



## Paper 04

**Abstract Title:** Modern Osteochondral Allograft Transplantation: The "Gold Standard" for Femoral Condyle Cartilage Repair?

**Authors:**

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**Objectives:** Cartilage repair for femoral condyle lesions comprise the majority of the biological procedures performed in the knee joint. Treatment options have evolved but there is still uncertainty regarding longer-term clinical outcomes with current surgical techniques. The objective of this study was to evaluate outcome of osteochondral allograft (OCA) transplantation utilizing dowel type grafts for the treatment of isolated femoral condyle cartilage lesions.

**Methods:** This study comprised 187 patients (200 knees) who underwent OCA transplantation for isolated cartilage lesions on the femoral condyle between 1999 and 2014. Mean patient age was  $31.1 \pm 11.6$  years, 62.6% were male, and the medial femoral condyle was affected in 69% of the knees. For all cases, dowel technique was used with commercially available surgical instruments utilizing the minimum amount of bone necessary for fixation (modern technique). A single graft was used in 145 knees (72.5%), two grafts were used in 55 knees (27.5%). Average allograft area was  $6.3 \text{ cm}^2$  (range, 2.3 to  $13 \text{ cm}^2$ ) and graft thickness was  $6.5 \pm 1.4$  mm (cartilage and bone combined). All patients had a minimum follow-up of 2 years. Evaluation included International Knee Documentation Committee (IKDC) scores; Knee injury and Osteoarthritis Outcome Score (KOOS), and patient satisfaction. The frequency and type of further surgery was assessed. OCA failure was defined as a further surgery that involved removal of the allograft. An additional subgroup analysis on location comparing medial to lateral femoral condyle grafts was performed

**Results:** The average follow-up was 6.7 years (range, 1.9 to 16.5 years). IKDC scores improved from preoperatively to latest follow-up for pain (5.5 to 2.7), function (3.4 to 7.3) and total scores (43.7 to 76.2) (all  $p < 0.001$ ). KOOS pain and activities of daily living scores improved from 66.5 to 85.3 and 74.5 to 91.1, respectively ( $p < 0.001$ ). At latest follow-up, outcome scores did not differ by location on the femoral condyle (Table 1). The majority of patients (89%) reported satisfaction with the results of the OCA transplantation. Further surgery was required in 52 knees (26%), of which 16 knees (8% of entire cohort) were defined as OCA failures (4 OCA revisions, 1 arthroscopy, 6 unicompartmental knee arthroplasties, and 5 total knee arthroplasties). The median time to failure was 4.9 years (range, 0.3 to 16.1 years). Survivorship of the OCA was 95.6% at 5 years and 91.2% at 10 years (Figure 1)

**Conclusion:** OCA transplantation utilizing a modern technique is a valuable procedure for the treatment of femoral condyle cartilage lesions, resulting in significant improvement in clinical scores, high patient satisfaction, and low reoperation and clinical failure rates. These results are similar or better than any other cartilage repair procedure for isolated femoral condyle lesions



Table 1. Outcomes among 184 knees with grafts in situ at latest follow-up

Measure	All knees N=184	Medial N=125	Lateral N=59	p-value*
IKDC				
Pain	2.7 ± 2.4	2.6 ± 2.4	3.1 ± 2.5	0.176
Function	7.3 ± 2.2	7.4 ± 2.2	7.2 ± 2.2	0.364
Total	76.2 ± 18.7	76.9 ± 19.2	74.8 ± 17.5	0.312
KOOS				
Symptoms	82.5 ± 15.5	84.0 ± 14.5	79.7 ± 17.2	0.251
Pain	85.3 ± 16.3	86.9 ± 15.6	82.5 ± 17.3	0.103
Activities of daily living	91.1 ± 14.7	91.8 ± 14.0	89.8 ± 16.0	0.535
Sports / recreation	70.2 ± 26.4	73.6 ± 24.0	64.9 ± 29.4	0.199
Quality of life	62.1 ± 24.3	64.5 ± 24.9	57.7 ± 22.6	0.113
Satisfaction				
Extremely satisfied	67.7%	70.5%	61.5%	0.260
Satisfied	21.3%	19.6%	25.0%	
Somewhat satisfied	5.5%	4.5%	7.7%	
Somewhat dissatisfied	3.0%	1.8%	5.8%	
Dissatisfied	2.4%	3.6%	0.0%	

Results are shown as mean ± standard deviation or percentage.

IKDC, International Knee Documentation Committee; KOOS, Knee injury and Osteoarthritis Outcome Score

\*P-value for comparison of medial vs lateral

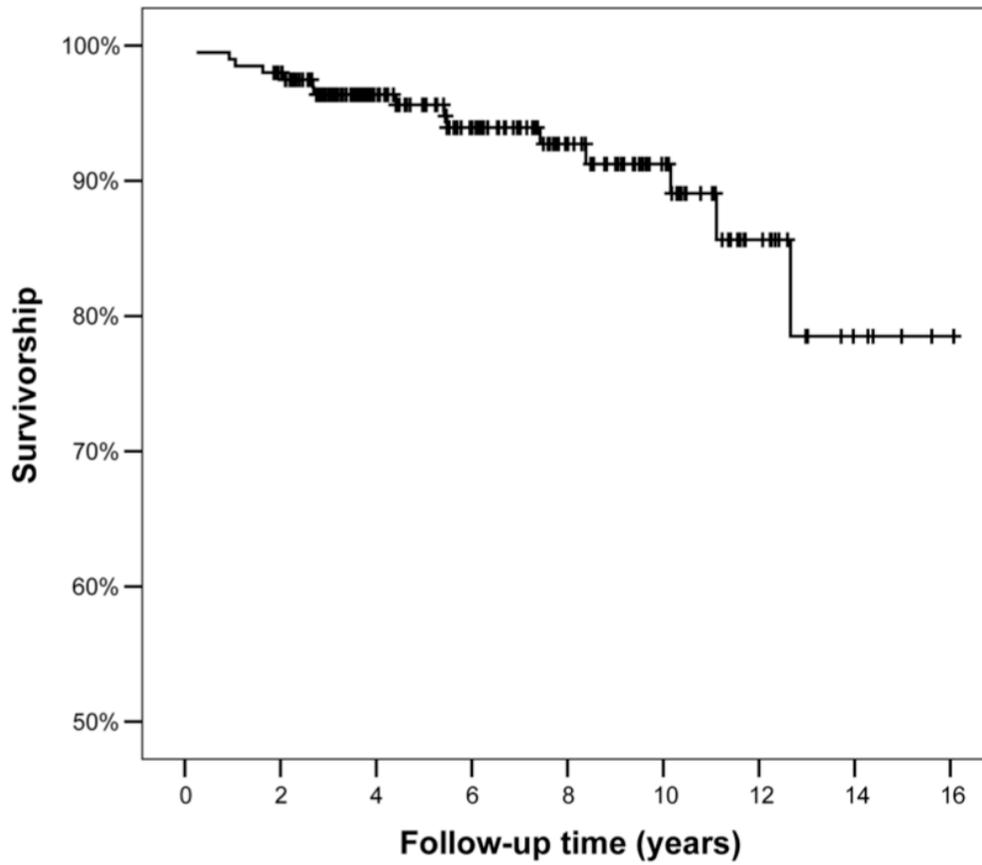


Figure 1. Kaplan-Meier survivorship with revision of the allograft or conversion to arthroplasty as the endpoint