A BRIEF SYNOPSIS OF THE RESEARCH ON CERVICAL AND LUMBAR TRACTION, DISTRACTION AND DECOMPRESSION

Guehring T, et al.: Disc distraction shows evidence of regenerative potential in degenerated intervertebral discs as evaluated by protein expression, magnetic resonance imaging, and messenger ribonucleic acid expression analysis. Spine. 2006 Jul 1;31(15):1658-65

"Distraction results in disc rehydration, stimulated extracellular matrix gene expression, and increased numbers of protein-expressing cells."


77 patients verified on pre-post MRI with signs and symptoms of herniation, underwent non-surgical intervention including pelvic traction. Changes in herniation and good-excellent symptomatic improvements were noted in over 82%. The authors draw the conclusion improving the discs contact with the blood supply accounts for healing of herniation.


30 patients with lumbar herniations were tractioned in a CT scanner at >50% body weight for -20 min. Hernia retraction occurred in 70% and good clinical improvements were seen in over 93%. The authors concluded improved blood flow was the source of healing. Additionally they speculated previous studies showing traction doesn't create negative intradiscal pressures perhaps used too light a force.


100 patients with disc syndrome unresponsive to manipulation were treated with high force traction (+80 lb). 86% of patients had good-excellent outcomes 12 had poor outcomes but most had pain for an extended duration.


58 subjects had an inclusive conservative program including traction (when initially shown to reduce leg symptoms). Overall 86% had good-excellent results.


3 patients with a ruptured lumbar disc had contrast medium and radiographic images taken during and after a lumbar traction procedure. The protrusions were shown to lessen considerably with the 30 minute prone traction sessions and a dimpling of the outer annulus suggested a negative intradiscal force was created.


Intermittent supine traction with -+50% body-weight, (10) 20 minute sessions with added exercises showed considerable improvement in over 90% of the 62 patients.

40 patients with neurological signs were treated with traction on a friction free table with 55-70 lbs for 20 minutes. Good-excellent results were seen in 55%. Mathews JA et. al.: Manipulation and traction for Lumbago and Sciatica. Physio Pract 4: 201, 1988.


Subjects were subjected to a supine angled traction force of up to 100 lbs. with x-ray examination. A rope angle of 18 degrees revealed separation greatest at L4-5 (Note: we speculate a more acute angle -10 degrees affords greater separation at LS-S 1). The separation was obvious up to T 12-L 1 with total elongation of the spine approaching +5mm. The vertebral separation is greater on the posterior vs. anterior aspect of the vertebra. Constatoyannis C, et. al.: Intermittent Cervical Traction for Radiculopathy Due to Large-Volume Herniations. JMPT, 25 (3) 2002.


The application of supine lumbar traction with adherence to several specific characteristics including progression to a peak force and altering the angle of pull from 10 degrees (L5 -S 1) to 30 degrees (L3) enhanced distraction at specific levels. Gose E. Naguszewski W&R: Vertebral axial Decompression for Pain associated With Herniated and Degenerated Discs or Facet syndrome: an Outcome Study. Neuro Research, (20) 3, 186-190, 1997. A retrospective analysis of over 770 cases, many assumed to be unresponsive to previous therapies showed a 71 % good-excellent success rate with -20 treatments on the prone VAX-D traction device. All patients treated prone with 65-95 lbs. of force 3-5 times per week.


This study was used to determine muscular guarding/contraction of Paraspinals with intermittent vs. static traction. Improved comfort noted in the intermittent traction group.


Intervertebral pressure was recorded before and during traction. 62% of prolapsed discs showed negative pressure prior to traction. 64% reduced IDP with traction and was related to distraction distance. In 19% of prolapsed discs the pressure actually increased, demonstrating the disruption to the hydrostatic mechanism occurring with complete annular damage and prolapse.


Cervical intermittent traction was shown to be effective in relieving pain, increasing frequency of myoelectric signals and improving blood flow in effected muscles.


29 patients and seven healthy volunteers had intermittent traction while in MR. Substantial increase in vertebral length was seen. Full herniation reduction in 3 and partial in 18 was reported.

The authors analysis shows loads not greater than those occurring in everyday life cause loss of stability of the disc and allow lateral nucleus displacement. The model indicates conservative therapy by traction may result in retraction of hernia by about 40%. Ramos G, Martin Wm: Effects of axial decompression on intradiscal pressure. J Neuro 81: 350-353, 1994.

Significant negative pressure (-100mm Hg) was recorded at L4/5 disc in three volunteers as axial traction was administered. Negative pressure was recorded at -50 pounds tension perhaps representing a minimal threshold force. Patients were prone and harnessed.


A negative myelogram but a positive CT for an L5 disc protrusion is presented. Five months of medical care preceded chiropractic care; the insurance company involvement in a case where treatment mode is changed from usual orthodox medical procedures of epidural steroid injection and physical therapy to chiropractic distraction manipulation is detailed. Finally, the clinical outcome of the case is provided. At the end of 6 weeks of care the patient returned to his full work duties as a truck driver. His range of motion of the thoracolumbar spine were full and normal and hi straight leg raises were positive right at 70 degrees and left at 60 degrees. He had taut hamstring muscle that required constant stretching so as to not mimic a positive straight leg raise sign. This case shows that time off work and cost were both reduced by chiropractic care.


An overview of Cox® distraction manipulation protocols is presented including diagnosis and treatment decision making in low back pain and sciatica cases and proper utilization of flexion distraction in treating lumbar spine and lower extremity pain. In addition, the outcome of 1,000 cases involving low back and/or leg pain treated with chiropractic adjusting (92% utilizing flexion distraction) is presented. A qualitative clinical and literature review provides the basis of the overview of diagnostic and treatment protocols. A descriptive case series design was used to collect outcome information on 1,000 patients with low back and/or leg pain; patients were pooled from two separate studies. Patients were treated by 30 different chiropractors, and a minimum of 20 cases was supplied by each physician. A descriptive review of cases showed that less than 4% of patients with low back or leg pain were candidates for surgery. Less than 9% of patients reached the chronic stage of care. The mean number of days to maximum improvement under care was 29, and the average number of treatments to maximum improvement was 12. The results of this study provide some evidence for the use of chiropractic management, particularly flexion distraction manipulation, in the treatment of back pain problems due to a variety of mechanical causes.
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Cyriax, Quilette, and Kramer hypothesized that as the vertebrae in the spine are distracted, a negative pressure develops in the disc, and sucks back a protrusion. The present study shows that the decrease in the intradiscal pressures may provide the opportunity for the reduction in the disc bulge during the flexion-distraction procedure. Ramos et al. reported decreases in the intradiscal pressures during Vertebral Axial Decompression (VAD) procedure on three patients measured intraoperatively. The result of the present study are in general agreement with the study reported by Ramos and Martin. Andersson et al. reported increases in the intradiscal pressures at L3-L4 disc on four volunteers during active and passive traction. A possible reason for the increase in the intradiscal pressures could be that the muscles of the in vivo subjects could have been contracting while under active and passive traction. Work is in progress to monitor the muscle activity during in vivo situations of treating the patients using the flexion-distraction procedure.


We observed a significant decrease in intradiscal pressure during the flexion-distraction procedure for low back pain. The pressure has increased during extension motion of the table. The pressures have increased during right lateral motion whereas the pressures have decreased during the left lateral motion. During circumduction the pressures have decreased during the left lateral and flexion motions, where as they have increased during right lateral and flexion combined motions. In all of the motions the pressures returned to their original values when the spine was brought back to the initial prone position. One of the reasons for the increase and decrease during lateral motions is due to the fact that the transducer was inserted some what right laterally from the center of the disc. The results clearly show that the pressures are affected during different motions of the spine associated with the motions of the table. Even though the present study is limited to one cadaver, the results are very interesting and studies with more number of cadavers and studies on animals can give further insight into the changes in the pressures at different regions of the spine.


We observed a significant decrease in intradiscal pressure during the flexion-distraction procedure for low back pain. When the discs were not pressurized, the pressures went below 0 mm Hg. When the discs were pressurized, the decrease in the intradiscal pressures was much larger, suggesting that in patients with higher intradiscal pressures, the decrease may be much higher during the treatment. The pressures returned to their original values when the spine was brought back to the initial prone position. Quilette(2), and Kramer (3) hypothesized that as the vertebrae in the spine are distracted, a negative pressure develops in the disc, and sucks back
a protrusion. Ramos et al. (4) reported on the intradiscal pressure during Vertebral Axial Decompression (VAD) procedure on three patients measured intraoperatively. The results showed that the disc pressures reduced during the VAD therapy. They demonstrated that the disc pressures can go as low as -160 mmHg. The results of the present study are in general agreement with the study reported by Ramos and Martin (4). Anderson et al. (5) reported the intradiscal pressures at L3-L4 disc on four volunteers during standing, lying, active traction, and passive traction. The findings showed an increase in the disc pressure during both active and passive traction. The results from the present study do not agree with the results reported by Anderson et al. (5). A possible reason could be that the muscles of the in vivo subjects could have been contracting while under active and passive traction. Work is in progress to monitor the muscle activity during in vivo situations of treating the patients using flexion-distraction procedure.


A Grand Rounds discussion of a patient suffering from severe low back pain with pain radiating into the left thigh. The patient occasionally gets "stuck" in a position where he is leaning forward and to the right, and he must slowly work out his back in order to straighten up again. Dr. Cox discusses the examination of the patient, the possible pain generators for the patient's pain, and the Cox Distraction Adjusting procedures recommended for the case. Algorithms of decision making and treatment protocol are presented for Cox® Distraction diagnosis and care of an acute low back pain patient. As well, discussion of potential sources of the pain is presented. Many references cited.


Algorithms of the standard of care for Cox® Distraction are presented and explained. Automated axial distraction, the newest ability of Cox® Technique protocol, is introduced in a very technical, step-by-step fashion with illustrations as to hand positioning as well as instrument use. AAD eases the distraction procedures for the physician and provides a smooth adjustment for the patient.


Cox® Distraction procedures for the cervical spine and thoracic spine are a natural outgrowth of its application to the low back. This technical overview of Cox® Distraction procedures for the cervical and thoracic spine is intended to introduce this form of care for patients intolerant of classic rotatory thrust techniques due to such anatomical and pathological findings as degenerative disc disease, vertebral artery syndrome, disc herniation, blocked vertebra, occipitalization, scoliosis, other congenital defects, as well as for patients who just cannot be high velocity adjusted.


Chiropractic distraction manipulation and physiological therapeutic care relieved 2 patients with low back and radicular pain attributed to MRI-confirmed synovial cysts of the lumbar spine. This treatment may be an initial conservative treatment option for synovial cysts with careful patient monitoring for progressive neurologic deficit which would necessitate surgery. Distraction manipulation may be a safe and effective conservative treatment of synovial cyst causing radicular pain; further data collection of clinical outcomes is warranted.

Patients with radiculopathy did significantly better with FD. There were no significant differences between groups on the Roland Morris and SF-36 outcome measures. Overall, flexion–distraction provided more pain relief than active exercise; however, these results varied based on stratification of patients with and without radiculopathy and with and without recurrent symptoms. The subgroup analysis provides a possible explanation for contrasting results among randomized clinical trials of chronic low back pain treatments and these results also provide guidance for future work in the treatment of chronic low back pain.


During a one-year followup, participants previously randomized to physical therapy attended significantly more healthcare visits than those participants who received chiropractic care.


In this first trial on flexion distraction care, flexion distraction was found to be more effective in reducing pain for 1 year when compared to a form of physical therapy.


A 34-year-old female presented to a chiropractic office with severe, unremitting, cervical, shoulder, and arm pain of several months' duration. Past medical history, clinical evaluation, and plain-film radiographs revealed findings consistent with Klippel-Feil syndrome. The radiographs revealed a C2/3 block vertebrae, atlas assimilation, and premature degenerative changes consistent with the syndrome. Treatment consisted of cervical flexion-distraction manipulation and adjunctive therapies. This patient felt relief after the first treatment and experienced a complete resolution of her symptoms after eight treatments performed over a period of 2 months. Klippel-Feil syndrome is an anatomical entity that results in premature cervical degenerative changes, which may cause radiculopathy. Flexion-distraction manipulation performed to the cervical spine is a relatively new clinical procedure, which shows great promise for the treatment of cervical radiculopathy.


A 60 year old male presented with complaints of pain and limited motion in his neck, with pain and weakness in his left shoulder and arm. These symptoms began after a fall approximately 4 months prior. His previous allopathic care included medication and physical/occupational therapy, which provided no significant relief. Cervical plain film radiographs demonstrated degenerative changes and the magnetic resonance imaging revealed multilevel central stenosis. The patient was treated with flexion-distraction manipulation, which provided significant relief of his subjective and objective findings. Cervical stenosis with resultant radicular and neurological complaints may be difficult to manage with both conventional allopathic and chiropractic treatment. Flexion distraction manipulative therapy may be an effective treatment option for these often difficult cases.

Background: Although flexion distraction performed to the lumbar spine is commonly utilized and documented as effective, flexion distraction manipulation performed to the cervical spine has not been adequately studied. Subjective: To objectively quantify data from the Visual Analogue Scale (VAS) to support the clinical judgment exercised for the use of flexion distraction manipulation to treat cervical radiculopathy.

Bulbulian R, Burke J, Dishman JD: Spinal reflex excitability changes after lumbar spine passive flexion mobilization. Journal of Manipulative and Physiological Therapeutics 2002; (Vol. 25, Issue 8, Pages 526-532

Background: Flexion distraction has gained increased credibility as a therapeutic modality for treatment of low back pain. Although important work in the area has elucidated the intradiskal pressure profiles during flexion distraction, the accompanying neural responses have yet to be described. Objective: The purpose of this pilot study was to assess neural reflex responses to motion with 3 degrees of freedom applied to the lumbar spine and to evaluate H-reflex responses of the soleus. Methods: Subjects (n = 12) were measured for H-maximum reflexes determined from stimulus response recruitment curves measured in neutral prone position. The mean of 10 evoked H-waves (at H-maximum stimulus intensity) were measured in neutral position, flexion, left and right lateral flexion, and axial rotation of the trunk on an adjusting table. H-reflexes were expressed as a percentage of maximal M-wave for the criterion measure. Spinal range of motion was quantified by digitization.

Results: The data showed variation in some movement ranges, notwithstanding identical table positioning for all subjects. Mean H-reflex amplitude was decreased (15.2 ± 5.8 mV to 13.8 ± 5.8 mV), and the H/M ratio was also decreased in flexion compared with neutral (55.0% ± 19.1% to 50.3% ± 19.4%; P < .05). Conclusions: Trunk flexion is accompanied by inhibition of the motor neuron pool. Slight perturbations in numerous afferent receptors are known to significantly alter the H-reflex. The absence of measurable changes in lateral flexion and trunk rotation may indicate that both slow- and fast adapting receptors could be involved in lumbar motion. These preliminary findings suggest the need for further dynamic motion studies of the flexion distraction neurophysiologic condition.

Gallucci G [1438 S.O.M. Center Road, Mayfield Heights, OH 44124 -- (216)461-4848]: The effectiveness of chiropractic treatment for disc syndrome. A Study by Blue Cross and Blue Shield of Ohio and Physicians First, Inc. (1996)

A study was conducted as a joint venture between Physicians First, an established chiropractic clinic, and Blue Cross and Blue Shield of Ohio. The purpose was to compile statistics on the effectiveness of chiropractic treatment of back injuries that might otherwise require surgical intervention. The study was composed of a total of 10 patients with diagnosed intervertebral disc syndrome. All 10 subjects had received treatment from a medical doctor for the diagnosed conditions. The subjects were treated under a twelve week plan which included the utilization of Cox Distraction Technique. Post-treatment surveys revealed that all 10 patients reported improvement in the frequency and severity of symptoms.


Lumbar radicular symptoms can be caused by lumbar intervertebral disc herniations. If a disc injury is positively established through diagnostic imaging, surgery is a commonly recommended approach. Flexion/distraction manipulation is a therapeutic alternative that may offer relief for subjective complaints and elimination of objective signs. Success with this technique might spare the patient an operative procedure. This is a case report of one such incidence. Flexion/distraction manipulation is a treatment developed by James M. Cox. It is often used for lumbar disc injuries (herniation, bulges, etc.), and for other low back and lower
extremity radicular conditions. The technique involves the use of a specialized table which allows for passive distraction, flexion, lateral bending, and rotation. These different planes of motion, along with the use of appropriate adjunctive therapy and exercises, allow for reduction of symptoms attributable to lumbar disc syndromes. Contraindications and indications for flexion/distraction manipulation have been identified and enumerated. Flexion/distraction manipulation is a treatment that should be investigated as a part of the algorithm for presurgical therapies of lumbar intervertebral disc injuries. This alternative in conservative care may be of benefit to a large number of patients. The surgical option for treating intervertebral disc herniations might be reduced with propagation of flexion/distraction manipulation.


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"Serial MRI of 20 patients treated with the decompression table shows in our study up to 90% reduction of subligamentous nucleus herniation in 10 of 14. Some rehydration occurs detected by T2 and proton density signal increase. Torn annulus repair is seen in all."


"Eighty-six percent of ruptured intervertebral disc (RID) patients achieved 'good' (50-89% improvement) to 'excellent' (90-100% improvement) results with decompression. Sciatica and back pain were relieved." "Of the facet arthrosis patients, 75% obtained 'good' to 'excellent' results with decompression."


"Results showed that 86% of the 219 patients who completed the therapy reported immediate resolution of symptoms, while 84% remained pain-free 90 days post-treatment. Physical examination findings showed improvement in 92% of the 219 patients, and remained intact in 89% of these patients 90 days after treatment."


"All but two of the patients in the study improved at least 30% or more in the first three weeks."

"Utilizing the outcome measures, this form of decompression reduces symptoms and improves activities of daily living."


Spinal Decompression Therapy "...allowed imbibition and complete reduction of the visualized herniation." “Spinal decompression therapy provided an effective means of treatment for this patient's symptoms resulting from discal herniation (extrusion) with associated impingement of the adjacent nerve root." "MR imaging proved to be a useful and non-invasive technique in monitoring the efficacy of decompression therapy as it applies to this case." "Decompression of the spine proved to be superior to the other forms of conservative care when applied to our patient. The patients' results were both subjectively favorable and objectively quantified." from my iPad