

## 13-year Follow-up of Treatment of Osteochondral Lesions with MACI

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**Category:** Ankle, Arthroscopy, Hindfoot, Sports, Trauma

**Keywords:** osteochondral lesion, talus, matrix-induced autologous chondrocyte implantation

**Introduction/Purpose:** Surgical management of osteochondral lesions of the talus (OLT) present an ongoing treatment challenge. Previously, matrix-induced autologous chondrocyte implantation (MACI) demonstrated improved pain and function at 7-years postoperative, providing evidence that MACI is a reliable method for treating cartilage. However, it is unknown the long-term results of MACI in OLT. The purpose of this study was to assess 13-year clinical follow-up data and the long-term success of this implant by comparing patient reported outcome measures (PROMs) pre-operatively, at 7-years post-operative, and at 13-years post-operative.

**Methods:** A prospective investigation of MACI was performed on 10 patients with OLTs who had failed previous arthroscopic treatment. Of the 10 patients, 9 were available for 7-year and 13-year follow-up. Short Form Health Survey (SF-36) and the American Orthopaedic Foot & Ankle Society (AOFAS) hindfoot evaluation were utilized at pre-operative, 7-year, a 13-year postoperative. For each patient, a paired t-test was used to compare 13-year post-operative PROMs to pre-operative PROMs. A single factor analysis of variance (ANOVA) determined whether PROMs were different between pre-operative, 7-year post-operative, and 13-year post-operative time intervals. When a significant difference was detected, a post-hoc Tukey's determined which time periods were different.

**Results:** SF-36 data at 13-years showed significant improvements in Physical Functioning ( $p=0.012$ ), Lack of Bodily Pain ( $p=0.017$ ), and Social Functioning ( $p=0.007$ ) compared with preoperative data. There were no differences in other components of the SF-36 outcomes ( $p>0.05$ ). Although the AOFAS was on average 12 points higher at 13-years postoperative, this was not statistically significant ( $p=0.173$ ). As for comparing PROMs over time, 13-years post-operative PROMs were comparable to 7-years post-operative (Table 1). There were better PROMs for Physical Functioning, Bodily Pain, and Social Functioning at 7- and 13-years post-operative compared to pre-operative while Physical Role Functioning was also better at 7-years post-operative compared to pre-operative.

**Conclusion:** This study shows MACI provides greater pain relief and function at 13-years post-operative with stable long-term follow-up. MACI should be considered for osteochondral lesions that fail initial microfracture.

**Table 1**

Table showing statistical comparisons of preoperative, 7-year post-operative, and 13-year post-operative patient reported outcome scores of AOFAS and SF-36. Numbers presented as mean  $\pm$  standard deviation.

	Preop	7-Year	13-Year	p – Values*
SF-36 Physical Functioning	28 $\pm$ 17 <sup>A</sup>	83 $\pm$ 16 <sup>B</sup>	64 $\pm$ 29 <sup>B</sup>	< 0.001
SF-36 Physical Role Functioning	25 $\pm$ 35 <sup>A</sup>	83 $\pm$ 35 <sup>B</sup>	74 $\pm$ 49 <sup>A,B</sup>	0.016
SF-36 Bodily Pain	31 $\pm$ 12 <sup>A</sup>	65 $\pm$ 21 <sup>B</sup>	61 $\pm$ 33 <sup>B</sup>	0.010
SF-36 General Health Perceptions	67 $\pm$ 19	76 $\pm$ 26	66 $\pm$ 24	0.598
SF-36 Vitality	50 $\pm$ 18	69 $\pm$ 25	61 $\pm$ 28	0.244
SF-36 Social Functioning	47 $\pm$ 26 <sup>A</sup>	86 $\pm$ 25 <sup>B</sup>	86 $\pm$ 25 <sup>B</sup>	0.004
SF-36 Emotional Functioning	74 $\pm$ 32	89 $\pm$ 33	81 $\pm$ 30	0.619
SF-36 Mental Health	77 $\pm$ 11	84 $\pm$ 13	85 $\pm$ 14	0.332
AOFAS	60 $\pm$ 14	78 $\pm$ 18	72 $\pm$ 17	0.083

\*p-Values reported using a single factor ANOVA. Superscript letters (A, B) indicate where statistical differences exist between time intervals using a post-hoc Tukey's test.