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Research and Reference materials with regard to Axial Disc Decompressive Therapy

1) Bogduk, N,: The Anatomical Basis for Spinal Pain Syndromes. ***JMPT*** 6:Nov.Dec1995. There is no scientific basis for the belief muscles are a source of chronic pain. However controlled studies show how common disc and facet pain is accounting for more than 70% of chronic back pain.

2) Komari H, et al.: The Natural History of Herniated Nucleus with Radiculopathy. ***Spine*** 21: 225-229, 1996 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 disc's contact with the blood supply accounts for healing of herniation.

3) Onel,D et. al.: CT Investigation of the effects of Traction on Lumbar Herniation. ***Spine*** 14: 82-90, 1989. 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.

4) Parsons, WB Cumming, JDA: Traction in Lumbar Disc Syndrome. ***Can Med Jour*** 77:7-10,1957. 100 patients with disc syndrome unresponsive to manipulation were treated with high force traction (+801b). 86% of patients had good-excellent outcomes 12 had poor outcomes but most had pain for an extended duration.

5) Saal, JA Saal, JS: Nonoperative Treatment of Herniated Lumbar Disc w/ Radiculopathy. ***Spine*** 14 (4): 431-437, 1989. 58 subjects had an inclusive conservative program including traction (when initially shown to reduce leg symptoms). Overall 86% had good-excellent results.

6) Mathews, JA: Dynamic Discography: A Study of Lumbar Traction. ***Annls of Phys Med***, IX (7), 265-279, 1968. 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.

7) Lidstom, A Zachrisson M: PT of the low back pain and sciatica. ***Scan Joul of Rehab Med***, 2: 37-42, 1970. Intermittent supine traction with -+50% body-weight, (10) 20 minute sessions with added exercises showed considerable improvement in over 90% of the 62 patients.

8) Hood, LB Chrissman, D: Intermittent Traction in the Treatment of Rupture Disc Plays Ther 48: 21, 1968. 40 patients with neurological signs were treated with traction on a friction-free table with 55-701bs for 20 minutes. Good-excellent results were seen in 55%.

9) Mathews JA et. al.: Manipulation and traction for Lumbago and Sciatica. ***Physio Pract*** 4: 201, 1988. A controlled trial of traction with manipulative techniques. Traction force Applied at ~ 100 lbs for 20 minutes leading to substantial relief in over 85%.

10) Colachis S, Strohm BR: Effects of lntermittant Traction on Vertebral Seperation. ***Arch of Phys Med& Rehab***, 50: 251-258, 1969. 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 L5-S 1). The separation was obvious up to T12-L1 with total elongation of the spine approaching +5mm. The vertebra separation is greater on the posterior vs. anterior aspect of the vertebra.

11) Constatoyannis C, et. al.: Intermittent Cervical Traction for Radiculopathy Due to Large-Volume Herniations. ***JMPT***, 25 (3) 2002. Three weeks of the above described traction method to large volume hemiations resulted in complete resolution of symptoms in 4 patients.

12) Shealy N, Leroy P: New Concepts in Back Pain Management. ***AJPM*** (1) 20:239241 1998. 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.

13) 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.

14) Weatherall VF: Comparison of electrical activity in the sacrospinalis musculature during traction in two different positions. ***J Ortho Sports Phys Ther***(8):382-390, 1995. Through the use of EMG electrical activity was shown to be similar in the prone laying position vs. the supine position in a group of patients.

15) Letchuman R, Deusinger RH: Comparison of sacrospinalis myoelectric activity and pain levels in patients undergoing static and intermittent lumbar traction. ***Spine*** 18(10): 1361-1365, 1993 This study was used to determine muscular guarding/contraction of Paraspinals with intermittent vs. static traction. Improved comfort noted in the intermittent traction group.

16) Chin YG, Li FB, Huang CD: Biomechanics of traction for lumbar disc prolapse. ***Chinese Ortho***; Jan(l): 40-2, 1994. 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.

17) Nanno M: Effects of intermittent cervical traction on muscle pain. EMG and flowmetric studies on cervical paraspinals. ***Nippon Med J***; Apr;61(2):137-47, 1994. Cervical intermittent traction was shown to be effective in relieving pain, increasing frequency of myoelectric signals and improving blood flow in effected muscles.

18) Chung TS, Lee YJ et ah Reducibility of cervical herniation: evaluation at MRI during cervical traction with a nonmagnetic device. ***Radiology*** Dec; 225(3):895900,2002. 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.

19) Dietrich Met al: Non-linear finite element analysis of formation and treatment of disc herniation. ***Proc Inst Mech Eng***; 206(4):225-31, 1992. The author's 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%.

20) 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.

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