Does Use of Demineralized Bone Matrix Affect the Union Rate in Arthroscopic Ankle Fusions?

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Category: Ankle

Keywords: ankle; arthritis; arthrodesis, demineralized bone matrix

Introduction/Purpose: Despite DBM having positive effects on union rates in other subspecialties of orthopaedics, there is a general lack of evidence about bone graft substitutes in foot and ankle surgery. To our knowledge, orthopaedic surgeons have never evaluated the use of demineralized bone matrix (DBM) as it pertains to the union rate of arthroscopic ankle fusions. The purpose of this clinical study is to compare the rate of union in arthroscopic ankle fusions in patients that have had DBM to those without DBM. The hypothesis of this study was that use of DBM would increase the union rate in all patients undergoing arthroscopic ankle arthrodesis.

Methods: This is a retrospective review of 521 consecutive patients from October 2002 to April 2016. Seventy-one ankles from 68 patients met inclusion criteria. These patients underwent primary arthroscopic ankle arthrodesis. Forty patients had DBM and 31 patients did not have DBM. Age, gender, body mass index, smoking, and preoperative radiographic deformity were controlled. The primary outcome measure was union rate of arthroscopic ankle arthrodesis. Secondary outcome measures were time to union, rate of wound complications, rate of return to operating room, and rate of development of post-operative deep vein thrombosis (DVT).

Results: Seventy-one patients were available for final follow-up. Average age of the patients was 55.3 +/- 17.6 years. The mean follow-up time was 39.5 months. Unions were assessed on routine post-operative radiographs. If there was a concern for nonunion, patients were further assessed with a computerized tomography scan. Nonunion rate of patients who did have DBM was 7/40 (18%) and nonunion rate of those who did not have DMB was 8/31 (26%) (p=0.40). There was no statistically significant difference between those who did have DBM and those who did not have DBM in wound complication rate (5% vs 6%, p=1.0), rate of return to the operating room (35% vs 39%; p=0.75), and DVT rate (0% vs 0%), respectively. There were no major complications in this study.

Conclusion: This study is the largest study to directly compare union rate and complications in patients who had DBM versus those who did not in the setting of arthroscopic ankle fusion. In this study, use of DBM does not affect union rate in patients undergoing arthroscopic ankle arthrodesis. Additionally, use of DBM does not affect the rate of wound complications, return to the operating room, and development of post-operative DVT.

Foot & Ankle Orthopaedics, 3(3)
DOI: 10.1177/2473011418S00368