INPLASY PROTOCOL

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None declared.

Comparison of volar locking plate and external fixation of distal radius fractures – a meta-analysis of randomized controlled trials

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Review question / Objective: **This analysis compared the surgical outcomes of volar locking plate (VLP) and external fixation (EF) for distal radius fractures (DRFs) to determine which treatment was superior to the other.**
Condition being studied: **The postoperative results of the patients of distal radial fractures treated with VLP or EF.**
Eligibility criteria: **(a) the design of studies were RCTs; (b) studies reported data on DRFs patients; (c) studies compared surgical outcomes for DRFs using VLP with EF; (d) studies reported data on disabilities of the arm shoulder and hand (DASH) scores, patient-rated wrist evaluation (PRWE) questionnaire, visual analogue scale (VAS) scores, grip strength, range of motion, radiological results, or complications.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 22 September 2021 and was last updated on 22 September 2021 (registration number INPLASY202190069).

INTRODUCTION

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Condition being studied: **The postoperative results of the patients of distal radial fractures treated with VLP or EF**

METHODS

Participant or population: **Patients with distal radial fractures.**

Intervention: Volar locking plate or external fixation

Comparator: Functional results, radiographic parameters, complications.

Study designs to be included: Randomized controlled trials.

Eligibility criteria: (a) the design of studies were RCTs; (b) studies reported data on DRFs patients; (c) studies compared surgical outcomes for DRFs using VLP with EF; (d) studies reported data on disabilities of the arm shoulder and hand (DASH) scores, patient-rated wrist evaluation (PRWE) questionnaire, visual analogue scale (VAS) scores, grip strength, range of motion, radiological results, or complications.

Information sources: Electronic databases.

Main outcome(s): 16 randomized controlled trials with a total sample size of 1427 were included. Significant differences favoring volar locking plate were detected in the disabilities of the arm shoulder and hand scores at 3, 6, and 12 months, grip strength at 3 and 12 months, extension at 3 and 6 months, flexion at 3 and 6 months, supination at 3 months, volar tilt at 12 months, radial length at 6 months postoperatively. The overall complication rate was significantly lower in volar locking plategroup.

Quality assessment / Risk of bias analysis: The quality of each study was independently assessed by two reviewers based on Cochrane risk-of-bias criteria, and each quality item was graded as low risk, high risk, or unclear risk. The 7 items used to evaluate bias in each trial included the randomization sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessment, incomplete outcome data, selective reporting, and other bias. We defined other bias as trials sponsored by medical device companies and trials without similar baseline characteristics.

Strategy of data synthesis: Mean differences (MD) with a 95% confidence interval (CI) were calculated using the inverse variance method for continuous variables; and risk ratio (RR) with a 95%CI were calculated using the Mantel-Haenszel analysis method for dichotomous variables. In consideration of the Between-studies heterogeneity, the random-effects model was used for meta-analysis.

Subgroup analysis: we stratified the study into subgroups according to the different results reported, including DASH score, PRWE score, VAS score, grip strength, radiographic parameters, ROM, complications.

Sensitivity analysis: Considerable heterogeneity was detected for variables. We carried out sensitivity analyses for these variables in which we restricted the analysis to some studies.

Country(ies) involved: China.

Keywords: Distal radius fractures; External fixation; Volar locking plate; Randomized controlled trials; Meta-analysis.

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