

The effect of Tisseel[®] on early bone healing of ash in ovariectomized rat

난소적출 백서에서 치아 회분말 및 연석고 매식시 티셀의 효과

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Purpose: The present study examined the early bone healing pattern of grafted bone and the degree of new bone formation to determine the effect of the Tisseel[®] after grafting with a particulate dentin and plaster of Paris mixture in ovariectomized rat.

Material and Methods: Forty-eight rats were randomly assigned to four groups, and each group was further divided into two subgroups: 4 weeks and 8 weeks after implantation. The defect was filled in different manners: Group 1, non-graft group; Group 2, tooth ash-plaster graft group; Group 3, Tisseel[®] and tooth ash-plaster graft group; and Group 4, Ovariectomy and tooth ash-plaster graft group; Group 5, Ovariectomy and tooth ash-plaster graft group and Tisseel[®] graft group. Histologic sections were obtained for histomorphometric analysis of the defects at 4 and 8 weeks after surgery.

Results: When each week was compared in 4 week groups, a significant difference ($p=0.000$) was present in overall. A significant difference was observed between groups 1 and 2 ($p=0.004$), groups 1 and 3 ($p=0.004$), groups 1 and 4 ($p=0.004$), groups 2 and 4 ($p=0.004$), groups 2 and 5 ($p=0.004$), groups 3 and 4 ($p=0.045$), and groups 4 and 5 ($p=0.013$). A significant difference ($p=0.000$) was also present in overall new bone formation in 8-week group. A significant difference was present in new bone formation between groups 1 and 2 ($p=0.004$), groups 1 and 3 ($p=0.006$), groups 1 and 4 ($p=0.004$), groups 1 and 5 ($p=0.006$), groups 2 and 4 ($p=0.005$), groups 2 and 5 ($p=0.006$), groups 3 and 4 ($p=0.022$), groups 3 and 5 ($p=0.009$), and groups 4 and 5 ($p=0.022$)

Conclusion: Compared with controls, a significant difference was observed in new bone formation by grafting ash, ash and tisseel, ash after ovarian resection, and ash and Tisseel[®] after ovarian resection. A better new bone formation was observed with ash alone group than ash and Tisseel[®] combined group; however, this difference was not statistically significant. Thus, Ash alone or ash and Tisseel[®] combined could be used depending on the situation. Nonetheless, a significantly less new bone formation was observed with ash alone after ovarian resection or ash and tisseel combined compared with those with no ovarian resection. New bone formation was significantly better when ash was used alone or ash and Tisseel[®] combined was used.

References

1. Carmagnola D, Berglundh T, Lindhe J: The effect of a fibrin glue on the integration of Bio-Oss[®] with bone tissue. An experimental study in labrador dogs. *J Clin Periodontol* 2002; 29: 377-383.
2. Albrektsson, T., Bach, A., Edshage, S & Jonsson, A.: Fibrin adhesive system(FAS) influence on bone healing rate. A microradiographical evaluation using the bone growth chamber. *Acta Orthopedica Scandinava* 1982; 53: 757-763.
3. Carmagnola, D. Berglundh T., Araujo M., Albrektsson T & Lindhe J: Bone healing around implants placed in a jaw defect augmented with Bio-Oss[®]. An experimental study in dogs. *Journal of Clinical Periodontology* 2000; 27: 799-805.
4. Kania R. E., Meunier, A., Hamadouche, M., Sedel, L. & Petite, H. Addition of fibrin sealant to ceramic promotes bone repair: long-term study in rabbit femoral defect model. *Journal of Biomedical Materials Research* 1988; 43: 38-45.