Comparison of MRI Results of Grafts Obtained by Unilateral Anterior Cruciate Ligament Reconstruction Either Using Anteromedial Portal Only or Transtibial Method with Contralateral Healthy Knee: Tibial Tunnel or Graft Insertion?

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Objectives: Our aim is to compare graft angles and tibial tunnel insertion in patients undergone single bundle ligament reconstruction using anatomical anteromedial (AM) and transtibial (TT) method with the contralateral healthy knee by using MR imaging. And to investigate correlation of this evaluation with functional results.
Methods: We investigated 96 knees of 48 patients undergone anterior cruciate ligament (ACL) reconstruction with AM or TT method. 23 of 48 patients were operated with AM method. These patients were named as Group A. 25 patients were operated with TT method and named as group B. MRI was taken for both knees in each group postoperatively at the mean 10.47 (9-15) and 11.72 (9-17) months, respectively. Angle between ACL graft and anatomical axis of tibia in coronal and sagittal plane, [Sagittal ACL graft angle (SAGA), Frontal ACL graft angle (FAGA)], middle insertion point on tibial articular surface, [Sagittal ACL middle point (SGMP), Frontal ACL tibial tunnel middle point (FTMP), and Sagittal ACL tibial tunnel middle point(STMP)] was assessed by three orthopaedic surgeons. Values in both groups, inter observer, values between operated and healthy knees and differences between two groups were statistically evaluated. Functional scores between operated and healthy knees were evaluated with the Lysholm scoring system.
Results: Inter observer results were statistically significant in group A between operated and healthy knees for 1st and 2nd observers in SAGA values and for 1st and 3rd, and 2nd and 3rd observers in FAGA values ($p<0.05$). In group B there was statistically significant difference in SAGA values for 1st and 2nd, and for 2nd and 3rd observers and in FTMP values for 1st and 3rd, and 2nd and 3rd observers ($p<0.05$). Statistically significant difference was detected between SAGA, FAGA and SGMP values of operated and healthy knees of A and B groups in all three observers' evaluation ($p<0.05$). No statistically significant difference was detected between STMP values of operated knees and SGMP values of healthy knees in both groups ($p>0.05$). Statistically significant difference was detected between SAGA and FAGA values of operated knees in both groups ($p<0.05$). There was statistically significant difference in Lysholm scores between group A and B ($p<0.05$). Nonetheless there was no statistically significant difference between the Lysholm scores of operated knees in A and B groups ($p>0.05$).
Conclusion: ACL reconstruction surgery with TT and AM methods do not provide anatomical reconstruction in Sagittal plane. Moreover, functional results were not as good as contralateral healthy knees. Although tibial tunnel was in anatomical position in both TT and AM methods, the posterior insertion of graft is thought to be the result of anterior placement of interference screw.

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