Does Concomitant Meniscus Allograft Transplantation Influence Outcomes of Osteochondral Allograft Transplantation? A Comparative Matched-Pair Analysis

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INTRODUCTION:

Background: Osteochondral allograft transplantation (OCAT) is an accepted knee joint preserving treatment strategy for focal osteochondral lesions that is often conducted in combination with meniscus allograft transplantation (MAT). Despite its frequent and simultaneous utilization, there remains a paucity in literature reporting on outcomes and failure rates after concomitant procedures.

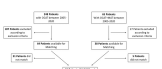
Purpose: To determine 1) the mid-term clinical success rate after OCAT with MAT in comparison to a matched-pair cohort undergoing isolated MAT, 2) if patient specific and procedural variables influence the risk of failure, and 3) patient-reported outcome measures over time.

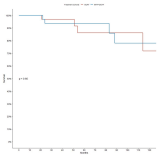
METHODS: A single-center matched-pair cohort study was conducted investigating outcomes in patients who underwent OCAT of the medial or lateral femoral condyle with and without MAT between 2004 and 2020. Patients were matched 1:1 by age (±5 years), gender (M/F), BMI (±5), and grouped Kellgren and Lawrence grade (0,1/2,3). The minimum follow-up time was 2 years. Radiographic variables (*ICRS* grade and *Kellgren and Lawrence* grade) were assessed preoperatively and at follow up. Subjective patient-reported outcome measures (PROMs) (*Lysholm* score; *KOOS* (knee disability and osteoarthritis outcome score) including subscores; *IKDC* (International Knee Documentation Committee) score, and *VAS* (visual analog score)) were collected preoperatively and at follow up. Clinical failure was defined as revision surgery due to graft failure or conversion to TKA (total knee arthroplasty). Patient-reported, clinical, and radiographic outcomes were compared between groups.

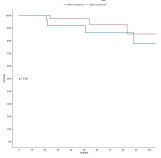
RESULTS: A total of 66 patients (33 treated with isolated OCAT, 33 treated with OCAT and MAT) aged at a mean ± SD of 26.3 ± 8.7 years (61% male) met inclusion criteria. The follow-up time was 5.6 ± 3.3 years (minimum, 2 years). Both cohorts showed no difference in KL grade postoperatively (P = .59). There was a significantly higher ICRS grade detected at follow up in the OCAT+MAT group (2.81 ± 1.10) compared to the OCAT group (2.04 ± 0.96) (P < .05). There were no significant differences between the groups regarding reoperation rate (OCAT: n=6; OCAT+MAT: n=13, P = .116), time to reoperation (OCAT: 46.67 ± 47.27 months vs. OCAT+MAT: 28.08 ± 30.16 months, P = .061), and failure rate (OCAT: n = 4 [12.1%] vs. OCAT + MAT: n = 5 [15.2%], P = .66). In the OCAT+MAT group, increased tibial slope conferred a 1.65-fold increase in the hazards for failure over decreased slope (HR 1.65, 95% CI 1.10 – 2.50, p<.05. Patient-reported outcome scores were significantly improved at final follow up compared to preoperative status. No significant differences were seen between groups with respect to subjective IKDC, Lysholm, Tegner, and KOOS results, except for the KOOS symptoms subscale sore, which was significantly higher in the OCAT+MAT group as compared to the OCAT group (mean difference 14.6, P < .05) and did exceed the minimal clinically important difference threshold of 10.7.

DISCUSSION AND CONCLUSION:

Long-term results after isolated OCAT and OCAT + MAT show high rates of healing and sustainable subjective improvement of knee function and quality of life. A survival rate of 87% was noted at a mean follow up of 5.6 years. Both cohorts did not significantly differ in terms of failure rate and patient-reported outcomes. These results imply that isolated OCA is an efficient joint preserving treatment that can be combined with MAT in well selected patients with meniscal insufficiency without negative influence on global clinical outcomes.







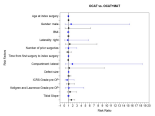


TABLE 1
Matching Criteria Utilized to Match Patients Undergoing OCA with and without MAT[*]

Variables	Range
Age	± 5 years
Gender	Male/Female
Pre-operative Kellgren&Lawrence Grade grouped	0,1/2,3
BMI	± 5

*n=33 patients per group, BMI, body mass index; MAT, meniscus allograft transplantation; OCA, osteochondral allograft