Enhancement of Orthodontic Anchorage and Retention by Local Injection of Strontium

(An Experimental Study in Rats)

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Abstract

Orthodontic research carried out in advances to investigate the effect of the local injection of pharmacological agents in retarding orthodontic tooth movement to provide fewer complexes, less expensive and patient friendly approaches to enhance orthodontic anchorage and retention.

The present study was examined the clinical and histological effect of the local injection of strontium a dual action bone building agent on experimental tooth movement in rats.

Thirty six ten-week- old male Wister rats were randomly divided into two groups of eighteen animals. Two experiments were carried out. In the first , both the right and left maxillary first molars were moved buccaly with a standardized expansion spring under local injection of strontium on the experimental side. A 0.25 ml of Strontium chloride solution of 240 mg/ml concentration was injected every two days into the subperiosteum area buccal to the left maxillary first molar which was served as experimental side. The right first molar served as a control with an injection of 0.25 ml distilled water. At the end of the three weeks of experimental period the local injection of strontium caused significant with 53% inhibition in tooth movement of the left maxillary first molar after the force was applied. In the second, both the right and left maxillary first molars were moved buccaly with the spring for three weeks. Two days before the spring was removed the injection of 0.25 ml of Strontium chloride solution of 240 mg/ml concentration was begun into the palatal side of maxillary left first molar which was served as experimental side and 0.25 ml distilled water was injected at the palatal side of the right first molar which was served as a

control side . At the end of the three weeks of experimental period the local injection of strontium caused a significant with 29% inhibition of relapse movement of the left maxillary first molar after the force was removed.

Histological examination showed that strontium enhanced osteoblast and reduced osteoclast number at the end of the three weeks of experimental period in both experiments.

The results of the study suggested that local injections of strontium can inhibit both experimental and relapsed tooth movements in rats thereby enhance both orthodontic tooth anchorage and retention.