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Case Study

Resolution of temporomandibular joint dysfunction (TMJD) by correcting a lateral head translation posture following previous failed traditional chiropractic therapy: a CBP® case report

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Abstract. [Purpose] To present the case of the resolution of right temporomandibular joint dysfunction (TMJD) following the correction of a right lateral head translation posture. [Subject and Methods] A 24 year old female reported facial pain and jaw clicking in the right TMJ. Radiography revealed a 19 mm right head (shift) translation posture. TMJ vibration analysis showed characteristic abnormalities for the right TMJ. The patient was treated with CBP® technique mirror image® left sided exercises, and traction methods as well as spinal manipulative therapy (SMT). [Results] After 36 treatments over a 12-week time period, a complete correction of the lateral head posture was achieved corresponding with a complete resolution of jaw pain and clicking. TMJ vibration analysis demonstrated normal right side TMJ characteristics following treatment. [Conclusion] Abnormal head/neck postures, such as lateral head translation, may be an unrealized source of TMJD and may be explained through the 'regional interdependence' model or by how seemingly unrelated anatomy may be associated with a primary complaint.
Key words: TMJD, Head translation, CBP

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INTRODUCTION

Temporomandibular joint disease/dysfunction (TMJD) is a term relating to the presence of pain and dysfunction of the jaw joint and muscles of mastication and may involve jaw or muscle pain, malocclusion of the TMJ, and sounds such as clicking with jaw movements[1]. Although not life-threatening, TMJD can affect a patient's quality of life as it may be difficult to manage[2].

TMJD affects 20–30% of the adult population[3] with more females being affected[4]. Common treatments for TMJD include provision of occlusal splints, pain medication and psychosocial interventions, although there is no universal or standard treatment. TMJD is thought to be multifactorial, but these factors are poorly understood[5].

It has been hypothesized[6, 7] and demonstrated[7] that cervical postural deviations are correlated with TMJD through the muscles of the stomatognathic system. Specifically, both forward head posture and cervical spine alignment are found to be implicated in TMJD[8–10]. We hypothesize that any head deviation, including a lateral translation posture may affect the biomechanical integrity of the TMJ and cause TMJD. We also hypothesize that the correction of lateral head posture would alleviate TMJD.

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Postural correction is possible and has been proven to be effective by the Chiropractic BioPhysics® (CBP®) approach[11–13]. This technique was invented by Dr. Don Harrison in the 1980s, and incorporates the application of mirror image® exercises, adjustment techniques and traction methods to restore proper alignment of the spine and posture. These methods have been substantiated in many clinical trials[14–26].

We present the case of a female patient suffering from TMJD who was treated with Chiropractic BioPhysics® (CBP®) mirror image® protocols for a prominent right lateral head translation posture.

SUBJECT AND METHODS

A 24 year old female dental assistant presented complaining of chronic right TMJ pain and clicking. She also reported a history of thoracic spine pain, headaches (1–2 per week), and asthma. She had been under traditional chiropractic care all her life (i.e. spinal manipulative therapy −SMT).

Upon assessment she reported that her thoracic pain was a 4/10, rising to a 6/10 at worst (0=no pain; 10=worst pain ever), she scored a 16% on the general pain index questionnaire (GPI), and a 14% on the neck disability index questionnaire (NDI).

Radiographic assessment was performed for the cervical spine and was analyzed using the PostureRay system (Trinity, FL, USA). This system uses the Harrison posterior tangent method for lateral images[27–30] and the modified Risser-Ferguson method for anteroposterior (AP) images[30]. These methods are repeatable and reliable[27–30], as is posture[31].

The AP cervical image showed a prominent right head translation of 19mm, a cervicodorsal (CD) angle (the angle of best fit lines between upper and lower CD spine) of 6.2° to the left, and an 'Rz' angle (rotation angle about the z-axis of the lower line to the vertical) of 6.8° to the right[32] (Fig. 1).

The patient was diagnosed with cervical subluxation, TMJD, and cervicocranial syndrome and began treatment by CBP structural rehabilitation protocol[11–13]. The goal was to treat the symptoms by correcting the structural spinal misalignment. CBP typically involves the 'E-A-T' approach; that is, corrective Exercises, Adjustments and Traction procedures[11–13]. By 'corrective,' specific mirror image methods are used. The exercises prescribed in this case were one-sided, left head translations. SMT was also provided.

The patient's traction involved a left-sided translation and tilt in a seated position, where padding was used to relieve traction pressure from the jaw (Fig. 2). As the patient better tolerated this procedure, she was graduated to a right side-laying position where the head and neck was leveraged against an angled block, again stretching the head and neck into the mirror image, or to the left (Fig. 2). Traction duration was 15 minutes at each session. All treatments were performed by either JOJ or RRM corresponding to 13 years and the first year of practice, respectively, at the time the patient presented to the office in 2012.

The patient's dentist performed a TM joint vibration analysis (JVA) and determined the affected right joint to have a vibration signature consistent with TMJD characteristics (Fig. 3). JVA is superior over traditional, subjective palpation and auscultation testing as it is an objective assessment based on the principles of motion and friction. Normal TMJ joint motion produces very little friciton and almost no vibration, however, mechanical displacements in the TMJ will produce greater friction and vibration that can be quatified by JVA. The patient gave verbal and written consent for the publication of these results.

RESULTS

Assessment after 36 treatments revealed the patient scored a 2/10 for thoracic pain, 2% on the GPI, 2% on the NDI, and reported her jaw pain essentially gone, bothering her only very rarely. The follow-up AP cervico-thoracic radiograph indicated the right head translation was completely reduced (1.3 mm vs. 19mm) and the corresponding spinal angles were also reduced approximating the vertical axis with a CD angle of 2.8° to the right (vs. 6.2° to the left), and an Rz angle of 1.7° to the left (vs. 6.8° to the right) (Fig. 1).

The dentist re-tested the patient with the TM JVA and determined that the right TMJ pattern characteristics were unremarkable, meaning the joint had little vibration as the friction dynamics were normalized following the treatment (Fig. 3).

DISCUSSION

This case demonstrates a near complete resolution of TMJ disorder in a patient by correcting a right lateral head translation posture. This is the first case of its kind, and we believe it may be one potential under-diagnosed cause of TMJD.

There is a limited amount of literature on the lateral head translation posture. Don Harrison first presented postures as rotations about, and translations along, the orthogonal Cartesian coordinate system[33] consistent with Panjabi's orientation of the axes suggested for individual joints[34]. This was the first formal recognition of this postural deviation.

Oakley and Harrison[35] determined that approximately 50% of patients who present with neck pain and/or headaches have a lateral head translation posture. They also found that the older the patient was, the longer they had suffered with pain, and the greater their head deviations 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.

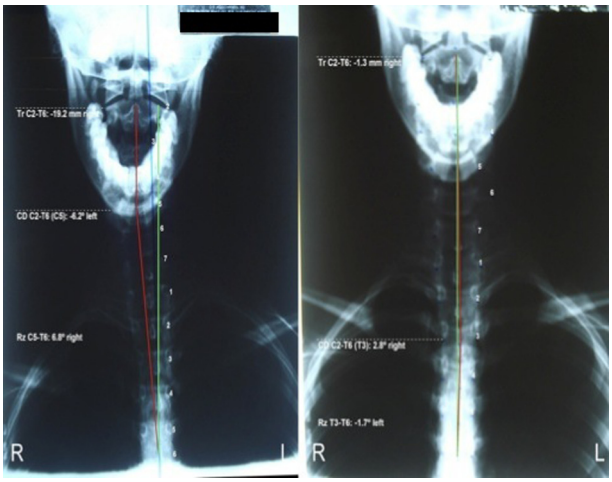

Fig. 1. Left: Initial AP radiograph showing a 19.2 mm right head translation with a corresponding 6.2° CD angle to the left, and a 6.8° Rz angle to the right; Right: A 1.3 mm right head translation with a 2.8° CD angle to the right and a 1.7° Rz angle to the left.

Fig. 2. Patient traction.
Left: Patient initiated left sided head/neck traction in seated position, her left shoulder is braced against secure support, the head is pulled by pulley system; Right: Patient graduated to more aggressive traction; the natural body weight is forcing head and neck to the left, leveraged on firm block, the rest of the body is supported in a neutral position.

There has been one clinical trial and three case reports on the correction of lateral head translation posture by CBP methods[22, 36–38]. Harrison et al.[22] reported an 80% reduction in pain levels corresponding to a 50% reduction in lateral head posture in 51 chronic neck pain subjects (average 37 treatments over 12.8 weeks) as compared to a control group of 26 volunteers who had no treatment, no posture correction, and no symptom relief.

Oakley and Harrison[36] reported a 50% reduction of right head translation posture in a 56 year old patient suffering from chronic neck pain and headaches having previous cervical spine fusion surgery. This patient's symptomatic relief was clinically dramatic, achieved in only 25 treatments over two weeks, and retained at an 11.5 year follow-up. Berry, Oakley and Harrison[37] presented a case demonstrating the complete reduction of a right head translation posture that alleviated a 57 year olds' cervical radiculopathy after 36 treatments over a 12-week time period. The same authors[38] also reported on the complete reduction of a right lateral head translation and resolution of headaches and neck pain in a 55 year old after 36 treatments over a 12-week time period.

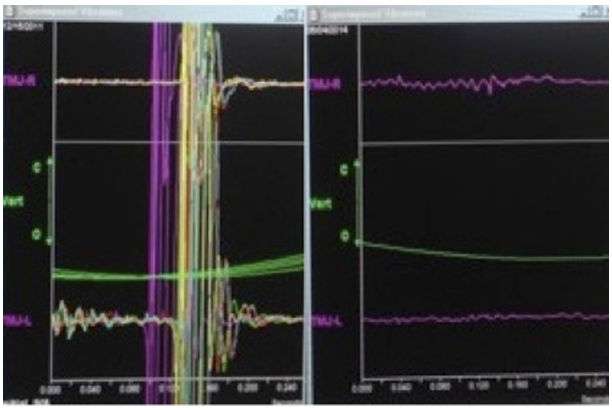

Fig. 3. TMJ vibration analysis.
Left: Abnormal vibration characteristics representative of TMJD; Right: Normal vibration characteristics after treatment.

Harrison et al.[32], testing a group of student volunteers, discovered that the normal lateral head translation range of motion is about 50 mm from midline (100 mm bilaterally). The patient in this case had 19 mm of lateral head translation. Although a 40% of maximum lateral head translation may not seem significant, only 14 mm of lateral head translation posture may contribute to chronic neck pains[22] (the average deviation in 51 chronic neck pain patients in the Harrison trial).

It is postulated that lateral asymmetry in head and neck posture will biomechanically exert corresponding asymmetrical stresses and strains onto the anatomically related tissues, including the TMJ, and that these pathologic tissue stresses may contribute to pain and dysfunction such as neck pain, headache and TMJD. This hypothesis is supported by the fact that the TMJD was relieved with restoration of the coronal head and neck symmetry. Further, the TM JVA confirmed the restoration of normal joint function following treatment.

The successful outcome in this patient is consistent with the concept of 'regional interdependence (RI)[39].' RI is a new clinical model of musculoskeletal intervention (and assessment) that has the underlying premise that "seemingly unrelated impairments in remote anatomical regions of the body may contribute to and be associated with a patient's primary report of symptoms[39]."

Abnormal postures will always exert abnormal stresses/strains onto related anatomical tissues[40–43]. This is why with

more research, we hypothesize that posture (or the absence of good posture) will prove to be implicated in a plethora of human disease states not previously considered. Recent evidence is adding support for the RI concept[39]. RI may explain why treatment for TMJD continues to be varied and outcomes often unsuccessful, as a dentist/treating doctor would attempt to treat TMJD by focusing on the affected TMJ exclusively, while ignoring the greater picture of abnormal posture as a potential cause of the TMJD as explained by the RI model and illustrated in this case.

The present case is limited by being a single case. Further, there is no long-term follow-up. Another limitation is that, although we are assuming the re-alignment of the head and neck posture is resulting in the improved outcome in this patient, multiple treatments were given to the patient. SMT and exercises, however, do not routinely correct posture[44–46]. The effects of performing the corrective exercises and SMT may have had an effect on improving the symptoms of TMJD in this patient despite the improvement in posture. However, we hypothesize that it was indeed the reduction of the lateral head translation posture—the fact that the patient had also received previous SMT would support our contention. Future research in correlating head and neck postural parameters and their therapeutic correction with TMJD is intriguing and highly encouraged, as current TMJD treatments are both ineffective and controversial.

Conflict of interest

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

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