عنوان مقاله:

A Mathematical Approach for Describing Time-Dependent Poissonâ€™s Ratios of Periodontal Ligaments

محل انتشار:

مجله فیزیک و مهندسی پزشکی, دوره 2, شماره 3 (سال: 1391)

تعداد صفحات اصل مقاله: 8

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خلاصه مقاله:

Periodontal ligament is a thin layer of soft tissue that connects root of a tooth to the surrounding alveolar bone. These ligaments play an important role in initiating tooth movement when loads are applied to teeth with orthodontic appliances. The majority of such soft tissues exhibit as viscoelastic bodies or have a time-dependent behavior. Due to the viscoelastic behavior of the periodontal ligaments, the mechanical properties are strongly affected by the loading history. Poissonâ€™s ratios for the viscoelastic materials are time-dependent (in time domain) or complex frequency-dependent (in frequency domain) quantities. Moreover, three-dimensional stress fields depend on these Poissonâ€™s ratios. The main objective of this work was to develop a mathematical approach capable of determining the time-dependent Poissonâ€™s ratios of the periodontal ligaments based on experimental data of stress relaxation and creep tests. The resulting stress relaxation and creep curves are described by a three-parameter viscoelastic models. The time-dependent Poissonâ€™s ratios of the periodontal ligaments have been obtained as increasing functions of .time, because shear modulus of these ligaments relaxes much more than their bulk modulus

کلمات کلیدی:

Poissonâ€™s Ratio, Viscoelastic, Stress-relaxation, Creep, Periodontal ligament

لینک ثابت مقاله در پایگاه سیویلیکا: