the subjective IKDC and Lysholm were statistically lower in patients with greater hyperextension. When a meniscus injury was present, in patients with greater hyperextension, the frequency of medial meniscus injury was statistically higher than in patients with less hyperextension. Only hyperextension greater than 6.5 degrees was statistically significant associated with re-rupture when evaluated alone (p < 0.001). Regardless of the other characteristics evaluated, only hyperextension statistically influenced the re-rupture of patients (p < 0.001), and the chance of re-rupture in patients with hyperextension greater than 6.5 was 14.65 times the chance of patients with hyperextension less than 6.5.

Conclusion: The cut-off point established to discriminate an ACL re-rupture was 6.5 degrees of hyperextension. Only hyperextension statistically influenced a re-rupture and the chance of re-rupture in patients with hyperextension more than 6.5 degrees was 14.65 times the chance of patients with hyperextension less than 6.5.

Category: Knee - ACL

Risk Factors For Anterior Cruciate Ligament Graft Failure In Elite Athletes: An Analysis Of 342 Professional Athletes With A Mean Follow-Up Of 100 Months From The Santi Study Group

Abstract ID# 22036

All Authors:
Bertrand Sonnery-Cottet MD, PhD FRANCE
Graeme P. Hopper MCBh, MSc, MRCSed, MPSTEd, MD, FRCSGlas (Tr+Orth) UNITED KINGDOM
Charles Pioger MD FRANCE
Corentin Philippe MD FRANCE
Abdo Helou MD FRANCE
Joao Pedro Campos PORTUGAL
Lampros Gousopoulos MD, FRCS FRANCE
Alessandro Carrozzo MD ITALY
Thais Dutra Vieira MD FRANCE

Summary:
Professional athletes undergoing isolated ACLR and aged 21 or younger are at >2-fold risk of graft failure. Orthopedic surgeons treating elite athletes should combine an ACLR with a LEAP to improve ACL graft survivorship.

Data:
Anterior cruciate ligament (ACL) injuries are amongst the most common knee injuries sustained in elite sport and athletes generally undergo ACL reconstruction (ACLR) to facilitate their return to sport. Multiple studies have reported predictors for ACLR failure, including age, activity level, graft size, graft choice, increased posterior tibial slope and meniscal deficiency. However, no studies are specific to professional athletes and include the addition of a lateral extra-articular procedures (LEAP). The purpose of this study was to determine the risk factors for graft failure in professional athletes undergoing ACLR. It was hypothesized that athletes who underwent combined ACLR with a LEAP would experience significantly lower rates of graft rupture in comparison to those who underwent isolated ACLR. Professional athletes who underwent primary ACLR using autograft by the senior author (BSC) between January 2003 and January 2020 with a minimum follow-up of 2 years were considered for study inclusion. Patients were excluded if they underwent major concomitant procedures, including multiligament reconstruction surgery or osteotomy. Patient notes were reviewed by an investigator, independent of the primary surgeons, to determine if they had sustained a further ipsilateral knee injury, sustained a contralateral knee injury or had undergone any reoperations or complications after the index procedure. Key demographics and additional secondary surgery were also documented. A total of 420 professional athletes underwent ACLR during the study eligibility period. After application of the exclusion criteria, 342 athletes were identified as eligible for final inclusion with a mean follow-up of 100.2 ± 51.9 months (range, 24 - 215 months). 31 graft failures (9.1%) were reported, all requiring revision surgery due to symptomatic instability. The rate of graft failure was significantly higher when ACLR was not combined with a LEAP (15.5% vs 6.0%, p = 0.0105) and in younger athletes (13.8% vs 6.6%, p = 0.0290). A multivariate analysis was performed using the Cox model and demonstrated that athletes undergoing an isolated ACLR had a >2-fold higher risk of ACL graft failure (Hazard Ratio (HR) = 2.678 [1.173;4.837], p = 0.0164) when compared to a combined ACLR with a LEAP. Additionally, athletes aged 21 or younger were also at >2-fold risk of graft failure (HR = 2.381 [1.313;5.463], p = 0.0068). Gender, sport and graft type were not found to be significant risk factors. Secondary surgery on the ipsilateral knee took place in 62 athletes (18.1%). Additionally, 42 athletes (13.2%) had a subsequent ACL rupture of the contralateral knee. The main finding of this study was that professional athletes who underwent isolated ACLR had a >2-fold higher graft failure rate than when ACLR was combined with a LEAP. Additionally, athletes aged 21 or younger also had a >2-fold higher graft failure rate when compared to older athletes.

Orthopedic surgeons treating elite athletes should combine an ACLR with a LEAP to improve ACL graft survivorship.

Category: Knee - ACL

ACL Reconstruction With Hamstring Tendon Is Associated With A Sixfold Increase In Failure Rates Compared With Patella Tendon Grafts In Young Females - A Cohort Study From The New Zealand ACL Registry

Abstract ID# 22817

All Authors:
Hamish Love FRACS NEW ZEALAND
Anika Tiplady MCBh NEW ZEALAND
Simon W. Young MD, FRACS NEW ZEALAND

Summary:
ACL reconstruction with hamstring tendon is associated with a sixfold increase in failure rates in young females when compared with patella tendon graft.

Data:
Introduction: Young female athletes are a specific population group that is at high risk of primary ACL rupture and subsequent graft failure. Despite large numbers of ACL reconstructions being carried out in young females, there is limited analysis of outcomes in this group, leading to low levels of evidence for graft choice. This study utilizes ACL Registry data to analyze the effects of graft choice on graft survival and PROMs in females aged 15-20 years old. Method: Prospective data captured by the New Zealand ACL Registry between April 2014 and March 2022 were reviewed. Females aged between 15-20 were included with a minimum follow-up of 1 year. The primary outcome measure is ACL graft failure during the study period with the key independent variable being graft type, patellar or hamstring tendon autograft. This is summarised as the rate per 100 patient years and is compared between the two groups using the hazards ratio generated from a Cox-proportional hazards regression. Secondary outcome measures were Marx activity scores, and the Knee Osteoarthritis and Outcome Score (KOOS) patient reported outcome measure. Results: A total of 1261 primary ACL reconstructions in females aged 15-20 were reviewed. Hamstring grafts were used in 797 reconstructions (63%), and patella tendon graft used in 464 reconstructions (37%). There was no difference between the groups in terms of age, time to surgery, pre-injury Marx or KOOS scores. Patella tendon grafts were a larger diameter, 9.5mm vs 8.1mm on average (p<0.001). Patients with a hamstring tendon graft had a graft revision rate of 7.6% compared with 1.1% in patients with a patella tendon graft (hazard ratio 6.1; 95% CI, 2.4-15.1; P<0.001). No differences were noted when comparing KOOS subscales between hamstring and patella tendon groups at 1,2 and 5 years follow up. The patella tendon group had higher Marx scores at 12 months 8.6 vs 7.3 (P<0.001). This difference did not persist at 2 and 5 years follow up. Conclusion: This New Zealand ACL Registry study on graft failure rates in females aged 15-20 years old demonstrates a 6.1 times higher ACL graft failure rate with hamstring grafts compared to patella tendon grafts.

Category: Knee - ACL

Outcomes Of Arthroscopic Posterior Capsular Release for Loss Of Knee Extension after Anterior Cruciate Ligament Reconstruction: Minimum 2-Year Follow Up

Abstract ID# 23245

All Authors:
Joseph C. Brinkman MD UNITED STATES
Jose Iturregui BS UNITED STATES
David G Deckey MD UNITED STATES
Sailesh Vardhan Tummala MD UNITED STATES
Neeraj Vij BS UNITED STATES
Kostas Economopoulos MD UNITED STATES

Summary:
In our series, arthroscopic posterior capsular release resulted in significant improvement of knee extension and patient reported outcome scores at 6 month and 2 years postoperatively with a low rate of recurrent stiffness.