ORIGINAL RESEARCH

Sixty Patients With Chronic Vertigo Undergoing Upper Cervical Chiropractic Care to Correct Vertebral Subluxation: A Retrospective Analysis

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ABSTRACT

Objective: The objective of this article is threefold: to examine the role of head and neck trauma as a contributing factor to the onset of vertigo disorders; to explore the diagnosis and treatment of trauma-induced injury to the upper cervical spine through the use of protocol developed by the International Upper Cervical Chiropractic Association (IUCCA); and to investigate the potential for improving and eliminating vertigo through the correction of trauma-induced upper cervical injury. Data from 60 chronic vertigo patients who recalled prior trauma, presented with upper cervical injuries, and received care according to the above protocol are reviewed.

Clinical Features: Each patient was examined and cared for in the author's private practice in an uncontrolled, non-randomized environment over an eight-year period. The 60 patients were diagnosed by their physicians with the following types of chronic vertigo: benign paroxysmal positional vertigo (BPPV), cervicogenic, disembarkment syndrome, labyrinthitis, Meniere's, and migraine-associated vertigo (MAV). Of the 60 vertigo patients, 56 recalled experiencing at least one head or neck trauma prior to the onset of vertigo including auto accidents (25 patients); sporting accidents, such as skiing, cycling, or horseback riding (sixteen patients); or falls on icy sidewalks or down stairs (six patients).

Intervention and Outcome: Two diagnostic tests, paraspinal digital infrared imaging and laser-aligned radiography, were performed according to IUCCA protocol. These tests objectively identify trauma-induced upper cervical subluxations (misalignments of the upper cervical spine from the neural canal) and resulting neuropathophysiology. Upper cervical subluxations were found in all 60 cases. All 60 patients responded to IUCCA upper cervical care within one to six months of treatment. Forty-eight patients were symptom-free following treatment and twelve cases were improved in that the severity and/or frequency of vertigo episodes were reduced.

Conclusion: A causal link between trauma-induced upper cervical injury and the onset of vertigo appears to exist. Correcting the injury to the upper cervical spine through the use of IUCCA protocol appears to improve and/or reverse vertigo disorders. Further study in a controlled, experimental environment with a larger sample size is recommended.

Key Indexing Terms: upper cervical spine, chiropractic, vertigo, trauma, thermography

Introduction

While the relationship between cervical trauma and the later development of vertigo disorders (benign paroxysmal positional vertigo, labyrinthitis, Meniere's, etc.) remains debatable, many researchers have confirmed the connection.[1-10] However, researchers have not yet defined an exact mechanism to explain the onset of chronic vertigo following trauma, nor have they isolated an objective method for measuring and/or diagnosing the kind of trauma-induced injuries that appear to precipitate vertigo disorders.

This paper serves to address the above issues through the summary of case histories, diagnostic test results, and treatment responses of 60 chronic vertigo patients, 56 of whom recalled head or neck trauma prior to vertigo onset. These patients were examined and cared for in the author's private practice over an eight-year period in a non-experimental environment without control subjects. This

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paper does not purport to be a controlled research study, but rather serves to provide a foundation for future research.

The specific procedure utilized with these patients was developed by the International Upper Cervical Chiropractic Association (IUCCA).[11] Whether the results detailed in this report could be reproduced with another chiropractic technique is unknown and is an area for further research. Patients with other neurological conditions such as Parkinson's disease, Multiple Sclerosis, Bipolar Disorder, Tourette Syndrome, and Migraine headaches also responded favorably to IUCCA upper cervical chiropractic intervention.[12-15] In these cases, patients reported experiencing traumas to the head and/or neck prior to the onset of symptoms and diagnoses.

Clinical Features

Sixty patients with chronic vertigo consented to examination and treatment in the author's private practice. Patients began treatment at various intervals over an eight-year period. The six chronic vertigo categories suffered by the subjects, as diagnosed by their physicians, included benign paroxysmal positional vertigo (BPPV), cervicogenic, disembarkment syndrome, labyrinthitis, Meniere's, and migraine-associated vertigo (MAV). Patient data (vertigo type, gender, age, years since diagnosis, whether the patient was diagnosed by a physician, etc.) were compiled and listed in Table 1.

Of 60 vertigo patients, nine BPPV cases, 27 cervicogenic cases, three disembarkment cases, two labyrinthitis cases, eleven Meniere's cases, and eight MAV cases were examined and treated. Patients ranged in age from twelve to 73 years and had experienced vertigo between one and 37 years. All patients had been diagnosed by their physicians and many had suffered for years and "had tried everything" to find relief including but not limited to medications, cervical exercises, physical therapy, massage, rolfing, acupuncture, herbs, cervical manipulation, Chinese medicine, and biofeedback.

Patients were questioned as to whether they recalled a history of trauma (blow to the head, concussion, whiplash, accident, fall, etc.) prior to the onset of chronic vertigo. Of the 60 patients, 56 (93%) recalled a history of trauma (Table 1). Of the 56 patients who recalled traumas (many recalled more than one), 25 reported experiencing auto accidents (many were minor rear-end collisions); 16 reported blows to the head and/or neck during sporting activities including skiing, snowboarding, cycling, horseback riding, etc.; and six reported falls on icy sidewalks or down stairs. The duration between the traumatic event and vertigo onset ranged from just a few months to multiple years.

Intervention

Each patient was examined and cared for utilizing protocol developed by the International Upper Cervical Chiropractic Association (IUCCA).[11] The care is based on the original upper cervical chiropractic research performed by Palmer seventy years ago.[16-17] It should be noted that there are numerous chiropractic techniques that focus upon the cervical spine; however, only the technique used in these cases will be discussed in this report. To illustrate the examination and treatment procedures, a single case is detailed below.

A 51-year-old female (Case #40, Table 1) attended a chiropractic evaluation and recalled her health history following an auto accident at age 25. Prior to the accident, no health problems were reported. Medical records obtained from the patient's neurologist confirmed her history, diagnoses, and treatment.

At age 25, the patient was driving a vehicle without headrests. She was broadsided on the driver's side and taken to the hospital by ambulance. Her neurologist confirmed that she sustained an upper cervical fracture. For 30 days in the hospital, her neck was immobilized. No surgical intervention was performed. After her release from the hospital, she wore a hard cervical collar for two months and was not permitted to drive. Following this two-month period, she was released from care and resumed regular activity.

Eight years later, at age 33, she experienced the first episode of dizziness while also suffering from a cold. She recalled that her left ear filled with fluid and that she could hear and feel the fluid shift whenever she moved her head. Her doctor drained the fluid but it returned so she was prescribed decongestant medication. The dizziness resolved.

At the age of 41, she reported the onset of severe, daily dizzy spells. One again, she could hear and feel the fluid in her ears. She recalled that dizziness and nausea began one day without warning after she bent down to tie her shoes. After undergoing numerous tests, she was diagnosed with labyrinthitis and prescribed anti-nausea and decongestant medication. Despite daily medication use, the dizziness continued for ten years. At age 51, she sought help from upper cervical chiropractic care.

After the patient's medical history was recorded, her evaluation was performed in accordance with the guidelines of the IUCCA through their Applied Upper Cervical Biomechanics (AUCB) program.[11] A paraspinal thermal analysis was performed with the Tytron C-3000 (Figure 1- Titronics Research and Development) from the level of C7 to the occiput according to thermographic protocol.[18-20]

Figure 1: A patient being scanned with the Tytron C-3000 system

Paraspinal digital infrared imaging, which measures cutaneous infrared heat emission, is a form of thermography, a neurophysiological diagnostic imaging procedure. Thermography has been established in chiropractic as a practical and sensitive test for spinal nerve root irritation, articular facet syndromes, peripheral nerve injuries, sympathetic pain syndromes, and the vertebral subluxation complex.[21-23] 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 the neurological control of that area. Normal or abnormal skin temperature then becomes an indicator of normal or abnormal neurological function.

In blind studies comparing thermographic results to that of CAT scan, MRI, EMG, myelography, and surgery, thermography was shown to have a high degree of sensitivity (99.2%), specificity (up to 98%), predictive value, and reliability.[24-26] Thermography has been effective as a diagnostic tool for breast cancer, repetitive strain injuries, headaches, spinal problems, TMJ conditions, pain syndromes, arthritis, and vascular disorders, to name a few.[27-36] A limited number of articles have been published demonstrating the use of paraspinal thermal imaging as an integral part of upper cervical protocol, including reports of patients with Parkinson's disease, Multiple Sclerosis, Migraine headaches, Tourette syndrome and Bipolar disorder.[12-15]

Compared to established normal values for the cervical spine, the subject's paraspinal scans contained thermal asymmetries of 0.5ºC. (Figure 4) According to cervical thermographic guidelines, thermal asymmetries of 0.5ºC or higher indicate abnormal autonomic regulation or neuropathophysiology.[37-40]

In addition to revealing thermal asymmetries, the subject's scans displayed static thermal differences, thus, a thermal "pattern" was established. "Pattern analysis" of paraspinal temperatures, first developed by Palmer, has received increased attention in chiropractic research.[16-17, 41-51]

Because upper cervical misalignments were suspected in this patient, a precision upper cervical radiographic series was performed.[52] The x-ray equipment included a laser-aligned frame (Figure 2- American X-ray Corporation) to eliminate image distortion. To maintain postural integrity, this subject 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 x-ray tube. The four views (lateral, anterior-posterior, anterior-posterior open mouth, and base posterior) enabled examination of the upper cervical spine in three dimensions: sagittal, coronal, and transverse. Analysis of the four views was directed towards the osseous structures (foramen magnum, occipital condyles, atlas, and axis) that are intimately associated with the neural axis.[52] Right laterality of atlas was found (Figures 6-9).

In accordance with AUCB upper cervical protocol, the two criteria used to determine subluxation in this case were thermal asymmetry (measured by paraspinal thermal imaging) and vertebral misalignment (measured by cervical radiographs). Because both criteria (0.5ºC thermal asymmetry and right laterality of atlas) were met, a care plan was discussed with the patient. In addition, it was recommended that the subject continue her medical treatment and medications unless otherwise advised by her physician.

Following the patient's consent, chiropractic care began with an adjustment to correct the right laterality of atlas. To administer the adjustment, the patient was placed on a knee-chest table with her head turned to the right (Figure 3). The knee-chest posture was utilized because of the accessibility of the anatomy to be corrected. Using the right posterior arch of atlas as the contact point, an adjusting force was introduced by hand.[53] The adjustment's force (force = mass X acceleration) was generated using body drop (mass) and a toggle thrust (acceleration).

Next, the patient was placed in a post-adjustment recuperation suite for fifteen minutes as per thermographic protocol.[18-20] After the recuperation period, a post-adjustment thermal scan was performed. The post-adjustment scan revealed a thermal difference of only 0.1ºC, which was considered normal according to established cervical thermographic guidelines (compared to the pre-adjustment differential of 0.5ºC).

Figure 2: Upper cervical x-ray configuration that includes a laser-aligned frame, a laser mounted to the x-ray tube, positioning chair, and head clamps for accuracy in measuring upper cervical subluxation.

Therefore, resolution of the patient's presenting thermal asymmetry (elimination of the thermal "pattern") was achieved (Figure 5).

All subsequent office visits began with a thermal scan. An adjustment was administered only when the patient's presenting thermal asymmetry ("pattern") returned. If an adjustment was given, a second scan was performed after a fifteen-minute recuperation period to determine whether restoration of normal thermal symmetry had occurred. This subject's office visits occurred two times per week for the first two weeks of care, one time per week for the following two weeks, two times per month for the following month, and one time per month thereafter.

After this patient's first upper cervical adjustment, she attended a second office visit later that week in which thermal asymmetry was present. Accordingly, another adjustment was performed. At this second visit, she reported feeling less congestion in her ears.

During the second week of care, she required one adjustment and reported awakening most days without congestion in her ears. As a result, after consulting with her physician, she decided to decrease her medication use.

During weeks three and four, no adjustments were required. She reported the complete absence of dizziness and nausea. She discontinued all medications.

During months two through four, three adjustments were required. Prior to each of those three adjustments, she reported noticing a slight amount of ear congestion, which resolved following the adjustments. Otherwise, no symptoms were reported.

Figure 3: Knee-chest adjusting posture. The adjustment, based on x-ray findings, is performed to correct lateral and rotational deviation of the upper cervical spine from the foramen magnum.

For the following eight months, the subject was examined once per month. Thermal symmetry was present at each visit, so no adjustments were administered. All symptoms remained absent and no medications were required. During the year of care, no other intervention was reported that could have provided an alternative explanation for the improvement of the patient's condition.

The additional 59 patients were examined and cared for utilizing the same IUCCA protocol detailed above, including the use of paraspinal digital infrared imaging, laser-aligned upper cervical radiography, knee-chest adjusting procedure, and post-adjustment recuperation. Upon examination with paraspinal digital infrared imaging, all 59 patients showed static thermal asymmetry of at least .5ºC, or thermal "pattern".

In addition, all patients' laser-aligned cervical radiographs showed upper cervical deviation from the neural axis. On average, each patient's atlas and axis deviated from the foramen magnum (occiput) laterally (to the left or right) five millimeters or less and rotationally (anterior or posterior) five degrees or less. Atlas listings are depicted with laterality of left (L) or right (R) and rotation of anterior (A) or posterior (P). The lateral movement of axis is listed to the left (ESL) or right (ESR). (Table 1)

Because upper cervical subluxations were discovered in all 59 patients, it was recommended that each of these patients receive care to correct their cervical injuries. Before initiating care, patients were advised to continue medical treatment including medications unless otherwise advised by their physicians. After consent was obtained, care was administered according to IUCCA protocol.

Outcome

Outcomes of the 60 vertigo cases are illustrated in column 11 of Table 1. If all symptoms were absent following treatment, "SF" is listed, denoting "symptom-free." If symptoms were improved, meaning episodes of dizziness were less frequent and/or less severe, "I" is noted. From a total of 60 cases, 100% of patients were improved or symptom-free following upper cervical chiropractic care. Forty-eight patients' vertigo disorders were completely resolved (symptom-free) within one to six months of upper cervical care. The remaining twelve cases were improved in that the severity and/or frequency of vertigo episodes were reduced.

Conclusion

Sixty patients with chronic vertigo were evaluated and cared for using protocol developed by the International Upper Cervical Chiropractic Association (IUCCA). Histories of trauma were recalled in 56 cases; upper cervical subluxations were found in all 60 cases; and 100% of the cases responded to care, with symptoms either improved or completely reversed. These results suggest a causal link between trauma, upper cervical injury, and vertigo onset. Correcting the injury to the upper cervical spine through the use of IUCCA protocol appears to improve or eliminate vertigo. Further study in a controlled environment with a larger sample size is recommended.

Acknowledgements

The author gratefully acknowledges Drs. William Amalu and Louis Tiscareno of the International Upper Cervical Chiropractic Association (IUCCA) for their Applied Upper Cervical Biomechanics Course and the Titronics Corporation for the Tytron C-3000 Paraspinal Digital Thermal scanner.

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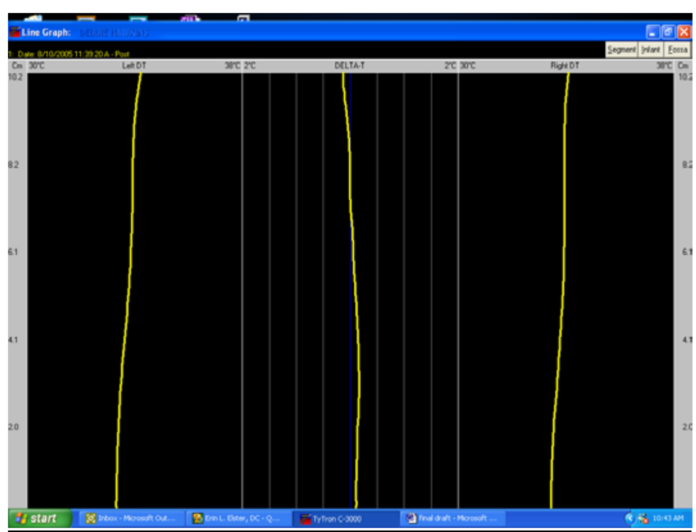
Figure 4 Pre-scan

Figure 5 Post Scan



<u>Table 1</u>

Case No.	Vertigo Type	Age	Gender	Years of Vertigo	DX by MD?	Thermal Deviation	X-ray Listing	History of Trauma?	# of months of TX	Result from TX
1	BPPV	54	M	5	Yes	0.5°C	ESR	none	1	SF
2	BPPV	50	F	37	Yes	1.1°C	ARP	auto	1	SF
3	BPPV	62	F	1	Yes	0.5°C	ESL	auto	2	SF
4	BPPV	63	M	1	Yes	0.6°C	ESR	blow to head	2	SF
5	BPPV	52	M	5	Yes	0.5°C	ESL	fall on ice, auto	1	SF
6	BPPV	26	F	1	Yes	0.5°C	ARP	blow to head	2	SF
7	BPPV	50	F	1	Yes	0.5°C	ESR	auto	2	SF
8	BPPV	51	F	8	Yes	0.5°C	ESR	diving	2	SF
9	BPPV	29	F	2	Yes	0.5°C	ESL	fall on ice	3	SF
10	C	32	M	5	Yes	0.8°C	ARA	waterskiing	2	SF
11	C	43	F	15	Yes	0.5°C	ARA	ski, auto	2	SF
12	C	37	F	5	Yes	0.5°C	ESR	ski, auto	1	SF
13	C	39	F	5	Yes	0.6°C	ESL	auto	2	SF
14	C	28	F	1	Yes	0.6°C	ALP	auto	1	SF
15	C	28	F	1	Yes	0.9°C	ALA	bike	6	SF
16	C	31	F	1	Yes	0.5°C	ESR	auto, bike	1	SF
17	C	12	F	3	Yes	0.9°C	ALA	blow to head	1	SF
18	C	49	F	5	Yes	0.5°C	ALA	auto, fall down stairs	2	SF
19	C	33	M	2	Yes	0.7°C	ESL	kite surfing	3	SF
20	C	38	F	1	Yes	0.6°C	AR	auto, fall on ice	1	SF
21	C	34	M	1	Yes	0.6°C	AR	blow to head	2	SF
22	C	23	M	5	Yes	0.6°C	ESR	bike	3	SF
23	C	52	F	1	Yes	0.5°C	ARP	auto	2	SF
24	C	39	F	14	Yes	0.6°C	ARA	fall off trampoline	2	SF
25	C	45	F	4	Yes	0.5°C	ESL	auto	2	SF
26	C	45	F	4	Yes	0.6°C	AL	auto	2	SF
27	C	37	F	17	Yes	1.0°C	ALA	auto	6	SF
28	C	60	F	4	Yes	0.5°C	ARA	auto	3	SF
29	C	33	M	2	Yes	0.6°C	ALA	auto	2	SF
30	C	46	F	1	Yes	1.2°C	ALP	fall on ice	3	SF
31	C	42	M	1	Yes	0.5°C	ESL	auto	2	SF
32	C	41	F	1	Yes	1.0°C	AR	auto	5	I
33	C	47	F	4	Yes	0.7°C	ARP	auto	2	I
34	C	25	M	2	Yes	0.5°C	AL	blow to head	3	I
35	C	52	F	4	Yes	0.5°C	ALA	auto	3	I
36	C	41	F	1	Yes	0.5°C	AL	auto	1	I
37	D	33	F	12	Yes	0.7°C	AR	auto	5	SF
38	D	50	F	3	Yes	0.5°C	ALA	horseback riding	2	I
39	D	49	F	8	Yes	0.6°C	AL	auto	6	I
40	L	51	F	18	Yes	0.5°C	AR	auto	2	SF

Table 1 Continued

41	L	29	F	2	Yes	0.5°C	AR	snowboard	2	SF
42	M	49	M	2	Yes	0.5°C	ALA	auto	4	SF
43	M	45	M	1	Yes	0.5°C	AR	auto	2	SF
44	M	60	F	1	Yes	0.5°C	ALA	none	1	SF
45	M	61	M	1	Yes	0.5°C	AR	none	1	SF
46	M	29	F	5	Yes	0.6°C	ESR	auto, snowboard	3	SF
47	M	54	M	3	Yes	0.6°C	ARA	bike	2	SF
48	M	73	F	1	Yes	0.6°C	ESR	none	4	I
49	M	32	F	2	Yes	0.8°C	AL	blow to head	2	I
50	M	49	F	2	Yes	0.5°C	AR	none	3	I
51	M	41	F	3	Yes	0.5°C	ARP	fall off ladder	1	I
52	M	30	F	1	Yes	0.7°C	AL	auto, sledding	2	I
53	MAV	24	F	7	Yes	0.5°C	ALP	auto	1	SF
54	MAV	23	F	3	Yes	0.5°C	AR	fall down stairs	6	SF
55	MAV	36	M	2	Yes	0.7°C	ALA	auto, bike	2	SF
56	MAV	45	F	1	Yes	0.7°C	AL	auto, bike	2	SF
57	MAV	22	F	2	Yes	0.5°C	ESR	auto	3	SF
58	MAV	21	F	5	Yes	0.6°C	ESR	blow to head	2	SF
59	MAV	39	F	1	Yes	0.5°C	ESR	auto	2	SF
60	MAV	12	F	2	Yes	0.5°C	ESR	fall on monkey bars, auto	2	SF

Figures 6-9

Lateral Cervical

A-P Cervical

A-P Open Mouth

Base Posterior

The four views (lateral, anterior-posterior, anterior-posterior open mouth, and base posterior) enabled examination of the upper cervical spine in three dimensions: sagittal, coronal, and transverse. Analysis of the four views was directed towards the osseous structures (foramen magnum, occipital condyles, atlas, and axis) that are intimately associated with the neural axis.