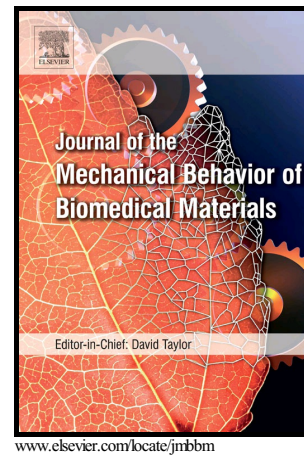


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PII: S1751-6161(15)00318-5
DOI: <http://dx.doi.org/10.1016/j.jmbbm.2015.08.034>
Reference: JMBBM1594

To appear in: *Journal of the Mechanical Behavior of Biomedical Materials*

Received date: 2 March 2015
Revised date: 26 August 2015
Accepted date: 30 August 2015

Cite this article as: Siegward D. Heintze, Dominik Monreal and Valentin Rousson, Fatigue resistance of denture teeth, *Journal of the Mechanical Behavior of Biomedical Materials*, <http://dx.doi.org/10.1016/j.jmbbm.2015.08.034>

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Fatigue resistance of denture teeth

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Abstract

Aims: There is no standard test to determine the fatigue resistance of denture teeth. With the increasing number of patients with implant-retained dentures the mechanical strength of the used denture teeth requires more attention and valid laboratory test set-ups. The purpose of the present study was to determine the fatigue resistance of various denture teeth using a dynamic load testing machine.

Methods: Four denture teeth were used: Bonartic II (Candulor), Physiodens (Vita), SR Phonares II (Ivoclar Vivadent) and Trubyte (Dentsply). For dynamic load testing, first upper molars with a similar shape and cusp inclination were selected. The molar teeth were embedded in conical steel molds with denture base material (ProBase, Ivoclar Vivadent). Dynamic fatigue loading was carried out on the mesio-buccal cusp at a 45 degrees angle using dynamic testing machines and 2'000'000cycles at 2 Hz in water (37 °C). Three specimens per group and load were submitted to decreasing load levels (at least 4) until all the three specimens no longer showed any failures. All the specimens were evaluated under a stereo microscope (x20 magnification). The number of cycles reached before observing a failure, and its dependence on the load and on the material, has been modelled using a parametric survival regression model with a lognormal distribution. This allowed to estimate the fatigue resistance for a given material as the maximal load for which one would observe less than 1% failure after 2'000'000 cycles.

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