Comparing Outcomes of Procedures Using Allograft, Autograft, or No Adjuvants in Foot and Ankle Fusions

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INTRODUCTION:

There is great interest in orthobiologics as surgical adjuvants to decrease rates of complications, including non-union, and time to fusion. While there are a limited number of studies investigating the role of orthobiologics in healing following foot and ankle fusion procedures, there is an even greater lack of large studies investigating the use of allographic or autographic adjuvants as compared to those procedures without. As such, the purpose of this study is to compare the outcomes of patients receiving crushed cancellous allograft, autograft, or no biological adjuvant to determine if there is a difference in complications and time to fusion following foot and ankle arthrodeses.

METHODS:

A multi-institutional retrospective review was conducted of 296 patients with minimum 6-month follow-up, undergoing arthrodesis by one of four fellowship-trained foot and ankle orthopaedic surgeons from 2016-2022. Patients underwent ankle (n=74), subtalar (ST) (n=124), midfoot (n=154), or forefoot (n=27) fusions. Data collected included demographics, medical history, orthobiologics used, postoperative complications, readmission and reoperation rates. 58 (19.6%) cases used no biological adjuvant, 224 (75.7%) used allograft, and 14 (4.7%) used autograft. 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). The overall cohort was majority female (58.4%) with a mean age 56.49 (range 18-81) years, BMI 31.96 (range 16.16-56.17) kg/m^2 and follow-up duration 1.43 (range 0.50-5.96) years.

RESULTS:

The allograft cohort was significantly older (p=.019) with significantly higher rates of cardiac disease (p<.001) and hypertension (p=.006), the no graft group had significantly lower BMI (p<.001). Allograft was used at a statistically significantly higher rate in ST (p<.001) and ankle fusions (p=.044) while forefoot fusions had a higher rate of no graft use (p<.001). The overall union rate was 88.9% and mean time to fusion 153.41±102.36 days, with no significant difference between cohorts. Similarly, there was no statistically significant difference in rate of postoperative infection, reoperation, or revision following fusion procedures regardless of graft usage.

DISCUSSION AND CONCLUSION:

Joints treated with no biological adjuvant, allograft, or autograft demonstrated equivalent fusion rates in this large study. Additionally, there was no difference in the rate of postoperative adverse outcome regardless of graft usage. These findings should be considered by providers and patients alike when considering the use of biological adjuvants in foot and ankle fusion procedures.

Table 1. Bivariate Analysis of Outcomes by Biologic Adjuvant.

	Overall (N=397)	None (N=95)	Allograft (N=281)	Autograft (N=20)	*p* Value
Nonunion	9.62%	5.26%	10.4%	14.2%	.414
Infection	5.40%	10.3%	4.01%	7.14%	.114
Readmission within 90 days	0.33%	1.72%	0%	0%	.243
Reoperation	17.6%	20.6%	16.9%	15.3%	.771
Revision	5.06%	1.72%	5.35%	14.2%	.140
Removal of Hardware	14.1%	12.0%	15.1%	7.14%	.606

* $p < .050$