

Mosaicplasty/Osteochondral Autograft Transfer Remains a Durable Solution for Symptomatic Chondral Defects of the Knee: Two to Ten-Year Follow-up Analysis

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INTRODUCTION: Little to no long-term data exist following mosaicplasty/osteochondral autograft transfer (OATS). The purpose was to assess the long-term outcomes of osteochondral autograft transfer in terms of patient-reported outcomes, reoperation rates, and conversion to arthroplasty.

METHODS: Between September 1999 through April 2021, 63 patients who underwent mosaicplasty were queried from an institutional cartilage registry with patient-reported outcome measures (PROMs), including the 36-Item Short Form Survey (SF-36), the Knee Outcome Survey Activities of Daily Living Scale (KOS-ADL), and the International Knee Documentation Committee Subjective Knee Form (IKDC) for OATS surgical procedures from the practice of six fellowship-trained knee specialists. Inclusion criteria were patients treated with mosaicplasty with preoperative PROMs and minimum two-year follow up. Exclusion criteria were prior ipsilateral surgical procedures, advanced osteoarthritis, revision cartilage procedures, inflammatory arthropathy, or loss to follow up. The preoperative and minimum two-year clinical outcomes with respect to the SF-36 score, reoperation rates, and conversion to arthroplasty were analyzed.

RESULTS:

Mean age was 27.4 ± 12.4 years and 20/63 (31.7%) were female with a mean follow up of 5.7 ± 3.2 years. The mean lesion size was 2.3 ± 1.6 cm² requiring a mean of 2.2 ± 1.3 autograft plugs. Mean IKDC and KOS-ADL increased from 46.4 ± 15.1 and 64.4 ± 16.3 preoperatively to 70.4 ± 22.6 and 83.8 ± 11.7, respectively, at 10-year follow up. A total of 69% and 67% surpassed the MCID and SCB1,2, respectively, for IKDC at 2-year follow up; similarly, 60% and 33.3% surpassed MCID and SCB, respectively, for IKDC at 10-year follow up. The overall reoperation rate was 28.6% at a mean of 43.8 years with partial meniscectomy, chondroplasty, and loose body removal most commonly performed. Two patients required arthroplasty conversion.

DISCUSSION AND CONCLUSION: OATS remains a durable knee preserving cartilage repair operation with low incidence of reoperation 10 years following index procedure.

Table 1. Demographic Data for Osteochondral Autograft Transfer/Mosaicplasty

	OATS/Mosaicplasty (n=14)
Male/Female, n	40/20
Mean Age at surgery, yrs	27.4 ± 12.4
Mean Follow-up, yrs	5.7 ± 3.2
Mean Body Mass Index, kg/m ²	25.5 ± 5.0
Right/Left Knee, n	32/31
Patellofemoral joint %	15/63 (23.8%)

OATS = Osteochondral Autograft Transplantation

Table 2. Osteochondral Lesion Characteristics

Mean Treated Area (mm ²)	2.3 ± 1.6
Mean Number Autograft Plugs	2.2 ± 1.3
Lesion Location	
MFC	30/63 (47.6%)
LFC	17/63 (27.0%)
Patella	11/63 (17.5%)
Trochlea	5/63 (7.9%)
Donor Site Location	
Trochlea	
Proximal Medial	9/68 (13.2%)
Proximal Lateral	30/68 (44.1%)
Unspecified Laterality	2/68 (2.9%)
Notch	19/68 (27.9%)
MFC	1/68 (1.47%)
LFC	8/68 (11.8%)
Donor Site Backfill %	43/63 (68.3%)
Concomitant Procedure (%)	21/63 (33.0%)

MFC=medial femoral condyle, LFC = lateral femoral condyle

Table 3. Patient Outcomes

	Baseline	2 Years	5 Years	10 Years
SF-36				
Physical Functioning	58.1 ± 23.1	83.3 ± 16.2	85.1 ± 22.2	80.3 ± 23.0
Role Limitations - Physical Health	53.8 ± 35.0	88.1 ± 22.6	90.0 ± 22.0	83.3 ± 33.2
IKDC	46.4 ± 15.1	76.1 ± 19.0	78.0 ± 18.0	70.4 ± 22.6
% Achieve MCID		22/32 (68.8%)	18/23 (78.2%)	9/15 (60%)
% Achieve SCB		8/32 (25.2%)	14/23 (60.9%)	5/15 (33.3%)
KOS-ADLx	64.4 ± 16.3	83.2 ± 12.7	85.1 ± 11.8	83.8 ± 11.7
% Achieve MCID		24/36 (66.7%)	22/32 (68.8%)	9/15 (60%)
% Achieve SCB		24/36 (66.7%)	22/32 (68.8%)	9/15 (60%)
Overall Reoperation Rate (%)		18/63 (28.6%)		
Overall Conversion to TKA (%)		2/63 (3.2%)		
Mean time to Reoperation (yrs)		3.67 ± 6.2		

SF-36 = 36-Item Short Form Survey, MARS = Marx Activity Rating Scale

IKDC = International Knee Documentation Committee, KOS-ADL = Knee Outcome Survey