

Prospective Observational Study of a Non-Arthroscopic Autologous Cartilage Micrografting Technology for Knee Osteoarthritis

Dimitrios Tsoukas, Ilie Muntean, Christos Simos and Ruben Sabido-Vera
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INTRODUCTION & OBJECTIVES

Knee osteoarthritis (OA) causes chronic pain, disability, and has a major global burden. Current conservative and injectable options do not stop structural deterioration or regenerate normal articular cartilage.

Autologous micrografting technology (AMT®) uses patient's own auricular cartilage and mechanically disaggregates it to obtain an injectable suspension enriched in progenitor cells to stimulate regeneration. It has a good safety profile and minimal manipulation requirements.

The AMT® procedure is based on the **Rigenera® technology**, which has been used worldwide to stimulate and enhance self-regenerative processes for multiple conditions, such as wound healing and androgenetic alopecia, as well as being used for the treatment of osteochondral lesions and knee chondropathy.

Objective: to determine the clinical effect and outcomes of the AMT® procedure in patients with mild to moderate knee OA.

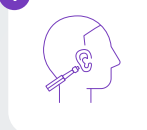
METHODS



Age range: 37–84 years
Patient sample: Grade 1–3 (8 subjects) and 3–4 (2 subjects) of OA in the Kellgren-Lawrence scale

AMT PROTOCOL

1



Three 2.5-mm auricular concha cartilage biopsies under local anesthesia

2



Mechanical disaggregation in Rigeneracons® RS in 4 mL saline to obtain an injectable micrograft suspension.

3



Single intra-articular injection into the external femorotibial compartment under sterile conditions

ASSESSMENTS

Baseline

1 month

6 months

12 months

- MRI and X-ray characterization
- KOOS questionnaire

- KOOS questionnaire
- Clinical evolution

- KOOS questionnaire
- Clinical evolution

- Clinical evolution
- Safety analysis

You can find all the information related to this poster in the following article:



Tsoukas D, Muntean I, Simos C, Sabido-Vera R. Prospective Observational Study of a Non-Arthroscopic Autologous Cartilage Micrografting Technology for Knee Osteoarthritis. Bioengineering. 2023; 10(11):1294. <https://doi.org/10.3390/bioengineering10111294>

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RESULTS

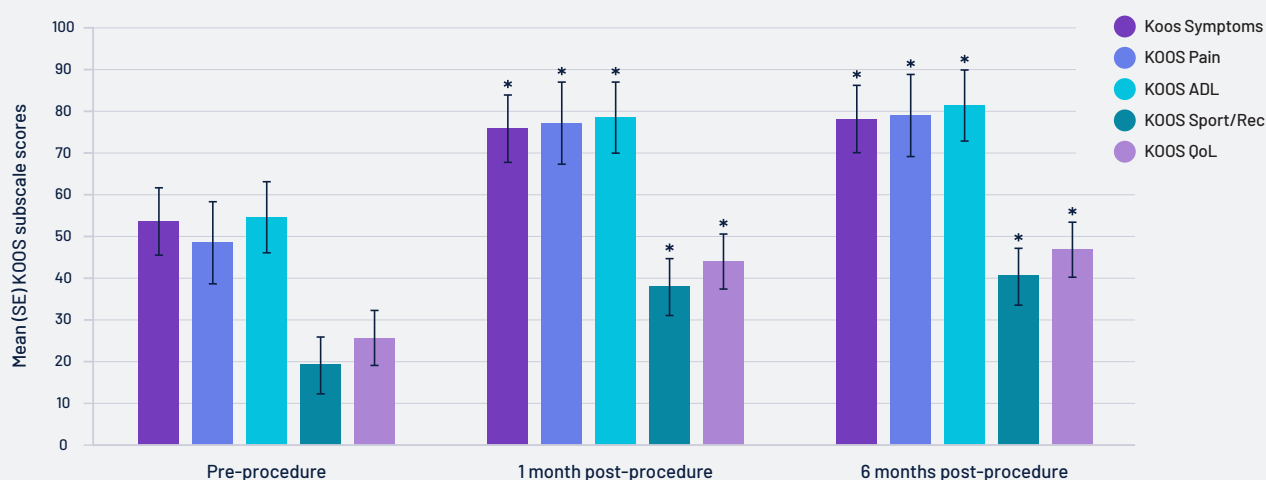
MRI and X-ray findings (baseline)

- MRI revealed subchondral bone edema, chondropathy of the patella, and medial compartment narrowing.
- X-ray revealed the presence of osteophytes and medial compartment narrowing.

Clinical evolution

- All 10 procedures were successful with **pain resolution or reduction** and recovery of daily activities in every patient.
- **Mobility improved** as early as 3 weeks.
- Patients reported return to cycling, running, and low-intensity basketball within 2–3 months in some cases.
- Physical exam at 1 and 6 months showed steady improvement in instability, pain, swelling, locking, stair climbing, and squatting in all patients.

KOOS outcomes



Safety

Donor ear: complete healing within 1 week, no stitches, no infections or “cauliflower ear.”

Joint: no adverse events reported; 12-month follow-up showed continued good mobility with minimal or no pain in all patients.

DISCUSSION & CONCLUSIONS

- The current series shows **rapid, sustained symptom and function improvement** after a single, minimally invasive AMT[®] injection in early-moderate OA, complementing prior in vitro, animal and early clinical data on cartilage micrografts.
- One intra-articular injection of autologous auricular cartilage micrografts using AMT[®] appeared **clinically effective and well tolerated** for early-moderate knee OA over 12 months in this uncontrolled cohort.
- It should be further studied in a larger randomized controlled trials with longer follow-up and imaging endpoints

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