

**Olecranon Fractures: Factors Influencing Reoperation**

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**Purpose:** Tension band (TB) and plating (open reduction and internal fixation [ORIF]) are two methods of fixation for olecranon fractures. While ORIF is used for comminuted fracture patterns, evidence is inconclusive regarding the best technique for simple fracture patterns requiring fixation. Often this decision is based on surgeon preference due to lack of significant outcomes data. In this study, we evaluate isolated olecranon fractures over a decade at a single Level I trauma center in order to investigate the factors influencing reoperation in TB versus ORIF.

**Methods:** A retrospective chart review at a Level I trauma center identified 489 patients who underwent operative management of olecranon fractures (CPT code 24685) from 2003 to 2013. These patients’ charts were reviewed for information including gender, height, weight, body mass index (BMI), American Society of Anesthesiologists (ASA) classification, mechanism of injury, fracture type, and fracture classification. Charts were also reviewed for complications; any instance of infection, nonunion, malunion, loss of function, or hardware complication requiring an unplanned surgical intervention was noted. Patients with any additional injuries were excluded from the study. Electronic radiographs of these patients were reviewed to identify OTA fracture classification and patients who underwent TB or ORIF. Both  $\chi^2$  and multivariate analyses were used to determine any statistical difference in complication rates between groups.

**Results:** 177 patients met inclusion criteria of isolated olecranon fractures. TB was used for fixation in 43 patients (24%) and ORIF in 134 patients (76%). There were 50 open fractures, with 10 in the TB group (grade 1 = 6, grade 2 = 4, grade 3 = 0) and 40 in the ORIF group (grade 1 = 7, grade 2 = 23, grade 3 = 10). Surprisingly, no statistical significance was found when comparing complication rates in open (36.0%) versus closed (36.2%) olecranon fractures ( $P = 1$ ). In a multivariate analysis controlling for age, gender, ASA, open versus closed fractures, and OTA fracture classification, the key factor in outcome was method of fixation. Overall, 23 patients had complications (53.6%) in the TB group compared to 41 patients (30.6%) in the ORIF group with infection and hardware removal being markedly higher in the TB group (table). Patients with TB were 3.8 times more likely to return to the operating room compared to the ORIF group.

	TB	ORIF	P Value
Total patients with complications	23	41	0.01
Hardware removal	20	20	0.0005
Infection	6	8	0.11

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**Conclusion:** Our results demonstrate that the dominant factor driving reoperation in isolated olecranon fractures is the type of fixation employed. When controlling for all variables, there is a 3.82 times greater chance of reoperation in patients with TB fixation. Surgeons must be cognizant of the risk of a potential second operation when using TB fixation.