

Local Injection of Bone Mesenchymal Stem Cells and Fibrin Glue Promotes the Repair of Bone Atrophic Nonunion In Vivo.

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Abstract:

Introduction: This study aimed to evaluate the efficacy of local injection of bone mesenchymal stem cells (BMSCs) and fibrin glue in the treatment of atrophic nonunion in an animal model. **Methods:** Thirty-six male Lewis rats were randomly assigned into three groups: Group A (control group), Group B (atrophic nonunion group), and Group C (experimental group). All the rats underwent femoral osteotomy of the right hind limb, and stabilized with a custom-designed external fixator. Atrophic nonunion of the rats in Group B and C was induced by cauterization of the periosteum and bone marrow removal, and repaired by injection of fibrin glue and BMSCs-seeded fibrin glue, respectively. The surgically treated femurs were assessed by radiographic and histological analysis, and biomechanical test. **Results:** During the follow-up period, the external fixator maintained correct placement and all the femurs retained normal positioning. Eight weeks postoperatively, atrophic nonunion was detected in Group B, with the presence of fibrous connective tissue in the osteotomy gap. The femurs in Group C demonstrated complete bony bridging of the osteotomy gap, with the formation of plenty of woven bone. **Conclusion:** The repair of bone atrophic nonunion can be promoted through local injection of BMSCs and fibrin glue.

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