

Predictors of Persistent Pain After Distal Clavicle Fracture Fixation in an Active Military Population

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Purpose: Previous studies reporting on distal clavicle fractures have demonstrated a high rate of hardware removal and persistence of symptoms, particularly in those attempting to return to high-demand activities. The purpose of this study is to evaluate the clinical and occupational outcomes of military service members following surgical management of distal clavicle fractures.

Methods: All active-duty service members undergoing primary distal one-third clavicle fracture open reduction and internal fixation (ORIF) between October 17, 2007 and July 20, 2012 were reviewed. Inclusion criteria were applied to all active-duty service members with confirmed group II clavicle fractures and minimum 2-year follow-up. The electronic health record was queried for each service member to confirm accurate coding and extract pertinent demographic parameters and clinical outcomes to include primary outcomes of persistence of pain, hardware removal, and postinjury deployment.

Results: 48 service members were identified with an average follow-up of 3.8 years (range, 2.0-6.7). The average age was 30.3 years (range, 20.0-50.8). 35% (n = 17) experienced persistence of symptoms, 44% (21) required hardware removal, and 35% (n = 17) returned to deployment. 100% of fractures reached radiographic union, although 4% (n = 2) were delayed unions. There was a higher rate of symptom persistence in those treated with hook plates (58%, n = 7) compared to those treated with standard plating technique (28%, n = 10), even after hardware removal (odds ratio [OR] 3.64, confidence interval [CI] 0.93-14.18, P = 0.063). There was an increased rate of symptom persistence in those who underwent hardware removal (48%) than those without (26%), and this approached significance (P = 0.12). The incidence of persistence of pain in those who underwent concomitant coracoclavicular fixation (33%) was not significantly different than those without coracoclavicular fixation (36%) (P = 0.88). As body mass index (BMI) increases, there is a trend towards nondeployment in those who undergo distal clavicle fracture ORIF (OR 0.77, CI 0.59-1.01, P = 0.0598). There was no significant difference in the rate of those who deployed with or without hardware removal (48% and 26%, respectively; P = 0.12). There was also no significant difference in the rate of those who deployed with or without persistence of symptoms (P = 0.52).

Conclusion: At a mean 4-year follow-up, there was a 3.6-fold increase in persistence of symptoms in those treated with a hook plate despite routine plate removal. Overall persistence of pain occurred in 35% of patients, with increases to 59% among those treated with hook plates. There is an increased overall rate of persistence of symptoms in patients who have undergone hardware removal. Among patients with high upper extremity occupational demands, such as active-duty military service members, there is a high incidence of persistent symptoms and hardware removal. Persistence of pain and hardware removal did not prove to be a significant risk factor in preventing deployment.

The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.