A Cohort Study of Risk Factors for Failure of Total Ankle Replacements: A Data Linkage Study Using the National Joint Registry and NHS Digital

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INTRODUCTION: Despite the increasing numbers of ankle replacements that are being performed there are still limited studies on the survival of ankle replacements and which factors influence survivorship between different implants. The primary aim of this study is to link NJR data with NHS digital data to determine the true failure rates of ankle replacements and to determine the risk factors for failure of total ankle replacements.
METHODS:
A data linkage study combined National Joint Registry Data and NHS Digital data. The primary outcome of failure is defined as the removal or exchange of any components of the implanted device inserted during ankle replacement surgery. Life tables and Kaplan Meier survival charts demonstrated survivorship. Cox proportional hazards regression models with the Breslow method used for ties were fitted to compare failure rates.
RESULTS:
A total of 5,562 primary ankle replacement were recorded on the NJR between 1 April 2010 and 31 December 2018. The unadjusted 1-year survivorship of ankle replacements was 98.8% (95% CI 98.4%-99.0. The 5-year survival in 2,725 patients was 90.2% (95% CI 89.2%-91.1) and the 10-year survival in 199 patients was 86.2% (95% CI 84.6%-87.6%).

In univariate cox regression models, age, BMI, ASA, Charlson comorbidity score, and indication for surgery were significantly associated with an increased risk of failure. In multivariate cox regression models, only age (HR 0.956, 95% CI 0.942-0.970), BMI (HR 1.032, 95% CI 1.006-1.059), and indication (HR 0.880, 95% CI 0.799-0.968) were associated with an increased risk of failure.
DISCUSSION AND CONCLUSION: Ankle replacements have been demonstrated to have higher failure rates in younger patients, those with an increased BMI, and those with osteoarthritis. These findings should be taken into account when deciding which patients should undergo an ankle replacement and in counseling them on the likely survivorship of their ankle replacement.