

Vertical bone augmentation with simultaneous implant placement using particulate mineralized bone and mesenchymal stem cells: a preliminary study in rabbit.

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Publication Date: 2013

Abstract:

This study aimed to assess vertical bone augmentation with simultaneous implant placement in rabbit tibiae using particulate mineralized bone/fibrin glue/mesenchymal stem cell. Bone marrow was aspirated from tibiae of five 10-week-old New Zealand White male rabbits. Right and left tibiae of each rabbit were prepared, and a 3-mm protruding implant from tibial bone was placed in each side. Particulate allogenic bone/fibrin glue/mesenchymal stem cell combination was placed around test implants and particulate bone graft/fibrin glue around controls. Two months postoperatively, the animals were euthanized, and sections were prepared for histological analysis. The mean amount of vertical bone length was higher in the experimental group than the control group (2.09 mm vs 1.03 mm; $P < .05$). New supracrestal trabecular bone formation was also significantly higher in the test group (28.5 \pm 4.5% vs 4.3 \pm 1.8%; $P < .05$). Mesenchymal stem cell/particulate allograft/fibrin glue appears to be a promising combination for vertical bone augmentation around simultaneously inserted implants in rabbit tibia.