

Revision Rates after Total Elbow Arthroplasty or Hemiarthroplasty for Acute Distal Humeral Fractures: Danish National Comparative Study of 366 Consecutive Patients

Andreas Falkenberg Nielsen¹, Ali Al-Hamdani, Jeppe Vejlgard Rasmussen², Peter Kraglund Jacobsen³, Theis Muncholm Thillemann, Bo Sanderhoff Olsen⁴

¹Shoulder- & Elbow Surgery, Herlev & Gentofte Hospital, ²Herlev University Hospital, ³Odense University Hospital, ⁴Herlev Hospital, Dept. T

INTRODUCTION:

Elbow arthroplasty is an established treatment of distal humeral fractures not amenable to internal fixation. Total elbow arthroplasty (TEA) is the most common modality, but elbow hemiarthroplasty (EHA) is becoming more popular, and it is still unclear which option produces the best results. We hypothesized that TEA is associated with a higher revision rate than EHA, due to aseptic loosening.

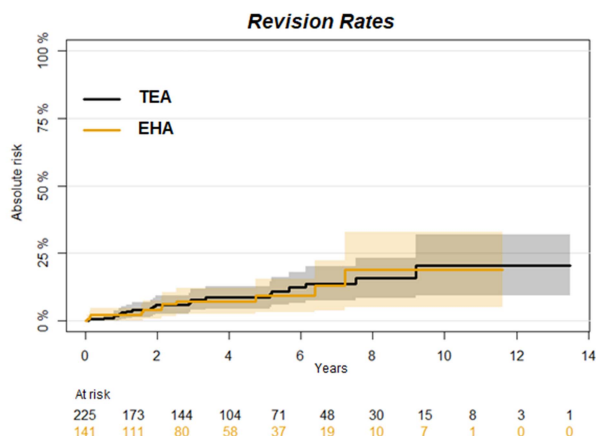
The aim was to compare revision rates of TEA and EHA in the treatment of acute distal humeral fracture.

METHODS:

Using individual hospital records of procedures we identified all patients with an acute distal humeral fracture treated with an elbow arthroplasty in the period from January 1, 2008 until December 1, 2021. Data was collected retrospectively by review of patient medical records. Kaplan-Meier analysis was used to estimate the cumulative revision rates for TEA and EHA. To evaluate risk factors for revision, hazard ratios (HR) were estimated using the Cox-proportional hazard model with mutual adjustment for age, sex, time to surgery, and implant type (TEA or EHA).

RESULTS: 225 TEA and 141 EHA procedures were included. All TEAs were semi-constrained (136 Coonrad-Morrey [Zimmer], 4 Latitude [Tornier], 37 Nexel [Zimmer], and 48 Discovery [Lima]). All EHAs were of the Latitude Elbow System [Tornier]. The 2-, 5- and 10-year revision rates were 5.8% (95% confidence interval [CI]: 2.5% - 9.2%), 8.6% (95% CI: 4.4% - 12.8%) and 20.5% (95% CI: 9.2% - 31.9%) for TEA, and 4.0% (95% CI: 0.5% - 7.5%), 9.3% (95% CI: 3.0% - 15.6%), and 18.7% (95% CI: 4.8% - 32.7%) for EHA. Overall, 21 TEAs and 11 EHAs were revised. The most common cause for revision of TEA was aseptic loosening (n=11, 52%), where loosening of the humeral component was the cause in 10 cases. The most common cause of revision of EHA was ulnar erosion (n=5, 46%). After adjustment, the HR of revision for male patients was 4.17 (95% CI: 1.79 - 9.71). The HR of revision for EHA was 0.84 (95% CI: 0.39 - 1.78) with TEA as reference.

DISCUSSION AND CONCLUSION: Revision rates of TEA and EHA were similar, but high compared to other large joint arthroplasties, and with increased risk of revision for males. Although the size of the presented data is small, revision rates of EHA does not seem inferior compared to TEA. EHA might bridge the gap between internal fixation and TEA, but functional results and patient-reported outcomes are necessary for further evaluation.



Revision Rates		
	EHA, N = 11	TEA, N = 21
Revision rate (95% CI)		
2 year	4.0% (0.5%, 7.5%)	5.8% (2.5%, 9.2%)
5 year	9.3% (3.0%, 15.6%)	8.6% (4.4%, 12.8%)
10 year	18.7% (4.8%, 32.7%)	20.5% (9.2%, 31.9%)