

Concentrated red bone marrow/platelet-rich fibrin compound with an autologous periosteum debris scaffold for repair of mandibular defects. [Chinese]

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Abstract:

BACKGROUND: The platelet-rich fibrin scaffold structure is conducive to the growth of red bone marrow mesenchymal stem cells and various growth factors, promoting final osteogenesis.

OBJECTIVE: To investigate the feasibility of the concentrated red bone marrow/platelet-rich fibrin compound with the autologous periosteum debris scaffold for repair of rabbit mandibular defects.

METHODS: Bilateral mandibular bone defect models were prepared in New Zealand white rabbits using self-control method. The left side was the experimental side, and implanted with the concentrated red bone marrow/platelet-rich fibrin compound with the autologous periosteum debris scaffolds; the right side was the control side, and implanted with periosteum fragments and nano-hydroxyapatite composite scaffolds. All experimental animals were sacrificed after 2, 4, 8, 12 weeks to prepare tissue samples for general observation, imaging analysis, hematoxylin-eosin staining and scanning electron microscope detection. **RESULTS AND CONCLUSION:** The imaging examination and histological staining showed that the experimental side was superior to the control side in the aspects of bone healing, osteogenesis speed and quality. Under the scanning electron microscope, the experimental side had better compatibility with surrounding tissues and no inflammation reaction. The data of the tooth CT and evidence of new bone formation showed the bone density and new bone area of the experimental side were significantly higher than that of the control side ($P < 0.05$). These data indicate that concentrated red bone marrow/platelet-rich fibrin compound with the autologous periosteum debris scaffolds has an obvious osteoinductive role,

which is expected to be a new-type material for clinical repair of mandibular defects.