Matrix-Associated Stem Cell Transplantation (MAST) in Chondral Defects of the Ankle is Safe and Effective - 5-Year-Followup

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Introduction/Purpose: The aim of the study was to assess the 5-year-follow-up of matrix-associated stem cell transplantation (MAST) in chondral defects of the ankle.

Methods: In a prospective consecutive non-controlled clinical follow-up study, all patients with chondral defect that were treated with MAST from April 1, 2009 to September 30, 2011 were analyzed. Size and location of the chondral defects and the Visual-Analogue-Scale Foot and Ankle (VAS FA) before treatment and at follow-up were analysed. Stem cell-rich blood was harvested during the procedure from the ipsilateral pelvic bone marrow with a Jamshidi needle (10 x 3mm, Cardinal, Dublin, OH, USA) and a special syringe (Arthrex-ACP, Arthrex, Naples, FL, USA) through a stab incision. The syringe was centrifuged (10 minutes, 1,500 rotations per minute). The supernatant was used to impregnate a collagen I/III matrix (Chondro-Gide, Geistlich, Wollhusen, Switzerland) that was cut to the size of the cartilage defect roughly before and definitely after. The matrix with stem cells was fixed into the chondral defect with fibrin glue (Tissucoll, Deerfield, IL, USA).

Results: Sixty-six patients with 69 chondral defects were included in the study. The age of the patients was 35 years on average (range, 12-64 years). VAS FA before surgery was 48.9 on average (range, 16.5-75.9). The defects were located as follows, medial talar shoulder, n=28; lateral talar shoulder, n=28 (medial and lateral talar shoulder, n=3), tibia, n=3. The defect size was 1.4cm² on average (range, 0.6 - 6cm²). 60 patients (91%) completed 5-year-follow-up. No patient was converted to fusion or total ankle replacement. The VAS FA improved to an average of 78.2 (range, 60.8-100; p=.01).

Conclusion: MAST led to improved and high validated outcome scores at 5-year-followup. No method related complications were registered. Even though a control group is missing, we conclude that MAST is an effective method mid-term for the treatment of chondral defects of the ankle.

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