# Repair of cartilage defects treated by cell-free collagen type I based implant - clinical and magnetic resonance imaging results at 2-year follow-up


## Abstract

**Purpose** Several well-described techniques are available for the treatment of chondral and osteochondral defects. The aim of the study was to assess the safety and efficacy of a single-stage procedure incorporating a new cell-free collagen type I gel for the treatment of small chondral and osteochondral defects in the knee evaluated at 2 years follow-up.

**Methods** 15 patients were treated with a cell-free collagen type I gel plug of 11 mm diameter. The grafts were implanted in the debrided cartilage defect and fixed by press-fit only. The clinical outcome was assessed preoperatively and at 6 weeks, and 6, 12, and 24 months after surgery using the International Knee Documentation Committee (IKDC) score, Tegner activity scale and visual analog scale (VAS). Graft attachment rate was assessed 6 weeks postoperatively using magnetic resonance imaging (MRI). Cartilage regeneration was evaluated using the Magnetic Observation of Cartilage Repair Tissue (MOCART) score at 6, 12 and 24 months after implantation. Clinical results were correlated with MRI findings.

**Results** Six male and nine female patients were included in this study, with a mean age of 26 (range: 19–40). No complications were reported. The mean VAS values after 6 weeks and the mean IKDC patient values after 6 months were significantly improved from the preoperative values ($p = 0.005$ and $p = 0.009$, respectively). This improvement remained up to the latest follow-up. There were no significant differences between the mean pre-operative and post-operative Tegner values. Significant improvement of the mean MOCART score was observed after 12 months and remained by 24 months ($p < 0.001$). MR images showed that in 14 of the 15 patients, the graft was completely attached by 6 weeks postoperatively. At 24 months after implantation, MRI demonstrated complete filling in all cases with a mainly smooth surface, complete integration of the border zone, homogenous structure of the repaired tissue, and nearly normal signal intensity. No correlation between any variables of the MOCART score and the clinical scores was observed.

**Conclusions** The present study reveals that the new method appears to be a safe technique with both good clinical and magnetic resonance imaging results. Use of press-fit only implanted grafts of a smaller diameter leads to a high attachment rate at 24 months follow-up.