Novel Surgical Treatment for Cartilage Reconstruction in the Foot and Ankle

Foot & Ankle Category: Ankle

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Introduction
A prospective study was designed to describe the details of the fully arthroscopical surgical technique with autologous matrix-induced chondrogenesis (AMIC) combined with subchondral microfracture and platlet-rich plasma (PRP) for cartilage reconstruction in the foot and ankle. Short-term results evaluated with Hannover Scoring System (HSS) and VAS for pain, function and satisfaction will be presented.

Methods
We performed 97 (2009-2011) arthroscopic AMIC procedures on osteochondral defects in the foot and ankle in different locations including subtalar, talonavicular and ankle joint. 64 patients were included in this ongoing study of the ankle joint. We invited the patients for a follow-up examination prospectively at 6 weeks, 12 weeks, 6 months and 12 months and evaluated them with the VAS Score for pain, function, satisfaction and the Hannover Scoring System (HSS). The operation was performed in all patients by the senior surgeon (HT). Detailed description of the different steps of the operation will be discussed in the presentation. To summarize the main steps of the operation; first, we debrided the local osteochondral lesion, afterwards performed a microfracturing with a special awl. The "microfracture holes" of the subchondral bone were filled with plated-rich plasma (PRP). Thereafter, the defect is covered with a collagen matrix soaked with PRP and sealed with fibrin glue. In the aftertreatment, the patients receive a plaster for 3 days, partial weight bearing for 8 weeks and accompanying physiotherapy for 8-12 weeks.

Results
At this stage scientific reliable data could be delivered in a short-term follow-up up to 1 year. In the ankle joint, the HSS improved from 54.9 (±12.89) baseline to 6 weeks 62.8 (±16.63); 3 months 64.6 (±16.29); 6 months 74.6 (±15.73); 1 year 81.5 (±14.43; p<0,05 cp. to baseline). VAS pain: 4.3 (±2.65) baseline to 6 weeks 6.6 (±2.89); 3 months 6.8 (±2.65); 6 months 7.3 (±2.63); 1 year 8.1 (±2.83; p<0,05 cp. to baseline). VAS function: 3.9 (±2.44) baseline to 6 weeks 4.6 (±3.11); 3 months 6 (±2.35); 6 months 7 (±2.65); 1 year 7.3 (±3.1; p<0,05 cp. to baseline). VAS satisfaction: 2.7 (±2.58) baseline to 6 weeks 5.5 (±2.87); 3 months 6 (±2.91); 6 months 7.1 (±3.05); 1 year 7.8 (±2.88; p<0,05 cp. to baseline). Subtalar joint and talonavicular joint were painfree after 1 year with minor limitations in eversion and inversion. Separations of the talo-calcaneal coalitions were still open and painfree after 2 years.

Conclusion
Autologous matrix-induced chondrogenesis (AMIC) procedure combined with microfracture and platlet-rich plasma (PRP) is in our opinion a reliable therapy for osteochondral lesions of the foot and ankle. We observed promising, continuously improving early results in a short term follow-up. Further research is needed to maintain the position of this novel technique for cartilage reconstruction in the foot and ankle.