Parkinson's Disease: Are Some Cases Misdiagnosed Cranio-Mandibular Dysfunction?

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Abstract: Multiple case histories have shown that neuromuscular orthopedic repositioning of the mandible can resolve symptoms normally attributable to Parkinson's disease in some instances. The purpose of this article is to 1) present case histories that mimic Parkinson's 2) describe common neurological disturbances 3) and describe differential diagnostic tests to identify cranio-mandibular dysfunction. Conclusion: a review of medical literature and clinical experience indicates that cranio-mandibular dysfunction can induce symptoms normally attributable to Parkinson's disease. The frequency of misdiagnosis in Parkinson's is not known and needs further investigation.

Parkinson's is a diagnosis of exclusion.[1] Emerging clinical evidence has shown that some patients with symptoms normally attributed to Parkinson's are in fact neuropathic manifestations induced by cranio-mandibular dysfunction.

The purpose of this article is to 1) present case histories that mimic Parkinson's 2) describe common neurological disturbances 3) and describe differential diagnostic tests to identify cranio-mandibular dysfunction.

Case histories from multiple dentists has shown that neuromuscular orthopedic repositioning of the cranio-mandibular relationship[2] is effective in some cases at stopping many symptoms typically attributed to Parkinson's disease Those symptoms include:

- **tremors**
- **limb weakness**
- **rigidity**
- **nocturia**
- **speech disturbance**
- **swallow disturbance**
- **fatigue**
- **depression**
- **anxiety**
- **memory loss**
- **insomnia**
- **dizziness**
- **fainting**
- **impaired proprioception**
- **loss of smell**
- **dystonia**
- **imbalance**
- **gait dysfunction**
- **scoliosis**

Case History:

GD: Age 68. Twenty year working diagnosis of Parkinson's disease with progressive development of severe dystonia. Additional medical complaints of sleep apnea, frozen right shoulder, loss of motor control of right arm except wrist twisting, severe cervicalgia, weakness, and weight loss. Neuromuscular computerized jaw motion analysis showed him to have a severe excess freeway space[3] of 7mm. Mandibular orthosis was delivered to support relaxed neuromuscular resting position of the mandible with 1mm freeway space. Patient had an immediate near complete cessation of tremors and dystonia. Monthly adjustment of orthosis has maintained tremor free status. Arm and shoulder function gradually returned. Increase in weight started after four months of maintenance on dental orthosis.

Cranio-mandibular Dysfunction and its Sequella

Cranio-mandibular dysfunction is poorly understood by the dental profession, and even less by the medical profession. It is not the purpose of this article to discuss the many misunderstood aspects of this malady. Suffice it to say, it is my opinion that the medical and dental professions have failed miserably in their knowledge and understanding of the breath of pathology induced by cranio-mandibular dysfunction. This I believe has occurred due to dentistry's lack of knowledge and training in cranio-mandibular orthopedic neurophysiology.

Since most health practitioners are unaware of the means by which cranio-mandibular dysfunction can cause many of the symptoms attributed to Parkinson's disease, I would like to detail a few of those pathways:

Rigidity:

Trigeminal proprioceptors (alignment sensors in jaw muscles) are known to modulate the golgi tendon apparatus systemically (i.e. when the bite is off, the brain knows it and can cause muscles systemically to tighten up). This has been extensively investigated in Japan, typically showing that when the bite is compromised (loss of height on posterior teeth) on laboratory animals on one side of their body, the other side contracts and becomes rigid, thus causing scoliosis. In these studies, the animals become weak on the same side as the scoliosis and quit using their limbs on that side.

Weakness:

Muscle weakness is present in early signs of Parkinson's disease. The work of John Beck, MD, orthopedic surgeon and sport specialist, as well as others[4], has demonstrated the profound effect that the bite can have on systemic muscle strength. It is his opinion that when the bite is compromised it overloads the autonomic nervous system, causing the body to shutdown (i.e. weaken).[5]

Depression/Anxiety:

There is extensive literature associating TMJ (temporomandibular joint dysfunction) with depression. This is thought to be caused by multiple pathways including trigeminal nerve modulation of sensory input into the limbic brain, and pain neuropeptide modulation of brain neurotransmitters.[6]

Fatigue:

Fatigue is a symptom that is frequently reported with cranio-mandibular dysfunction.[7] Multiple dentists have reported a very high degree of success in reversing chronic fatigue symptoms with bite therapy.

Dizziness/fainting:

The trigeminal nerve is known to control blood flow to the brain through what is called the trigeminal-vascular complex.[8] Excess trigeminal stimulation has been demonstrated to cause dizziness and fainting.[9]

Gait/impaired proprioception:

With bite disturbance, substance P levels are disturbed, which are known to be as-

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sociated with disturbed proprioception.[10] The trigeminal nerve modulates somatosensory input into the brain; hence tonicity within the nerve could affect motor function.[11]

Loss of smell:

Few medical personnel are aware that we have two noses: the olfactory and the trigeminal chemoreceptors. Research has shown that these two systems are interdependent. Hence, with trigeminal disturbance from bite dysfunction, it is easy to see how smell could be affected.[12]

Imbalance:

The vestibular system receives input from a wide variety of sources. The trigeminal nerve, with its massive sensory component (28% of sensory cortex), is a major contributor to vestibular function. Hence, when trigeminal nerve tonicity is disturbed, it has the potential to cause imbalance.[13]

Insomnia:

The trigeminal nerve tonicity level becomes elevated with cranio-mandibular dysfunction. The trigeminal nerve has a major influence on the reticular formation in the brain stem, which controls the activation level of the brain. The trigeminal proprioceptors in the mescencephalic nucleus are known to modulate the pineal gland, hence effecting sleep/wake cycles. Also, trigeminal disturbance has a significant effect on serotonin levels, which effects sleep.[14]

Tremor:

Multiple case histories have shown an unclear connection between bite and tremors. The suspected mechanism is thought to be trigeminal input into the reticular formation. Brendan Stack, DDS, MS produced a video entitled "Complex TMJ Disorders and Tremors" a couple years ago, video documenting numerous tremor cases that responded to jaw repositioning therapy.

Weak Voice:

The recurrent laryngeal nerve, a branch of the vagus nerve, supplies motor function to the voice box (larynx). The trigeminal nerve is known to modulate vagus nerve function under certain situations; hence bite disturbance would have the ability to modulate voice.

Masked Face:

The trigeminal nerve is known to have the ability to modulate muscles of facial expression.[15] This I have seen demonstrated numerous times clinically when chronic Bell's Palsy symptoms resolve with jaw orthopedic therapy.

Scoliosis:

Scoliosis is known to occur more frequently with Parkinson's disease than with the general public.[16] Scoliosis is also known to be caused by bite disturbance.[17]

Identifying Cranio-mandibular Dysfunction

When the jaw is malaligned, the trigeminal nerve is hyper activated through the necessary accommodations that it has to perform. This affects all aspects of the trigeminal nerve: sensory, motor, and proprioceptive. Hence, any and all aspects of trigeminal neural interaction can be affected, leading to a very broad array of disorders. Many studies to date have shown that TMJ patients have a very high medical utilization rate (i.e. they are sick for a very large number of other reasons).[18] If a patient has significant cranio-mandibular dysfunction, a thorough medical history will typically reveal multiple pathologies attributable to trigeminal disturbance. This knowledge is a major factor in the recognition of cranio-mandibular dysfunction.

A major reason for the consequential medical disorders is due to the fact that jaw malalignment causes "substance P" (SP)[19] levels to become elevated in the body. The trigeminal nerve has an extreme high density of pain fibers, thus causing it to have a major effect on SP levels in the body. SP is not actually a neurotransmitter, but a neuropeptide (a compound that does not get recycled, hence it lingers in the body and with endocrine like properties). There is a classification of medical disorders called "neurogenic inflammatory disorders" that are associated with elevated SP. Clinical experience has shown that these disorders respond at a very high percentage rate to orthopedic jaw alignment therapy. This group includes headaches, fibromyalgia, asthma, seizures, etc. SP levels have been implicated in the development of Parkinson's disease.[20]

Diagnosis of cranio-mandibular dysfunction is quite controversial in the dental profession and quite unreliably performed. Bernard Jankelson placed jaw function on an objective scientific basis with the development of neuromuscular concepts[21] and electronic instrumentation in the 1970's. These concepts were a great advancement, though they have received limited acceptance by the dental profession.

When screening for cranio-mandibular dysfunction, I have found a couple simple tests of inordinate value. They are:

1. compare position of the mandible in speech and biting: speech and centric occlusion should be on the same trajectory[22]
2. have the patient open wide and close on a tongue blade. There should exist a fair arc in open/close without anterior/posterior shifting of the mandible. If the mandible anteriorizes more than 1/8 inch when closing on the tongue blade, it suggests there is a significant cranio-mandibular dysfunction.[23]
3. observe the mandibular position of patient at various times: rest position and speech position. The mandible should be close vertically to bite position.[24] Excess space between jaws at rests can causes slight speech distortion (lisp). This is often either caused by mouth breathing, particularly nocturnally, or tongue thrusting.

Satisfying these conditions infers the following corollaries:

a. speech and centric occlusion should be on the same trajectory
b. there should exist a fair arc in open/close without anterior/posterior shifting of the mandible
c. Overbites are generally dysfunctional.

Treatment for Cranio-mandibular Dysfunction

When diagnostics[25] have confirmed that cranio-mandibular dysfunction is present, treatment is initiated with a diagnostic orthosis to reposition the mandible. This is typically a removable dental appliance that supports the mandible in a relaxed neuromuscular position. This effectuates a calming of the trigeminal system and in time typically resolves many associated pathologies.

In the event that the diagnostic ortho-

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sis is effective, the mandible will need to be stabilized in the therapeutic position by a variety of options.

Conclusion:

Both clinical experience and medical literature support the fact that some patients diagnosed with Parkinson's disease, may in fact have neuropathies induced by cranio-mandibular dysfunction. ■

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Definitions:

Cranio-mandibular malalignment: a condition in which the teeth do not relate the maxillary and mandibular bones in the same relationship as where the muscles suspending the jaw want the jaw to be. This requires the jaw muscles to accommodate to the tooth position, thus causing the jaw muscles and trigeminal nerve to become hypertonic/hyperactive. This is a very common condition in modern man.

Trigeminal nerve: the fifth cranial nerve composed of three divisions which exit the skull above the eye, below the eye, and inside the lower jaw. It is unusual in that it has both motor and sensory capabilities. Due to its extreme high density of pain fibers, 28% of the sensory cortex is devoted to it alone. It is anatomically and functionally a spinal nerve. Sitting atop the spinal chord it has the ability to modulate the ascending spinal signal, thus modulating spinal input into the brain.

Trigeminal System: the trigeminal nerve and all systems directly modulated. The systems directly modulated include spinal muscle tone, limbic brain, pineal gland, glossopharyngeal nerve, C1-C3, vagus nerve, cerebral blood flow, thyroid function, sympathetic tonicity, gait, muscle strength, peripheral blood flow, neuropeptide levels, hearing, smell, taste, pigmentation, etc.

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Definition:dentistry, neuromuscular
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For further information on the dental controversy see: http://www.myotronics.com.au/Article_006.htm
[22] Speech is a muscular phenomenon and biting is a skeletal phenomenon- you like to have the musculoskeletal system coordinated. Typically, when the discrepancy, either vertically or horizontally, becomes greater that 1/8 inch (3mm), significant trigeminal pathology arises.
[23] Even though the TMJ has the ability to translate, the TMJ functions best when function requires it to translate least. Excess range of motion (including translation) hyper excites the trigeminal system.
[24] The temporomandibular joint functions best when occlusion is such that it supports jaw functions within a minimal range of motion (i.e. speech, rest, and open/close arcs are superimposed, as well as height of mandible during speech is within 1.5 mm of occlusion). George W. Bush is a good example of a person with excess space between the teeth when speaking.
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