
CASE STUDY

Resolution of Headaches & Neck Pain in a 59-Year-Old Male with Rheumatoid Arthritis Undergoing Upper Cervical Chiropractic Care: A Case Report

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ABSTRACT

Objective: To review the positive health outcomes of a patient with rheumatoid arthritis experiencing headaches and neck pain undergoing upper cervical chiropractic care.

Clinical Features: A 59-year-old male presented to a private chiropractic practice with a chief complaint of headaches, neck pain, and rheumatoid arthritis.

Intervention and Outcomes: Eight upper cervical adjustments were delivered over a period of 12 visits in 10.5 weeks utilizing the National Upper Cervical Chiropractic Association (NUCCA) Technique. Complete resolution of headaches and neck pain were reported by the patient following the first adjustment and the patient was able to discontinue his medication.

Conclusion: The upper cervical subluxation may be a contributing factor to rheumatoid arthritis related pain. Reduction of the subluxation with specific vectored correction may help reduce pain not only in the head and neck, but throughout the entire body in people suffering from rheumatoid arthritis. More research is warranted investigating the effects of upper cervical care and rheumatoid arthritis.

Key Words: *Rheumatoid Arthritis, RA, headache, neck pain, upper cervical, subluxation, orthogonal, NUCCA, chiropractic, arthritis, inflammatory arthritis, chiropractic adjustment*

Introduction

Rheumatoid Arthritis (RA), as defined by the Mayo Clinic, is a chronic inflammatory autoimmune disorder that mistakenly damages the synovial joint lining throughout the body. This joint damage causes an increase in chronic systemic inflammation which can damage a variety of body systems including the skin, eyes, lung, heart, and blood vessels. Rheumatoid arthritis most commonly begins between the ages of 40-60 years in the hands and feet and then travels centrally.

RA is generally considered to be an autoimmune disorder affecting mostly the joints, but about 40% of people with RA

also develop symptoms in many other areas. Flares, or periods where the symptoms worsen temporarily, are common with RA. Chronic damage to the synovium and joints can destroy the cartilage and bone that make up the joint, resulting in very painful movement and steady breakdown in quality of life. The cause of RA is still unknown, but some medical experts believe that certain genetic predispositions could be making some people susceptible to environmental factors that bring about this disorder, while people without these genetic factors are left unaffected.¹

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The diagnosis of RA is based commonly on three characteristics and sometimes a fourth. The three characteristics include the signs/symptoms described above, higher than normal ESR (Erythrocyte Sedimentation Rate) and Rheumatoid Factor in blood work, and characteristic x-ray changes especially in the hands and feet (bone erosions, joint swelling, joint deformity). The fourth and least commonly used method to diagnose RA is through a tissue biopsy or a joint fluid analysis for abnormalities.²

Medical management of the rheumatoid arthritis patient has focused largely on medications to try to force the RA into remission and prevent flares. When certain powerful drugs called Disease Modifying Anti-Rheumatic Drugs (DMARDs) are given as early as possible after the diagnosis, remissions seem to be more likely. NSAIDs are very commonly given to treat the pain throughout care and also corticosteroid medications such as Prednisone are also very commonly given to treat the pain. The long-term side effects of these treatments can be very serious including liver damage, bone marrow suppression, and lung infections. There are some newer DMARDs that are called Biologic Response Modifiers, which are supposed to target the aspects of the immune system that create inflammation and therefore joint damage, but these also have serious side effects including increased risk of infections.³

The rheumatologist may also refer the RA patient to a physical therapist so the patient can learn alternative ways to move and do tasks to avoid as much pain as possible, without the goal of solving the problem, but with the goal of altering lifestyle to decrease the pain from the RA. Surgeries range from synovectomy, where the doctor will extract the inflamed synovium from the joint, all the way to joint replacement if the damage progresses far enough. Some doctors have started prescribing different oils, such as fish oil and plant based oils for ingestion in order to provide better joint motion. Other approaches include movement therapies, such as Tai Chi, in order to keep joints moving smoothly and through a full range of motion to help the joints stay functional longer throughout the RA process. Gentle exercise such as stretching or water aerobics may help with some people experiencing pain with RA. Relaxation techniques and deep breathing techniques may also help to decrease pain in some individuals with RA.⁴

Historically, chiropractic has not had much of a role in managing RA due to its nature of intervening at the level of the spine, and not directly with blood marker levels as seen in RA. The results of traditional spinal manipulation (high velocity, low amplitude thrusts) with a patient with RA have been few. In the literature, there have only been a few case studies published that examine the role of the upper cervical subluxation on the progression of RA. A 2015 study⁵ discusses relief of acute thoracic pain in a patient with RA using traditional spinal manipulation. An earlier 2012 study⁶ shows 9/10 pain in a woman with RA dropping down to 1/10 pain under traditional chiropractic care. A third loosely connected study⁷ done in 2011 shows improvement of hip movement and function following traditional chiropractic care of patients with osteoarthritis, a different form of arthritis caused by simple wear and tear, and not by the same factors causing RA.

Case Study

History

A 59-year-old male with RA presented with neck pain and headaches as his major complaint. He also had ringing in his ears, foot pain, low back pain, and pain in his elbows, hands, hips, knees, legs, and feet bilaterally in addition to swollen joints from his RA. His history showed he was hit from the side in a motor vehicle accident 15 years ago at approximately 40 mph, which is when the headaches and neck pain started and the joint pain in the rest of the body intensified.

In the last 15 years, he has been under the care of his rheumatologist for his RA, which has included mostly anti-inflammatory medications, prednisone shots, prescription pain killers, and muscle relaxers when he has a flare up. He has also had epidural steroid injections in his back two different times for pain. He is a brick layer, so his job is very rough on his body and seems to amplify the pain frequently.

Examination

The NUCCA technique assessment was used for this patient and the following postural distortions were found on 6/1/17 using the Spinemaster and Horizontally Leveled Line Chart: left head tilt, left neck translation, left high shoulder 2", left trunk rotation, left low hip, left hip rotation, left hip translation 1.5 degrees, right fixed point ½ degree, weight 4 lbs heavy on the left, and a supine left short leg⁸ was estimated visually to be 1/2".

Cervical x-rays were obtained and measured for the atlas listing according to the NUCCA protocol.^{9,10} The calculated vector based off the NUCCA x-ray series was Left Atlas, Low 2" with 0 Atlas Rotation, requiring a Superior counterclockwise torque and a contact point inferior ¼" and anterior ½" from the palpable anterior inferior tip of the left mastoid process as measured from the pre Lateral film (Figure 1). The pre Nasium film (Figure 2) revealed atlas laterality to be left 0.45 degrees, head tilt was left 3.38 degrees, lower angle was left 1.32 degrees, and angular rotation was left 1.61 degrees. The pre Vertex film (Figure 3) revealed the atlas to be rotated left posterior 0.28 degrees with a spinous to the left 2.64 mm.

The Spinemaster is a piece of postural measuring equipment very similar to NUCCA's Anatometer.^{9,11} It is able to measure the vertebral prominence deviation from center, hip height inequality, hip translation from center, and weight differential, all in the frontal plane.

Intervention

The patient was first adjusted on 6/2/2017 and was seen 12 times before his re-exam on 8/15/17, and was adjusted 8 times in that 10.5 weeks based off postural distortions being present. The patient was seen two times per week for the first 3 weeks and then missed 3 weeks from 6/26/17-7/17/17 due to vacation, and then was seen two times per week until the re-exam on 8/15/17.

Outcomes

This case study follows the patient's first 10.5 weeks of care. After the patient's first adjustment the leg length was visualized as even, the head was tilted slightly to the left, the left shoulder was high $\frac{1}{2}$ ", no trunk rotation, the neck was straight vertical, the hips were centered, no hip rotation, the fixed point was to the right $\frac{1}{4}$ degrees, and the weight was 1-lb heavy on the left. The patient required adjustments on visits 1-7, and on visits 8-12 the patient only required 1 adjustment. Visits 8, 9, 10, and 12 the patient's legs were even, head straight, shoulders level with no rotation, neck vertical, hips centered with no rotation, fixed point centered, and weight right 2 lbs, left 4 lbs, left 4 lbs, left 4 lbs respectively. On visit 11 the patient's left leg was $\frac{1}{4}$ " short, head was straight, the left shoulder was high with no rotation, the neck was left, the hips were to the left $1\frac{1}{4}$ degrees with no rotation, the fixed point was $\frac{1}{4}$ degree to the right, and the weight was 15 lbs to the left. After the correction on the 11th visit, the patient's legs were even, head straight, shoulders level with no rotation, neck vertical, hips centered with no rotation, fixed point centered, and weight to the left 2 lbs. On the progress self-report, the three comments the patient wrote down were "Posture is better," "Not taking Tramadol for pain of RA (since starting care)," and "0 headaches, 0 neck pain." He also rated his percentage of relief to be 90% improved and classified his improvement as "Excellent."

Cervical post x-rays were obtained immediately after the initial correction and measured for the atlas listing according to the NUCCA protocol.^{9,10} The calculated vector based off the NUCCA post x-ray series was Left Atlas, high 1" with 0 Atlas Rotation, requiring a Superior counterclockwise torque and a contact point inferior $\frac{1}{4}$ " and anterior $\frac{1}{2}$ " from the palpable anterior inferior tip of the left mastoid process. The post Nasium film (Figure 4) revealed atlas laterality to be left 0.17 degrees, head tilt was right 1.25 degrees, lower angle was left 1.08 degrees, and angular rotation was right 2.50 degrees. The post Vertex film (Figure 5) revealed the atlas to be rotated left posterior 0.06 degrees with a spinous to the left 0.14 mm.

Discussion

Positive outcomes for neck pain^{12,13} and headaches¹⁴⁻¹⁶ especially with the NUCCA protocol¹⁷ has been thoroughly documented in the scientific literature, but positive outcomes for RA have only been explored minimally. Thus, the discussion will be focused primarily on five mechanisms that are noteworthy in the upper cervical subluxation's effect on RA pain levels.

Restored Mechanical Gravitational Balance & Vertical Axis of Motion

"Bodily distortion is the only sure indication – the only positive symptomatic evidence – of a C1 subluxation because it is measurable."⁹ Since this body distortion takes its toll on the body over time, pain throughout the body can occur. Normal body position has been defined as "a stabilized state for a subluxation-free spinal column is one in which the skull, spinal vertebrae, and pelvis are aligned or restored to their normal positions on the vertical axis of the body; a state in which all acting influences are

cancelled by other influences resulting in a balanced or unchanging system"⁹ and "It is reasonable to assume, then, that if the skull, spinal vertebrae, and pelvis are not on the vertical axis in a balanced way that problems could arise, especially in regards to pain throughout the body's framework due to the abnormal stresses on the joints throughout the body, myofascial, and other soft tissue systems. Lennon states "Posture and normal physiology and function are interrelated. Abnormal posture is evident in patients with chronic pain related conditions..."¹⁸ When the upper cervical subluxation is corrected, the body balances back to the vertical axis and the gravitational trauma to those joints and tissues that were under stress can heal,⁹ meaning the joints and tissues of the body can symptomatically improve as well.

Neuroimmunity Interruption Resulting in Inflammation

Knowing that the central nervous system controls, in large part, immunity in the body,¹⁹⁻²³ and "endocrinology and neuroscience are really two aspects of the same process,"⁹ it stands to reason that the immunity in the body can be impacted when the nervous system is impacted. In Bienenstock J, et al's paper, they said "These observations support the conclusions that nerves and mast cells may constantly communicate and provide a structural and conceptual framework whereby the central nervous system may communicate with inflammatory events."²² So, it seems as if the research strongly supports the idea that immune response and inflammation are controlled and regulated by the central nervous system. This has also been found to be the proposed mechanism in chronic pain coupled with neuroimmunity²³ as well as chronic pain compared to without chronic pain.²⁴ In the latter study by Roy, Boucher, and Comtois,²⁴ proinflammatory cytokines were seen to normalize after chiropractic care, eliminating an inflammation response by correcting the central nervous system function and impacting those inflammation mediators. CD4 T helper cells, which are pivotally involved with inflammation and autoimmunity, have been shown to be dramatically improved after upper cervical adjustments in one study.²⁵ Any of these scenarios could potentially be at play with this patient in particular, resulting in a decreased inflammation response as a result of normalized immune function from the central nervous system correction at the level of the brainstem from the NUCCA correction.

Upper Cervical Instability and RA

RA is very strongly correlated with upper cervical instability.²⁶⁻²⁹ The question is not being asked; which came first, the RA inflammation or the upper cervical instability? And is there one that plays the bigger role in the upper cervical instability or the RA symptomatology? It might go both ways. Most research is presented from the perspective of how RA affects the upper cervical region in terms of stability and ligament laxity. Most research takes the stance that the RA inflammation and characteristic pannus of the joints commonly targets the C1/C2 articulation. Once that joint is effected, the stabilizing structures around it are also effected, which is what causes the instability of that joint in particular.²⁶ There is not much perspective going the other direction, pointing out how an upper cervical subluxation

can cause, and contribute to, extra inflammation in the body, altered upper cervical joint juxtaposition, altered upper cervical biomechanics, and therefore upper cervical instability. At this point we do not know if the RA would have caused the upper cervical instability without the subluxation present as well. It is reasonable to assume that not only could the RA affect the upper cervical region, but the upper cervical region could also affect the RA as well. Ligament instability/laxity associated with RA can result in increased neurological stress, altered CSF flow and vascular supply interruption,^{30,31} which can effect RA symptoms, as well as this patient's headaches and neck pain. In a 1996 study it was shown that there were many positive outcomes when the upper cervical spine was surgically stabilized,³² so it appears that if non-surgical stabilization was possible, it would be preferable. This nonsurgical stabilization could be why this patient had such a positive outcome. The overall picture is a possible positive feedback loop, with RA and the upper cervical subluxation each progressively worsening the other, in which case, the cycle needs to be broken by either halting the RA physiology or correcting the upper cervical subluxation, the latter of which was done with this patient.

Undiagnosed Central Pain Syndrome in Addition to RA

It is possible that this patient, and possibly others as well, is suffering from two issues simultaneously, namely RA and Central Pain Syndrome (CPS). CPS occurs when there is damage to the central nervous system which causes neurological dysfunctions to arise. Although CPS can be caused by many things that interrupt or damage the CNS, the condition that this patient presented with was a subluxation of the upper cervical spine at the craniocervical junction. This is where the brainstem is located and can be affected by subluxations,^{9,33} such as the one with which this patient presented. Once the brainstem is effected, then pain can be perceived almost anywhere in the body either in large regions or limited areas. The consistent pain felt as a result of this may be misdiagnosed and lumped in as part of a pre-existing systemic disease such as RA.

Different factors that would exacerbate this subluxation causing the CPS (such as getting hit in the head or self-manipulating the neck) would not be detected or suspected by a practitioner looking for the cause of RA related flair ups. Aching pain is common in CPS patients, as is commonly reported in RA patients as well. The distal areas of the body (hands and feet) commonly take the brunt of the pain, as commonly does RA. The last aspect that overlaps between the two is that CPS may not manifest due to a subluxation at the time the subluxation occurs, so it may be days, months, or even years before the pain begins, giving the illusion that the pain from the RA is flaring up or progressively worsening.³⁴

Specifically, in this patient's CPS, the Spinothalamic Tract might have been disrupted, resulting in chronic unresponsive pain from nociceptors in multiple parts of the body, when it was the subluxation at the upper cervical spine causing the issue that the brain was misinterpreting as pain in the body.³⁵ It is a possibility that correcting the cause of the undiagnosed CPS, or in other words, correcting the subluxation, may have eliminated 90% of this patient's pain which was from the

CPS, and now only the 10% of this patient's pain that was truly from the RA remains.

Vagus Nerve Dysfunction Leading to Gut Issues and Subsequent Inflammation

There have been links to many gut issues and RA. A study by Henriksson et al found that 35-40% of RA patients presented with a certain bacterial overgrowth called SIBO, and the paper demonstrated a causal relationship between SIBO and generalized musculoskeletal inflammation.³⁶ Sher et al published a similar study in 2013 where they discovered a dramatic increase of *Prevotella copri* in the gut in patients with RA³⁷ while patients with Psoriatic Arthritis did not, as showed by his later 2015 study³⁸. Another gut originating cause of inflammation is from peptidoglycans, which actually have been linked to joint inflammation in particular, and in conjunction, metabolites in the gut have been shown to cause inflammatory degenerative arthritis symptomatology³⁹ very similar to RA symptomatology. RA has also been associated with reactions to food antigens, and it is suggested that RA actually originates with a problem in the gut.⁴⁰ In addition, dietary changes such as gluten free, vegetarian and vegan have shown improvement in RA symptoms by impacting the gut.⁴¹

There are many different gut issues correlated with RA, and changing variables with the gut can decrease inflammation, so what if the problem is not with the gut itself, but with the vagus nerve that plays a large role in gut function? The common denominator that ties it all together could be the vagus nerve being irritated or altered by the upper cervical subluxation as it passes through the area of misalignment, followed by the gut dysfunction, which is then followed by increased inflammation in the body, which is seen as an RA flair up. The traditional approach to RA has been to stop eating what makes that dysfunctional system flair up or taking medications to block physiological inflammatory processes instead of correcting the subluxation so the vagus nerve can control gut function effectively. Trying to impact the gut, and therefore RA symptoms, by altering diet or introducing medication still leaves the question of why the gut is dysfunctional in the first place, which may be answered by the upper cervical subluxation impacting the vagus nerve.

Limitations

This study is simply a case report, and not enough evidence has been amassed to make any statements related to correlation or causation between RA and the upper cervical subluxation. More testing needs to be done in order to clarify this relationship, including more case studies to start with, and then advancing to more rigorous testing to flesh out the relationship between the upper cervical subluxation and RA to determine a causal relationship.

There is some positioning error in the x-rays, so therefore they may not show exactly what the patient's true misalignment measured. This, of course, does not negate the results with the corrected posture pattern and symptomatic relief, but it is noteworthy nevertheless.

Conclusion

The symptoms this patient was experiencing in this case have been improved 90% since the first NUCCA adjustment. This was a case where the patient had been diagnosed with rheumatoid arthritis and was on pain medication for the pain associated with that RA while simultaneously suffering from neck pain and headaches at the same time. This patient has had no headaches or neck pain since the first adjustment and has not had to take any pain medication for his RA since the first adjustment.

There is more need for research into the role of NUCCA in managing RA pain, especially combined with headaches and neck pain. Although there have been a few case studies regarding traditional chiropractic care and RA, there need to be more focused on the upper cervical subluxation in particular, as this has the potential to be a key piece in the RA puzzle. Randomized clinical trials need to be done to define the relationship between the upper cervical subluxation and RA symptomatology.

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Figures

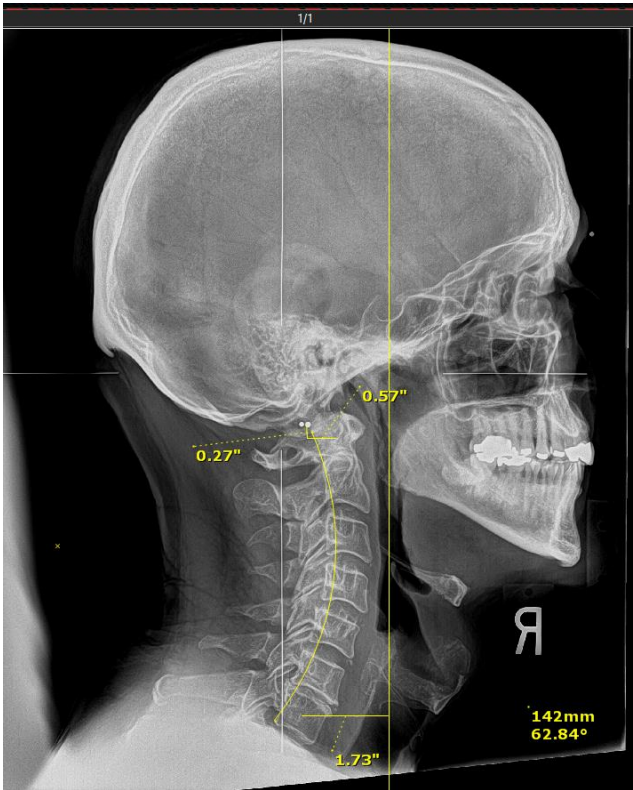


Figure 1: Pre Lateral

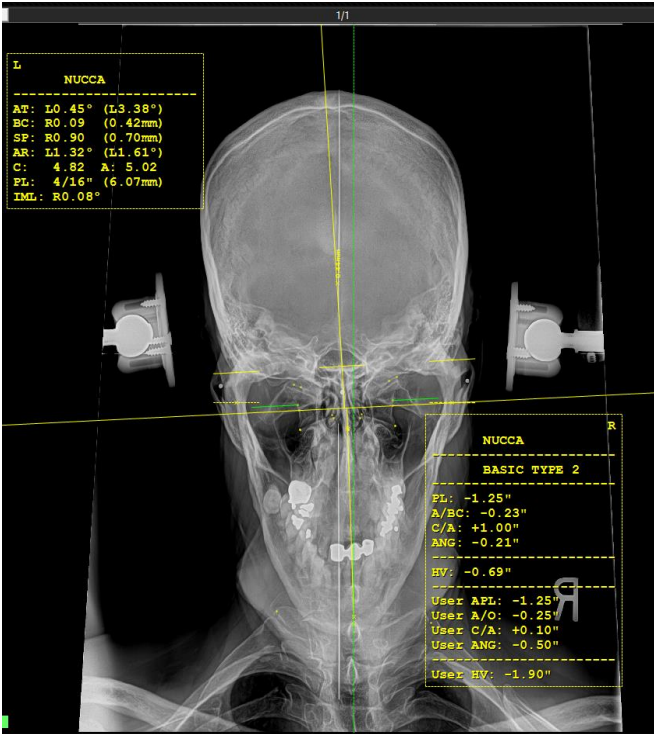


Figure 2: Pre Nasium



Figure 3: Pre Vertex

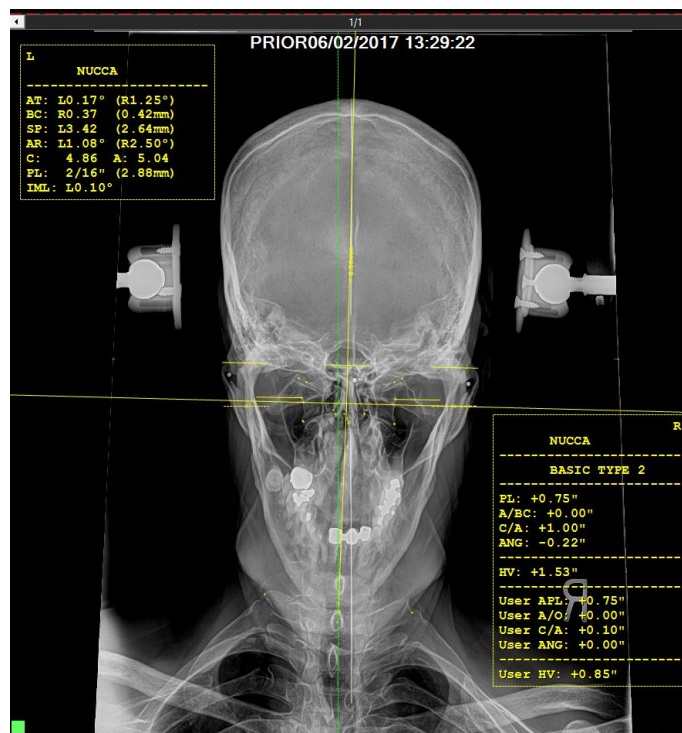


Figure 4 Post Nasium



Figure 5: Post Vertex