



Case Study

Alleviation of chronic spine pain and headaches by reducing forward head posture and thoracic hyperkyphosis: a CBP[®] case report

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Abstract. [Purpose] This case presents the reduction of both forward head posture and thoracic hyperkyphosis in a young male with chronic back pain and headaches by a comprehensive posture rehabilitation program as a part of Chiropractic BioPhysics[®] methods. [Participant and Methods] A 32 year old male presented with constant pain and headaches for seven years since he was involved in a work related injury. He had seen five different MDs, undergone multiple imaging tests, and received multiple prescriptions, thirteen steroid injections and was recommended for a spine surgery that he had denied. He was on long-term disability. Upon comprehensive posture and spine assessment, the patient had exaggerated forward head translation and thoracic hyperkyphosis. The patient was treated 36 times over 13-weeks with cervical and thoracic extension exercises, traction, and manipulation. [Results] After treatment the patient reported dramatic improvement in symptoms as indicated on valid disability questionnaires and substantial improvements in posture. [Conclusion] Posture-related pain and disability is not often addressed in allopathic medicine but substantial posture improvements are achievable in short time periods as this case illustrates. Poor postures in young patients should be corrected to avoid long-term consequences. Radiography as used in spinal rehabilitation is safe and reliable.

Key words: Thoracic kyphosis, Anterior head translation, Posture rehabilitation

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INTRODUCTION

Deterioration of upright posture has been observed to occur with aging¹⁻⁵⁾. A common postural pattern is the forward shift of the head (anterior head translation: AHT) and the progressive slouching of the upper and middle back termed thoracic hyperkyphosis (THK)⁶⁾.

THK is a serious diagnosis as it is associated with many deleterious health outcomes such as early death⁶⁻¹⁰⁾, pain¹¹⁾, altered gait¹²⁾, compression fractures^{6, 13)}, and reduced quality of life^{14, 15)}. When this postural pattern is seen in the younger patient, it is particularly concerning, as the normal (untreated) prognosis is a worsening of spinal deformity and onset of associated disease. Debra Kado, MD, has termed THK as a syndrome in its own right¹⁶⁾.

The early diagnosis and treatment of THK is essential in the prevention of the otherwise associated typical poor health outcomes. Several clinical trials and case reports have documented the successful non-surgical reduction of THK in patients¹⁷⁻²⁶⁾. These methods primarily involve back extension exercise regimens, and more recently thoracic extension traction methods²³⁻²⁶⁾.

This case presents the reduction of both AHT and THK in a young male with chronic back pain and headaches by a combination of cervico-thoracic extension exercises and traction methods as a part of Chiropractic BioPhysics[®] (CBP[®]) methods.

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Table 1. SF-36. Scores out of 100

Date	Health perception	Physical functioning	Role-Physical	Role-Emotional	Social functioning	Mental health	Bodily pain	Energy/fatigue
Normal	72	84	81	81	83	75	75	61
8-30-17	50	50	0	33	50	48	45	20
11-08-17	77	90	75	100	100	60	55	40
12-06-17	87	90	100	100	100	76	78	70

PARTICIPANT AND METHODS

A 32 year old male presented reporting to be in constant pain for seven years since he was involved in a work related injury where his truck rolled over on a county road. He had undergone multiple CT scans, X-rays, and MRI imaging, and had seen five different MDs regarding his chief complaint of severe mid back pain. He received multiple pain medicine prescriptions, thirteen steroid injections and was recommended for a three level fusion in the thoracic spine that he had denied. He ended up on long-term disability when he presented to our spine clinic.

The patient's primary complaint was severe middle back pain. He also suffered from neck pain, low back pain, daily headaches, and dizziness. The patient reported the mid back pain to average a 5/10 (0=no pain; 10=worst pain ever) and could be an 8/10 at worst, scored a 38% on the neck disability index (NDI)²⁷, and a 28% on the headache disability index (HDI)²⁸. The patient also scored poorly on many categories on the RAND quality of life questionnaire (SF-36)²⁹ (Table 1).

Range of motion assessment showed reduced cervical bilateral bending as well as cervical extension was within normal limits (WNL) but produced pain. The patient demonstrated weak cervical flexion (4/5) as well as had positive cervical compression, maximum bilateral foraminal compression, bilateral Hibbs, and bilateral Yoemans tests. Handgrip strength was 30 kgs on the left and 28.6 kgs on the right. Visual posture assessment revealed a prominent forward head posture (anterior head translation: AHT), a thoracic hyperkyphosis and a forward flexed thorax.

Cervical radiographs were taken and analyzed using the PostureRay system (Trinity, FL, USA). This system uses the Harrison posterior tangent method to measure sagittal images³⁰⁻³³ and is repeatable and reliable as is standing posture³⁰⁻³⁴. The patient had a prominent AHT (38.2 mm vs. 0-15 mm normal³⁵), loss of cervical lordosis having an absolute rotation angle (ARA) between C2-C7 of -12.4° (vs. -31-42° normal^{35, 36}); negative indicates extension), and an atlas plane line (APL) of 0.3° (vs. -24-29° normal^{35, 37}) (Fig. 1). The patient also had a prominent hunched posture with thoracic hyperkyphosis (T1-T12=55.2°; normal=43.7°³⁸) and an anterior thoracic sagittal balance (T1 anterior to T12) of 43.3 mm (vs. 0 mm ideal) (Fig. 2).

The patient was treated by CBP posture correcting methods³⁹⁻⁴¹ that incorporates mirror image[®] concepts aimed to reduce the AHT and THK. Specifically, CBP technique incorporates traction methods that hyper-extend the spine (i.e. cervico-thoracic area) in order to create permanent stretching or creep-deformation of the anterior longitudinal ligament, discs and soft tissue elastic structures in order to make spine and postural improvements^{42, 43}.

The patient was seen approximately three times a week for 12 weeks, totaling 36 rehabilitation visits. Mirror image exercises were done on a power plate (Northbrook, IL, USA) for 10 minutes to warm the body up and to increase the intensity⁴⁴. Exercises consisted of neck extensions against resistance using the Prolordotic (Circular Traction Supply Inc., Huntington Beach, CA, USA) (Fig. 3). Anterior thoracic translation exercises both by retracting the head and pelvis with the thorax positioned on a block against the wall and by facing the wall with a block placed at the pelvis against the wall (Fig. 4). Foam rolling to the mid thoracic spine area would proceed the exercises. Each exercise was done for approximately three minutes.

The patient was given spinal manipulative therapy to mobilize the spinal joints as well as mirror image drop table postural maneuvers to stress posterior translation of the head as well as extension of the thoracic spine; that is the head piece was elevated positioning the head posterior to the thorax and the thoracic drop-piece mechanism would be engaged to jar and stimulate the cervico-thoracic joints in the over-corrected position.

The patient did spinal traction in a supine UTS (Universal Tractioning Systems, LLC., Las Vegas, NV, USA) strapping the femurs down and pulling up (anteriorly) at T9, allowing the head to extend and retract (Fig. 5). The patient was also given a daily home care regimen of first foam rolling, 100 repetitions of the above mentioned exercises, and traction using a thoracic Denneroll™ (Denneroll Spinal Orthotics, Wheeler Heights, NSW, Australia) placed at T9 for up to 15 minutes. The patient gave verbal and written consent for the publication of these results.

RESULTS

Upon re-assessment (12/6/17) the patient reported to be 90% improved for the primary complaint of mid back pain as well as headaches and dizziness. He reported his back pain to average 1/10 and the scores on the NDI and HDI were 4% and 0%, respectively. SF-36 scores were significantly improved; in fact initially the patient was below normal on all health indices and

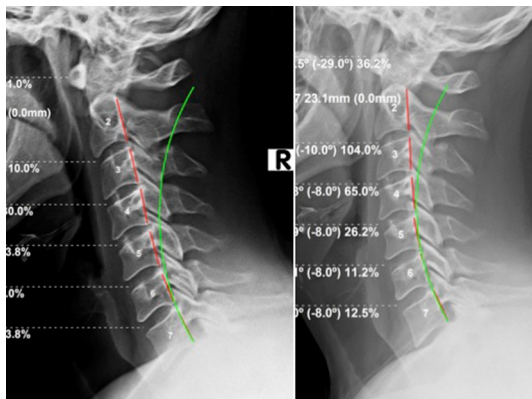


Fig. 1. Lateral cervical radiographs. Left: Initial (8/28/17); Right: Follow-up (12/6/17). Green line indicates normal ideal cervical lordosis; red line highlights patient posterior vertebral body margins (CBP Seminars, Inc.).

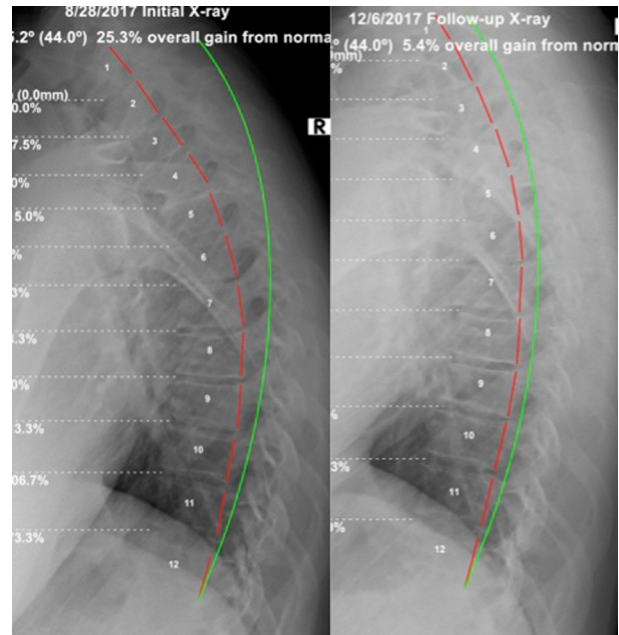


Fig. 2. Lateral thoracic radiographs. Left: Initial (8/28/17); Right: Follow-up (12/6/17). Green line indicates normal thoracic kyphosis; red line highlights patient posterior vertebral body margins (CBP Seminars, Inc.).

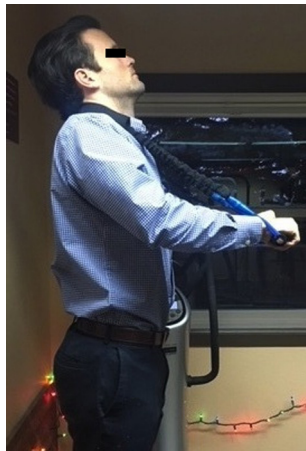


Fig. 3. Cervical mirror image hyperextension exercise.



Fig. 4. Thoracic extension exercises. Left: Patient is anteriorly translating their thorax towards the wall and extending the head; Right: Patient is simultaneously retracting their head and pelvis towards the wall.

after treatment was above normal for all (Table 1).

Visually, the patient’s posture was much improved and all orthopaedic tests were WNL except he demonstrated a positive Hibbs on the left and had reduced right lateral flexion of the cervical spine. His handgrip strength improved on the left to 34 kgs (29.5 kgs on right).

Radiographic analysis showed an improved AHT (23.1 mm vs. 38.2 mm), APL (-18.5° vs. 0.3°), increased cervical lordosis (-22.4° vs. -12.4°), reduced thoracic kyphosis (46.4° vs. 55.2°), and improved thoracic sagittal balance (T1–T12: 9.3 mm vs. 43.3 mm).



Fig. 5. Traction set-up. Patient's thoracic spine is being forced into extension by pulling strap, and the head is allowed to be pulled by gravity backwards.

DISCUSSION

This case demonstrates the resolution of chronic back pain and daily headaches with the improvement of posture and reduction of AHT and THK. The treatment was performed over 13-weeks and valid disability and quality of life questionnaires documented the dramatic health improvements.

As mentioned, THK should be considered its own 'syndrome¹⁶⁾'. Kado refers to it being a 'geriatric syndrome' because of its association with a plethora of future dire health consequences⁶⁻¹⁶⁾. When this posture is diagnosed in a younger individual, as in this case, it may be more serious. This is because posture tends to deteriorate over time¹⁻⁵⁾, so the worse ones posture is at a younger age, the greater potential for worsening. Thus, we concur with Jaeger et al. who suggest that the correction of this deformity should be achieved earlier rather than later²³⁾.

Since spinal pain and headache is associated with deviations of spinal posture⁴⁵⁻⁵¹⁾, the preservation of upright posture and spine alignment should be the goal for patients having back pains and/or headache. The CBP methods utilized in this case are well studied⁵²⁻⁶⁴⁾, and extension type traction and exercise procedures should be incorporated into rehabilitation programs for those suffering from THK and AHT.

It should be mentioned that radiographs were used to document the severity of the posture and spine alignment³⁰⁻³³⁾. The Harrison posterior tangent method (lines along the posterior body margins) is repeatable and reliable and has an error margin that is less than 2 mm and 2 degrees rendering the method an exceptional technique to quantify spine alignment. X-rays are the preferred method of assessing body posture as the internal spine alignment is not visualized by other means, for example, by photography. Further, because THK is commonly associated with vertebral compression fracture^{6, 13)}, definitive knowledge of the presence of fracture is important for 'correction potential' as fractures of course, would limit the amount of posture/spine improvement.

There is a current push in medicine for the decrease of imaging that involves radiation for fear of future cancers⁶⁵⁻⁶⁷⁾. This effort is futile however, as all cancer risks are estimated based on a faulty linear model (linear no-threshold model: LNT), and it does not consider the healing faculties of the body⁶⁵⁻⁷⁰⁾. It has been a hotly debated topic, but recently there have been calls for the elimination of the LNT model as used in radiation safety as it is argued that there is actually no data that exists to support that low-dose radiation as used in radiography will ever contribute to future cancer development⁶⁵⁻⁷⁰⁾. Thus use of radiography for spine and posture assessment and quantification is a reliable and safe practice. Practitioners and patients should not be dissuaded from radiographic imaging based on unfounded fears.

A limitation to this case is the lack of a long-term follow-up. Further, multiple treatments were given during treatment, thus it is unknown which aspect of the treatment was most responsible for the posture improvements; although based on previous studies it seems that extension traction of the spine results in structural posture improvements⁵⁷⁻⁶⁴⁾, exercises may also contribute to improving THK¹⁷⁻²²⁾. Further research into non-surgical rehabilitation approaches to reversing AHT and THK need to clarify these issues.

Conflict of interest

PAO is paid by CBP NonProfit, for writing the manuscript; DEH teaches chiropractic rehabilitation methods and sells products for patient care as used in this manuscript.

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