International Platform of Registered Systematic Review and Meta-analysis Protocols

INPLASY

Surgical Versus Conservative Treatment for Low-Energy Lisfranc Injuries: A Systematic Review

INPLASY202660051

doi: 10.37766/inplasy2026.6.0051

Received: 11 June 2026

Published: 11 June 2026

Lu, X; Dong, X; Ge, J.

Corresponding author:
XING LU

jerglu88@outlook.com

Author Affiliation:
The First People's Hospital of Yangquan.

ADMINISTRATIVE INFORMATION

Support - None. Institutional support only.

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

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202660051

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 11 June 2026 and was last updated on 11 June 2026.

INTRODUCTION

Review question / Objective To compare functional outcomes, return to activity, complication rates, and treatment crossover rates between surgical and conservative management for low-energy (Nunley I-III, ligamentous-predominant) Lisfranc injuries, and to evaluate the IFASC 2025 treatment recommendations against the best available comparative evidence.

Condition being studied Low-energy (Nunley I-III, ligamentous-predominant) Lisfranc injuries of the tarsometatarsal joint complex, sustained through ground-level falls, sports twisting mechanisms, or low-velocity trauma, without fracture-dislocation.

METHODS

Participant or population Adults (≥16 years) with low-energy Lisfranc injuries sustained through ground-level falls, sports twisting, or low-velocity trauma. Eligible injury patterns: Nunley stages I-III, subtle, occult, ligamentous, or purely ligamentous injuries without fracture-dislocation.

Intervention Surgical treatment including open reduction and internal fixation (ORIF) with transarticular screws or dorsal bridge plating, flexible fixation (suture button/TightRope/InternalBrace), or primary tarsometatarsal arthrodesis.

Comparator Conservative treatment including non-weightbearing cast or controlled ankle motion boot immobilization for a minimum of 4 weeks, followed by graduated weightbearing and structured rehabilitation.

Study designs to be included RCTs, quasi-RCTs, prospective and retrospective comparative cohort studies with contemporaneous controls. Single-arm conservative treatment studies retained as a secondary data source for the treatment crossover rate parameter only.

Eligibility criteria Inclusion: Adults ≥16 years; low-energy Lisfranc injuries (Nunley I-III, ligamentous, subtle, occult); direct comparison of surgical vs conservative treatment; reporting ≥1 outcome (AOFAS, VAS-FA, FAAM, return to sport, crossover rate, complications); RCTs, quasi-RCTs, comparative cohort studies with contemporaneous controls; English or Chinese.
Exclusion: High-energy trauma (motor vehicle, fall from height); Myerson B/C fracture-dislocations; open fractures; Charcot arthropathy; pathological fractures; single-arm studies (except conservative-only studies used for crossover rate); case series n<10; reviews; cadaveric/biomechanical studies; non-English/non-Chinese language.

Information sources PubMed (MEDLINE), EMBASE (Ovid), Cochrane CENTRAL, Web of Science Core Collection, CNKI (中国知网), Wanfang (万方), VIP (维普), ClinicalTrials.gov, WHO ICTRP. Reference lists of included studies and relevant systematic reviews were hand searched. Searches conducted from database inception to June 2026.

Main outcome(s)
Primary outcomes:
1. Functional outcome scores (AOFAS Midfoot, VAS-FA, FAAM, SF-36 PCS) at ≥12 months follow-up
2. Return to sport/work rate at final follow-up

Secondary outcomes:
3. Treatment crossover rate (conservative → surgical)
4. Post-traumatic arthritis (radiographic K-L ≥2 or clinical diagnosis)
5. Reoperation rate
6. Complications (wound infection, nerve injury, hardware failure, DVT, CRPS)
7. Patient satisfaction and residual pain (VAS 0-10).

Quality assessment / Risk of bias analysis RCTs: Cochrane Risk of Bias 2 (RoB 2) across five domains.
Non-randomized comparative studies: ROBINS-I (Risk of Bias in Non-randomized Studies of Interventions) across seven domains, with particular attention to confounding by indication (Domain 1).
Risk of bias assessed independently by two reviewers; discrepancies resolved by consensus.

Strategy of data synthesis Random-effects meta-analysis (REML estimator for between-study variance) with Hartung-Knapp-Sidik-Jonkman adjustment was planned where ≥3 studies contributed data per outcome. For continuous outcomes (AOFAS, VAS-FA), mean differences or standardized mean differences (Hedges' g) where different scales were pooled. For binary outcomes (crossover rate, return to sport, complications), risk ratios with 95% CI. Heterogeneity assessed with I^2 and Cochrane Q. GRADE framework for certainty of evidence. Due to missing full-text data, quantitative synthesis was limited to the treatment crossover rate; all other outcomes were synthesized narratively with individual study estimates. Prespecified subgroup analyses (Nunley stage, surgical technique, study design, athlete vs general population, publication era) were planned but not feasible due to insufficient study counts per subgroup.

Subgroup analysis Prespecified but not feasible due to limited study counts:
1. Nunley stage (I vs II-III)
2. Surgical technique (ORIF screws vs bridge plating vs flexible fixation vs primary arthrodesis)
3. Study design (RCT vs observational)
4. Athlete vs general population
5. Publication era (≤2015 vs >2015).

Sensitivity analysis
Planned but not feasible:
1. Leave-one-out analysis
2. Restriction to low/moderate risk of bias studies
3. Exclusion of studies with >20% treatment crossover
4. Fixed-effect model alternative
5. Exclusion of studies with n <10 per group.

Language restriction English and Chinese. No other language restrictions applied at the search stage.

Country(ies) involved China.

Keywords Lisfranc injury; tarsometatarsal joint; conservative treatment; surgical fixation; low-energy; ligamentous; Nunley classification; systematic review; IFASC consensus.

Contributions of each author
Author 1 - XING LU.
Email: jerglu88@outlook.com
Author 2 - Xin Dong.
Email: dx-997@163.com
Author 3 - Jianzhong Ge.
Email: 1983808224@qq.com