Comparison of Reoperation Rates Following Arthrodesis and Total Ankle Arthroplasty
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Precis/Summary:
The purpose of this study is to compare the reoperation rates of ankle arthrodesis and ankle replacement using observational, population-based data from all inpatient admissions in California over a ten-year period. Our hypothesis was that patients undergoing ankle replacement would have a lower risk of subtalar fusion but a higher overall risk of major revision surgery.

Abstract:
Background: The role of ankle arthroplasty in the treatment of ankle arthritis is controversial. Ankle fusion is commonly performed but there is ongoing concern about functional limitations and arthritis in the adjacent subtalar joint. Ankle arthroplasty is expanding as an alternative to ankle fusion, but reported results are limited to case series. The purpose of this study is to compare the reoperation rates of ankle arthrodesis and ankle replacement using observational, population-based data from all inpatient admissions in California over a ten-year period. Our hypothesis was that patients undergoing ankle replacement would have a lower risk of subtalar fusion but a higher overall risk of major revision surgery.

Methods: We identified patients undergoing ankle replacement and ankle arthrodesis in the years 1995-2004 as inpatients using California's discharge database. Short-term outcomes were examined including rates of reoperation for a major revision procedure, pulmonary embolism, amputation and infection. Long-term outcomes analyzed included rates of major revision surgery and subtalar joint fusion. Logistic and proportional hazard regression models were used to estimate the impact of the choice of ankle replacement or ankle fusion in predicting the rates of adverse outcomes, accounting for patient factors including age and Charlson comorbidity.

Results: A total of 4,705 ankle fusions and 480 ankle replacements were performed during the ten-year study period. Patients undergoing ankle replacement had an increased risk of device-related infection and major revision procedures. The rates of major revision surgery for ankle replacement patients were 9% at 1-year and 23% at 5-years post-operatively compared to 5% and 11% following ankle arthrodesis. Ankle arthrodesis patients had a higher rate of subtalar fusion at five-years post-operatively than ankle replacement patients (2.8% and 0.7%, respectively). Regression analysis confirmed a statistically significant increase in the risk for ankle replacement patients of major revision surgery (hazard ratio 1.93, p<0.001) but a decreased risk of subtalar fusion (hazard ratio 0.28, p=0.03) compared to ankle fusion patients.

Conclusion: This study demonstrates a higher risk of reoperation for major revision surgery and infection following ankle replacement. However, ankle replacement patients are less likely to require fusion of the adjacent subtalar joint on long-term follow-up. This study confirms a higher risk of complications following ankle replacement but also its potential advantages in avoiding subtalar joint pathology when compared to ankle fusion. Further controlled trials are necessary to clarify the appropriate indications for ankle arthrodesis and ankle replacement.