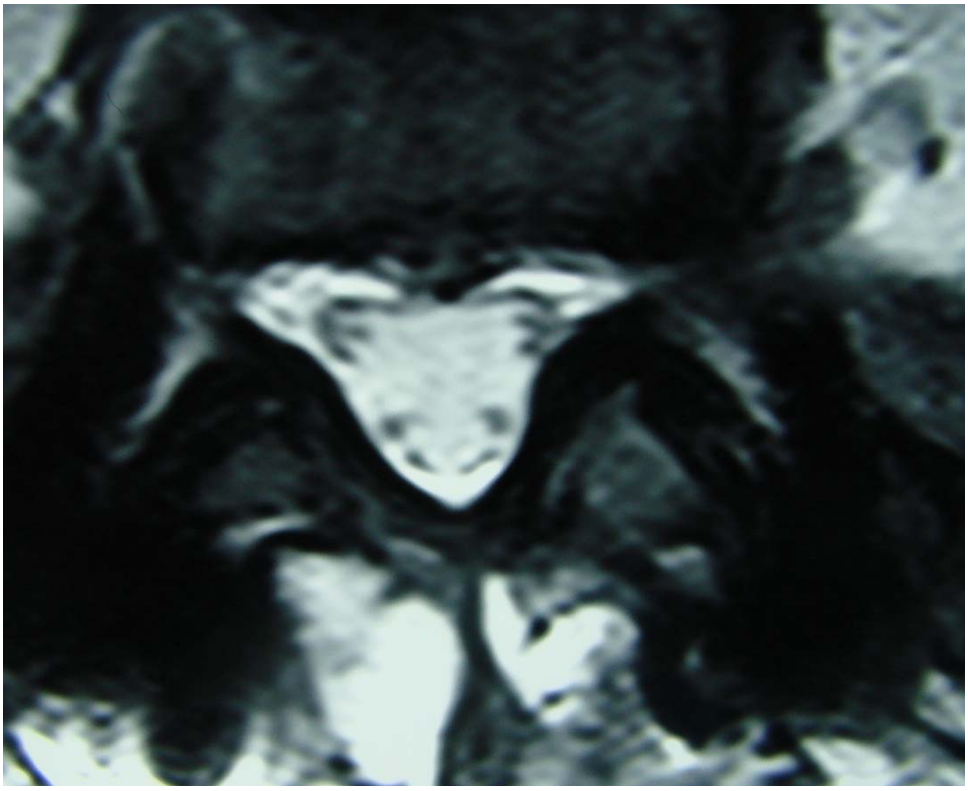

Figure 14. This is the axial image of the L5-S1 central disc herniation after flexion distraction manipulation.

Figure 14 is the axial image of the L5-S1 disc level in May, 2009 following flexion distraction decompression and absence of right and left leg first sacral nerve sciatic radiculopathy. There may be reduced disc size compared to Figure 6 taken prior to flexion distraction decompression manipulation but the central disc hernia is still present even though the patient is free of lower extremity S1 dermatome pain.

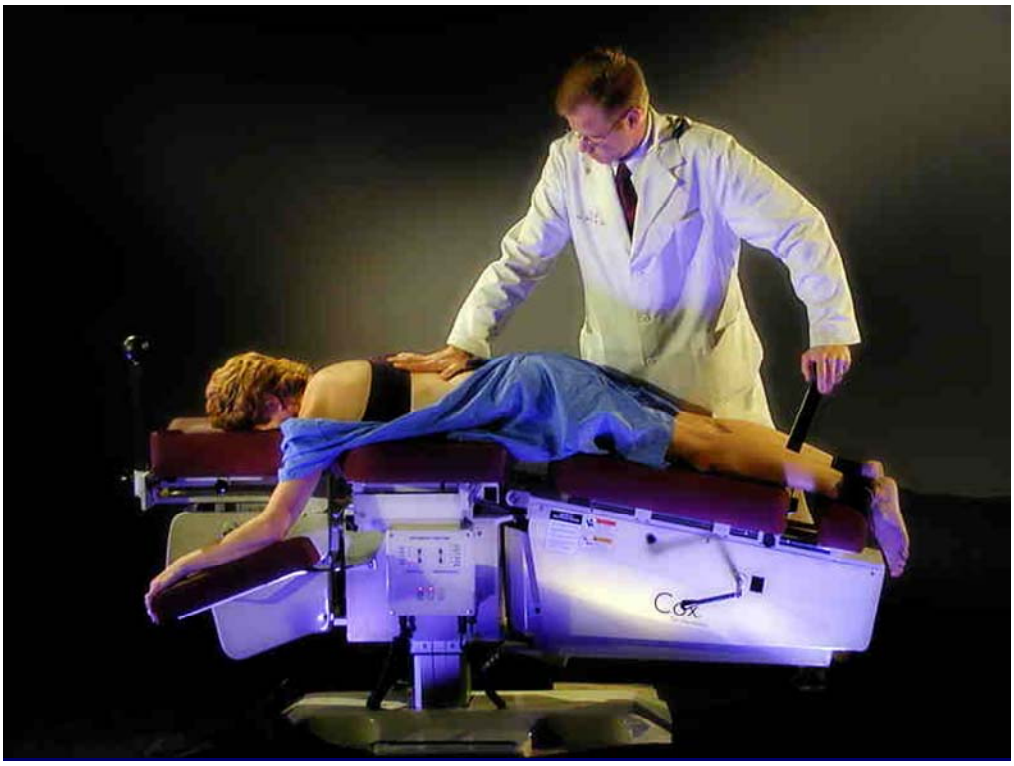

Figure 15 illustrates the application of flexion distraction and decompression adjusting to the lumbar spine

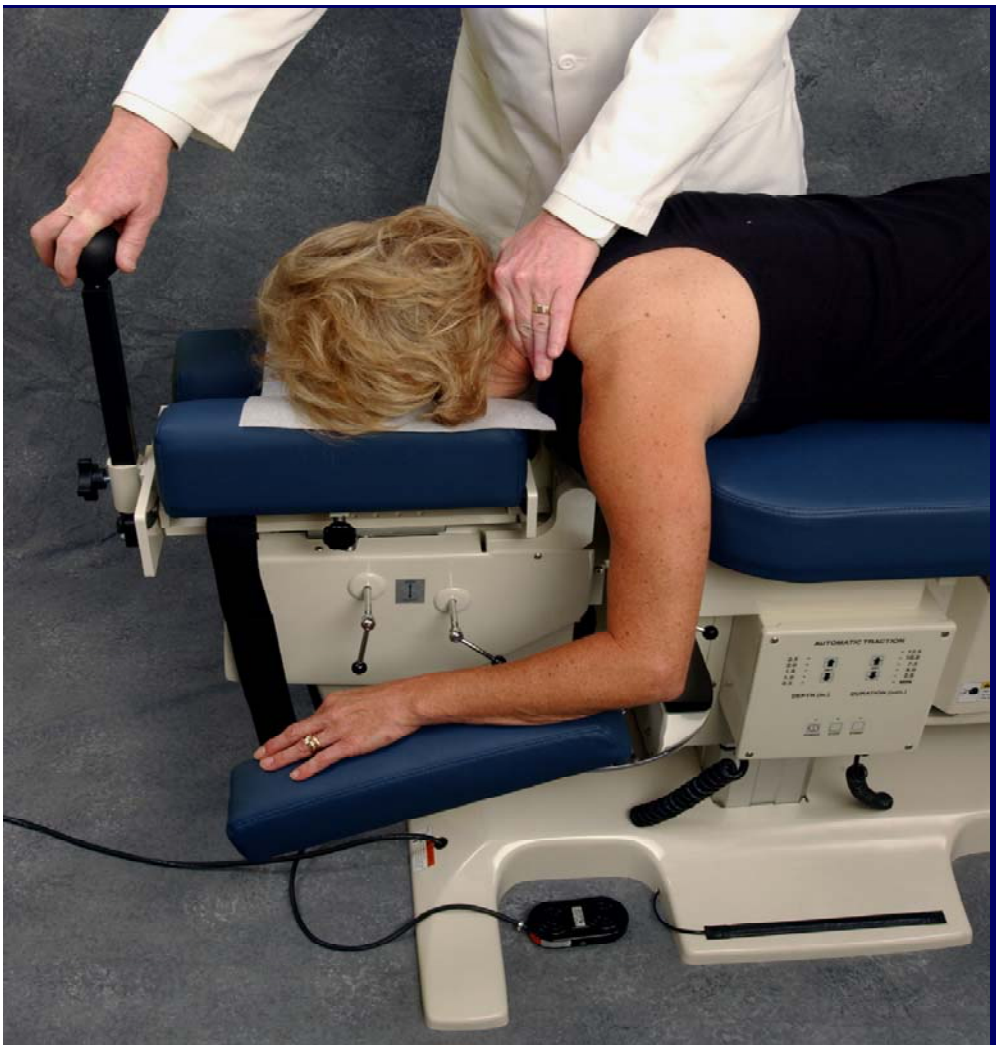

Figure 16 is the application of flexion distraction and decompression adjusting to the cervical spine.

Detailed treatment application protocol of flexion distraction

This is a case demanding strict tolerance testing prior to and during flexion distraction and decompression spinal manipulation. Review of these protocols will be discussed here and referenced for the reader's study. Figure 15 shows flexion distraction and decompression adjusting being delivered to the lumbar spine. The algorithm outlining patient history and examination to arrive at the protocol of a radiculopathy or non radiculopathy patient to be treated with flexion distraction manipulation is discussed first. Co-management of cases, surgical referral, frequency of spinal manipulation, clinical expected outcomes, the transfer of passive to active care with patient improvement, patient placement and tolerance testing prior to applying flexion distraction and decompression spinal manipulation is thoroughly outlined at this reference. [8] In the case presented here, the tolerance testing for central, lateral, and cuff placement is most thoroughly applied. This patient is treated as a protocol I patient which is a radiculopathy patient. This patient showed no pain on tolerance testing. Treatment was applied without ankle restraints so as to apply low amplitude, carefully controlled long y axis

decompression with flexion distraction. At no point in her care did she ever feel any iatrogenic pain from the manipulation given. Certainly with the bolt and rod fusion as well as the intertransverse fusion, tolerance testing is very important.

Flexion distraction long y axis decompression was first applied at the L1-L2 level where the large left subligamentous and lateral recess disc herniation was seen on MRI study. As no pain was produced, on the third spinal manipulation delivery, contact on the L3 and L5 spinous processes was made and again the same careful tolerance testing was performed. With no iatrogenic instance, and again with no ankle restraints, very gentle flexion distraction decompression was applied to the L3-L4 and L5-S1 segment. The patient tolerated this well with the comment that it felt relieving of her pain.

As pain decreased from a VAS 10 to VAS 6 in the lower extremities, the force application of long y axis decompression was slowly increased with careful tolerance testing. Localization of the distraction was also isolated to the thoracolumbar spine via a thoracic restraint so as to concentrate the distraction to the low thoracic and upper lumbar spine. This was tolerance tested and found to relieve pain for the patient. Her home exercise program was increased. Physiological therapeutic use of positive galvanism was applied over the L5-S1 central disc herniation and the left L1-L2 left disc herniation. This was followed by low intensity paravertebral muscle stimulation only to the degree to cause minimal muscle contraction. This was actually a feeling to the patient of mild skin stimulation.

Of course, the purpose and need of such careful tolerance testing and initial very slow and mild application of force was to prevent any adverse side effect in this surgically fused spine. No adverse effects were ever felt by the patient and the result of care was described earlier and will again be summarized at the conclusion of this paper. This author has treated many surgically fused spines such as presented here and has encountered no iatrogenic problem as long as the protocol outlined here is followed.

Figure 16 illustrates the cervical spine long y axis decompression application in this case. Tolerance testing is carried out as in the lumbar spine and is described in the textbook cited as reference 9. [9] The protocol for treating radicular and non radicular patients is shown in this textbook and the reader is referred to it for in-depth study of technic application. A certification course in the diagnosis and treatment of the spine as described here is offered through the accreditation of the National University of Health Sciences. It involves a written and practical examination for certification.

Discussion:

This is a case handled with flexion distraction of the L1-L2, L3-L4 and L5-S1 disc levels. The L5-S1 disc herniation would best explain this patient's lower extremity radiating S1 radicular pain. No femoral nerve distribution of pain or paresthesias was present. The altered motion and weight bearing arising from such a fused spine and the resultant disc degeneration above the fused segments is probable. Chiropractors are called on, with increasing frequency, to see these cases. Two points about this: 1. full relief is not realistic in many such cases and fifty percent relief can be a good clinical outcome; 2. limited spinal adjustments are available to the chiropractor in this type case because high velocity side posture adjusting nor postero-anterior thrust technic are well tolerated. It is important to fully explain the stenosis condition to the patient, offer them their options of care, and inform them that it is unrealistic to gain 100% relief of such chronic and debilitating conditions. We do not cure such conditions, but rather control them through spinal manipulation and patient active home care and ergonomic life style changes.

The literature is very supportive of spinal manipulation for the treatment of spinal stenosis. Three groups of low back pain patients are classified: non-specific LBP, back pain with radiculopathy or spinal stenosis, and back pain with other specific causes. [10] Diagnostic imaging should be performed on patients with progressive neurologic deficits or serious factors and MRI only if surgery or epidural steroid injections are considered. Patients need to be given evidence based options and spinal manipulation, acupuncture, exercise, massage, yoga are recommended. The source of this information is the American Pain Society and the American College of Physicians for primary care of low back pain. Prolotherapy, facet joint injection, intradiscal steroid injection, and percutaneous intradiscal radiofrequency thermocoagulation are not effective, and epidural steroid injections give short term but not long term relief of pain. Spinal cord stimulation is moderately effective for failed back surgery syndrome with persistent radiculopathy, though device-related complications are common. Surgery for leg pain (radiculopathy) with herniated lumbar disc and symptomatic spinal stenosis is associated with short-term benefits compared to nonsurgical therapy, though benefits diminish with long-term follow-up. For patients with no leg pain (non radicular back pain) with disc degeneration, fusion is no more effective than intensive rehabilitation, but associated with small to moderate benefits compared to standard nonsurgical therapy. [10] New surgical implant devices have increased lumbar fusion rates dramatically in Medicare patients according to a study of 306 US hospitals. There was a 20-fold increase in surgical rates among Medicare enrollees from 1992-3 to 2002-3 in lumbar fusion, representing the largest coefficient of variation seen with any surgical procedure. Medicare spending for inpatient back surgery more than doubled over the decade and spending for lumbar fusion increased more than 500%, from $75 million to $482 million. In 1992, lumbar fusion represented 14% of total spending for back surgery; by 2003, lumbar fusion accounted for 47% of spending. [1] Lumbar cage fusion rates increased from 3.6% in 1996 to 58% in 2001. The result was increased complication risk without improving disability or reoperation rates. Two years after fusion 64% of the cases were disabled, 22% had reoperation, and 12% had other complications. Lumbar fusion devices compared with exercise and cognitive intervention are no better in randomized clinical trials. The use of cages or instrumentation was associated with increased complication risk compared with bone-only fusions without improving disability or reoperation rates. In conclusion, use of intervertebral fusion devices rose rapidly after their introduction in 1996 and this increased use was associated with an increased complication risk without improving disability or reoperation rates. [2]

In a study of 600 single-operated Workers Compensation low back patients, 71% did not return to work 4 years later and of 400 multiple-operated backs 95% did not return to work 4 years later. [11] After being off work for 6 months, 50% of patients return to work, 20% return to work after 1 year off and none return to work after 2 years off. [12] Factors predicting poor outcomes in low back pain are: presence of a belief that back pain is harmful or has the potential to be severely disabling, fear-avoidance behavior and reduced activity levels, tendency to low mood and withdrawl from social interaction, and expectation that passive treatment rather than active participation will help. [13]

A study in Maine involved 400 patients with sciatica resulting from a lumbar disc herniation treated surgically or non surgically who were followed over a 10 year period. By 10 years, 25% of surgical patients had undergone at least one additional lumbar spine operation, and 25% of non surgical patients had at least one lumbar spine surgery. At 10 year follow-up, 69% of surgically treated patients and 61% of those treated non surgically reported improvement in their predominant symptom of back or leg pain. [3] In a similar study, 97 patients with low back and

leg pain due to spinal stenosis were treated surgically or non surgically. After 8 - 10 years, 53% of surgically treated and 50% of non surgically treated patients reported that their predominant symptom of low back pain was improved. [4] It is interesting to note that improvement does not mean one hundred percent improvement, but rather some degree of improvement, but also from this study emerges the statistic that from 30 to 50 percent of these patients were the same or worse after surgical or non surgical treatment. The conclusion is that there is room for further research and improved procedures for low back pain, spinal stenosis, and disc herniation.

Katz reported that lumbar disc disorders cost in excess of 100 billion dollars a year to treat and 5% of the patients absorb 75% of the cost. [14] Fairbanks [15] reported on 349 18-55 y/o chronic low back patients with comparison of surgical stabilization with intense rehabilitation. There was no evidence that surgery was any more beneficial than intensive rehabilitation although surgery costs more, shows potential risk and is not cost effective.

With the awareness that cases such as the one reported here are the most costly in human suffering and dollars treated in the United States today, and the reported value of spinal manipulation as conservative care for them, the chiropractic profession has the responsibility and obligation to formulate the best spinal manipulation technics for their care. It is with these concepts in mind that this paper is presented.

Conclusion: A case is presented of recurring low back and bilateral lower extremity radiculopathy following lumbar spine fusion surgery. When first seen for this complaint, the patient also complained of neck and upper extremity pain due to MRI confirmed three level cervical spine disc herniations and resultant spinal stenosis. Flexion distraction decompression adjusting was the form of spinal manipulation employed in treating the case. Excellent relief of bilateral lower extremity radicular pain was achieved and good relief of the low back pain. Total headache and right upper extremity pain relief was attained with recurrent neck and left arm pain if home exercises, ergonomic practice and bi weekly spinal flexion distraction and decompression manipulation is not followed. This case is a condition that is controlled, but not cured. Specialized chiropractic distraction spinal adjusting, designed with exacting tolerance testing to prevent iatrogenesis and specific treatment protocol application as described in this paper was the care. Physiological therapeutic modalities were also used. Further clinical studies are needed to exactingly align this form of spinal manipulation into interdisciplinary care of spinal stenosis and failed back surgery syndromes and to compare its clinical outcomes to other forms of spinal manipulation.

Competing interests

The author is the developer of the technic and instrument used in this case report. He holds a patent on the cervical headpiece, has no ownership in the company manufacturing the instrument and is compensated for his input to its development.

Acknowledgements

Written informed consent was obtained from the patient for publication of this case report and for the use of accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

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