

The Clinical Use of Human Culture-Expanded Autologous Bone Marrow Mesenchymal Stem Cells Transplanted on Platelet-Rich Fibrin Glue in the Treatment of Articular Cartilage Defects: A Pilot Study and Preliminary Results. Haleem AM1, Singergy AA, Sabry D, Atta HM, Rashed LA, Chu CR, El Shewy MT, Azzam A, Abdel Aziz MT. *Cartilage*. 2010 Oct;1(4):253-261.

Abstract

OBJECTIVE:

To test the hypothesis that platelet-rich fibrin glue (PR-FG) can be used clinically as a scaffold to deliver autologous culture-expanded bone marrow mesenchymal stem cells (BM-MSCs) for cartilage repair and to report clinical results 1 y after implantation of MSCs PR-FG.

PATIENTS AND METHODS:

Autologous BM-MSCs were culture expanded, placed on PR-FG intraoperatively, and then transplanted into 5 full-thickness cartilage defects of femoral condyles of 5 patients and covered with an autologous periosteal flap. Patients were evaluated clinically at 6 and 12 mo by the Lysholm and Revised Hospital for Special Surgery Knee (RHSSK) scores and radiographically by x-rays and magnetic resonance imaging (MRI) at the same time points. Repair tissue in 2 patients was rated arthroscopically after 12 mo using the International Cartilage Repair Society (ICRS) Arthroscopic Score.

STUDY DESIGN:

Case series; level of evidence 4.

RESULTS:

All patients' symptoms improved over the follow-up period of 12 mo. Average Lysholm and RHSSK scores for all patients showed statistically significant improvement at 6 and 12 mo postoperatively ($P < 0.05$). There was no statistically significant difference between the 6 and 12 mo postoperative clinical scores ($P = 0.18$). ICRS arthroscopic scores were 8/12 and 11/12 (nearly normal) for the 2 patients who consented to arthroscopy. MRI of 3 patients at 12 mo postoperatively revealed complete defect fill and complete surface congruity with native cartilage, whereas that of 2 patients showed incomplete congruity.

CONCLUSION:

Autologous BM-MSC transplantation on PR-FG as a cell scaffold may be an effective approach to promote the repair of articular cartilage defects of the knee in human patients.