Lower Risk of Revision with Suspensory Tibial Fixation Versus Interference Tibial Fixation of Hamstring Tendon Autografts in Anterior Cruciate Ligament Reconstruction: Results from the New Zealand ACL Registry

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INTRODUCTION:
The hamstring tendon is frequently used to reconstruct the anterior cruciate ligament (ACL), but there is a lack of consensus on the optimal method of fixation. Registry studies have shown the type of femoral fixation device can influence the risk of revision ACL reconstruction, but it is unclear whether the type of tibial fixation has an effect. In New Zealand, over 95% of hamstring tendon grafts are fixed with a suspensory device on the femoral side, with tibial fixation more varied between suspensory and interference devices, with or without a sheath. The aim of this study was to analyze whether the type of tibial fixation device influences the risk of revision ACL reconstruction.
METHODS:
Prospective data recorded in the New Zealand ACL Registry were analyzed. Primary ACL reconstructions performed between April 2014 and December 2019 were included, allowing for a minimum follow-up of one year. Only patients with a hamstring tendon autograft fixed with a suspensory device on the femoral side were included. The predictor variables of interest included the type of fixation device on the tibial side, the number of graft strands and graft diameter. The rate of revision ACL reconstruction was compared via Chi-Square test. A multivariate Cox regression survival analysis was performed with adjustment for patient age, sex, time from injury-to-surgery and the activity at the time of injury. Hazard ratios (HR) with 95% confidence intervals (CI) were computed.
RESULTS:
A total of 6145 primary ACL reconstructions with a hamstring tendon autograft were analyzed, of which 59.6% were fixed with a suspensory device on the tibial side (n = 3662), 17.6% fixed with an interference screw with a sheath (n = 1079) and 22.8% fixed with an interference screw without a sheath (n = 1404). When compared to suspensory devices (revision rate = 3.4%), a higher risk of revision was observed when using an interference screw with a sheath (revision rate = 6.2%, adjusted HR = 2.05, 95% CI 1.20 – 3.52, p = 0.009) and without a sheath (revision rate = 4.6%, adjusted HR = 1.81, 95% CI 1.02 – 3.23, p = 0.044). The number of graft strands and a graft diameter of ≥ 8 mm were not associated with the risk of revision.
DISCUSSION AND CONCLUSION:
In this study of hamstring tendon autografts fixed with a suspensory device on the femoral side during primary ACL reconstruction, the use of an interference screw, with or without a sheath, on the tibial side had a higher risk of revision when compared to a suspensory device.