Background

Total elbow replacement (TER) is an accepted treatment for complex intra-articular distal humerus fractures in elderly patients. Distal humeral hemiarthroplasty (HA) is also a potential surgical option for unreconstructable fractures and avoids the concerns regarding mechanical wear and functional restrictions associated with TER. In the current literature, there are limited data available to compare the revision rates of HA and TER for the treatment of fracture. We used data from a large national arthroplasty registry to compare the outcome of HA and TER undertaken for fracture/dislocation and to assess the impact of demographics and implant choice on revision rates.

Methods

Data obtained from the Australian Orthopaedic Association National Joint Replacement Registry from May 2, 2005, to December 31, 2021, included all procedures for primary elbow replacement with primary diagnosis of fracture or dislocation. The analyses were performed using Kaplan-Meier estimates of survivorship and hazard ratios (HRs) from Cox proportional hazards models.

Results

There were 293 primary HA and 631 primary TER procedures included. The cumulative percentage revision (CPR) rate at 9 years was 9.7% for HA (95% confidence interval [CI] 6.0, 15.7), and 11.9% (95% CI 8.5, 16.6) for TER. When adjusted for age and gender, there was a significantly higher risk of revision after 3 months for TER compared to HA (HR 2.47, 95% CI 1.22, 5.03, $P = .012$). There was no difference in the rate of revision for patients aged <55 years or ≥75 years when HA and TER procedures were compared. In primary TER procedures, loosening was the most common cause of revision (3.6% of primary TER procedures), and the most common type of revision in primary TER involved revision of the humeral component only (2.6% of TER procedures). TER has a higher rate of first revision for loosening compared to HA (HR 4.21, 95% CI 1.29, 13.73; $P = .017$). In HA procedures, instability (1.7%) was the most common cause for revision. The addition of an ulna component was the most common type of revision (2.4% of all HA procedures).

Conclusion

For the treatment of distal humerus fractures, HA had a lower revision rate than TER after 3 months when adjusted for age and gender. Age <55 or ≥75 years was not a risk factor for revision when HA was compared to TER. Loosening leading to revision is more prevalent in TER and increases with time. In HA, the most common type of revision involved addition of an ulna component with preservation of the humeral component.