Abstract #1916

Two-Year-Followup in 20 Patients After Matrix-Associated Stem Cell Transplantation (MAST) in Chondral Defects of the 1st Metatarsophalangeal Joint

Presenting Author:

Martinus Richter, MD, PhD

Additional Authors:

Stefan Zech, MD, Stefan A. Meissner

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Introduction/Purpose: For treatment of chondral defects, matrix-associated stem cell transplantation (MAST) is a modification of autologous matrix-induced chondrogenesis (AMIC) with a potential higher concentration of stem cells due to harvesting fluid at the bone marrow and in-vitro processing. The aim of the study was to assess the 2-year-followup of MAST in chondral defects of the 1st MTP.

Methods: In a prospective consecutive non-controlled clinical follow-up study, all patients with chondral defect that were treated with MAST from April 1st 2009 to March, 30th, 2013 were analyzed. Patients with bilateral treatment or with MAST at more than one joint surface were excluded from the study. The size and location of the chondral defects, method-associated problems and the Visual-Analogue-Scale Foot and Ankle (VAS FA) and range of motion were registered and analyzed.

MAST was performed as a single open procedure including debridement and microfracturing of the chondral defects. Stem cell-rich blood was harvested during the procedure from the ipsilateral pelvic bone marrow and was centrifuged (10 minutes, 1,500 RPM). The supernatant was used to impregnate a collagen I/III matrix (Chondro-Guide®, Geistlich, Baden-Baden, Germany) that was cut to the size of the defect before. The matrix with stem cells was fixed into the chondral defect with fibrin glue (Tissucoll, Deerfield, USA).
**Results:** Twenty-five chondral defects in 20 patients were included in the study. The age of the patients was 42 years on average (range, 35-62 years), 14 (70%) were male. The VAS FA before surgery was 50.5 on average (range, 18.3-78.4). The defects were located as follows, medial metatarsal head, n=7; lateral metatarsal head, n=18 (medial and lateral metatarsal head, n=5). The defect size was 0.7 cm² on average (range, .4 - 1.5cm²). ROM was 10.2/0/18.8° on average. All patients completed 2-year-followup. No method related complications were registered. The VAS FA improved to an average of 91.5 (range, 74.2-100; t-test (comparison with preoperative scores), p=.01). ROM improve to 32.5/0/25.5 one average (p=.05).

**Conclusion:** MAST led to good clinical scores and improved range of motion. No complications were registered. Even though a control group is missing, we conclude that MAST is a safe and effective method for the treatment of chondral defects of the 1st MTP joint. The main advantage of MAST in comparison with ACI and MACI is the single procedure methodology. The advantage in comparison with AMIC is the potential higher concentration of stem cells. It remains unclear if this method is superior to AMIC, and what kind of tissue is created.