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## **CLINICAL ASSESSMENT OF THE FREEWAY SPACE**

A clinical procedure for evaluating the dental freeway space is needed. This need presents an opportunity for interdisciplinary collaboration and cooperation.

**Background:** Kinematic recordings have been made of freeway space dimensions in a variety of dental patient categories (Rugh & Drago, 1981; Konchak, Thomas, Lanigan, & Devon, 1987; Martin, Alarcon, & Palma, 2000). These and other studies have involved kinesiographic recordings of the rest position of the mandible and during dynamic excursions and other mandibular movements. In the research of Martin, Alarcon, and Palma (2000), for example, using a kinesiograph (K6, Myo-Tronics, Seattle, WA), 3-dimensional (vertical, anteroposterior, and lateral) jaw movements were made without interfering with the motion of the jaw. Their system used a sensor array strapped to the patient's head that tracks the spatial location of a magnet fixed on the mandibular incisors. Mandibular position was recorded at rest and during jaw movements in maximum excursions, during swallowing and chewing.

Martin, Alarcon, and Palma (2000) found that the freeway space ranged from 2.63 mm to 2.7 mm. These dimensions fall within the normal range of variability defined in previous studies by Nielsen, Marcel, Chun, and Miller (1990); and Ferrario, Sforza, Miani, D'addona, and Tartaglia (1992).

While our primary clinical interest in the freeway space is at the posterior dentition, it is impractical to obtain direct measures of the posterior freeway space in the typical clinical situation. Borrowing principles gleaned from kinesiographic studies of mandibular position and functions obtained anteriorly and with external reference points, a simple clinical assessment of freeway dimensions can be proposed.

**Clinical Assessment:** A procedure for assessing the dental freeway space can be accomplished under three conditions: (1) **The patient's mandibular rest position.** Ask the patient to moisten his/her lips, swallow, breathe deeply, and relax his/her jaws with eyes closed (Martin, Alarcon, & Palma, 2000). For most patients with a myofunctional disorder, the lips will be parted for this task. Use a millimeter ruler to obtain a measure of the vertical distance between the base of the nose and the bottom of the chin. This dimension is referred to as the *lower face height* in facial esthetic evaluations. (2) **The patient's mandibular rest position with lips gently approximated.** Follow the patient instructions given for condition (1), with the added instruction to gently approximate the lips. (3) **The patient's habitual occlusion position.** Ask the patient to bite on his/her back teeth, and record the lower face height distance from base of nose to bottom of chin. For this measure, patients with a myofunctional disorder may exhibit a lips-apart posture. Comparison of the millimeter differences in lower face height between conditions (1) and (3), and (2) and (3) will yield two separate measures of freeway space. For patients with a myofunctional problem, these measurement comparisons may differ at initial examination. At the completion of treatment, a decrease or equalization of initial differing freeway space dimensions can be considered a therapy success.

Comparisons of measures between conditions (1) and (2), with occlusion (3) would be expected to range from 2 to 5 millimeters. The freeway space values obtained in initial examination provide a baseline for evaluating progress during treatment and at completion, as well as in follow-up evaluations of stability. Such data should be included in clinical reports to referral sources.

Prior to examination, it is suggested that young patients be asked to blow their nose. This suggestion is based on aerodynamic studies of the airway showing that many children have poor nasal hygiene. Nasal debris can increase nasal resistance during quiet respiration by up to 50% (Riski, 1983; Mason & Riski, 1983, Hanson & Mason, 2003). An inability to properly manage nasal debris encourages a mouth open posture and mouth breathing. Teaching a patient to monitor and clear nasal debris is an appropriate component of a myofunctional treatment plan.

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