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Clinical Results from the First Large Series of Anterolateral Ligament Reconstruction Demonstrate Reduced ACL Graft Rupture Rates and Improved Return to Sport

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Summary:
The rate of ACL graft failure when combined with anterolateral ligament (ALL) reconstruction is significantly less than with isolated ACL reconstruction with B-PT-B or hamstring tendons. ACL+ALL is also associated with significantly greater odds of returning to the pre-injury level of sport. Clinical results at latest follow up show no evidence of increased complications or overconstraint.

Abstract:
Background: Graft failure and low rates of return to sport are major concerns after ACL reconstruction. It is for this reason that there is currently great interest in the role of the anterolateral ligament (ALL) in controlling rotatory laxity and its ability to share load with the ACL graft. However, the vast majority of research relating to ALL reconstruction is laboratory based and its clinical role remains undefined. There are concerns regarding overconstraint of the knee based on historical experience with non-anatomical lateral extra-articular tenodeses.

Purpose: To evaluate the role of combined ACL and ALL reconstruction in reducing graft rupture rates and improving return to sport in a high risk population of young patients participating in contact sports.

Methods: A prospective series of 502 patients who underwent primary ACL reconstruction with either bone-patellar tendon-bone graft (BPTB n=105), quadrupled hamstring tendons (4HT n=176), or combined hamstring tendon and anterolateral ligament reconstruction (HT+ALL n=221) was studied. Kaplan Meier analysis was performed to provide survivorship data that were analyzed in multivariate Cox regression models to identify prognosticators of graft rupture and return to sport.

Results: The mean age was 22.4 ± 4.0 years (range 16-30), 364/502 patients (72.5%) were male. The mean duration of follow-up was 38.4 months (range 24-54). The mean post-operative subjective IKDC score was 84.4 +/- 11.6. There was no difference between groups with respect to the postoperative improvement in subjective IKDC (mean delta IKDC 27.0 +/-15.7, P=0.84) or the mean side-to-side laxity difference 0.5 +/-0.9mm (P=0.3879). The rate of graft failure in patients with HT+ALL grafts was 3.1 times less than with 4HT [hazard ratio, 0.327; 95% CI 0.13-0.758] and 2.5 times less than with B-PT-B [hazard ratio, 0.393; 95% CI 0.153-0.953]. There was no significant difference in the graft failure rate between 4HT and B-PT-B groups [hazard ratio, 1.204; 95% CI 0.555-2.66]. Overall, 93% of patients returned to sport at latest follow-up. Return to self-described pre-injury level of sport was 64.6%. The HT+ALL graft

was associated with higher odds of return to pre-injury level of sport than 4HT [Odds ratio, 1.938; 95% CI 1.174-3.224] but not compared to B-PT-B [Odds ratio, 1.460; 95% CI 0.813-2.613].

Conclusion: The role of the anterolateral ligament in the ACL injured knee has been a topic of great controversy. The main reason for this has been a reliance on laboratory-based studies in lieu of clinical results. This study is the first to compare HT+ALL with other common techniques for ACL reconstruction. This large series with medium-term follow up conducted in a high-risk population of young patients participating in pivoting sports demonstrates that the rate of graft failure with HT+ALL is significantly less than with ACL reconstruction performed with B-PT-B or 4HT only. HT+ALL is also associated with significantly greater odds of returning to the pre-injury level of sport when compared to 4HT. Clinical results at latest follow up show no evidence of increased complications or overconstraint compared to other common techniques of ACL reconstruction