



## 59. THE EFFECT OF ANTI-INFLAMMATORY MEDICATION ON ORTHODONTIC TOOTH MOVEMENT

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**Introduction.** It is now well-known that orthodontic tooth movement (OTM) is possible due to the biological response to the applied mechanical forces. The new studies have revealed its inflammatory nature. This in turn raises the question of whether the orthodontic treatment can be altered by anti-inflammatory medication. And if yes, should it be a concern for orthodontists?

**Aim of study.** Among the patients who seek orthodontic help there can always be some who are simultaneously undergoing an anti-inflammatory treatment. While not all the anti-inflammatory drugs have been thoroughly studied, we now know a few which can indirectly alter either the process, or the results of OTM. Taking into consideration the common use of this medication, it would be beneficial for orthodontists to know how these drugs can affect the treatment and if their influence on OTM can be managed.

**Methods and materials.** A systematic review of articles and textbooks in English have been made. Only the original content without translation was used. Platforms containing medical articles were used as a database: PubMed, ScienceDirect, Research4Life, Oxford Academic. The keywords were: orthodontic tooth movement, anti-inflammatory drugs. Articles that contained the terms 'Orthodontic appliances', 'Biomechanics' were excluded.

**Results.** Most NSAIDs non-selectively inhibit the formation of prostaglandins (PGs), which results in suppression of any inflammatory process and a delay of OTM. Acetaminophen acts on the central nervous system, leading to a slight decrease of PG' levels, having no significant effect on the rate of OTM. A few original studies addressed the use of COX-2 inhibitors during orthodontic treatment. An original human study conducted by Villa et al. in 2005 showed that the tooth movement patterns in patients receiving placebo and those administered with nabumetone were almost identical. Animal experiments revealed the inhibiting effect of the glucocorticoids (GCs) on the osteoblasts' function. This led to decrease of bone formation, resulting in accelerated OTM, as well as in compromised retention period. Most review articles highlight the elevated risk of osteoporosis in patients receiving GCs.

**Conclusion.** A thorough literature review makes it clear that the antiinflammatory drugs have a considerable influence on the rate of OTM which however can be successfully managed. The administration of the non-selective NSAIDs will lead to a significant decrease in OTM. Acetaminophen is the only known exception. A COX-2 blocking NSAID (nabumetone) has been shown to also have no influence on OTM rate. More research in this field is needed. Glucocorticoids medication will lead to an acceleration of OTM, but will also compromise the retention period. Therefore orthodontists may want to reduce the orthodontic force, to make the control visits more often and to provide an enhanced retention method.