

Original Article

Stress effect on the mandibular dental arch by mentalis muscle over activity, finite element analysis

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Abstract

OBJECTIVES: The perioral muscles postural and functional abnormality should be clearly evaluated. The influence of the abnormal function of mentalis muscle on the shape and posture of the mandible was evaluated using a finite element approach.

METHODS: Finite element analysis was used to create a three-dimensional representation of a human mandible that represents a dry normal mandible with teeth (33-36 gm/cm²). Pressures were applied directly to the labial surface of the mandible's lower anterior dento-alveolar structure reflecting the normal lips muscle function. While on abnormal swallowing pattern, lip muscle force (300 gm/cm²) had been assumed.

RESULTS: Shape and postural abnormality of the mandible with malocclusion particularly at the anterior dentoalveolar and basal bone region in sagittal direction as well as inward pressure on the mandibular posterior region.

CONCLUSION: Abnormal perioral muscle function throughout growth and development may result in a shape and postural abnormality of the mandible and a accompanying malocclusion.