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Who manages tooth movement in orthodontics? mechanics versus histology?

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Tooth movements occur systematically, thanks to the regular responses of the tissues, in order to maintain the balance against biological and mechanical stimuli. The most important factor affecting the amount of tooth movement is remodeling in the alveolar bone. Different methods to move teeth faster have been tried for years.

The teeth are moved with brackets and wires in the bracket slot. In the mesiodistal movement of the tooth, a friction occurs between the bracket and the wire, as happens in all mechanics in nature. 40-50% of approximate force applied for tooth movement is used to overcome the friction resistance. It is not applicable to apply too much force to the teeth in order to overcome the friction force. Very heavy forces cause undesirable movements or immobility of the teeth, pain and loss of anchorage.

Although a limited number of cells in the affected area are activated as a result of cellular activation provided by mechanical appliances, it has been suggested that all or most of the cells in the area are activated by chemical and physical applications. In this respect, studies on the benefits of locally applied agents in orthodontic treatment have been increased.

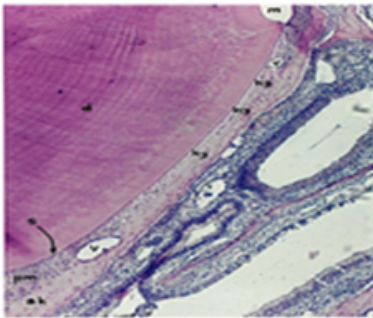


Figure 1: In Karadede's study examining experimental orthodontic tooth movement in rats using low-dose aspirin, the hyalinization area in the pressure region of the upper medial region of the periodontal membrane (Harris Hematoxylin-Eosin x 30).

(m) enamel
(d) dentin
(s) cementum
(v) blood vessel
(ak) alveolar bone
(hy) hyalinization
(pm) periodontal membrane

Recent publications

1. Davidovitch Z., Krishnan V., Role of basic biological sciences in clinical orthodontics AJO 2009; 135:222-31. <https://doi.org/10.1016/j.ajodo.2007.03.028>
2. Tanne K, Matsubara S, Hotei Y, Sakuda M, Yoshida M. Frictional forces and surface topography of a new ceramic bracket. Am J Orthod Dentofacial Orthop 1994;106(3):273-278. [https://doi.org/10.1016/s0889-5406\(94\)70047-8](https://doi.org/10.1016/s0889-5406(94)70047-8)
3. Proffit WR, Fields HW, Sarver DM. Contemporary Orthodontics. Fourth Edition, Missouri, Elsevier Health Sciences. 2007; 359-394. ISBN: 9780323093002.

Biography

Ozkan Buyuk graduated from Faculty of Dentistry, Gazi University in 2006. In his undergraduate education, he also studied at Cardiff

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University within Erasmus Student Exchange Program. After graduation, he started his postgraduate education at Gazi University, Institute of Health Sciences, Oral Pathology Program. In 2013, he did internship and studies on molecular biology at the Department of Pathology, Faculty of Medicine, Cologne University. Between 2014-2019, he worked as a lecturer at Nisantasi University Dental Prosthesis Technology Program. He also got enrolled in undergraduate education in Anadolu University Open Education, Healthcare Management Program in 2017. In 2019, he started his doctorate education at Izmir Katip Celebi University, Institute of Health Sciences, Department of Orthodontics. In 2020, he was appointed to the Oral and Dental Health Program of Izmir Katip Celebi University Vocational School of Health Services. He continues his clinical and academic studies in orthodontics and lectures at associate degree level.

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