Asia-Pacific Chiropractic Journal

CASEREPORT

The Long and Winding Road of Whiplash Associated Disorders: An Applied Kinesiology Chiropractic Case-Report

Scott Cuthbert

Abstract: *Objective* The objective of this case study is to report the long, detailed, and ultimately unsuccessful treatment modalities used (medical, pharmaceutical, physiotherapeutic, and chiropractic) for the victim of a motor vehicle accident (MVA) over 1.5 years. The missing component was then applied for the patient, which involved the evaluation and treatment of the patient's injured cranio-sacral system, producing resolution of her MVA symptom picture.

Clinical Features A 32-year-old obese female was referred by her neurologist with a 1.5 year history of symptoms after a MVA. Her measurable orthopedic and neuromuscular deficits are described after 47 chiropractic and 9 physiotherapeutic and a dozen medical visits, including 18 months of heavy medication as her treatment.

Intervention In this case, chiropractic cranial, TMJ, and cervical subluxations were addressed in a patient who had suffered a MVA with whiplash associated disorders (WAD) 1.5 years previously, which were resolved through the use of applied kinesiology chiropractic treatment. This case offers the reader a detailed medical and chiropractic history review, showing the many months of unsuccessful treatments victims of MVAs often suffer. The case can also serve as a foundation for a detailed discussion regarding how to effectively incorporate chiropractic cranial treatment into chiropractic practice for patients who present with head or neck pain after MVAs. The patient was placed on a care plan consisting of three times a week for the first two weeks before significant symptom reductions and functional restoration was achieved.

Outcomes At the second week examination on her sixth visit, the patient stated that she had been steadily experiencing significant recovery in mobility, strength, mood, independence, sleep, and energy. For the first time in 1.5 years, her headaches and neck and low back pain were stabilised. All cervical range of motion was improved, as were her visual analog scales (going from 1050 on initial examination to 250 after 2 weeks of treatment), and the Neck Disability Form and Oswestry Low Back Disability Forms each going from the "severe disability" (or 34) rating to "no disability" rating (or 8).

Indexing Terms: chiropractic; AK; Applied Kinesiology; WAD; Whiplash Associated Disorders.

Introduction

On January 23, 2018 the author received one-and-a-half inches of records from two medical doctors, a physical therapy center, and a chiropractor regarding 1.5 years of consistent treatments for a patient involved in a motor vehicle accident (MVA) on July 22, 2016. This case report will make the reader aware that some victims of motor vehicle accidents (MVAs) suffer years of symptoms after their initial injuries which can frustrate the patient, the doctors, the insurance company payers and many others because of negligible results.

... It is easy for chiropractors to be critical of a drug-based approach to managing WAD, but what happens when another chiropractor's approach is equally ineffective? Cuthbert reports that an approach grounded in AK with gentle and minimal intervention has been shown to produce resolution to the satisfaction ...'

Significant numbers of patients transition to a chronic state after MVAs. Further, various treatments for the chronic stage of the condition, including manipulative, medication, and exercise have offered only modest affects with only 10-20% of patients having a completely successful outcome, with little or no disability at the 12-month follow up. (1)

It is my contention that many health problems arise from a mechanism in the body about which the majority of doctors are unaware: the cranial-sacral mechanism. Members of the chiropractic and osteopathic professions have made a major effort to understand dysfunction in this area and to correct it. Unfortunately this knowledge has not been widely dispersed or taught in our chiropractic colleges, and a majority of individuals continue to suffer with health problems which could be corrected if a larger number of doctors were aware of the wide range of problems developing from disturbances in the mechanics of the human head.

Many of the areas in which application of the cranial concept might be of great benefit are controlled by specialists who are not yet aware of this very potent and vital tool for their patients. These specialties include pediatrics, obstetrics, dentistry, psychiatry, ear-nose-and-throat doctors, and the general practitioner. Other conditions that may be caused by cranial problems are hypertension, impaired brain circulation, disturbances in the endocrine and digestive systems, vision, hearing, and general neurologic disorganization. Parents and teachers often assign improper labels to children such as 'slow learner'; 'poor reader'; 'dyslexic'; 'poor listener'; 'hyperactive'; or 'poorly disciplined' – not realizing that sensori-motor confusion arising from cranial disturbances underlie each of these conditions. Unfortunately, these patients tend to travel from doctor to doctor receiving only temporary - if any relief - from their condition. This case report elaborates in detail upon this problem in the case of one long-suffering chiropractic patient.

A review of the patient's medical, chiropractic, PT, and radiological records will be offered, preceding my examination and treatment of this patient. The major involvements in this patient's health and those that may have a bearing on her motor vehicle accident of July 22, 2016 are compiled below.

Motor Vehicle Accident History

On July 22, 2016 the patient was the restrained driver in her 2014 Chevrolet Cavalier, traveling on Third Street in La Junta, CO, USA, at approximately 30 mph. At the cross street before her a person driving a full-sized Chevrolet pick-up ran a stop sign and broad-sided her car on the passenger side. The patient is unaware of the speed of the other vehicle. Damage to her car was about US$13,000.00 and it was repaired. The road condition was dry.

When asked what happened to her at the time of impact, the patient states that she doesn't know; she just got out of the car and ran around to the other side for fear of what was happening to her eight-year-old daughter, riding in the passenger side front seat. When again asked what happened at the point of impact she said, '*I don't know. I was just jerked around.*' Emergency personnel took her daughter by ambulance to the emergency room, accompanied by the patient. The daughter was examined, x-rayed and released. The patient states that she was not examined at the hospital. Another daughter, four, was in the back seat of the car. Both daughters had some eye problems, and the older girl had a hip injury. The daughters have been seen by an optometrist of their city. The patient was not cut or bruised.

She stated she didn't really have any symptoms immediately. That night her neck became very painful, and she developed a severe headache that she called a '*ringing*' headache. She also developed back pain, and pain across her shoulders. The next morning she went to her family physician and was sent to the hospital for x-rays. Her family physician prescribed many

medications for her over the following 1.5-year period, and referred her to a chiropractor, a physical therapy centre, and a neurologist.

Review of records following 1.5 years of consistent chiropractic, medical, and physiotherapy treatment

A chiropractor began the first of 47 treatments for this patient after her MVA over the course of 12 months on August 1, 2016. The initial complaints were '*pain and soreness in the neck, upper back, and low back as a result of a motor vehicle accident*.' There is notation of muscle contraction tenderness throughout the paraspinal muscles, and multiple vertebral articular dysfunctions. There is notation of decreased cervical range of motion of left rotation and left lateral flexion. There is notation of pain ' … radiating into the right buttock(s) and lower extremity with deep tendon reflexes … ' but not noting whether they are increased, decreased, normal or absent. Cervical distraction and foraminal compression tests normal. Treatment consisted of full-body laser and concentrated laser on two areas twice per visit, massage and manipulation as indicated. In the following 1.5 years of 47 visits there is continued complaint of soreness in the neck and back and headache, with treatment remaining the same.

September 11, 2016 it is noted, '*The patient was doing well but condition has recently exacerbated. The patient reported pain and soreness in the neck, upper back, and bilateral arm(s). Soreness as a result of an overexertion*.' Treatment remains the same.

On January 11, 2017 there is indication that '*The patient was doing well but the condition has recently exacerbated. Patient continues to experience intermittent pain, headaches, and soreness in the neck and low back. The condition is exacerbated by lifting children*.'

The complete notes of February 5, 2017 are as follows:

'*There is no change in the patient's condition. Exam findings are as above. Treatment today consisted of full-body laser and concentrated laser on two areas twice per visit, massage and manipulation as indicated. The patient should return in three days*.' This seems to indicate there were some objective tests done, but there is no indication of what or anything to relate to '*exam findings as above*.' Perhaps '*exam findings as above*' refers to findings on previous office visits. On February 15 it is indicated that there is muscle contraction and tenderness. Palpation in the bilateral paralumbar muscles with L1-5 and sacroiliac joint articular dysfunction noted. Treatment remains the same.

On March 6 2017 there are similar objective notes about the paraspinal muscles and of C1-3 cervical dysfunction, as well as L4-5 and sacroiliac articular dysfunction. The notes continue in a similar vein until April 3, 2017 when it is noted that the patient was doing well but condition has recently exacerbated as a result of a fall. The same splinting and tenderness of the paracervical, dorsal, and lumbar muscles are noted. Also noted are decreased range of motion of the cervical spine in all planes. The chiropractor notes that the patient should be at reduced activity and using cold at home as prescribed. Treatment was the same.

Subjective symptoms and treatment remain the same until May 30, 2017 when it is noted the patient reports constant pain and soreness of the neck and low back with headache, visual disturbance, and disorientation. The same notes regarding the paraspinal muscles and multiple vertebral articular dysfunctions are noted. '*The patient is referred out for other medical care and should probably visit a neurologist. Treatment is maintaining current level of MMI.*' Treatment continues through June and July, with the same type of subjective symptoms and minimal objective findings.

There is a copy of a letter dictated March 7, 2017 *To Whom It May Concern* by the chiropractor regarding the Food and Drug Administration's final approval for the use of low-intensity laser

therapy for the treatment of a spectrum of conditions. Apparently this letter is in reference to some treatment with laser therapy being billed and denied.

Imaging

July 23, 2016: Routine lumbar and cervical spine. Cervical spine, five views. Impression: Negative cervical spine. Lumbar spine, five views. Degenerative disc change at L5-S1.

August 16, 2016: Lumbar MRI without contrast. Impression: Small central disc protrusion at L5-S1 without nerve root involvement.

September 13, 2016: Ultrasound of the abdominal area, limited. Status post-motor vehicle accident. Impression: Normal right upper quadrant ultrasound.

October 15, 2016: X-ray of right hip and pelvis post-motor vehicle accident. Impression: Negative.

December 6, 2016: MRI of the head with and without contrast. MRI of cervical spine with and without contrast. Impression: Normal magnetic resonance imaging. Examination of the cervical spine and impression: Normal enhanced magnetic resonance imaging examination of the brain.

Medical Treatments for MVA

July 27, 2016, physician's assistant notes that the *Darvocet* is not helping the lower back pain, and that stretching exercises have been prescribed.

August 10, 2016 follow-up. Physician assistant notes that she is doing some better and has seen the chiropractor, and there is a note that she has some pain radiating down into the legs with no paresthesias. The neck is still slightly stiff. '*Does have some generalized paraspinal lumbar pain. Again, does have the radiculopathy. Straight leg raises are negative for pain or paresthesias.*' It is noted that the cranial, motor, sensory, reflexes and cerebellar functions are all intact. An MRI of the lumbosacral spine is ordered, and recommendation that she start physical therapy for ultrasound and massage 3x/week for the next month. She is encouraged to continue treatment with the chiropractor for the neck problems, but to hold off on any work on the back until the MRI is done.

August 20, 2016: Follow-up by the family physician for a lot of pain and discomfort in the low back area. She's having some neck discomfort, and it is noted that there was no severe pain or discomfort prior to this injury. '*She is now having more discomfort in the low back area with some numbness and radicular-type symptoms down both legs. Her recent MRI showed some disc bulging with concerns of inflammation in the nerve root. She has had an MRI ordered.*' In the back area it is noted, '*It is somewhat tender over the lower lumbosacral disc area with positive straight leg raising bilaterally to some neuropathic discomfort and pain down the legs*.' A tapering dose of *prednisone* is started.

On September 4, 2016 a list of her present medications are *Vioxx*, *Skelaxin*, *Vicodin*, and *Elavil*. It is noted that she continues to see the chiropractor and physical therapists. Neck and back pain continue, and has recently developed a sensation of fullness and discomfort under the right lower rib cage. She occasionally has headaches, particularly involving the right side of her neck. She has some mild dizziness, particularly when moving from one position to another, and has noticed some intermittent blurred vision. The abdomen is noted as soft and non-tender.

October 18, 2016: Follow-up by family physician. Symptoms noted are no headache, dizzy when turns fast, neck and back pain. It is noted that plain film x-rays are taken of the pelvis and right hip, which were negative. Family physician notes that she might benefit from further physical therapy. '*I would like to start her on 3x/week for the next month, ultrasound, deep massage to the neck and back, and possibly some stretching exercise program.*' Examination is a general medical-type examination of the systems. The only orthopedic/neurologic information is

tenderness in the paraspinous muscles of the neck with fairly good range of motion. Straight leg raising is positive to some discomfort in the back but no paresthesias down the legs. Neurologic is noted as '*generally stable*.' Plan is to continue medications the same. '*She is re-started on physical therapy*.'

The patient was prescribed a total of 9 sessions of physical therapy following her MVA by her family physician.

November 12, 2016: Follow up by physician's assistant. '*PT caused severe pain to legs. There is no longer leg paraesthesia. Neck much better. There is nagging back pain and a complaint of significant fatigue and weakness*.' Plan is to decrease medication dosages. It is indicated that she feels that physical therapy is not benefiting her much, and she will continue exercises at home. There is encouragement to increase her physical activities of walking and working on her strength.

November 20, 2016: Follow-up by family physician. Subjective complaints of weakness and pain in the right arm, increased fatigue, problems using right side. Neck has some improvement. There is no distinct nerve paraesthesia distribution. It is noted, '*Her symptom complex is really hard to evaluate*.' The general medical examination is negative. Under extremities it is noted, '*She does have some pain with elevation of the right shoulder, some tenderness in the paraspinous muscles, but I do not delineate any weakness in the right arm or right leg and her gait is reasonably stable.*' Plan is to increase *Neurontin* to 300 mg at bedtime. Head and neck MRI with and without gadolinium.

December 10, 2016: Follow-up by family physician. '*An MRI of the head and neck has been completed, with both studies normal. The patient is having neck pain, head pain (probably in relation to the previous motor vehicle accident). She complains that she tingles in the groin when she bends over, and has a lot of discomfort. She was also complaining of numbness in the left arm.*' Family physician's impression is now (1) left arm, bilateral arm paraesthesia, (2) lumbosacral disc disease, (3) post-MVA, (4) chronic muscle pain, (5) hypothyroidism, (6) cervical pain, (7) paraspinous muscle pain, (8) element of traumatic fibromyalgia developing.

September 26, 2017: Follow-up by family physician for post-MVA. He notes that she is having quite a bit more back pain lately. '*She notes that the back is giving her a lot of severe aching and discomfort. Some into the buttocks but not down into the legs*.' MD now rates her as having chronic fibromyalgia, chronic paraspinous muscle pain/strain, cervical shoulder neck pain/strain, lumbosacral disc problems, bilateral arm paresthesias, intermittent upper respiratory infections. He adds an extra dose of *Neurontin*. '*Additionally, the patient is having some agitation problems.*' The patient is started on some *Ativan* for her nerves and agitation, which she will utilise as needed for anxiousness and agitation. There is no major change in examination findings, except she seems to have less discomfort with range of motion of the shoulders and the arms.

November 21, 2017: Follow-up family physician. Patient is seen mostly for motor vehicle accident of 7/22/16. '*Part of I think her fatigue and difficulties relates to her hypothyroidism. We really do not have her dosage stabilised well. Her other medical problems in addition to the MVA with the neck, cervical strain, neuropathic discomfort in the shoulders and arms bilaterally, low back pain with neuropathic discomfort. She also has the hypothyroidism, the traumatic fibromyalgia, chronic paraspinous muscle pain/strain, lumbosacral disc disease, chronic anxiety, agitation and depression, arm paresthesias, chronic allergic rhinitis, chronic pain syndrome.*'

'T*he patient states that she has been having increasing problems breathing at night. During the day it feels like she is choking. Has had a lot of nasal congestion and drainage*.'

Medical Impression 1.5 years after initial MVA on July 22, 2016

'*The patient with persistent pain and discomfort. Now having other problems going on, particularly: (1) upper respiratory congestion, (2) post-spontaneous AB with D and C, fetal demise, (3) recurrent upper respiratory infections (URI), (4) recurrent bronchitis, (5) hypothyroidism, (6) chronic fatigue, (7) lumbosacral back pain, (8) arm numbness and paresthesias, (9) chronic depression, (10) anxiety/agitation, (11) chronic paraspinous muscle discomfort, (12) traumatic fibromyalgia, (13) hypothyroidism control has been difficult.*'

Under Plan family physician states: '*The patient is to add in the Flonase and the Allegra. Will continue on her other meds for the post-MVA musculoskeletal problems. There is distinct concern in my mind that the patient's focus is to move to a situation of disability. She asked me particularly about applying for Social Security disability. I know her mother has taken that route. I think at this age and in particular I do not think she meets criteria for Social Security disability. Thus I think her focus needs to get away from being disabled and more toward focusing on getting more active, losing weight and trying to establish a more normal life pattern. I think this is going to be hard to accomplish in her.*'

Medications

1. *Vicodin*. Two b.i.d
2. Started on *Flonase*, two sniffs both nostrils at bedtime
3. *Allegra* 160 each a.m.
4. *Neurontin* 300 b.i.d.
5. *Vicodin* 5/500, on b.i.d.
6. *Elavil* 25 mg at bedtime
7. *Skelaxin* 400 t.i.d.
8. *Vioxx* 50 once a day
9. *Ultram*, one t.i.d.
10. *Ativan* 1 gm, ½-1 b.i.d. as needed for anxiousness/agitation

'*Plan: The patient needs to continue to lose weight, get off all caffeine, avoid tobacco, avoid alcohol. She will need to stop the Vioxx. We will try to control her musculoskeletal discomfort with modalities other than non-steroidal at this point in time.*'

[It is not the author's purpose here to judge the medical treatment provided in this chiropractic case report, but I believe it was important that the prescribed medications be reviewed by someone in the medical discipline. For example, many of the patient's advancing symptoms might have correlated with medication side-effects. More recently the medical records note her increasing agitation, anxiety, nausea, and vomiting.]

Some of the possible side effects of her medications are now noted: (2)

- *Flonase*: agitation, aggression, back problems, headache, vomiting, weight gain, and worsening of asthma, among others.
- *Vioxx*: abdominal pain, headache, heartburn, nausea, stomach discomfort, among others.
- *Vicodin*: nausea and vomiting, among others.
- *Allegra*: fatigue, indigestion, and nausea, among others.
- *Neurontin*: Blurred, dimmed, or double vision, dizziness, drowsiness, fatigue, involuntary eye movement, itchy, runny nose, lack of muscular coordination, nausea, tremor, vomiting.

- *Elavil*: anxiety, fatigue, headache, inability to sleep, nausea, stomach upset, tingling and pins and needles in arms and legs, vomiting, weakness, and weight gain, among others.
- *Skelaxin*: nausea, vomiting, gastrointestinal upset, drowsiness, dizziness, headache, and nervousness or "irritability."
- *Ultram*: Agitation, anxiety, bloating and gas, constipation, convulsive movements, diarrhoea, dizziness, drowsiness, dry mouth, feeling of elation, hallucinations, headache, indigestion, itching, nausea, nervousness, sweating, tremor, vomiting, weakness, abdominal pain, confusion, coordination problems, feeling of illness, flushing, frequent urination, inability to urinate, loss of appetite, menopausal symptoms, rash, sleeping problems, visual problems
- *Ativan*: dizziness, sedation (excessive calm), unsteadiness, weakness, agitation, change in appetite, depression, eye function disorders, headache, memory impairment, mental disorientation, nausea, skin problems, sleep disturbance, stomach and intestinal disorders.]

Neurological Report, September 9, 2017 (14 months after MVA)

Medical neurologist reviews the medication the patient is taking and her therapy. It is indicated that the physical therapy did not seem to help. *Vicodin* is taken primarily in the evening or at night because it makes her groggy during the day. *Amitriptyline* is also taken at bedtime. She thinks it helps her sleep. *Neurontin* is taken at bedtime and relaxes her. *Neurontin* taken during the day makes her too groggy to take care of her children. She's not certain whether *Vioxx* really helps or not. She uses her *Albuterol* inhaler PRN, usually about two-three times a week. She feels the chiropractic treatment helps her for at least two to three days. She's being treated once a week. Neurologist indicates that motor and sensory examinations are normal, and that examination of the head and neck revealed no abnormality. Deep tendon reflexes and superficial reflexes were normal. His diagnosis is post-traumatic headaches, neck pain, and low back pain. He suggests a trial of *Ultram*.

November 22, 2017: Progress report. Medical neurologist noted she is taking *Skelaxin* and that it does help a little and she would rather take it than not take it. Neurologist notes right upper quadrant pain associated with some vomiting in the prior two weeks. There is also some epigastric pain associated with the vomiting. The pain lasts only a minute or two and tends to come and go. Neurologist asks her to stay on the same regimen and to see him again in six months. Neurologist suggests she consider seeing the author of this report at this time. She does so after the Christmas holiday.

Professional Applied Kinesiology (PAK) Chiropractic Examination

History, subjective symptoms consultation, and PAK examination began at 10am and ends at 11:30am, January 15, 2018, approximately 18 months after MVA.

After listening to the patient's initial history, my first question to the patient was how she feels she is doing from all of her treatments. The patient stated that she has not improved very much. She is able to turn her head better now, whereas it had extremely limited motion to begin with. She complains mostly of constant neck pain, pain across her shoulders, and mid and low back pain. She has headaches almost daily. She feels weakness in her hands. She states that when she moves quickly her eyes blur. Bright light bothers her eyes, and she states that she's very nervous. She has difficulty chewing foods that have a more dense consistency, such as meat. She's had a lot of digestive problems, throwing up. Tension in her chest. She has numbness in her legs at times. She has difficulty sleeping and is on medication for that, but she wakes frequently during the night. Her energy level is very poor.

She had no chiropractic care previous to this accident.

The patient's stated weight is 240 lbs and height is five feet five inches. Blood pressure seated is 106/79; standing 98/64, pulse rate 79. Normally the blood pressure rises around 6mm when standing to accommodate against gravity so adequate blood is supplied to the brain. She acknowledges that she gets lightheaded when she stands, and also bright lights bother her eyes. This was not present prior to the accident, and are physical signs of adrenal gland stress and dysfunction, called Ragland's sign. (3)

Self-appraisal of pain and disability

The patient was asked to fill out a pain drawing, Neck Disability Form, Oswestry Low Back Disability Form, fifteen questions on a Visual Analog Scale of Neck and Associated Pain, and fifteen questions on a Visual Analog Scale of Low Back Pain.

The pain drawing is marked in the areas that she described during our initial consultation. The codes for symptoms are mostly contained within the drawing, and appropriately there are no exaggerating comments marked on the form. The codes for numbness and/or ache are distributed on almost all of the body.

The Neck Disability Form is a modification of the Oswestry Low Back Disability Form to apply to the cervical spine and associated pain. Her score is 32, placing her in the high severe bracket of neck disability. This correlates with my impression of her following my initial consultation and examination … again, tragically, nearly 1.5 years of treatments for her MVA.

The Visual Analog Scale of Neck and Associated Pain has a total score of 1900. The questions are 0-100 on a grid of 0-10. Of the 15 questions there are 19 scales of 1-10, giving the total score of 1900 (some questions are bilateral). The patient's score is 1324.

Her score on the Oswestry Low Back Disability Form is 27, placing her in the lower portion of the severe bracket of low back disability.

The Visual Analog Scale of Low Back Pain has a total score of 1500. The questions are 0-100 on a grid of 0-10. The patient's score is 1050.

Orthopedic tests

Romberg, finger-to-finger, and finger-to-nose tests are passed. Able to do a heel-to-shin test on the right but not the left. Babinski test is down-turning. Postural analysis – right shoulder and head elevation, increased anterior pelvic tilt.

Trendelenburg test is negative bilaterally. There is right sacroiliac elevation in Adam's position. Adam's test causes pain in the sacral area. Right Kemp test causes pain in the right knee. Right and left Kemp test causes pain in the lumbar spine without radiation to the legs. Lumbar lateral flexion range of motion is within normal limits. Lumbar extension is within normal limits but causes pain in the lumbar spine. Lumbar flexion is moderately limited. Right Bechterew test causes some posterior knee and thigh pain. Bilateral Bechterew tests cause pain across the sacroiliac area.

FABERE Patrick test causes pain in the groin, but no pain in the hip. Eli's test is positive bilaterally for pain across the sacroiliac area. There is no sciatic nerve tenderness. Mennell's test for sacroiliac joint strain is positive. Lindner's seated test causes pain in the lumbar spine and the neck. When moving from sitting to supine or supine to sitting position she rolls to the right. Straight leg raise tests are limited at about 80°. There is posterior thigh pain and posterior knee pain, judged to be from muscle tension rather than radiculopathy. This is supported by Bragard and Fajersztajn tests increasing posterior knee pain without increasing posterior thigh or gluteal muscle pain.

Biceps, triceps, brachioradialis, quadriceps and Achilles reflexes are 3+ bilaterally. Right JayMar dynamometer strength is 40/40/35 lbs; left 30/30/30 lbs; the patient is right-hand

dominant. Shoulder depression bilaterally causes neck pain but no radiation into the arms. Jackson foramina compression causes neck pain with no radiation to the arms. Cervical axial traction provides relief in the neck as indicated by her saying that it feels good. Cervical axial compression increases pain.

Cervical range of motion measured by Cybex compound inclinometer:

Flexion = 31°, Extension = 54°

Left Lateral flexion = 21°, Right Lateral flexion = 26°

Left Rotation = 78°, Right Rotation = 83° measured supine

Professional Applied Kinesiology Manual Muscle Tests (MMT)

The purpose of specific muscle tests in this examination is to determine if there is objective evidence to substantiate the continuing subjective complaints. If so, then the examination design continued to determine the cause of the dysfunction and whether it could be improved. To accomplish this, various sensory receptor stimuli were applied to determine if the muscle dysfunction was improved, indicating the weakness was functional in nature and had potential for improvement. If there was improved muscle function, the type of sensory stimulus that caused the improvement separated the problem from a peripheral neuropathy, receptor, spinal cord, brainstem, cerebellum, thalamus, or cortical lesion. Unless otherwise noted the muscle tests listed in this examination as strong were equivalent to 5 and weak as 4 as graded in the Guides to the Evaluation of Permanent Impairment, 5th edition, by the American Medical Association. (4)

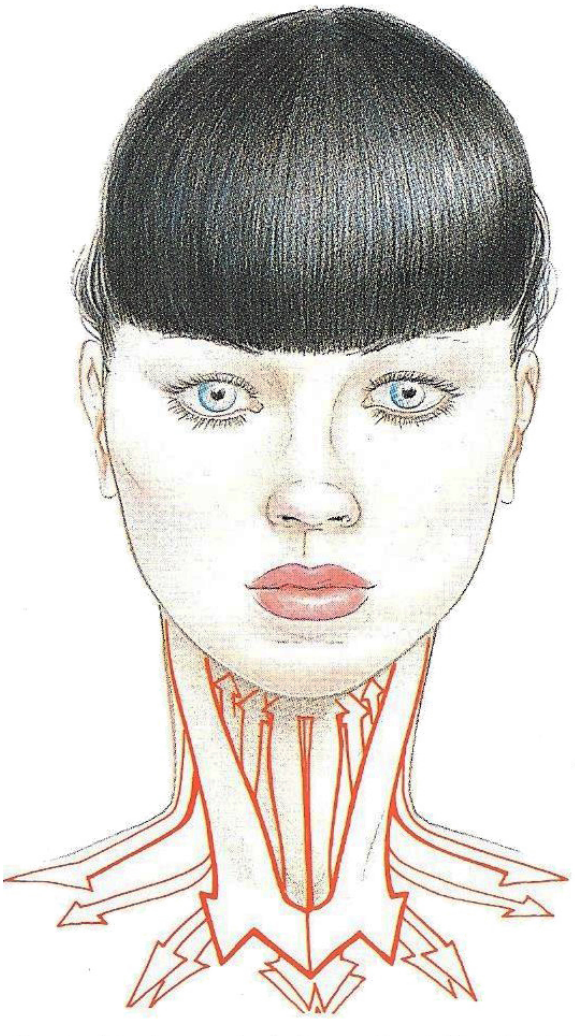

Fig 1: Vectors of testing force and function replicated in accurate manual muscle tests of the neck

Extensor hallucis muscles test weak bilaterally. *Psoas* and tensor fascia lata muscles test weak bilaterally and respond to suboccipital stimulation. Abdominal muscles test weak. Pelvic category I dysfunction.

Right 1st rib head is very tender, but there is no similar tenderness at the left 1st rib head that is consistent with pelvic category I dysfunction. Stretching the *sacrotuberous* and *sacrospinous* ligaments on the right takes pain out of the 1st rib head area. This is a spondylogenic referred pain from the pelvis to the cervical and upper thoracic area. (26) This source of referred pain is corrected by proper correction of the pelvic category I dysfunction. This also relates to paraspinal muscle pain from C1 to T8. Bilateral *gluteus maximus* muscles test weak and strengthen with suboccipital stimulation, indicating a vertebral fixation between the upper cervical vertebrae. Bilateral lower trapezius muscles are weak and strengthen with stimulation to the dorsolumbar junction, indicating a vertebral fixation at that area.

Pectoralis (clavicular and sternal divisions) test weak bilaterally. Deep neck flexors and *sternocleidomastoid* muscles test weak bilaterally. The *upper trapezius muscles* test weak bilaterally if tested properly (not just a shoulder shrug). There is a saccade of eye movement in the right upper quadrant. When the eyes are held in that position there is weakening of previously strong muscles. *Deltoid* and *serratus anticus* are weak and strengthen with a specific vector of support to the 6th cervical vertebra. *Infraspinatus*, *supraspinatus*, *subscapularis*, and t*eres minor* are strong on the left. F*lexor digiti minimi brevis* and *opponens pollicis* are strong bilaterally. *Rhomboid* muscles strong bilaterally. Support to the atlas on the right from posterior to anterior strengthens the pectoral and psoas muscles. Several of the above muscles indicated as testing weak improve strength by certain phases of held respiration.

Initial examination was concluded at 11:30 am.

Impression after PAK examination

The records of previous treatments related to the MVA of July 22, 2016 are extremely limited in providing objective information, with the exception of the physical therapy assessments and treatments. The medical treatment is entirely medication. The chiropractic treatment is devoid of information that allowed me to evaluate its effectiveness.

The typical note was '*Treatment today consisted of two applications of attended, low intensity laser therapy on more than one affected area @ 90 sec./ application* [where was it applied?]*, massage* [what muscles and why?], *and manipulation* [which vertebra(e), How was the need determined? Did the correction hold on the next visit?] *as indicated*.'

It was my opinion that the patient continued to have problems related to the MVA of July 22, 2016. The scores on the Disability and Visual Analog Scale of Pain forms is somewhat higher than I would expect when correlated with my examination findings.

I did not find support for lumbar radiculopathy. On August 10, 2017 the family physician's physician assistant indicated '*Does have some generalized paraspinal lumbar pain. Again, does have the radiculopathy. Straight leg raises are negative for pain or paresthesias.*' This information is contradictory, and there is no other information in the notes supporting radiculopathy except on occasions pain on straight leg raising. Even in those instances there is no support shown for the straight leg test increasing pain such as a follow-up Bragard test. I find some indication of referred pain from the lumbosacral and sacroiliac joints to the legs because of the strain in those areas. (5)

Applied Kinesiology Chiropractic Examination and Treatment

(How this MVA with WAD patient finally began to recover)

In the reviewed records motor function (muscle function) is indicated as normal in contrast with my findings of numerous muscles testing 4/5. In the reviewed records there is no indication of how or what muscles were tested. It is my opinion that the muscle grading was done by testing muscle groups that will not find the same information that tests designed to optimise a single muscle function will. (6, 7)

I was able to enhance her muscle function by applying different vectors of force to the vertebral level of muscle innervation and by other methods of influencing the nervous system.

It is indicated in the medical and neurological examination records that the cranial reflexes were normal, although it was not indicated what tests were done. I did not find pathological dysfunction of the cranial nerves, but I did find some of them not functioning optimally. My examination found disorganisation between cranial nerves III, IV, and VI producing the saccade of eye movement and weakening of previously strong muscles when the eyes were held in that direction. This is due to failure of good organisation between the head-on-neck, visual righting, and labyrinthine reflexes. Abnormal afferent input from the vestibular, visual, or somatosensory systems are common in MVA patients, and can result in abnormal sensory-motor control. The resulting mismatch, which may occur in the presence of conflicting afferent information, may underlie symptoms of dizziness or unsteadiness, problems in maintaining a stable upright posture, and measurable deficits in head and eye movement control in people with headache and neck pain after a MVA. (8, 9, 10)

In addition the sternocleidomastoid and upper trapezius muscles tested 4/5. They are supplied by cranial nerve XI. Cranial and TMJ treatment showed that there was ongoing dysfunction of cranial nerve V supplying the muscles of mastication. This accounted for the complaint of TMJ as well as headache pain.

Whenever the patient opened her mouth, sang, swallowed, or clenched her teeth, the muscles of her low back and neck would immediately become inhibited. Correction of this dysfunction, along with the balancing of her temporal bones with cranial treatment, made this phenomenon disappear from her functionality.

It was from this point forward that her total symptom picture began to improve dramatically. The methods of AK TMJ correction have been extensively discussed in the chiropractic as well as dental literature. (11, 12, 13)

This patient's cranial nerve dysfunction was due to disorganisation within her cranial-sacral primary respiratory system. (9, 10, 11, 12, 13) This created dural tension that appeared to have wide influences on the functionality of the nervous system. (14) At the time of my initial examination there was a pelvic category I fault and indications of cranial dysfunctions related to her headaches, neck pain, TMJ dysfunction and stress, including her blurry vision. After 2 weeks of AK treatment (3 visits per week) all of these findings and a majority of her symptoms were better.

This patient also suffered from numerous viscerosomatic disorders that effected her spinal muscles. After treating her hypothyroidism (Hashimoto's thyroiditis, an autoimmune condition) with a protocol developed by Dr. Datis Kharrazian (AK physician, neurologist and nutritionist) the patient lost weight and gained motivation and energy. (15)

Correction of her hyperventilation syndrome by correcting her diaphragm muscle impairment and teaching her how to breathe properly improved her energy as well and significantly reduced her anxiety.

Adrenal gland reflex testing was present on her initial visit, 16 and the use of two nutritional supports (*Drenamin* and *Albizia*) removed her Ragland's signs after 2 weeks and further improved her mood and gave her hopes about the future turning positive. (17, 18)

When there was improved function in the patient's condition, her feet and ankles were corrected for proper neurologic function during gait. Treatment of her digestive system (dysbiosis, determined using AK manual muscle testing procedures) furthered her weight loss and energetic recovery.

The difference in this treatment plan from what this patient had experienced before was that it started with evaluating and treating her with objective neurologic muscle tests and applying the treatment that immediately returned the objective tests to normal. Follow-up examination and treatment was frequent enough to determine if the corrections were holding. If not, further evaluation was necessary to determine why the recidivism was present. In a case like this it is expected that stability of corrections can be obtained within two weeks of examination and treatment three times a week. At that time I reduced frequency to one time a week for one or two months. As my corrections became stable, re-evaluation once a month for 6 months was adequate to determine that the stability was permanent.

Discussion

The Applied Kinesiology Revolution in Cranial Therapy

I believe that correction of the cranial-sacral primary respiratory system produced the wide range of objective improvements throughout her body. This corrected the cranial nerve dysfunctions effecting her head, neck, jaws and shoulders and reduced the dural tensions throughout the spinal system, producing a positive effect on many aspects of her nervous system. Follow-up spinal examinations found considerable improvements after the cranial-sacral function was improved.

In recent years, cranial research and theory have highlighted the roles of muscles, joints and nerves in the function of the neuro-musculoskeletal system. This system has been described as the *Primary Machinery of Life* as it is how we all move and communicate.

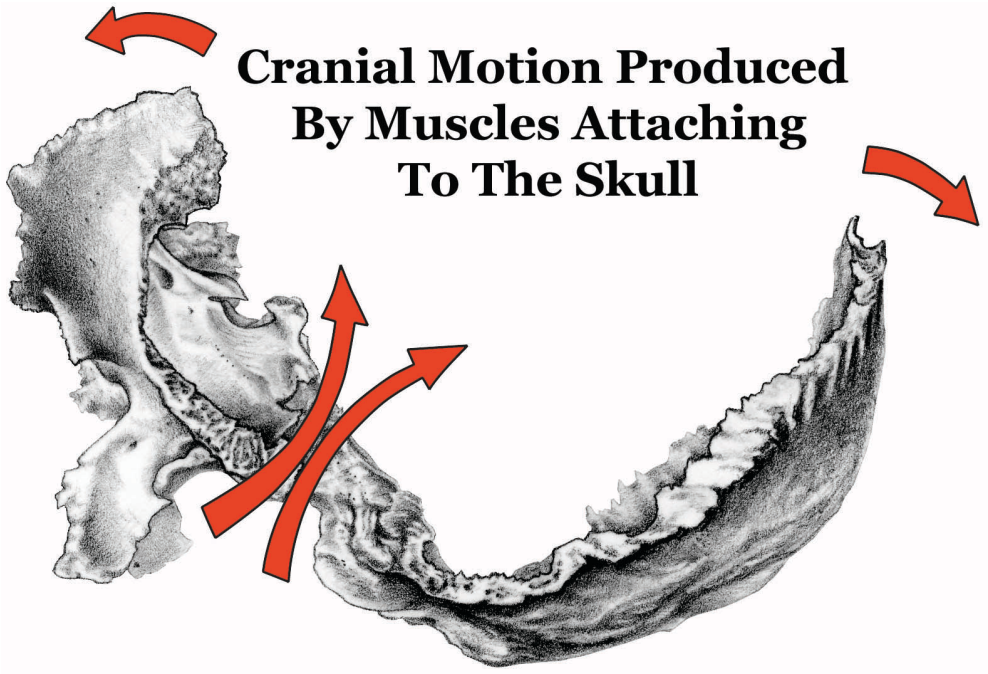

Fig 2

Glossary of Applied Kinesiology's Integrative Diagnostic System
Manual muscle test
The actual testing of the muscle had been firmly established by Kendall and Kendall, (7) who held that a muscle from a contracted position against increasing applied pressure could either maintain its position (rated as 'facilitated' or 'strong') or break away and thus be rated as 'inhibited' or 'weak'. The testing of muscle strength itself has been widely practiced in manual medicine for decades and the use of the MMT for functional conditions continues today with the work of Goodheart (and nearly 1 million 'kinesiologists' around the world), and many others like Janda, Lewit, and Liebenson. *The American Medical Association* has accepted that the standard method of MMT used in AK is a reliable tool and advocates its use for the evaluation of disability impairments. (4)
Challenge
Challenge is a diagnostic procedure unique to AK that is used to determine the body's ability to cope with external stimuli, which can be physical, chemical, or mental-emotional. Cranial and vertebral challenge as used in this case report have been described in the literature previously. (19) After an external stimulus is applied, muscle-testing procedures are done to determine a change in the muscle strength as a result of the stimulus. Through this approach, ineffective therapies that produced no improvements in muscle strength were rejected, and only those that elicited a positive muscle response were used. This guided the treatments given to the patient.
Therapy localization
Therapy localization is a diagnostic procedure unique to AK that consists of placing the patient's hand over areas of suspected involvement and observing for a change in the MMT. This method assists the doctor in rapidly finding areas that are involved with the muscle dysfunction found on MMT and has been used around the world clinically for over 50 years. (19) Rosner et al in two consecutive, blinded, controlled clinical trials and literature reviews clearly supports the AK concept of therapy localisation. (20, 21, 22) Collectively these data suggest that stimulating or stabilising the muscles, joints, ligaments, and skin -- and their associated cutaneomotor reflexes -- can produce measurable changes in muscle function.
'Weak' muscle
A muscle that may or may not develop full power, but on MMT it does not neurologically function at its full capacity. Preferable terms for muscles that test weak or strong are termed conditionally inhibited and conditionally facilitated, respectively. According to the majority of leading researchers in the field of chiropractic and manual medicine today, the combination of muscular inhibition, joint dysfunction and trigger point activity are the key peripheral components leading to functional pathology of the motor system. In AK, the presence of each of these factors are differentially diagnosed using the 'challenge' procedure cited above.
Indicator muscle
A muscle tested to determine if there is a change in its strength as a result of some testing mechanism (challenge or therapy localization, for instance) applied to the body. Generally an indicator muscle is strong prior to the test, and weakens as a result of the specific testing procedure.

Deficits in strength, endurance, and increased fatigability have been consistently demonstrated in the muscles that attach to the cranium in patients with WAD, neck pain and headache. (23) Correction of these weaknesses by AK cranial therapy has been documented for over 50 years.

This is a revolutionary improvement in the approach to, and concepts behind, cranial therapy. In AK we ask: how is '*low back or neck pain*' explained without considering the muscles moving the low back or neck? The cranium should be looked at in the same way, no more mysteriously than the rest of the body.

The earlier belief that the movements palpated in the cranium were driven by a powerful but still unproven primary respiratory mechanism meant that the mandible was rarely addressed in classical cranial work. However in AK there is recognition of what is called the stomatognathic system, indicating the relationship of cranial mechanics to many other body structures. For instance in the conventional cranial management of whiplash strain, most attention is paid to the soft tissues of the cervical spine. However, as an appendage to the anterior skull, the mobile jaw, if abruptly altered in its function, is capable of straining the entire cranium.

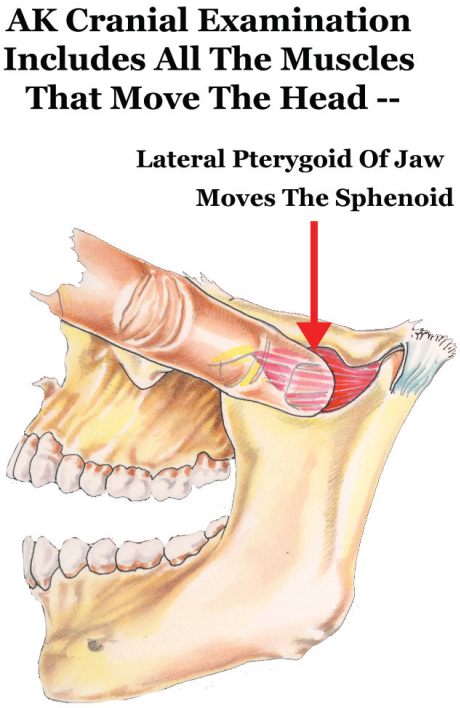

Fig 3

The muscular links with the mandible create a connection between temporomandibular dysfunction and sphenoidal and temporal bone cranial dysfunction, with influences being possible from either direction. Trapezius muscle dysfunction forces the occiput into cranial flexion or extension and normalisation of the strength and function of the muscle must be achieved before treatment to the cranial base can be effective. Changes in upper trapezius strength have been demonstrated in patients with cranial dysfunctions, whiplash, neck pain and headache. (24) The influence of cranial sutural mobility on a malfunctioning sternocleidomastoid or upper trapezius muscle would be profound and sutural disturbances are beyond question a physiological occurrence. (25)

During the AK treatment of cranial dysfunction, careful attention is paid to muscular dysfunctions that definitely impact cranial suture mobility. Any attempt to normalise cranial function without appropriate attention to these powerful muscular influences, acting directly on the sutures and therefore on the motion potentials of the cranium, makes results short-lived.

The causes of muscular imbalances like the ones seen in this patient after her MVA are the AK cranial practitioner's bread-and-butter. Doctors using AK not only evaluate the entire body from the feet to upper neck, but they examine and treat the jaw and head. The positive outcomes for this long-suffering WAD patient may suggest that she finally received the holistic examination she needed.

Conclusion

Based on my examination of the patient and my careful review of her previous medical, PT as well as chiropractic records, it was my considered opinion that the patient's condition was caused by the MVA. She did have some headaches, fatigue, back pain, and a few other symptoms prior to the accident. The MVA was consistent with the development of cranial dysfunctions resulting in the neurologic dysfunction as outlined here.

After 1 month of AK cranial treatment, the patient returned to pre-accident status. After 12 more months of care (involving her thyroid, adrenal, digestive, as well as spinal dysfunctions), the patient was able to lose 35 pounds and began an exercise program that improved her shape and outlook.

The year and a half that her condition lingered without much improvement and the developing psychological problems were unfortunate and unnecessary given the rapidity of her recovery after her integrated cranial system began to be corrected.

Scott Cuthbert
BA, DC
Chiropractor, Dumaguete City
Associate Editor
cranialdc@hotmail.com

Cite: Cuthbert S. The Long and Winding Road of Whiplash Associated Disorders: An Applied Kinesiology Chiropractic Case-Report. Asia-Pac Chiropr J. 2022;2.4. URL apcj.net/papers-issue-2-5/#CuthbertWADAK

About the author

Scott Cuthbert, DC practices in the Philippines and is Associate Editor with the *Journal*. He has served on the Board of Directors of the *International College of Applied Kinesiology USA*. He is the author of three textbooks on applied kinesiology (in addition to 15 papers cited by *Index Medicus*, and over 50 peer-reviewed research papers) on applied kinesiology approaches to functional health problems.

References

1. Walton DM, et al. Risk factors for persistent problems following acute whiplash injury: update of a systematic review and meta-analysis. J Orthop Sports Phys Ther. 2013 Feb;43(2):31-43.
2. Prescribers' Digital Reference, 2022. Available at: https://www.pdr.net/.
3. Cuthbert S, et al. Correlation of Manual Muscle Tests and Salivary Hormone Tests in Adrenal Stress Disorder: a Retrospective Case Series Report. Townsend Letter: The Examiner of Alternative Medicine. Jan. 2015.
4. American Medical Association: Guides to the Evaluation of Permanent Impairment, 5th Edition, Chicago, IL, 2001:510.
5. Hoppenfeld, S., Physical Examination of the Spine and Extremities (New York: Appleton-Century-Crofts, 1976).
6. Cuthbert SC, Schmitt W. Common errors and clinical guidelines for manual muscle testing: "the arm test" and other inaccurate procedures. Chiropr Osteopat. 2008 Dec 19;16:16.
7. Kendall, E., E.K. McCreary, & P.G. Provance, Muscles – Testing and Function, 4th ed (Baltimore: Williams & Williams, 1993).
8. Richter HO. Neck pain brought into focus. Work. 2014;47: 413– 418.
9. Magoun, H.I., ed, Osteopathy in the Cranial Field, 3rd ed (Belen, NM: Privately published, 1976).
10. Upledger, J., & J. Vredevoogd, Craniosacral Therapy (Chicago: Eastland Press, 1983).
11. Gelb H. Clinical Management of Head, Neck and TMJ Pain and Dysfunction. W.B. Saunders, Philadelphia, PA, 1977.
12. Goodheart, GJ, Jr. 1976. Kinesiology and Dentistry. J Amer Soc Psychosomatic Disease 6:16-18.
13. Cuthbert S, Walther DS, et al. Applied Kinesiology Essentials: The Missing Link in Health Care. Available at: Amazon, Kindle.
14. Breig, A. Adverse Mechanical Tension in the Central Nervous System (New York: John Wiley & Sons, 1978).
15. Kharrazian D. Why Do I Still Have Thyroid Symptoms? When My Lab Tests Are Normal: A revolutionary breakthrough in understanding Hashimoto's disease and hypothyroidism. Elephant Press LP: 2010.
16. Cuthbert S, et al. Correlation of Manual Muscle Tests and Salivary Hormone Tests in Adrenal Stress Disorder: a Retrospective Case Series Report. Townsend Letter: The Examiner of Alternative Medicine. Jan. 2015.
17. Standard Process Labs, Drenamin. https://www.standardprocess.com/products/drenamin.
18. Supreme Nutrition Products, Ashwagandha Supreme. https://www.supremenutritionproducts.com/AlbiziaSupreme/index.html.
19. Cuthbert SC, Walther DS. Whiplash Dynamics and Manual Muscle Testing. Amazon Kindle, 2018.
20. Rosner AL, Leisman G, et al. Reliability and validity of therapy localization as determined from multiple examiners and instrumentation. Funct Neurol Rehabil Ergon. 2015;5(3):365.
21. Rosner AL, Charles E. Therapy Localization in Applied Kinesiology: Validation by Means of Blinding in a Cohort Study. Funct Neurol Rehabil Ergon 2016;6(2):85-96.
22. Cuthbert S. Applied Kinesiology Essentials: The Missing Link in Health Care. Amazon: Kindle. Chapter 3: Applied Kinesiology's Diagnostic Advantages: Challenge and Therapy Localization. 2014: 25-38.
23. Jull et al. Chap. 4: Alterations in Cervical Muscle Function in Neck Pain. In: Whiplash, Headache and Neck Pain: Research-based directions for physical therapists. Elsevier: Edinburgh; 2008:41-58.
24. Cuthbert S, et al. The Association of Manual Muscle Tests and Treatment Outcomes With Headache and Cranial Dysfunctions: A Retrospective Case Series Report. Altern Ther Health Med. 2018 Nov;24(6):8-21.
25. Retzlaff, E.W., Mitchell, F.W. The cranium and its sutures. Berlin: Springer-Verlag; 1987:68. An annotated bibliography of over 250 papers relating to cranial manipulative therapy.
26. Dvorak, J., & V. Dvorak, Manual Medicine Diagnosis (New York: Thieme-Stratton, Inc, 1984).