

# Case Study

## Complete Cervical Kyphosis Correction and Resolution of Low Back Pain Utilizing Pierce Technique

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### Abstract

**Objective:** To review the chiropractic effectiveness of a modified Pierce Results System protocol on the correction of cervical kyphosis without the use of traction or exercise.

**Clinical Features:** A 41 year old female with a 2 year history of low back pain had seen multiple chiropractors in the past with no relief of symptoms. MRI revealed bulging lumbar disc, thecal sac indentation by the ligamentum flava, and neural foramina were stenotic bilaterally. Recommended for surgery by orthopedic surgeon.

**Intervention and Outcomes:** During the initial examination standard radiography and video fluoroscopy revealed vertebral subluxations at multiple levels. Lateral cervical radiography revealed a  $-51^\circ$  kyphosis of the cervical curve. Following 6 weeks of adjustments, post x-ray revealed a  $60^\circ$  lordosis of the cervical curve, a change of  $111^\circ$ . The patient's subjective low back pain complaints significantly improved as well.

**Conclusion:** Using video fluoroscopy to identify the specific levels of vertebral subluxations, structural changes can be made on post x-ray evaluation without the use of traction or exercise.

**Keywords:** *Chiropractic, subluxation, cervical curve, Pierce Results System, video fluoroscopy, low back pain*

### Introduction

Low back pain (LBP) is one of the most prevalent conditions today, occurring in an estimated 6-12 percent of the population and being the single most common work related injury.<sup>1-3</sup> In recent years medical care expenditures have increased 629% on low back pain care. With this rise in LBP related cases and medical expenditures, we have not seen population based improvements in outcomes or disability rates.<sup>4</sup> It is believed that biomechanical, neurological, and postural abnormalities all play a part in LBP related cases.

These all are encompassed within chiropractic's model of the vertebral subluxation complex. Since chiropractic works with these specifically, it can be hypothesized that correction of the vertebral subluxation complex or biomechanical, neurological, and postural abnormalities can result in relief of LBP related symptoms. Chiropractic care has show to be one of the most utilized treatments for LBP related complaints and has also been show to have better patient satisfaction that MD care.<sup>5,6</sup>

In LBP related cases outcome measurements are an important factor to monitor the patient's improvement with specific treatment methods.<sup>7</sup> This must be taken into account to provide scientific, evidence based research on the subject.

The normal structure of the spine has been documented in the literature.<sup>8</sup> An abnormal position of the spine has been shown to cause an increased incidence of health related problems and through chiropractic care, positive outcome measures.<sup>9-16</sup> The Pierce Results System not only takes this into account, but looks at static x-rays and spinal motion under video fluoroscopy to better understand the nature of the vertebral subluxation complex on that particular patient.

One aspect of LBP care that has been neglected is the importance of the compensatory nature of the spine and its relationship to the vertebral subluxation complex. Within the Pierce Results System of spinal analysis, specifically using plain film x-ray and video fluoroscopy, this is taken into account.

Looking at the spine as a complete functional unit may allow for better LBP related outcomes and more cost effective options.

Low back pain is one of the most common and one of the most expensive aspects of the health care system. In recent years there has been an increased cost associated with the diagnosis and treatment of LBP related disorders.<sup>1,2</sup> Surgical interventions have been on the rise with higher costs and no significant improvement over conservative care.<sup>6,17</sup>

Chiropractic care has been shown to not only have a high patient satisfaction rate, but also shown to be effective for both acute and chronic LBP conditions.<sup>5,18-23</sup> Chiropractic care is also effective for the treatment of more severe case of LBP involving lumbar disc herniations.<sup>24,25</sup> Not only is chiropractic effective for LBP, it's also been shown as a preventative measure to future LBP related injuries.<sup>26,27</sup>

### Case Report

The 41 year old female first experienced LBP two years prior when the back of her chair gave way and she subsequently fell on her back. During those 2 years she had tried multiple chiropractors with no relief of symptoms. In the previous week she had consulted with an orthopedic surgeon who recommended spinal surgery. MRI revealed thoracolumbar dextroscoliosis, L3-L4 loss of disc dehydration, L4 posterolisthesis on L5 with loss of disc height and hydration as well as disc bulge, spondylosis, hypertrophy of the facets, the ligamentum flava indenting the thecal sac, and neural foramina are stenotic bilaterally, posterior listhesis of L5 on S1 with herniated nucleus pulposus effacing ventral epidural fat.

Upon initial examination the patient reports 6-8 out of 10 low back pain, leg pain, and hip pain, all of which were constant. A-P lumbopelvic x-ray revealed an external rotated ilium on the left side. Video fluoroscopy of the lumbar spine revealed abnormal motion on left lateral bending at L4 and L5. Lateral cervical x-ray revealed a Pierce Results System measurement of the cervical -20cm (-51°), showing a near complete cervical kyphosis (Fig 1).

Video fluoroscopy revealed right spinous rotation of T1-T2 and left spinous rotation of T3 up rotation of the head to the right and left. Video fluoroscopy of the cervical spine revealed atlas did not move superior towards occiput on flexion, and C5 did not move properly in flexion. Flexion, extension, and rotation of C2 were all evaluated using video fluoroscopy. Over the course of 6 weeks and 12 office visits the aforementioned subluxations were adjusted. In addition C3, C6, T11, and T12 were adjusted. The course of treatment used was a modification of the standard Pierce Results System Protocol.

Although video fluoroscopy and standard radiography was used to obtain all vertebral subluxation listings, no thermal instrumentation was used, which is a standard protocol in the Pierce Results System. In addition, the Sigma Instruments electronic instrument adjuster was used for additional analysis of spinal motion. All adjustments were done with the instrument from P-A and none were done by hand. The

instrument was set on 20-25 lbs of pressure with 12 impulses per second with the automatic shut-off utilized. Electric stimulation was used initially for relief of pain and muscle spasm.

On the 11<sup>th</sup> visit LBP was rated 0/10, leg pain was 0/10, and hip pain was 3/10. A post x-ray was taken 6 weeks later of the cervical spine revealing a +17cm cervical curve (+60 °) (Fig 2). An evaluation of the pre and post lateral cervical x-ray revealed a 111° change in the cervical curve in which the patient was only adjusted during a 6 week period. The post video fluoroscopy study revealed abnormal motion at only atlas in flexion.

### Discussion

The Pierce Results System goal is to restore proper structure to the spine, and to provide proper motion within that structure demonstrated by standard radiography and video fluoroscopy. The cervical curve is measured using the AcuArc Ruler based on the radius of a circle measured in centimeters. It was developed by Dr. Vern Pierce as a way to evaluate differences in the cervical curve from one patient to another. Pierce concluded that assuming no abnormalities were present, a perfect cervical curve would measure +17cm. He was also very interested in how a normal spine should look, and therefore all listings are based on a comparison to normal, not left, right, or segments above and below. Within this system it is important to note that modifications have been made in this case.

Thermal instrumentation is used as a standard to allow the chiropractor to know when to adjust, based on full spine pattern analysis of the skin temperatures along the spine. This was not used in this case. It should also be noted while not a deviation from the standard Pierce Results System protocol, all adjustments were done with the instrument.

### Locating Primary Subluxation

In this case it can be assumed the reason the patient was recommended for surgery and other chiropractors failed to relieve the LBP is because they failed to address the compensatory nature of the spine. Although video fluoroscopy revealed vertebral subluxations in the lumbar region and pelvic dysfunction was present, the true cause was the cervical spine. The reversal of the cervical curve causes the lumbar spine and pelvis to compensate, creating abnormal biomechanical structure and abnormal stress in the lumbopelvic region. Removing the cervical kyphosis will allow the lumbopelvic region to realign to its normal position. This allows us to realize there may be several causes of low back pain and related outcomes other than biomechanical, neurological or postural abnormalities specifically in the lumbar or pelvic region as it relates to LBP.

Although a +17 cervical lordosis is ideal for the patient, proper cervical motion within that structure is of equal importance.

The bigger question then remains, how can this be achieved? Previous chiropractic publications have suggested or debated that in addition to chiropractic adjustments, cervical traction and exercises are needed to restore proper structure. There is

also debate to its effectiveness at all. It is also suggested the time frame for this to occur is over the course of several months at a minimum.<sup>10,11,12,16,28</sup> In this case, and in the Pierce Results System, changes in the cervical curve are evident in fewer visits without the use of cervical traction or patient exercises. This provides a more cost effective model to the corrective nature of vertebral subluxation because it can be done with less intervention in a shorter amount of time, even in complicated cases such as lumbar disc herniations.

X-ray has been used in chiropractic for almost as long as it's been around and there seem to be only very minor risks associated with the radiation the patient is exposed to.<sup>29,30</sup> If evidence of these changes is proven true through subsequent research studies further utilization of video fluoroscopy in chiropractic should be warranted. This allows for a low exposure dose to the patient but provides the doctor with intimate details of the spine in motion. With the detailed information one never needs to guess which segments of the spine are not moving properly. Instead they can provide specific chiropractic care to reduce the vertebral subluxation.

### Conclusion

The Pierce Results System provides an alternative view to the traditional approach to LBP related cases by taking the entire spine and its likelihood to compensate into account. Correcting the abnormal structure within the cervical spine can alleviate most symptoms associated with LBP. It also shows that video fluoroscopy can be a valuable tool in finding and correcting vertebral subluxations. The effectiveness of this system may allow for better outcome measures by preventing unnecessary surgery, and providing faster treatment outcomes with less intervention such as traction or exercise.

With time, cost, and less reliance on patient self exercises taken into account, more proficient ways of dealing with LBP are possible. Further research needs to be done on this matter with a larger group in order to overcome the limitations of this study.

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Figure 1



Figure 2