

Improved Survival Rates with Fixed Bearing Total Ankle Arthroplasty

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INTRODUCTION: With increasing total ankle arthroplasty (TAA) being performed and a plethora of new survivorship data available, an updated literature review is needed to better understand the impact of different types of implants on the outcomes of TAA. The purpose of this study is to compare the outcomes of fixed vs. mobile bearing TAAs in the literature.

METHODS: A comprehensive search of MEDLINE for all articles published between 2004 and 2021 was conducted with a minimum two-year mean follow up. Two reviewers evaluated each study to determine whether it was eligible for inclusion and abstracted the data of interest. Meta-analytic pooling of group results across studies was performed, examining implant survival and component failure. Seventy-three implant groups met inclusion criteria, only 3rd and 4th generation implants. Forty-one groups (56.2%) were implanted with mobile bearing devices, and 32 (43.8%) with fixed bearing implants. In total, 6,498 subjects were included, with a mean age of 61.77 years and a mean BMI of 28.5 kg/m². At a mean follow up of 62.2 months, the overall reoperation rate was 21.13% and the metal component revision rate was 10.16%.

RESULTS: The mean follow up of mobile bearing TAA studies (N=41) was 77.8 (range 24-188.4) months, and that of fixed bearing studies (N=32) was 45.3 (range 24-85.2) months. Multivariate analysis of bearing type, controlling for follow-up duration, found fixed bearing implants had statistically significantly higher metal component survival rates (fixed=96.1%, mobile=87.9%, p=.001); however, there were no statistically significant differences in rates of reoperation (fixed=17.0%, mobile=24.8%, p=.768). When examining specifically tibial and talar component failure rates, there was no statistically significant difference between bearing type (fixed tibial=1.46%, mobile tibial=2.95%, p=.472) (fixed talar=2.19%, mobile talar=2.79%, p=.966). Overall implant survival rates at one, two, five, and ten years were 96.4%, 96.0%, 92.7%, and 79.4%, respectively, and did not differ by bearing type (Table 1).

DISCUSSION AND CONCLUSION: Implant survival was statistically significantly better for 3rd and 4th generation fixed bearing TAAs as compared to mobile bearing TAAs, controlling for length of follow up. There was no statistically significant difference in total reoperation rate. This suggests that fixed bearing implants may offer improved implant survival compared to mobile bearing implants, though further research is needed to confirm these findings.

Table 1. Multivariate Analysis of total ankle arthrodesis implant outcomes stratified by bearing type.

	Fixed bearing	Mobile Bearing	P Value
Mean Follow-up	45.26 ± 20.17	77.79 ± 43.74	<.001*
Metal Component Survival Rate	96.1%	87.9%	.001*
Reoperation Rate	17.0%	24.8%	.768
Revision Rate	7.0%	12.7%	.207
Rate of Conversion to Arthrodesis	1.9%	4.3%	.067
Rate of Tibial Sided Failure	1.5%	2.9%	.472
Rate of Talar Sided Failure	2.2%	2.8%	.966
1-year survival rate	98.3%	95.7%	.411
2-year survival rate	97.1%	95.1%	.179
5-year survival rate	93.3%	91.6%	.350
10-year survival rate	82.7%	79.3%	.731

*p < .050