were performed 6, 12 and 24 months postoperatively. Results: Tunnel filling showed comparable results for autologous and allogenic grafts. The mean percentage of tunnel filling for allogenic bone graft was 82.61% to 84.94% ($p=0.4415$) for autologous corticocancellous graft. Hounsfield units differed in both groups significantly ($p=0.0015$) compared to a representative native bone area of the proximal tibia. There was also a significant difference between the Hounsfield units with a mean of 630.5 for allograft and 431.7 for autograft ($p<0.0001$). KOOS score was significantly higher 6 months postoperatively with a mean of 80 in the autograft group compared to 68 in the allograft group. Whereas there was no significant difference between the two study groups in IKDC score 6 months postoperatively. In the clinical examination, no relevant differences in range of motion or ligamentous stability (KT 1000) were found. Conclusion: Allogeneic bone graft is non inferior to the gold standard autologous corticocancellous bone graft in terms of tunnel filling, knee function, IKDC and stability 6 months postoperatively. The difference in the KOOS score at 6 months postoperatively below the minimally clinically important difference (MCID) and substantial clinical benefit (SCB). Both allograft and autograft showed Hounsfield units of cortical bone, however autologous bone graft was closer to normal cancellous bone than the allogeneic graft.

Summary: Increased tibiofemoral rotation angle was associated with increased odds of ACLR failure particularly if the angle is higher than 4.5 degrees.

Data: Purpose: Coronal and sagittal malalignment of the knee are well-recognized risk factors for failure after anterior cruciate ligament reconstruction (ACLR). However, the effect of axial malalignment on ACLR graft survival is yet to be determined. In this study we aimed to evaluate if increased tibiofemoral rotational malalignment, namely tibiofemoral rotation angle (TFA) and tibial tubercle-trochlear groove (TT-TG) distance, is associated with ACLR graft failure. Methods: this is a matched-control study in which 151 patients who underwent revision ACLR due to graft failure (failure ACLR group) were compared to a matched-control group of 151 patients who underwent primary ACLR with no evidence of failure after at least 2-years follow-up (intact ACLR group). Patients were matched by sex, age, and meniscal injury during primary ACLR. Assessment of axial malalignment was performed on preoperative magnetic resonance imaging (MRI) through the TFA and the TT-TG distance. Sagittal alignment was measured through posterior tibial slope (PTS) on MRI. Optimal TFA cutoff associated with graft failure was identified by a receiver operating characteristic (ROC) curve. Kaplan-Meier curve with log-rank analysis was performed to evaluate the influence of TFA on ACLR longevity. Results: In the failure ACLR group, mean TFA was $5.8 \pm 4.5$ (range, -5 to 16) degrees while for the intact ACLR group this mean was $3.0 \pm 3.3$ (range, -3 to 15) degrees ($p<0.001$). Neither TT-TG distance nor PTS presented statistical differences between the groups. ROC curve suggested an optimal TFA cutoff of 4.5 degrees for ACLR graft failure. Considering this threshold, patients who presented TFA higher than 4.5 degrees had 6.6-times greater likelihood of graft failure in comparison to patients with TFA $< 4.5$ degrees ($p<0.001$). A 5-years survival of 81% was found in patients with TFA $< 4.5$ degrees, while it was 44% for TFA greater than 4.5 degrees ($p<0.001$). Conclusion: Increased TFA was associated with increased risk of ACLR failure when the TFA was higher than 4.5 degrees. Measuring the TFA in patients with ACL tears undergoing reconstruction may inform surgeons about additional factors that may be considered prior to ACL reconstruction for a better outcome.

Category: Knee - ACL Revision

Increased Tibiofemoral Rotation Angle is Associated With Graft Failure After Anterior Cruciate Ligament Reconstruction

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