

# **In vivo alveolar bone regeneration by bone marrow stem cells/fibrin glue composition.**

Authors: Zhang L., Wang P., Mei S., Li C., Cai C., Ding Y.

Publication Date: 2012

## **Abstract:**

The repair of alveolar bone defects caused by trauma, periodontal diseases and inflammation is still a challenge for both researchers and clinicians. Although there are many attempts to regenerate bone based on different seed cells and scaffolds, the results are still unsatisfactory. This study aims to clarify whether it could be efficient to reconstruct the alveolar bone by the combination of bone marrow stem cells (BMSCs) without pre-osteinduction in vitro with fibrin glue (FG). The BMSCs were obtained from 2-week-old Sprague-Dawley (SD) rats and expanded in vitro with non-introduction. Afterwards, they were composited with FG for in vivo implantation. The animal models of traumatic alveolar bone defects were established bilaterally in the maxilla of 15 rats which were randomly divided into 3 groups. The BMSCs/FG composition was transplanted into 5 rats of the treated group. Another 5 rats in the negative control group were transplanted by pure FG without BMSCs. The rest 5 rats served as the blank control. Gross observation and histological analysis were made to evaluate the new bone formation 6 weeks after transplantation. Micro-CT was also used to estimate the bone healing through three-dimensional reconstruction and the bone density analysis. The amount of new bone formed in the treated group was significantly greater than the negative and blank control. Our results suggest that the strategy of combining BMSCs with FG is effective in the repair of alveolar bone defects. Its clinical application is promising. Crown Copyright © 2011 Published by Elsevier Ltd. All rights reserved.