Similar Outcomes following Medial Femoral Condyle Osteochondral Allograft Transplantation in Patients with Varus and Non-Varus Alignment

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INTRODUCTION: Fresh osteochondral allograft (OCA) transplantation is an effective technique for the treatment of focal chondral and osteochondral defects in the knee. Long-term survivorship and outcomes of cartilage repair surgery are affected by factors such as patient age, body-mass index, etiology of damage, previous surgical procedures, and degree of degenerative change. Coronal plane alignment assessment is essential in the treatment of knee cartilage pathologies, as deviations may lead to elevated contact pressures in the affected compartment and subsequent repair tissue. Previous studies advocate for utilization of offloading osteotomies when performing cartilage repair procedures in the setting of varus or valgus malalignment. The magnitude of impact may be more pronounced for pure chondral grafts, such as autologous chondrocyte implantation, in comparison to osteochondral grafts. The purpose of this study is to evaluate how varus malalignment affects graft survival and patient-reported outcomes (PROs) following isolated OCA transplantation of the medial femoral condyle (MFC).

METHODS: A total of 81 patients who underwent isolated, primary OCA transplantation of the MFC between 2005 and 2019 with standing alignment radiographs were identified. Data were collected using a prospective, single-surgeon cartilage registry with minimum 2-year follow up. Patients with previous or concomitant osteotomy were excluded. Coronal plane alignment was evaluated by two independent reviewers utilizing standing hip to ankle radiographs. Reoperations following the OCA were captured, and OCA failure was defined as removal of graft or conversion to arthroplasty. PROs were measured pre- and postoperatively using IKDC, KOOS, and overall patient satisfaction scores.

RESULTS: The study cohort included 48 patients with varus alignment and 33 patients with non-varus (neutral or valgus) alignment. Mean mechanical axis alignment for varus patients was 3.7±1.7 degrees. The mean age was 31 years and 68% were male. Patients with varus alignment were older than patients with non-varus alignment (33 and 27 years respectively, p=0.030). There were no differences in patient gender, BMI, diagnosis, number of grafts, total graft area, or previous surgery between groups. Mean follow up was 5.8 years. Graft survival was similar between patients with varus alignment (97.9%) and non-varus alignment (93.9%). Though patients with non-varus alignment had higher rates of reoperation (24.2% vs. 12.5%), this was not statistically significant. Patients with varus alignment were more likely to be satisfied or extremely satisfied with their outcome than patients with non-varus alignment (90.9% vs. 77.3%). Additionally, non-statistically significant trend towards greater total IKDC score and KOOS sub-scores were seen in patients with varus alignment.

DISCUSSION AND CONCLUSION: Patients undergoing isolated OCA transplantation of the MFC have high rates (>90%) of graft survival and significant improvements in pain and function. Patients with mild varus malalignment were found to have postoperative outcomes similar to patients with neutral or valgus alignment.