

Anterior-Inferior Plating Results in Fewer Secondary Interventions Compared to Superior Plating for Acute Displaced Midshaft Clavicle Fractures

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Purpose: We sought to determine if a difference in plate position for fixation of acute, displaced, midshaft clavicle fractures affects the rate of secondary intervention. Our null hypothesis was that there would be no difference.

Methods: After IRB approval, 266 patients treated surgically for an acutely displaced midshaft clavicle fracture between 2000-2012 were identified and reviewed retrospectively at a minimum of 24 months follow-up (F/U). Fractures were divided into two cohorts, according to plate position: anterior-inferior (AI) or superior (S). Exclusion criteria included age <16 years, incomplete data records, and loss to F/U. Group analysis included demographics (age, gender, BMI [body mass index]), fracture characteristics (mechanism of injury, open or closed), hand dominance, ipsilateral injuries, time between injury and surgery, time to radiographic union, length of F/U, and frequency of secondary procedures. Fisher exact test, t test and odds ratio were used for statistical analysis.

Results: Final analysis included 174 fractures / 173 patients. 111 (64%) were in group AI, and 63 (36%) were in group S. No differences in demographics, fracture characteristics, time to surgery, time to union, or length of F/U existed between groups. Six patients / six fractures (5.2%) in Group AI underwent a secondary surgery (4 patients had the plate removed due to irritation, 1 developed an infected nonunion, and another fell, refracturing the clavicle) whereas 14 patients / 14 fractures (21.8%) in group S required a secondary surgery (12 due to irritation from the plate, 1 developed a nonunion, and 1 presented with a fractured implant). An additional intervention secondary to superior plate placement was highly statistically significant ($P = 0.002$). Furthermore, because 80% of these subsequent interventions were a result of plate irritation with patient discomfort, the odds ratio for a second procedure was 5 times greater in those fractures treated with a superior plate.

Conclusion: This Level III therapeutic retrospective comparative study indicates that when all other variables are held equal, an anterior-inferior plate appears to lessen clinical irritation and results in significantly fewer secondary operations. Considering patient satisfaction and a reduced financial burden to the health care system, we recommend routine anterior-inferior plate application when open reduction and internal fixation of the clavicle is required.