Development of biomechanical theory of tooth movement in orthodontical treatment

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Abstract

Problem of orthodontical correction of human dentoalveolar anomaly is considered. It is interesting to create biomechanical theory of tooth movement in orthodontical treatment for a control, optimization, results prediction and personalization of this process. In this paper, attention is paid to research of initial tooth movement (i.e. within alveolar pit) using the well known concepts of center/region of resistance of tooth. The main aim of the work presented in this paper is experimental investigation of region of resistance of tooth, namely determination of its type and location depending on geometrical and mechanical characteristics of "tooth-periodontium" system. Also, research objective is analytical determination method creating of periodontium compliance matrix elements. Software was created for solution of stated research objectives. It realizes computational determination of region of resistance type and location. Also, the graphical representation of this region is available as set of lines of translational action. These results can be used for investigation of initial tooth movement.

Keywords: Center of resistance, region of resistance, tooth movement, experimental determination