

The Effect of Glucocorticosteroid Medication on Orthodontically Induced Root Resorption

(An Experimental Study on Rats)

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Abstract

Many patients use drugs on a daily basis, and all these drugs have therapeutic effects, as well as side effects that may influence the cells targeted by orthodontic forces.

In the present study we investigate the effect of different courses of glucocorticosteroid treatment on orthodontically induced root resorption and the rate of orthodontic tooth movement.

A 'Split- mouth design performing orthodontic tooth movement in 30 male Wistar albino rats divided into three groups: control group (n = 10), acute course (n = 10) and chronic course (n = 10). Acute and chronic course groups received corticosteroid treatment (5 mg/kg/day of methylprednisolone) for 3 and 7 weeks, respectively, while no pharmacological treatment was performed in the control group. The upper right 1st molar was moved mesially for 21 days in all three groups with a closing-coil spring delivering 20 g of force to cause orthodontic tooth movement by means of fixed orthodontic appliance.

The rate of orthodontic tooth movement monitored throughout the experimental period after insertion of orthodontic appliance for each group at three times interval (week 1, 2, and 3). At the end of the experiment, the biopsy was taken.

A histopathological based assessment method for the percentage of root resorption was performed at the coronal and apical level on both compression and tension sites of the non-appliance and appliance sides.

The acute course group showed significantly more root resorption at the compression-coronal level compared with the control and the chronic course group; while significantly higher rate of orthodontic tooth movement was found in the chronic course group compared with acute course and control groups.

This could be ascribed to the lack of balance between blastic activities (inhibited by the drug) and the clastic activities (enhanced or unchanged by drug administration) occurring in the initial phase of drug administration.

As a consequence, a careful monitoring of patients undergoing corticosteroid treatment is suggested.