Abstract ID# 21891
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Summary:
ACL reconstruction using soft tissue QT autograft demonstrates equivalent clinical outcomes compared to HT autograft at 2 years yet statistically higher patient reported outcomes at 5-years postoperatively.

Data:
Purpose: The purpose of this study was to compare the 5-year clinical and functional outcomes of the soft tissue quadriceps tendon (QT) to those of the hamstring tendon (HT) autograft. Methods: A retrospective review of patients undergoing ACL reconstruction using either soft tissue QT or HT autograft with at least 5 years of follow up was conducted. Surgical technique included anteromedial portal creation for the femoral tunnel and transtibial technique for the tibia. Graft fixation was achieved with interference screws for the QT and combination of interference screw and suture button for the HT cohort. The two groups were compared for differences in outcomes including International Knee Documentation Committee (IKDC) score, Lysholm score, return to sport, and complications. Results: A total of 37 patients with QT autograft and 46 HT autografts were included in the study with a mean follow up of 69.9 months and 70.9 months, respectively. The QT group demonstrated a larger graft size on average (9.64mm vs. 7.90mm, p < .0001). The IKDC and Lysholm scores were not significantly different between the two groups at 2-years postoperatively. At 5-years postoperatively, the QT group demonstrated significantly greater IKDC (p = 0.018) and Lysholm (p = 0.007) scores although the absolute difference did not meet minimal clinically important difference (MCID) thresholds. There was no significant difference in the rate of achieving MCID at either 2 or 5 years postoperatively. The two groups demonstrated comparable rates of return to sport, time to return, and postoperative complications. Conclusion: ACL reconstruction using soft tissue QT autograft had equivalent clinical outcomes compared to HT autograft at 2 years and statistically higher patient reported outcomes at 5-years postoperatively. There was no clinically significant difference found between the two cohorts. The QT autograft is an effective alternative to HT autograft with noninferior outcomes to the hamstring autograft at midterm follow up.

Category: Knee - ACL Graft Choice

Bone- Vs. Soft-Tissue Quadriceps Tendon Autograft for Anterior Cruciate Ligament Reconstruction - A Comparison of 559 Patients

Abstract ID# 23273
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2023 Congress Abstracts - Knee ACL Graft Choice

Mid-Term Outcomes of the All-Soft Quadriceps Tendon Versus Hamstring Autograft In Primary Anterior Cruciate Ligament Reconstruction: Comparison With Minimum 5-Year Follow Up

Abstract ID# 23401
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Summary:
There is no statistically significant difference in patient-reported outcome measurements, revision- or contralateral surgery between patients treated with bone-quadriceps tendon or soft-tissue-quadriceps tendon autograft.

Data:
Purpose: To compare patient reported outcome measurements (PROMs) and reoperation rates in patients treated with soft tissue quadriceps tendon autograft (S-QT) or quadriceps tendon autograft with bone block (B-QT) in anterior cruciate ligament reconstruction (ACL-R). Methods: All ACL-Rs performed between January 2010 and December 2020 at a single specialized orthopaedic center were recorded in a prospectively administered Microsoft (MS) Access-based database. Patient-administered questionnaires including Visual Analogue Scale (VAS) for pain, Lysholm score and Tegner activity score were obtained preoperatively and at 6, 12 and 24 months postoperative as revision- and contralateral ACL-R were recorded. Preinjury physical activity level was measured with the Tegner Activity Scale and classified as low (<3), medium (4-6), and high (>7). All patients were grouped into 4 age categories: <15, 15-30, 31-45, >45 years. Besides ACL graft ruptures, concomitant injuries to cartilage and menisci were recorded. Binary logistic regression was used to assess the influence of the following factors on the need to undergo revision surgery or ACLR on the contralateral limb: graft preparation technique, age group, preinjury Tegner activity level, sex, and additional surgical interventions. Additional Mann-Whitney U- and chi-square test were used for between group comparison. Results: A total of 556 patients (45.6% female) with primary QT-A ACLR were included in the study. Out of those 347 49.5% (n=347) where treated with B-QT and 50.5% (n=345) with S-QT. Mean age was 29.1 ± 13.0 and 31.4 ± 12.2 (p<.04), respectively. Both groups did not differ preoperatively with regards to gender, sports activity level, time from injury to surgery or additional performed interventions. At final follow-up no statistical differences between both groups were observed in VAS for pain (median [range] B-QT: 0 [0-6]; S-QT: 0 [0-8]), Lysholm score (B-QT-BB: 87.5 [20-9]; S-QT: 88.2; 17.6), Tegner activity level (median [range] B-QT: 6 [2-10]; S-QT: 6 [1-10]) and rate of return to preinjury Tegner activity level (B-QT: 67.6%; S-QT-ST: 67.2%). Revision surgery - (B-QT: 12.8%, n=3; S-QT: 2.9%, n=3) or contralateral ACLR rates (B-QT: 2.8%, n=7; S-QT: 3.9, n=9) did not differ between both groups. Neither graft type, age, preinjury Tegner activity score, sex or additional surgical interventions had a significant value in predicting the need for revision- or contralateral ACL surgery. Conclusion: There is no statistically significant difference in patient-reported outcome measurements, revision- or contralateral surgery between patients treated with bone quadriceps tendon or soft-tissue-quadriceps tendon autograft. Neither graft type, age at time of surgery, preinjury Tegner activity level, sex or additional surgical interventions had a significant value in predicting the need for revision- or contralateral ACL surgery.

Category: Knee - ACL Graft Choice

2023 Congress Abstracts - Knee ACL Graft Choice

Adverse Events and Complications following Primary ACL Reconstruction with Quadriceps Tendon Autograft: A Systematic Review

Abstract ID# 23401
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Summary:
Complications following primary ACLR using quadriceps tendon autograft were recorded in 10.5% of knees, with persistent knee pain being most common. No difference was reported in the overall incidence of complications with the use of the QT versus QTPB grafts, however persistent knee pain was 2.7x greater with use of a soft tissue quadriceps graft.

Data:
Background: Anterior cruciate ligament reconstruction (ACLR) surgery with quadriceps tendon (QT) grafts – both with and without a patellar bone plug – have gained popularity in recent years in both the primary and revision setting. Nevertheless, with the use of QT autografts, postoperative complications occur.

Purpose: To systematically review the incidence of postoperative complications following primary anterior cruciate ligament reconstruction (ACLR) with quadriceps tendon autograft, while comparing complication rates in patients undergoing all-soft tissue quadriceps tendon (QT) grafts versus quadriceps tendon grafts with a patellar bone plug (QTPB). Study Design: Systematic Review; Level of Evidence IV Methods: A literature search was performed by querying PubMed, Embase, and Scopus databases from database inception through August 2022 using the 2020 PRISMA guidelines. Inclusion criteria consisted of level I to IV human clinical studies in English or English-language translation reporting complications following primary ACLR using quadriceps tendon autograft. The incidence of complications within the included studies was extracted. Differences in the incidence of postoperative complications between ACLR with quadriceps tendon with and without a patellar bone plug were calculated. Results: Twenty studies from 2004-2022, comprised of 2,381 patients (n = 2,389 knees) with a mean age of 27 (mean range, 12 - 58) years, consisting of 68.8% males, were identified. The mean follow-up was 28.5 (mean range, 6 - 47) months. The total incidence of complications was 10.3%, with persistent post-operative knee pain being most common (10.8%). Patients who underwent ACLR with all-soft tissue QT grafts had a 2.7x increased incidence of persistent knee pain (23.3% versus 8.6%) and reoperations (5.9% versus 3.2%) when compared to QTPB grafts (both, p < 0.01). There was no appreciable difference in total complications, graft failures, ACLR revisions, cyclops lesions, or range of motion deficit (all, p > 0.05). Patellar fractures occurred exclusively following QTPB (2.2%). Conclusions: Complications following primary ACLR using quadriceps tendon autograft were recorded in 10.5% of knees, with persistent knee pain being most common. No difference was reported in the overall incidence of complications with the use of the QT versus QTPB grafts, however persistent knee pain was 2.7x greater with use of a soft tissue quadriceps graft.

Category: Knee - ACL Graft Choice

Donor Site Morbidity Following Anterior Cruciate Ligament Reconstruction Using Quadriceps Tendon Versus Bone-Patellar Tendon-Bone Autograft: Results at 2-Year Follow-Up

Abstract ID# 23496
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Summary:
High satisfaction rates and negligible major complications were observed with respect to donor site morbidity with both QT and BTB autograft ACL reconstruction.

Data:
INTRODUCTION: Bone-patellar tendon-bone (BTB) autograft has historically been regarded as the gold standard for anterior cruciate ligament reconstruction (ACLR). Despite widespread utilization of BTB autografts, multiple complications following BTB harvest have been reported, including anterior knee pain, difficulty kneeling, patellar tendon rupture, patella fracture, tendon contracture, and numbness. The quadriceps tendon (QT) autograft has been proposed as an alternative graft in young, high demand patients to achieve comparable clinical outcomes while avoiding complications associated with BTB autograft. Recently, a novel 10-question donor site morbidity (DSM) instrument was developed by Hackett et al that was used to evaluate DSM following BTB ACLR. However, to date, the instrument has not been used to evaluate DSM following QT harvest. Therefore, a retrospective evaluation of DSM following ACLR with QT versus BTB autograft was performed.

METHODS: All patients who underwent ACLR with QT autograft between January 2018 and February 2020 were identified in a single institution registry and matched to a control group of patients who underwent BTB autograft ACLR on the basis of age and sex. DSM was assessed using a 10-question DSM instrument and scores were compared to traditional patient reported outcome measures including the IKDC, Marx Activity Scale, and SANE scores. Post-operative complications including quadriceps tendon rupture, patella fractures, and graft failure were assessed via registry query. Multivariate analysis was conducted to investigate factors associated with DSM. RESULTS: Thirty-two QT patients (15M,17F) with a mean age of 23.0 years (range 13-45) were compared to 61 BTB patients (32M,29F) with a mean age of 22.2 (range 13-45) who responded at a minimum 24-months after surgery. DSM scores were rated good or excellent in 26/31 QT patients (81%) versus 44/61 BTB patients (72%) (P = 0.45). Significant differences were noted between graft types with respect to presence of numbness, with 37/61 BTB patients (61%) versus 10/32 QT patients (31%) reporting mild, moderate, or diminished sensation to light touch (P = 0.02). Differences were also noted in kneeling pain, with 30/61 BTB patients (49%) versus 6/32 QT patients (19%) reporting either mild pain with kneeling or inability to kneel on hard surfaces (P < 0.01). Finally, differences were reported in patient-reported presence of quadriceps wasting, with 20/32 QT patients (38%) reporting atrophy versus 15/61 BTB patients (25%) (P = 0.01). However, no differences were noted in pain at donor site, size of numbness, difficulty with stairs or prolonged sitting, anterior knee pain, or incision cosmesis (P > 0.05). Multivariate analysis demonstrated that graft type, sex, body mass index (BMI), operative age, and meniscus integrity were not associated with DSM scores (P > 0.05). Correlations between PROMS and DSM showed correlations with IKDC, Marx, and SANE (P < 0.01). There were no instances of quad tendon rupture, patella fracture, or ACL graft failure in either group. DISCUSSION: DSM following ACLR with QT and BTB autograft demonstrated good to excellent results in the majority of patients. Significantly more BTB patients experienced numbness at the harvest site and pain with kneeling compared to QT patients. However, more patients reported quadriceps atrophy following QT compared to BTB autograft. PROMS correlated with DSM scores, suggesting that these instruments may be impacted by DSM following ACLR.

Category: Knee - ACL Graft Choice

Tibial Tunnel Expansion And Correlation With 4-Strands Graft Maturation 2 Years After ACL Reconstruction Using Tibial and Femoral Adjustable Cortical Suspensions

Abstract ID# 23175
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Summary:
At 2 years of ACL reconstruction using a ST4 fixed by ASF, the average tibial tunnel enlargement was 13% and no correlation was found between graft maturation and tibial expansion.

Data:
Introduction Reconstruction of the anterior cruciate ligament (ACL) using a short quadruple semitendinosus (ST4) graft fixed with an adjustable suspensory fixation (ASF) has several advantages but is suspected to generate micromotion, tunnel widening and poor graft maturation. The aim of this study was to evaluate tibial tunnel expansion and graft maturation using a ST4 fixed at both tibial and femoral side with ASF. Methods We analyzed retrospectively 149 patients with data collected prospectively at 2 years of follow up with magnetic resonance imaging (MRI). Maturation was analyzed by the Signal-to-Noise Quotient (SNQ) and Howell score at the tibial and articular part of the graft (Ti and Ar Graft). The expansion, the bone-graft contact and the graft volume in the tibial tunnel were calculated by MRI measurement. Results At 25.6 months, MRI analysis showed 13% +/-17 expansion of the tibial tunnel, the mean SNQ was 3.75 +/-7.11 for the Ti graft and 1.97 +/-3.49 for the Ar graft, the Howell score of the Ti graft was

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