

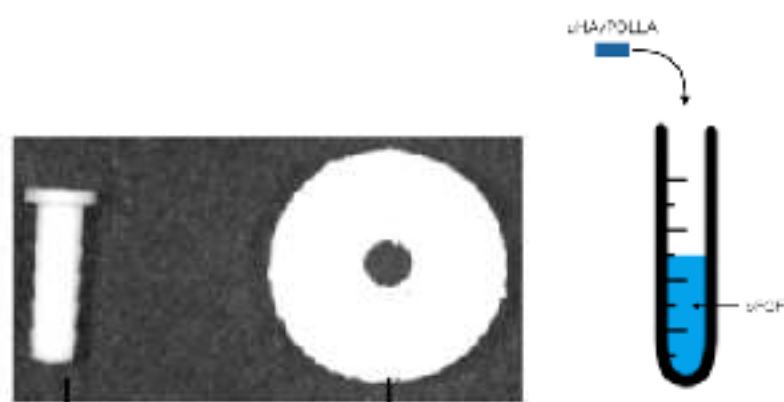
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### Background and Aim

The previous study, we demonstrated that the porous uncalcined hydroxyapatite / poly-DL-lactic acid block(uHA/PDLLA) is biodegradable and osteogenic suggesting that this material is a useful material for vertical bone augmentation. Recently, it has been reported that recombinant human bFGF (basic fibroblast growth factor) developed as a periodontal tissue regeneration drug, which promotes proliferation of undifferentiated mesenchymal stem cells and the new bone formation. The aim of this study was to evaluate the new bone formation of the uHA/PDLLA block using bFGF for vertical bone augmentation on the parietal bone of the rabbits.

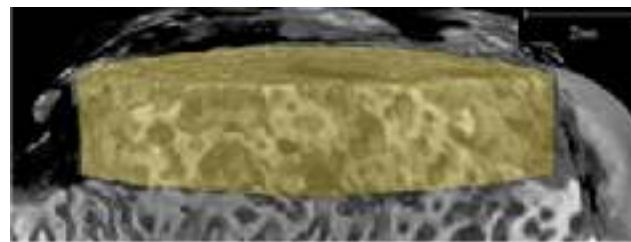
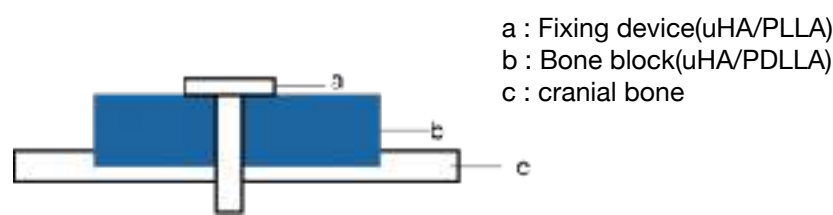
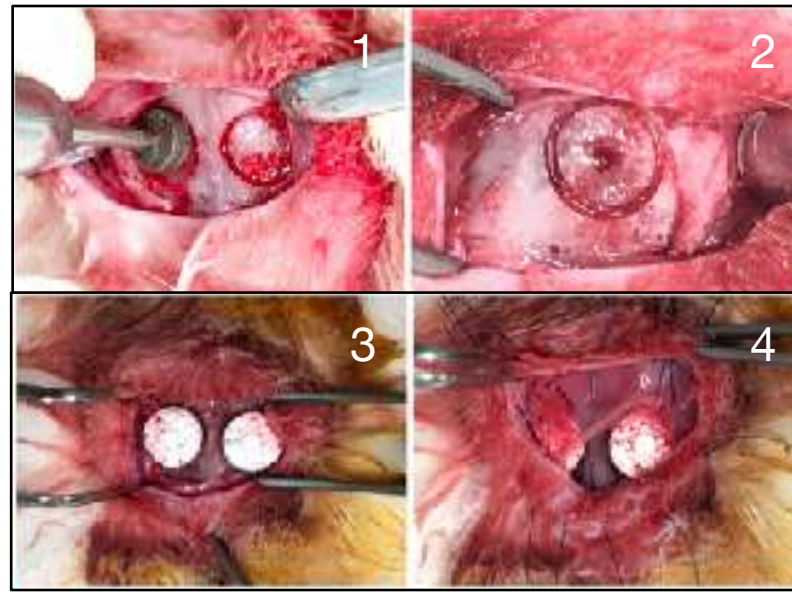
### Methods and Materials

Ten Japanese male white rabbits were divided into two groups. Under general anesthesia, a horizontal incision between the base of both ears was made. The musculature and the periosteum were reflected laterally to expose the parietal bone. Two recipient beds were created in each calvarial bone: the calvarial bone was marked by an 8mm trephine bur and the cortical bone was removed using a 2mm round bur. uHA/PDLLA+bFGF and uHA/PDLLA (sham) were positioned and fixed with the fixation pins at each of the prepared sites, then the flap was sutured with 4-0 nylon.



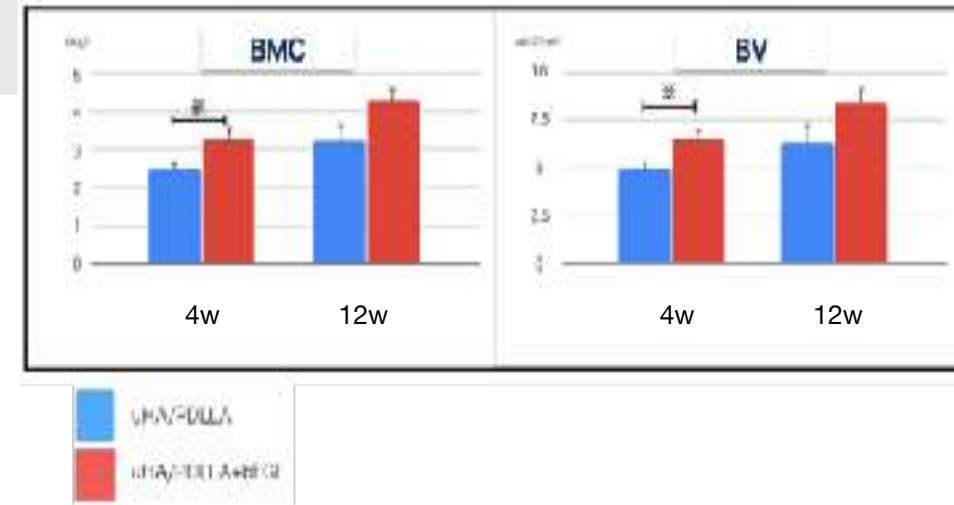
Fixing device(uHA/PLLA) Bone block(uHA/PDLLA)

### Methods and Materials



ROI (Region of Interest)

Bone mineral content (BMC) and bone volume (BV) at 4 and 12 weeks were measured with  $\mu$ CT. Decalcified specimens were prepared for histological analysis. Multiple comparisons between groups were performed with Mann-Whitney's U test. A P-value of  $<0.05$  was considered statistically significant. All statistical analyses were performed with statistical software.

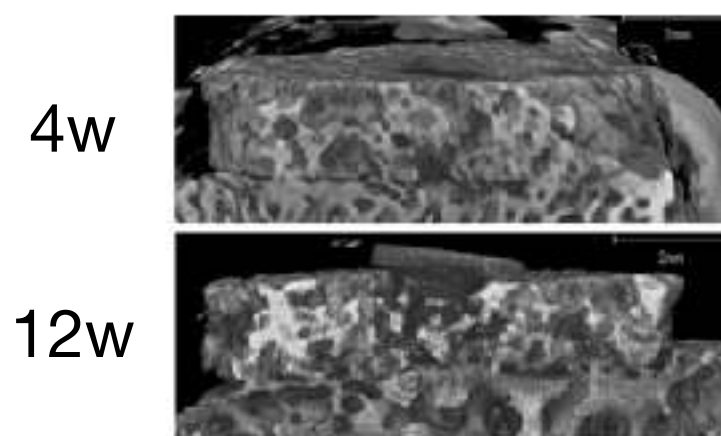


The blocks directly contacted with the original bone at 4 and 12 weeks in each group. The border between the material and the basal bone became vague at 12 weeks. New bone formation and capillaries were more frequently observed in uHA/PDLLA+bFGF group. Bone mineral content (BMC) and bone volume (BV) were increased from 4 to 12 weeks in both uHA/PDLLA+bFGF and uHA/PDLLA groups. In addition, BMC and BV of uHA/PDLLA+bFGF group were significantly higher than uHA/PDLLA group at 4 weeks. However there was no significant difference between the two groups at 12 weeks.

### Conclusion

The results of the present study suggested that the combination of uHA/PDLLA and bFGF is potentially effective for early new bone formation.

### Results



※ This image shows uHA/PDLLA

### References

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