

Revision Total Elbow Arthroplasty: Indications and Outcomes at a Single Institution

Benjamin Zmistowski, MD; Nisha Kale, MD; Lindsey Kahan, MD; Jay D. Keener, MD; Ken Yamaguchi, MD; Alexander Aleem, MD

Research performed at Washington University in St. Louis, MO

Introduction

Total elbow arthroplasty (TEA) has demonstrated improved pain and function for multiple diagnoses. However, it is associated with high failure and complicate rates, oftentimes requiring revision TEA. The long-term outcomes of revision TEA remain ill-defined. This study establishes the survival of revision TEA from a high-volume single institution.

Methods

Following institutional review board (IRB) approval, a retrospective review of all revision TEA performed at a tertiary referral center from Sep 1999 to Sep 2022 was performed. The following data was collected: patient demographics, comorbidities, and surgical history; revision implant parameters and linkage status; surgical details including bone loss, radiographic analysis, and cement quality; and indication for primary and revision TEA. Post-operatively, patients were followed for complications, re-operation, and revision. A historical primary TEA cohort was utilized for comparison. Statistical analysis was performed with SPSS (Version 29; IBM; Armonk, NY).

Results

53 elbows in 51 patients underwent revision TEA during the study period. Average patient age was 57.3 years (range: 32-86 years), 35/51 (68.6%) were female, and the mean follow-up was 12.7 years (range: 3-25 years). 42/53 (79%) of revised elbows were Stryker Latitude (Stryker; Kalamazoo, MI). The most common indication for revision was aseptic loosening (41/53, 77.4%) and mean time from primary TEA to first revision at this institution was 4.5 years (range: 7 days to 27 years). Nearly two-thirds of the elbows (32/53; 60.4%) underwent 97 re-operations and one-third (18/53; 33.9%) underwent re-revision TEA. Patients undergoing revision TEA were at substantially greater risk of re-operation (60.8% versus 41.1%; $p=<0.05$) and subsequent revision (34% versus 18.3%; $p=<0.05$) relative to primary TEA. The most common indication for re-operation was infection (62%) and the most common indication for re-revision was aseptic loosening (71%). 12/41 (29.3%) of elbows that underwent index revision for aseptic indications ultimately required subsequent surgery for infection. Following revision TEA, one-fifth of (10/53; 18.8%) were definitively explanted. Factors associated with re-operation were younger age, female gender, and post-operative draining wounds. Factors associated with re-revision were younger age and longer follow up.

Conclusion

Total elbow arthroplasty remains a viable option for treating numerous pathologies of the elbow. However, patients that require a revision TEA suffer a high re-operation rate and re-revision rate greater than that of primary TEA. Infection and aseptic loosening complicate a significant number of revision TEA. Continued efforts to improve long-term outcomes of TEA by optimizing implant design, surgical technique, and patient selection would have substantial benefit.