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"ANALYSIS OF CHANGES IN BILATERAL MASSETER AND ANTERIOR TEMPORALIS MUSCLE EFFICIENCY IN COMPLETE DENTURE WEARERS. -AN EMG STUDY"

By

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ABSTRACT

Introduction: The loss of natural teeth leads to bone resorption and muscular hypotonicity, which may affect the structures involved in mastication. Atrophy of supporting tissues, poor adaptation, reduced masticatory efficiency, and psychosocial embarrassment are major complaints of edentulous patient wearing old/faulty denture. The need for this study is to examine the effect of old/faulty dentures and a new denture on the bilateral Masseter and anterior Temporalis muscle efficiency, and to evaluate the psychological comfort of a patient. Various techniques are available for examining the stomatognathic system, recording of electromyographic (EMG) activity is a convenient and useful method because it directly measures muscle activity.

Objectives: To assess the changes of bilateral Masseter and anterior Temporalis muscle activity in-patient wearing old/faulty dentures in comparison to the evaluations performed for 5 month following fabrication and insertion of new dentures.

Materials and methods: 15 edentulous patients wearing complete denture prosthesis selected as a subject for the investigation. Individuals presenting with history of neuromuscular and temporomandibular disorders (TMD) are excluded from the study according to exclusionary criteria. Surface electrodes from electromyographic unit

(EMG) were placed in the region of right and left anterior Temporalis muscle and Masseter muscle, and the patients will be asked to perform maximum voluntary contraction (MVC). The EMG signals filtered and amplified with a time constant of 10ms. The muscle activity analyzed twice for each patient: (1) with the old/faulty dentures and (2) 5 month following fabrication and insertion of new denture.

Results: The electrical activity during maximum voluntary contraction exhibited statistically significant improved muscle efficiency with new denture when compared to those with old denture wearer in place for 5 months. Highly significant change in muscle activity was seen in right side of the Temporalis muscle as compared to other groups of muscles after having new denture in place for 5 months.

Conclusion: New dentures or improvements in occlusion and vertical dimension produce a positive benefit to the patient by reducing the muscle effort during chewing without affecting masticatory performances. The reduction in muscle effort is likely to cause less tissue and in the end may minimize residual ridge resorption and, a new complete denture allows for neuromuscular reprogramming, which contributes to muscular balance of the masticatory system. A period longer than five months of wearing the new complete dentures is required for adaptation and the acquisition of functional capacity.

Key words: Electromyography, masticatory muscles efficiency, motor units, complete denture, maximum voluntary contraction.