Prognostic Risk Factors for Postoperative Failure after Isolated Primary Medial Patellofemoral Ligament Reconstruction: A Systematic Review

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INTRODUCTION:
Patellar instability is a frequent orthopedic problem often presenting as patellar dislocation in younger patients and athletes. Medial patellofemoral ligament reconstruction (MPFL-R) is a common surgical treatment for patellofemoral instability. While the procedure has a generally high success rate, cases of post-operative recurrent dislocation and persistent instability may occur due to preexisting anatomic risk factors and technical errors in the procedure.
METHODS:
A review of the current literature was performed following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. A search was performed using the terms "medial patellofemoral reconstruction" or "MPFLR" using the databases of Pubmed, MEDLINE, and Cochrane on December 31, 2021, resulting in 1242 articles. With the use of systematic review software Rayan QCRI, studies were included based on their inclusion of postoperative failures after MPFL-R and description of anatomic, demographic, and technical risk factors. The collective data was analyzed to determine how many knees were associated with each risk factor.
RESULTS:
23 studies were included in the final analysis, encompassing a total of 1847 knees with 213 failures. Failures included 147 cases of recurrent dislocation and 66 cases of recurrent subluxation or instability. Data was collected on a total of 26 defined risk factors. For anatomic risk factors, severe trochlear dysplasia, femoral anteversion, preoperative J-sign, elevated tibial tuberosity to trochlear groove distance, and patella alta were the risk factors most associated with failures. Of these, trochlear dysplasia had the most significant impact on outcomes, with 11 studies encompassing 56 failed knees reporting severe trochlear dysplasia as a risk factor for failure. For technique risk factors, nonanatomic femoral tunnel placement (>10mm from Schöttle's point) was the overall most impactful risk factor with 65 failed knees. Analysis of technical aspects also found that single bundle graft, gracilis autograft, graft overtensioning, and modified adductor sling graft were all risk factors for poor postoperative outcomes.
DISCUSSION AND CONCLUSION:
While MPFL reconstruction remains a reliable surgical treatment for recurrent patellar instability, consideration of key risk factors may help avoid technical pitfalls of the procedure, better guide indications for concomitant procedures, and establish better postoperative expectations for patients. This systematic review finds that nonanatomic femoral tunnel graft placement and severe trochlear dysplasia (types II-IV) have the most consistent association with recurrent patellar dislocation after isolated MPFL-R.