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AUTOLOGOUS BONE MARROW MESENCHYMAL STROMAL CELLS CAN TREAT ARTHRITIC JOINTS OF RHEUMATOID ARTHRITIC PATIENTS: REPORT OF TWO PATIENTS

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Background: Adult human bone marrow (BM) contains a population of mesenchymal stromal cells (MSC) that contribute to tissue regeneration. Further interest in the clinical application of MSC has been generated by the observation that MSC can exert profound immunosuppression by inhibiting T-cell activities in vitro. Rheumatoid arthritis (RA) is a T-cell-mediated systemic autoimmune disease characterized by cartilage and bone destruction associated with local production of inflammatory mediators. Joint destruction renders RA a candidate disease for cartilage repair using MSC. However, the issue of whether MSC from patients with RA are functionally altered must be addressed before proceeding to clinical application. The aim of this study was to investigate the properties of BMMSC isolated from patients with active RA in vitro and the efficacy of treating arthritic joints of RA patients with autologous BMMSC by intra-articular injection.

Methods: Two patients were recruited. BMMSC were isolated and characterized (including tri-differentiation immunosuppression assay) before implanting the cells back into patients.

Results: BMMSC were successfully isolated from both patients. These BMMSC can differentiate into adipocytes, osteocytes and chondrocytes. Isolated MSC also showed immunosuppressive ability when co-cultured with activated autologous peripheral blood T-cells. Subsequently, successfully isolated and characterized MSC were injected back into patient A's knee joints and patient B's hips. At 1 month after autologous BMMSC implantation, significant reduction of rheumatoid factor was observed in both patients.

Conclusions: This preliminary study showed the properties of BMMSC from RA patients were comparable to healthy MSC, and can be used for autologous transplantation.