

Orthodontic Treatment in Periodontally Compromised Patients - Medicine or Poison

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Purpose

Dentoalveolar structure harbors various dental stem cells, including periodontal ligament stem cells (PDLSCs), dental follicle precursor cells (DFPCs) and stem cells from apical papilla (SCAP). Sutures and periosteal area also considered as sources for undifferentiated but powerful mesenchymal cells. Mechanical stimulus facilitates the proliferation and differentiation of those immature cells, leading to the formation of bone, tooth and pulps. Although the fundamental biology is well understood, it is hardly incorporated in the clinical situation. Then the question is: does the biology really help clinical decision making? To find the value of integrated biology in the clinical orthodontics, following subjects are introduced and explained.

Methods & Results

The authors protracted 51 mandibular molars in 37 adults into an edentulous area by using sliding mechanics with a lever arm or a miniscrew-supported root spring. The authors measured root length and alveolar bone height on panoramic radiographs and corrected according to the crown length registration method. All edentulous spaces closed successfully in an average of 31.7 months, and the average crown and root movements were 4.97 and 8.64 millimeters, respectively. The root length decreased significantly by 0.80 mm (5.53%), but root resorption of more than 2 mm occurred in only 4.0% of molars. The alveolar bone height was reduced significantly by 0.56 mm, but ABL of more than 2 mm occurred in only 2.0% of molars. Linear mixed model results revealed that EARR and ABL correlated only with RM and age, respectively. Additionally, teeth with immature root apices under active forced eruptions were traced over time and all of the examined teeth showed complete apex development with various root length, implicating an odontogenic nature of the orthodontic tooth movement via providing favorable environment for local mesenchymal cells.

Conclusion

The results indicate that strategic orthodontic tooth movement can be used for effective osteogenic/odontogenic purposes. Intrusive root movement may facilitate bone formation around the moving tooth.

Profile.

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