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Paper #5

Treatment of Painful Irreparable Partial Meniscal Defects With a Polyurethane Scaffold: Mid-term Clinical Outcome and Survival Analysis

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Summary:
A biodegradable, polyurethane scaffold was designed to fulfill a challenging clinical need in the treatment of patients with painful irreparable partial meniscal defects.

Abstract:
Background: A biodegradable, polyurethane scaffold was designed to fulfill a challenging clinical need in the treatment of patients with painful irreparable partial meniscal defects.
Hypothesis: The use of an acellular polyurethane scaffold for new tissue generation in irreparable partial meniscal defects provides both mid-term pain relief and improved functionality.
Study Design: Case series; Level of evidence, 4.
Methods: Fourty-four patients with irreparable partial meniscal defects (29 medial and 15 lateral) were implanted with a polyurethane scaffold (Actifit, Orteq Ltd) in a prospective, single-arm, proof-of-principle study with a minimal 5-years follow-up. Clinical outcomes were measured with visual analog scale (VAS), International Knee Documentation Committee and Knee Injury and Osteoarthritis Outcome Score (KOOS) at baseline and at 24 and 60 months of follow-up. MRI was used to evaluate the meniscal implant and cartilage status of index compartment. Kaplan-Meier time to treatment failure distributions were also performed. Removal of the scaffold, conversion towards meniscal transplant or unicompartimental/total knee arthroplasty were used as end points.
Results: The patients who participated in this study showed significant clinical improvement after surgery (mean ± SD, baseline / 24months / 60 months): VAS (56.2 ± 21.6 / 24.6 ± 22.7 / 19.3 ± 26.9) and total KOOS (206.5 ± 79.7 / 329.8 ± 108.9 / 333.6 ± 112.2). MRI evaluation of the scaffolds showed a smaller-sized implant when compared to the native meniscus with an irregular surface at 24 and 60 months of follow-up. Stable cartilage status of the index compartment at 60 months of follow-up was demonstrated in 46.7% of patients compared with baseline status. During the follow-up period 62,2% of implants survived. At final follow-up, 66.7% of the medial scaffolds were still functioning versus 53.8 % of the laterals. Seven patients were lost to follow-up (15.9%).
Conclusion: The polyurethane meniscal implant can improve knee joint function and significantly reduce pain in patients with segmental meniscus deficiency up to 5 years after implantation. Stable cartilage status of index compartment at 60 months of follow-up was demonstrated in 46.7% of patients, calling into question the chondroprotective ability of the implant. A relatively high failure rate was noticed. Long-term and randomized controlled studies are mandatory to confirm initial results and reliability of this procedure.