Long-Term Outcomes of Total Elbow Arthroplasty for Distal Humeral Fracture: Results from a Prior Randomized Clinical Trial

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Purpose: The use of total elbow arthroplasty (TEA) has become an increasingly popular treatment option in the setting of acute trauma for elderly patients with comminuted intra-articular distal humeral fractures. Multiple retrospective studies have documented good to excellent clinical outcome following TEA for trauma at short- to moderate-term follow-up. However, the longevity and long-term complications associated with this procedure are unknown. The objective of the present study was to examine long-term outcomes and implant survival in patients from a randomized clinical trial (RCT) comparing TEA to open reduction and internal fixation (ORIF).

Methods: We followed patients from a previously reported RCT comparing TEA and ORIF in patients over 65 years of age with comminuted, intra-articular distal humeral fractures conducted between 2000 and 2006. 42 patients were originally randomized. Patients and/or family members were contacted to obtain the required information. Outcomes included patient-reported grading of function and pain, revision surgical procedures, and implant survival.

Results: 11 patients were lost to follow-up, and we were able to obtain follow-up on 31 patients (7 men and 24 women, mean age 78 years). There were 2 early postoperative deaths, and 17 late deaths (19/42, 45%) and the mean follow-up was 8.3 years (range, 1.9-14.2 years). Three patients in the ORIF group underwent a second surgical procedure, at a mean of 1.7 years postoperatively, all for hardware removal. Two patients underwent a secondary procedure in the TEA group at a mean of 1.1 years postoperatively, one for irrigation and debridement for a deep infection, and a second for elbow release. There were no differences between the two groups with regard to rates of revision surgery (P = 0.36) (Fig. 1). Of the 18 patients with a TEA who were followed, none required revision of

\[ \Delta \text{OTA Grant} \]

The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.
the TEA, and this group included 8 who were living with their original arthroplasty, and 10 who died with a well-functioning implant in situ.

**Conclusion:** Total elbow arthroplasty is an effective and reliable procedure for comminuted fractures of the distal humerus in elderly patients. Our study revealed that long-term survival of the implant is excellent, with no patient requiring a late revision. This finding, combined with the better functional results and rapid rehabilitation compared to ORIF we have previously reported, confirms the utility of TEA in this elderly, low-demand, and frail population. For the overwhelming majority of these patients, a well-performed TEA will give them a well-functioning elbow for life and be the last elbow procedure they require.