Graft Choice for Anterior Cruciate Ligament Reconstruction with Concurrent Lateral Extra-Articular Procedure: A Systematic Review and Network Meta-analysis of Randomized Controlled Trials

Kwangho Chung[1], Joo Hyung Han, Min Jung[1], Hyun-Soo Moon, Se-Han Jung[1], Sung-Hwan Kim[2]
[1]Yonsei University College of Medicine, [2]Gangnam Severance Hospital, Yonsei University Coll

INTRODUCTION: The purpose of this study is to systematically review current randomized controlled trials (RCTs) and conduct a network meta-analysis (NMA) to assess and compare graft failure and clinical outcomes, focusing on the graft choice in anterior cruciate ligament reconstruction (ACLR) with concomitant lateral extra-articular procedure (LEP).

METHODS:

A systematic search was performed on PubMed, Embase, Cochrane Library, and Google Scholar to identify RCTs involving primary ACLR with concomitant LEP. Data on graft failure, residual pivot shift, residual anterior-posterior (AP) laxity, International Knee Documentation Committee (IKDC) scores, Lysholm scores, Tegner scores, and documented complications were collected. Subsequently, a NMA was conducted on this dataset.

RESULTS:

In the meta-analysis of included 13 studies with 1935 patients, ACLR using a hamstring tendon (HT) graft with LEP showed significantly lower graft rupture (odds ratio, OR: 0.28, 95% CI: 0.16 to 0.52), graft failure (OR: 0.28, 95% CI: 0.16 to 0.52) and clinical failure (OR: 0.48, 95% CI: 0.35 to 0.65) compared to isolated ACLR. ACLR using a bone-patellar tendon-bone (BPTB) graft with LEP showed significantly lower clinical failure (OR: 0.30, 95% CI: 0.12 to 0.80) compared to isolated ACLR. ACLR with an HT graft with LEP showed significantly lower residual pivot shift rates (OR: 0.46, 95% CI: 0.22 to 0.94) compared to isolated ACLR. ACLR with an HT graft with LEP (MD: 2.22, 95% CI: 0.80 to 3.63) and ACLR with a BPTB graft with LEP (mean difference, MD: 3.70, 95% CI: 0.85 to 6.55) showed significantly higher Lysholm scores compared to isolated ACLR.

DISCUSSION AND CONCLUSION:

In graft rupture, graft failure and clinical failure rates, ACLR using a HT graft with LEP is superior to isolated ACLR. ACLR using a BPTB graft with LEP showed a superiority in clinical failure rates compared to isolated ACLR. Clinical outcome scores improved significantly in all groups at follow-up, but differences were not clinically relevant.