ALLEVIATION OF RADICULOPATHY BY STRUCTURAL REHABILITATION OF THE CERVICAL SPINE BY CORRECTING A LATERAL HEAD TRANSLATION POSTURE (–TXH) USING BERRY TRANSLATION TRACTION AS A PART OF CBP METHODS: A CASE REPORT

Robert H. Berry, DC[1], Paul Oakley, DC[2], Deed Harrison, DC[3]

[1] *Private Practice, Montour Falls, NY, USA*
[2] *Private Practice, Newmarket, ON, Canada*
[3] *CBP NonProfit Inc., Eagle, ID, USA*

ALLEVIATION OF RADICULOPATHY BY STRUCTURAL REHABILITATION OF THE CERVICAL SPINE BY CORRECTING A LATERAL HEAD TRANSLATION POSTURE (–TXH) USING BERRY TRANSLATION TRACTION AS A PART OF CBP METHODS: A CASE REPORT

ABSTRACT

Objective: To present a case of the restoration upper limb radiculopathy with neck pain in a patient with a prominent lateral head translation posture treated by Berry translation traction as a part of Chiropractic BioPhysics (CBP®) technique.

Clinical Features: A 57-year-old male patient with right arm radiculopathy and neck pain sought care. He had decreased neck flexibility, numbness down his arms, and weakness in his right hand. Digital radiography showed a lateral head translation posture and cervical hypolordosis.

Intervention & Outcome: The patient received CBP® care including mirror image, opposite-sided head translation exercises and traction, as well as spinal manipulative therapy and prone drop-table adjustments. After 12 weeks of care, he reported no neck pain or numbness and had full hand strength. Cervical x-ray showed complete improvement in AP cervicothoracic posture.

Conclusion: We believe that correcting the lateral head shift posture by Berry translation traction decreased the spinal nerve tension in the pons-cord tissue tract, releasing its intermittent impingement and subsequent arm numbness and hand weakness in this patient. (Chiropr J Australia 2017;45:63-72)

Key Indexing Terms: Chiropractic; Posture; Cervical Spine

INTRODUCTION

When Donald D. Harrison applied the standard orthogonal (Cartesian) coordinate system as presented by Panjabi et al (1) to human posture, he found that virtually half of all human movement had not yet been studied (2). All of the translations, other than forward head posture and sagittal balance had not been reported in the literature.

Side-shifted head posture or lateral head translation posture was first reported in the peer-reviewed literature in 2000 (3). Harrison and colleagues quantified lateral head translation posture in a group of 20 normal subjects and found the spinal coupling pattern of an S-configuration in the cervicothoracic spine. The lower cervicothoracic spinal region would laterally flex toward the side of head translation, and the upper cervical spine would laterally flex away from the side of head translation, rebalancing the head to vertical.

Since the source of neck pain remains controversial (4), and little evidence of effective interventions has been determined (5), a factor such as abnormal loading on the spinal tissues that occurs in lateral head translation postures (3) may be a significant structural source of pain origin in those with this posture. The side-shifting of the cervical spine may exert pathological tensions onto the cord and/or nerve roots to elicit neurologic symptomatology.

We hypothesize that restoration of normal symmetry to the cervicothoracic spine by Chiropractic Biophysics (CBP®) procedures in patients with lateral head translation postures and radiculopathy would result in favorable outcomes due to the relationship of the spinal cord to the cervical spine posture.

This report discusses a successful outcome in a 57-year-old male with a lateral head translation posture suffering from radiculopathy and neck pain. H was treated by the Berry head translation traction system as a part of CBP® technique.

CASE REPORT

Clinical Features

A 57-year-old male presented to a spine clinic complaining of neck pain with numbness and tingling down the right arm into the fingertips. He had a long history of motocross racing, and many traumas resulting from that. He reported to use his body physically as he had been a contractor for over 25 years.

The same patient had been treated by one of us many years previously for the same complaint. He had contemplated consultation with a hand surgeon when his wife recommended that he find his former chiropractor. He was most upset because he could barely hold a larger diameter pen to sign checks and sign for building materials due to his loss of grip strength. He stated that he had added tape to his pen to increase its diameter as this eased his ability to grip it.

His blood pressure was 135/82, orthopedic tests were positive for cervical compression as well as for lateral compression tests bilaterally, worse on the right. Shoulder range of motion (ROM) was within normal limits (WNL). Digital cervical ROM (in degrees) was tested and showed: flexion 56 (50N), extension 57(60N), left flexion 49 (45N), right flexion 38 (45N), left rotation 88 (80N) and right rotation 78 (80N).

Hand dynamometer testing showed left hand at 101.4lbs and right hand at 54.0lbs with pain. Numerical rating scale (NRS: 0=no pain; 10=worst pain) was a 6/10, with tingling down both arms into both hands. Average NRS was reported to be 4/10 and worst NRS to be 10/10. The Neck Disability Index (NDI) scored an

18%. He reported his main complaint to be not of pain but of the numbness, tingling and weakness in his right hand.

Posture analysis revealed forward head posture (FHP) (+TzH), a right head translation (-TzH), and a right head tilt (+RzH). It was also noted the patient had a slight left thoracic cage shift (+TxT), a high left shoulder (+RzT), and a right posteriorly rotated pelvis (-RyP).

Radiographic Exam

PA and lateral cervical spine radiographs were taken and measured using PostureRay system (New Port Richey, FL), an assessment system using the Harrison posterior tangent method for lateral images (6-8), and the modified Risser-Ferguson method for AP/PA images (8) (Figures 1 and 2). These analysis methods are both reliable and repeatable (6-8), as is posture (9).

The PA cervico-thoracic view (Figure 1) revealed a right head translation (-TxH: 15mm), a cervico-dorsal (CD) angle at C2-T5 of -2.9°, and an Rz angle from C6-T5 of 4.5°. The lateral view (Figure 2) showed FHP of 40.9mm, an atlas plane line (APL) of -23.7°, and an absolute rotation angle (ARA) of -28.8°.

Intervention and Outcome

The patient committed to a 3-month initial program of care using Chiropractic BioPhysics (CBP®) technique (10-12). The patient was treated on a 3 times per week basis for 12 weeks.

Treatment consisted of full-spine spinal manipulative therapy (SMT), CBP mirror image drop table adjustments, hand-held adjusting instrument paraspinal stimulation, mirror image corrective exercises (Figure 3) as well as mirror image head translation traction (Figure 4).

After 36 treatments over 12-weeks, the patient was re-assessed (9/28/15). The patient reported that his neck pain was reduced to negligible (NRS: 6/10 vs. 0-1/10), and the NDI was also reduced (18% vs. 0%). The digital neck ROM also improved: flexion (56° vs. 72°), extension (57° vs. 71°), left flexion (49° vs. 62°), right flexion (38° vs. 54°) and rotations initially WNL were now 85° on the right and 81° on the left. Hand dynamometer strength testing revealed significant improvement in the initially weak right arm (54.0lbs vs. 111.3lbs); the left arm slightly improved as well (101.4lbs vs. 113.2lbs).

The patient also had a follow-up PA cervical x-ray to assess changes expected from the Berry translation traction (13) (Figure 1, right). Mensuration demonstrated complete reduction of the lateral translation (-TxH: -15mm vs. +3.9mm, reduction of the CD angle (CD: -2.9° vs. -2.2°), and a reduction of the Rz angle (Rz: +4.5° vs. 0°).

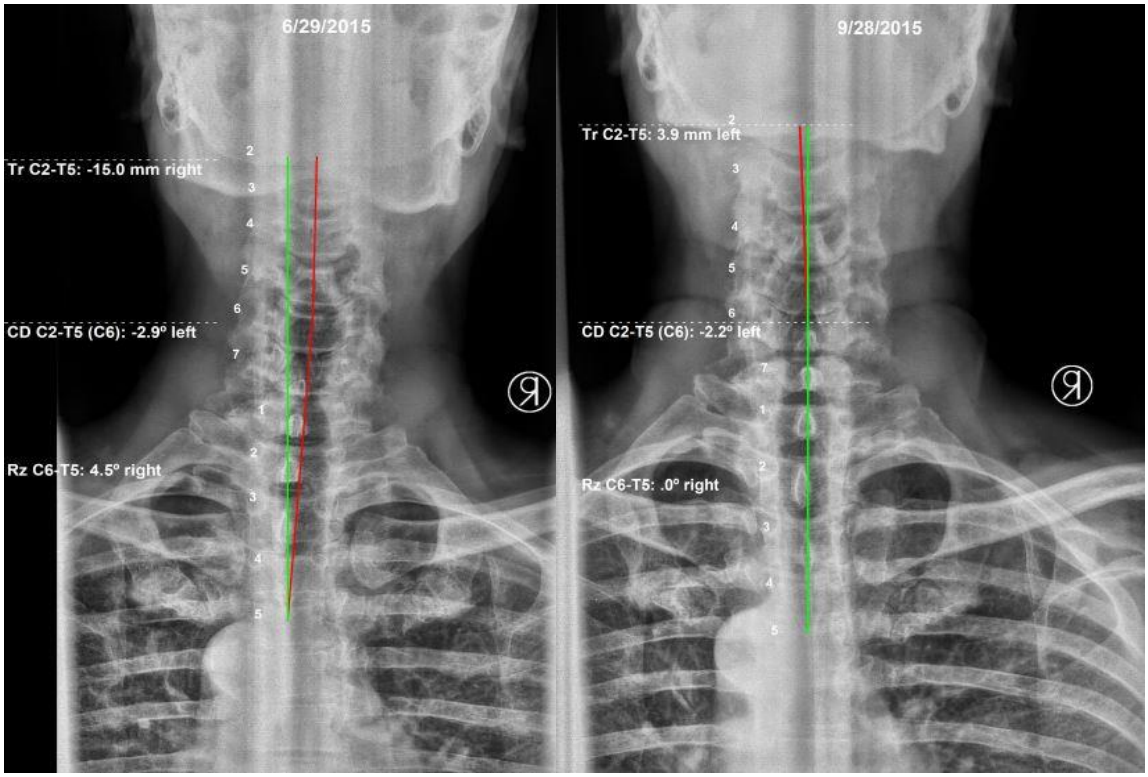

Figure 1. PA radiograph views. Left: Initial view (6/29/2015) demonstrating 15mm right head translation (-TxH), a cervico-dorsal angle (CD) of -2.9°, and a Rz angle of 4.5°; Right: 12-week follow-up (9/28/15) showing reduction of –TxH (3.9mm), decreased CD angle (-2.2°), and decreased Rx angle (0°).

At this time the patient was very satisfied with his symptomatic improvements Stating: “I am glad that I found my chiropractor after all of these years. He saved me from going to a hand surgeon and I have my hands back so I can continue to work.” The patient chose to continue treatment to work on his lateral cervical spine misalignment.

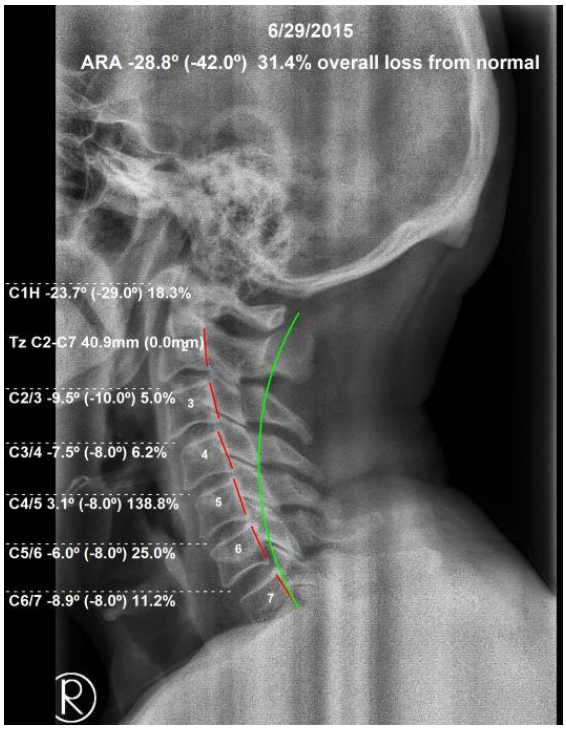

Figure 2. Lateral cervical radiograph (6/29/2015). Alignment shows forward head posture of 40.9mm, atlas plane line of -23.7°, absolute rotation angle of -28.8°.

Figure 3. Mirror image corrective exercise. Patient side-shifts or translates head to the left. Care is taken to not allow the head to tilt or rotate to the left.

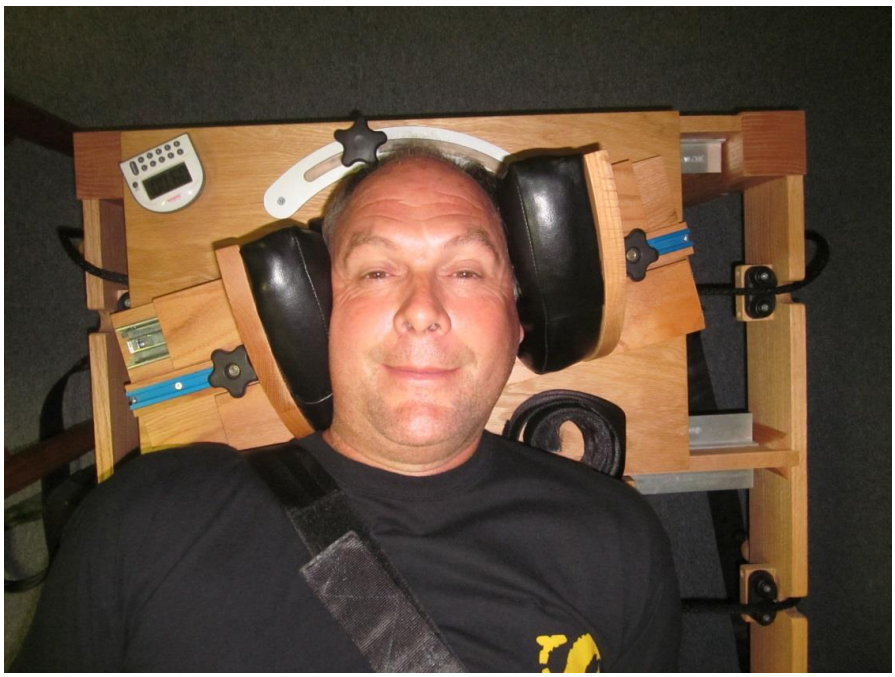

Figure 4. Lateral head translation traction. Patient's head is being over-corrected by being side-shifted or translated to the left of midline. The shoulder strap prevents the right shoulder from raising. The head clamp is rotated to prevent the tendency of the head from tilting to the left.

DISCUSSION

This report documents the successful outcome in a 57-year-old patient with radiculopathy and hand weakness with a lateral head shift posture. The correction of symmetry to the cervical spine alignment by CBP® Berry translation traction methods correlated with improvement in his symptoms.

Oakley and Harrison (14) determined that approximately 50% of patients who present with neck pain and/or headaches have a lateral head shift posture. They also found the older the patient, the longer they had suffered with pain, and the greater their head shifts were. They reasoned that with head shift postures, asymmetrical forces may contribute to a further head excursion from midline, further increasing the forces and contributing to increasing neck pain levels.

According to Harrison (3), the normal lateral head translation ROM from midline in normal subjects is about 30mm. The patient in this case had a presenting lateral head deviation of 15mm, a 50% of total ROM in his neutral resting posture. Harrison et al (15) demonstrated that a population with approximately 15mm of lateral head translation posture having neck pain can have their pains alleviated by correcting this head shift posture by CBP methods.

In a trial by Harrison et al (13), 51 patients with lateral head translation posture were treated by Harrison CBP mirror image postural methods, including manipulation, opposite head posture exercise, and opposite head translation posture traction ('Berry translation traction'). These were compared to a control group of 26 volunteers. Both groups had chronic neck pain and lateral head translation posture. After treatment the patients receiving treatment had an 80% improvement in pain levels corresponding with a 50% correction in posture. There was no change in the control group.

In this case report, there was a 100% correction of posture and a virtual 100% decrease in pain (NRS:6/10 vs. 0-1/10; NDI:18% vs. 0%). This is double the correction than demonstrated in the trial and probably explains why the patient got such good symptomatic results.

Moustafa et al. trial reported on the simultaneous improvement in cervical lordosis in 15 patients with cervical spondylosis and the alleviation of radiculopathy (15,16). The treatment consisted of 30 sessions over a 2.5-month timeframe involving stretching exercises, infrared radiation, as well as a 3-point bending cervical extension traction. The control group consisted of 15 patients treated identically with the exception of not having the cervical spine extension traction. Documentation of pain level, peak-to-peak amplitude of dermatomal somatosensory evoked potentials, and cervical spine flexion-extension kinematic analysis was done initially, after 10-weeks of treatment, and after 3-months at follow-up. Both groups had initial symptom reduction at the end of 10-weeks of treatment, however, the control groups symptoms returned to baseline at the follow-ups. The treatment group receiving the cervical extension neck traction had an increase in lordosis and remained symptomatically improved at the 3-month and at a 2-year follow-up (16).

The resolution of radiculopathy occurring in the Mustafa trial (15,16) may lie in the relaxation in the pons-cord tissue tract. This is because, normal, non-pathological cervical spine flexion causes an 'unfolding' of the cord tissue, referred to as 'physiologic movement (17),' alternatively, when normal movements irritate the neural tissues by exerting compression, tensile, and/or shearing stresses, it causes 'pathologic movement' of cord tissue (18,19).

Harrison et al. (20) argue that it doesn't just have to be pathologic situations (i.e. bulging disc, spondylosis, spinal stenosis, etc.) to cause this neural irritation, but can be caused by abnormal alignment of the spine (aka spinal subluxation). We rationalize that a lateral head translation posture combined with forward head posture, as in our case, may exert a threshold amount of irritation onto the neural tissue to elicit neurologic pathology in the form of radiculopathy. By correcting the head translation posture, the irritation was relieved enough to allow the tissues to heal and allow normal function, and in this case, hand strength to return.

The limitations to this case are that it is only a single case, with no long-term follow-up. Further, multiple treatments were given to the patient, however, exercise alone as well as manipulation to the spine does not routinely correct structural alignment (21-23). The results are consistent with Moustafa et al (15,16) however, and show promise for relieving cervical radiculopathy by correcting the alignment of the cervical spine posture.

CONCLUSION

We believe that correcting the lateral head shift posture by Berry translation traction decreased the spinal nerve tension in the pons-cord tissue tract, releasing its intermittent impingement and subsequent arm numbness and hand weakness in this patient.

REFERENCES

1. Panjabi MM, White AA 3rd, Brand RA Jr. A note on defining body parts configurations. J Biomech 1974;7(4):385-7
2. Harrison DD. Abnormal postural permutations calculated as rotations and translations from an ideal normal upright static posture. In Sweere, JJ. Chiropractic family practice, Aspen Publishers, Gaithersburg, 1992, chap 6-1, p. 1-22
3. Harrison DE, Harrison DD, Cailliet R, et al. Cervical coupling during lateral head translation creates an S-configuration. Clin Biomechanics 2000;15:436-440
4. Rao R. Neck pain, cervical radiculopathy, and cervical myelopathy: pathophysiology, natural history, and clinical evaluation. Instr Course Lect 2003;52:479-488
5. Sarig-Bahat H. Evidence for exercise therapy in mechanical neck disorders. Man Ther 2003;8:10-20
6. Harrison DE, Harrison DD, Cailliet R, Troyanovich SJ, Janik TJ, Holland B. Cobb method or Harrison posterior tangent method: which to choose for lateral cervical radiographic analysis. Spine 2000;25(16):2072-8
7. Jackson BL, Harrison DD, Robertson GA, Barker WF. Chiropractic biophysics lateral cervical film analysis reliability. J Manipulative Physiol Ther 1993;16(6):384-91
8. Harrison DE, Holland B, Harrison DD, Janik TJ. Further reliability analysis of the Harrison radiographic line drawing methods: Crossed ICCs for lateral posterior tangents and AP Modified-Riser Ferguson. J Manipulative Physiol Ther 2002;25:93-98
9. Harrison DE, Harrison DD, Colloca CJ, et al. Repeatability over time of posture, radiograph positioning, and radiograph line drawing: An analysis of six control groups. J Manipulative Physiol Ther 2003;26:87-98

10. Harrison DD, Janik TJ, Harrison GR, et al. Chiropractic Biophysics technique: a linear algebra approach to posture in chiropractic. J Manipulative Physiol Ther 1996;19:525-535
11. Harrison DE, Harrison DD, Hass JW. Structural rehabilitation of the cervical spine. Evanston, WY: Harrison CBP® Seminars, Inc., 2002
12. Oakley PA, Harrison DD, Harrison DE, Haas JW. Evidence-based protocol for structural rehabilitation of the spine and posture: review of clinical biomechanics of posture (CBP®) publications. J Canadian Chiropr Assoc 2005;49:270-296
13. Harrison DE, Cailliet R, Betz J, et al. Conservative methods for reducing lateral translation postures of the head: A non-randomized clinical control trial. J Rehabil Res Dev 2004;41(4):631-9
14. Oakley PA, Harrison DE. The prevalence of lateral head shift postures in a patient population: A correlation of posture magnitude, pain, and demographic variables. J Chiro Ed 2004;18(1):73-74
15. Diab AA, Moustafa I. The efficacy of cervical lordosis rehabilitation for nerve root function, pain, and segmental motion in cervical spondylotic radiculopathy. Physiotherapy 2011;S846-7
16. Moustafa I, Diab AM, Harrison DE. The efficacy of cervical lordosis rehabilitation for nerve root function, pain, and segmental motion in cervical spondylotic radiculopathy: a randomized trial. Proceedings of the WFC 13th Biennial Congress: May 13-16, 2015. p.157
17. Breig A. Biomechanics of the central nervous system. Stockholm, Almquist & Wicksell, 1960
18. Breig A. Adverse mechanical tension in the central nervous system. Stockholm, Almquist & Wicksell, 1978
19. Panjabi M, White A. Biomechanics of nonacute cervical spinal cord trauma. Spine 1988;13:838-42
20. Harrison DE, Cailliet R, Harrison DD, Troyanovich SJ, Harrison SO. A review of biomechanics of the central nervous system--part II: spinal cord strains from postural loads. J Manipulative Physiol Ther. 1999 Jun;22(5):322-32.
21. Hrysomallis C, Goodman C. A review of resistance exercise and posture realignment. J Strength Cond Res 2001;15:385-390
22. Harrison DE, Cailliet R, Harrison DD, Janik TJ, Holland B. A new 3-point bending traction method for restoring cervical lordosis and cervical manipulation: A nonrandomized clinical controlled trial. Arch Phys Med Rehab 2002;83:447-453
23. Hurwitz EL, Aker PD, Adams AH, Meeker WC, Shekelle PG. Manipulation and mobilization of the cervical spine: a systematic review of the literature. Spine 1996;21:1746-1759