Unicolumnar Pin Fixation of Type III Supracondylar Humeral Fractures Is Associated with a Greater Than Three Times Higher Odds of Lost Reduction

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Purpose: Our aim was to compare the rate of loss of reduction between two groups of type III supracondylar humeral fracture patients: a unicolumnar fixation group versus a bicolumnar fixation group.

Methods: Patients with type III supracondylar humeral fractures were identified from surgical billing records. Pin placement was categorized as unicolumnar fixation (lateral column only) or bicolumnar fixation (lateral and medial column). The status of reduction and fixation at time of fluoroscopy was identified by assessing the Baumann angle, the Gordon index, and anterior humeral line (AHL). Loss of reduction was assessed at time of healing and defined as a Baumann angle change ≥10 and Gordon index of ≥0.5, and failure of AHL to intersect the capitellum. Statistical analysis was performed using the Fisher exact test and logistic regression.

Results: There were 257 patients included in the study (mean age 5.8 years; range 2-14). Of these patients, 183 had bicolumnar fixation, with 6% (11) demonstrating loss of reduction. 74 patients had unicolumnar fixation with 18% (13) showing loss of reduction. These two rates were significantly different ($P = 0.008$) with a 3.3-times higher odds (95% confidence interval = 1.3, 8.6) of loss of reduction with unicolumnar fixation. Multivariate analysis showed statistical significance of unicolumnar versus bicolumnar fixation ($P = 0.007$) and showed a trend toward higher loss of reduction with increased fluoroscopy time ($P = 0.07$).

Conclusion: There is a statistically significant increase in the rate of supracondylar fracture loss of reduction for patients with unicolumnar fixation when compared to bicolumnar fixation.