

# Ankle Arthrodesis Increases Risk of Progression to Total Knee Arthroplasty compared to Total Ankle Arthroplasty

Gloria Shoshana Coden, Andrzej Brzezinski, Kurt J Hofmann

**INTRODUCTION:** There is an association between ankle and ipsilateral knee arthritis. It is unknown how the increased range of motion and improved gait mechanics provided by total ankle arthroplasty (TAA) affects the progression of knee arthritis compared to ankle arthrodesis (AA). We hypothesized that patients treated with TAA would have a lower incidence of postoperative total knee arthroplasty (TKA) compared to AA.

**METHODS:** We retrospectively reviewed a matched cohort of 2,088 AA and 2,088 TAA performed between 1/1/2007 and 12/31/2019 using a commercial claims database with minimum 2-year follow up. Mahalanobis nearest neighbor matching was performed by age, gender, year of surgery, geography, indication for TAA/AA, and preoperative history of knee posttraumatic, rheumatoid, or osteoarthritis. Records were reviewed for demographics, medical history, and postoperative TKA. Age (54.57 versus 55.0 years,  $p=0.08$ ), gender (50.72% versus 50.81% female,  $p=0.98$ ), and incidence of preoperative knee arthritis (29.17% versus 30.70%,  $p=0.29$ ) were similar between AA and TAA. Univariable and multivariable regression analyses were performed.

**RESULTS:** Patients with AA were 1.83 times more likely to require TKA (230 (11.02%) versus 132 (6.32%), 95% CI=1.45-2.33). Additional risk factors included earlier year of ankle surgery (odds ratio (OR)=0.91, 95% confidence interval (CI)= 0.87-0.94), older age (OR=1.04, 95% CI= 1.02-1.06), and knee osteoarthritis (OR=8.16, 95% CI= 6.34-10.50), posttraumatic arthritis (OR=6.24, 95% CI= 3.01-12.92), and rheumatoid arthritis (OR=3.06, 95% CI= 1.80-5.18) compared to no arthritis, but not gender (OR=1.24, 95% CI= 0.98-1.57). Posttraumatic ankle arthritis (OR=0.73, 95% CI= 0.57-0.95) decreased the risk for postoperative TKA compared to ankle osteoarthritis, but rheumatoid arthritis (OR=1.01, 95% CI= 0.50-2.03) or another indication for TAA/AA (OR=1.03, 95% CI= 0.62-1.71) had similar risk to ankle osteoarthritis. For those who underwent a TKA, there was a similar time between TAA/AA and TKA (mean=3.05 years (range=0.21-9.10 years) versus 3.08 years (range=0.36-13.23years)  $p=0.91$ ).

## DISCUSSION AND CONCLUSION:

There is a significantly higher incidence of patients undergoing TKA after AA compared to TAA. We recommend that surgeons consider TAA over AA, especially in young, active patients with minimal knee arthritis as a strategy to help delay the progression of knee arthritis.

