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Meta-analysis of unilateral extrapedicular versus bilateral transpedicular percutaneous kyphoplasty for osteoporotic vertebral compression fracture

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 13 December 2023 and was last updated on 13 December 2023.

INTRODUCTION

Review question / Objective The purpose of this study is to compare the efficacy and safety of unilateral extrapedicular puncture and bilateral transpedicular puncture in percutaneous kyphoplasty for osteoporotic vertebral compression fracture.

Condition being studied This study investigates the efficacy and safety of unilateral extrapedicular puncture and bilateral transpedicular puncture in percutaneous kyphoplasty for osteoporotic vertebral compression fracture, it aims to provide comprehensive evidence for guiding clinical decisions in treating osteoporotic vertebral compression fracture.

METHODS

Participant or population People with osteoporotic vertebral compression fractures.

Intervention Unilateral extrapedicular percutaneous kyphoplasty.

Comparator Bilateral transpedicular percutaneous kyphoplasty.

Study designs to be included randomized or non-randomized controlled study.

Eligibility criteria (1) Study types: randomized or non-randomized controlled study, (2) Participants: patients with clinically diagnosed osteoporotic vertebral compression fracture, (3) Interventions:

unilateral extrapedicular PKP and bilateral transpedicular PKP, (4) Outcome indexes: duration of operation, cement leakage, visual analogue scale, Oswestry disability index, Cobb's angle recovery, and anterior vertebral height restoration, (5) Publication time: from 2013 to 2023.

Information sources Date sources for this review include MEDLINE, PubMed, Web of Science, Cochrane databases, CNKI, Chinese Biomedical Literature Database, and Wanfang Data.

Main outcome(s) Visual analogue scale, Oswestry disability index, Cobb's angle recovery and anterior vertebral height restoration.

Additional outcome(s) Duration of operation and cement leakage rate.

Quality assessment / Risk of bias analysis The evaluation of the quality of retrospective studies will be conducted using the renowned Newcastle Ottawa Scores. The potential bias will be assessed for randomized controlled trials in accordance with the guidelines proposed by the Cochrane Collaboration. Two review authors will independently evaluate the quality or the risk of bias in the studies included. In case of any disagreement, a third reviewer will be consulted.

Strategy of data synthesis The meta-analyses will be conducted using the Review Manager software (RevMan Version 5.4 Cochrane Collaboration). For dichotomous data, odds ratios (OR) will be used for calculation, while mean difference (MD) with 95% confidence intervals (CI) will be used for continuous data. We will use Cochran's Q test and the degree of inconsistency (I^2) to evaluate heterogeneity among combined results. In order to determine the appropriate statistical model for pooling the data, a fixed-effects model will be employed when the $P > 0.05$ and $I^2 < 50\%$. Conversely, if these criteria are not met, the random effects method will be utilized. The integration results are deemed statistically significant if the $P > 0.10$, funnel plot analysis will be used to determine publication bias.

Subgroup analysis Subgroup analysis will be conducted for studies exhibiting substantial heterogeneity.

Sensitivity analysis Sensitivity analysis will be performed by systematically excluding individual studies to evaluate their impact on the overall results for each outcome indicator.

Country(ies) involved China.

Keywords Meta-analysis; unilateral extrapedicular; bilateral transpedicular; percutaneous kyphoplasty; osteoporotic vertebral compression fracture.

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