## Stemmed vs. Non-stemmed Ankle Replacements: Mid to Long-Term Outcomes – A Systematic Review

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## INTRODUCTION:

Total ankle replacements (TAR) are increasingly recognized as a viable alternative to ankle arthrodesis for treating endstage ankle arthritis. Although initially associated with high rates of adverse events, newer generations of implants have led to improved outcomes. Reports on mid to long-term outcomes of TAR, comparing those with a tibial stemmed component versus non-stemmed ones, are still sparse. This study aimed to evaluate outcomes across multiple TAR studies with a minimum follow-up of 5 years.

## METHODS:

A multi-database search was conducted in April 2024 following PRISMA guidelines. We included all articles involving patients who underwent primary TAR and had a minimum five-year follow-up, reporting clinical outcomes and complications. We collected the American Orthopedic Foot and Ankle Society (AOFAS), Visual Analog Scale (VAS), and Item Short Form Health Survey (SF-36) scores. Additionally, we included range of motion at the final follow-up. RESULTS:

Out of an initial search of 2,291 articles, 82 met our inclusion criteria, with 35 utilizing a tibial stemmed implant and 47 using a non-stemmed one. The stemmed cohort comprised 4,270 ankles, while the non-stemmed cohort consisted of 7,676 ankles. The mean follow-up period was 83.3 months for the stemmed cohort and 96.5 months for the non-stemmed. The mean age of the stemmed cohort was 62.3 years, compared to 69 years for the non-stemmed cohort. Implant survivorship was comparable, although slightly higher in the stemmed cohort at final follow-up, with 86.5% compared to 82.74% in the non-stemmed cohort. The mean time to revision was 60.4 months for stemmed implants and 43.9 months for non-stemmed implants. The stemmed cohort experienced a total of 447 revisions, while the non-stemmed cohort had 812 revisions. Implant loosening was the most common cause of revisions, accounting for 24.3% in the stemmed cohort. Other reasons for revision included infection and fracture of any of the implant components. The mean AOFAS, SF-36, and VAS scores showed similar improvements in both cohorts. The complete range of motion arc improved from 24.1 degrees to 31 degrees in the stemmed cohort, and from 26.83 degrees to 33.95 degrees in the non-stemmed cohort.

DISCUSSION AND CONCLUSION: The outcomes following both types of TAR implants are favorable, indicating improvement in clinical outcomes over mid to long-term follow-up. However, the mean time to revision was considerably longer in the stemmed implants compared to the non-stemmed ones, despite comparable rates of revision and complications. This study suggests that stemmed implants may offer improved survivorship compared to non-stemmed implants, which could influence current implant utilization and future implant design. Nevertheless, future research should assess long-term effectiveness and refine patient selection criteria to enhance the generalizability of these results.