

Concentrated Bone Marrow Aspirate May Decrease Postoperative Cystic Occurrence Rate in Autologous Osteochondral Transplantation for Osteochondral Lesions of the Talus: A Retrospective Case-control Study

Yoshiharu Shimozono, MD, Eoghan Hurley, MBBCh, BAO, John Kennedy, MD, FRCS(Orth)

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Introduction/Purpose: Autologous Osteochondral Transplantation (AOT) provides excellent clinical outcomes for osteochondral lesions of the talus (OLT), however, there is concern regarding the presence of cysts at the bone interface. The presence of subchondral bone cysts has been previously shown to be correlated with graft failure, and high rates of postoperative subchondral cysts formation of up to 75% at short-term follow-up have been reported. Concentrated bone marrow aspirate (CBMA) may have the potential to improve integration between the graft and native articular cartilage and bone, and may reduce interface cyst production. The purpose of this study was to clarify the efficacy of CBMA in AOT as compared with AOT alone, regarding the presence of postoperative cyst formation, postoperative functional outcomes and magnetic resonance imaging (MRI) outcomes.

Methods: Patients who underwent AOT between 2004 and 2008 were retrospectively assessed at a minimum of 5-year follow-up. Twenty-eight patients were treated with AOT and CBMA (AOT/CBMA group) and 26 patients were treated with AOT alone (AOT alone group). Clinical outcomes were evaluated using the Foot and Ankle Outcome Scores (FAOS) and Short-Form 12 (SF-12) preoperatively and at final follow-up. Postoperative MRI was evaluated with the modified Magnetic Resonance Observation of Cartilage Repair Tissue (MOCART) scoring system. Cystic formation was evaluated on postoperative MRI, and cyst diameter and cyst location were assessed.

Results: Fifty-four of 59 eligible patients were included. Of those, 28 patients were treated with AOT and CBMA and 26 patients were treated with AOT alone. The mean FAOS and SF-12 significantly improved in both AOT/CBMA and AOT alone groups, but there were no statistical differences between groups in FAOS (80.6 vs 75.4, $p = 0.217$) and SF-12 (71.1 vs 69.2, $p = 0.694$) at final follow-up. Additionally, there was no difference in the mean MOCART Score (80.4 vs 84.3, $p = 0.484$). However, AOT/CBMA did result in a statistically lower rate of cyst formation (46.4% vs 76.9%, $p = 0.022$) (Table 1). No statistical differences were found between groups in cyst location and cyst diameter (table 1).

Conclusion: CBMA reduced the postoperative cystic occurrence rate in patients treated with AOT, although CBMA did not result in significant differences in functional outcomes nor MOCART score in patients who underwent AOT.

Table 1. Data of cystic change after AOT

	AOT alone (N=26)	AOT/CBMA (N=28)	P Value
Patients with cysts, No. (%)	20 (76.9%)	13 (46.4%)	0.022*
Cysts, No.	26	16	
Number of cysts, mean	1.3 ± 0.6	1.2 ± 0.2	0.697
Cyst diameter, mean	3.8 ± 1.9	4.9 ± 3.2	0.225
Cyst Location			
Graft	7 (26.9%)	4 (25.0%)	0.891
Inferior	5 (19.2%)	5 (31.3%)	0.888
Peripheral	14 (53.8%)	7 (43.8%)	0.525