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# Comparative Outcomes of Autologous Chondrocyte Implantation and Osteochondral Allograft Transplantation with Patellar Realignment for Patellar Instability with Associated Cartilage Defects

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## INTRODUCTION

Articular cartilage pathology can stem from a spectrum of etiologies including osteochondritis dissecans, avascular necrosis, degenerative joint disease, and injury resulting from as recurrent instability of the patella.

The purpose of this study was to identify differences in clinical and functional outcomes in patients treated with either autologous chondrocyte implantation (ACI) or osteochondral allograft (OCA) transplantation for chondral defects with concomitant medial patellofemoral ligament (MPFL) reconstruction and tibia tubercle osteotomy (TTO).

## MATERIALS & METHODS

Patients who underwent ACI or OCA transplantation with concomitant MPFL reconstruction and TTO were identified.

Outcome measures included the Knee Injury and Osteoarthritis Outcome Score for Joint Replacement (KOOS Jr.), International Knee Documentation Committee (IKDC) evaluation, and Short Form Health Survey (SF-12) physical scores.

Defect location, size, complications, and rate of subsequent surgery were determined.

## FIGURES and TABLES

	ACI N=13	OCA N=10	P value
<b>Number of Defects</b>			
<b>Time between arthroscopy and surgery (Days)</b>	88.9 (36.2)	190 (205)	.319
<b>Largest Diameter of defect (mm)</b>	19.4 (4.82)	22.0 (5.87)	.288
<b>Area (cm<sup>2</sup>)</b>	3.34 (1.88)	4.03 (1.56)	.351
<b>Thickness:</b>			1
<b>Partial Thickness</b>	1 (7.69%)	1 (10.0%)	
<b>Full Thickness</b>	12 (92.3%)	9 (90.0%)	
<b>Defect Outerbridge Classification</b>			1
<b>3</b>	6 (46.2%)	4 (40.0%)	
<b>4</b>	7 (53.8%)	6 (60.0%)	

Table 1. Index arthroscopy chondral defect

	ACI N=13	OCA N=10	P value
<b>Number of Defects</b>			
<b>Time between arthroscopy and surgery (Days)</b>	88.9 (36.2)	190 (205)	.319
<b>Largest Diameter of defect (mm)</b>	19.4 (4.82)	22.0 (5.87)	.288
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Table 2. Index arthroscopy chondral defect

	ACI N=11	OCA N=7	P Value
<b>KOOS Jr</b>	85.1 (13.8)	63.7 (19.7)	<b>.031*</b>
<b>IKDC</b>	74.2 (15.3)	51.2 (28.2)	.077
<b>SF-12</b>	54.1 (3.53)	42.6 (9.21)	<b>.007*</b>
<b>Follow-Up Time (days)</b>	1855 (722)	1447 (698)	.254

Table 3. Outcome scores by patient, bold indicates significance

## RESULTS

Defects had comparable baseline characteristics in each group (ACI vs OCA) including size measured during index arthroscopy (3.34 cm<sup>2</sup> vs 4.03 cm<sup>2</sup>, P = .351),

Outerbridge classification (54.8% grade 4 vs 60.0% grade 4, P = 1.000), and AMADEUS score (47.1 vs 58.6, P = .298).

Postoperative outcomes were comparable including revision rate (15.4% vs 10.0%, P=1.000) and 2-year IKDC scores (74.2 vs 51.2, P = .077).

ACI did have significantly higher 2-year KOOS Jr. (85.1 vs 63.7, P = .031) and SF-12 scores (54.1 vs 42.6, P = .007) compared to OCA.

## DISCUSSION

ACI or OCA transplantation for chondral defects with concomitant MPFL reconstruction and TTO can be safely performed in an outpatient setting with functional and clinical outcomes being comparable.

Functional scores including KOOS Jr. and SF-12 were shown to be significantly higher at 2-year follow-up in the ACI cohort, however, postoperative IKDC scores, rates of revisions, and clinical evaluations were comparable between cohorts.

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