Treatment of Bipolar, Seizure, and Sleep Disorders and Migraine Headaches Utilizing a Chiropractic Technique

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Abstract

Objective: To discuss the use of an upper cervical technique in the case of a 23-year-old male patient with rapid-cycling bipolar disorder, sleep disorder, seizure disorder, neck and back pain, and migraine headaches.

Clinical Features: The patient participated in a high school track meet at age 17, landing on his head from a height of 10 ft while attempting a pole vault. Prior to the accident, no health problems were reported. Following the accident, the patient developed numerous neurological disorders. Symptoms persisted over the next 6 years, during which time the patient sought treatment from many physicians and other health care practitioners.

Intervention and Outcome: At initial examination, evidence of a subluxation stemming from the upper cervical spine was found through thermography and radiography. Chiropractic care using an upper cervical technique was administered to correct and stabilize the patient's upper neck injury. Assessments at baseline, 2 months, and 4 months were conducted by the patient's neurologist. After 1 month of care, the patient reported an absence of seizures and manic episodes and improved sleep patterns. After 4 months of care, seizures and manic episodes remained absent and migraine headaches were reduced from 3 per week to 2 per month. After 7 months of care, the patient reported the complete absence of symptoms. Eighteen months later, the patient remains asymptomatic.

Conclusion: The onset of the symptoms following the patient's accident, the immediate reduction in symptoms correlating with the initiation of care, and the complete absence of all symptoms within 7 months of care suggest a link between the patient's headfirst fall, the upper cervical subluxation, and his neurological conditions. Further investigation into upper cervical trauma as a contributing factor to bipolar disorder, sleep disorder, seizure disorder, and migraine headaches should be pursued. (J Manipulative Physiol Ther 2004;27:e5)

Key Indexing Terms: *Chiropractic Manipulation; Bipolar Disorder; Migraine; Seizure Disorders*

Introduction

The following case report describes a 23-year-old male patient's fall on his head at age 17; the onset of rapid-cycling bipolar disorder, sleep disorder, seizure disorder, neck and back pain, and migraine headaches following the accident; the intervention of chiropractic care utilizing an upper cervical technique; and his symptomatic response.

Reports documenting successful treatment of patients with similar diagnoses using chiropractic care are limited primarily to the research conducted by Palmer[1,2] 70 years ago (using a similar upper cervical technique), which was never published in a peer-reviewed, indexed fashion.

The rationale for the use of chiropractic care in this case was to correct the patient's upper cervical subluxation that was discovered during his initial evaluation. Patients with other neurological conditions, such as Parkinson disease and multiple sclerosis, who had similar upper cervical subluxations also responded favorably to chiropractic intervention.[3,4] It should be noted that, in such cases, patients reported a substantial blow to the head or whiplash injury prior to the onset of symptoms and diagnoses. This case suggests a correlation between a blow to the head, upper cervical subluxation, and neurological disease and serves to establish a foundation for future research.

Case report

A 23-year-old man sought chiropractic care. He related his medical history following a pole-vaulting accident

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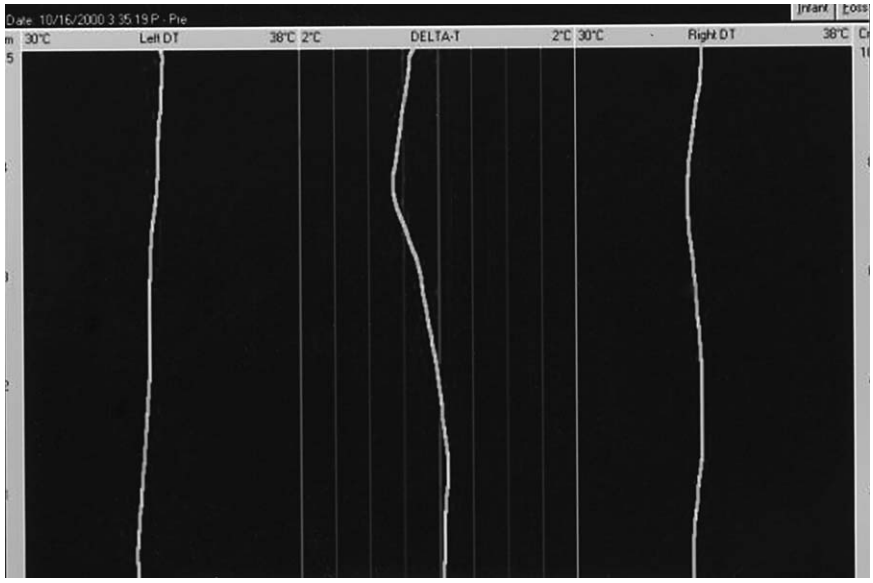

Fig 1. *Preadjustment paraspinal digital infrared image. Thermal asymmetry of 0.5 °C is present.*

6 years prior, reporting that he was healthy before the accident. Both parents confirmed their son's health history. Medical records obtained from the patient's neurologist confirmed his history, diagnoses, and treatment.

At age 17, he landed on his head from a height of 10 ft while attempting a pole vault during a high school track meet. A computed tomography (CT) scan revealed no abnormal findings, and he was released from the hospital the same day.

Immediately following the accident, he noticed the onset of neck pain focused at the base of his skull, back pain, daily headaches, and migraine headaches approximately 3 times per week. He described his pain as an "unbearable everyday occurrence."

Several days after the accident, he began experiencing "blackouts," which were later diagnosed as petit mal seizures. While initially infrequent, the seizures increased to 4 per day.

During the first 6 months following the accident, the patient noted the onset of depression, which first became apparent to his sister and later to his parents as associated behaviors and symptoms became more pronounced. The patient described a complete loss of appetite, extreme lethargy, a lack of concern for himself, and an extremely erratic sleep cycle that often left him awake for several days followed by periods of 14 to 18 hours of sleep. The patient reported the inability to sleep when he wanted to, noting he slept instead when he was able, occasionally sleeping on the street.

The patient and his mother reported that he consulted with approximately 24 practitioners during this time, including physicians, pain specialists, chiropractors, Rolfers, massage therapists, and physical therapists. Prescribed medications and therapies did not alleviate or reduce symptoms.

Both parents expressed concern for his safety during this period, noting that his thoughts and behaviors were "dark and disturbing." They stated that he occasionally worked odd jobs or took classes, but that he repeatedly quit or failed at each. He could not maintain friendships, as he frightened people with his topics of discussion, habits, and behaviors.

Several years later, he was diagnosed with rapid-cycling bipolar disorder and sleep disorder and prescribed Tegretol. He discontinued use of this medication after 1 month due to side effects, noting no improvement in symptoms.

To alleviate pain and depression, he self-medicated with illegal drugs in an attempt to "make himself feel better." After addiction became apparent, his parents checked him into a drug rehabilitation program, which he completed. His visit to me came shortly after.

After the patient's medical history was recorded, his evaluation was performed in accordance with the guidelines of the International Upper Cervical Chiropractic Association (IUCCA) through their Applied Upper Cervical Biomechanics (AUCB) program.[5] It should be noted that there are numerous chiropractic techniques that focus upon the upper cervical spine; however, only the technique used in this case will be discussed in this report.

A paraspinal thermal analysis was performed with the Tytron C-3000 (Titronics Research and Development, Iowa City, Iowa) from the level of C7 to the occiput according to thermographic protocol (Fig 1).[6-9] Paraspinal digital infrared imaging, which measures cutaneous infrared heat

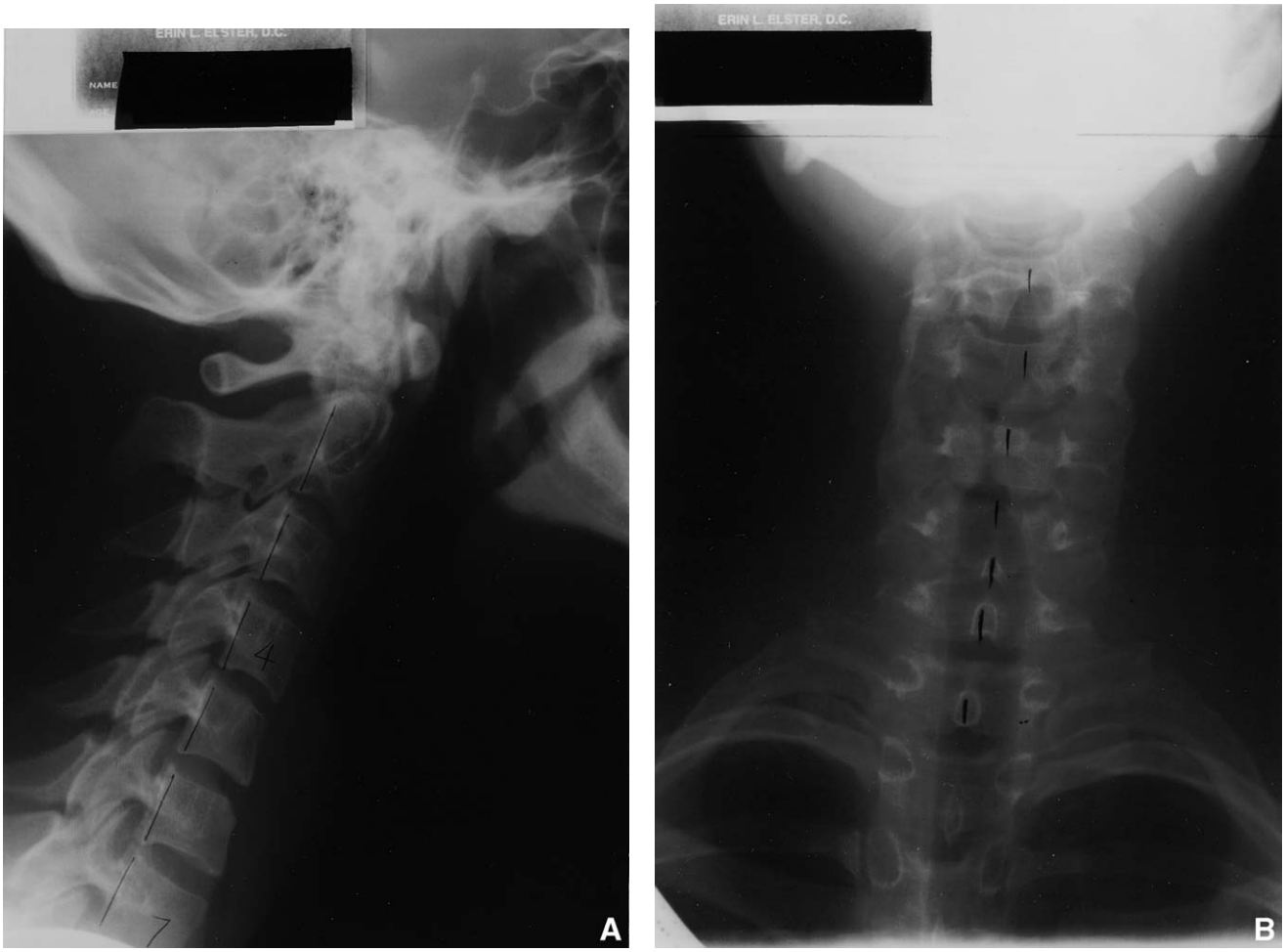

Fig 2. ***A*** *through* ***D****, Upper cervical radiographs. Deviation of the upper cervical spine from the neural canal is present.*

emission, is a form of thermography, a neurophysiological diagnostic imaging procedure. Since the amount of blood passing through the skin is directly controlled by the sympathetic nervous system (through control of dilation or constriction of blood vessels), the temperature of any one area of the skin reflects, in part, the neurological control of that area. Normal or abnormal skin temperature then becomes an indicator of normal or abnormal neurophysiology.

While thermography has been documented extensively in medical research,[10-12] this specific use as an integral part of chiropractic protocol has been documented only in 2 peer-reviewed articles involving patients with Parkinson disease and multiple sclerosis.[3,4] This is the first case reporting use of paraspinal thermal imaging for this patient's conditions.

Compared with established normal values for the cervical spine, the patient's paraspinal scans contained static thermal asymmetries of 0.5°C. According to cervical thermographic guidelines, thermal asymmetries of 0.5°C or higher indicate abnormal autonomic regulation or neuropathophysiology.[13-16]

Because upper cervical misalignments were suspected in this patient, a precision upper cervical radiographic series was performed (Fig 2).[17] The radiographic equipment included a laser-aligned frame (American X-ray Corporation, Knoxville, Tenn) to eliminate image distortion. To maintain postural integrity, the patient was placed in a positioning chair using head clamps. In addition, the patient was aligned to the central ray using a laser (Titronics Research and Development) mounted on the radiographic tube. The 4 views (lateral, anterior-posterior, anterior-posterior open mouth, and base posterior) enabled examination of the upper cervical spine in 3 dimensions: sagittal, coronal, and transverse.

Analysis of the 4 views was directed toward the osseous structures (foramen magnum, occipital condyles, atlas, and axis) that are intimately associated with the neural axis. Laterality and rotation of atlas and axis were measured according to each vertebra's deviation from the neural

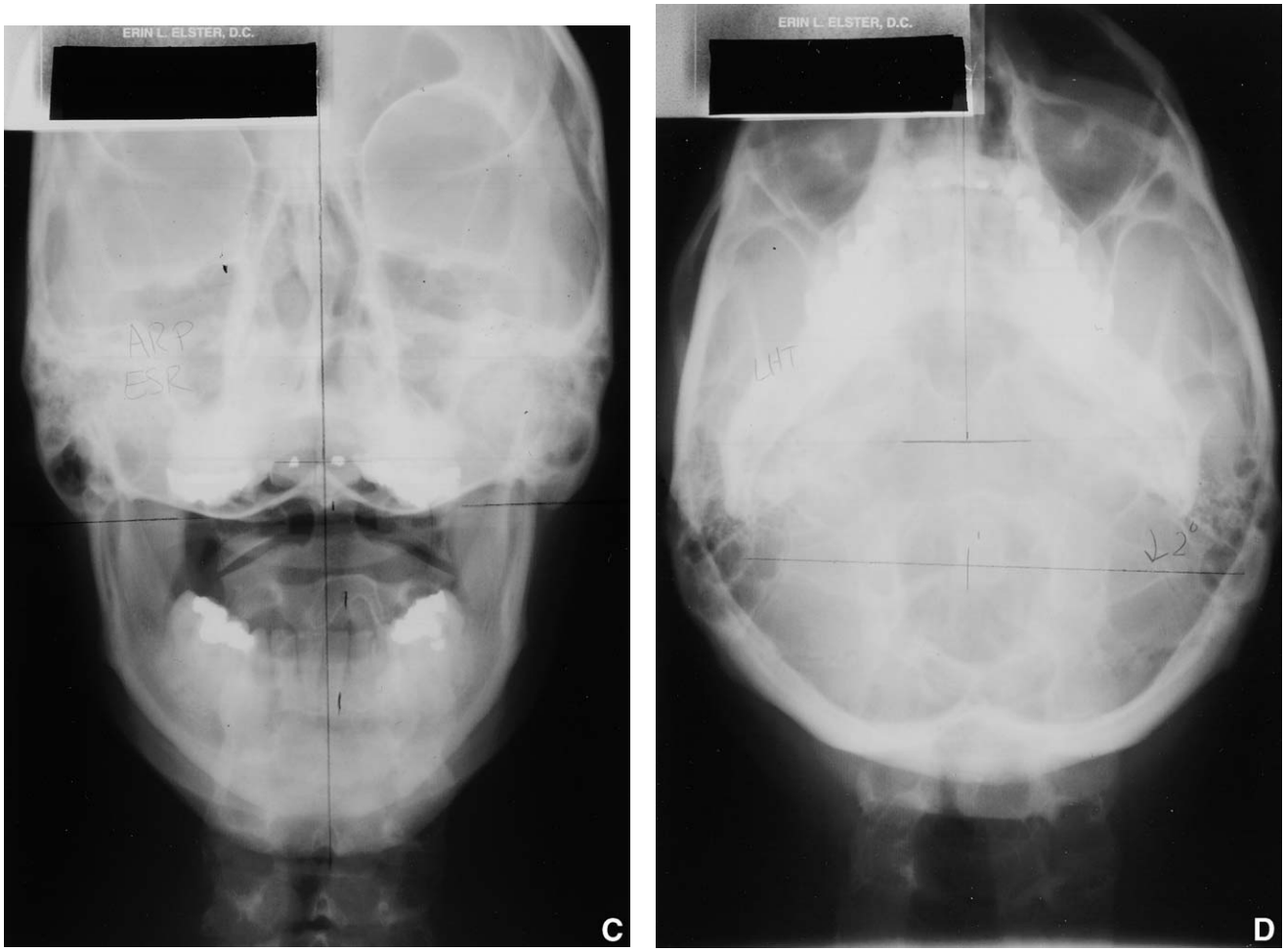

Fig 2. *Continued*

axis.[17] Right laterality of atlas and axis (3 mm) and right posteriority of atlas (2°) were found. According to the technique's protocol, it was determined that an adjustment to the atlas from the right side would be appropriate to correct the upper cervical subluxation.

After the diagnostic findings and care plan were discussed, the patient consented to care. The patient was encouraged to continue to have his condition monitored by his neurologist during the care period.

Chiropractic care began with an adjustment to correct the right laterality and posteriority of atlas. To administer the adjustment, he was placed on a knee-chest table with his head turned to the right. Using the right posterior arch of atlas as the contact point, an adjusting force was introduced by hand.[18]

Following the adjustment, the patient was placed in a postadjustment recuperation room for 15 minutes as per thermographic protocol.[6-9] After the recuperation period, a postadjustment thermal scan was performed (Fig 3). The postadjustment scan revealed a thermal difference of only 0.1°C, which was considered normal according to established cervical thermographic guidelines (compared with the preadjustment differential of 0.5°C).

All subsequent office visits began with a thermal scan. An adjustment was administered only when the patient's presenting thermal asymmetry returned. The patient's office visits occurred 2 times per week for the first 2 weeks of care, 1 time per week for the following 2 weeks, and 1 time per month thereafter.

The symptomatic changes observed by the patient's family, the patient's neurologist, and the patient himself were recorded at each office visit throughout the 18 months of chiropractic care. The findings are discussed below in narrative and tabular form.

During the first month of care, the patient reported a gradual decline in seizures and manic episodes until they were absent (Table 1). He experienced a reduction in headaches \ and neck pain. He also noted improvements with sleep patterns, sleeping from approximately 11:00 PM to 8:00 AM or 9:00 AM, several nights per week, although he

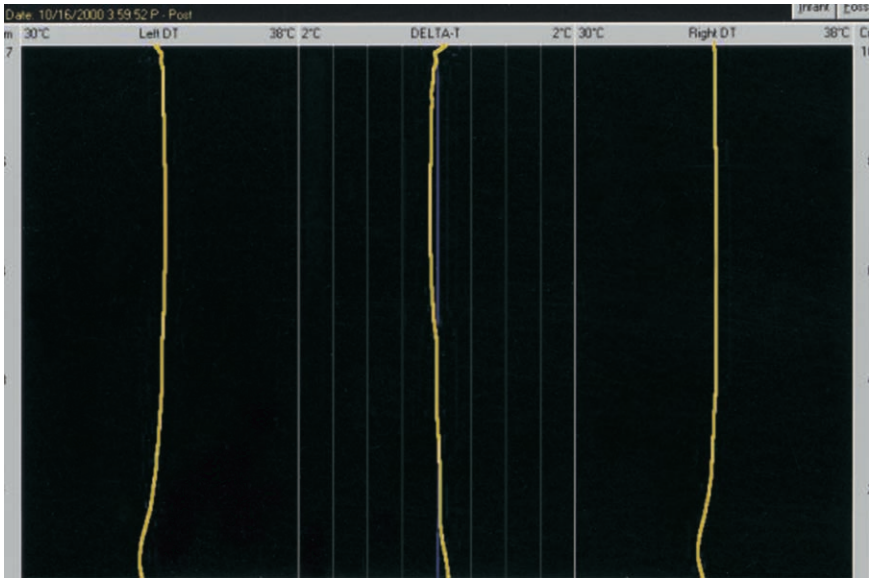

Fig 3. *Postadjustment paraspinal digital infrared image. Thermal asymmetry is present.*

still experienced multiple days/nights per week with hypersomnia (excessive sleep) or sleep cycle reversal (where he slept during the day and remained awake at night).

At the end of the second month of care, the patient was assessed by his neurologist, who concluded that the seizures and mood disorder appeared to be stable. In his report, he stated that the patient "...was in quite good spirits. No significant anxiety or depression (was evident). No thought disorder (was evident). He appeared to have good judgment. Seizures seem not to be a current problem." His neurologist confirmed that headaches, neck pain, and sleep disorder continued to be problematic, recommending pain medications (Amerge, 1 mg tablets) for the headaches, which the patient used as needed.

During the third and fourth months of care, the patient maintained his previous improvements, including the absence of seizures and mania (Table 1). He reported continued reduction in neck pain and in the number and severity of headaches. He returned to school during the fourth month of care, maintaining a schedule of 16 hours of classes per week; 10 to 15 hours of study per week; and 5 to 6 hours of computer-based assignments per week.

At the end of the fourth month of care, the patient was reevaluated by his neurologist, who confirmed that the patient's mood and seizures remained stable. In addition, the neurologist concluded that the subject's headaches were improved and that sleep, while improved, remained a concern. However, the neurologist did not recommend sleep medications due to his concern of negatively impacting the bipolar condition.

During the fifth and sixth months of care, the patient's pain and sleep disorder continued to lessen until all symptoms (manic episodes, seizures, headaches, sleep disorder, pain) were absent by the seventh month (Table 1).

During the 10th month, the patient began a job working in a factory 40 hours per week and by the 11th month, the subject completed an application to enroll in the local college of massage therapy. He began school the following semester (1 month later). Six months later (18 months since his first adjustment), he completed his first semester of massage therapy school at the top of his class. During those 6 months, all symptoms remained absent.

At the conclusion of his case at 18 months, the patient expressed "disbelief" that he was free of depression, pain, seizures, and headaches and reported how appreciative he was to be "a normal person like everyone else." He stated that he was "happy" and even "excited to be alive."

Prior to his release from care, the patient was informed that an additional traumatic event could again cause upper cervical subluxation, resulting in a relapse of symptoms or the development of new symptoms. Therefore, according to the chiropractic technique's protocol, it was recommended that the patient be evaluated 2 to 4 times per year to confirm that his normal neurophysiology was maintained.

During the chiropractic care period, no other intervention was reported that could have provided an alternative explanation for the dramatic improvement of the patient's conditions. Since this is the first case to be reported on this topic, it is necessary to confirm that this positive outcome could be replicated in additional patients. Therefore, it is recommended that a more extensive study be performed, employing the chiropractic technique discussed

Table 1. *Months 1 through 18*

Care timetable	No. of adjustments performed	Symptomatic changes
Week 1	2	None
Weeks 2 and 3	0	Fewer headaches and seizures Improved sleep Better mood
Week 4	0	Absence of seizures and mania Improved sleep Improvements confirmed by neurologist
Weeks 5-8	1	Continued absence of seizures and mania Continued sleep improvement
Month 3	0	Headaches reduced to 2 per week Sleeping 8-10 hours per night
Month 4	1	Headaches reduced to 2 per month Reduction in neck pain Returned to school Improvements confirmed by neurologist
Months 5 and 6	1	Reduction in neck and back pain Normal sleep cycle
Months 7-9	0	Absence of all symptoms
Month 10	1	Began working 40 hours per week
Month 11	0	Enrolled in massage therapy school
Month 12-18	3	Achieved all As and Bs in school All symptoms remained absent

in this report along with a large sample and control subjects.

Discussion

This article discusses a patient with seemingly unrelated conditions, raising questions as to how chiropractic care, or any single treatment for that matter, could have produced a favorable result. The very idea that such a relatively "simple" solution could provide the answer to a myriad of complex health problems invokes skepticism. It would be natural, therefore, to dismiss the results as an anomaly.

However, over the course of the past century, discoveries in the fields of medicine and science have repeatedly demonstrated similar phenomena throughout the natural world. For example, entire species, such as human beings and chimpanzees, are differentiated through slight variations in genetic sequencing.[19] Tissues and organs are developed based on the genetic code read through the elegantly simple double helix of the DNA molecule. In fact, everything we know today about both the human body and the natural world lends support to the notion that the myriad of perplexing and seemingly distinct neurological diseases and disorders could, in fact, share a common neurological explanation and resolution.

Consider the case chronology. A healthy 17-year-old landed on his head from a height of approximately 10 ft while attempting a pole-vault at his high school track meet. Immediately thereafter, numerous neurological and pain conditions began. Advice and treatment were sought from many different health care practitioners, but the conditions persisted for 6 years. During a chiropractic evaluation utilizing an upper cervical technique, an upper cervical subluxation was found. After the initial adjustment to the patient's upper neck was administered, the patient's symptoms began to subside and continued to improve until absent during the care period.

As the patient was healthy prior to his headfirst fall and developed symptoms immediately following the accident, it follows that the impact had a causal effect on the patient's various health problems. Hundreds of medical references substantiate this deduction by naming head and neck trauma as a cause of all of the conditions.[20-27] Furthermore, because the patient did not respond to other forms of treatment but showed dramatic improvement following the intervention of chiropractic care utilizing an upper cervical technique, it appears that the upper cervical subluxation contributed to the patient's conditions.

When examining the neuropathology involved in the patient's various conditions, several similarities exist. In the cases of bipolar and sleep disorders, symptoms are thought to be caused by alterations in neurochemistry, specifically serotonin, a neurotransmitter that originates in the raphe nuclei in the pons of the brainstem.[28,29] Seizures have been linked to widespread activation and/or hypersensitivity of the brainstem.[30] Migraine headaches have been attributed to malfunctions of the brainstem trigeminal nucleus and brainstem serotonergic pathways that affect nerves and blood vessels in the head.[31,32] Postural abnormalities and paraspinal imbalances can occur due to improper innervation of antigravity muscles, influenced by serotonergic pathways within the brainstem and several brainstem nuclei, including the vestibular nucleus.[33,34] Thus, all of the patient's conditions could arise from malfunctions within the brainstem and most could be attributed to a single neurotransmitter, serotonin.

The relationship between upper cervical subluxation and brainstem function is an area requiring further research. Since chiropractic care appeared to stimulate the patient's symptomatic improvements, then it follows that the care may have generated improvement in his brainstem chemistry

and circuitry. Two theories, discussed below, are proposed to explain the relationship between upper cervical subluxation and neurological dysfunction.

The first mechanism, central nervous system facilitation, can occur from an increase in afferent signals to the brainstem coming from articular mechanoreceptors after a spinal injury.[35-38] The upper cervical spine is uniquely at risk for this problem because it possesses inherently poor biomechanical stability (lacks intervertebral disks and vertical zygapophyseal joints), along with the greatest concentration of spinal mechanoreceptors.

Hyperafferent activation (through central nervous system facilitation) of the sympathetic vasomotor center in the brainstem may lead to the second mechanism, cerebral penumbra, or brain hibernation.[39-42] According to this theory, a neuron can exist in a state of hibernation when a certain threshold of ischemia is reached. This ischemia level (not severe enough to cause cell death) allows the cell to remain alive, but the cell ceases to perform its designated purpose. The brain cell may remain in a hibernation state indefinitely, with the potential to resume function if normal blood flow is restored. If the degree of ischemia increases, the number of functioning brain cells decreases and the disability worsens.

The question remains as to why this upper cervical chiropractic procedure produced results when other techniques (chiropractic, rolfing, massage, etc.) performed on the patient's neck were unable to do so. The answer likely rests in the utilization of advanced diagnostic technology (paraspinal digital infrared imaging and the laser-aligned upper cervical radiographs) and the specific upper cervical adjusting procedure. The combination of the diagnostics and the adjustment allowed for precise diagnosis, correction, and stabilization of this patient's upper cervical subluxation.

It is therefore possible to theorize the following: the patient's headfirst impact sprained spinal ligaments in his upper neck, allowing for an upper cervical subluxation. Due to the upper cervical subluxation, a variety of complex, detrimental neurological changes developed (probably originating in the brainstem), which ultimately allowed for the manifestation of the patient's conditions. Despite a variety of treatments administered, the patient's symptoms remained until the upper cervical subluxation was discovered and reduced. Once the patient's upper cervical alignment was corrected and stabilized, irritation to the central nervous system was eliminated and the patient's normal neurophysiology was restored.

This case could be considered unique because it is the first to document favorable results utilizing chiropractic care with bipolar, sleep, and seizure disorders and migraine headaches in combination. However, as mentioned previously, the link between head trauma, upper cervical subluxation, and neurological disease already has been established.[3,4] Therefore, further research focusing on trauma-induced upper cervical injuries and their neurophysiological manifestations is recommended.

Conclusion

This case report details the history of a 23-year-old man suffering from bipolar disorder, sleep disorder, seizures, migraine headaches, and neck and back pain following a headfirst fall; the 18-month intervention of chiropractic care utilizing an upper cervical technique; and the patient's response. Evidence of an upper cervical subluxation was found using paraspinal digital infrared imaging and upper cervical radiographs. It was corrected by performing a specific adjustment to the first cervical vertebra according to radiographic findings. The upper neck subluxation could have been caused by an accident in which the patient fell headfirst into the ground while pole vaulting. All of the patient's conditions were absent by the seventh month of care and remained absent at the conclusion of care. Further investigation into upper cervical injury and resulting neuropathophysiology as a possible etiology or contributing factor to bipolar disorder, sleep disorder, seizures, and headaches should be pursued.

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