Arthroscopically Assisted Coracoclavicular (CC) Stabilization Using a Suture Button Device for Lateral Clavicle Fracture with CC Ligament Injury

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Summary: Arthroscopically assisted coracoclavicular (CC) stabilization using a suture button device for lateral clavicle fracture with CC ligament injury founded satisfactory radiologic and clinical outcomes with low risk of implant irritation.

Background: The treatment for lateral clavicle fracture is still controversial, especially with coracoclavicular (CC) ligament injury. Various fixation techniques including, a pre-contoured plate, a hook plate, K-wire fixation and coracoclavicular (CC) stabilization, has been proposed to manage lateral clavicle fracture. We performed arthroscopically assisted CC stabilization using a suture button device for lateral clavicle fracture with CC ligament injury in order to achieve vertical stability of the central clavicle fragment and decrease the risk of implant irritation and removal. The purpose of this study was to evaluate the radiologic and clinical outcomes of arthroscopically assisted CC stabilization using a suture button device for lateral clavicle fracture with CC ligament injury.

Methods: Five consecutive patients with lateral clavicle fracture with CC ligament injury were treated with arthroscopically assisted CC stabilization using the suture button device. (Dog bone button and FiberTape, Arthrex, Naples, FL, USA). The mean follow-up period was 10 months (range, 6-12 months). Radiologic analysis was performed to evaluate bone union and the existence of CC ligament ossification using serial plain radiographs at 3 and 6 months after operation. Post-operative range of motion (ROM) was evaluated at 3 and 6 months after operation. Shoulder functional score was evaluated using Japanese Orthopedics Association score (JOA score) at 6 months after operation. Results: Mean operation time and amount of bleeding were 75.8 ± 8.2 min and 20.2 ± 10.6 ml. There were no perioperative complications, including surgical site infection, nerve injury, and fractures of coracid and clavicle. All cases showed complete bone union (2 cases at 3 months and 5 cases at 6 months after operation). Mean postoperative ROMs at 3 and 6 months after operation were 140.0 ± 21.0 and 162.0 ± 17.2 in anterior elevation, 49.0 ± 15.0 and 64.0 ± 8.0 in external rotation, and L1 ± 4.0 and Th11 ± 4.0 in internal rotation. Mean JOA score was 98.0 ± 3.1 at 6 months after operation. No case showed implant irritation and needed for implant removal. Conclusion: Arthroscopically assisted CC stabilization using a suture button device for lateral clavicle fracture with CC ligament injury founded satisfactory radiologic and clinical outcomes. The major advantages of this technique are high rate of bone union and low rate of complications including implant irritation.

Category: Shoulder - Fractures

Dual Plate Fixation Of Midshaft Clavicle Fractures May Reduce Reoperation Rates Compared To Single Plating With Anterior Or Superior Fixation Techniques

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Summary: Dual plate fixation of displaced midshaft clavicle fractures has an eight-fold lower risk of reoperation compared to single plate fixation, while accounting for age, smoking, and high-risk fracture morphology.

Data: Introduction: Dual plate fixation has been proposed as a solution to the high rates of reoperation secondary to operative management of displaced midshaft clavicle fractures. Previous studies have recommended dual plating for patients specifically at higher risk of reoperation. Therefore, the purpose of this study was to compare reoperation rates among patients who underwent single superior, single anterior, and dual plating while adjusting for risk factors including age, smoking status, and high-risk fracture morphology. We hypothesized lower rates of reoperation among patients who underwent dual plate fixation. Methods: This was a retrospective cohort study of all patients who presented with a midshaft clavicle fracture and underwent ORIF between 2007 and 2021 to our trauma/sports divisions. Patient demographics, fracture pattern, plating technique, postoperative complications, date of surgery, reoperation status, date of last follow up, and date of reoperation were documented. We report hazard ratio (HR) estimates using a multivariate multilevel mixed-effects parametric survival model, which accounted for patients with multiple reoperations and adjusted for covariates. Results: A cohort of 395 patients (mean age 38.5±14.4 years, 81.7% male) were identified with average follow-up of 5.5±8.6 months. There were 77 z-type, 157 transverse, and 161 oblique fractures. With regards to plating technique, 152 underwent single superior plating, 149 experienced single anterior plating, and 94 had dual plating. After initial operation, there were 8 total instances of non-union (2.0%), 0 in the dual plating cohort (0%), 4 in the superior plating cohort (2.6%), and 4 in the anterior plating cohort (2.7%) (p=0.35). A total of 28 reoperations took place among 19 patients (4.8%), with 6 patients experiencing multiple reoperations. Single plating with superior placement revealed the highest reoperation rate of 0.26 per person-years, followed by anterior placement with 0.17 per person-years, and finally dual plating with 0.02 per person-years (Figure 1). Patients who underwent single plating (either anterior or superior placement) revealed a greater rate of reoperation when compared to patients who underwent dual plating (HR: 8.3, p=0.045). Patients who underwent single plating with superior placement had a rate of reoperation ten-times greater than patients who underwent dual plating (HR:10.1, p=0.03). Patients who underwent single plating with anterior placement had a rate of reoperation six-times greater than patients who underwent dual plating (HR: 6.4, p=0.09), although not statistically significant. Conclusion: Dual plate fixation of displaced midshaft clavicle fractures has an eight-fold lower risk of reoperation compared to single plate fixation, while accounting for age, smoking, and high-risk fracture morphology. More specifically, dual plating had lower rates of