



33. IMMUNE SYSTEM RESPONSE TO ORTHODONTIC TOOTH MOVEMENT

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Introduction. Dental movements during orthodontic treatment are generated by a mechanical force that induces an aseptic inflammatory response in the tissues of the periodontal system, which subsequently generates the process of bone resorption and apposition. Knowing the immune system mechanisms involved in tooth movement can be useful in orthodontic practice, regarding the selection of the treatment method, the management of forces applied to the periodontal units and the correct application of biomechanical principles.

Aim of study. Analyzing the interaction of the immune system with tooth movements in orthodontic treatment, which helps to gain vast insights into shortening the treatment period and reducing the number of complications.

Methods and materials. The study involved a detailed review of the literature to highlight recent findings in the field of the interaction between the immune system and orthodontic movements. Clinical and experimental studies that assessed the immune response in the context of orthodontic treatment were also reviewed.

Results. The literature review reveals that orthodontic movements can activate local immune responses, causing the release of cytokines, prostaglandins and other mediators of inflammation, which subsequently play a significant role in triggering bone remodeling processes around the teeth subjected to the applied forces. According to some researchers, orthodontic forces induce synthesis and secretion of endogenous prostaglandins by local cells, which in turn stimulates the osteoclastic process of bone resorption. Pain associated with orthodontic movements has also been found to be related to local inflammation and changes in intercellular interaction.

Conclusion. The response of the immune system to orthodontic movements is a complex phenomenon, in which the interactions between immune cells, dento-periodontal tissues and biological processes are closely related. Understanding these mechanisms is an essential component for optimizing orthodontic treatment, both from the perspective of effectiveness and patient comfort. Also, identifying ways to manage the inflammatory response may contribute to the development of more personalized and better tolerated therapeutic strategies.