

Combined Increase in Posterior Tibial Slope and Static Anterior Tibial Translation Results in High Graft Rupture Rates for ACL Reconstruction using Hamstring Autograft Despite Lateral Extra-articular Tenodesis

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INTRODUCTION:

The addition of a lateral extra-articular tenodesis (LET) to anterior cruciate ligament reconstruction (ACLR) has been shown to reduce ACL graft rupture rates. Posterior tibial slope (PTS) and static anterior tibial translation (SATT) are also recognized as risk factors for ACL graft rupture.

The aim of the present study was to evaluate the impact of PTS and SATT on graft rupture rates following ACLR using hamstring autografts combined with LET. Our hypothesis was increased PTS and SATT will result in increased ACL graft rupture rates despite the addition of a LET.

METHODS:

This retrospective, single-center, single-surgeon study included patients who underwent primary ACLR with hamstring autografts combined with LET between January 2014 and December 2017. Demographic data were collected, and the association between PTS, SATT, and ACL graft rupture rates was assessed with a minimum follow-up of 6 years. Subgroup analyses were performed using PTS thresholds of 9° and 12°, as well as an SATT threshold of 5 mm. Univariate and multivariate analyses were conducted to identify significant risk factors for ACL graft rupture.

RESULTS:

Out of the 934 ACLR procedures performed, 207 patients met the inclusion criteria. With a 90% of response rate, 186 patients who underwent primary ACLR with hamstring autografts and LET were analysed. ACL graft rupture rate for patients with a PTS $\geq 12^\circ$ (19.4%) was significantly ($p < .001$) higher than for patients with PTS $< 12^\circ$ (2.7%). The highest ACL graft rupture rate (26%) is observed in patients with both a PTS $\geq 12^\circ$ and an SATT ≥ 5 mm. Patients with a PTS $< 9^\circ$ demonstrated no ACL graft ruptures (0/60). The risk of graft rupture was significantly associated with a PTS $\geq 12^\circ$ (OR 12; 95% CI, 0.1-0.4; $p < .001$), SATT ≥ 5 mm (odds ratio, 1.4; 95% CI, 0.2-3; $p = 0.045$) and age < 18 -years-old (OR 4.1; 95% CI, 0.8-22.1; $p = 0.015$).

DISCUSSION AND CONCLUSION:

Despite the addition of a LET, almost 20% of patients undergoing ACLR with hamstring autografts experienced graft rupture when PTS was $\geq 12^\circ$. When combined with an increased SATT (≥ 5 mm), the graft rupture rate rose to 26%. In contrast, no graft ruptures were observed in patients with a PTS $< 9^\circ$. These findings emphasize the importance of evaluating PTS and SATT individually rather than systematically performing LET.