

Fixation of Simple Olecranon Fractures Using a Hybrid Intramedullary Screw and Tension Band Construct

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INTRODUCTION:

Olecranon fractures are common injuries that require surgical intervention for optimal outcomes. Various fixation methods have been described in the literature, including the use of intramedullary proximal ulna screws in combination with tension band augmentation. Limited research has compared this hybrid technique to other established methods of fixation. This study compares complication and reoperation rates between these groups.

METHODS:

A retrospective review was conducted on patients with olecranon fractures who underwent internal fixation at a level 1 trauma center between January 1, 2013, and April 22, 2023. Data was collected using CPT codes, and patients were categorized into five groups based on the method of fixation received: no implant, tension band only, locking olecranon plate, intramedullary screw and tension band hybrid, and other. Variables such as patient demographics, Mayo fracture classification, open versus closed injury, implant type, reoperation rates, and postoperative complications were recorded.

RESULTS:

A total of 217 patients were included in the study. No difference was found in sex ($p=0.660$), presence of diabetes ($p=0.594$), smoking status ($p=0.666$), laterality ($p=0.809$). The nonsurgical group had a significantly higher proportion of patients with open fractures ($n=7$) compared with closed fractures ($n=8$) ($p=0.018$).

BMI, OR time, and blood loss were logarithmically transformed to produce parametric data confirmed with Q-Q plots and Shapiro-Wilk testing. These were then tested with One-Way ANOVA and Bonferroni correction. There was no difference in BMI between groups ($p=0.05$). OR time and blood loss was found to be higher in the locking plate group ($p<0.001$). Estimated blood loss was found to be higher in the locking plate group than the other treatment group ($p=0.013$). The locking plate group had an OR time significantly higher than the no implant group ($p<0.001$) and the other treatment group ($p=0.003$). No difference in OR time was found between the locking plate group and the intramedullary screw plus tension band group ($p=1.000$) or the tension band group ($p=0.576$).

Chi-squared tests were used to compare implant choice and our primary outcome, reoperation rate, and secondary outcomes of fracture type and presence of open fracture. No difference was found with implant choice and reoperation rate ($p = 0.461$). There was a significant difference found with reoperation and fracture type ($p = 0.027$) and open fracture ($p = 0.002$).

DISCUSSION AND CONCLUSION:

The primary findings of this study indicate no significant difference in implant choice and reoperation rates among the various fixation methods used for olecranon fractures. These findings suggest that the hybrid fixation technique, utilizing intramedullary proximal ulna screws in combination with tension band augmentation, is a viable and comparable treatment option when compared to other well-documented methods of fixation. This study also reiterates that severity of initial injury is often the most important factor related to poorer outcomes. Further discussion and analysis of the data will provide a comprehensive understanding of the implications and recommendations for olecranon fracture fixation.