Surveillance of Distal Radius Fractures: Impact on Subsequent Osteoporosis Screening, Treatment, and Fracture Risk

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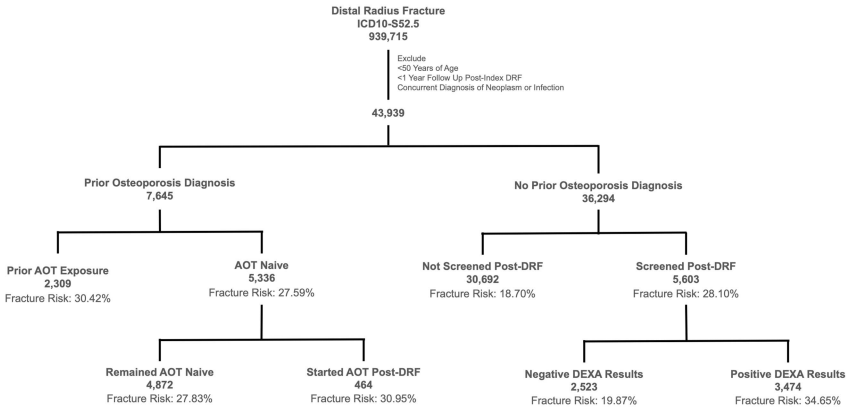
INTRODUCTION: Osteoporosis-related fractures are a significant global burden, with fragility fractures such as distal radius fractures (DRF) expected to rise as the population ages. Despite their frequency and value as predictors of underlying bone deterioration, DRFs are often under-screened and undertreated for osteoporosis compared to hip and vertebral fractures due to their lower mortality risk. This study assesses the impact of early pharmacological intervention and osteoporosis screening following DRF on reducing future fracture risk.

METHODS: Using data from the TriNetX US Collaborative Network, a retrospective cohort study was conducted to analyze electronic health records of 43,939 patients over 50 years old who sustained a DRF. Patients were initially grouped based on osteoporosis diagnosis status before the index DRF. Those with a prior diagnosis of osteoporosis were further divided based on their exposure to anti-osteoporotic therapy (AOT) within one year post-DRF. The groups included prior AOT users and those who were AOT-naive. After the DRF, treatment-naive patients were divided into those initiated on AOT post-DRF or patients who remained untreated post-DRF. Those with no prior diagnosis of osteoporosis were divided depending on whether they had undergone osteoporosis screening post-DRF. Propensity score matching controlled for patient age, gender, and comorbidities across all groups. The primary outcome of the study was the five-year fracture risk, stratified based on prior osteoporosis diagnosis, post-fracture AOT exposure, and osteoporosis screening status following the index DRF.

RESULTS: In this cohort study of 43,939 patients, 17.4% of patients had a prior diagnosis of osteoporosis, of whom 30.2% had previously received anti-osteoporosis therapy (AOT) before the fracture. Among AOT-naive patients, 91.3% remained untreated post-DRF. For patients with a prior diagnosis of osteoporosis, the five-year fracture risk was high regardless of treatment status, ranging from 27.59% to 30.95%. Interestingly, propensity-matched analysis showed increased fragility fracture rates among those initiated on AOT post-DRF (13.36%) compared to both untreated patients (6.26%) and those who received AOT prior to DRF (9.76%). In patients without prior osteoporosis, the overall five-year fracture risk was 19.37%, with those who underwent osteoporosis screening post-DRF having a significantly higher overall fracture risk of 28.10% compared to 18.70% in unscreened patients. Among those screened, patients with negative DEXA results had an overall fracture risk of 19.87%, while patients with positive DEXA results indicating osteoporosis had a significantly higher risk of 34.65%.

DISCUSSION AND CONCLUSION: Despite current guidelines recommending that all adult fractures be evaluated for potential osteoporotic origin, our study shows that very few patients are being investigated for underlying bone fragility after an initial DRF and consequently are not able to receive appropriate treatment. Our results show an increase in fracture rates in those that start AOT after an index DRF compared to both untreated patients and those who received prior AOT. However, these results are not likely due to the AOT therapy itself but rather due to inconsistent management of osteoporosis following a DRF where earlier AOT treatment is being reserved only for those that are ‘high risk’ of future fractures. Given these findings, future osteoporosis management strategies should be expanded to encompass all patients with suspected decreased bone mineral density in order to decrease the risk of subsequent fractures. This study demonstrates that addressing the under-treatment of osteoporosis and subsequent fragility fractures requires a comprehensive approach targeting all stages of the disease, including improvement of screening, timely initiation of treatment, adherence to therapy, and prevention of further bone degeneration.


Distal Radius Fracture
ICD10-S52.5
939,715
Exclude
<50 Years of Age
<1 Year Follow Up Post-Index DRF
Concurrent Diagnosis of Neoplasm or Infection
43,939
Prior Osteoporosis Diagnosis
7,645
No Prior Osteoporosis Diagnosis
36,294
Prior AOT Exposure
2,309
Fracture Risk: 30.42%
AOT Naive
5,336
Fracture Risk: 27.59%
Not Screened Post-DRF
30,692
Fracture Risk: 18.70%
Screened Post-DRF
5,603
Fracture Risk: 28.10%
Remained AOT Naive
4,872
Fracture Risk: 27.83%
Started AOT Post-DRF
464
Fracture Risk: 30.95%
Negative DEXA Results
2,523
Fracture Risk: 19.87%
Positive DEXA Results
3,474
Fracture Risk: 34.65%