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Relationship Between Body Posture and Mandibular Posture

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Introduction

The position of the human body is determined by the head, which aligns with the primary orientation planes:

- Bipupillary
- Optical
- Occlusal

These planes, together with the head, must be parallel to each other to ensure postural stability of the skull.

When the head's positioning changes, occlusion is also affected. Muscular balance and joint stability are altered as well. Occlusal contacts may then occur with interferences or premature contacts, causing contraction or stretching of the muscles involved in the Stomatognathic System.

The Stomatognathic System is a functional unit in which tissues of different origins and structures work harmoniously to perform various functional tasks.

Part of this complex system is the TMJ (Temporomandibular Joint), which represents the articulated connection of the mandible with the skull base. The skull, in turn, has muscular and ligamentous connections with the cervical region, forming a functional system called the Cranio-Cervico-Mandibular System, which affects the entire vertebral column (Craniosacral System).

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Objective

The objective of this study is to analyze changes in the patient's overall posture originating from poor mandibular posture, or vice versa.

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Justification

Body balance is related to the positioning of the skull on the cervical region, which determines the individual's posture. Skull positioning is related to the TMJ. When the mandible is out of its physiological position, the skull's position can be altered, consequently affecting the relationship of the skull with the cervical spine and the entire vertebral column.

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Literature Review

Cranio-cervico-facial dysfunctions are very common and, in some individuals, progress toward temporary or permanent dysfunction of the cranio-mandibular system.

In addition to possible joint malfunction, the muscular chains involved in mandibular movement may work inadequately to promote less traumatic occlusion. Antagonistic muscle groups contract with different tones, causing imbalance in the muscular chains throughout the body. According to Souchard (1990), human body segments are anatomically and functionally related through muscular chains, whose elastic behaviors characterize posture.

When mandibular movement occurs with normal muscular tone and proper interaction, mouth opening and closing are performed without deviation (both lateral and anterior-posterior).

According to Bricot (1999), the stomatognathic system is directly connected to muscular chains through the mandibular opening muscles and the hyoid bone, which plays a pivotal role, but also through muscles that support occlusion and swallowing: sternocleidomastoid, trapezius, pectorals, etc. Any imbalance in the stomatognathic system can affect the entire postural tonic system.

Bricot also notes that the stomatognathic system links anterior and posterior muscular chains. The tongue and mandible are directly connected to the anterior chain, while the maxilla, through the skull, relates to the posterior chains. The hyoid bone plays a

fundamental role in this communication, as does proprioception between the dental arches and the temporomandibular joint.

Bricot (1999) asserts that any imbalance in the stomatognathic system can decompensate the postural tonic system, and vice versa: mandibular position affects cervico-scapular posture, and cervico-scapular posture affects mandibular position.

Imbalances in the stomatognathic system decompensate the postural tonic system, and vice versa, through trigeminal nerve nuclei along the brainstem and numerous afferents involved in tonic-postural balance.

Darling & Kraus (1994) reported that changes in head posture affect mandibular rest position, and physiotherapeutic intervention can improve head posture.

Balters (1955) stated that all dentofacial anomalies are accompanied by postural anomalies.

Rocabado developed an analysis that aids in determining head position relative to the cervical spine and hyoid bone.

According to Ariadne Tescaro Garcia (2001), mandibular position is not static; condylar positioning in the glenoid cavity is influenced by occlusion, muscular chains, and the neuromuscular system.

Peres, Agné & Peres, Roseli Luppino show that postural muscles work synergistically or antagonistically. Muscular chains may originate from the feet (ascending chains) or from upper segments (descending chains). These two situations often coexist, indicating that the global postural system can be altered by stomatognathic issues, and vice versa.

According to João Alberto Martinez, there is a positive correlation between mandibular posture and body posture; thus, patient diagnosis should not be restricted to the oral cavity (occlusion), but also include evaluation of the vertebral column and its involvement with the patient's postural tonic system.

The cervical spine has two anatomically distinct parts:

- Upper cervical spine (suboccipital region), consisting of the occipital, atlas, and axis, forming the atlanto-occipital and atlanto-axial joints. The atlanto-occipital joint allows mainly flexion-extension; the atlanto-axial, rotation. Joint stability is maintained by membranes and ligaments.
- Lower cervical spine, from the lower plateau of the axis to the upper plateau of the first thoracic vertebra. Movements include flexion-extension and lateral rotation.

According to Peres, Agné & Peres, Roseli Luppino, upper cervical vertebrae are related to occlusion; any occlusal issue alters their positioning, and vice versa.

Valentino et al. (1991) correlated posture, mandibular position, and dental occlusion through electromyographic recordings of masseter, temporal, thoracic and lumbar paravertebral muscles during plantar arch modifications using insoles. They concluded that plantar arch modifications stimulate neuronal mechanoreceptors, triggering contraction of antigravity muscles, readjusting head position and center of gravity, thereby modifying the occlusal plane.

Complementarily, Valentino & Melito (1991) discussed functional relationships between masseter, anterior and posterior temporal, digastric muscles, and leg muscles (fibularis longus, tibialis anterior, gastrocnemius). Experimentally, changing the ground support modifies the chewing cycle, as does its correction.

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