The PRI Benefits of Using a Mandibular Versus a Maxillary Appliance

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Lateral Posterior Teeth Sensory Awareness

PRI practitioners want to use occlusal appliances or splints that allow the teeth to glide unimpeded over the biting or contact surface. These are permissive, acrylic splints that also allow the user to be guided both in side to side and forward and backward movement of the mandible without increasing the need for the neck to stabilize the head or the cranial osseous matrix, that includes the maxillary bones. As neck muscle tension increases, the muscles that elevate the mandible become active as co-stabilizers of the anterior neck, and bruxism and clenching also increases. A large amount of people who clench or brux, do so because of poor recognition of their lateral posterior teeth on one side of their mouth. 71% of all clenchers exhibit bilateral clenching[1] more than likely because of narrow maxillary (palate) or mandibular arches, malocclusion, forward head posture or lost occlusal support on one side of their mouth[2]. Their ability to disocclude one side of their teeth as they occlude on the other side with their teeth is difficult. Therefore, this inability to alternate occlusal lateral function places the individual in a neurologic state called isometric occlusion. This is a condition where one has the tendency to "hold" himself or herself steady, by contracting masseter muscle without movement of the mandible. This isometric contraction is also compounded when freedom of the mandible to move is lost because of patterned neck instability, malocclusion, poor temporal bone position, or palatal narrowness.

Periodontal Ligament Proprioception

Body position or posture is attained through recognizing a sense of equilibrium which is provided by afferentation received from vestibule sensation, visual sensation, and somatic sensation. The periodontal ligament attaches the tooth to the osseous or alveolar cavities of the mandible and maxilla. Within this collagenous structure are sensors or proprioceptive fibers that perceive force placed on or through the teeth. Afferent sensory nerve feedback from pressure placed on teeth from tooth contact directly influences protective muscle activity of the masticatory muscle[3]. When occlusal awareness or support is lost from lateral posterior group of teeth (supporting zone)[2], information that is received from the masticatory muscle mechanoreceptors, the temporomandibular joint proprioceptors and the mechanoreceptors in the periodontal membrane, changes. These changes from sensory re-afferentation affect the neck muscles through the trigeminal nerve[4]. Differences in the lateral information that accompanies unilateral loss of the lateral posterior support from tooth contact causes changes in lateral activity of the neck muscles and lateral changes of both head and standing position. Therefore, changes in lateral sensory afferentation from tooth contact causes or contributes to lateral shift of weight distribution[2]. An occlusal splint that dissipates the forces placed on individual teeth from the first bicuspid back allows for disocclusion on one side of the mouth when the other side is occluding. This is important for masticatory, ambulatory and respiratory function where alternating lateralized function is so important.

Lateral Pterygoid Influence on Sphenoid Function

The lateral pterygoid muscle attaches to the condyle of the mandible and to the sphenoid bone which needs to shift from side to side, as does the mandible. Mandibular movement control depends on the degree of simultaneous counter rotation of the sphenoid. When the mandible rotationally translates to the left, through the left condyle, the left side of the sphenoid and the left maxilla move into internal rotation while the right side of the sphenoid and the right maxilla move into external rotation[5]. This movement that the lateral pterygoids provide to the sphenoid enables the cranium to function without patterned asymmetrical expansion occurring[6]. Unilateral or bilateral palatal compression reflects limited alternation movement of the sphenoid. Preserving lateral translator rotation at the mandible allows the greater wings of the sphenoid to lift and lower the temporal bones, and therefore decompress and compress the temporal mandibular joint normalizing arthroidal and physiologic function both at the temporal mandibular and sphenoid temporal joints. A properly balanced mandibular splint allows the elevator muscle of the mandible to relax secondary to activation of arthoidal glide of joint surfaces of the temporal bones through lateral oblique, trusive, and smooth glide of teeth on teeth. This movement is primarily offered through the lateral pterygoid concentric and eccentric activity that indirectly decompresses the temporomandibular joints, the palate, and the atlanto-occipital joints via sphenoid temporal articular mechanics. Alternating lateral pterygoid function may also contribute to the pterygoid processes ability to separate from the maxilla to allow posterior maxillary expansion, especially when palatal and cranial expansion is desired[7].

Mandibular Appliance Benefits

A patient that bruxes or clenches isometrically and has headaches, but no temporomandibular joint or neck issues, may need adequate protection for the teeth through the use of a full coverage acrylic maxillary appliance, that is usually worn at night. However, for those that need cranial sensory input from periodontal ligament of the maxilla, to assist in palatine, temporal, sphenoid and occipital movement, an acrylic mandibular appliance is recommended by the Postural Restoration Institute®. An appliance fabricated for the mandible, to allow for smooth lateral glide and posterior group function in addition to sensory orientation provided by the lateral posterior maxillary teeth, will provide palatal freedom for cranial expansion and temporal fossae rotation. This appliance will also compliment sensory awareness of the rest position of the tongue and lateral function of all the glossus muscle, because the unrestricted palate will not be covered with acrylic. Anterior incisor contact should be light, so that permissive perceptual occlusal sense from the anterior centric stops (from the appliance) during protrusion can enhance backward head movement, thus reducing malfunction of the hyoid and mandible often associated with forward head posture.

A mandibular appliance allows the patient to acquire a natural rest or neurologic neutral position for the head and neck, which can be altered in the same individual at different points in time and may vary from individual to individual.[8] This type of appliance also promotes a raised tongue position, nasal breathing, proper lip closure, balanced lateral pressure of the cheek muscles of the maxillary arch and balanced hyoid position.[9]

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