

Cervicogenic Headaches

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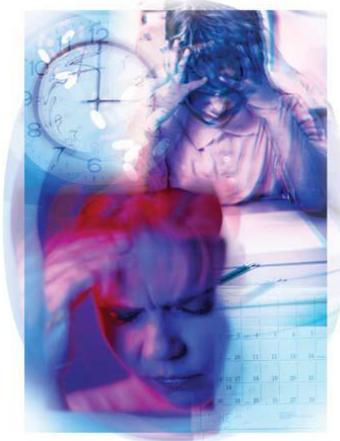
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INTRODUCTION:

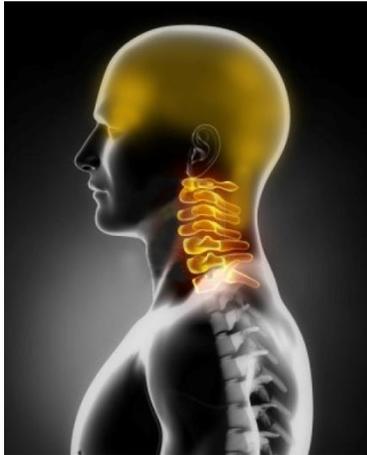


Cervicogenic headache is defined as pain referred to the head from a source in the cervical spine.¹ This condition represents a whole host of disorders of ligaments, muscles, nerves and soft tissues all of which can refer pain into the head. It is no wonder why some consider the diagnosis of cervicogenic headaches “controversial.”² Some authorities such as the International Headache Society, believe diagnosis can be based on clinical criteria alone but others state that the diagnosis should be based on confirmatory tests to establish the diagnosis. Approximately 47% of the global population suffers from headaches.³⁻⁷ 15-20% of those experienced cervicogenic headaches.^{5,8} The mean age this disorder is found is 43 years. The condition is more common in women. The most common source of cervicogenic headache is degenerative changes

involving the cervical facet joints. If such is the case it is no wonder why this is such a huge problem and the majority of physicians and allied healthcare providers struggle so in trying to manage this condition. It is often said that a comprehensive, multidisciplinary pain treatment program provides the greatest opportunity for overall clinical improvement.² When is the last time you have heard of a “comprehensive multidisciplinary program” where clinicians of various disciplines work together, collaborate and communicate and develop a consensus about care? When is the last time where you have entered into a clinician’s office and they even had a clue of which discipline of provider what the best choice for a given condition? What this requires is a physician that actually has a multidisciplinary background with significant experience in the various disciplines. Otherwise you end up with a “let’s try this approach.” This article will attempt to delve into the complicated topic of cervicogenic headaches and provide those who are trying to become an informed consumer a common sense approach to the various treatment approaches and provide a guide into the maze of endless therapies available for the cervicogenic headache patient.

WHO IS IN CONTROL?

One of the great spine researchers of the last 50 years is Nicoli Bogduk, PhD, MD a professor of anatomy in Australia. He is an individual I have a great deal of respect for. He states, "People in control of the headache field seemingly have not, cannot, or will not recognize that this model for cervicogenic [neck based] headache is not only the best evolved of all headaches but is testable in vivo, in patients with headache complaints. No other form of headache has that facility." So, who is in control? Neurologists, are the primary discipline in medicine in medicine that are used for consultants for headache patients. There is nothing wrong with this. They have special fellowship programs providing sub-specialty training in headaches. In fact one of the few disciplines that do. They can do a very good job of managing the complexity of migraine and other headache syndromes. But when it comes to cervicogenic headaches this pushes the limits to their expertise. This is what Dr. Bogduk is trying to say. I have travelled across the country to watch headache neurologist practice and try and learn from them some of their management methods. Probably the best that I have seen across the US happens to be at the University of Washington, in Seattle. Why, because that individual has been willing to "think out of the box." This individual has a much more comprehensive understanding of not only migraine physiology and other headache syndromes but



actually has an understanding of the various disciplines and techniques used by various disciplines when it comes to pain in the head arising from the cervical spine. So, there are neurologist out there that do have this knowledge, the problem is they are hard to find.

Typically, headaches that may be stemming from the cervical spine are usually above the nose but can include the eye and and at the tendon insertions in the back of the neck.⁹ Patients will of course often have pain in the upper neck however, it is possible that sometimes cervicogenic headaches have pain in the back of the head or front of the head as previously described without neck pain.

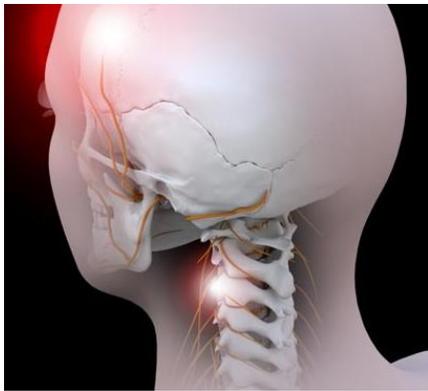
CASE STUDY #1: Let's Define the Problem

Mr. D is a 74 year old male with a 10 year history of chronic daily headaches. He has had the resources to visit countless headache specialists over the years. He has been to 4-5 major university based headache clinics and has been through so many treatments it was exhausting taking a history. He has had dozens of occipital nerve blocks done by multiple neurologist over the last 5 years. These blocks involve the injection of a corticosteroid onto a nerve in the back of the head which we will be describing in detail later. He has had little improvement but has continued to return back for more injections in hopes that something will work. He had tried botox injections without benefit. I was particularly interested tha he had so many occipital nerve blocks done. When I asked him where the headache pain was at he stated "the pain is over my forehead and in the front of my head." His pain was not in a distribution that would be typical of the occipital nerves. I asked him "tell me about your neck." 5 years prior he had developed spinal stenosis



and had undergone a 3 level decompression surgery to protect his spinal cord. He had no symptoms of arm pain or neurological symptoms related to the spinal cord. It was hoped that doing to spinal cord decompression would relieve his headache but it had no effect on his headache symptoms. He described neck pain in the upper part of the neck. I asked if this pain was the impetus for so many occipital nerve blocks. Apparently, it in fact was. But... when detailed questions were asked about the character, type of pain and specifically the location of the pain again it was not over the occipital nerves but rather directly over the facet joints of the C2-C3 facet joint! Remember, the most common cause of cervicogenic headaches are arthritic facet joints in the neck!

Could it be, that for 10 years he has travelled the US seeing countless headache specialist at major university settings and this condition was as simple as facet joint pain? Well, I took a second look at his MRI. There were several clues in the MRI. First he had severe enough arthritis to develop stenosis that required a 3 level decompression. The method they used to do the decompression involves taking down

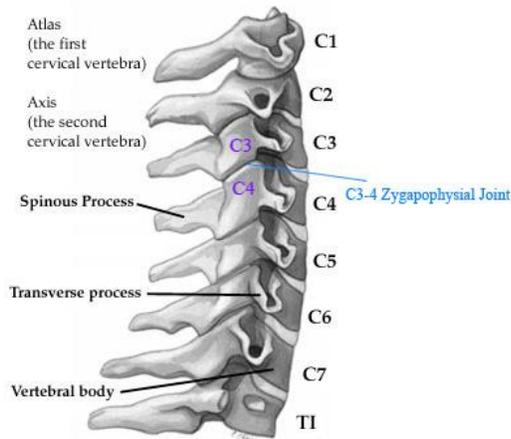


some of the supportive ligaments. His headaches actually should have gotten worse following the surgery but in fact it did not. Why.... So I looked further. He had large “flowing” calcifications of the ligaments in the front of his spine extending down from C3 to C6. This condition is called DISH (dystrophic idiopathic skeletal hyperostosis.” This condition fuses or restricts motion to cervical segments. The surgery he had did not make his arthritic facet joints worse because they were stabilized by the DISH. But, there was a segment above this region not effected by DISH. This was the C2-C3 segment. What is the most common facet joint causing headaches? The C2-C3 facet joint is the most common source.

What next? I took an ultrasound probe and placed it on the back of the neck to visualize the C2-C3 facet joint and placed a small amount of local anesthetic on the facet joint on both sides and his frontal headache melted away in minutes. The local will wear off, the pain will return. What is this individual going to do to manage facet joint arthritis and instability caused by multiple fused segments below that level? There is no amount of massage, heat, ice packs, chiropractic or osteopathic manipulation, acupuncture, therapy modalities that is going to do anything but provide a few hours to a day of temporary relief. He can be referred to a “pain specialist” and they will cleverly block the joint with x-ray guided procedures or block the nerves that innervate the joint. This will relieve his pain and then they will burn the nerves that innervate the joint utilizing radiofrequency probes. The pain will be improved for about 6 months until the nerve regenerates and then the whole treatment starts over again. This procedure is expensive and further drives the cost of care up. What can his individual do? The answer is in the precise diagnosis? He has facet pain because of excessive stress on the ligaments and the arthritic facet joint. If there is a way to strengthen the supportive ligaments of soft tissues of the joint then maybe he has a chance for recovery! Can you do that? Can you strengthen or restore stability to a ligament in the cervical spine? Of course you can. This is a routine procedure we do almost every day. This treatment will involve very special injection procedures that proliferate collagen and connective tissues in the ligament and connective tissues that support the spinal segment. This will involve targeting not only the facet joint ligaments but other supportive ligaments in this segment as well.

The answer to part of the problem is that those in control of headache management will need to learn about IROM practitioners. How they differ from traditional pain specialists and how they may be able to collaborate with this providers to help certain categories of headaches where their skill set can “come in handy.”

THE CERVICAL FACET JOINTS:



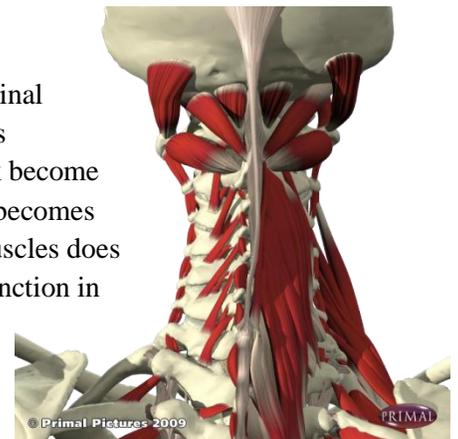
As we have reviewed in the above case study the cervical facet joints can be a common source of cervicogenic headaches. We provide just one case example of this phenomenon. This subject warrants further discussion. The picture to the right shows a cervical spine in side view. The 2 structures labeled C3 and C4 come together to form a joint. These joints are paired on each side of the cervical spine and are what we are referring to as a “facet joints.” These structures are enveloped by ligaments and connective tissues that provide structural support. These ligaments and joints are also richly innervated by nerves that provide important sensory input with joint motion.

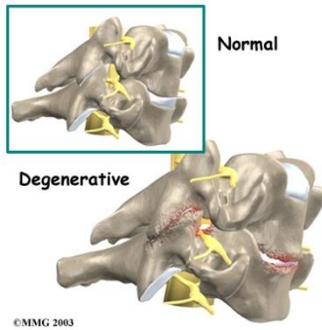
These structures have been the interest of osteopathic, chiropractic and physical therapy practitioners for many many years. I would have to turn this chapter into a book to adequately discuss the complexity of the topic of how these different practitioners view these joints and the various theories that govern their practice paradigms. Instead, I am going to try to provide some insight and guidance. When a patient has cervical facet joint pain stemming from primarily the upper cervical spine segments C1-C3 the pain they experience may be not only upper neck pain but headache as well. In addition to the cervical facet joints patients with cervical disc herniation at also been noted to have headache complaints.^{10,11}

Before we get too far I want to introduce the ready to a basic concept popularized by Kirkaldy-Willis an orthopedic surgeon in Canada who provide some very good insight to spine degenerative pathology. He stated that there are basically 3 phases in the continuum of spinal degenerative disease. These phases are:

1. Dysfunction phase
2. Instability phase
3. Stabilization phase

Dysfunction phase: This phase is characterized by restricted motion of a spinal segment. These areas of motion restriction can come and go. This process is associated with muscular tension. Whether key intrinsic muscles of the neck become adaptively shortened via complex neurological reflexes or whether the joint becomes restricted and sets of a series of reflex stimulus that leads to the tightened muscles does not really matter for this discussion. Injury to the neck can also lead to dysfunction in spinal segments. The disciplines of osteopathic and chiropractic both focus a great deal of their interventions utilizing manual therapy to correct these articular dysfunctions and their associated soft tissue changes.

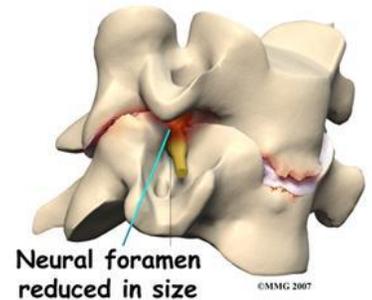




Instability phase: Overtime dysfunction can lead to breakdown of ligaments and supportive connective tissues and eventually leads to instability of the spinal segment. There is a saying “you can be worn lose, torn lose or born lose.” This means you can wear through degeneration or injured and develop instability. You can also be born with lax ligaments that can also be a source of instability. Regardless, of the source of the instability it causes chronic stress to the ligaments and soft tissues and persistent pain. These process is always associated with associated muscular tension and pain. Many practitioners of manual medicine fail to recognize this phase of spinal degenerative pathology. I was guilty of this

in my early years of practicing as a chiropractor myself. I quickly began to realize however as I gained clinical experience that patients with instability will frequent PT, and manual therapies for the temporary relief their interventions provide.

Stabilization phase: The sequelae of instability is arthritic changes and proliferation of bone, bone spurs that narrow the passage ways for the spinal cord and spinal nerves. This can lead to nerve root pain that can extend into the arm or leg. The term spinal stenosis means narrowing of the spinal canal or neural foramen where nerves pass. It is important to target instability to slow progression of stenosis.



Why did we digress on this topic? It turns out that one needs to have a basic foundation of some of these concepts to understand why we intervene using the methods that we do.

OSTEOPATHIC & CHIROPRACTIC CARE FOR CERVICOGENIC HEADACHES:

There is evidence that manipulative therapy of the cervical facet joints are effective in treating cervicogenic headaches.^{12,13} In addition, directing manipulative therapy for the upper cervical spine facet joints and facet arthropathy seems to be most effective.¹⁴⁻¹⁶ Spinal manipulative therapy has been shown to be more beneficial limb massage, laser light therapy, nonsteroidal anti-inflammatory medications and other therapy modalities.¹⁷

To question is now if an individual has headaches and it is suspected these headaches may be coming from the cervical spine should an individual seek the consultation of a chiropractor or osteopathic physician? I would say for the most part yes. Having been trained originally has a chiropractor and having had many years of experience in utilizing both osteopathic and chiropractic manipulative therapies I could not count the times that I have resolved an individual’s ongoing headaches by a few simple manual therapy treatments. Manipulation procedures of the cervical spine especially the upper cervical spine is not without risk. One of the potential risks of all manipulative therapy is a stroke although this risk is a rare complication the risk is not completely zero. Despite this I still recommend manual therapy. There are certain types of manipulative therapy procedures that increase the risk and procedures that are carried out that decrease the risk of this complication and so choose



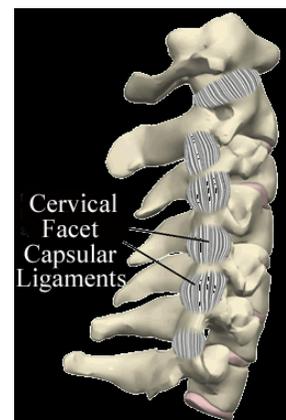
the individual he seek consultation with wisely.

What is an adequate trial of manual therapy? It is my personal opinion that if you have seen an individual for 6 or 8 visits and you have not had substantial change in her condition in need to discontinue.¹⁸ If you seek the care of a chiropractor and they immediately placed you on a treatment plan involving 3 visits per week followed by 2 visits per week followed by 1 visit per week and they are recommending a protracted course of care that is beyond the 6 or 8 visits you need to discontinue that service and find another chiropractor. That is a business plan and not a treatment plan.

I get relief from my headaches with chiropractic treatment but the symptoms continue to return where am I supposed to do? One of the reasons why I chose to leave the chiropractic industry, go onto medical school and eventually enter the field of interventional regenerative orthopedic medicine was that I was unable to resolve recurrent symptoms in patients participating in active rehabilitation program's and chiropractic or osteopathic manual therapy programs. Remember, we have had a discussion about the phases of degeneration. If an individual is beginning to develop spinal segmental instability usually they experience transient symptomatic relief from manipulation only to have the symptoms recur. This creates chiropractic and osteopathic junkies where the individual continues to return back in order to "maintained" symptomatic control. Chiropractic and osteopathic manipulation is much better suited to the dysfunction phase of spinal pathology in degenerative disease. One of my biggest concerns with the chiropractic profession is that so many of these providers failed to recognize the instability phase of spinal degeneration. There are trained to manipulate. And thus, with that one too in their toolbox they applied a manipulative therapy treatment to all spinal pathology and to all phases of degeneration which is in, my opinion, inappropriate. I am speaking as a chiropractor practicing over 30 years as well as an individual who is a physician specializing in advance spine intervention. Therefore, the answer to the question is that you need to discontinue the chiropractic treatment and seek care from a physician who specializes in regenerative orthopedic medicine. Many years ago, these practitioners were difficult to find but there are more and more physicians specializing in sports medicine, physical medicine rehabilitation, etc. that are beginning to take interest in this method of treatment and are developing subspecialty skills and training in this area. Find it individual who has good experience with prolotherapy and other regenerative injection therapy treatments and he will probably find the answer to the problem. Remember, if the practitioner is also in advance spine interventional specialist confirmation of the diagnosis can be made with ultrasound or x-ray guided local anesthetic blocks.^{15,19} So, in summary with regards to manipulative therapy for headaches I first it may be worthwhile trial of care to consider either osteopathic or chiropractic manual therapy.

REGENERATIVE INJECTION THERAPY FOR CHRONIC NECK PAIN & ASSOCIATED HEADACHES:

As we have previously discussed with injury or degenerative change one can develop a subtle spinal segmental instability in one or more joints throughout the spine. This can occur typically in the mid years of life simply from degenerative changes. With degenerative changes involving the disc and segments of the spine attenuation of the capsular ligaments of the facet joints and other supportive ligaments occurs. This causes chronic irritation of the ligaments and soft tissues and chronic pain. Individuals who seek physical therapy, chiropractic care,



osteopathic manual therapy, massage therapy, etc. and do not have long standing symptomatic relief from a few sessions of treatment need to consider facet joint instability. As a previous practicing chiropractor I saw this phenomenon on a regular basis. Although I helped many individuals with manipulative therapy there was also a portion of this patient population I cared for where I provided only transient symptomatic improvement. As I continued to return back to school and progressed through the educational process through medical school, residency, fellowships and other educational endeavors I began to explore a “regenerative medicine approach” to this problem. Once I found out that there were simple procedures that can target the ligaments and supportive soft tissues and restore stability I decided to devote what ever amount of time was required to master the method.

My first experience with “regenerative injection therapy” was the use of prolotherapy 27 years ago. I met, trained with and learn from some of the masters of this technique. Prolotherapy involves typically the injection of dextrose based solutions onto the ligaments. It is rather interesting that the injection of a simple sugar could stimulate the proliferation of collagen in connective tissue and would have the capacity to strengthen and improve ligament instability. It seems odd until you realize the simplistic physiology involved. I have addressed this topic in detail on this website on the article entitled “regenerative injection therapy and pain medicine” for those who want further information on this topic. To be brief dextrose sugar at 15-25% is noted to be a “hypertonic solution”. This means that the dissolved solute concentration (sugar) is higher when you injected around cells then the solute concentration inside the cell. This causes an osmotic effect on cells causing cells to burst or release their interest cellular fluids. These fluids containing growth factors that stimulate another special cell called a fibroblast to move into the area and begin to lay down collagen in connective tissue. It is a way to “fool” the body into thinking that it injury has occurred in the area of the targeted injection. The body in its attempt to heal that injury lays down collagen in connective tissue and thus restores the strength back to the ligament. It is basically as simple as that. Over the years we have significantly advanced these regenerative injection techniques to include various types of cellular medicine injections and injection of extracellular matrix proteins, growth factors, etc. to induce healing of ligaments as well.

In 1994, we began to experiment to leak use growth factors derived from platelets that are taken from your blood. As we began to refine this technique it became an important method that we began to utilize for chronic neck pain and headaches stemming from the cervical spine. This process requires a simple IV blood draw and to have that blood process in our laboratory where the platelets are separated and concentrated from your blood. The platelets are suspended in your plasma (the fluid your blood cells are suspended in). This platelet concentrate now called Platelet Rich Plasma (PRP) is now commonly used by us to restore connective tissue and stability to arthritic facet joints. We have used this technique for many years and have developed specific techniques over time to improve our outcomes.

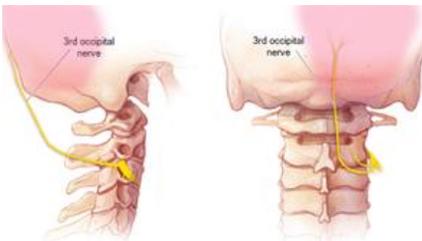


Over the years we have also explored other regenerative medicine techniques and eventually began to utilize stem cells as another method of injection therapy directed to the facet joints and ligaments of the cervical spine to help with neck pain and associated headaches. It has taken us years of research and clinical trials of various types

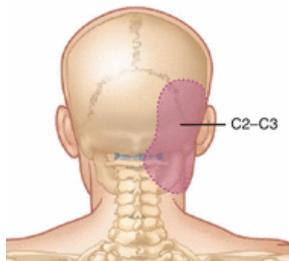
of stem cell therapies to finally find specific techniques that consistently work well. Each time we has mastered and perfected various regenerative injection therapy techniques which include the use of platelets and various types of stem cell therapies we have gotten better and better at being able to improve the patient's condition with fewer and fewer encounters.

If an individual is experiencing headaches associated with chronic facet joint dysfunction and instability prolotherapy and other regenerative injection therapy techniques can be one of the more effective treatment techniques that a patient can experience. I have acquired significant experience with this technique and have treated thousands and thousands of patients with this condition successfully. The key is appropriate patient selection, a precision diagnosis and precision injection techniques and methods. Although I will discuss the use of radiofrequency neural ablation techniques as described below my experience with regenerative injection techniques have been so positive that I have abandoned the use of ablative technology in place of a more "regenerative approach." It was learning the foundational techniques and approach of prolotherapy that eventually cause me to focus my entire practice in developing regenerative medicine technology into the methods and techniques we use today.

RADIOFREQUENCY NERVO-ABLATION PROCEDURES FOR CERVICOGENIC HEADACH:



I now speak from the perspective of an interventional pain specialist. As an individual who has done two pain medicine fellowship training programs and have experience in interventional procedures including radiofrequency procedures this discussion would not be complete with a review of this topic.



The third occipital nerve is a nerve that extends from the cervical spine and overlies the C2-C3 facet joint and then extends up the back of the head as shown in the picture to the left. Pain physicians utilizing x-ray guidance or ultrasound guidance can place a needle on the nerve and perform a local anesthetic block.^{14,20} If that block provides relief of the headache this can be a confirmatory

test following the confirmatory test the nerve can be thermally ablated.²¹ The

ablation procedure is performed by placing radiofrequency probes placed over the location of the nerves that innervate the facet joint of C2-C3 and the third occipital nerve. This is typically done under x-ray guidance as shown on the right. Following this, a radiofrequency electrothermal energy is run through the tip of the needle and the nerve is thermally ablated. This process of radiofrequency neural ablation has been used for this type of headache for many years by physician specializing in pain management. This is a procedure that I have personally abandoned. This does provide relief of the pain and relief of the

headache. However, nerves regenerate and is a nerve regenerates the pain recurs and the procedure will need to be repeated. Nerves will regenerate after radiofrequency procedure in 6-9 months. The other issue that I have with this procedure is a relatively common complications associated with this procedure which is a postprocedural third occipital neuralgia. Yes, the ablation procedure can result in increased "neuropathic pain" in the distribution of the nerve making her problem worse. A study of 64 patients



undergoing C2-C3 radiofrequency (third occipital nerve ablation) was studied. 12 of the 64 patients develop this complication and thus the incidents of this postprocedural neuropathic pain complication was 19%.²²

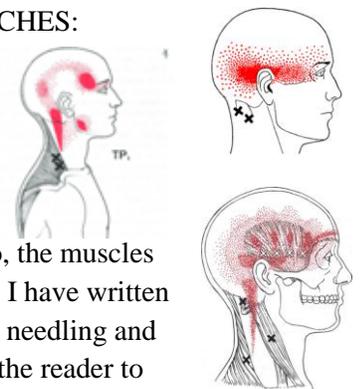
CASE STUDY #2:

Mrs M is a 35-year-old Caucasian female was involved in a rear end motor vehicle accident. She was unaware of injury following the impact but shaken up at the scene of the accident. She was seen in the emergency room and evaluated and discharged with a few pain medications. The following day she woke up with significant headaches and neck pain and pain extending across the shoulders. Her primary care physician was unwilling to see her because she was involved in a motor vehicle accident. She was seen by a chiropractor and began a course of treatment. She was seen 3 or 4 times per week receiving massage and manipulation treatment. Manipulation treatment did not provide significant relief but the massage always seem to help at least for a very short period of time. After 6 months of treatment and mounting chiropractic and massage therapy bills she has continued to have symptoms despite the therapeutic intervention. She was referred to a pain management physician who started her on some medications and referred her back to physical therapy as therapy for which she continued for another 3 months. She was then referred to us for consultation. She was tender throughout the upper neck and muscles. She was tender over the cervical facet joints. She had painful movement of her neck from right to left. She was extremely afraid of needles but after some reassurance she consented to the use of acupuncture needle. Acupuncture dry needling was carried out in the muscles of the neck, shoulders and in the upper neck. Prior to treatment she described pain on right and left rotation movement. This pain was immediately relieved following treatment. Her headache complaints were significantly improved and neck pain markedly improved immediately following treatment. Unsure as to whether or not she would maintain this benefit she was scheduled to follow-up in a week. On follow-up, she reported complete resolution of the headache complaints that she did have some residual neck pain. She was much more enthusiastic about receiving acupuncture treatment after having experienced significant improvement. After 3 more treatments she had significant and long lasting relief from the neck pain and was discharged from care.

This patient's condition represented a primary myofascial pain syndrome that occurred as a result of a motor vehicle accident. The reason why she maintained symptoms despite treatment is described in article we have online covering the topic of myofascial pain.

ACUPUNCTURE DRY NEEDLING / GUNN IMS FOR CERVICOGENIC HEADACHES:

One of the other structures in the cervical spine that refers pain into the head is the muscles. Remember, when there is cervical facet joint dysfunction there is usually always and increased tone in the muscles of the neck. The adaptive shortening of the muscles can then result in myofascial pain that refers into the head. It is also important to understand that adaptive shortening of the muscles and the development of myofascial pain can cause cervical facet joint dysfunction. So, the muscles can cause facet joint dysfunction or the facet joint dysfunction can affect the muscles. I have written an article on the website on myofascial pain addressing the subject of acupuncture dry needling and the contributions of C. Chan Gunn and IMS (intramuscular stimulation). I encourage the reader to read that article in its entirety if interested in pursuing this topic further.





With regards to simple conservative measures directed to cervicogenic headaches the combination of manipulation and acupuncture dry needling or GUNN IMS has been invaluable in my practice over 2 decades. An acupuncture needle directed to the points located on the right to specific key muscles of the cervical spine of illicit a powerful

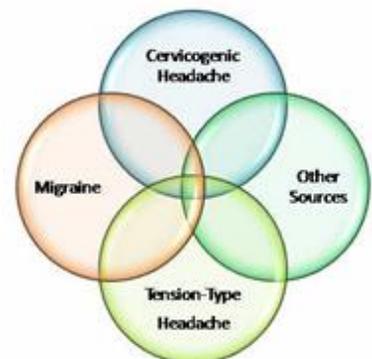
neurophysiologic reflex that results in relaxation of shortened muscles and therefore can often immediately relieved trigger points in the muscle and myofascial pain. This can result in symptomatic relief of headaches derived from the muscles of the cervical spine. This simple intervention can often relieve headaches associated with cervical strain injuries, only occurring from motor vehicle accidents as well as. The other important point of this simple intervention is that it can be diagnostic. A few simple acupuncture needles placed in key muscles of the neck that result in symptomatic relief long-term suggest the pain was primarily of myofascial pain origin. If the patient has transient relief lasting for only a short period of time then we do not have to continue to pursue treatment directed to the muscle. This means that the pain is coming or stemming from deeper structures of the spine such as the facet joints with the disc. It is a technique that brings me to a conclusion as to the source of the patient's cervicogenic headaches very rapidly. This prevents my patients having to undergo repeated unnecessary treatments directed to the muscles such as repeated massage therapy, physical therapy visits or visits to the chiropractor. It is a method that I had used for over 25 years.



CASE #3:

Mrs. J is a 54-year-old Caucasian female with a long-standing history of migraine headaches. She typically had no aura with the headaches which means she had no symptoms of visual disturbances or other unusual sensations prior to the onset of the headache. She has had several previous motor vehicle accidents. The most recent several years ago has left her with ongoing neck pain has never completely resolved since the accident. Over the last few years she has been experiencing increasing neck pain and increasing headache frequency. Most recently over the last year she is having daily headaches that extend from the upper neck into the back of the head and radiate into the bilateral frontal areas of the head. About once a week she experiences more intense headaches behind the eye with associated nausea and vomiting for which she takes medications for her. The constant daily headaches are beginning to affect her day-to-day function and her focus and concentration at work. She has seen her neurologist for the headaches and they have warned her about taking too many anti-inflammatory medications and pain medications because of the potential of rebound headaches or migraine conversion headaches from medication overuse headache. At night she finds it difficult to position her neck in a comfortable position and thus wakes up multiple times in the evening because of neck pain. Chiropractic care has provided little to no relief. Physical therapy has not improved her condition. She sees a massage therapist once a week because she does feel periods of transient improvement with massage that can last for a few hours to a day and then the symptoms recur.

When she was referred to us for management careful examination revealed an individual with multilevel degenerative disc disease and facet joint



disease. She had multilevel cervical facet joint degenerative instability and relief of neck pain with local anesthetic injection directed to the facet joint. She was diagnosed with multilevel cervical facet joint instability secondary to previous injuries and disc and facet joint disease. She underwent a course of cervical prolotherapy visits directed to the cervical facet joints in order to stabilize her cervical facet joints. Her neck pain improved and her constant daily headaches resolved. At present time she still has migraine headaches that occur twice per year which are easily managed now with antimigraine pharmaceuticals. Evaluating individuals with headaches is a complex process which requires a multidisciplinary understanding. There is a complex interplay between pain in the head from multiple sources including nerves and soft tissues, tension type headaches, migraine headaches and cervicogenic headaches.

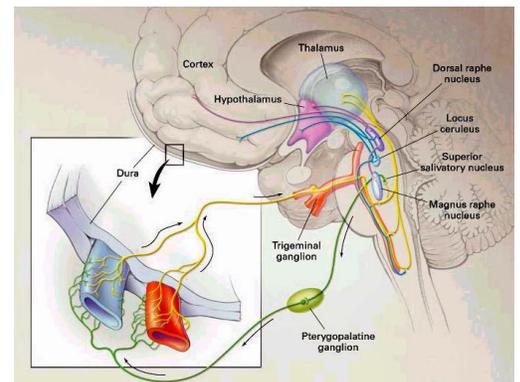
It is important to understand complex interplay between cervicogenic headaches and migraine headaches. As we will discuss below a significant number of individuals with migraines can have cervical spine difficulties trigger the migraine headaches. In this scenario the patient's chronic facet joint disease and constant daily headache complaints secondary to facet joint disease was the trigger mechanism for frequent migraine headaches.

THE MIGRAINE CONNECTION:



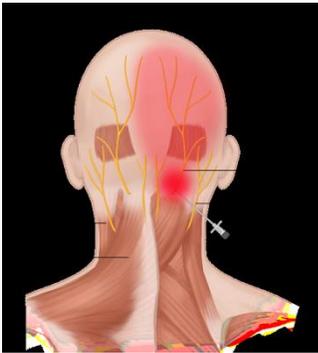
This topic of cervicogenic headaches becomes even more complicated when one realizes the interplay between tension-type headaches and migraine headaches. This article is not going to comprehensively discuss the topic of migraine headaches and we will need to cover that topic and a full article addressing that topic. We bring up the topic of migraine headaches because there can be an important interplay between migraine headaches and cervicogenic headaches. We are not going to get into a significant amount of detail about migraine pathophysiology however, we do need to address the topic briefly. For the most part the brain is not sensitive to pain. However, the blood vessels and the connective tissue

coverings of the brain are. The structures are innervated by branches of the trigeminal nerve system. The primary nucleus of the trigeminal system does not sit within the brain but rather sits in the brainstem which is in the upper cervical spine. Interesting enough the upper cervical ligaments and facet joints share a sensory nucleus with the trigeminal nucleus in the brainstem. Because of this phenomenon there can be a “crosstalk” within the brainstem between these 2 systems. For example, it is not uncommon for a patient with a migraine headache to have upper neck pain because of referred pain into the neck from the trigeminal nucleus.



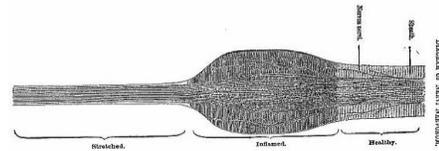
In addition, as we have already discussed individuals with neck pain causing headaches can cause a “triggering mechanism” to stimulate frequent migraines. The case example noted above describes an individual who gradually developed worsening neck pain secondary to combined injury and advancing degenerative changes in her neck. Her neck pain and associated cervicogenic headaches became a stimulus for frequent migraine headaches. As soon as the cervical spine problem was appropriately diagnosed and treated her migraine headaches returned back to her usual frequency.

OCCIPITAL NEURALGIA:



The greater and lesser occipital nerves are derived from the upper cervical spine and moved to the back of the head by traversing through some fibrous tunnels in the upper cervical spine and suboccipital region. These fibrous-muscular tunnels or potential locations of entrapment. Entrapment and compression of the occipital nerve can lead to characteristic neuralgic pain in the distribution of the nerve which is typically extending into the back of the head. The diagnosis of occipital neuralgia can be made by simple local anesthetic injection on the nerve. However, in my opinion this is inadequate. This may answer the question of what but not why. You may understand **what** the condition is (occipital neuralgia) and understanding why the nerve is problematic within the tunnel is even of more importance. It is common

place for neurologist, headache specialist, and pain physicians to perform occipital nerve blocks but if the problem is not addressed symptoms recur. When a nerve is compressed with him in a fibrous connective tissue channel or fibro-osseous channel there is a back pressure phenomenon within the nerve. Besides a host of neurophysiologic and pathologic processes that occur secondary to entrapment neuropathy the nerve begins to produce and release an abnormal amount of cervical important “neuropeptides” such as substance P, calcitonin gene related protein, etc. These neuropeptides are responsible for “winding up” and hypersensitive in the nerve. The majority of physicians performing occipital nerve blocks do so with the use of local anesthetics usually lidocaine and a corticosteroid. Although these substances can be helpful we find it more helpful with the use of simple 5% dextrose with a low-dose corticosteroid. The dextrose solution has unusual affect on the nerves by blocking these neuropeptides. In addition, we attempt to hydro-distend the connective tissues away from the nerve. This technique is called neural fascial hydro-distention. I have addressed this topic in an article on the website entitled neural fascial hydrodistention.



Although occipital nerve blocks may provide temporary relief is important to identify underlying cause. We utilize occipital nerve blocks utilizing the hydrodistention technique previously described as well as treatment of the myofascial structures of the neck to relieve sustained muscular tension that can often be tensing connective tissues around the nerve. In addition, we also find it is important to treat facet joint dysfunction, ligamentous instability, and other pathology a coexistent and are often at the root cause of occipital neuralgia.

THE TMJ CONNECTION:

Individuals with cervicogenic headaches may have temporomandibular joint dysfunction in addition to the headache complaints. Up to 44% of patients with cervicogenic headaches.²³ It is not the intended to discuss a comprehensive review of TMJ dysfunction. However, when evaluating headache complaints and cervicogenic headache I shows consider evaluating the TMJ. Although the orthopedic medicine practitioner does have some tools and techniques to address TMJ syndromes such as acupuncture dry needling, prolotherapy injections directed to the TMJ and various other types of injection therapies we feel it is critical to also collaborate and antegrade care with dentists and specialist who are better prepared to evaluate for malocclusion, various dental and bite abnormalities that may be placing a symmetrical stress on the temporomandibular joint.

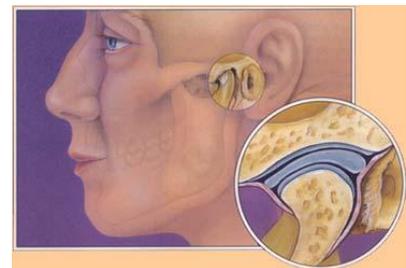
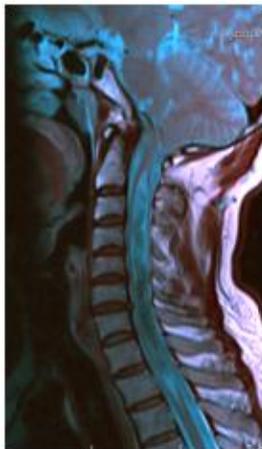
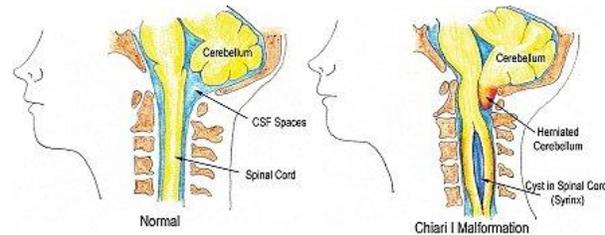


Table 1	HIS diagnostic criteria for cervicogenic headaches. ²³
Grade	Criteria
A	Pain referred from a source in the neck and felt in one or more regions of the head and / or face, fulfilling criteria C and D.
B	Clinical laboratory and / or imaging evidence of a disorder or lesion within the cervical spine or soft tissues of the neck known to be, or generally accepted as a valid cause of headache.
C	Evidence that the pain can be attributed to the neck disorder or lesion based on at least one of the following: <ol style="list-style-type: none"> 1. Evidence of clinical signs that implicate a source of pain in the neck. 2. Abolition of headache after diagnostic blockade of a cervical structure or its nerve supply with placebo or adequate controls.
D	Pain resolves within 3 months after successful treatment of the causative disorder or lesion

ARNOLD-CHIARI MALFORMATION:



Arnold Chiari malformation is a downward displacement of a portion of the cerebellum and base of the brain through the foramen magnum. The foramen magnum is the hole where your spinal cord exits the cranium. There are several types of these malformations classified based on their severity. The brainstem, cranial nerves, and cerebellum may be vulnerable to compression—can produce symptoms. Most individuals have Arnold-Chiari type I throughout their life and never know they even have the condition and it never causes a problem. It is only discovered accidentally when imaging is performed.



If Arnold-Chiari malformation causes symptoms the headaches from this condition are classically a protracted, suboccipital headache that is aggravated by Valsalva maneuver (coughing, sneezing, straining to go to the bathroom) or postural changes.²⁴ If Arnold-Chiari malformation is in fact the source of ongoing headaches and a decompression surgical procedure can be performed relieving the pressure on the brainstem and cerebellum. If Arnold-Chiari type I becomes symptomatic it typically does not become symptomatic in childhood but rather later in life. This can cause dizziness and imbalance, headaches, swallowing difficulties and sleep apnea. This condition can cause both headaches and neck pain. Some individuals may experience impairment of fine motor skills, chronic fatigue, painful tingling in the hands or feet. Obviously most individuals with symptomatic Arnold-Chiari malformation type I are going to be misdiagnosed for many years before this is eventually discovered or noted to be the cause. Again this condition may require a surgical procedure to resolve the symptoms.

You must remember that most individuals with Arnold-Chiari malformation with headaches are experiencing headaches from other causes and not because of the Arnold-Chiari malformation. So it does require a specialist to sort this out.

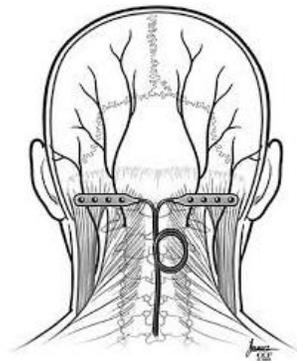
Arnold-Chiari malformation affects females more than males. It is relatively common and can be found in 1 out of every 1000 and sometimes even more common. Types of Arnold-Chiari malformation include:

- **Type I:** This is the most common type. In this type, the lower part of the cerebellum but not the brainstem extends through the opening in the base of the skull. Normally, only the spinal cord passes through this opening. This type is the only type that can be acquired and may not be congenital.
- **Type II:** This type typically occurs in children born with a spinal malformation called spina bifida. Spina bifida is an incomplete development of the vertebra and spinal cord where the spinal cord can be exposed through an opening in the spine. This type is typically known as the “classic type”. Both the cerebellum and brainstem extend through the foramen magnum.
- **Type III:** This type of Arnold-Chiari malformation is more serious. It involves the protrusion or herniation of the cerebellum and brain stem through the foramen magnum which causes severe neurological deficits. This form is very rare.
- **Type IV:** This type involves more significant congenital defects from incomplete or undeveloped cerebellum. It can be associated with exposed parts of the skull and spinal cord. This type is also rare.

PERIPHERAL NERVE STIMULATION FOR CERVICOGENIC HEADACHES:



On very rare occasions an individual may have such intractable occipital neuralgic pain that there is no way to control the symptoms using the various techniques described. Interventional pain physicians are trained to implant special stimulators that can be placed within the spine or over peripheral nerves. A small generator device which is battery-powered can be implanted and attached to the leads as shown in the picture to the right. These special stimulator devices can



be extremely effective in relieving the pain associated with certain types of headaches. I used these so rarely that I have for the most part discontinued doing implantation devices and will refer patients to physicians to do this on a regular basis.

In my entire practice I have yet to refer a single patient for this procedure. However, during my fellowship training at the University of Washington in Seattle I did encounter this method of treatment and trained with physicians who have specialized skills and implanting these devices. During those years I did see patients benefit from these procedures so I bring the topic to provide this information to those who are reading these articles and want to be an informed consumer.

TENSION TYPE HEADACHES:

They affect approximately 1.4 billion people or 20.8% of the population. Tension type headaches often occur during the teenage years and affect three women to every two men. As we have previously stated over 47% of the population experience headache.²⁵ Tension type headaches are



typically characterized by pain that is bilateral in the back of the head and the frontal regions of the head. It is often associated with a sense of a “tight band” around the head. This definition unfortunately is not terribly specific and often time cervicogenic headaches and tension-type headaches overlap. It was originally theorized that muscular tension may be the source of these headaches and therefore were named “tension type headaches”. It is also been theorized that stress and psychogenic factors are associated with these types of headaches.²⁶ Interesting enough, it is also been theorized that long-standing tension headaches tend to occur in individuals with low cortisol levels.²⁷ Whether or not such is the case the burden of tension headaches is staggering. Individuals experiencing persistent tension-type headaches, only development overreliance on nonprescription caffeine-containing analgesics or an unfortunate dependence or possibly addiction to narcotic analgesics. They can experience GI bleeds from the use of nonsteroidal anti-inflammatory medications.

Pain associated with tension-type headaches are often a throbbing quality with a sense of tightness as previously described around the back of the head and frontal regions. Compared with migraines tension-type headaches typically are less severe. Symptoms may include difficulty in concentrating, a sense of muscular tightness or stiffness in the back of the head, frontal areas and stiffness in the neck. Pain onset is often shortly after rising in the morning. Patients may have insomnia, sensitivity to light and sound. Individuals do not experience nausea or vomiting similar to migraine headache patients. Tension-type headaches can last for 30 minutes to an hour up to a week at a time.

Tension-type headaches are actually divided into 3 types:

1. In frequent episodic: (less than one day of headache per month.)
2. Frequent episodic: (1-14 days of headaches per month.)
3. Chronic: (Greater than 15 days per month).

It has been suggested that regular exercise, stretching, balance meals and adequate sleep are all part of a tension type headache treatment program.²⁸ Is common place that we require our patients with tension-type headaches to leave their office at lunch and walk every day. Again low levels of cortisol may be present and this is something that can be evaluated by laboratory examination. Because tension type headaches and cervicogenic headaches are so intertwined we often try initially treatment directed to the cervical spine which include chiropractic or osteopathic manual therapy and acupuncture dry needling as an initial form of treatment in our facility. Acupuncture itself has been shown to be valuable which was reported as a review of 11 studies involving 2317 patients whether seem to be demonstrated a benefit of acupuncture.²⁹ Personally, I favor Gunn IMS (acupuncture dry needling) as a method of treatment of tension-type headaches and have found that to be even more effective.

One of the surprising treatments that has emerged for both migraine and tension-type headaches is the use of topical application of essential oils. Essential oils which can simply be purchased at your local health food store often contain Peppermint, Lavender, Eucalyptus and Rosemary or some other combinations. This was not anything that I would have investigated as a physician until I began to have countless patients describe benefits of topical application around the temple, for head and the back of the neck of these essential oil formulas. I find this method certainly more attractive than the use of opioid medications and other analgesic medications which can have side effects of rebound phenomenon, etc. It is a relatively harmless trial to see if this benefits to headache patient and I encouraged those who have tension-type headaches and migraines to try this. Other natural remedies that may be helpful is omega-3 fatty acid supplementation. Obviously stress management is a critical issue. Unfortunately, we state this on a regular basis but most are unwilling to modify lifestyle to deal with stress management and their lives. It is felt by many that getting out and walking and regular exercise is part of a daily regimen that can reduce stress and have a significant effect on headaches.

One could not discuss the topic of tension headaches without at least addressing medications. The frequent use of over-the-counter analgesics or opioid medications can lead to conversion of headaches to chronic daily headaches secondary to medication overuse and rebound phenomenon. I just warn all individuals about this and if he finds herself taking medications on a daily basis I encouraged the reader to get off all medications and often times the headache frequency will markedly improved. Simple analgesics and nonsteroidal anti-inflammatory medications are more appropriate for episodic tension type headaches. There are combination analgesics which contain caffeine. These are somewhat of a second choice. Individuals who have tension-type headaches should avoid the use of triptan medications which are actually used for migraines. Muscle relaxants are actually not muscle relaxants at all but rather sedatives and I do not believe have a place in tension-type headache management.

Actually it has been shown that Tri-Cyclen antidepressant medications such as amitriptyline is a first drug of choice for prophylactic treatment of chronic tension-type headaches. I prefer to use nortriptyline rather than amitriptyline because there are less side effects. There are other antidepressant medication such as mirtazapine and venlafaxine both antidepressant medications which have been considered second choice medications. The prophylactic treatment using any medication which includes antidepressant medications are problematic because of side effects which can be dry mouth, difficulty in urination, weight gain, somnolence, etc.

IN SUMMARY:

Cervicogenic headaches are a common phenomenon. Milder cases can be treated with simple soft tissue techniques, manual therapy, acupuncture dry needling and a myriad of simple interventions which often times are very effective in treating cervicogenic headaches. Individuals who have chronic recurrent cervicogenic headaches need to seek care outside of typical soft tissue massage, manual therapy techniques, etc. and consider being evaluated for treatment of chronic facet joint instability, degenerative joint disease, etc. Treatments directed to instability resolve chronic segmental dysfunction which leads to relaxation of muscle tension and relief of headaches. We have addressed the topic of regenerative injection therapy in multiple articles on this website and I encourage the reader to further their investigation on these methods of treatment by reviewing those articles.

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