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Title: Long-term Clinical Outcomes of One-Stage Cartilage Repair in the Knee Using Hyaluronic Acid-based Scaffold with Bone Marrow Aspirate Concentrate (HA-BMAC): Thirteen Year Follow-up.

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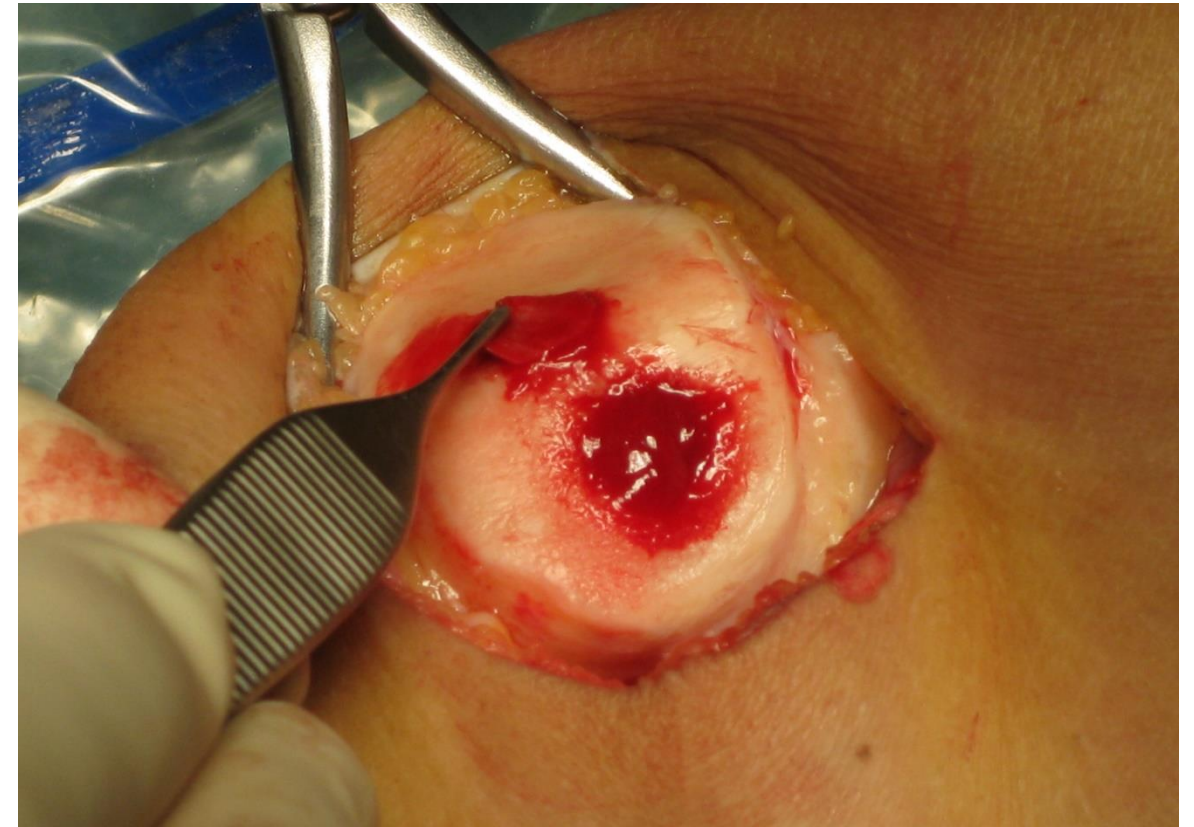
Disclosures:

- Dr. Alberto Gobbi is Scientific Consultant for Anika Therapeutics
- Dr. Alberto Gobbi and co-authors have not received any:
 - Research and educational support
 - Royalties and stock options
 - Other support



Aim

The aim of this study is to investigate the long-term outcomes of **one-step cartilage repair using a hyaluronic acid-based scaffold combined with bone marrow aspirate concentrate (HA-BMAC)** in treatment of full-thickness cartilage lesions of the knee.



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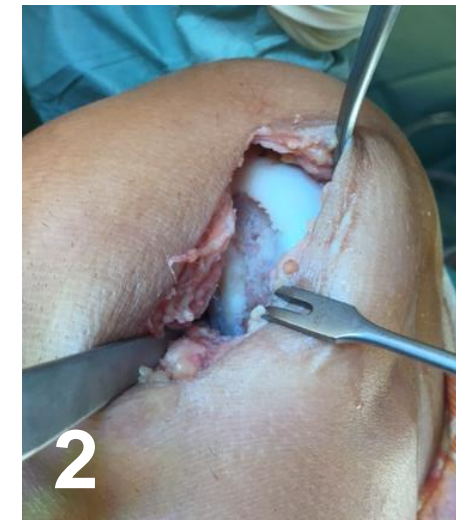
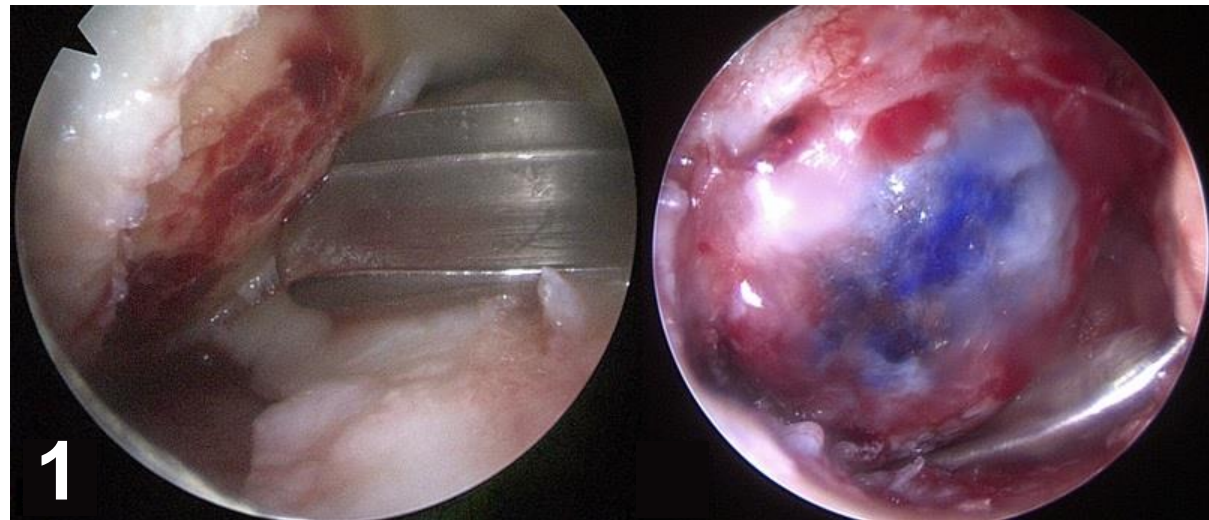
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Methods

- **Twenty-two patients** (mean age: 48.5 years) were treated for **full-thickness cartilage lesions** in the knee and then prospectively followed for a **mean duration of 13 years** (range 10 - 15 years).
- Median cartilage lesion size was **6.5 cm²** (range, 2-27 cm²).
- Clinical outcomes were examined using patient reported scoring system with the **Knee Injury and Osteoarthritis Outcome Score (KOOS)**.
- An analysis comparing preoperative and postoperative scores was performed and also evaluating patient age, lesion size, number of treated lesions and concurrent treatment with associated procedures.

Depending on the location of the lesion the procedure may be done through arthroscopy (1) or arthrotomy (2)



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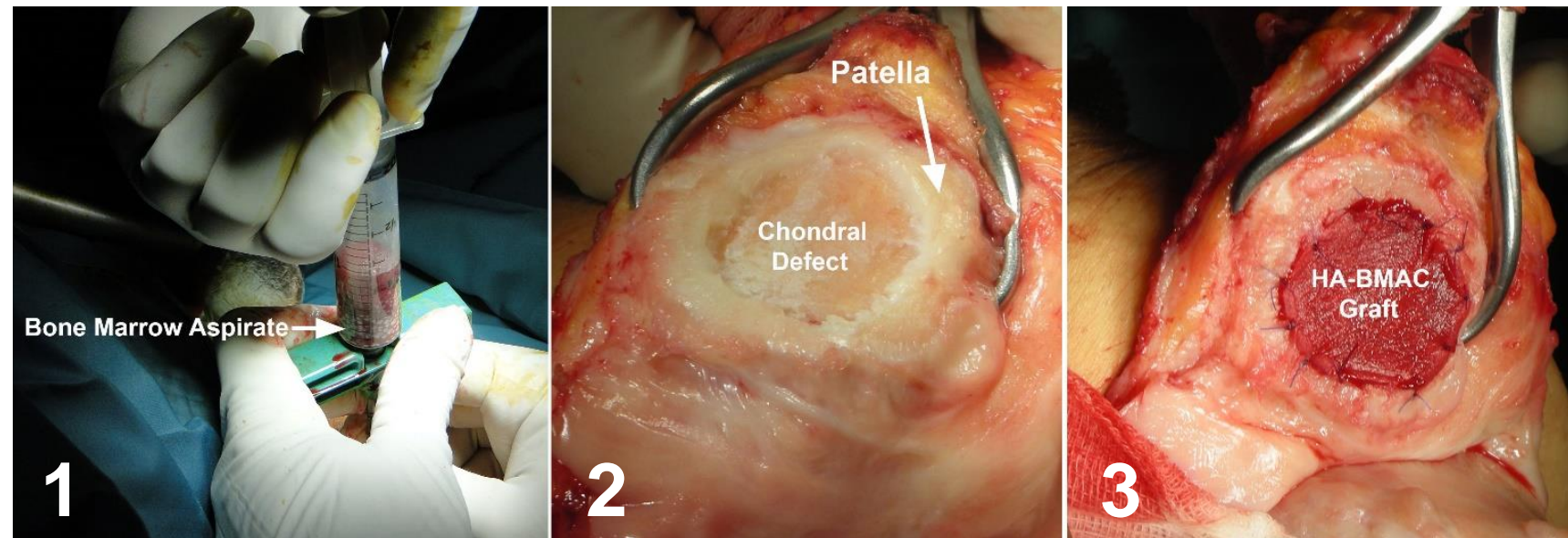


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Methods

Step by step procedure:

1. Aspiration of Bone marrow from ipsilateral iliac crest **(1)**
2. Preparing the defect (loose cartilage is removed, vertical walls are made around the periphery of the defect with special chondrectomes) **(2)**
3. Removal of calcified cartilage layer without damaging the subchondral bone plate
4. Measuring the defect with aluminum foil template to size the hyaluronic acid-based scaffold
5. Bone marrow is centrifuged and mixed with Batroxobin (Plateltex®act-Plateltex S.R.O. Bratislava, SK) to create a clot
6. The hyaluronic acid-based scaffold and clot are combined to create the HA-BMAC
7. HA-BMAC is placed on the lesion **(3)**



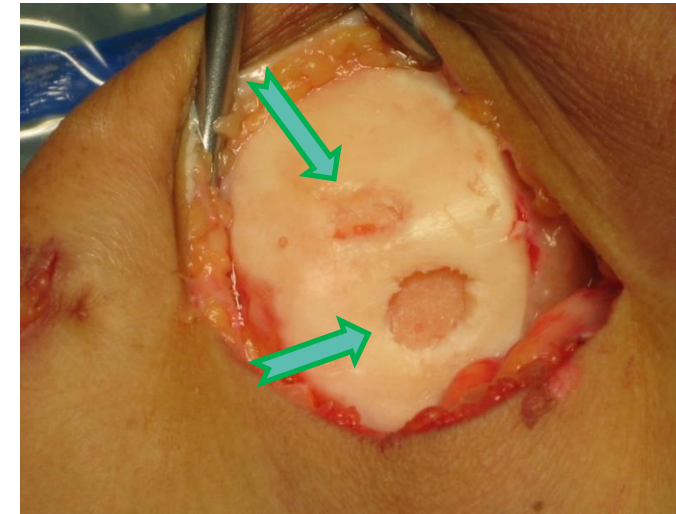
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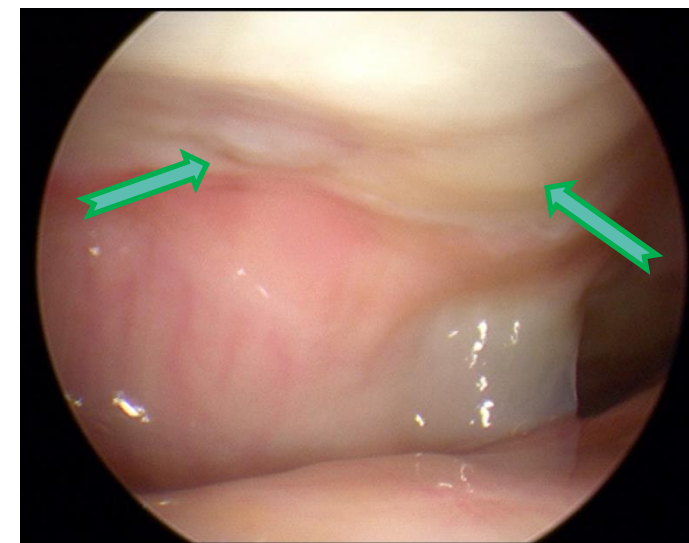
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Results

- Twenty one patients were prospectively followed for a mean duration of 13 years, one patient loss to follow up due to death.
- At final follow-up the median KOOS subset scores were pain - 80,33, symptoms - 80,05, activities of daily living - 85,29, sports - 70,38 and quality of life - 74,86.
- All scores were significantly increased at final follow-up ($p < 0.001$) compared to preoperative values. Similar median outcome scores were revealed after classifying patients by age, lesion size, treatment of multiple lesions, treatment of multiple knee compartments, and treatment by concomitant procedures.
- There were no complications reported. No correlation was identified between body mass index or lesion size and outcome scores.



Before HA-BMAC procedure



Second look at 6 years after HA-BMAC



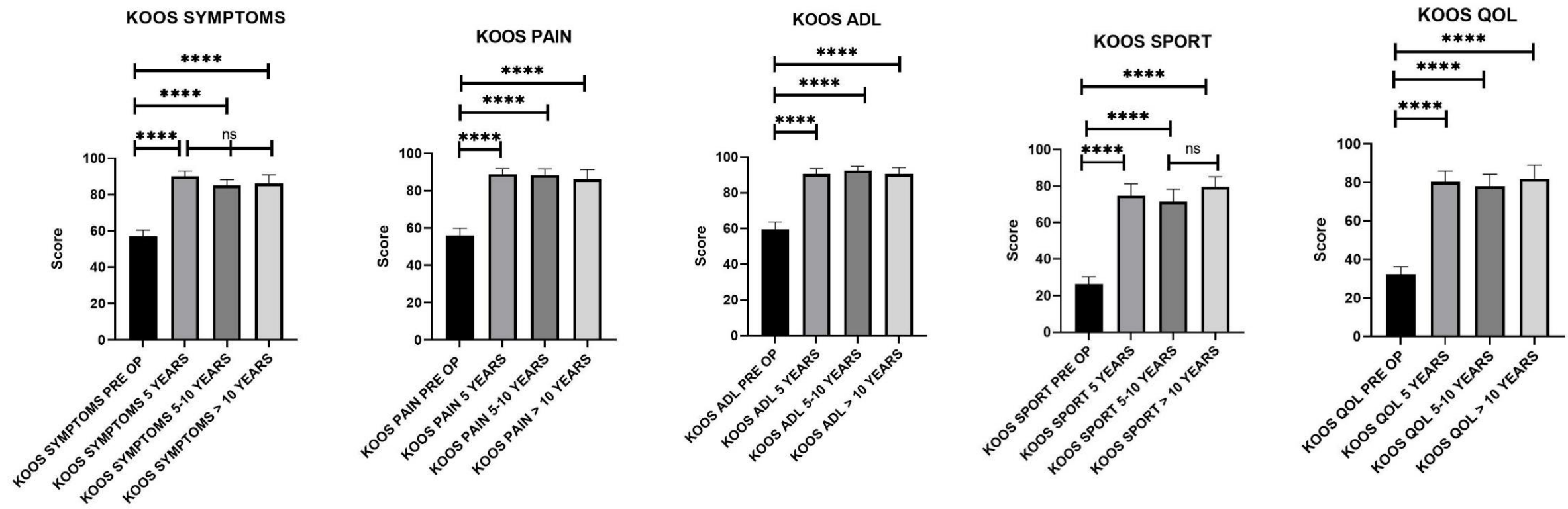
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KOOS score pre-op, at 5 years, 5-10 years and at final follow-up



Conclusion

- In conclusion the treatment of full-thickness cartilage lesion in the knee using a hyaluronic acid-based scaffold with activated bone marrow aspirate concentrate has **good to excellent clinical outcomes at long-term follow-up.**
- The repair with HA-BMAC leads to comparatively successful long-term outcomes in the treatment of small or large lesions, single or multiple lesions and lesions in 1 or 2 compartments but also in cases with associated lesions.
- **Good clinical outcomes** can be expected in patients **over 45 years of age**, but outcomes may be comparatively more successful in younger patients.



References:

1. Gobbi, A., & Whyte, G. P. (2019). Long-term Clinical Outcomes of One-Stage Cartilage Repair in the Knee With Hyaluronic Acid-Based Scaffold Embedded With Mesenchymal Stem Cells Sourced From Bone Marrow Aspirate Concentrate. *The American Journal of Sports Medicine*, 47(7), 1621–1628. <https://doi.org/10.1177/0363546519845362>
2. Gobbi, A., Karnatzikos, G., & Kumar, A. (2014). Long-term results after microfracture treatment for full-thickness knee chondral lesions in athletes. *Knee Surgery, Sports Traumatology, Arthroscopy: Official Journal of the ESSKA*, 22(9), 1986–1996. <https://doi.org/10.1007/s00167-013-2676-8>
3. Gobbi, A., Kon, E., Berruto, M., Francisco, R., Filardo, G., & Marcacci, M. (2006). Patellofemoral full-thickness chondral defects treated with Hyalograft-C: a clinical, arthroscopic, and histologic review. *The American Journal of Sports Medicine*, 34(11), 1763–1773. <https://doi.org/10.1177/0363546506288853>
4. Gobbi, A., Karnatzikos, G., Scotti, C., Mahajan, V., Mazzucco, L., & Grigolo, B. (2011). One-step cartilage repair with bone marrow aspirate concentrated cells and collagen matrix in full-thickness knee cartilage lesions: Results at 2-year follow-up. *Cartilage*, 2(3), 286–299. <https://doi.org/10.1177/1947603510392023>
5. Gobbi, A., Karnatzikos, G., & Sankineani, S. R. (2014). One-step surgery with multipotent stem cells for the treatment of large full-thickness chondral defects of the knee. *The American Journal of Sports Medicine*, 42(3), 648–657. <https://doi.org/10.1177/0363546513518007>
6. Gobbi, A., Chaurasia, S., Karnatzikos, G., & Nakamura, N. (2015). Matrix-Induced Autologous Chondrocyte Implantation versus Multipotent Stem Cells for the Treatment of Large Patellofemoral Chondral Lesions: A Nonrandomized Prospective Trial. *Cartilage*, 6(2), 82–97. <https://doi.org/10.1177/1947603514563597>
7. Gobbi, A., Scotti, C., Karnatzikos, G., Mudhigere, A., Castro, M., & Peretti, G. M. (2017). One-step surgery with multipotent stem cells and Hyaluronan-based scaffold for the treatment of full-thickness chondral defects of the knee in patients older than 45 years. *Knee Surgery, Sports Traumatology, Arthroscopy: Official Journal of the ESSKA*, 25(8), 2494–2501. <https://doi.org/10.1007/s00167-016-3984-6>
8. Whyte, G. P., Herman, K., & Gobbi, A. (2021). One-Step Cell-Based Cartilage Repair in the Knee Using Hyaluronic Acid-Based Scaffold Embedded with Mesenchymal Stem Cells Sourced from Bone Marrow Aspirate Concentrate (HA-BMAC). *Lower Extremity Joint Preservation*, 47–54. https://doi.org/10.1007/978-3-030-57382-9_5

