

Clinical Outcomes of All Soft Tissue Quadriceps Tendon Autograft in ACL Reconstruction

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Objectives: The quadriceps tendon (QT) autograft has been successfully utilized for anterior cruciate ligament (ACL) reconstruction for decades. While many studies have shown QT autografts are an effective graft choice, few have prospectively examined short and intermediate-term clinical outcomes following revision procedures. This study examines prospectively collected intermediate-term clinical outcomes, including complication rates, following primary ACL reconstruction with all soft tissue QT autograft.

Methods: 353 patients undergoing primary ACL reconstruction with an all soft tissue QT autograft were prospectively followed. All procedures were performed by a single surgeon, utilizing a minimally invasive graft harvest technique and suspensory fixation. All patients received aggressive rehabilitation without functional bracing post-operatively. Subjective assessment of knee function was obtained using pre-operative and post-operative IKDC scores, with a minimum of 1-year follow-up. Postoperative KT-1000 arthrometer and isokinetic strength testing measurements were collected at regular intervals. The incidence of graft harvest site hematoma, arthrofibrosis, and graft failure were recorded.

Results: The mean age of the study population was 20.4 ± 6.4 (mean \pm SD) years, with an average follow up of 2.53 ± 1.04 years. Primary ACL reconstruction was performed in 353 patients. The patient population was approximately evenly split by gender with 27 male (56%) and 21 female (44%). and the preoperative mean IKDC score was 44.9 ± 15.5 , and postoperative mean IKDC score was 85.2 ± 14.3 , ($p < 0.0001$). The percentage of patients with ≤ 3 mm side-to-side difference on KT-1000 arthrometer testing at 6-weeks, 3-months, and 6-months was found to be 97%, 96%, and 93%, respectively. No significant increase ($p > 0.05$) in side-to-side measurements was found between the 6-week to 3-month or the 3-month to 6-month intervals. Isokinetic strength testing at 6 months post-operatively showed the mean extension torque at $60^\circ/s$ and $180^\circ/s$ was 75.2% and 80.3% respectively. These values increased significantly at 1 year to 86.1% ($p < .0006$) and 87.5% ($p = .018$). Graft harvest site hematoma developed in 11 patients (2.7%) and arthrofibrosis occurred in 30 (7.5%). Graft failure requiring revision occurred in 17 (4.2%) patients, with a mean time to revision procedure of 542 ± 210 days post-operatively.

Conclusion: ACL reconstruction with an all soft tissue QT autograft using a minimally invasive harvest technique and suspensory fixation has acceptable short and intermediate-term clinical outcomes. No evidence of early graft failure or lengthening was discovered, confirming suspensory fixation is sufficient for aggressive rehabilitation in a young, athletic patient population. The low complication and failure rates in patients that received QT autograft for ACL reconstruction compare favorably to published data on alternate autograft options. The results of this study support the use of all soft tissue QT autograft in ACL reconstruction.

The Orthopaedic Journal of Sports Medicine, 5(7)(suppl 6)
DOI: 10.1177/2325967117S00310
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