Clinical Outcomes of Particulated Juvenile Articular Cartilage Allograft Transplantation for Patellofemoral Defects

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INTRODUCTION: Multiple treatment options are available for the management of cartilage lesions of the patellofemoral joint. Superiority of any one technique has not been established largely due to a limited body of reported clinical outcomes. The purpose of the present study is to report clinical outcomes of a cohort of patients undergoing particulated juvenile articulated cartilage (PJAC) allograft transplantation for patellofemoral articular cartilage defects, which includes patient-reported outcomes, return to sport rates, and reoperation rates. METHODS:

A retrospective review was performed of all patients who received PJAC allograft transplantation for the treatment of a patellofemoral articular cartilage defect at a single institution from 2014 to 2022. Demographic characteristics and surgical data, including concomitant procedures, were collected. Clinical outcomes recorded included complications (including reoperation), return to sport, and the following patient-reported outcomes: Patient-Reported Outcome Information System (PROMIS) Pain Interference, PROMIS Physical Function, and Kujala knee scores.

RESULTS: Fifty-three knees (48 patients) with a mean age of 23.6 years (range:18 to 45 years) and mean follow up of 24.5 months (range: 4-107 months) were included. The mean respective postoperative PROMIS Pain Interference, Physical Function, and Kujala knee scores were 47.4 ± 7.7 , 53.3 ± 8.9 , and 81.8 ± 15.6 . For patients that participated in an organized sport, the overall return to sport rate was 95.0% (19 out of 20). During follow up, 13 knees (24.5%) developed a complication, including 6 reoperations (11.3%). The most common complication was anterior-based knee pain, which was treated with conservative measures. The 6 reoperations, occurring from 1 to 27 months postoperatively, included revision cartilage transplantation with matrix-induced autologous chondrocyte implantation (1), lysis of adhesions (1), chondroplasty (1), trochleaplasty (1), revision medial patellofemoral ligament reconstruction (1), and revision closure for wound dehiscence (1). Multivariable logistic regression analysis investigating complications (n=13) and reoperations (n=6) with multiple covariates including age, sex, BMI, prior ipsilateral knee surgery, defect area, and concomitant surgery, found no significant associations.

DISCUSSION AND CONCLUSION:

Excellent patient-reported outcome measure scores and return to sport rates can be obtained for patients undergoing PJAC allograft transplantation for the management of articular cartilage defects in the patellofemoral joint. Although the postoperative complication rate was acceptable, with most being treated conservatively, further studies should continue to refine patient and surgical factors in order to optimize outcomes.

