

A TriNetX Database Analysis of Total Elbow Arthroplasty Utilization, Re-Operation, and Revision Rates in the US Performed for Distal Humerus Fracture Versus Arthritic Degeneration

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INTRODUCTION: Total elbow arthroplasty (TEA) is a surgical intervention used to treat a variety of issues affecting the elbow joint. Common indications include distal humerus fracture (DHF) and arthritic degeneration (AD). This study aims to describe and compare the trends of DHF vs AD TEA utilization and reoperation over a 10-year study period. The study hypothesizes that TEA to treat DHF is being performed more frequently and carries a lower risk, as well as a later occurrence of reoperation compared to TEA performed for AD.

METHODS: A retrospective cohort study was performed, and the TriNetX US Collaborative Network was queried from 2015–2024, looking at patients who received a TEA (CPT 24363). Cohorts were defined as having had an index TEA performed during the study period and split further based on a recent DHF diagnosis or an AD diagnosis (rheumatoid, traumatic, osteo) without a recent DHF. Incidence trends were assessed for the three groups. Reoperative outcomes and timings were evaluated a maximum of 10 years after index TEA. DHF, AD, and reoperation groups were defined by ICD and CPT codes. Statistical analysis was performed to evaluate the differences between the DHF and AD groups.

RESULTS:

There were 1440 identified patients who had undergone a TEA during the 10-year study period, 686 (47.6%) for DHF and 609 (42.3%) for AD. Patients were predominantly female ($p < 0.00001$), with DHF mean age being significantly higher than the AD mean age (76y +/- 12 vs 68y +/- 12; $p < 0.0001$). During the total study period there were significantly more TEAs performed for DHF than AD ($p < 0.01$), with a cumulative rate difference of 0.054 (95% CI: 0.017-0.09). The overall reoperation rate for TEA was 19.2% with DHF being 14.9% and AD being 24.8% ($p < 0.00001$), with a cumulative rate difference of .099 (95% CI: 0.056-0.14). The mean time until one of the analyzed reoperations was 1.85 +/- 1.42 years for all TEAs with DHF being 2.01 +/- 1.53 years and AD being 1.81 +/- 1.41 years ($p = 0.30$).

DISCUSSION AND CONCLUSION:

The hypothesis was partially upheld as TEA for DHF was performed more frequently and carried a lower risk of reoperation occurrence compared to TEA for AD, without a significant difference in timing. Total elbow arthroplasty continues to be a treatment utilized for both DHF and AD, but it is important to keep in mind how the indication affects postoperative reoperation burdens on patients and surgeons alike. Recently, there also seems to be a shift in usage of TEA to treat DHF rather than AD, a finding that requires further investigation.