

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

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## Keywords

Orthodontic tooth movement, Platelet-rich plasma, Tartrate resistant acid phosphatase, Accelerated tooth movement.

## 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.

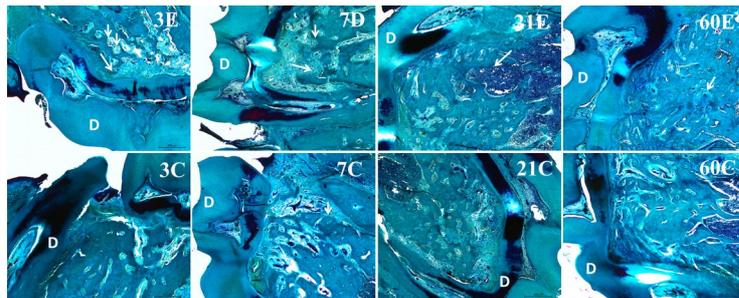


Figure 1. In all groups, new ossification and vascularization areas is demonstrated with arrow, dentin (D). Photomicrographs are demonstrated of experimental and control groups stained with TCM. Groups: 3E, 7E, 21E, 60E are experiment days 3, 7, 21 and 60. 3C, 7C, 21C and 60C; control days 3, 7, 21 and 60. Scale bar represents 400  $\mu$ m.

## 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 ( $42,616 \pm 0,753$ ) group compared to hPRP-C ( $50,457 \pm 1,003$ ) group ( $p=0,0001$ ). This trend continued until day 21. On day 60, alveolar bone volume density of hPRP-E and hPRP-C ( $40,405 \pm 2,471$ - $44,512 \pm 0,811$ ) closed up to each other..

## Conclusion

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

### References

Marx RE. Platelet-Rich Plasma (PRP): What Is PRP and What Is Not PRP? *Implant Dent.* 2001; 10(4): 225-228.