

Decreased Reoperation Rate with Viable Allogenic Bone Scaffold in Foot and Ankle Fusions

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INTRODUCTION:

A nonunion is a challenging clinic problem following foot and ankle arthrodeses. There is great interest in orthobiologics as surgical adjuvants. The purpose of this study is to compare Viable Allogenic Bone Scaffold to other commonly use orthobiologics (PDGF-B agonist [PDGF-B], allograft bone morphogenetic protein [ABMP], crushed cancellous allograft [CC]) to determine if there is a difference in union rates following foot and ankle arthrodeses.

METHODS:

A retrospective review was conducted of 390 feet (373 patients) with minimum 3-month follow-up, undergoing arthrodesis by one of two fellowship-trained foot and ankle orthopaedic surgeon from 2016-2023. Patients underwent ankle, pantalar, triple, subtalar (ST), midfoot, or talonavicular fusion. Data collected included demographics, medical history, orthobiologics used, postoperative complications, readmission and reoperation rates. 42 (10.8%) cases used no biologic, 91 (23.3%) cases used PDGF-B with CC, 43 (11.0%) used solely ABMP, 95 (24.4%) used ABMP with CC, 66 (16.9%) used solely CC, 42 (10.8%) used V92 only, and 11 (2.8%) used V92 with CC. Union was defined as bridging bone on three joint quadrants on AP and lateral radiographs, or greater than 50% bridging bone of the joint space on computed tomography (CT).

RESULTS:

The overall cohort was majority female (54.4%) with mean age 56.71 (range 16-82) years, mean BMI 32.24 (range 17.1-62.7) kg/m² and mean follow-up duration 1.13 (range .25-5.96) years. Of the 390 cases, the ST joint was most commonly fused (56.2%). When considering demographics and comorbidities, only BMI ($p=.013$) and rate of cardiac disease differed between cohorts, with cases using Viable Allogenic Bone Scaffold with CC having significantly lower BMI and decreased rates of cardiac disease. Among the overall cohort, the only postoperative outcome which differed between biologics was readmission within 90 days in which patients receiving no biologic were readmitted at a significant higher rate ($p=.003$). Cases using VABS cellular bone matrix versus all other orthobiologics had statistically significantly lower rates of reoperation (VABS=5.66%, No VABS=17.5%; $p=.026$) and reoperation for hardware removal (VABS=3.77%, No VABS=16.0%; $p=.019$). There was no difference in rates of union, nor time to union in based on orthobiologic used.

DISCUSSION AND CONCLUSION:

In foot and ankle arthrodeses treated with Viable Allogenic Bone Scaffold, there was equivalent fusion rates and time to fusion when compared to other orthobiologics. Arthrodesis performed using V92 demonstrated statistically significantly lower rates of reoperation when compared to treatments using other orthobiologics. Surgeons should be aware of these findings when selecting bone graft for foot and ankle arthrodesis.