
CASE STUDY

Reduction in Symptoms Related to Parkinson's Disease Concomitant with Subluxation Reduction Following Upper Cervical Chiropractic Care

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ABSTRACT

Objective: To provide a detailed report on one case of a 67 year-old female with Parkinson's disease under upper cervical chiropractic care.

Clinical Features: A 67 year-old female patient presenting to a private practice with an atlas subluxation complex as well as signs and symptoms of Parkinson's disease that include weakness, tremors, scoliosis and rigidity.

Intervention and Outcomes: Over a period of 6 months, the patient was seen 19 times and was adjusted 12 times following the NUCCA protocol. Improvements in radiographic measurements, paraspinous thermography, and sEMG were recorded. Patient self-reported improvements in weakness, tremors, rigidity, and overall mobility.

Conclusion: The upper cervical subluxation may be a contributing factor to the symptomatic expression of Parkinson's disease. Reduction of the subluxation with specific vectored correction may be a plausible, safe, and effective approach for managing PD. More research is warranted investigating the effects of upper cervical care and Parkinson's Disease (PD).

Key Words: *Parkinson's Disease, upper cervical, subluxation, orthogonal, NUCCA, atlas*

Introduction

Parkinson's disease (PD) is a progressive neurodegenerative disease characterized by resting tremor, bradykinesia, rigidity, and postural instability. An estimated one million Americans live with Parkinson's with approximately sixty thousand new cases diagnosed each year.¹ Currently there is no cure for Parkinson's disease.

PD is a result of destruction to the substantia nigra which is responsible for signaling the basal ganglia to secrete dopamine and filter sensory signals to the motor cortex. The inability to inhibit neural impulses to the cortex results in overactivation presenting as the essential tremor and muscular rigidity.¹

Conventional medical treatments include Levodopa and Carbidopa in order to increase dopamine action on the central nervous system. Though these drugs have displayed effectiveness in managing Parkinson's symptoms, the effect of the drug decreases over time requiring higher dosages. It has been shown recently that Levodopa is associated with severe involuntary dyskinesias.² Deep brain stimulation has shown promise in improving motor symptoms and quality of life, but come with a high risk of serious adverse effects.³

Research in the chiropractic management of patients with Parkinson's disease is limited. Elster documented improvements in Parkinson's patients undergoing upper cervical chiropractic care in two studies.^{4,5} The current paper will describe the reduction of vertebral subluxation findings

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and its relationship to a patient's self-reported symptomatology.

Case Report

History

The following describes a 67 year-old female presenting to a private chiropractic practice with complaints of weakness, tremors, scoliosis and rigidity due to Parkinson's disease. She reports the symptoms began 5 years prior to starting care and was diagnosed with Parkinson's disease shortly after the symptoms began. She also states that she has a history of migraine headaches, nervousness, right shoulder pain, vertigo, constipation, and osteoporosis. She notes that since the diagnosis that she falls almost every day due to issues with vertigo and balance. The severity of her symptoms has contributed to her missing work and reducing her ability to perform activities of daily living.

Examination

A full chiropractic physical examination was performed. Recommendation for care is made based on findings that indicate aberrant neurological function due to the atlas subluxation complex. Exam findings include supine leg length inequality,⁶ postural distortion,⁷ static/motion palpation findings,⁸ aberrant paraspinal thermography,⁹ and aberrant sEMG readings.¹⁰

Supine leg length examination revealed a contracted left leg at 3/8". Her posture showed left head tilt, right low shoulder, and a left low hip measured at 4.25 degrees using a pelvic/shoulder caliper. Palpation showed tenderness and pain in the posterior cervical musculature at the levels of C1 and C2. Paraspinal thermography and sEMG data are shown in Figure 1.

Intervention

The atlas subluxation complex was suspected and radiographs were taken to measure the magnitude and direction of the atlas misalignment. A lateral, nasium, and vertex film were taken and analyzed following protocol of the National Upper Cervical Chiropractic Association (NUCCA).¹¹ The nasium film is used to derive the direction and magnitude of atlas laterality, head tilt, deviation from center of the lower cervical spine, and height vector needed for correction. The vertex film shows the direction and magnitude of atlas rotation. The measurements for each factor are displayed in Table 1. An atlas laterality measurement of 1.4 degrees to the right, 1 degree of right head tilt, left lower angle of 4 degrees, and posterior rotation of 1.75 degrees was measured. Analyses of these films by those trained in Grostic/Orthospinology methods have been demonstrated to have good to excellent reliability in the peer-reviewed literature.¹²⁻¹⁴

NUCCA adjustments are delivered in the side lying position on a static headpiece designed with various forms of mastoid support. The height and rotation vectors are measured in inches and a resultant vector is revealed to determine the stance and line of drive in which the adjustment is delivered. The correction is performed with a low force hand adjustment with an excursion ranging from 1/16 to 1/8 of an inch in

depth.¹¹ Following the adjustment a postural reassessment, leg length evaluation, and static palpation of the cervical spine are performed again to confirm a reduction in the atlas subluxation.

A post adjustment nasium radiograph was taken following the first adjustment. Measurements of the post adjustment nasium film are shown in Table 1. Atlas laterality was reduced to .9 degrees to the right, 0 degrees of head tilt, and left lower angle measurement of 2.2 degrees. This listing was kept for future visits. Studies by Rothchester and Palmer have shown that reduction in the magnitude of the atlas misalignment is correlated with improvements in patient symptomatology in neck pain¹⁵ and headaches.¹⁶

Outcome

The care took place over 6 months and 19 visits were made. The patient was adjusted at her default listing based on the presence of leg length inequality, paraspinal thermometry using break analysis, and postural distortion.

Following one month of care, a progressive reassessment was performed. After one month, the patient reported a 60% improvement in weakness, a 50% improvement in tremors, and a 0 % improvement in rigidity. Paraspinal thermography showed greater symmetry and a reduction in break reading at C6. Paraspinal thermography and sEMG data are displayed in Figure 2.

During the third month of care, another progressive reassessment was performed. The patient reported a 40% improvement in weakness, a 60% improvement in tremors, and a 30% improvement in rigidity.

Over a 6 month period, the patient reported a 70% improvement in mobility and a significant decrease in the number of falls in addition to reassessment improvements. The patient also states improved ability to perform activities of daily living, including work. The patient was assessed for atlas subluxation on 19 visits and the patient was adjusted 12 times. The post nasium x-ray was taken and showed an atlas laterality measurement of 0 degrees, head tilt 0 degrees, and lower angle measurement of .2 degrees.

Discussion

The current study documents significant self-reported improvements in Parkinson's related symptoms with proportional reduction in the upper cervical subluxation findings. Literature studying the effects of chiropractic care for patients with Parkinson's disease is limited. Elster, in two studies, reported improvements in 40/44 (91%) of Parkinson's patients under going upper cervical care.^{4,5} She proposes that the upper cervical subluxation causes hyperafferent activation of the vasomotor centers of the brainstem and/or the superior cervical ganglion. The facilitation of the sympathetic nervous system causes a decrease in cerebral blood flow which can cause a state of reversible ischemic penumbra¹⁸ in many of the neurons of the basal ganglia rather than irreversible ischemic necrosis. Restoration of cerebral blood flow through deep brain stimulation has been associated with improvement in

symptomatology in patients with PD.¹⁹ Increases in cerebral blood flow have also been documented following cervical spine adjustments in a 2007 study by Scott et al.²⁰

Brainstem Pathophysiology and PD

The anatomical structures located in the upper cervical spine create the opportunity for the atlas subluxation to create neurological dysfunction not found in other parts of the spine. Grostic noted that the strength of the dentate ligaments in the region of the upper cervical spine can create a tractioning of the brain stem and spinal cord in the presence of small misalignments.²¹ The traction stress on the cord allows for mechanical irritation of the nerve tracts as well as compression of the venous structures related to the cord causing microvascular ischemia. Relative ischemia to the brainstem can also be caused by atlas misalignment causing hypertension as suggested by Barkis et al.²²

Jubault et al found in vivo evidence that brain stem atrophy may be the first identifiable stage of neurodegeneration in patients with PD.²³ The authors also note that the neural degeneration at the brainstem level may be responsible for the non-motor symptoms experienced by patients with PD (autonomic dysfunction and sleep disturbances). Dysfunction at the brain stem level with cholinergic neurotransmitters is also implicated in symptoms characteristic of symptoms advanced PD.²⁴ It is hypothesized that the upper cervical subluxation can aggravate and mimic Parkinson's symptoms by progressive degeneration of the neural structures of the brain stem though extended periods of relative ischemia to the brain stem.

This case report shows that measurable reduction in atlas laterality measurement is correlated with improved neurological findings including reduced postural distortion, increased symmetry paraspinous thermography readings, reduction in sEMG activity, and improvement in a patient's neurological symptomatology.

Conclusion

The results of this case study suggest that correction of the atlas subluxation complex through orthogonally-based chiropractic adjustments may improve outcomes in patients with Parkinson's disease. The authors suggest that the atlas subluxation may compress the neural and vascular structures of the upper cervical spine. This compression may cause a decrease in cerebral and medullary blood flow creating a relative ischemia to the neural structures responsible for Parkinsonian symptoms. Further studies with a larger sample size and control groups are advised.

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Table 1 – Nasium Film Measurements by Date

<i>Date</i>	<i>Laterality</i>	<i>Head Tilt</i>	<i>Lower Angle</i>
<i>Initial</i>	Right 1.4 °	Right 1 °	Left 4 °
<i>One Week Later</i>	Right .9 °	0 °	Left 2.2 °
<i>4 Months Later</i>	0 °	0 °	Left .2 °

Figure 1 -- Initial Thermography and SEMG

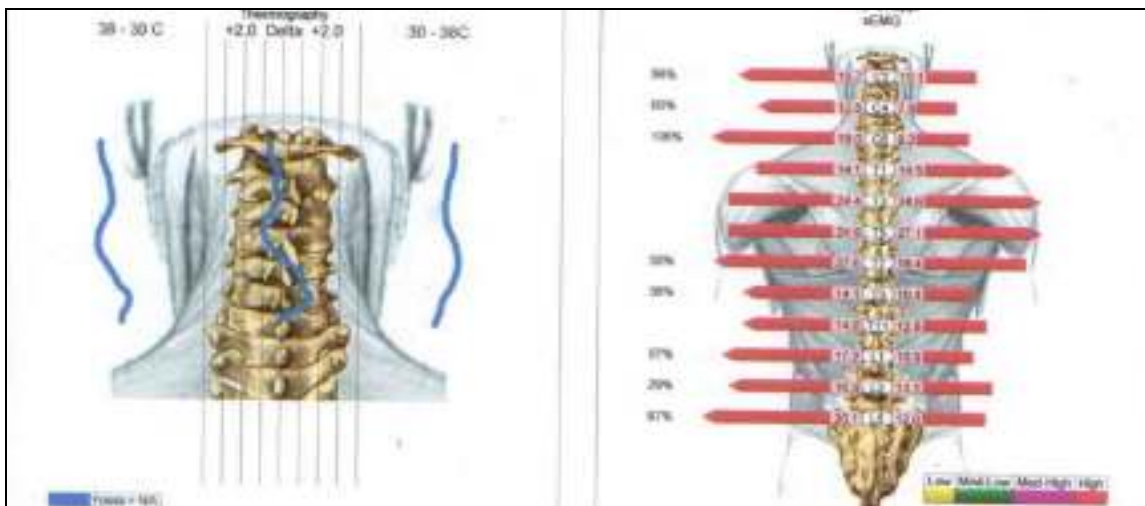


Figure 2 -- One month after starting chiropractic care

