

Plate Fixation Does Not Beat Nonoperative Treatment for Displaced Midshaft Clavicular Fractures: A Meta-Analysis of Randomized Controlled Trials*Sarah Woltz, MD; P. Krijnen, PhD; I.B. Schipper, MD, PhD*

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Purpose: Are patients with a displaced midshaft clavicular fracture really better off after plate fixation than after nonoperative treatment? This debate continues despite many relevant publications. Since the last meta-analysis, two new randomized trials (RCTs) have been performed on the subject. The aim of this study was to analyze whether patients with a displaced midshaft clavicular fracture are best treated with plate fixation or nonoperatively, by evaluating all available RCTs on this subject.

Methods: A systematic search of electronic databases (PubMed, Medline, Embase, and Web of Science) was performed to identify RCTs comparing nonoperative treatment with open reduction and plate fixation for fully displaced, midshaft clavicular fractures. Risk of bias of the studies was assessed according to the criteria stated in the Cochrane Handbook for Systematic Reviews of Interventions. Outcomes were nonunion, symptomatic nonunion (ie, nonunion with complaints to such a degree that a secondary operation was indicated), shoulder function (Constant Score and DASH [Disabilities of the Arm, Shoulder and Hand] Score) and number of secondary operations.

Results: Six RCTs (620 patients) were included. The risk of nonunion was lower in the operatively treated patients (RR 0.15, CI 0.07-0.33). One-third of the patients with a nonunion did not receive further treatment. Secondary operations for complications were indicated less often in the operatively treated patients (RR 0.42, CI 0.22-0.81), while in 17% of both groups a secondary operation was performed when including plate removal operations (RR 0.97, CI 0.57-1.67). Constant and DASH scores after 1 year were better after plate fixation with a mean difference of 4.4 points (CI 0.90-7.86) and 5.1 points (CI 0.06-10.08), respectively.

Conclusion: Plate fixation significantly reduces the risk of nonunion, but does not have a clinically relevant advantage regarding functional outcome. Secondary operations are common after both treatments. Overall, there is not enough evidence for routine operative treatment for all patients with a displaced, midshaft clavicular fracture.