Outcome After Olecranon Fracture Repair: Does Construct Type Matter?

Edward Delsole, MD; Christian Pean, MS; Nirmal Tejwani, MD; Kenneth Egol, MD; New York University Hospital for Joint Diseases, New York, New York, USA

Background/Purpose: Both plate and screw fixation and tension band wiring for simple and comminuted displaced olecranon fractures have been advocated. Few studies have explored the impact of these two surgical techniques on patient clinical outcomes and complication rates. This study compares clinical and functional outcomes of patients with displaced olecranon fractures treated with either a tension band wire (TBW) or a plate construct (PC).

Methods: We performed a retrospective review of operatively treated olecranon fractures by two surgeons at an academic medical center over a 7-year period. Patient demographics, injury information, and surgical management were recorded. Fractures were classified according to the OTA and Mayo systems. A single fellowship-trained orthopaedic trauma surgeon utilizing a similar construct in all cases performed all TBWs. Plate constructs were performed by one of two surgeons and consisted of either a precontoured or one-third tubular "hook" plates contoured intraoperatively and applied to the dorsal aspect of the proximal ulna. Measured outcomes included range of elbow motion, time to union, and development of postoperative complications. To assess functional outcomes, the Mayo Elbow Performance Score (MEPS) was obtained for all patients. Outcomes were compared using an unpaired, two-tailed Student t test and the Fisher exact test with significance defined as a P value <0.05. All patients were followed for a minimum of 6 months.

Results: A total of 58 patients were included in this study: 23 fractures were treated with a TBW and 35 fractures with a plate and screw construct. Both groups were similar with respect to patient sex, age, OTA and Mayo fracture type, and duration of follow-up (14 ± 9.5 months in TBW, 13 ± 19.2 months in PC). Patients undergoing plate fixation had more severe postoperative flexion contractures at their final office visit than those undergoing TBW (-9° ± 7.6° vs -4° ± 9.4°, P = 0.02). Time to radiographic union was longer in the plate group (18 ± 8 weeks) versus the TBW (13 ± 8 weeks) as well (P = 0.03). MEPS scores were slightly better in the TBW group versus the PC group (97.6 ± 5.2 vs 93.1 ± 8.6, P = 0.03). There was no difference in rates of symptomatic hardware between groups (26% in TBW vs 33% in PC, P = 0.98). No difference was observed between groups for postoperative range of motion, rate of heterotopic ossification, or rate of reoperation for any reason. Two patients in each group required a second surgery.

Conclusion: This study suggests that TBW and plate fixation of olecranon fractures have similarly excellent functional outcomes in the olecranon fracture subtypes studied. Those patients undergoing plate fixation had longer time to union and slightly worse MEPS scores, although the clinical significance of the difference was minimal. TBW remains an effective treatment for appropriately selected olecranon fractures, and in this cohort outperformed plate osteosynthesis.

See pages 47 - 108 for financial disclosure information.