

Osteochondral Autograft Transplantation Augmented with Particulate Cartilage Extracellular Matrix and Bone Marrow Aspirate Concentrate for Treatment of Large Osteochondral Lesions of the Talus in Pediatric Patients

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INTRODUCTION:

Osteochondral autograft transplant (OAT) is often used to treat large osteochondral lesions of the talus (OLT) and is generally associated with good outcomes. The addition of adjuncts such as cartilage extracellular matrix with bone marrow aspirate concentrate (ECM-BMAC) has been shown to further improve the OAT procedure by reducing the rate of adjacent postoperative cysts when treating large osteochondral lesions of the talus. While this procedure has been studied in adults, there is limited literature on its efficacy in pediatric patients.

We hypothesized that adolescent patients would achieve good patient-reported outcomes based on PROMIS scores following OAT + ECM-BMAC for treatment of large osteochondral lesions of the talus.

METHODS:

All patients under age 18 undergoing an OAT + ECM-BMAC procedure by a single surgeon between 2016 and 2021 were identified. Charts were reviewed for age, pathology, surgical approach, lesion size, lesion location, sex, and BMI. Clinical follow up was performed and Patient-Reported Outcomes Measurement Information System (PROMIS) surveys were sent to all patients preoperatively and to all patients who were over 1 year out from surgery.

RESULTS:

A total of 31 patients under age 18 treated with OAT + ECM-BMAC were identified. Average age at the time of surgery was 16.03 (range: 14 years- 17 years). Twenty patients presented with a medial talar lesion, 10 with a lateral talar lesion, and 1 with a central talar lesion. Average lesion size was 119.35 mm². Clinical follow up was available for all patients at at least 1 year post surgery. Out of the 25 patients with available preoperative MRIs, 17 presented with a violated subchondral plate. Preoperative PROMIS completion was available for 20 patients (64.5%), and postoperative PROMIS completion was available for 18 patients (58.06%). Adolescent patients treated with OAT + ECM-BMAC demonstrated significant improvement in two of the postoperative PROMIS domains: Physical Function and Global Physical Health. PROMIS survey data is summarized in **Table 1**.

DISCUSSION AND CONCLUSION:

To our knowledge, this case series represents the largest number of OAT + ECM-BMAC procedures performed on pediatric patients. Significant pre-to-postoperative improvement in two of the PROMIS domains demonstrate that pediatric patients can achieve good outcomes following OAT + ECM-BMAC for treatment of large osteochondral lesions of the talus.

Average Pre-to-Postoperative Change in PROMIS			
Domain:	Pre-operative	Post-operative	P-Value
Physical Function	42.21	53.71	0.0004*
Pain Interference	59.51	46.81	0.0001*
Pain Intensity	48.19	39.54	0.0032*
Global Physical Health	49.27	56.70	0.026*
Global Mental Health	56.81	56.70	0.98
Depression	45.13	45.78	0.84

Table 1. Pre-to-postoperative change in PROMIS. * indicates significance.