

CASE STUDY

Reduction of Sleep Bruxism in a 9-Year-Old Child Receiving Chiropractic Care for Vertebral Subluxation: A Case Report

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Abstract

Objective: To describe the reduction in severity of sleep bruxism in a 9-year-old child receiving Torque Release Technique for vertebral subluxation.

Clinical features: A 9-year-old male with a 4-year history of sleep bruxism was presented for chiropractic care. Postural alterations were found in conjunction with indicators of vertebral subluxation throughout the spine.

Intervention & Outcomes: Chiropractic care using Torque Release Technique (TRT) was provided for vertebral subluxations. The patient demonstrated reported reduction in sleep bruxism and had objective improvement in posture.

Conclusion: A course of chiropractic care using TRT was associated with reduction of sleep bruxism and improvement in objective posture. More research is needed to investigate the role chiropractors may play in helping similar patients so as to inform clinical practice and future higher-level research designs.

Key words: *Pediatric, bruxism, sleep bruxism, chiropractic, cervical spine, Torque Release Technique, vertebral subluxation, chiropractic adjustment, chiropractic manipulation*

Introduction

Sleep bruxism (SB) is described as a movement disorder resulting in habitual, non-functional and forceful teeth contact (grinding and clenching of teeth) during sleep.^{1,2} The prevalence of SB has been reported as ranging from 5.9% to 49.6% of the pediatric population.^{1,3} Diagnosis of SB has been formalised by the American Academy of Sleep Medicine using four criteria 1) anterior teeth wear, 2) posterior teeth occlusal wear, 3) parents' report of frequent noises of teeth grinding during sleep, and 4) a white line at buccal mucosa.⁴ However, some studies rely primarily on parents' reports.¹

The etiology of SB is not well understood, however it is considered multifactorial in nature including central nervous system, psychosocial and genetic influences.¹ It has

been linked to a number of health concerns and conditions, from musculoskeletal conditions such as migraine headaches and somatic complaints, to longer term psychological complications such as anxiety, depression and aggression disorders.^{1-3,5-7}

The typical therapeutic approach to SB is the use of dental appliances, behaviour modification and pharmaceuticals.^{3,6} However, it has been reported that specific and effective treatments are not well established.³

It has been reported that SB concerns a number of healthcare providers, primarily medical, dental and psychological health care domains, and that a multidisciplinary approach should be

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considered.⁵ Although a multidisciplinary approach to care and a strong link to central nervous system dysfunction have been established, there is very limited literature reporting the inclusion of chiropractic care or even manipulation in the management of SB.⁸⁻¹¹

To inform clinical practice the purpose of this case report is to describe the reduction in severity of sleep bruxism in a 9-year-old child receiving Torque Release Technique for vertebral subluxation.

Case Report

History

A 9-year-old male presented for a chiropractic consultation by his mother who was concerned about “why does my son grind his teeth so loudly at night?” The history revealed that SB had been persistent for four years, which was when he started at primary school. Additionally, he had been experiencing regular and heavy nose bleeds over the recent months for no apparent reason.

The child’s history revealed an induced birth, however no other intervention was required. He has been fully immunized and had been formally assessed and reported as having “Autism Spectrum Disorder tendencies”, however was not deemed significant enough to be formally diagnosed. The family had moved country of residence when he was 3 years old, which along with stress in relationships with his parents and siblings were reported as the only events that have had a significant effect on his emotional health. The rest of his history was unremarkable.

Examination

Posture examination, measured through visual analysis, revealed a significantly higher left hip, and right shoulder and occiput with significant forward head carriage of 2-3 centimetres. Range of motion (ROM) assessment of the cervical region was performed using a bubble inclinometer. Cervical ROM assessment revealed flexion and extension of 60° each, with left and right lateral flexion each being 40°.

Initial chiropractic examination for vertebral subluxation revealed a right shortened leg length inequality, negative right Derifield, left sacral restriction, and right cervical syndrome. Soft tissue subluxation indicators noted in the cervical region included hypertonicity of the right Levator Scapula muscle, the right Scaleneus Medius muscle and the sub-occipital muscles bilaterally. Bilateral paraspinal hypertonicity was noted throughout the thoracic and lumbar regions. Biomechanical subluxation indicators included reduced joint play (end-feel) at C1-C3, C5, C7, T12 and the right sacroiliac joint, while restriction in inter-segmental motion was primarily noted at C1 (ASR) and C2 (spinous left).

Thermography and sEMG studies were recorded using the Insight Millenium™. Thermography revealed extreme dysautonomia at C1 to C3 and mild dysautonomia at T12, while sEMG revealed areas of hyperactivity throughout the spine. (see figure 1).

Intervention

Chiropractic care was administered over a period of four weeks where the patient was seen twice weekly for eight visits using Torque Release Technique (TRT). The Torque Release Technique (TRT) model of chiropractic care that focuses on detecting areas of vertebral subluxation at locations of dural attachment, being the upper and lower cervical spine (C1, C2, C5), sacrum, coccyx and the pelvis, assessed through primarily functional leg checking and spinal pressure testing procedures. The application of the chiropractic adjustment is via the Integrator™ instrument.^{12,13}

Outcomes

During the course of chiropractic care the patient’s parent reported reduction in SB by one-third following the first adjustment. By the third visit the parent reported continued reduction in SB intensity and frequency along with the patient’s behaviour being reported as less hyperactive and more relaxed. Following a small increase in SB intensity after a weeks break in chiropractic care between the third and fourth visits, however there was a further cessation of SB for two days following the fifth visit, with maintained reduction in SB throughout the remainder of his chiropractic care.

Posture examination improved revealing balanced hip and shoulder levels, with reduced forward head carriage. Cervical ROM remained within the same normal limits as the initial examination.

Vertebral subluxations were adjusted as indicated by the TRT protocol, with the number of adjustments made each visit ranging from 2-4. The most commonly adjusted segments were C2 (75% of visits) and C1 (62.5% of visits), for a complete summary of levels adjusted per visit see table 1.

Significant changes, indicating improvement in dysponesis and dysautonomia were recorded via thermography and sEMG after the progress examination. Thermography findings improved primarily in the upper cervical region. sEMG findings also improved. (see figure 2).

Discussion

Sleep bruxism is an increasingly common condition reported in children,^{1,3} and has been associated with other long term psychological conditions that can have serious effects on the individuals quality of life.^{1,2,3,5-7} Insana et al. describe a cascade of events among preschool age children to illustrate how the manifestation of SB results in long term health and neurocognitive problems. For example, anxiety and depression have been linked to SB, as the frequency of SB increases health problems (such as poor immune function) increase and neurocognitive performance decreases, resulting in the child to be 1.4 times more likely to perform poorly in school.⁵

Diagnosis of SB has been challenging with a lack of consistent criteria being used, however SB appears to be more common in males,¹ and can be attributed personality characteristics (such as aggression, anxiety and hyperactivity) that have been triggered by past life events.^{6,7} Motta et al., however, reported a significant link between craniocervical posture (primarily

significant forward head posture relating to hypertonicity of the muscles of the cervical spine) and the prevalence of SB.¹⁴

The typical management for SB has been reported as being limited in effect.³ Management has focused on occlusal adjustment of dentition, use of dental appliances (dental splints and mouth guards), behavioural modification and administering pharmaceuticals.^{3,6} However, professions that concern themselves with the effects of altered cervical spine biomechanics, such as chiropractors and manual therapists, may have relevance in supporting those with SB.

To assess the relevance to chiropractic a systematic review of the literature on bruxism and chiropractic was performed. The Index to Chiropractic Literature (1980-2017) and PubMed (1966-2017) were consulted using the search terms “chiropractic AND bruxism” and “bruxism AND manipulation”. Inclusion criteria for our review included both peer-reviewed and non-peer-reviewed articles. Our review found an extreme paucity of literature, revealing two abstracts from conference proceedings^{8,15} and two case reports (both involving pediatric patients).^{9,10}

Of the two conference proceedings Williams et al. assessed 21 patients and found that bruxism was associated with marked displacement of the temporal bones and expansion of the cranial cavity in patients with Multiple Sclerosis.⁸ Weinstein found that the use of a biofeedback headband reduced bruxism in 75% of patients, although the relevance to chiropractic in this case is limited.

Kunston⁹ reported on the resolution of SB in a 6-year-old female receiving upper cervical chiropractic care. The author rationalizes that neurological input at the brainstem caused by spinal dysfunction (vertebral subluxation) promotes activation of the muscles of mastication resulting in bruxism. This is somewhat consistent with the postural findings of Motta et al.¹⁴

Laferrere¹⁰ reported that the parents of a 6-year-old female reported significant reduction in SB following a course of full spine chiropractic care including diversified upper cervical adjusting techniques. However, there were other modalities and medications administered to the child so it is difficult to determine the benefits of chiropractic adjustments in this case.

Vinjamury et al.¹¹ discuss the effectiveness of chiropractic care in the management of mild to moderate temporomandibular disorders (TMD) and resulting improvement in overall health quality. However, while SB was discussed within the range of TMD none of the seven subjects in the study appear to have presented with SB reducing the relevance to the current study.

Chiropractic care aims to optimize health and wellbeing through the enhancement of the nervous system function by removing nerve interference caused by vertebral subluxations.¹⁶ The correction of vertebral subluxations by chiropractic adjustments are a fundamental component of personal enhancement and wellbeing. Vertebral Subluxation as stated by the Association of Chiropractic Colleges is a “complex of functional and/or structural and/or pathological articular changes that compromise neural integrity and may

influence organ system function and general health.”¹⁷

The overall positive results in reduction of SB in the current case are congruent with the correction of upper cervical subluxation as reported in the case reports above.^{9,10} The initial presentation of personality characteristics (Autism Spectrum Disorder tendencies) and life event triggers experienced by the patient are consistent with the literature.^{6,7} Additionally, significant postural forward head carriage noted on exam and reduction of this after the course of chiropractic care is congruent with the findings of Motta et al.¹⁴

Limitations

As this is an isolated clinical case the findings cannot be generalized. Additionally, reports of SB were exclusively dependant on parent subjective reports and no other diagnostic criteria, and posture was visually analyzed by the chiropractor rather than using an objective measure leaving this up to the discretion of the chiropractor to record.

Conclusion

A course of chiropractic care using TRT was associated with reduction of sleep bruxism and improvement in objective posture. More research is needed to investigate the role chiropractors may play in helping similar patients so as to inform clinical practice and future higher-level research designs.

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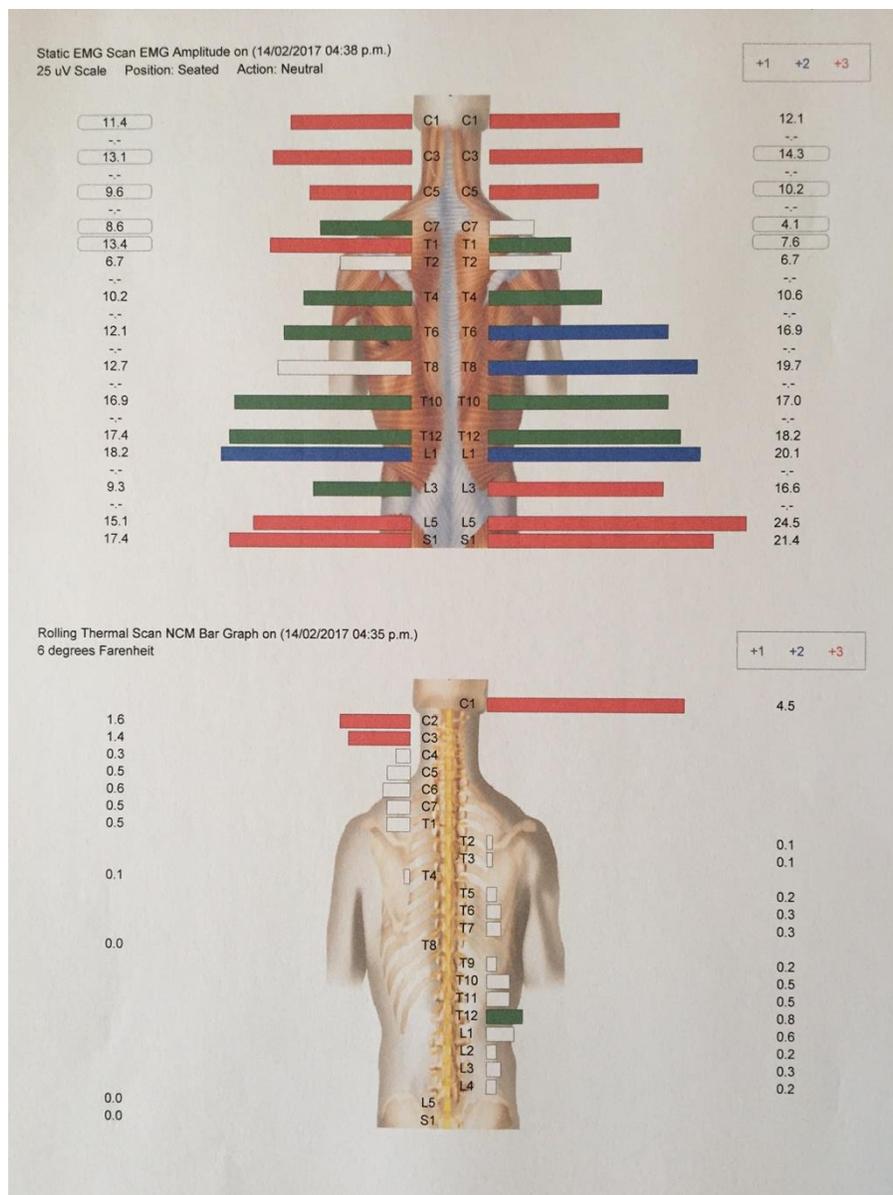


Figure 1. Thermography and surface EMG study at initial visit

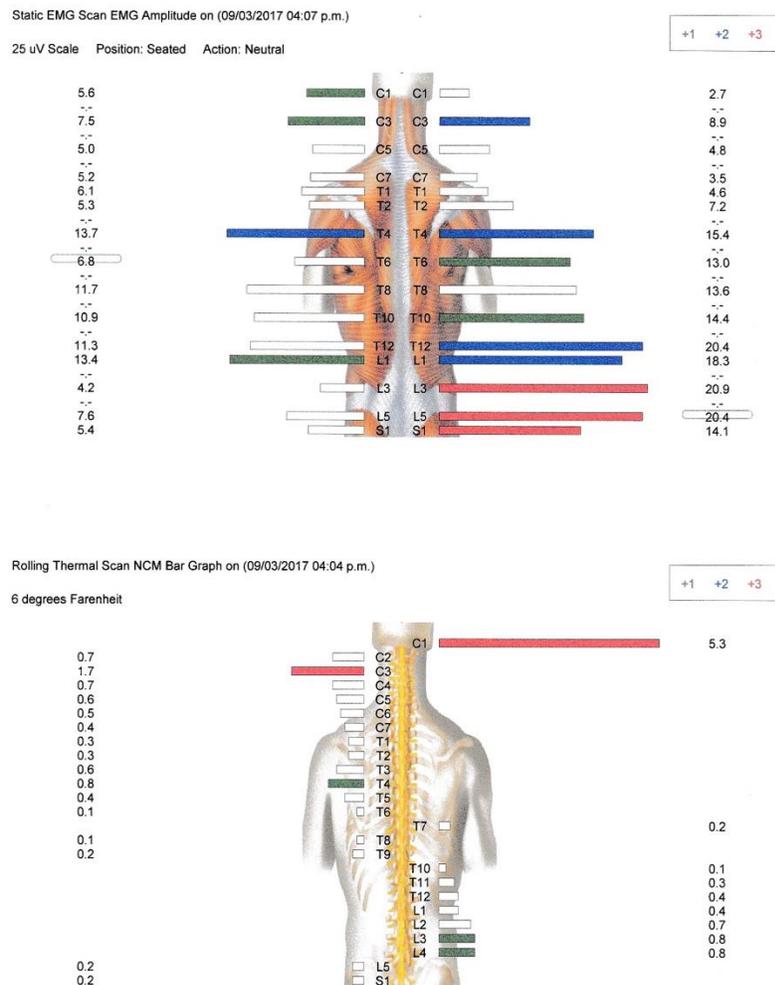


Figure 2. Thermography and surface EMG study at progress examination

Visit	Levels adjusted
1	C1 Lat R (R torque), C2 Sp L (L torque)
2	C1 Lat R (R torque), C0 R (L torque), C2 Sp L (L torque)
3	C0 R (L torque), C2 Sp L (L torque), Cox, R ant sphen
4	C1 Lat R (R torque), C2 Sp R (R torque), S3 R (R torque)
5	C2 Sp L (L torque), R AI Sac, C0 R (L torque)
6	C0 R (L torque), C2 Sp L (L torque), C1 Post R (R torque), Cox
7	C1 Lat R (R torque), R AI Sacrum, T6
8	C7 Sp R, T12 L, T4 R

Table 1. Adjustment summary by visit