

## Comparison of Transforming Growth Factor- $\beta$ 1 Levels in the Human Gingival Sulcus during Canine Retraction Using Elastic Chain and Closed Coil Spring

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**Abstract :** When an orthodontic force is applied to a tooth, an inflammatory response is initiated then lead to bone remodeling process, and the process accommodates tooth movement. One of cytokine that plays a prominent role in bone remodeling process was transforming growth factor-beta 1 (TGF- $\beta$ 1). The purpose of this study was to identify and compare changes of TGF- $\beta$ 1 in human gingival crevicular fluid during canine retraction using elastic chain and closed coil spring. Ten patients (mean age  $20.7 \pm 2.9$  years) participated. The patients were entering the space closure phase of fixed orthodontic treatment. An upper canine of each patient was retracted using elastic chain, and the contralateral canine was retracted using closed coil spring. Gingival crevicular fluid samples were collected from the canine teeth before and 7 days after the force was applied. Transforming growth factor-beta 1 was determined by enzyme-linked immunosorbent assay (ELISA). The concentrations of TGF- $\beta$ 1 at 7 days were significantly higher compared to before canine retraction in both groups. In the evaluation of between-group difference, before retraction, the difference was insignificant, whereas at 7 days significantly higher values were determined in the closed coil spring group compared to elastic chain group. The result suggests that TGF- $\beta$ 1 is associated with the bone remodeling that occurs during canine distalization movement. Closed coil spring gave higher TGF- $\beta$ 1 concentrations thus more bone remodeling occurred and may be considered the treatment of choice.

**Keywords :** closed coil spring, elastic chain, gingival crevicular fluid, TGF- $\beta$ 1

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