

Mid-term Results of Particulated Juvenile Articular Cartilage Allograft Transplantation to the Knee

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Background

- Full-thickness chondral lesions of the knee in the young, active patient remain a concern
- Treatment options range from marrow stimulation to autologous or allograft transplantation
- DeNovo NT (Zimmer) is a juvenile particulated cartilage allograft
- In use since 2007 for defects of knee, talus, talocalcaneal joint, elbow, shoulder and hip
- Relatively few reports of use in the knee in the literature
- No studies exist with outcomes greater than 2 years

Purpose

To present clinical and radiographic outcomes of DeNovo implantation for focal chondral defects of the knee at 5 years post-operatively

Methods

- All patients at our institution who underwent DeNovo transplantation between 2009 and 2014
- A preoperative MRI and at least one MRI at a minimum of 6 months post-op
- Two musculoskeletal radiologists evaluated these using the MOCART (Magnetic Resonance Observation of Cartilage Repair Tissue) score
- Clinical outcomes determined with the modified Lysholm Knee Scale

Outcomes

- 26 patients (28 knees); 17M:9F; Mean age @ surgery: 33.7 (21-49 years)
- 34 Outerbridge grade IV cartilage lesions identified (21 femur, 13 patella; 2 knees w/ 3 lesions, 1 knee w/ 2)
- Average cross sectional area: **3.075 cm²**
- Associated: patellar realignment (16), ACL reconstruction (7), partial meniscectomy (9), loose body removal (4)
- 12 returns to OR (2 MUA only, 9 arthroscopic debridement of repair tissue overgrowth, 1 for both)

Outcomes

- Mean MOCART score was 54.7 (range 20-85).
- 70% of images showed complete fill of defect
- 60% w/ full integration at border zone, intact surface repair tissue.
- 30% isointense to native cartilage on T2 sequencing

- Average pre-op Lysholm: 50.30 (29.17-68.76).
- At mean 4.4 years post-operatively, Lysholm improved to 83.94 (70.84-100.01)
- Statistically significant ($p=0.018$)

Conclusion

- DeNovo NT can be an excellent option for single-stage allograft cartilage restoration
- This is the first study to demonstrate clinical and radiographic improvement at 5 years post-operatively
- Trend towards improved MOCART scores with time
- Clinical outcomes are maintained at 5+ years from surgery