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Finite element analysis of the stress released by buccinator muscle in the mandibular dental arch during sucking habits



ABSTRACT:

Objectives: The effect of buccinator muscle on the mandible need to be more clarified. Finite element method used to estimate the effect of the buccinator during abnormal function on the size and shape of the mandible.

Methods: Three-dimensional model of human mandible using Finite element analysis referring to dry normal mandible with teeth as a template, The mechanical characteristic of the materials were supposed to be homogenous, isotropic, and linear elastic. Auto mesh order used to discredit the model under analysis to numerous elements; every element includes numbers of apexes called nodes; the association of elements and nodes called the finite element mesh. The force of (2 gm/cm²) had been applied perpendicular to buccal surface of posterior teeth within the mandible representing normal buccinators muscle function on the mandible. While for simulation of abnormal suckling, buccinators muscle force (21 gm/cm²) applied to the same area.

Results: abnormal size and shape of the mandible with malocclusion especially at the posterior teeth area in transverse direction in addition to backward pressure on the chin and anterior teeth result from abnormal suckling force.

Conclusion: It could be concluded that abnormal function of buccinators during growth and development could result in size and shape variation of the mandible with concomitant malocclusion.