Aspects on the relation between function and dentofacial morphology: understanding the aetiology, the treatment stability and the relapse of the anterior open bite

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Over the years there has been a need to study the influence of masticatory muscle function on craniofacial growth because the knowledge of the mechanisms behind both normal and abnormal craniofacial growth is a prerequisite for adequate treatment of craniofacial anomalies, including dental malocclusions.

In this presentation, we will view the influence of the masticatory muscle function on craniofacial growth as it has been recorded in a series of animal experimental and clinical studies. The common characteristic of these investigations is that the elevator muscles of the mandible influence the transversal and the vertical dimensions of the face. The decreased loading of the jaws due to masticatory muscle hypofunction may lead to decreased sutural growth and bone apposition, resulting in turn in an decreased transversal growth of the maxilla and narrower bone bases for the dental arches. Furthermore, an increase in the function of the masticatory muscles is associated with anterior growth rotation pattern of the mandible, with well-developed angular, coronoid, and condylar processes, as well as more dense internal bone structures of the alveolar bone.

Anterior open bite is a malocclusion with different origin. The importance of diagnosis to differentiate the etiology of the anterior open bite may have an impact on the treatment and the stability of the results. In growing individuals the vertical dimension is increased during the eruption of the teeth and the vertical growth of the alveolar process, in harmony with the individual's craniofacial growth. Disruption of the normal mandibular growth due to complicated traumatism or arthritis of the mandibular condyle may create anterior open bite. Extrinsic factors as oral habits, dysfunction of the masticatory muscles and incorrect tongue position may also influence the vertical dentofacial dimension causing anterior open bite. Treatment of open bite malocclusion is complex and challenging because of the moderate to poor long-term stability and the possibility of compromised esthetics. Relapse of treated cases could be linked, among others, to the remaining etiologic factors that disrupt the balanced secondary eruption of the anterior and posterior teeth. The healthy conditions of the stomatognathic system and the good functional capacity of the oral and masticatory muscles are important factors that may influence the stability of the treatment.

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Dr Kiliaridis has been Professor and Chairman of the Departments of Orthodontics, University of Geneva, since 1999. He graduated (DDS) from the University of Thessaloniki, Greece, and received his Odont Dr/PhD from Göteborg University, Sweden, where he also completed his specialist training in Orthodontics. He worked there as Associate Professor, while running a part-time private practice. Dr Kiliaridis has authored or co-authored over 200 research papers and book-chapters and has received several distinctions and international awards. He is coordinator of the European Orthodontic Teachers Forum and vice president of the Network for Erasmus Based European Orthodontic Programmes (NEBEOP).