CASE STUDY

Resolution of Trigeminal Neuralgia Following Chiropractic Care to Reduce Cervical Spine Vertebral Subluxations: A Case Study

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ABSTRACT

Objective: This case study reports the improvement in quality of life experienced by a patient undergoing cervical specific care as an alternative to medication or surgery for the management of Trigeminal neuralgia.

Clinical Features: A 57 year old female presented with right sided trigeminal neuralgia (TN) of two years duration. TN pain was helped by medication and exacerbated by exposure to cold. Secondary complaints included high blood pressure, hypothyroidism, diminished hearing in left ear, cervicalgia, bilateral shoulder pain, right shin numbness and allergies. Prescriptions include Gabapentin 900 mg 3xs/day (2700 total with 3600 being maximum prescribed), triamterene 37.5 mg 1x/day, synthroid 75 mg 1x/day and nasacort as needed. History included being knocked unconscious in a fall when ten years old, significant fall while skiing thirteen years prior and recent fall onto the sidewalk. Orthopedic and neurological examination demonstrated the right leg one inch short relative to the left leg, one inch bilateral cervical syndrome and positive modified Prill tests for atlas (C1), axis (C2) and C5. Cervical x-ray analysis determined listings of axis entire segment right and a posterior C5. Diminished disc space and minor degenerative arthritis noted at C5/6 consistent with cervical trauma (whiplash).

Intervention and Outcomes: One week after specific adjustments to C5 and axis, TN pain diminished dramatically in frequency and intensity. After discussing the improvement with her neurologist, she started cutting back on her Gabapentin dosage. After eight weekly visits, the patient was completely off the medication and pain free. Additionally, she reduced her high blood pressure medication by fifty percent. After two years of monthly maintenance care, she is still pain free without medication, even after major dental work.

Conclusion: This case study demonstrates the effectiveness of cervical specific care as an alternative to medication or surgery for the control of pain associated with TN.

Key Words: *Trigeminal neuralgia, upper cervical subluxation complex, cervical specific adjustments, Gabapentin (Neurontin), cervical trauma, whiplash, chiropractic.*

Introduction

Trigeminal neuralgia (TN) or tic douloureux, is a neuropathic disorder of CN V, the Trigeminal, that causes paroxysmal episodes of severe lancinating pain in the eyes, lips, nose, scalp, forehead or jaw[1] In 1756 French physician Nicolaus Andre burned a branch of the Trigeminal nerve with a caustic liquid. He described the disorder as tic douloureux, which means painful spasm.[2] It is estimated that 1 in 15,000 people suffer from trigeminal neuralgia, although the actual figure may be significantly higher due to frequent misdiagnosis and lack of sufficient studies of incidence and prevalence.[3] TN usually develops after the age of 50, although there have been cases with patients being as young as three years of age.[4] The condition can bring about stabbing, mind-numbing, electric shock-like pain from just a touch of the cheek. The pain of Trigeminal neuralgia is often falsely attributed to pathology of dental origin. "Rarely do patients come to the surgeon without having had removed many, and not infrequently all, teeth on the affected side."[5] Extractions do not help. The pain is originating in the Trigeminal nerve itself, often in its roots, not in an individual nerve of a tooth. Because of this difficulty, many patients may go untreated for long periods of time before a correct diagnosis is made. The Trigeminal nerve is the fifth cranial nerve, a mixed cranial nerve responsible for sensory data such as tactition (pressure), thermoception (temperature), and nociception (pain) originating from the face

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above the jaw line. It is also responsible for the motor function of the muscles of mastication (chewing), but not facial expression. Several theories exist to explain the possible causes of this pain syndrome. Leading research indicates that it is a blood vessel, possibly the superior cerebellar artery, compressing the microvasculature of the trigeminal nerve near its connection with the pons. Such a compression can injure the nerve's protective myelin sheath and cause erratic and hyperactive functioning of the nerve. This can lead to pain attacks at the slightest stimulation of any area served by the nerve as well as hinder the nerve's ability to shut off the pain signals after the stimulation ends. This type of injury may rarely be caused by an aneurysm (an outpouching of a blood vessel), by a tumor, by an arachnoid cyst in the cerebellopontine angle[6]; or by a traumatic event such as a car accident, causing an upper cervical subluxation complex.[7]

The Dentate Ligament-Cord Distortion Hypothesis may provide an explanation for the efficacy of correction of upper cervical subluxations in relieving trigeminal neuralgia.[8] The paroxysmal nature of pain indicates that it arises as a sudden discharge of neurons as a result of irritation of the trigeminal nerve, or it could occur in the gasserian ganglion or in the spinal nucleus of the trigeminal nerve. Direct mechanical vascular irritation of the spinal nucleus might also explain those cases which surgical destruction of the ganglion or sectioning of the nerve fails to provide relief.

Involvement of the mid-cervical spine in TN has been suggested by a report in the Journal of Traditional Chinese Medicine in which 8 of 12 subjects experienced complete relief from TN symptoms as a result of mid-cervical adjustments.[9] A trauma case in which bilateral TN pain developed after whiplash was reported in a British journal by McGlone in 1988, suggesting that injury to the extra cranial portion of the trigeminal nucleus precipitated the facial pain.[10] Ten upper cervical practitioners reported complete relief from TN symptoms in 50 of 68 cases (74%), while another 14 described partial relief.

In a case study Elster, a 38-year-old female experienced TN pain for 3 years. It began with a "shock" sensation above her lip and eventually moved throughout the right side of her face and forehead. She was initially prescribed 200mg of Neurontin and eventually increased up to 1800mg per day to try to reduce the pain. Even while taking 1800mg of Neurontin per day, she experienced excruciating pain on the right side of her face and forehead. She also experienced dizzy spells, ear ringing, and hearing loss on the right. Medical doctors had no answers other than to suggest surgery to possibly impact the involved nerves and blood vessels.

During this patient's upper cervical exam, a neck injury was found. When questioned as to possible traumatic causes of the injury from her medical history, she recalled experiencing a blow to her head shortly before the onset of the TN pain and her other symptoms. This blow to her head most likely caused the upper cervical injury. After several months of upper cervical care to correct the upper neck injury, she was pain-free, and gradually reduced her pain medication. The dizziness, ear ringing, and hearing loss were also absent after upper cervical care. Dr. Elster encourages patients that have not had success with one upper cervical chiropractor to try another one. “You should not give up on the whole concept because one technique did not work.”

Two to four percent of patients with TN, usually younger, have evidence of multiple sclerosis, which may damage either the Trigeminal nerve or other related parts of the brain. When there is no structural cause, the syndrome is called idiopathic. Post herpetic neuralgia, which occurs after shingles, may cause similar symptoms if the trigeminal nerve is affected.

People with the condition "are begging to be killed," according to Kim Burchiel, M.D., professor and chairman of neurological surgery at the Oregon Health & Science University School of Medicine who sees several new TN cases a week.[11] The episodes of pain may occur paroxysmally. To describe the pain sensation, patients may describe a trigger area on the face, so sensitive that touching or even air currents can trigger an episode of pain. It affects lifestyle as it can be triggered by common activities in a patient's daily life, such as eating, talking, shaving and tooth brushing. The attacks are said to feel like stabbing electric shocks, burning, pressing, crushing or shooting pain that becomes intractable. Individual attacks affect one side of the face at a time, last several seconds, hours or longer, and repeat up to hundreds of times throughout the day. The pain also tends to occur in cycles with complete remissions lasting months or even years.

Approximately ten percent of cases are bilateral, or occurring on both sides. This normally indicates problems with both trigeminal nerves since one serves strictly the left side of the face and the other serves the right side, or irritation of the brain stem. Pain attacks typically worsen in frequency or severity over time. A great deal of patients develop the pain in one branch, then over years the pain will travel through the other nerve branches.

There is often no cure for trigeminal neuralgia. Many people however find relief from medication, upper cervical specific chiropractic adjustment or one of the five surgical options. Atypical trigeminal neuralgia, which involves a more constant and burning pain, is more difficult to treat, both with medications and surgery.

Carbamazepine is the most common first line treatment.[12] If patients do not find sufficient improvement some surgical treatments may be helpful. Surgery may result in varying degrees of numbness to the patient and lead occasionally to anesthesia dolorosa, which is numbness with intense pain. However, some people do find dramatic relief with minimal side effects from the various surgeries that are now available. Neurosurgical treatment of TN inside the cranium dates from the 19th century, when sectioning of the sensory root between the Gasserian ganglion and the pons was performed.

Owing to the rarity of TN, many physicians and dentists are unfamiliar with the affliction's symptoms. As a result, TN is often misdiagnosed. A TN sufferer will often seek the help of numerous clinicians before a firm diagnosis is made. Those physicians that do have experience with TN are hesitant to treat patients under the age of 30 or patients who do not show nerve compression on their MRIs, although nerve compression

is not the only cause of TN. In a recent case, a child's health care costs totaled over $500,000.00 before the TN diagnosis was made.[13] It may also be caused by nerve trauma done during a dental procedure such as a root canal, or trauma to the upper body, neck or head. Patients under the age of 30 are particularly at risk of not receiving proper medical attention, as many physicians falsely believe that one must be in the later years of life in order for pain to strike and that the patient may be seeking pain killing drugs.

Trigeminal neuralgia is called the suicide disease. In fact, for those who live with TN for more than 3 years, about half commit suicide. Dentists that suspect TN should proceed in the most conservative manner possible, and should ensure that all tooth structures are truly compromised before performing extractions or other procedures.

Because of the hurdles noted above, it is essential for patients who believe they are suffering from TN to seek the advice of a TN specialist, neurologist and/or upper cervical specific chiropractor if they find their primary care physician to be dismissive of their pain. Local support groups and chat rooms on the internet with others suffering from TN may be helpful. Diagnosis is clinical. The Trigeminal Neuralgia Association is a good resource for clinical information.

Anticonvulsants such as carbamazepine, oxcarbazepine, topiramate, phenytoin, or gabapentin are generally the most effective medications to reduce the frequency and intensity of attacks. No medication has been developed specifically to target TN pain. Most of the medicines used today were developed to treat epilepsy. They help TN because they slow down the whole central nervous system.

Generally speaking, opiate based analgesics offer the best relief from TN attacks. Anticonvulsant effects may be potentiated with moderate to high levels of adjuvant therapies such as baclofen and/or clonazepam. Baclofen may also help some patients eat more normally if jaw movement tends to aggravate the symptoms. The pain may be treated long-term with an opioid such as Morphine, methadone, oxycodone or Duragesic in patch form. Botox can be injected into the nerve by a physician, and has been found helpful using the migraine pattern adapted to the patient's special needs. Patients may also find relief by having their neurologist implant a neuro-stimulator.

Surgery may be recommended, either to relieve the pressure on the nerve or to selectively damage it in such a way as to disrupt pain signals from getting through to the brain. However, some patients require follow-up procedures if a recurrence of the pain begins. Of the five surgical options, the microvascular decompression is the only one aimed at fixing the presumed cause of the pain. In this procedure, the surgeon enters the skull through a 25 mm (one-inch) hole behind the ear. The nerve is then explored for an offending blood vessel, and if one is found, the vessel and nerve are separated or "decompressed" with a small pad, usually made from an inert surgical material such as Gore-Tex. When successful, MVD procedures can give permanent pain relief with little to no facial numbness.[14]

Three other procedures use needles or catheters that enter through the face into the opening where the nerve first splits into its three divisions. A cost effective percutaneous surgical procedure known as balloon compression have has been helpful in treating the elderly for whom surgery may not be an option due to coexisting health conditions. Balloon compression is also the best choice for patients who have ophthalmic nerve pain or have experienced recurrent pain after microvascular decompression.[15]

Similar success rates have been reported with glycerol injections and radiofrequency rhizotomies. Glycerol injections involve injecting an alcohol-like substance into the cavern that bathes the nerve near its junction. This liquid is corrosive to the nerve fibers and can mildly injure the nerve enough to hinder the errant pain signals. In a radiofrequency rhizotomy, the surgeon uses an electrode to heat the selected division or divisions of the nerve. Done well, this procedure can target the exact regions of the errant pain triggers and disable them with minimal numbness.

The nerve can also be damaged to prevent pain signal transmission using Gamma Knife or a linear accelerator-based radiation therapy. No incisions are involved in this procedure. It uses very precisely targeted radiation to bombard the nerve root, this time targeting the selective damage at the same point where vessel compressions are often found. This option is used especially for those people who are medically unfit for a long general anesthetic, or who are taking medications for prevention of blood clotting.[16]

Most sufferers of TN do not present with any outwardly noticeable symptoms, though some will exhibit brief facial spasms during an attack. As a result, it is often difficult for friends and family members of TN suffers to accept that their loved one, who was previously healthy, is now suffering from intractable pain. That doubt can be a great hindrance to the support of the patient, as friends and family, as well as physicians, will often seek a psychological root cause rather than a physiological abnormality. This is especially true of those suffering who may not have any compression of the TN and in whom the sole criterion of the diagnosis may be the complaint of severe pain (constant electric-like shocks, constant crushing or pressure sensations, or a constant severe dull ache) and in this case Trigeminal neuralgia still exists but is not visible to physicians because it was caused by the nerve being damaged during a dental procedure such as root canals, extractions, gum surgeries, or it may be a condition secondary to multiple sclerosis, or closer to the brain stem.

Many TN sufferers are confined to their homes or are unable to work because of the frequency of their attacks. It is important for friends and family to educate themselves on the severity of TN pain, and to be understanding of limitations that TN can place upon the sufferer. However, at the same time, the TN patient must be extremely proactive in furthering his or her rehabilitative efforts. Enrolling in a chronic pain support group, or seeking one-on-one counseling, can help to teach a TN patient how to adapt to the affliction.

As with any chronic pain syndrome, clinical depression has the potential to set in, especially in younger patients who often are under treated for chronic pain. Friends and family, as well as clinicians, must be alert to the signs of a rapid change in

behavior, and should take appropriate measures when necessary. It must be constantly reinforced to the sufferer of TN, that treatment options do exist.

Methods

The technique utilized is based on the work of BJ Palmer DC, as developed at his Research Clinic at Palmer Chiropractic College in Davenport, IA, from the early 1930s until his death in 1961.[17,18,19] Techniques also include the vertebral subluxation pattern work of his clinic director, Lyle Sherman DC, for whom Sherman College of Straight Chiropractic, Spartanburg, SC is named.[20] A detailed case history was taken on the first visit (45 minute discussion), followed by a spinal examination. A report of findings was given, recommending a minimum set of three cervical x-rays because evidence of an upper cervical subluxation was discovered. X-rays and analysis of the upper cervical vertebrae based on the work of William G Blair DC was used to determine chiropractic listings of subluxation.

Lateral cervical, A-P open mouth and nasium x-rays were taken. Dr. Blair began to develop his distinctive method for the analysis and correction of subluxations of the cervical spine soon after graduating from the Palmer School of Chiropractic. Trained in the classical upper cervical specific "Hole In One" (HIO) method, he soon became concerned with the potential effects of osseous asymmetry or malformation on the accuracy of the traditional spinographic analysis in producing a valid adjustive listing. His observations of skeletal specimens also led him to conclude that the prevailing view of misalignment of atlas in relation to the occiput was inaccurate.[21]

He found that the atlas could not move in a truly lateral direction because the slope of the lateral masses and the condyles created an osseous locking mechanism preventing such motion; and atlas could not rotate in relation to occiput in the coronal plane without causing a gapping of the atlanto-occipital articulations due to the complementary shapes of the articular surface of the occipital condyles and the lateral masses.[22] Lateral cervical film was analyzed to determine evidence of whiplash injury. Posterior atlas listing (anterior occipital listing), along with the lack of proper cervical curve, was considered evidence of a history of neck trauma in this study. The A-P Open Mouth view was used to study lateral deviations of the neural rings, which may cause brainstem pressure. With the nasium x-ray the antero-lateral (distal) margins of each of the articulations were clearly classified as being juxtaposed on the left and underlapped on the right. Overlapping is synonymous with anterior and superior atlas listings with laterality of the side of the overlap, underlapping indicates posterior and inferior C1 listings on the opposite side of the underlap. These appositional judgments of each articulation were combined to deduce the actual unilateral PIL misalignment of atlas in relation to occiput. Axis (C2) was misaligned to the right creating a variable listing in relation to axis. An anatomically accurate adjustive formula was then derived.

When three x-rays were not sufficient to determine upper cervical listings, complete sets of custom Blair x-rays, including individual protracto views of both atlanto-occipital articulations, are taken. There are only four atlas listings under this system—anterior and superior on either the right or left, or posterior and inferior on either the right or left. Using the anterior tubercle of atlas as the reference point, considering the rocker configuration of the atlanto-occipital articulation, if atlas moves posterior then it must also move inferior.

Detailed leg checks were performed on each visit, utilizing the work of J Clay Thompson DC and Clarence Prill DC.[23] Dr Thompson, with the help of Romer Derifield DC, popularized the cervical syndrome check for the upper cervical subluxation complex in the 1940's. Since then, no one has come up with a reason relative leg length would change when a patient gently turns their head from side to side, while either prone or supine, thus not under the effects of gravity, except upper cervical subluxation. What causes one leg to appear shorter than the other and to change relative length when the head is turned, taking into consideration that the patient is lying down, not under the effects of gravity? One subluxation complex hypothesis proposes that the mechanism of fixation involves impingement of the atlanto-occipital intra-articular fat pad causing reflexive guarding contraction of the suboccipital muscles. Stimulation of the spindles in these muscles are thought to be involved in the initiation of tonic neck reflexes that alter global extensor muscle tone to achieve proper body balance in response to head movement.[24]

A conservative approach in determining evidence of subluxation was used. That is, when in doubt no adjustment was given. The leg checks were the main criterion used to decide when to adjust or not. To determine whether the major subluxation was at the level of atlas or axis, Prill modified leg length tests were utilized. With patient prone, patient was instructed to gently and steadily raise their feet toward the ceiling, while the doctor resisted such movement with his hands. The peripheral nerves were being tested, those that innervate the postural muscles holding one upright in gravity, so it was imperative that the patient only lift their legs slightly and maintain this pressure for at least two seconds. This test was for atlas, the top cervical vertebra. Instructing patients to rotate their feet while the doctor provided resistance and checking relative leg length was used to test axis. Some clinicians prefer to have the toes rotate outward. I had the patient pull their feet together. This corresponds to the rotation of the head on the neck, 50% of which occurs at the level of C2.

Although many chiropractors that utilize the Blair technique do not adjust the lower cervicals, I did in this study. Dr Blair died before getting below C4 in his analysis and adjusting technique protocol. I agree with Blair that until the upper cervical spine is cleared of subluxation, adjusting the lower cervicals will not hold. But in my experience, when there is a significant "kink" in the lower cervicals caused by a whiplash injury, a specific lower cervical adjustment will help the upper cervical adjustments hold significantly longer.

Thermographs of the cervical spine were utilized using a Tytron C-300 instrument. These were used to develop a pattern of subluxation in order to determine when to adjust. A graph reading that is static and persistent over time is considered to be the patient's pattern.[26,27] When it was

determined that the patient was in a pattern of subluxation, a toggle recoil adjustment was performed on axis, with the patient in a side-posture position, or a Pierce technique adjustment was performed on atlas, C5 or C6, with the patient prone. Side posture was used when laterality is the main component of the subluxation. The term used for this type of misalignment is translation, and most often occurs with a side impact trauma, for instance, a "T-bone" type of automobile accident. When posteriority was the major component of the subluxation, the prone position is favored. This misalignment usually is the result of the typical "rear ended" type of automobile accident.

A Thuli chiropractic table, using the cervical drop piece was utilized. For side posture adjustments the headpiece was set to drop straight down, and with prone adjustments, it was set to drop down and forward. The patient was then rested for fifteen minutes and rechecked, to make sure that the pattern had been broken.

Case Report

A 57 year old female presented with right sided trigeminal neuralgia (TN) of two years duration. TN pain was helped by medication and exacerbated by exposure to cold. Secondary complaints of high blood pressure, hypothyroidism, diminished hearing in left ear, cervicalgia, bilateral shoulder pain, right shin numbness and allergies. The patient does not use tobacco, exercises and eats a balanced diet.

Prescriptions include gabapentin 900mg 3xs/day (2700 total with 3600 being maximum allowed), triamterene 37.5 mg 1x/day, synthroid 75 mg 1x/day and nasacort as needed. History included being knocked unconscious in a fall when ten years old, a significant fall while skiing thirteen years prior and a recent fall onto the sidewalk.

Chiropractic examination showed the right leg one inch short relative to the left leg, one inch bilateral cervical syndrome and positive modified Prill tests for atlas (C1), axis (C2) and C5. Cervical x-rays analysis determined listings of axis entire segment right and a posterior C5. Diminished disc space and minor degenerative arthritis noted at C5/6 consistent with cervical trauma (whiplash).

One week after specific adjustments to axis and C5, TN pain diminished dramatically in frequency and intensity. After discussing the improvement with her neurologist, she started cutting back on her Gabapentin dosage. After eight weekly visits, the patient was completely off the medication and pain free. Additionally, she reduced her high blood pressure medication by fifty percent. After two years of monthly maintenance care, she is still pain free without medication, even after major dental work.

Discussion

All sensory information from the face is sent to the trigeminal nucleus. On entering the brainstem, sensory fibers from V, VII, IX, and X are sorted out and sent to the trigeminal nucleus, which thus contains a complete sensory map of the face and mouth. The trigeminal nucleus extends throughout the entire brainstem, from the midbrain to the medulla, and continues into the cervical cord, where it merges with the dorsal horn cells of the spinal cord. The nucleus is divided anatomically into three parts, from caudal to rostral they are the spinal trigeminal nucleus, the main trigeminal nucleus, and the mesencephalic trigeminal nucleus.

The three parts of the trigeminal nucleus receive different types of sensory information. The spinal trigeminal nucleus receives pain and temperature fibers. The main trigeminal nucleus receives touch and position fibers. The mesencephalic nucleus receives proprioceptor and mechanoreceptor fibers from the jaws and teeth.

The spinal trigeminal nucleus contains a pain/temperature sensory map of the face and mouth. From the spinal trigeminal nucleus, secondary fibers cross the midline and ascend in the trigeminothalamic tract to the contralateral thalamus. The trigeminothalamic tract runs parallel to the spinothalamic tract, which carries pain/temperature information from the rest of the body. Pain/temperature fibers are sent to multiple thalamic nuclei. The central processing of pain/temperature information is markedly different from the central processing of touch/position information. Information from the neck and the back of the head is represented in the cervical cord. Information from the face and mouth is represented in the spinal trigeminal nucleus.

Within the spinal trigeminal nucleus, information is represented in an onion skin fashion. The lowest levels of the nucleus (in the upper cervical cord and lower medulla) represent peripheral areas of the face (the scalp, ears and chin). Higher levels (in the upper medulla) represent more central areas (nose, cheeks, lips). The highest levels (in the pons) represent the mouth, teeth, and pharyngeal cavity.

The trigeminal nerve is the largest of the cranial nerves. Its name derives from the fact that it has three major branches: the ophthalmic nerve (V_1), the maxillary nerve (V_2), and the mandibular nerve (V_3). The ophthalmic and maxillary nerves are purely sensory. The mandibular nerve has both sensory and motor functions.

The ophthalmic, maxillary and mandibular branches leave the skull through three separate foramina: the superior orbital fissure, the foramen rotundum and the foramen ovale. The ophthalmic nerve carries sensory information from the scalp and forehead, the upper eyelid, the conjunctiva and cornea of the eye, the nose, the nasal mucosa, the frontal sinuses, and parts of the meninges. The maxillary nerve carries sensory information from the lower eyelid and cheek, the nares and upper lip, the upper teeth and gums, the nasal mucosa, the palate and roof of the pharynx, the maxillary, ethmoid and sphenoid sinuses, and parts of the meninges. The mandibular nerve carries sensory information from the lower lip, the lower teeth and gums, the chin and jaw (except the angle of the jaw, which is supplied by C2-C3), parts of the external ear, and parts of the meninges. The mandibular nerve carries touch/position and pain/temperature sensation from the mouth. It does not carry taste sensation, but one of its branches, the lingual nerve carries multiple types of nerve fibers that do not originate in the mandibular nerve.

It is imperative that physicians diagnosing and treating

Trigeminal neuralgia understand that the lesion causing the facial pain can originate anywhere adjacent to the nerve, all the way from the lower cervical spine to the face.

Conclusion

Although a case study is limited in its ability to provide conclusions, this study is a typical representation of over three hundred cases researched at Burcon Chiropractic over the past ten years, where the same protocol is used for all one sided brain stem disorders, including Bell's palsy, migraine headaches, Meniere's syndrome, Trigeminal neuralgia, multiple sclerosis and Parkinson's disease.[28,29,30,31]

Although this patient was satisfied with pain control benefits provided by medication, she was concerned about possible side effects, especially impairment while driving from somnolence and dizziness. She was not interested in surgery because of the possible negative side effects. She reported that not only did cervical specific care provide more relief than medication, positive side effects included lowered high blood pressure and an improved state of over all well being.

Physicians should consider recommending cervical specific care to those patients not satisfied with a medicinal and/or surgical approach to the control of their Trigeminal neuralgia.

References

1. Bayer DB, Stenger TG. Trigeminal neuralgia: an overview. Oral Surg. Oral Med. Oral Pathol. 1979 Nov;48 (5): 393–9.
2. Brown J, Coursaget C, Preul M, Sangvai D. Mercury water and cauterizing stones: Nicolas Andre and tic douloureux. J Neurosurg 1999;977-981.
3. Zakrzewska JM , Hamlyn PJ. Facial pain. In: Crombie IK, Croft PR, Linton SJ, et al, eds. Epidemiology of pain. Seattle: IAS Press, 1999:171–202.
4. Bloom R. "Emily Garland: A young girl's painful problem took more than a year to diagnose." Arizona Daily Star, 11.18.2004.
5. Dandy, Sir Walter. The Brain. The Classics of Neurology and Neurosurgery (Special ed.). Birmingham: Gryphon editions. 1987. pp. 179.
6. Babu R, Murali R. Arachnoid cyst of the cerebellopontine angle manifesting as contralateral trigeminal neuralgia: case report. Neurosurgery. 1991; 28 (6): 886–7.
7. Hinson R. Upper Cervical Neurology and Trigeminal Neuralgia. Abstracts from the 16th Annual Upper Cervical Spine Conference, Nov 20-21, 1999. Marietta, GA.
8. Grostic JD. Dentate Ligament-Cord Distortion Hypothesis. Chiropr Res J, 1988; 1(1):47-55.
9. Eriksen K. Upper Cervical Subluxation Complex: A Review of the Chiropractic and Medical Literature. Lippincott Williams & Wilkins, 2003.
10. McGlone R, Morton RJ, Sloan JP. Trigeminal pain due to whiplash injury. Injury 1988 Sep; 19(5): 366.
11. Burchiel KJ. "A new classification for facial pain". Neurosurgery 2003;53 (5): 1164–7.
12. Gronseth G, Cruccu G, Alksne J, et al (October 2008). "Practice parameter: the diagnostic evaluation and treatment of trigeminal neuralgia (an evidence-based review): report of the Quality Standards Subcommittee of the American Academy of Neurology and the European Federation of Neurological Societies". Neurology 71 (15): 1183–90.
13. Weigel, G; Casey, K. Striking Back: The Trigeminal Neuralgia and Face Pain Handbook. Gainesville: Trigeminal Neuralgia Association, 2004.
14. Solth A, Veelken N, Gottschalk J. Successful vascular decompression in an 11-year-old patient with trigeminal neuralgia. Child's Nervous System. 2008 June;24(6):763-766.
15. Natarajan, M. Percutaneous trigeminal ganglion balloon compression: experience in 40 patients. Neurology (Neurological Society of India) 200;48 (4): 330.
16. Rosenburg M, Zerris, Borden J. On the Cutting Edge… gamma knife radiosurgery for the treatment of trigeminal neuralgia, Departments of Oral and Maxillofacial Surgery, Anesthesia and Neurosurgery, Tufts University Schools of Medicine and Dental Medicine.
17. Palmer, BJ. The Subluxation Specific, The Adjustment Specific. Davenport, Iowa: Palmer School of Chiropractic, 1934.
18. Palmer, BJ. Chiropractic Clinical controlled Research. Volume XXV. Davenport, IA: The BJ Palmer Chiropractic Clinic, 1951.
19. Palmer, BJ. History in the Making. Volume XXXV. Davenport, Iowa: Palmer School of Chiropractic, 1957.
20. Sherman L. Neurocalometer-neurocalographneurotempometer Research. Eight BJ Palmer Chiropractic Clinic Cases. Davenport, IA: Palmer School of Chiropractic; 1951.
21. Addington E. Blair Cervical Spinographic Analysis. Conference of Research and Education, Monterey, CA June 21-23, 1991.
22. Blair W. Blair upper Cervical Spinographic Research; primary and adaptive malformations; procedures for solving malformation problems; Blair principle of occipito-atlanto misalignment. Davenport, IA: Palmer College of Chiropractic; 1968.
23. Prill, C. The Prill Chiropractic Spinal Analysis Technique. 2001.
24. Knutson G. Tonic Neck Reflexes, Leg Length Inequality and Atlanto-occipital Fat Pad Impingement: An Atlas Subluxation Complex Hypothesis. Chiropr Res J 1997; 4(2):64-76.
25. Burcon M, Olsen E. Modified Prill Leg Check Protocol. 11th Annual Vertebral Subluxation Research Conference, Sherman College of Straight Chiropractic, Spartanburg, SC 2003.
26. Hart J, Boone R. Pattern Analysis of Paraspinal Temperatures: A Descriptive Report. J Vert Sublux Res 1999-2000:3(4).
27. Burcon M. BJ's $50,000 'Timpograph still captures our imagination after more than fifty years. Chiropractic Economics, Nov/Dec 1995.
28. Burcon M. Parkinson's disease, Meniere's syndrome, Trigeminal neuralgia and Bell's palsy: One cause,

One Correction, Dynamic Chiropractor. 2003; Vol 21, Issue 11.
29. Burcon M. Cervical Specific Protocol and Results for 100 Meniere's Patients. The 26th Politzer Society Meeting, Oct 13-16 2007; Cleveland Clinic, Cleveland, OH. .
30. Burcon M. Upper Cervical Protocol and Results for 139 Meniere's Patients. The 13th International Symposium and Workshops on Inner Ear Surgery and Medicine, 2008;Zell am Zimmer, Austria.
31. Elster E. Upper Cervical Protocol for Five Multiple Sclerosis Patients. Today's Chiropractic November 2000.