

論文名 : Analysis of tooth brushing cycle

(ブラッシング時の歯ブラシの動的解析) (要約)

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Abstract

Objective: The aim of this study was to demonstrate the effectiveness of an analysis of tooth brushing cycles using a system that measures tooth brushing motion and brushing force with an accelerometer and strain tension gage attached to a toothbrush.

Background: Mechanical plaque removal with a manual toothbrush remains the primary method of maintaining good oral hygiene for the majority of the population. Because toothbrush motion has not been fully understood, it should be clarified by analysis of tooth brushing cycles.

Methods: Twenty healthy female dental hygienists participated in this study. Their tooth brushing motions were measured and analyzed using an American Dental Association approved manual toothbrush to which a three-dimensional (3-D) accelerometer and strain tension gage were attached. 3-D motion and brushing force on the labial surface of the mandibular right central incisor and the lingual surface of the mandibular left first molar were measured, analyzed and compared. Multilevel linear model analysis was applied to estimate variables and compare motion and forces related to the two tooth surfaces.

Results: The analysis of tooth brushing cycles was feasible, and significant differences were detected for durations and 3-D ranges of toothbrush motion as well as brushing force between the two tooth surfaces.

Conclusion: The analysis used in this study demonstrated an ability to detect characteristics of tooth brushing motion, showing tooth brushing motion to change depending on the brushed location. These results also suggest that more detailed instructions might be required according to patient's oral condition.