

TMD Functional Integrative Approach: Dental and Chiropractic Approach to Forward Head Posture.

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Sacro Occipital Technique (SOT) is a method of chiropractic care developed by Major DeJarnette, DC, DO, in the 1930s. He also pioneered dental chiropractic co-treatment as early as the 1960s. SOT is a highly specialized form of chiropractic treatment because of its integrative primary care nature. Patients are being seen by dentists in various states of pathology, and SOT chiropractic methods permit extensive differential diagnosis, allowing for accurate referral and necessary triage.

Why not any chiropractor?

SOT doctors are unique in that their method incorporates the relationship between the pelvis, spine, and TMJ; they have training in treating the TMJ, cranial bone and meningeal imbalance.

Why not a craniosacral practitioner?

With patients presenting with various stages of pathology, it is essential that dentists work with a primary care provider like an SOT chiropractor.

What makes an SOT chiropractor special?

Sacro occipital technique is one of the only chiropractic techniques that differentiates between sacroiliac joint hypermobility, commonly associated with TMJ ligament and disc dysfunction, and sacroiliac joint fixation, commonly related to apnea and airway dysfunction. Some joints need to be stabilized and others mobilized; SOT can differentiate this difference.

SOT incorporates whole-body, three-dimensional functional analysis and treatment, holographic body concept, and three-dimensional distortion patterns. Utilizing concepts similar to ones designed by Melvin Moss, DDS, SOT utilizes the concept of functional matrix theory with relationships to gravity, neurology, and viscerosomatic reflexes. Craniofacial and meningeal systems maintain patterns of stress which can be diagnosed and treated with SOT. Clinically, cranial and meningeal tensions have been found to inhibit normal bone motions needed for cerebrospinal fluid (CSF) circulation, response to gravitational influences, and dissipation of forces occurring with mastication.

Why an SOT chiropractor?

SOT chiropractors are familiar with TMD and whole-body interrelationships. They are primary care physicians with the ability to diagnose, refer, and triage. They have skills and the ability to help maintain balance and motion in the cranium following dental interventions that may limit balance and motion within the cranium. A 2004 study by the World Federation of Chiropractic (WFC) found that 6% of patients seek wellness care from general chiropractic providers. However, a 2008 survey (n=1316) found 40% of patients sought wellness care services from SOT practitioners.¹ The future of our healthcare system will be wellness care, and incorporating chiropractic and dentistry could be an important part of illness prevention.

Sacro Occipital Technique Organization – USA (SOTO-USA)

SOTO-USA is pioneering dental and chiropractic co-treatment. In August 2005, Sacro Occipital Technique Organization (SOTO)-USA joined the American Alliance of TMD Organizations (TMD Alliance). The TMD Alliance is an affiliation of different national and state-level societies that shares interests in the problems of temporomandibular joint disorders (TMD) and craniofacial pain. The TMD Alliance, now in its twelfth year, and represents approximately 15,000 members. SOTO-USA has yearly clinical dental chiropractic symposiums in the autumn.

How might an SOT chiropractor evaluate a TMD patient for dental integrative care?

SOT doctors evaluate the relationship and contribution of a patient's ascending and/or descending dysfunctional influences to posture and TMD. SOT has novel perspectives on descending postural influences originating from occlusion, condylar position, and airway compromise as well as ascending postural influences originating from occlusion, condylar position, and airway compromise.

Forward head posture (FHP) is a ubiquitous condition affecting a large aspect of the population, particularly associated with

the aging process. Recently, various factors have been found that could be contributory to the cause of FHP. One particular cause of FHP has been found to be associated with temporomandibular joint disorder and its related myofascial dynamics with their effect on oral cavity airway space.²

Dentists familiar with TMD treatment are uniquely qualified to be involved in our society's wellness care. Obstructive sleep apnea associated with airway compromise has far-reaching social implications. According to a national sleep foundation, 26% of study subjects had a high risk of obstructive sleep apnea.³ Obstructive sleep apnea is the most common respiratory disorder of sleep. This related sleep restriction leads to a variety of adverse physiologic and long-term health outcomes including all-cause mortality, diabetes, and cardiovascular disease.⁴ Consequences of sleep apnea include increased human errors, loss of productivity, and elevated risk of accidents. Conditions such as acute and chronic insomnia, excessive sleepiness, and sleep apnea warrant public health attention, since residual sleepiness during the day may affect performance of daily activities such as driving a car.⁵

How does forward head posture relate to obstructive sleep apnea or airway compromise? Significant forward inclination of the cervical column was found in the patients with an apnea index greater than 35 episodes/hour. As apnea severity progresses patients assume compensatory head postures in order to maintain an adequate airway patency.⁶ A study evaluating head posture and jaw position had subjects (N=120) divided into three groups based on their skeletal class, I, II, and III. Significant differences among the three groups were observed in the inclination of maxillary and mandibular bases to the spinal column. In general, the head position of Class II subjects tended to be more anterior while Class III more posterior.⁷

Patterns of Postural Influence

FHP has an important place in chiropractic and dentistry management of TMD

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disorders. Our professions need to determine if the dysfunctional postural patterns are descending or ascending. In an important study investigating this ascending and descending contribution of posture and TMD imbalance, Sakaguchi et. al., while evaluating 45 asymptomatic subjects, found that "Body posture was more stable when subjects bit down in centric occlusion. Changes in body posture affected occlusal force distribution. Altering body posture by changing leg length shifted the occlusal force distribution to the same side that had a heel lift."⁸

While we would prefer patients to have either an ascending or descending contribution to postural influence, more commonly, they present with a mixture of both patterns. It is in these "mixed" presentation patients that chiropractics and dentistry can offer improved patient outcomes. The typical patient that may likely need chiropractic dental co-treatment will usually present with low pain threshold, low physiological adaptive range, and a history of musculoskeletal pain or injuries.

From a dental perspective, understanding how an SOT chiropractor may evaluate a typical TMD patient could be useful. Dental practitioners may want to consider the following points in patients: (1) If standing or weightbearing makes the condition worse, then they are usually looking at ascending postural problem coming from the feet, knees, hip, or pelvis. (2) If sitting makes the condition worse, they are likely looking at something that is an ascending pelvic or lower lumbar problem. (3) If the condition is worse with non-weightbearing or when supine, then they are often dealing with something cervical or a descending TMJ or cranial problem.

Typically chiropractors familiar with SOT look to the stomatognathic system for the cause of TMD. **But what is an SOT chiropractor looking for when evaluating a TMD patient for descending influences?** With regard to occlusion, SOT chiropractors are trained to view a patient's dental-wear pattern and in centric and evaluate myofascial tension on occlusion. Condylar position can be important, so we palpate for symmetrical condylar position, determine if there is symmetrical mandibular motion on joint translation, and listen for joint crepitus on opening or closing. Descending airway compromise influences are evaluated by examining the patient's forward head

posture and the suboccipital and suprahyoid muscle tension. In patients with airway dysfunction, it is also important to evaluate if a patient must tilt the head back in order to swallow or take a deep breath.

What is an SOT chiropractor looking for when evaluating a TMD patient for ascending influences?

Foot , Ankle, Knee: The examination process involves determining whether the patient's condition is worse when standing or walking. It can be important to evaluate whether there are wear patterns on shoes indicative of unusual pedal dynamics and its effect on the lower kinematic chain.^{9,10} With some patients, their TMD presentation may relate to having a Morton's toe (first toe shorter than the second).

Hip, Pelvis, Spine: The patient history can give you important information such as whether the condition is worse when sitting, or whether there is a relationship between the TMD and pelvic or spine pain.¹¹ A visual assessment will help determine if a patient has a hyperkyphotic thoracic spine. Hyperkyphotic spines are commonly related to various conditions such as upper cross syndrome or FHP.

Cervical spine – forward head posture: The evaluation process includes noticing if the patient with FHP has greater difficulty breathing or swallowing when he attempts to reposition his head over his shoulders. During the history, we will investigate whether his cervical condition is post-traumatic or ergonomically related. It will also be essential to determine if the cervical spine's position was modified to compensate for lower extremity, pelvis, or spine imbalance.

What might be various causes of forward head posture?

Body postures have various etiologies: congenital, behavioral, psychological, and other. It helps to review various aspects of some common body postures to determine if we can gain a greater grasp of the causation. Understanding the various causes of posture presentations will help us better develop a plan of treatment. One common theme within various types of health care is that FHP is associated with dysfunction and degeneration of posture. For instance, this is seen within the following healthcare philosophies of chiropractic, dentistry, podiatry, psychology, Rolphing, Alexander

Technique, and Anasara yoga.

The field of chiropractic often associates FHP as being caused by the stress of ergonomics, gravity, or by general spinal degeneration. Patterns of ascending contribution to FHP involve factors associated with Lovett Brother relationships,¹² closed kinematic chain tensegrity, Selye's theories on biological stress,¹³ and forces of gravity on the bipedal human.

The Lovett Brother relationship suggests that when the cervical spine is not in balance, a descending righting modification is sent to the lower spine and pelvis. From another perspective, when the lumbosacral spine is not in balance, an ascending righting modification is relayed to the upper spine, jaw, and cranium. The anterior fascial line restriction affects attachment of the sternocleidomastoid muscle, and the posterior fascial line restriction affects the upper trapezius and suboccipital muscle attachments to the occiput. When there are fascial restrictions along the anterior fascial lines or posterior fascial lines, it has been determined that either will cause a forward head posture due to increased suboccipital muscle tension.¹⁴ Hans Selye determined that all forms of biological stress such as infections, injuries, allergies, immunological reactions, severe emotions, malnutrition, stress exertion, and severe exposure to sun, heat or cold, lead to adrenocortical failure characterized by a person with extreme FHP.¹³

The field of dentistry suggests that FHP is associated with stress related to a mandibular/C2 relationship or various types of airway dysfunctions. Casey Guzay, a student of physics, medicine, and engineering, put his research findings into a series of drawings titled *The Quadrant Theorem*.¹⁵ He determined that the apex of the combined muscular control of the mandible in all functioning movements is located at the dens between the atlas and axis cervical vertebrae. Therefore, according to Guzay's theory, increased dental stress affecting the TMJ would tend to cause a summation of muscular contraction at the C1/C2 region. This increased tension would lead to suboccipital muscle tension and FHP.

Various types of dental dysfunctions can lead to impaired airway space; for example, a Class II presentation. This can be caused by a retruded mandible driven by

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dental occlusion, chronic masticatory muscle (masseter and temporalis) tension, and TM disc dysfunction. In a Class II presentation, as the mandible retrudes, the airway space is compromised. With a compromised airway space, the head shifts forward to open up the airway space, creating FHP. One can therefore see how FHP is associated with airway space compromise and how it is commonly associated with obstructive sleep apnea (OSA).

Conclusion

Based on the relationship between the chiropractic and dental view of FHP, reducing ascending postural dysfunction before dental occlusion or TMJ/condylar modifications are performed may optimize dental procedures. Following any significant dental procedure, modifying occlusion or TM condyle position, chiropractic care can facilitate the patient's ability to accommodate to this optimal dental position.

While an SOT chiropractor can assist with functional and relatively short-term interventions, the dentist has a unique position in healthcare in that he or she can hold these corrections in a long-term basis by modifying occlusion and condylar position. As patients treated for TMD are being placed in a relatively permanent dental position, the chiropractor can help the patient's body hold this pattern of balance.

Dental and chiropractic co-management of patients with airway dysfunction characterized by FHP may be an important aspect of treatment for both TMD and OSA. Developing models of co-treatment, as well as assessment tools to determine appropriate referrals, can be a future goal as healthcare in the United States and internationally begins to focus more on prevention or wellness and less on treatment of illness. ■

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