Psychological Readiness after Revision ACL Reconstruction: A ROAR Study

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Summary:
As the first study to date to examine psychological readiness to return to sport in young patients after revision ACLR, at 6-months post-surgery, revision ACLR patients had lower psychological readiness scores, inferior knee functional outcomes scores, and delayed return to sport clearance. Greater attention to the psychological aspects of recovery in the revision ACLR setting may be important to help optimize post-operative care and outcomes.

Category: Knee - ACL Revision

Revision Anterior Cruciate Ligament Reconstruction With Quadriceps Tendon And Lateral Extra-Articular Tenodesis: Mid-To-Long-Term Clinical, Radiological And Functional Results

Abstract ID# 22146
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Summary:
Revision ACL reconstruction with quadriceps tendon and lateral extra-articular tenodesis provides mid-to-long-term anterior and rotatory laxity control, combined with a high rate of sports participation, 10 years after surgery.

Data:
Background: ACL reconstruction revisions rate varies from 2.1 to 4.9% according to different studies. It's a technical and challenging operation with many parameters to be considered in order to achieve good results. Graft choice remains a crucial element in surgery planning. Quadriceps tendon is becoming more and more popular in ACL revision reconstruction, due to its structural and biological properties, and its availability. Lateral extra-articular tenodesis in the revision setting has also proven its ability to protect the graft. Purpose: To evaluate mid-to-long-term results of an association of quadriceps tendon autograft and lateral extra-articular tenodesis for ACL revision surgery. Methods: Patients who underwent revision ACL reconstruction with quadriceps tendon autograft and lateral extra-articular tenodesis between September 2002 and September 2015 operated by the senior author were included. Outcomes included clinical evaluation, validated clinical and patient reported outcome scores and radiographic analysis at last follow-up. Results: 90/109 eligible patients were available for follow-up at mean 10.5 (± 3.3) years post-operatively. Anterior and rotatory laxity evaluated by Lachman and Pivot-shift tests as well as the side-to-side difference on a KT1000 arthrometer showed a significant improvement at latest follow-up (p<0.005). There were 20.5% of patients showing high grade (IKDC 3 or 4) residual pivot-shift. IKDC B or more radiographic changes were correlated to the timing between injury to surgery (p=0.049) and to the existence of a meniscectomy during one of the surgeries (p=0.018). A meniscectomy during the first surgery was correlated to chondral changes (ICRS 3 or 4) during the revision surgery (p=0.023). Sports participations at last follow-up was important, 89% (n=80) of patients still practicing sports and 39% (n=31) of them the same sport than before the first ACL injury. Patients with IKDC A or B pivot-shifts had better Tegner scores than patients with IKDC C or D pivot-shifts (6 (± 2) vs 4.2 (± 1), p=0.0024). Re-rupture rate was 5.5% (n=5). At last follow-up, 36.7% (n=33) of patients had a complementary surgery of the same knee (33% (n=11) of screw removal, 30% (n=10) of meniscectomies). Conclusion: ACL revision surgery with quadriceps tendon autograft and lateral extra-articular tenodesis provides a maintained control of anterior and rotatory laxity, 10 years after surgery. Sports participation at latest follow-up was high. ICRS 3 or 4 chondral changes and high grade residual pivot-shift were associated with lower Tegner scores. Meniscectomy was associated with worsened radiographic outcomes. Re-operation
rate was important (36.7%).

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Outcomes at 3 Years After Slope-Reducing High Tibial Osteotomy with Revision ACL Reconstruction. A Prospective Cohort Study

Abstract ID# 23306
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Summary: In patients with ACL graft failure and increased tibial slope, anterior closing wedge high tibial osteotomy provides a safe and reliable technique to control ACL graft re-tear and offer good functional outcome on the midterm.

Data: Background: Increased tibial slope is correlated with increased tibial translation and higher failure rates of ACL reconstruction. Cadaveric studies have shown that slope-reducing high tibial osteotomy (SR HTO) decreases ACL-graft forces and anterior tibial translation under axial load. However, the effect of SR HTO on ACL revision outcomes has not been comprehensively analyzed on the midterm. Purpose: To evaluate the midterm functional outcomes after slope-reducing osteotomy associated with revision ACL reconstruction. Study design: prospective cohort study; level of evidence, 2. Methods: 41 consecutive patients with ACL reconstruction failure and increased tibial slope (18°±2.7 degrees) were included. Tibial slope was calculated from full length standing lateral views using the tibial mechanical axis as a reference. Age 25±5.9 years, sex ratio 1.4, BMI 24.6±4.4 kg/m2. Revision was staged in two procedures in all cases: first surgery for SR HTO and tunnels bone grafting; second for reimplantation of ACL graft. The amount of slope reduction was measured with a target of slope at 6° to 8° degrees. The SR HTO was performed by an anterior approach with a tibial tubercle osteotomy for access. It was guided by a 3D printed patient-specific cutting jig to avoid alteration of coronal plane alignment and it was fixed with staples. Patients were followed for 3±1.4 years. Adverse events occurred in 9.7%: secondary displacement (1/41), delayed union (1/41). At the time of follow-up: ACL-RSI 48.8±22.6, IKDC 60.1±14.9, no recurrence in ACL graft failure. We observed no iatrogenic coronal plane alterations and no tibial slope over/under correction on postoperative EOS long standing AP and lateral x-rays. Secondary knee hyperextension was not reported. Return to sport was observed in 70.7% (29/41) with half of these patients (15/29) involved in level 1 sports according to the classification by Hefti et al. Conclusion: In patients with ACL graft failure and increased tibial slope, anterior closing wedge high tibial osteotomy provides a safe and reliable technique to control ACL graft re-tear and offer good functional outcome on the midterm.

Category: Knee - ACL Revision

High Prevalence of Increased Posterior Tibial Slope in ACL Revision Surgery Demands for a Patient Specific Approach

Abstract ID# 21955
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Summary: Patients with one or multiple ACL graft insufficiencies showed an overall high prevalence (35% (95% CI [29%; 42%])) of a PTS greater than or equal to 12° and the group of patients with a PTS greater than or equal to 12° showed a significant shorter survival of their first ACL graft.

Data: Purpose A posterior tibial slope (PTS) greater than or equal to 12° is a well described important risk factor for recurrent anterior cruciate ligament (ACL) graft insufficiency. The primary aim was to determine the prevalence of an “increased PTS” (PTS greater than or equal to 12°) in an ACL graft insufficiency population. The secondary aims were to investigate if the prevalence of increased PTS and the absolute PTS increases with the increasing number of ACL graft insufficiencies, as well as to investigate the survival time of the first ACL graft. The main hypothesis was that there is a high prevalence of increased PTS in ACL graft insuffi- cient patients. Further hypotheses were that the prevalence as well as the absolute PTS increases with the increasing number of ACL graft insufficiencies and that the survival of the ACL graft was shorter in patients with increased PTS. Methods Between January 2021 and March 2022, all patients with an ACL graft insufficiency were included. Exclusion criteria were previous multi-ligament surgery or new multi-ligament injury requiring multi-ligament surgery; previous ipsilateral septic knee arthritis; previous ipsilateral osteotomy; incomplete medical records; previous used ACL graft other than quadriceps, hamstring or patellar tendon autograft, or allograft tendon; previous ACL repair and no true lateral knee radiograph. The PTS was measured as the angle between to the medial tibial plateau and a line perpendicular to the proximal anatomical tibial axis. Patients were divided into groups depending on number of ACL graft insufficiencies: group A, 1 graft insufficiency; group B, 2 graft insufficiencies; group C 3 or more graft insufficiencies. Chi-square, fisher’s exact or independent student T tests were used to compare the prevalence of increased PTS and absolute PTS between the groups. The Kaplan-Meier curve and Log-rank test was used to compare the survival of the first ACL graft between patients with or without increased PTS. Significance was set at p<0.05. Results In total 206 patients (147 men / 59 women) were included. 73 patients showed an increased PTS with an overall prevalence of 35% (95% confidence interval (CI) (29%; 42%)). 155 patients were included in group A, 42 patients were included in group B and 9 patients were included in group C. The prevalence of increased PTS for group A, B and C was, 32% (95% CI [25%; 40%]), 38% (95% CI [23%; 53%]) and 78% (95% CI [51%; 100%]), respectively. The prevalence of increased PTS and mean PTS did not increase significantly between group A and B (p<0.05). However, both increased significantly between group A and C, and group B and C (p<0.05). The survival time of the first ACL graft in patients with an increased PTS was significantly shorter (p<0.001). Conclusion There is a 35% overall prevalence of increased PTS in the studied ACL graft insufficient patient population. The survival of the first ACL graft is shorter in patients with an increased PTS. Surgeons should be aware of the high prevalence of increased PTS when consulting patients for revision ACL reconstruction as it is an important risk factor for recurrent instability that may need to be addressed.

Category: Knee - ACL Revision

Comparison of Autologous Vs Allogenic Bone Graft In Two-Staged ACL Revision Surgery with Tunnel Filling. Radiological and First Clinical Results of a Prospective Randomized Controlled Trial

Abstract ID# 22723
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Summary: Allogenic bone graft shows comparable results in tunnel filling and clinical outcome compared to the gold standard autologous bone graft in two-staged ACL revision surgery.

Data: Introduction: With the increasing number of ACL reconstructions, the number of failures also rises. Often a two-staged treatment with tunnel filling and secondary ACL reconstruction is necessary in ACL revision surgery due to tunnel widening or poor tunnel placement. Aim of this study was to investigate if allogenic bone graft is non inferior to autologous corticocancellous iliac crest graft in terms of radiological bone regeneration. Materials and Methods: The study was designed as a prospective, randomized trial. 41 patients who required 2 staged ACL revision surgery were included. In 17 patients, the void filling was performed using iliac crest corticocancellous autograft and in 24 patients with allogeneic femoral head graft. 3 months postoperatively a CT scan was performed. Tunnel filling was measured in the axial planes dividing the area of the bone graft by the area of the whole tunnel. Additionally, the Hounsfield units of the bone graft were compared to a representative native cancellous bone area of the proximal tibia. Clinical assessments with testing of knee function (ROM), stability (KT 1000) and PROM's