

## Effect of Bone morphogenic protein 7 and Osteoprotegerin on bone formation in the expanded inter-premaxillary suture in rats

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### Introduction

The aim of this study was to evaluate the histomorphometric effects of bone marrow-derived mesenchymal stem cells (MSCs) which, has bone morphogenic protein 7 (Bmp7) or osteoprotegerin (OPG) with only Bmp7 or OPG on bone formation in rats after injecting into the inter-premaxillary suture.

### Materials and Methods

In the 4 groups, different chemical solutions i.e. MSC, MSC-Bmp7, MSC-OPG and MSC-Bmp7-OPG were injected the interpremaxillary suture of rats. The bone volumes (BV) of the 10- $\mu$ m serial sections with hematoxyline and eosin staining were estimated by Cavalieri's principle. In the area of interest, each point was 2500  $\mu$ m<sup>2</sup>

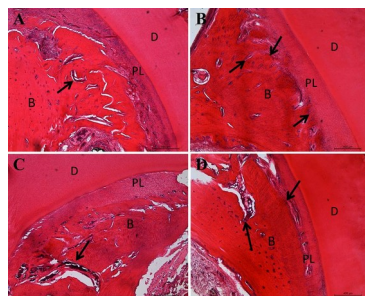


Figure 1. Photomicrographs are demonstrated all groups (A=MSC, B= MSC-Bmp7, C= MSC-OPG, D= MSC-Bmp7-OPG). Bone is demonstrated (B), dentin (D) and vascularization areas (arrows). Scale bar represents 400  $\mu$ m.

### Results and Discussion

The mean BV for MSC, MSC-Bmp7, MSC-OPG, and MSC-Bmp7-OPG was  $30,070 \pm 3,50$  mm<sup>3</sup>,  $53,048 \pm 0,507$  mm<sup>3</sup>,  $44,125 \pm 1,479$  mm<sup>3</sup>,  $39,116 \pm 5,008$  mm<sup>3</sup>, respectively. Comparison between mean bone volume for MSC- Bmp7 showed statistically a significant difference ( $p = 0.001$ ) compared with MSC-OPG or MSC-Bmp7-OPG.

### Conclusion

During the tooth movement and bone remodelling, the ratio of soft and bone tissues are protected with BMP7. It may shorten the retention period and may reduce the risk of relapse.



## References

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