Physical properties of root cementum: Part 25. Extent of root resorption after the application of light and heavy buccopalatal jiggling forces for 12 weeks: A microcomputed tomography study

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Abstract :

Highlights

- •We evaluated root resorption crater volumes with different force applications.
- •Continuous vs jiggling forces of the same magnitude produce similar volumes of root resorption.
- •Heavy jiggling forces produce greater root resorption than light jiggling forces.
- •Information on etiology of root resorption will decrease orthodontic treatment side effects.

Introduction

The aims of this study were to evaluate with microcomputed tomography the orthodontically induced inflammatory root resorption in premolars caused by buccopalatal jiggling movement with light and heavy forces and to compare it with the resorption caused by equivalent but continuous buccal forces.

Methods

The sample consisted of 60 maxillary first premolars collected from 30 patients (15 girls, 15 boys; ages, 13-18 years) who required orthodontic treatment with extractions. They were divided into 3 groups of 10 patients. Light (25 g) or heavy (225 g) buccal tipping orthodontic forces were randomly assigned on the maxillary right or left quadrant with either continuous buccal (positive controls) or buccopalatal jiggling forces for 12 weeks. At the end of the experimental period, the teeth were carefully extracted and processed for 3-dimensional imaging and volumetric evaluations of resorption craters. Data were analyzed with Wilcoxon signed rank tests.

Results

There was no statistically significant difference between positive control light ($P = 0.0173$) and heavy ($P = 0.0173$) continuous forces and jiggling forces for both force magnitudes. However, statistically significant differences were observed between heavy and light jiggling forces ($P = 0.038$), with heavy jiggling forces causing greater total root resorption than light jiggling forces.

Conclusions

Light and heavy jiggling forces in the buccopalatal direction did not cause significantly different amounts of root resorption when compared with continuous forces of the same magnitude. On the other hand, light jiggling forces resulted in less root resorption than heavy jiggling forces.

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