

INPLASY PROTOCOL

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None declared.

The Postoperative Effects of Patellar Eversion in Total Knee Arthroplasty: An Updated Systematic Review and Meta-analysis

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Review question / Objective: The aim is to assess the adverse effect between patellar eversion and patellar no-eversion duration of total knee arthroplasty(TKA).

Condition being studied: Patellar Eversion in Total Knee Arthroplasty. We have completed the most of work in this meta-analysis.

Eligibility criteria: The inclusion criteria were as following PICOS principle: 1. Participate, patients of all ages and gender who required primary TKA; 2. Intervention, the patients received patellar eversion duration the procedures of TKA; 3. Comparison, the patients did not receive patellar eversion in the procedures; 4. Outcomes, postoperative complications, postoperative pain, operation time, length of hospitalization, quadriceps strength, straightened leg (SLR), and Insall-Salvati ratio follow-up period; 5. Study, randomized controlled trials (RCTs). The exclusion criteria were case series studies without comparison groups and studies not reporting on the outcomes of interest.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 25 September 2021 and was last updated on 25 September 2021 (registration number INPLASY202190094).

INTRODUCTION

Review question / Objective: The aim is to assess the adverse effect between patellar eversion and patellar no-eversion duration of total knee arthroplasty(TKA).

Rationale: Total knee arthroplasty (TKA) has become one of the most vital operative strategies for patients with severe knee arthritis. The technique procedure provides excellent outcomes for deformity correction, pain relief, and functional improvement. During the operation, the

surgeons mobilize the patella to facilitate clear visualization of articular surfaces and allow better prosthesis placement. According to the manipulation, surgeons often divided the ways into patellar eversion and patellar non-eversion. In patellar eversion, the patella is twisted along the longitudinal axis of the quadriceps mechanism and retracted laterally. Eversion has the advantage of better exposure, but it results in perioperative torsion and increased tension on the extensor mechanism. This insult may potentially cause fibrosis and scarring of quadriceps and patellar tendons that may lead to patella baja and decreased mechanical advantage of the extensor mechanism after a less optimal position of the patella during the flexion and extension arc. Patellar non-eversion requires retraction or subluxation of the patella without eversion and is increasingly performed by orthopedic surgeons. Lateral retraction or subluxation of the patella provides less optimal surgical exposure. This can potentially increase the risk of component malposition, lateral tibial overhang, and traction damage to the patellar tendon. Several randomized controlled trials (RCTs) from 2007 to 2021 have recently been conducted to compare the relative effect of patellar eversion with patellar no-eversion during TKA. These individual RCTs involved a small sample size and made the results inconclusive. Additionally, three classical meta-analyses and one overlapping meta-analysis, from the year 2015 to 2019, have compared two kinds of surgical exposure. However, the conclusions were inconsistent with each other. The reason for this difference is the primary or interesting endpoints in these reviews are various. Zan et al. and Jia et al. concluded that patella eversion and lateral patella retraction could achieve similar clinical outcomes. In contrast, Yang et al. concluded that patellar non-eversion offers a shorter hospital stay and a lower incidence of postoperative complications from the same RCTs. There have been many RCTs on TKA that demonstrated that patellar eversion has definite efficacy and side effects. In this systematic review, we have mainly compared two adverse

postoperative effects, such as complications and pain. Therefore, this study will determine the adverse effects between patellar eversion and patellar no-eversion duration of TKA based on meta-analysis to determine the effects of patellar eversion.

Condition being studied: Patellar Eversion in Total Knee Arthroplasty. We have completed the most of work in this meta-analysis.

METHODS

Search strategy: We searched the MEDLINE, Embase, and Cochrane library databases using the keywords “TKA”, “total knee arthroplasty”, “TKR”, “total knee replacement”, “ever*”, “patellar”. The retrieval dates included the time from database creation to August 2021. There was no limitation in the process of searching.

Participant or population: Participate, patients of all ages and gender who required primary TKA.

Intervention: Intervention, the patients received patellar eversion duration the procedures of TKA.

Comparator: Comparison, the patients did not receive patellar eversion in the procedures.

Study designs to be included: Study, randomized controlled trials (RCTs).

Eligibility criteria: The inclusion criteria were as following PICOS principle: 1. Participate, patients of all ages and gender who required primary TKA; 2. Intervention, the patients received patellar eversion duration the procedures of TKA; 3. Comparison, the patients did not receive patellar eversion in the procedures; 4. Outcomes, postoperative complications, postoperative pain, operation time, length of hospitalization, quadriceps strength, straightened leg (SLR), and Insall-Salvati ratio follow-up period; 5. Study, randomized controlled trials (RCTs). The

exclusion criteria were case series studies without comparison groups and studies not reporting on the outcomes of interest.

Information sources: MEDLINE, Embase, and Cochrane library databases.

Main outcome(s): Postoperative complications, postoperative pain, operation time, length of hospitalization, quadriceps strength, straightened leg (SLR), and Insall-Salvati ratio follow-up period.

Quality assessment / Risk of bias analysis: The methodological quality was evaluated using the assessment tool recommended in the Cochrane Handbook for Systematic Reviews of Interventions. Authors independently assessed each of included studies. Disagreements were resolved by discussion and, if necessary, utilizing scrutiny by a third reviewer. For each study, the risk of bias was categorized as low, high, or unclear risk.

Strategy of data synthesis: RevMan 5.3 version (The Cochrane Collaboration, Copenhagen, Denmark) was used to perform the analyses. Relative risk (RR) and weighted mean differences (WMDs) were used for effect sizes, with 95% confidence intervals (CIs). The statistical methods included Mantel-Haenszel and inverse variance tests. We assessed heterogeneity with I² statistics. A fixed-effects model was employed during quantitative synthesis for low heterogeneity (I²≤50%). When heterogeneity was high (I²>50%, P<0.1), we first explored the possible sources of heterogeneity or used a random-effects model. P<0.05 was considered a statistically significant difference.

Subgroup analysis: We use subgroup analysis by dividing different groups.

Sensitivity analysis: We use sensitivity analysis in primary outcome.

Country(ies) involved: China.

Keywords: Patellar eversion; Total knee arthroplasty; Systematic review, Meta-analysis.

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