
CASE STUDY

Resolution of Meniere's Disease in a 68-Year-Old Female Following Upper Cervical Chiropractic to Reduce Atlas Subluxation Using Orthospinology Technique: A Case Study & Review of Literature

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ABSTRACT

Objective: To document and describe the positive health outcomes achieved by a patient with Meniere's Disease (MD) while undergoing chiropractic care.

Clinical Feature: A 68-year-old female presented to a private chiropractic office with a diagnosis of Meniere's Disease and an eight-year history of associated symptomatology including vertigo, roaring tinnitus, and vomiting that progressively worsened. Previous chiropractic and nutritional care were unremarkable at achieving results. Evaluation using Orthospinology technique revealed the presence of an atlas subluxation complex.

Intervention and Outcome: The patient underwent upper cervical chiropractic care using Orthospinology technique to reduce her atlas subluxation. 10 pre-calculated vectored adjustments were administered to her atlas vertebra over the course of 13 months. After the 5th month of care, the patient's ENT confirmed that she was no longer expressing MD symptomatology. The patient's symptomatology was greatly improved as she has had only one occurrence of minor dizziness since the start of care and a complete cessation of vertigo, roaring tinnitus, and vomiting.

Conclusions: The improvement in the patient's Meniere's Disease symptomatology while solely undergoing upper cervical care to reduce her atlas subluxation suggests that MD symptomatology may be related to the atlas subluxation. The need for additional studies is warranted.

Key Terms: *Chiropractic, upper cervical, subluxation, adjustment, Orthospinology, Meniere's Disease, dentate, NUCCA, dizziness, neurology, cranio-cervical junction*

Introduction

Since the discovery in 1861 by Prosper Meniere, Meniere's Disease (MD) has been loosely studied and not fully understood. Meniere found an abnormal labyrinthine exudate

in cadaveric studies in patients that had vertigo and acute hearing loss pre-mortem without neurological or central nervous system diseases. In 1938, Hallpike and Cairnes found

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dilation of the endolymphatic spaces of the vestibule and cochlea while performing histological studies on the temporal bones of deceased MD patients. Further understanding of the disease came with the artificial creation of endolymphatic hydrops in animal models. Destruction of the endolymphatic sac from fluid accumulation resulted in asphyxia of the labyrinthine end organs leading to hypofunction.¹ Recent studies have been exploring the Vestibulocochlear nerve and its roll in MD. In 2002, the University of Virginia found that patients with unilateral MD had demyelination of the vestibular nerve.²

Diagnostic Criteria

MD did not have a clear diagnostic criterion until 1995 when the American Academy of Otolaryngology-Head and Neck Surgery (AAOHNs) defined the disease. The patient must experience vertigo, acute hearing loss, roaring tinnitus, and fullness in the ear, at least twice. Symptoms may present partially, or fully, lasting minutes to hours at a time.^{3,4} Excessive endolymphatic fluid in the membranous labyrinth, which displaces the inner ear structures is attributed to these symptoms.⁵ There is no single diagnostic test that is sensitive and specific for MD. It is purely a subjective diagnosis of exclusion.⁶

Incidence & Prevalence

The Mayo Clinic in Rochester Minnesota conducted a cohort study, which found the prevalence of MD to be 10.1 per 100,000.¹ The literature has conflicting findings, though, as another study found the prevalence to be 190 per 100,000 with an 89:1 female to male ratio.⁷ The National Institute on Deafness and Other Communication Disorders (NIDCD) estimates that 45,500 new cases of MD are diagnosed each year.⁸ Meniere's Disease is considered a disability by the Social Security Administration and diagnosed individuals qualify for benefits.

Medical Management

The first goal of treatment is to decrease fluid retention by restricting salt intake and administer diuretics. Non-responsive cases may warrant intratympanic steroid therapy and/or transtympanic gentamicin. In severe cases, surgical intervention of vestibular nerve section and endolymphatic decompression have been utilized; however, scientific support for these procedures are lacking.^{9,10} An external pressure device (Menniett) has been historically used to regulate the pressure inside the inner ear; however, the literature reports that the improvement in these patients is similar to the natural trend improvement in untreated patients. The "University of Colorado Protocol" is used to identify and control disorders that impair cerebral and inner ear vascular perfusion.³ Efficacy has not been established with this method.

Orthospinology's Upper Cervical Chiropractic Procedure

Orthospinology's Upper Cervical Chiropractic Procedure is based on Dr. John F. Grostic's research. Dr. Grostic was concerned with the reproducibility from one chiropractor's care to another's at the time. This led him to develop a procedure that determines the existence of a subluxation,

calculates the correction vector necessary to reduce it, and evaluates the progress of the patient. Dr. Grostic defined an upper cervical subluxation as a misalignment of the atlas or axis vertebra, putting mechanical traction on the spine cord, resulting in impaired neurological function.¹¹ Dr. Grostic was the pioneering chiropractor to introduce post-adjustment x-rays into clinical practice to prove subluxation reduction and to recalculate the correction vector for the subsequent adjustment if warranted.

After Dr. Grostic's death, former board members from the Grostic Chiropractic Presentations created the Society of Chiropractic Orthospinology, Inc.^{12,13} The goal of the procedure is to remove the functional indicators of the subluxation as well as to reduce structural malposition of the atlas vertebra in relation to both the skull and the axis vertebra. A percussive instrument is utilized for added reliability and reproducibility of each adjustment.

Case Report

History

A retired 68-year-old Caucasian female presented to a private chiropractic office with chief complaints of severe dizziness and vomiting that would occur every 3 weeks for up to 8 hours at a time for the last 8 years. The patient had a secondary complaint of minor neck pain that occurred infrequently. She was diagnosed with Meniere's Disease by her Ear, Nose, and Throat physician (ENT) two years prior to the initial exam. The patient described her episodes as beginning with hearing a continuous "roar" in her left ear that shortly lead to 5 to 8 hours of crippling vertigo and vomiting.

The next two to three days following an MD episode, the patient would feel as if she were intoxicated with alcohol. During this period, she could not walk unassisted. Her ENT prescribed her a sodium restrictive diet that rendered no change in complaints. Secondly, she sought out chiropractic care, where she received seven months of full spine adjustments paired with a common food allergy elimination diet. Both interventions failed to improve the patient's symptoms. Furthermore, her MD episodes were beginning to increase in frequency, which lead her to seek upper cervical chiropractic care.

Physical examination

The patient was examined for upper cervical subluxation utilizing Orthospinology Procedure's.¹² Orthospinology Procedure's utilizes the supine leg length inequality (LLI) test, functional pelvic distortion (FPD) test, and static palpation of the cervical facet joints to determine if there is neurological disrupt within the patient. Supine LLI and FPD are used to detect neurological insult to the spinocerebellar tract. When the atlas bone misaligns relative to the occiput and C2, the dentate ligaments will become torqued thus putting mechanical traction on the spinocerebellar tract, leading to spasm of the large pelvic muscles and drawing one of the legs short.¹¹

Intra and inter-examiner reliability is very high for identifying which leg is short.¹⁴ Static palpation of the cervical facet joints

is used to detect neurological insult to the cervical paraspinal musculature. It has been shown that joint dysfunction in the cervical spine can lead to efferent sympathetic excitation. Since the C1 nerve innervates splenius cervicis, atlanto-occipital joint dysfunction can result in sympathetic excitation to the muscle, creating a state of hypertonicity revealed by palpation.^{12,15-18} Inter and intra-examiner reliability to locate cervical paraspinal hypertonicity was found to be very high.¹⁹ As defined earlier, an atlas subluxation expresses itself as a structural malposition of the atlas vertebra in relation to the occiput and C2, resulting in neurological insult.

Therefore, at this point, if these clinical indicators are present, three static x-ray views are warranted to obtain the 3-dimensional atlas malposition. The first view taken is the neutral lateral view. This reveals atlas malposition within the sagittal plane and allows the doctor to calculate the angle necessary to take the second view. The second view, the nasium, reveals atlas malposition within the coronal plane.

The third view is the vertex. This view reveals atlas malposition within the transverse plane. After these views are taken, specific lines are drawn on the films to calculate the angle and height necessary to reposition the atlas vertebra as close to 90 degrees relative to the occiput and C2 vertebra. Inter and intra-examiner reproducibility and repeatability for drawing these lines was found to be very high.^{12,13,20} To correct the misalignment, the patient is positioned on a specialized table, laying on their side, with their head placed on a headpiece designed to give support only to the mastoid.

This allows atlas to be adjusted with minimal force needed. The doctor then measures the angle and height on the patient required to reduce the malposition of atlas as determined from the lines drawn on the x-ray images. An instrument assisted, low force (less than three pounds), high velocity, adjustment is applied to the transverse process of atlas to reduce the malposition. After the first adjustment, the nasium and vertex views are retaken and compared to the pre-adjustment views, to determine if the adjustment made a correction to the atlas misalignment. After each adjustment, supine LLI, FPD, and static palpation are rechecked to determine if the adjustment relieved the neurological insult that was found prior to the adjustment. The patient is only adjusted on subsequent visits if supine LLI, FPD, and static palpation reveal neurological disruption.¹²

Physical findings

Physical examination of the patient revealed presence of a supine short left leg ¼ inch, moderately low left hip caliper measurement (indicating FPD), and taut and tender fibers over her C2-C5 facet joints. X-ray examination revealed a structural malposition of the atlas vertebra in all three anatomical planes. (Figures 1 & 3) MRI of the cervical spine showed multilevel degenerative changes, a mild left scoliotic curve, multilevel canal stenosis, and multilevel neural foraminal stenosis. As described above, these findings indicate that the patient had an atlas subluxation.

Orthospinology Procedure's Care

The patient was seen 15 times over the following 13 months

and adjusted on 10 of those visits to reduce her atlas subluxation. Nasium and vertex x-ray views were repeated immediately following the initial adjustment to record reduction of the atlas subluxation. (Figures 2 & 4). Reassessments were conducted at the 5th month during the 12th visit and at the 13th month during the 15th visits. The first reassessment revealed a complete cessation of MD episodes since her last vertigo attack six days prior to beginning upper cervical care.

She reported during her 2nd reassessment that she had one minor occurrence of dizziness one week following the 1st reassessment. After her first reassessment, a check-up with her ENT confirmed that she is no longer expressing symptoms and/or indicators of MD. The patient reported that over the course of care, she experienced three to four short occurrences of feeling intoxicated. During the 2nd reassessment, the patient subjectively claimed that she is doing 95% better since the initial visit.

Discussion & Review of Literature

The purpose of this study is to document the health outcomes of a 68-year-old female with Meniere's Disease that underwent treatment with Orthospinology Procedure's to reduce the atlas subluxation. According to the patient, she experienced only one minor occurrence of dizziness since the first adjustment. The patient did not participate in any other health intervention while under-going Orthospinology Procedure's care. It is significant to note that the patient's MD attacks were increasing in frequency up until the date of her first Orthospinology adjustment. Since this was the only intervention the patient was undergoing at the time, upper cervical care to reduce the atlas subluxation may have been a factor in resolving her major MD episodes. Four theories were found in the literature explaining how the upper cervical subluxation might lead to MD symptoms.

Sympathetic Excitation of the Eustachian Tube

An article by Franz et al. hypothesized a mechanism as to how the atlas subluxation can lead to MD presentation. Joint dysfunction between the C1 and C2 articulations can activate a cervical sympathetic reflex creating increased sympathetic tone. Since the Eustachian tube is innervated by sympathetic nerve fibers, increase tone will lead to an overproduction of endolymph leading to hydrops.¹⁵ A significant study pertaining to this case documented the health outcomes of 300 MD patients for 6 years following a cervical specific chiropractic protocol to reduce atlas subluxation. 300 out of 300 subjects reported a prior whiplash injury. Whiplash injuries commonly result in upper cervical joint dysfunction.⁶

Vertebral Artery Occlusion

The latest research produced by Paparella Ear Head and Neck Institute has noted that patients can present with MD in the absence of endolymphatic hydrops. The institute recommends that more theories be explored, which include ischemia and autoimmune disorders.²¹ According to Panjabi, 30° of atlas rotation begins to occlude the contralateral vertebral artery, while 45° for the ipsilateral side. Since the vertebral artery feeds the posterior inferior cerebellar arteries, decreased blood

flow could result in ischemia to the vestibulocochlear nerve. This theory supports the scientific findings in Burcon et al. with posterior and inferior atlas subluxation contralateral to the involved symptomatic ear presenting in 90% of MD subjects.^{6,16,17}

Cerebral Spinal Fluid Flow Blockage

Cerebral spinal fluid (CSF) is produced in the choroid plexus located in the floor of the lateral ventricles and the roof of the third ventricles. After production, CSF travels through the lateral ventricles and into the third ventricles by way of the intraventricular foramen. From here, CSF will move through the cerebral aqueduct to reach the fourth ventricles. Exiting the fourth ventricles, CSF takes two separate routes via the medial and lateral apertures. The lateral route flows to the pontine cistern located on the ventral surface of the brain stem. The medial route flows to the cerebro-medullary cistern, around the cerebellum, into the superior cistern, and draining into the interpeduncular cistern. Since recent research has shown CSF flow along the cranial nerve roots, a mechanical block at the cranio-cervical junction (CCJ) may cause restricted CSF flow to the root of the vestibule-cochlear nerve.^{17,22}

Torqueing of Dentate Ligaments

The intimate connection of the atlas bone to the spinal cord has long been hypothesized as a culprit for neurological insult. The 23 pairs of dentate ligaments attach medially at the pia mater to the dura mater laterally from the CCJ to T12. Due to the dura being attached to the atlas ring, misalignment of C1 can lead to torqueing of the dentate ligaments, displacing the spinal cord and brain stem. Since the origin of the vestibule-cochlear nerve is on the lateral aspect of the medulla, it has been hypothesized that torqueing of the dentate ligaments may put mechanical pressure on the vestibule-cochlear nerve.^{6,11,18}

Similar Case Studies

A review of the chiropractic literature turned up five separate studies involving upper cervical chiropractic care and improvement in MD symptomatology. Chung et al. documented the case of a 45-year-old male diagnosed with MD that underwent specific upper cervical care. After 22 adjustments to reduce the atlas subluxation, the patient reported that his quality of life was greatly improved and that his vertigo and hearing loss had been eliminated entirely.²³

Pennington et al. documented a case of a 63-year-old female undergoing upper cervical specific chiropractic care post vestibular nerve section that failed to reduce her MD symptoms. After two months of care, the patient reported that all of her MD complaints had been reduced.²⁴ Jones et al. documented a 52-year-old male diagnosed with MD undergoing upper cervical chiropractic care. After four adjustments, the patient reported that his subjective complaints had been reduced by 60%.²⁵

A case series conducted by Burcon consisted of 139 MD patients undergoing cervical specific chiropractic care to reduce the atlas subluxation. The author had the patients fill out a health questionnaire on their initial visit, after six weeks

of care, after one year, and after two years. The initial questionnaire for vertigo averaged an 8.5 on an intensity scale from 0 to 10 (10 being the worst). After six weeks, the average reduced to a 3. After one year, the average was a 2.3. After two years, the average reduced to 1.4 and 88 out of 139 subjects rated their vertigo as a 0 or a 1 out of 10.²⁶ Another case series conducted by Burcon consisted of 300 MD patients undergoing cervical specific chiropractic care to reduce the atlas subluxation.

Burcon documented the vertigo intensity of the subjects 7 times over the course of six years' post treatment. Results show the average initial vertigo intensity as an 8.5 rated on a scale from 0-10 (10 being the worst). The intensity average decreased at every documented follow up. After the sixth year follow up, the average intensity was 0.8, which is a 90% improvement. History of the subjects revealed 300 out of 300 had a prior whiplash injury and were diagnosed with MD on average 15 years' post injury. Examination of the subjects revealed that 270 of the 300 subjects presented with the same atlas subluxation which was posterior and inferior joint subluxation on the side opposite of ear involvement. This brings us back to the vertebral artery occlusion theory. Posterior and inferior joint subluxation begins to occlude the contralateral vertebral artery, supporting the authors finding.⁶

CAM management for MD

Lemon Bioflavonoids

In a 1963 study, 122 MD patients were supplemented with eriodictyol glycoside (lemon bioflavonoid) to observe its effect on sensori-neural hearing loss. The authors concluded that eriodictyol glycoside showed good results with sensori-neural loss. They state that the physiological mechanism is unknown, however.²⁷

Acupuncture

A 2016 literature review examined 12 randomized controlled trials (RCT) with 993 total MD participants undergoing acupuncture treatment. The results show that acupuncture has a positive effect on controlling vertigo, but no effect on hearing loss. The authors identified a limitation to their study as they included low quality RCTs within their results.²⁸

Limitations

This study is limited in the fact that it only follows the outcomes of one subject and that no objective measures were used to track the patient's symptoms.

Conclusion

This case documents the treatment history of a 68-year-old female diagnosed with MD and review of the literature to hypothesize how Orthospinology care to reduce the atlas subluxation may have played a role in eliminating her MD episodes. Since previous treatments failed to provide any palliative results, and her episodes were increasing exponentially, the patient decided to be evaluated for the presence of an atlas subluxation.

Physical examination suggested the presence of an atlas subluxation and radiographic imaging confirmed it. Ten adjustments were administered over 13 months to reduce the atlas subluxation. The patient presented to the office on her initial visit with mild vertigo. After the first adjustment, the patient has not had any major MD episodes, with only one short occurrence of dizziness. Her ENT confirmed that she is no longer showing signs or symptoms of MD.

The patient's atlas misalignment was consistent with Burcon's findings of posterior and inferior on the side opposite of the symptomatic ear. The need for a large population randomized controlled trial of Orthospinology Procedure's effect on MD symptomatology is warranted.

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Appendix

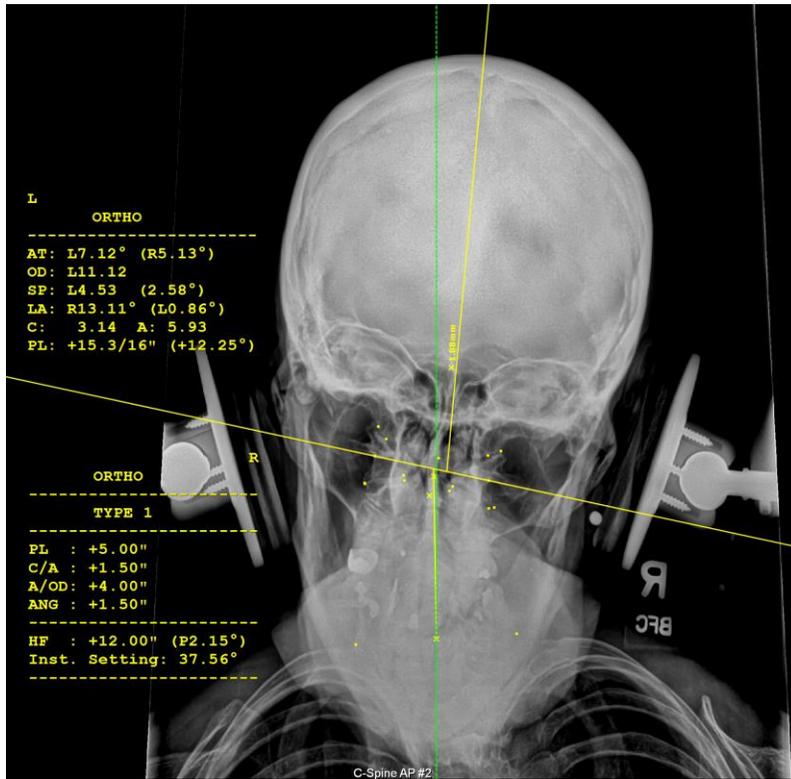


Figure 1. Pre Nasium film

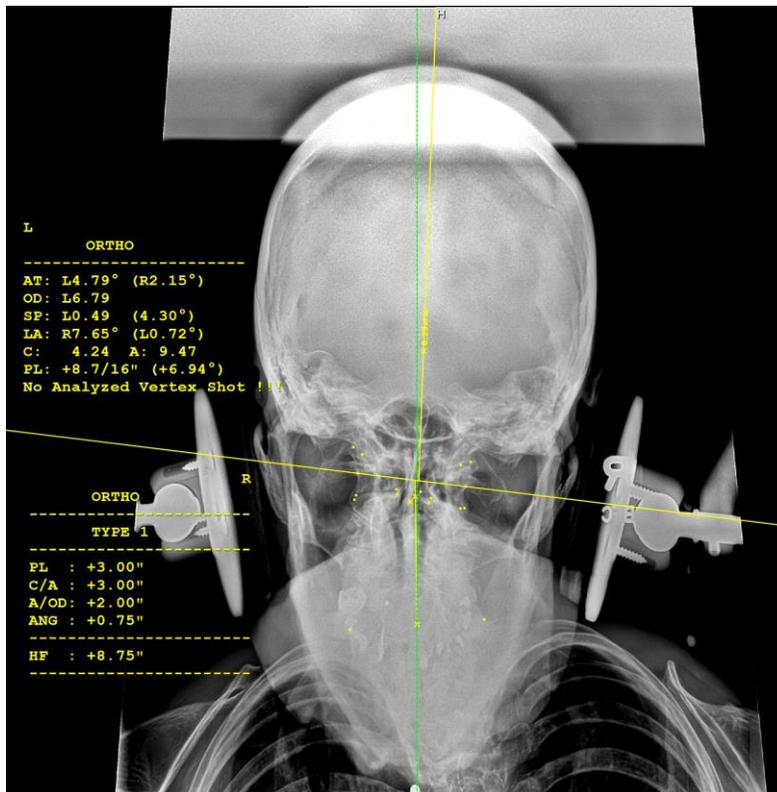


Figure 2. Post Nasium Film



Figure 3. Pre Vertex Film

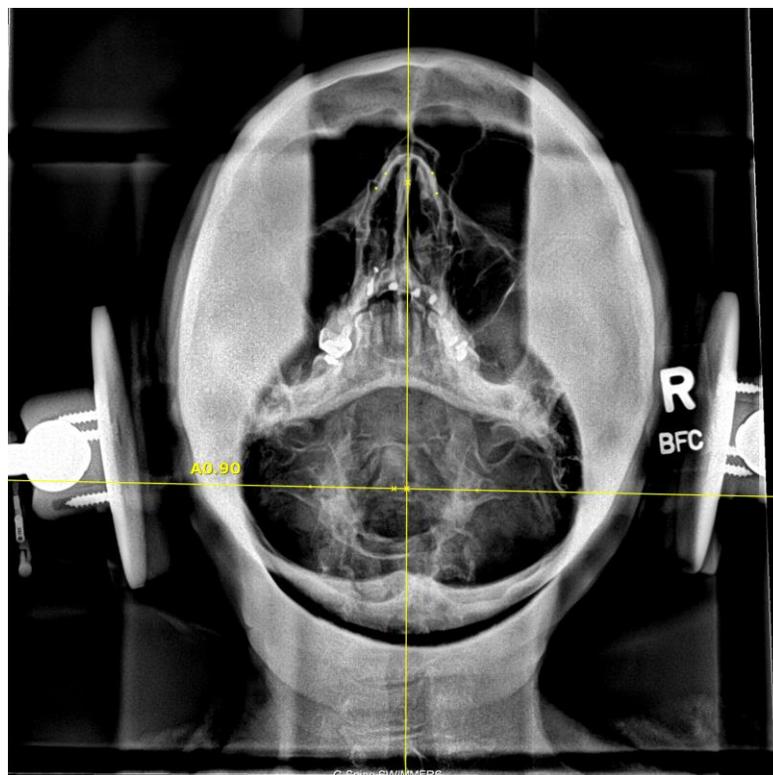


Figure 4. Post Vertex View