

Single Bundle Anterior Cruciate Ligament Reconstruction Using Quadriceps Tendon-Bone Autograft: Mid to Long Term Follow Up

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Summary:

Anterior cruciate ligament reconstruction using quadriceps tendon-bone autograft showed a reliable outcome comparable to other graft sources.

Abstract:

Introduction:

The objective of this study was to evaluate the clinical outcome after ACL reconstructions using quadriceps tendon-bone autograft in 329 patients.

Methods:

Three hundred and twenty-nine ACL reconstructions with use of quadriceps tendon-bone autograft were included in the study and the mean follow up period was 50.5 months (range, 24 to 133 months). Clinical assessment included manual laxity test, KT-1000 arthrometry, IKDC documentation, modified Lysholm scoring, questionnaire regarding anterior knee pain, and Cybex II isokinetic testing. Complications were also evaluated. Tunnel positions were analyzed in 3D reconstructed CT image by quadrant method.

Results:

Three hundred and two patients (95.0%), 295 patients (92.8%) and 311 patients (97.8%) demonstrated grade 0 or 1 instability on the anterior drawer test, the Lachman test, and the pivot-shift test, respectively. KT-1000 arthrometric analysis showed significant improvement in side-to-side differences on manual maximum testing ($p < 0.001$), with mean value improved from 4.4 preoperatively to 2.1 at the final follow-up. The mean modified Lysholm score improved significantly from 68.9 to 94.2 at the last follow-up ($p < 0.001$). The mean IKDC subjective evaluation score also improved from 60.9 to 83.8 ($p < 0.001$). When we look into the subscores of the IKDC subjective evaluation score, scores related to general pain and swelling, up and down the stairs, sitting, chair rising, running, jumping and stop & starting quickly were high, while, scores related to pain on sports activity, giving way and instability on sports activity, kneeling and squatting were low. Peak extension torque measured with a Cybex II isokinetic testing device was 82.2% and 87.2% of that on the uninvolved side at 60°/s and 180°/s, respectively, at the last follow-up. Anterior knee pain was tolerable during normal daily activities in 299 patients (94%) and donor site tenderness was complained by 24 patients (7.5%). Twelve patients (2.7%) needed revision surgery and were considered as a failure. Eight knees were revised due to traumatic re-injuries, and four were revised because of graft impingement with symptomatic instability. Fifteen patients (4.7%) experienced transient limitation of motion of the operated knee, which resolved after physiotherapy. 3D reconstructed CT evaluation revealed that femoral tunnel was placed at 35.5% in deep-shallow position and 31.1% in high-low position, while tibial tunnel was placed at 41.9% in anterior-posterior position and 47.3% in medial-lateral position. These results are comparable to several cadaver study data in the literature.

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Discussion and Conclusion:

Quadriceps tendon is a reliable graft alternative for ACL reconstruction with outcome comparable to other graft sources for this patient population consisted of mostly recreational players.