

Mini-Fragment Plate Fixation for Olecranon Osteotomies

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Purpose: While olecranon osteotomies are helpful for distal humerus visualization, traditional methods of fixation are commonly irritating for patients and require hardware removal. Recent studies have shown lower hardware removal rates for medullary screw constructs and 3.5-mm plates, but no studies have investigated the use of 2.7-mm plates for olecranon osteotomy fixation. The purpose of this study is to report on the outcomes of single 2.7-mm mini-fragment plate fixation of olecranon osteotomies for distal humerus intra-articular fractures.

Methods: Patients who sustained an intra-articular distal humerus fracture, as identified by CPT codes, were reviewed retrospectively over a 5-year study period (2016-2020) at a single Level I trauma center after IRB approval. Only patients who underwent an olecranon osteotomy for distal humerus visualization during their definitive operation and that was subsequently fixed with a single 2.7-mm plate were included. Primary outcomes were implant removal and osteotomy union. Secondary outcomes included indications for implant removal, implant failure, infection, and revision surgery. Hardware removal rates were compared to historically reported rates in the literature. χ^2 versus Fisher's exact tests were used to compare fixation groups based on number of patients in each cohort (5 or less was used for the cut-off for Fisher's exact test).

Results: 38 patients were included in the final analysis. The average age was 50 years (standard deviation [SD] 18), 58% (22 patients) were female, and there was an average follow-up time of 9.7 months (SD 5). All patients with mini-fragment plate fixation went on to union of their olecranon osteotomy. Three (7.8%) patients had their olecranon hardware removed for all causes: 1 for revision open reduction and internal fixation (ORIF), 1 for irritation, and 1 for concomitant capsulectomy and manipulation. There was a 21% (8 patients) revision surgery rate in the cohort. One patient required revision ORIF of the olecranon osteotomy for hardware loosening. Compared to other fixation constructs, mini-fragment plates had a lower removal rate than tension band wiring ($P = 0.0002$) and 3.5-mm plates ($P = 0.05$) and similar among medullary screws \pm wires. Nonunion rates were similar between all constructs ($P = 0.07$).

Conclusion: Single 2.7-mm mini-fragment plate fixation of olecranon osteotomies for distal humerus fractures is safe and effective with low rates of revision, hardware removal, and nonunion. This type of fixation should be considered when treating intra-articular distal humerus fractures that require an olecranon osteotomy.