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Case Study

Correction of pseudoscoliosis (lateral thoracic translation posture) for the treatment of low back pain: a CBP® case report

Monica Henshaw[1)], Paul A. Oakley[2)]*, Deed E. Harrison[3)]

[1)] Private Practice, UK
[2)] Private Practice: Newmarket, ON, L3Y 8Y8, Canada
[3)] CBP NonProfit, Inc., USA

Abstract. [Purpose] To present the case of a total reduction of pseudoscoliosis spinal deformity in an adult female suffering from recurrent back pains. [Participant and Methods] A 29 year old female suffering from recurrent back pains was diagnosed with lateral thoracic translation posture; aka pseudoscoliosis. The patient was initially given 12 treatments of relief care including spinal manipulative therapy, then another 24 treatments receiving the same plus mirror image® translation traction and exercises. [Results] The patient achieved a complete reduction of the lateral thoracic translation posture (pseudoscoliosis) as indicated on a post-treatment radiograph after 36 total treatments. Most orthopedic tests became normalized and the patients back pains were significantly improved after the correction of posture, but only slight improvements after the initial 12 sessions of manipulative therapy only. [Conclusion] Pseudoscoliosis is structurally reducible by use of CBP® mirror image® lateral translation traction methods and exercises and led to the resolution of back pains in this case. The diagnosis of pseudoscoliosis as opposed to true scoliosis is very important and likely underdiagnosed in common practice. Upright radiographic imaging is essential to differentiate these two spinal disorders and offers no harm to the patient. Comprehensive assessment including routine use of x-ray is recommended to differentiate between spinal disorders.
Key words: Pseudoscoliosis, Low back pain, Lateral thoracic translation

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INTRODUCTION

In the early 1980s, Don Harrison[1, 2)] applied the orthogonal Cartesian coordinate system to the analysis of body posture as Panjabi[3)] proposed for articulating joints in biomechanics research. Thus, the human frame can be evaluated as rotations and translations of the main body segments, the head, thorax, and pelvis (Fig. 1)[1, 2)].

This led to the unique approach to spine and posture rehabilitation methods as the mirror image or mathematically unique inverse functions[1)] of a patient's presenting postural alignment in rotations and translations and serves as the means to correct various deformities as applied clinically in Chiropractic BioPhysics® (CBP®) technique[1, 4)].

Pseudoscoliosis was presented in the literature in 2006 by Harrison et al.[5)] and is actually a lateral thoracic translation (side shift) posture; however, to the uneducated observer it likely would be labeled as 'scoliosis'. The difference between true scoliosis and lateral thoracic translation posture is the presence or absence of vertebral rotation[5, 6)]. Scoliosis is defined as a Cobb angle of 10° or greater with rotation of the individual vertebra[7)]. Lateral thoracic translation posture may demonstrate a Cobb angle greater than 10° but it will not have vertebra rotation, and it will also demonstrate an asymmetric, laterally displaced thoracic spinal position[5, 6)].

Differentiating true scoliosis from pseudoscoliosis is clinically important, as treatment approaches will vary dramatically.

*Corresponding author. Paul A. Oakley (E-mail: docoakley.icc@gmail.com)

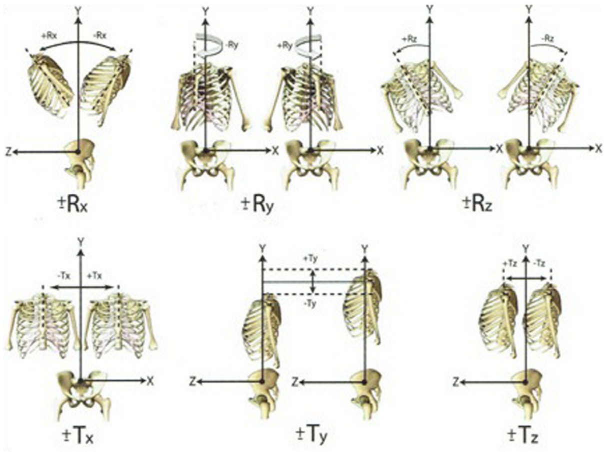

Fig. 1. Harrison's rotations and translations of the thoracic in relation to the pelvis. (Picture courtesy of CBP Seminars).

Correction of pseudoscoliosis is straightforward and more amenable to correction then true scoliosis[8]. We present the correction of a pseudoscoliosis on an adult female suffering from back pains.

PARTICIPANT AND METHODS

On 10/17/17, a 29 year old female presented with low back pain (LBP). She was 170 cm in height and 70 kg in weight. She reported to have a history of cervical and LBP after a previous motor vehicle collision, and that the recent episode began since she stopped going to the gym. The LBP was described as shooting, achy, numb, tingling, and there were no specific aggravating factors. Relief was only attained with a weekly sports massage. She reported to have been previously diagnosed with a 'disc bulge' four years previously by an MD at the hospital.

Upon assessment the lumbar range of motion (ROM) was limited in flexion, right lateral bending caused pain into the left sacroiliac joint, and extension was normal but painful over the lumbosacral area. Faber test was limited slightly bilaterally, Kemps test was positive, straight leg raiser test was positive bilaterally at 70° and demonstrated hamstring tightness, deep tendon reflexes showed a 1+ bilaterally for the achilles and patellar reflexes, and dermatome and myotome testing were unremarkable. The patient rated her pain as a 4/10 on average and an 8/10 at worst on the numerical pain rating scale (NPRS: 0=no pain; 10=worst pain ever). The patient scored a 26% on the revised Oswestry low back pain disability questionnaire (ODI), indicating 'moderate diability'[9].

Radiographic assessment was done for the lumbar spine. The images were digitized and analyzed using PostureRay (Trinity, FL, USA). This method uses the Harrison posterior tangent method for lateral images[10–12], and the modified Risser-Ferguson for antero-posterior (AP) images[13], which are repeatable and reliable methods of analysis[10–13], as is standing posture[14]. The AP lumbar image showed a 20.3 mm left thoracic translation (as measured as the horizontal distance from the estimated center of mass of L1 to a vertical line from the second sacral tuberosity)[6] (Fig. 2). This lateral displacement of the thorax produced a lumbodorsal angle (LDA=angle between best fit line of upper and lower lumbar estimated centers of mass) of 1.7° (normal=0°) and a lumbosacral angle (LSA=angle between best fit line of lower lumbar estimated centers of mass with a line across the sacral base) of −82.0° (normal=90°) (Fig. 2). The lateral lumbar view showed an absolute rotation angle (ARA) hypolordosis (L1–L5 ARA=27.2° vs. 40° normal[15]).

Between 10/18/17 and 11/14/17, the patient had 12 sessions of mostly 'relief care' consisting of full-spine, spinal manipulative therapy (SMT), and mirror image right-sided thoracic translation exercises were added for treatments 7–12. Full CBP corrective care including all previous procedures as well as right-sided thoracic translation traction (Fig. 3) was performed for the final 24 sessions (treatments 13–36) from 11/15/17 to 1/23/18. A re-assessment and follow-up x-ray was performed on 2/25/18, one month after ending care because the patient went on a month's vacation.

Mirror image exercises were right thoracic translation shifts, these were held for 5–10 seconds, and three sets of 15 repetitions were performed. It was recommended for the patient to work up to doing 100 repetitions at home as well. CBP traction consisted of lateral translation traction performed in a standing position for 10 minutes each session (Fig. 2). Lateral pulling pressure was to patient tolerance. Treatment frequency was approximately three times per week throughout care. Even though the patient went on vacation and the final assessment and x-rays were performed a month after cessation of treatment, it is unlikely this affected the outcome as it is difficult to change the structural alignment of the spine without spine-specific protocols[1, 2, 4, 8]; as well the patient reported to feel much improved prior to the vacation. The patient consented to the publication of this report including any radiographs and pictures.

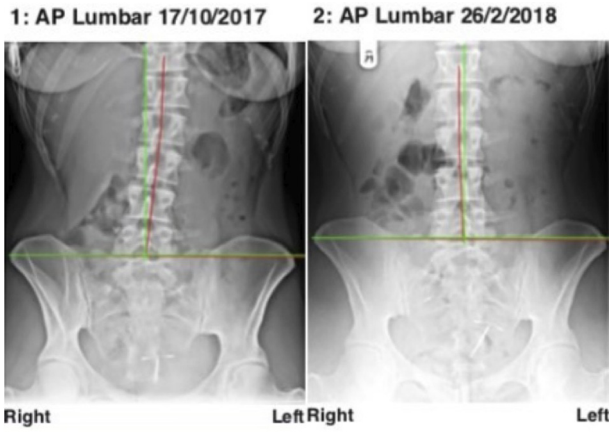

Fig. 2. Anteroposterior lumbar radiographs. Left: Initial (10/17/17) demonstrating a 20.3 mm left lateral thoracic translation 'pseudoscoliosis' posture; Right: Follow-up (2/25/18) demonstrating complete reduction of deformity.

Fig. 3. Traction set-up. Lower 'securing' strap holds patient hips to stand-up unit; upper 'pulling' strap located at lower ribs pulls horizontally to the right (opposite or mirror image of patient deformity).

RESULTS

After the first 12 treatments the patient was assessed but not x-rayed. The patient continued to display initial positive orthopedic tests with the exception that there was no more pain upon right lateral bending. Re-assessment after treatments 13–36 corrective traction and continuing previous treatments demonstrated a complete reduction of spinal deformity (pseudoscoliosis= −5.6 mm vs. 20.3 mm; LDA=−1.5° vs. 1.7°; LSA=87.9° vs. −82°) (Fig. 2). The patient reported to have a significant reduction in back pain, all orthopedic tests were normal except straight leg raiser was positive bilaterally indicating tight hamstrings. NPRS was rated a 2/10 on average and a 4/10 at worst (vs. 4–8/10), the ODI score was a 16% (vs. 26%), indicating 'minimal disability.'

DISCUSSION

This case illustrates the minimization of LBP and complete reduction of pseudoscoliosis in a 29 year old female. The post-radiograph was also taken one month following the last (36th) treatment verifying that the postural correction was stable.

In a non-randomized clinical control trial, Harrison et al.[8] demonstrated that in 36 treatment sessions using CBP corrective methods, a 50% average improvement (8 mm) occurred over an 11.5-week timespan in a sample of 63 patients with psuedoscoliosis. In a case by Oakley et al.[16] a 35 year old male achieved a complete correction of a 16 mm pseudoscoliosis in 12-weeks resulting in resolution of LBP not achieved after recent laminectomy surgery; a 9-month follow-up demonstrated stability of both the spinal correction and patient wellbeing. This patient had a 26 mm change (5.6 mm over-correction) after 30 treatments utilizing corrective exercises and only 24 treatments including mirror image traction, 36 treatments overall including SMT.

The current patient was not treated for lumbar hypolordosis, so still having an ODI score of 16% is probably resulting from this[14] and the patient should next be treated with CBP lumbar extension traction to increase the lordosis[17, 18]. Regardless, this case clearly demonstrates the benefit to this patient by correcting the frontal plane pseudoscoliosis deformity.

It should be mentioned that this case was straightforward in the sense that application of mirror image lateral thoracic translation exercises and traction methods resulted in complete correction of the coronal plane spinal deformity. Scoliosis treatment is more difficult, with outcomes rarely resulting in complete deformity reduction. The differentiation between true scoliosis and pseudoscoliosis can only be determined by x-ray (i.e. standing MRI is sparsely available, very expensive and not practical). The issue of radiation exposure and its potential risks comes to the forefront in relying on imaging that exposes patients to radiation exposures[19].

Although a much larger topic than can be thoroughly discussed, it must be realized that radiogenic cancer risk estimates from radiographic imaging are falsely based on the linear no-threshold (LNT) model or assumption[20]. This model is now outdated and inaccurate; with it falls the medical radiation safety slogan 'ALARA' (As Low As Reasonably Achievable)[21–23]. This is because the underpinnings of the LNT model are based on atomic bomb data that assume a linear relationship of exposure to risk from high-dose data extrapolated down to zero, but there is no data in the low-dose range as in given by x-rays that supports the LNT[24, 25]. In fact, radiation exposures from x-rays are less than the average annual and inescapable background radiation levels and offer negligible exposures to which there is no data suggesting these low-dose exposures are harmful[26].

Limitations to this case are that it is only a single case and there is no long-term follow-up. Another limitation is that there was no diary to track home exercise, the patient was only asked each visit, it is assumed the patient was honest stating her compliance, though this assumption is an obvious limitation. Further research needs to done on this posture as it has only been sparsely investigated and is very clinically relevant in the treatment of scoliosis vs. psuedoscoliosis thoraco-lumbar spinal disorders.

Conflict of interest

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

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