IN SUPPORT OF THE EFFICACY OF EGN (Jaw Tracking)

Clinical and research experts agree, unanimously, that restrictions, limitations, and deviations in jaw movement are classic signs of TM joint dysfunction.

More than 40 research studies have employed a jaw tracker to validate and document these restrictions, and to record normal mandibular function following treatment.

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ANNOTATED BIBLIOGRAPHY IN SUPPORT OF TRACKING JAW MOVEMENT


Evaluation of mandibular patterns is recommended as diagnostic criteria for all classifications of temporomandibular joint disorders. These disorders are characterized by restrictions, deviations, and limitations of these patterns, including range of motion, frontal deviations, limited lateral extrusion, etc.


Restrictions, deviations, limitations in jaw movement are important diagnostic criteria for TMD. Any restriction of jaw movement should be noted in either joint as related to opening, protrusion, and lateral excursion, and deviations of the midline incisal path should be graphed.


Pattern of anterior to posterior opening in patients with specific types of internal derangements is distinctly different than asymptomatic controls. In addition, maximal opening and closing velocities during function are significantly reduced in patients with TMJ symptoms. The sagittal and velocity parameters return to normal following surgery.

Patients with arthrographic diagnosis of internal derangement without reduction demonstrate jaw tracking traces of impaired vertical opening deviation towards the effected side and characteristic irregularities in the velocity tracing. Patients with reduction show only deviation to the effected side. Evaluation of their pattern appeared to be a reliable means to diagnose internal derangement of the TMJ.


In physical examination for TM disorders, measurement and recording of mandibular motion should be completed for opening, lateral and protrusive movements. The quality and symmetry of jaw movement should be noted and diagrammed.


The mandibular movements during speech were evaluated in a patient group, with diagnosed malocclusion, and a control group. Significant differences were found in the envelope of motion and path of motor movement, displayed by jaw tracking, between the patient group and controls.


A magnetic jaw tracker was used to track mandibular movements during resting, posture, swallowing, speech, chewing, and maximal openings. The method proved to be efficient in assessing the functional response to individual occlusal characteristics as well as the effectiveness of treatment, such as correction of malocclusion and reconstructions, involving increase in vertical dimension and re-establishing posterior support.


To study the statistical difference between functional and dysfunctional chewing, a group of subjects with good masticatory function was compared with subjects
with dysfunction of the stomatognathic system. Statistically significant differences were found using a magnetic jaw tracker between the movements of these two groups.


Mandibular movements and electromyographic activity of the elevator muscles were recorded during three chewing sequences in 86 dysfunctional individuals. It was found that in dysfunctional patients, 1) the normal symmetrical and balanced distribution in chewing cycles is lost and the movements are more restricted; and 2) EMG data showed marked alterations with a tendency to reduce or suppress the isometric phase of contraction during closing in the temporomandibular joint patients.


Using a jaw tracker, mandibular movements were evaluated for border and function movements in 24 normals and 26 patients with muscle pain associated with a craniomandibular disorder. The patient group demonstrated asymmetry in the length of laterotrusive movements, unequal laterotrusive excursions, and asymmetrical nonparallel movement patterns for mandibular protrusion and retrusion.


The range of mandibular movements has been correlated with arthrographic findings of the temporomandibular joint in 205 patients. Abnormalities of meniscus position in function have been found to influence mandibular movements in characteristic patterns. However, these altered movements alone are insufficient for a definitive clinical diagnosis of the specific type of internal derangement of the temporomandibular joint.

Because of its precise accuracy, the jaw tracker allows objective measurement of movements which could only be estimated before. **This instrumentation is extremely valuable for initial patient evaluations, as well as for monitoring treatment results.**


**Jaw tracking** was used to determine how surgical treatment effects the function of hemifacial microsomia patients. By measuring range of motion, lateral excursion, extrusion, and mastication, it was determined that **surgical treatment had improved mandibular range of motion in these subjects.**