

Case Study:
Complex Cervical Spine Case Study:
**Cox Distraction treatment of multilevel spondyloarthropathy
compression neuritis and sequella following anteroposterior C1-2
screw fixation and graft fusion.**

submitted by
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Brief Clinical History:

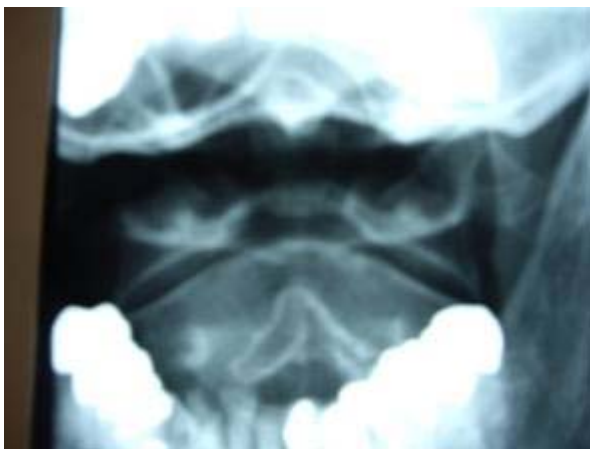
This 78 year old Caucasian male was involved in a motorcycle accident at age 14. He likely sustained a type II odontoid fracture at that time. However, it remained undiagnosed. In 1990, at age 67 he began to notice intermittent numbness in the fingertips of his left hand. Investigations revealed nonunion of an old type II odontoid fracture. His symptoms continued to progress, involving the right hand, as well as the trunk. On August 8, 1995, he was involved in a motor vehicle accident and awoke the next day with numbness from his nipple line to his toes. Physical examination was consistent with central cord compression. Radiographic evaluation of the upper cervical spine demonstrated C1-2 instability with 20 mm of movement. MRI study revealed large pannus formation extending from the non-union inferiorly along the posterior body of C2. The underlying spinal cord was significantly compressed with evidence of signal change within. Physical examination at that time included spastic catches in all extremities, clonus, grade 4 upper extremity weakness, global increase in DTR's and decreased pinprick and light touch of the left arm and right leg. The patient underwent a transoral C2 resection with removal of the underlying pannus followed by a posterior C1-2 transarticular screw fixation and interlaminar fusion. The surgery was initially successful; however two months later he required surgical debriedment and irrigation for a wound abscess that had developed. This secondary surgical procedure left the patient with loss of posterior nuchal muscle bulk and strength as well as substantial internal scar formation. This gentleman presented to my office on [June 13, 2006](#), complaining of "pressure on the upper back and neck, numbness and stiffness into the shoulders" and difficulty with walking.

Examination:

The patient is a 78 year old male. He is observed to have a mild spastic (neuropathic) gait and was somewhat unsteady. Observation of the posterior neck revealed a significant vertical surgical scar with loss of muscle volume at the midline. Peripheral pulses of the upper and lower extremities were equal bilaterally. Palpation of the lymph nodes in the neck and axilla was within normal limits. Palpation for muscle spasms and pain in the cervical spine was within normal limits. Some tenderness was noted in the bilateral atlantooccipital and cervicothoracic junction respectively. The deep tendon reflexes of the upper extremities are 2/2. Sensory examination of the upper and lower extremities was normal. Muscle strengths were intact at 5/5 throughout the upper extremities bilaterally. Cervical spine range of motion was limited in lateral flexion bilaterally to 5 degrees, bilateral rotation to 20 degrees, flexion to 37 degrees and extension to 24 degrees.



Note the post-surgical scar.



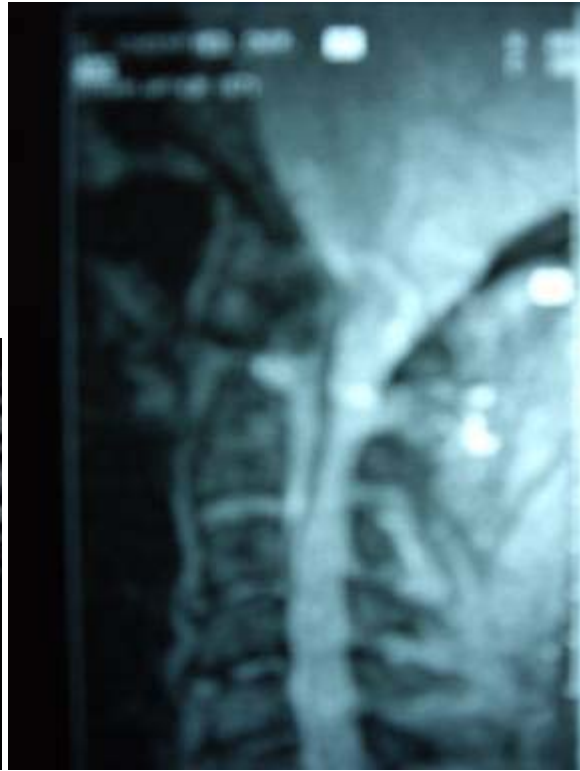
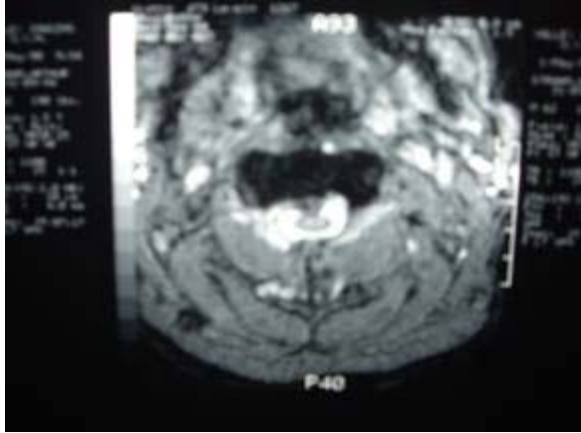
1990 plain film demonstrating non union through a type II odontoid fracture



1990 CT scan demonstrating nonunion through a type II odontoid fracture



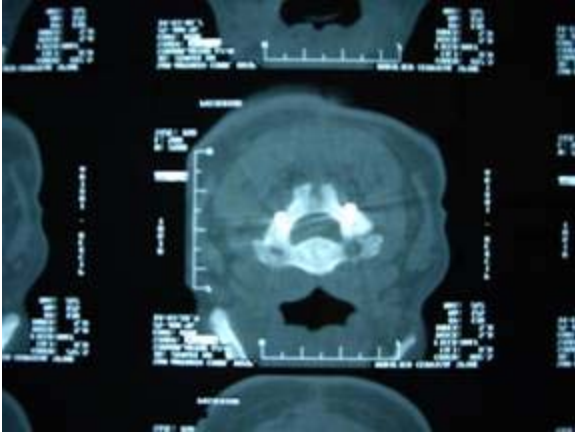
1995 post MVA plain film demonstrating nonunion through a type II odontoid fracture with flexion/extension 20 mm instability



MRI study revealed large pannus formation contacting the cord and extending from the non-union inferiorly along the posterior body of C2.



1996 post-surgical plain film with stabilizing screw fixation



1996 post-surgical CT scan with stabilizing screw fixation



2006 plain film showing advanced degenerative changes

Impression:

Post-surgical cervical degenerative stenosis C2-7

Treatment goals:

The initial treatment goals were to relieve the pressure sensation, stiffness, reduce spasticity on ambulation, and reduce spinal stenosis with decompression manipulation while gradually increasing the patient's activities of daily living. This patient was told that if he had not improved 50% within 4-6 weeks that he would be referred to another physician.

Treatment Methods:

This patient was treated with cervical spine long Y-axis distraction with range of motion at the adjacent levels to the fused segments (Protocol I) utilizing the Cox7 Table's cervical headpiece hand-held (without restraints), consisting of three 20-second long Y-axis distraction applications. Each 20-second interval consisted of five 4-second pumps. Distraction included decompression of the thoracic spine to T8-9. During this adjustment, cavitation was often heard and felt. This patient received a 30 minute massage of the cervical spine, shoulders and thoracic spine prior to the distraction to facilitate a decrease in muscular tonus and resistance. Treatment began on 6-13-06. He received 3 treatments per week for 3 months. In the fourth month he was seen 2 times per week. He continues as of this writing to be seen one treatment per week.



This is the contact hold for treatment application.

Treatment Outcomes:

Treatment resulted in progressive relief of the cervicothoracic pressure, numbness and stiffness. His gait and balance has improved. There was no iatrogenesis or increasing of patient pain with the procedures outlined here. Within the first month of care, the symptoms were 50% overall improved. There was a slow but progressive decrease in the intensity, frequency and duration of the symptoms over the following three months. He now describes his overall treatment outcome as greater than 70% overall improved.

Discussion:

Cervical stenosis with resultant radicular and/or neurological complaints may be difficult to manage with both conventional allopathic and chiropractic treatment. This is particularly true when there have been multiple surgical procedures and subsequent osteodegenerative biomechanical sequella. There is an ever narrowing list of treatment choices left to the physician as the complexity of the case increases. This case study describes a successful outcome with the implementation of the Cox Distraction adjusting procedures coupled with

massage therapy. It may be hypothesized that the success of this complex case can be found in the applied use of treatments derived from empirically based, and research driven biomechanical science. This patient had experienced at least four separate episodes (two MVA's, surgical fusion, surgical debriedment and removal of wound abscess) of central neuroinflammation. It has been hypothesized that nerve root injury produces neuroimmunologic and neurochemical changes, sensitizing the spinal cord and causing pain responses to manifest with greater intensity and longer duration after re-injury. (3) This alone would logically decrease the likelihood of a positive treatment outcome in this case. As this is a clear musculoskeletal condition, it would be well to recall the central tenets of spinal mechanical disease and its two etiologies: mechanical and chemical.

Mechanical pathology causes altered motion, mechanoreceptor stimulation, and neural compression that may become sufficient to initiate neurological disease. (4) There is also chemical pathology - inflammation of joints, disc, and neural tissue. This is instituted by injury and irritation resulting in the introduction of nuclear material into or outside the confines of the annulus fibrosus of the intervertebral disc or the formation of nociceptive stimulation by hormone (prostaglandin) and vasomotor (substance P, kinins, serotonin, histamine, potassium, calcitonin gene related peptide), and waste products (lactic acid, pH change, etc.) chemical excitation within the disc, joints, and soft tissues of the spine. Together these mechanochemical factors account for much of the presenting symptomatology.

Flexion distraction manipulative therapy may be an effective treatment option for these often-difficult cases as it addresses these mechanochemical factors.

It has been documented that under flexion of the cervical and lumbar spine the neuroforamen increase by 28% in size. Conversely, at extension a decrease in the size of the neuroforamen of up to 20% was recognized. (1,2) Flexion distraction reduces intradiscal pressure, decompresses lesions, and activates spinal and paraspinal receptors that are contained in the zygapophyseal joint capsule, muscle spindles, intervertebral discs, and ligament of the spine. A possible mechanism for hypoalgesia effect with spinal manipulative therapy includes activation of a central control mechanism, activation of zygapophyseal joint capsule stretch reflex-mediated inhibition, and afferent discharges from cutaneous receptors, muscle spindles, mechanoreceptors, and free nerve endings in the annulus fibrosus and ligaments of the spine.

Flexion distraction has gained increased credibility as a therapeutic modality for treatment of spinal pain. It is one of the most widely used techniques in chiropractic and is used strongly in intervertebral disc derangements, stenosis as well as simple back pain. From the complex to the simple, the severe to the mild, it increasingly appears that Cox® Technic Flexion Distraction is both safe and effective as the treatment of choice among the myriad of treatment options available, and particularly so when the treatment options are restricted due to complicating factors.

Author note: This is an excellent example of the benefit of Cox® Technic Flexion Distraction and Decompression long y axis decompression. Rotatory extension adjusting, in my clinical practice, could not be given to this case without iatrogenesis.

References:

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2. Muhle C, Resnick D, Sudmeyer M, Heller M: In vivo changes in the neuroforaminal size at flexion-extension and axial rotation of the cervical spine in healthy persons examined using kinematic magnetic resonance imaging. Spine 2001;26:E287-93.
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