

## Risk factors for intra-operative and post-operative fractures associated with primary total ankle replacement surgery - a data linkage study from the UK National Joint Registry

Razi Zaidi, MD, Andrew Goldberg, MD, MBBS, FRCS(Tr&Orth)

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**Introduction/Purpose:** Intra and post-operative fractures are recognised complications of total ankle replacement (TAR) surgery.

Intra-operative fractures are captured on the National Joint Registry (NJR) in the UK. The NJR has been capturing data on ankle replacement surgery since April 2010 and the number of TARs on the register is approaching 4000.

Post-operative fractures are captured in the Hospital Episodes Statistics (HES) database. HES stores all patients admitted to NHS hospitals in England and captures 125 million records each year. Diagnostic information is stored using the International Classification of Diseases (ICD) and operative details using the Office of Population, Censuses and Surveys Classification (OPCS) codes.

The purpose of this work was to determine the rate of intra and post-operative fracture with primary TAR and determine risk factors.

**Methods:** A data-linkage study of the UK National Joint Registry (NJR) data and Hospital Episodes Statistics (HES) database was performed using the first 3 years of NJR data. These two databases were linked in a deterministic fashion. 1522 NJR records were linked with the HES data set of over 90 million records. 1110 records were able to be linked and available for analysis.

Unlinked NJR data was analysed to identify intra-operative fractures. Linked data was analysed to identify post-operative fractures using ICD codes. Logistic regression was used to model predictors of intra and post-operative fractures. Every model was adjusted for patient characteristics including age, BMI, comorbidity and ASA grade.

**Results:** The rate of intra-operative fracture was 2.69% (95% CI 2.67% to 2.74%). When looking at patient characteristics no significant predictors emerged. Logistic regression adjusted for patient characteristics showed that patients with rheumatoid arthritis were twice as likely to have an intra-operative fracture.

The rate of post-operative fracture in the 12 months following primary TAR was 1.08% (95% CI 1.05% to 1.14%). Age emerged as a risk factor with a 5.5 fold increase in risk of post-operative fracture with age 65-74 compared with those below 65. Adjusted logistic regression showed an increase in risk of post-operative fracture in rheumatoid patients, hybrid operations and with those with multiple concurrent procedures. The risk of fracture was doubled with one associated procedure and tripled with two procedures.

**Conclusion:** The rate of intra and post-operative fracture associated with primary total ankle replacement is low. However care should be taken with patients over 65 as they are at greater risk of intra-operative fractures. Patients with rheumatoid arthritis are at greater risk of both, likely due to the effect of drug treatment. All efforts should be made to review medications and bone protective medication prescribed for these patients when undergoing TAR.

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