

Osteochondral Allograft Transplantation for Capitellar Osteochondritis Dissecans: Excellent Patient-Reported Outcomes Scores and High Return to Sports

Samuel Clifton Willimon, Michael T Busch¹, Anthony Egger, Erin Yuder, Jason Kim, Shivangi Choudhary, Crystal Ann Perkins¹

¹Children's Healthcare of Atlanta

INTRODUCTION: Unstable osteochondritis dissecans of the capitellum (OCD-C) is treated surgically, most commonly with loose body removal and marrow stimulation. This treatment has historically been associated with suboptimal return to high-demand upper extremity sports (baseball and gymnastics) and persistent elbow pain. Fresh osteochondral allograft transplantation (OAlloT) is an alternative treatment which restores subchondral bone and articular cartilage without donor site morbidity associated with autograft harvest. The purpose of this study was to evaluate the outcomes of osteochondral allograft transplantation in pediatric patients with unstable OCD-C 10mm or greater in size.

METHODS: A single-center prospective study was performed of consecutive pediatric patients, less than 19 years of age, with unstable OCD-C 10mm or greater in size treated with primary fresh OAlloT using pre-cut 10mm, 12mm, or 16mm cores. Imaging, including radiographs and MRI, were obtained preoperatively to assess OCD size and characteristics, as well as postoperatively to assess incorporation of the OCA. Patient-reported outcome scores (PROs), including sport data, were obtained preoperatively and annually following surgery. Minimum follow-up duration was 2 years.

RESULTS:

Twenty-six elbows in 24 patients, mean age 13.4 years (11.3 – 17.1 years) met inclusion. The most common primary sport was gymnastics in 11 elbows (42%), baseball/softball in 7 elbows (27%), and cheer in 3 elbows (12%). The majority of patients (88%) played at a competitive level. Median symptom duration prior to presentation was 3 months. The most common presenting symptoms were pain (85%) and mechanical symptoms (81%). Sixteen elbows (62%) presented with a >5-degree loss of elbow extension compared to the contralateral side. The capitellar physis was open in 23 elbows (88%). OCD location was central in 17 elbows (65%) and far lateral in 9 elbow (35%). Mean MRI size of the OCD was 11mm in coronal width, 12mm in sagittal length, and 6mm in depth. Twelve elbows (48%) had a loose body on MRI.

The majority of elbows (22, 85%) were treated with a single allograft plug, while 4 elbows had two allograft plugs transplanted. Median OCA size was 12mm. There were no infections nor arthrofibrosis. Two elbows (8%) had a secondary surgery, both underwent partial synovectomy and chondroplasty at 14- and 16-months following the primary surgery.

Postoperative MRIs were obtained in 15 elbows (58%) and had a mean BOGIE (Boston Osteochondral Graft Incorporation in the Elbow) score of 11, thus documenting a high degree of incorporation. Mean follow-up duration was 40 months (range 25 – 60 months). All patients had preoperative, 1-year, and 2-year PROs (Table 1).

Twenty-one elbows (81%) had returned to sports at 1-year postoperative, and all but 1 patient had returned to sports by 2-years following surgery. Forty-five percent of gymnasts returned to gymnastics, while the remaining pursued different sports. Five of 6 baseball players (83%) returned to baseball.

DISCUSSION AND CONCLUSION: OAlloT as a treatment for OCD-C is a procedure associated with low rates of complications, excellent graft incorporation, high elbow function and patient satisfaction, and overall high rates of return to sports at 2-years. Return to sports, particularly among gymnasts, was less than 50% in this series, which we attribute to a combination of factors, including loss of training and competition time at a critical time for an elite gymnast as well as physician counseling on alternative sports with less stress on the elbow. Continued patient follow up is ongoing and will be critical to the assessment of this treatment on the mid- and long-term outcomes in these young athletes.

	Pre-Op	1 Year	2 Years
Oxford Elbow Score	32.5	44.3	46.8
QuickDASH	18.2	4.2	1.2
QuickDASH Sport	62.5	10.5	1.3