The Impact of Family History In Anterior Cruciate Ligament Injuries in Professional Australian Rules Footballer Players

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Summary:
Professional AFL male Australian Rules footballers with a family history of ACL injury were at 3 times greater odds of having a primary ACL injury than their team mates without a family history.

Data:
Background Australian Rules football is the most popular football code in Australia and is the biggest cause for anterior cruciate ligament (ACL) injuries in the sporting population due to the high exposure to repeated change of direction, jumping, landing and tackling. The premier professional competition is the Australian Football League (AFL) in which ACL injuries create a major burden in time lost from competition. A family history of ACL injury has been reported to increase the odds of sustaining a first ACL injury by up to 2.5 times. This risk has not been investigated in an elite cohort playing a high risk sport. Purpose To determine if male AFL players with a family history of ACL injury were at increased odds of having an ACL injury. Methods All Afl players were asked to complete a survey detailing their age, time in the AFL, personal ACL injury history and details of immediate family members who had sustained an ACL injury. A 2x2 contingency table was used to calculate Odds Ratios (OR) and 95% confidence intervals (CI) to assess for a significant difference in the presence of a positive family history in those who had sustained an ACL injury and those who had not. Results Complete data was obtained from 410 out of 430 (95.3%) potential players. There were 4 players who were unsure of their immediate family history for ACL injury and were removed from the analysis. The mean age of the players was 23.6 years (range: 18-33) and they had been part of an AFL squad for a mean of 6 years. 32 (7.8%) players had sustained an ACL injury, 19 (59.4%) players had sustained their ACL injury whilst in the AFL and 13 (40.6%) had sustained their injury prior to being drafted. 15 out of 32 (46.8%) players who had sustained an ACL injury reported having a family history of ACL injury, compared to 82 out of 378 (21.7%) who had not sustained an ACL injury. Players with a positive family history were at significantly increased odds of having sustained an ACL injury compared to those without (OR 3.2 [95% CI 1.55-6.76], p<0.01). Conclusions Professional AFL male Australian Rules footballers with a family history of ACL injury were at 3 times greater odds of having an ACL injury than their team mates without a family history. This is greater than what has been reported in sub-elite population groups in other sports. Athletes playing Australian Rules football should be screened for family history of ACL injury and encouraged to complete targeted injury reduction programs.

Category: Knee - ACL
Outcomes of Soft Tissue Quadriceps Tendon Autograft for Primary ACL Reconstruction in Adult Population – A Systematic Review

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Summary:
No difference in Complication Rates or Patient-Reported Outcomes Between All Soft Tissue Quadriceps Tendon and Bone-Patella Tendon-Bone or Hamstring Autograft for Anterior Cruciate Ligament Reconstruction.

Data:
Introduction: Anterior cruciate ligament reconstruction (ACLR) can be performed with a number of different autografts including all soft tissue quadriceps autograft. (S-QT). S-QT has several advantages including decreased donor site morbidity, reduced anterior knee pain and comparable revision rates compared to other autografts. The primary aim of this review was to assess all complications of QT in adult population. Methodology: A systematic review of the literature was conducted in accordance with the PRISMA guidelines using the online databases Medline and EMBASE. Clinical studies reporting isolated primary ACLR using S-QT in the last 20 years were included and appraised using the Methodological Index for Non-Randomized Studies (MINORS) tool. Results: Eighteen studies were eligible, 3 radammed control trials (RCT), 11 comparative studies and 4 case series giving a total of 1145 cases of S-QT ACLR, 57% were men. The mean age was 26.8 ± 6.6 years (16-50) and. The mean follow-up was 23.6 months (6-65 months). Eight comparative studies reported the use of Hamstring (HT) graft and 5 studies reported the use of bone patellar tendon bone (BPTB) graft with 498 and 174 patients, respectively. Thirteen studies reported on post operative patient reported outcome measure scores (PROMs). International Knee Documentation Committee (IKDC) score was the most reported score in 11 studies followed by Lysholm score in 9 studies. All PROMs scores were comparable to HT and BPTB except one study found significant difference in Lysholm score in favour of BPTB (82 vs 90, p=0.055). Nine studies reported on knee laxity post operatively with various methods of clinical and instrumented assessment with no significant differences observed compared to BPTB. Complications of S-QT were reported in 14 studies, with overall complication rate of 8.2 % (89 patients). Graft failure was the most common complication n= 39 (3.5%), followed by meniscal lesion n=14 (1.3%) and Arthrofibrosis n=14 (1.3%). Infection was not a common complication with three patients from 2 studies, n= 3 (0.3%). Hardware prominence was the least reported complications with two patients who required hardware removal in one study n = 2 (0.2%). Re-operation for any reason was performed in 53 patients (4.7%). Anterior Knee/Kneeling pain was reported in 62 patients (5.6%) from 4 studies and graft site numbness in n = 4 (0.4%) from two studies. One study showed less donor site morbidity compared to BPTB and HT. Six studies reported no local complications and no graft site morbidity with S-QT. One study reported on less post operative pain and analgesia required with S-QT compared to HT in the immediate post-operative period (72 hours). Re-operation was performed in 89 patients (8.1%) with Cytoplast the most common cause for re-operation n=26 (2.3%) Conclusion: No significant difference in functional outcome scores, knee stability and ROM between soft tissue QT, HT and BPTB. QT demonstrated similar quadriceps recovery and return to sport at 9-12 months. Similar graft failure and reoperation rates at 2 years post-op with low infection <0.5%. Less analgesia consumption and better HT/QT ratio compared to HT and less anterior knee/kneeling pain at harvest site compared to BPTB. Further level I studies are recommended.

Category: Knee - ACL
Impact of an ACL Rupture on a Professional Soccer Player’s Career

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Summary:
In professional soccer, RTP at the professional level is high at 97%. Performance metrics show 59% of athletes are at the same league level at 2 years and this is comparable to HT and BPTB except one study found significant differences observed compared to BPTB. Complications of S-QT were reported in 14 studies, with overall complication rate of 8.2 % (89 patients). Graft failure was the most common complication n= 39 (3.5%), followed by meniscal lesion n=14 (1.3%) and Arthrofibrosis n=14 (1.3%). Infection was not a common complication with three patients from 2 studies, n= 3 (0.3%). Hardware prominence was the least reported complications with two patients who required hardware removal in one study n = 2 (0.2%). Re-operation for any reason was performed in 53 patients (4.7%). Anterior Knee/Kneeling pain was reported in 62 patients (5.6%) from 4 studies and graft site numbness in n = 4 (0.4%) from two studies. One study showed less donor site morbidity compared to BPTB and HT. Six studies reported no local complications and no graft site morbidity with S-QT. One study reported on less post operative pain and analgesia required with S-QT compared to HT in the immediate post-operative period (72 hours). Re-operation was performed in 89 patients (8.1%) with Cytoplast the most common cause for re-operation n=26 (2.3%) Conclusion: No significant difference in functional outcome scores, knee stability and ROM between soft tissue QT, HT and BPTB. QT demonstrated similar quadriceps recovery and return to sport at 9-12 months. Similar graft failure and reoperation rates at 2 years post-op with low infection <0.5%. Less analgesia consumption and better HT/QT ratio compared to HT and less anterior knee/kneeling pain at harvest site compared to BPTB. Further level I studies are recommended.
their primary ACL reconstruction was 24.1±4.2 years. Additional injuries at the time of ACLR included 63 (32%) medial meniscus tears with 42 (67%) repaired, 134 (67%) lateral meniscus tears with 82 (62%) repaired, and 31 (16%) chondral lesions of grade 3 or higher. 194 (97%) athletes returned to play (RTP) at 10.7±3.9 months. Return to play was strictly defined as returning to a professional level. Eighteen (9%) athletes sustained a re-rupture at a median of 11.1 months (IQR 8.6-16.6 months) with 6 occurring pre-RTP and 12 post-RTP, while 52 (26%) sustained a contralateral ACL rupture during their soccer career. At 2 years, performance metrics showed that 59% of athletes were playing in the same or higher-level league, while 15% were in a lower-level league but had more game appearances and minutes played than pre-injury. By 5 years, 34% of athletes were playing in the same or higher-level league and 26% were in a lower-level league but had more game appearances and minutes played. At 2 years, there were no significant predictors of performance when evaluating factors such as concomitant injuries, undergoing surgery after ACLR, or mechanism of injury. However, the presence of a grade 3 or 4 chondral lesion at the time of surgery significantly impacted both career length and performance with only 15% of athletes playing at the same or higher league at 5 years and these athletes were 3.5 times more likely to be playing at a lower league level or retired (p=.029). Meniscus repair lengthened the RTP timeline (11.6 months versus 9.8 months, p=.001), but no impact was seen at 5 years with league level or performance (all p>.05). No other injury characteristic predicted performance at 5 years post ACLR. Conclusion: While a high level of return to play, 97%, was achieved in professional soccer players following primary ACLR, their performance decreased with time. Performance metrics show 59% of athletes are at the same league level at 2 years and this decreases to 34% at 5 years post ACLR. Presence of a Grade 3 or 4 chondral lesion significantly decreased performance metrics, while a meniscus repair delayed RTP but did not impact performance metrics at 5 years post ACLR.

Category: Knee - ACL

Knee Extensor Mechanism Complications Following Autograft Harvest In ACL Reconstruction: A Systematic Review and Meta-Analysis

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Summary:
Based on current literature, the proportion of extensor mechanism complications after ACLR using either bone-patellar-tendon-bone (BTB) or quadriceps tendon autograft is low, indicating that extensor mechanism harvest remains a safe option.

Data:
Background: ACL reconstruction (ACLR) is a widely studied operation in the literature with the goal of optimizing techniques and patient outcomes. Graft choice is an important consideration in ACLR, as previous studies have reported donor site morbidity in the form of kneeling pain and anterior knee pain with bone-patellar-tendon-bone (BTB) or quadriceps tendon (QT) autografts. A less frequent yet substantial source of morbidity using extensor mechanism grafts is the potential for extensor mechanism disruption in the form of post-operative patella fracture or donor site tendon rupture. Existing systematic reviews have sought to characterize the relative donor site morbidity of BTB and QT grafts, but these studies have focused on donor site symptoms without reporting pooled proportions of patella fractures and donor tendon ruptures across the body of literature. Purpose: To estimate the proportion of patella fractures, patellar tendon ruptures, and quadriceps tendon ruptures associated with bone-patellar-tendon-bone (BTB) or quadriceps tendon (QT) autograft harvest during anterior cruciate ligament reconstruction (ACLR) using published data. Methods: A meta-analysis was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Peer-reviewed articles in English reporting on extensor mechanism complications associated with graft harvest in patients undergoing ACLR were included. Pooled proportions of patellar fractures, patellar tendon ruptures, and quadriceps tendon ruptures were calculated for each graft type (BTB, QT) using a random effects model. Results: Twenty-eight studies were analyzed. Nineteen studies (n = 8424) reported patellar fracture data for BTB autograft, and eight studies (n = 766) reported patellar fracture data for QT autograft. The pooled proportion of patellar fractures was 0.52% (95% CI 0.34%-0.91%) for BTB and 2.03% (95% CI 0.78%-3.89%) for QT. Ten studies (n = 10,890) reported patellar tendon rupture after BTB autograft, while three studies (n = 376) reported quadriceps tendon tears following QT. The proportion of patellar tendon ruptures after BTB harvest was 0.22% (95% CI 0.14%-0.33%) and the proportion of quadriceps tendon ruptures after QT harvest was 0.52% (95% CI 0.06%-1.91%). Based on the available literature, in 1000 BTB ACLR, one could expect 5.7 patella fractures and 2.2 patellar tendon ruptures; in 1000 QT ACLR, one could expect 20.3 patella fractures and 5.2 quadriceps tendon ruptures. The majority (16/28, 57.1%) of included studies were of level of evidence IV. Conclusion: Based on current literature, the proportion of extensor mechanism complications after ACL reconstruction using either BTB or QT autograft is low, indicating that extensor mechanism harvest remains a safe option. Surgeons can use these data to better inform their patients on the relative morbidity of autograft options in ACL reconstruction.

Category: Knee - ACL

Can We Identify Why Athletes Fail to Return to Sport after Anterior Cruciate Ligament (ACLR) Reconstruction? A Systematic Review and Meta-Analysis

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Summary:
This study aims to address this gap in literature and provide the specific reasons for why an athlete fails to return to sport after ACL reconstruction; we estimated the rate of failure to return to sports after ACL reconstruction to be 25.5%, with one-third of athletes citing fear of reinjury as the major deterrent for returning to sports.

Data:
Abstract: Purpose: Anterior cruciate ligament (ACLR) injuries are a relatively common orthopedic injury with an estimated incidence rate of 1 in 3000, however this number is believed to be much higher in the young athletic population. While existing literature has investigated outcomes of patient with successful return to sport, the outcomes of those who fail to return to sport have not been characterized. The purpose of this systematic review is to determine the rate of athletes who did not return to sport (RTS) after primary ACL reconstruction. We aimed to identify the specific reasons for failure to RTS by non-returning athletes. Methods: This meta-analysis was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Eligible studies included those explicitly reporting the rate of failure for RTS following ACL reconstruction as well as providing details on reasons for why athletes were unable to return. Data was collected on the number of athletes, average age, average follow up time, type of sport played, failure to RTS rate, and specific reasons for failure to return. A random effects model was employed to conduct the meta-analysis. Results: Thirty-one studies met the inclusion criteria and reported on a collective total of 4762 athletes. Among the athletes included, 2929/4762 (61.4%) were males, and 1839/4762 (38.6%) were females. The weighted rate of failure to return to sport after ACL reconstruction was 25.5% (95% CI, 19.88 - 31.66%). The estimated proportion of non-knee related reasons cited for failure to RTS was significantly greater than knee related reasons for failure RTS (55.4 % vs. 44.6 %, p-value < 0.0001). The most commonly cited reasons for failure to return was fear of injury (33.0%) followed by other reasons unrelated

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