

Return to Sports After Osteochondral Allograft Transplantation for Knee OCD: A CT-Based Assessment of Osseous Integration

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INTRODUCTION: Osteochondritis dissecans (OCD) often necessitates osteochondral allograft transplantation (OCA) in adolescent patients, but return-to-sport (RTS) outcomes including timing of return to sport remain variable with most surgeons waiting 6 months post-operatively prior to clearing athletes for full sports participation. Although magnetic resonance imaging (MRI) is commonly used postoperatively, its limitations in evaluating subchondral bone integration have prompted exploration of alternative imaging modalities (including CT imaging). The purpose of this study was to evaluate the utility of postoperative computed tomography (CT) imaging in assessing graft incorporation and its association with RTS readiness in adolescent patients undergoing knee OCA.

METHODS: A retrospective review was performed on adolescent patients who underwent knee OCA for symptomatic chondral lesions with postoperative CT imaging. Demographics, surgical data, and imaging features were collected, including graft details from the tissue bank and preoperative MRI. A CT scan was routinely ordered at the 3 month clinic visit and was typically obtained within the next 4 weeks pending insurance approval. If the graft was incorporated, patients were allowed to progress to all activities. CT scans were scored using the Assessment of CT Osteochondral Allograft (ACTOCA) system. Patient-reported outcomes (PROs), including the Single Assessment Numeric Evaluation (SANE), pain level, satisfaction, and Pediatric International Knee Documentation Committee (Pedi-IKDC) scores, were collected when available. RTS clearance was the primary outcome.

RESULTS: Twenty patients (15 males; mean age 16.3 ± 2.5 years) underwent 21 OCAs with postoperative CT imaging. Mean follow-up was 1.3 ± 1.1 years. Grafts were located in 14 femoral condyles and 7 trochlea. Eight patients had prior arthroscopy. Mean OCD lesion width (coronal) was 16.3 ± 4.3 mm and length (sagittal) was 20.4 ± 10.0 mm. Six procedures used the “snowman” technique. Mean preparation graft diameter was 16.8 ± 3.8 mm and after preparation depth was 10.3 ± 1.5 mm; second snowman grafts averaged 15.4 ± 3.8 mm by 10.0 ± 0.7 mm, respectively. CT was obtained at 3.02 ± 0.6 months. Mean ACTOCA score was 1.2 ± 1.0 . Nineteen grafts were stable and two partially integrated. 14 of 21 knees (67%) were cleared for sports at or prior to 6 months. One complication required revision. PROs, when available, revealed the following: mean SANE 84.5 ± 15.8 , pain 1.0 ± 2.2 , satisfaction 9.5 ± 0.8 , and Pedi-IKDC 77.4 ± 15.1 ; with all patients returning to their preinjury activity level.

DISCUSSION AND CONCLUSION:

CT imaging at 3–4 months postoperatively provided objective assessment of graft incorporation and enabled an expedited return to sport in 67% of patients undergoing OCA of the knee without compromising the longer-term health or function of the graft. These findings support the utility of CT as a complementary tool to guide postoperative management and RTS decisions following OCA.