Microfracture or AMIC for arthroscopic repair of acetabular cartilage defects in femoroacetabular impingement.

Dr. Andrea Fontana
Istituto Auxologico Italiano
Milan - Italy
Introduction

- Chondropathies of the acetabulum and the femoral head are a frequent cause of pain and functional limitation. Moreover, if cartilage defects in the hip are not adequately repaired, then progression of the damage and arthritic changes may occur.
Introduction

• Microfracture is the standard of care for the treatment of small cartilage defects in the hip. Microfracture involves penetration of the subchondral bone to release blood and bone marrow into the defect, initiating cartilage repair.
Introduction

• Autologous matrix-induced chondrogenesis (AMIC®) is a novel, one-step approach that combines microfracture with a collagen type I/III matrix (Chondro-Gide®) to cover the microfractured defect area. In this single-step procedure, the Chondro-Gide® matrix is placed over the defect to stabilize the fragile blood clot that arises from microfracture and to provide infrastructure for repair tissue formation.
Purpose

• The aim of this study is to retrospectively evaluate the efficacy of arthroscopic microfracture (MFx) and arthroscopic AMIC for the treatment of acetabular cartilage defects in femoroacetabular impingement (FAI) at 36 months follow-up. Only patients with available data at 6, 12 and 36 months were included in the study.
Material & Methods

• Microfracture technique.
• The subchondral bone was penetrated approximately 2-4 mm deep with an arthroscopic awl (30 and 45 degree angles are preferable) to create V-shaped holes of 1.5-2 mm diameter. It is generally suggested to begin the microfractures at the periphery and to proceed toward the centre at a distance of 5 mm. It is important to penetrate the subchondral bone perpendicularly, which can be particularly difficult in the hip, specifically in the supero-anterior areas of the acetabulum. Bone marrow bleeding from the holes can be verified after reducing the water pressure.
Microfracture technique
Material & Methods

- AMIC technique.
- Once the chondral defect was properly measured and shaped, microfracture of the subchondral bone was performed and then the matrix was directly inserted into the joint, using an arthroscopic cannula to prevent its loss in the surrounding tissues. It was then adapted to cover the chondral defect. After having positioned the matrix the traction was released to perform a series of 4-6 extension and rotation movements of the hip. Traction was then re-applied, and the position of the implant was arthroscopically verified. In case the matrix was not stable into the defect it was removed and re-applied using Fibrin glue to fix it.
AMIC technique
Material & Methods

- 50 patients (37 male, 13 female) were treated with arthroscopic MFx and 62 patients (28 male, 34 female) were treated with arthroscopic AMIC with the application of a collagen type I/III bilayer matrix (Chondro-Gide®). Patients were evaluated pre- and post-operatively by the Modified Harris Hip Score (MHHS) at 6, 12 and 36 months follow-up. Mean patient age at surgery was 41±10 (range 22-62 years) for MFx and 38±10 (range 18-50 years) for AMIC. All patients presented grade III to IV chondral defects (ICRS classification) with a mean lesion size of 3.8±1.6 cm² (range 2-10 cm²) for MFx and 3.6±1.8 cm² (range 2-12 cm²) for AMIC. 22 patients in the MFx and 27 Patients in the AMIC group had a concomitant chondropathy of the femoral head treated with microfracture only.
Results

- Baseline MHHS was 47±6 for MFx and 45±6 for AMIC. Major improvement was observed and comparable in the first 6 months and up to 12 months after surgery, MFx 85±9 and AMIC 83±8. In the AMIC group this result was maintained over time with a MHHS of 86±7 at 36 months. Interestingly in the MFx group the MHHS deteriorated from 12 to 36 months follow-up by 12 points to 73±9.
Conclusion

• Arthroscopic microfracture and arthroscopic matrix-enhanced microfracture AMIC are effective treatments for the repair of acetabular cartilage defects in FAI. The AMIC technique is also one-step procedure seemingly having advantages in maintaining improvements over time when compared to microfracture in FAI. Longer follow-up is needed to prove this trend for arthroscopic AMIC in FAI.