INPLASY

Dual-Mobility Versus Conventional Total Hip Arthroplasty for Femoral Neck Fractures: An Updated Systematic Review

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Corresponding author:
Qin He

scspine@163.com

Author Affiliation:
North Sichuan Medical College.

Mao, P; Zhang, R; Lin, J; He, C; Yang, F; Cao, D; Wang, F; Li, Y; Wang, P; He, Q.

ADMINISTRATIVE INFORMATION

Support - No support.

Review stage at the time of initial registration - 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 November 2026 and was last updated on 13 November 2026.

INTRODUCTION

Review question / Objective Among patients with femoral neck fractures undergoing primary total hip arthroplasty (THA), does dual-mobility THA (DM-THA), compared with conventional fixed-bearing THA, reduce postoperative hip dislocation at approximately one year? This review aimed to compare postoperative dislocation, prosthetic joint infection, re-operation, implant revision, mortality, functional recovery, and health-related quality of life, prioritizing randomized evidence.

Rationale Postoperative dislocation is an important complication after THA for displaced femoral neck fractures. Dual-mobility articulations may improve joint stability, but effects on other complications and functional recovery require evaluation. Earlier reviews combined randomized and observational evidence, limiting causal interpretation. The publication of the large multicentre DUALITY randomized trial in 2026 provided a reason to update the evidence, prioritizing randomized comparisons and evaluating observational findings separately.

Condition being studied Femoral neck fractures, particularly acute displaced intracapsular fractures, treated with primary total hip arthroplasty. The main clinical concern was postoperative hip instability and dislocation; associated complications and patient-reported recovery outcomes were also evaluated. Hemiarthroplasty and revision arthroplasty were outside the scope of the comparison.

METHODS

Participant or population Patients with femoral neck fractures undergoing primary total hip arthroplasty, with particular emphasis on patients with acute displaced fractures. Studies with varying age ranges were eligible if the fracture indication and intervention comparison met the review criteria.

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Intervention Primary dual-mobility total hip arthroplasty (DM-THA), using a dual-mobility acetabular articulation, irrespective of implant brand, fixation method, or surgical approach.

Comparator Primary conventional fixed-bearing total hip arthroplasty (THA) using a standard acetabular articulation. Hemiarthroplasty was not an eligible comparator.

Study designs to be included Randomized controlled trials, including randomized feasibility trials, directly comparing DM-THA with conventional THA formed the primary evidence base. Comparative observational cohort or registry studies were considered only as supplementary evidence and evaluated separately, without pooling with randomized trials. Non-comparative reports and case series were excluded.

Eligibility criteria Eligible studies enrolled patients undergoing primary THA for femoral neck fractures, directly compared DM-THA with conventional fixed-bearing THA, and reported at least one extractable postoperative clinical outcome. Randomized trials formed the principal synthesis; comparative observational evidence was used separately for context. Exclusions included THA for other indications, hemiarthroplasty comparisons, revision arthroplasty, non-comparative studies, reviews, case reports, study protocols, and conference abstracts lacking usable outcome data. There were no restrictions on publication date or language.

Information sources PubMed, Europe PMC, Embase, and Web of Science Core Collection were searched for publications from January 1, 1900, through October 13, 2026, using database-adapted subject headings and free-text terms relating to dual mobility and femoral neck fracture. ClinicalTrials.gov was searched separately for registered trials. Reference lists of relevant studies and systematic reviews were also screened. No language restrictions were applied.

Main outcome(s) Postoperative hip dislocation, defined as at least one dislocation within approximately 12 months after primary THA. Results reported at 9–15 months were considered for the main time window; outcomes assessed at other or unclear time points were evaluated separately.

Quality assessment / Risk of bias analysis RCTs were assessed independently by two reviewers using RoB 2 (randomization, intervention deviations, missing data, outcome measurement, selective reporting). Observational studies were assessed using ROBINS-I. GRADE evaluated certainty by outcome across bias, inconsistency, indirectness, imprecision, and publication bias. Disagreements were resolved by consensus.

Strategy of data synthesis Binary outcomes were expressed as crude risk ratios (log-Wald 95% CIs), absolute risk differences (Newcombe 95% CIs), and numbers needed to treat if applicable. Adjusted hazard ratios were reported separately. Pooling required comparable outcome definitions, follow-up, and usable data. Double-zero-event and inconsistent reports were summarized narratively without continuity corrections. Observational evidence was analyzed separately. No pooled primary effect was calculated. R was used.

Subgroup analysis Surgical-approach subgroups (posterior versus direct lateral) reported by the DUALITY trial were examined descriptively for postoperative dislocation. No formal treatment-by-approach interaction test was performed; these comparisons were not interpreted as definitive evidence of effect modification.

Sensitivity analysis The per-protocol dislocation estimate reported by DUALITY was compared with its modified intention-to-treat estimate as a supplementary robustness check. A formal leave-one-out or pooled sensitivity analysis was not undertaken because no reliable pooled estimate for the primary outcome was available. Trials with double-zero events or inconsistent reporting were considered narratively.

Country(ies) involved China.

Keywords Dual mobility; Femoral neck fracture; Total hip arthroplasty; Hip dislocation; Randomized controlled trial; Systematic review; Meta-analysis.

Contributions of each author

Author 1 - Pengyu Mao
Author 2 - Renchi Zhang
Author 3 - Jun Lin
Author 4 - Chuan He
Author 5 - Feng Yang
Author 6 - Dongping Cao
Author 7 - Fusheng Wang
Author 8 - Yanlun Li
Author 9 - Pingxi Wang
Author 10 - Qin He

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