The Effects of Local Platelet-Rich Plasma (Prp) Injection on Orthodontic Tooth Movement using the Cavalieri’s Principle

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Introduction
Platelet-rich plasma (PRP) is an autologous concentration of human platelets in a small volume of plasma and releases a cocktail of growth factors. It was thought to stimulate bone and soft tissue repair. Aim of this study was to evaluate the effects of local PRP injection during tooth movement in an animal model.

Materials and Methods
Tooth movement was performed on the upper first molars using a 40-g nickel titanium closed coil spring activated across the span from the central incisors to the first molar on both sides of the rats. PRP injection was done on the right side (hPRP-E) and the left side was kept as a splith-mouth control (hPRP-C). Measurements were done on days 3, 7, 21 and 60. Systematic sampling methods were used and stained with Tri-chrome Masson (TCM) technique. Ratio (%) of alveolar bone volume to the total volume between the roots of first molar was examined with a stereological method.

Results and Discussion
According to the stereological evaluation, On day 3 alveolar bone volume density between roots of upper first molar decreased in the hPRP-E (42,616±0,753) group compared to hPRP-C (50,457±1,003) group (p=0,0001). This trend continued until day 21. On day 60, alveolar bone volume density of hPRP-E and hPRP-C (40,405±2.471-44,512±0,811) closed up to each other.

Conclusion

Injection of high concentration PRP could accelerate orthodontic tooth movement via decreasing alveolar bone volume density on paradental tissues in a transient way.

References