

## Drop Vertical Jump Landing Mechanics Following Anterior Cruciate Ligament Reconstruction With And Without Lateral Extra-Articular Tenodesis – 6 Month Results from the ISAKOS Sponsored Stability Study

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### Summary:

There are no differences in drop vertical jump landing biomechanics at the knee when comparing anterior cruciate ligament reconstruction alone to anterior cruciate ligament reconstruction with lateral extra-articular tenodesis in young, active patients who are at high risk of graft failure.

### Abstract:

#### Introduction

The combination of anterior cruciate ligament (ACL) reconstruction plus lateral extra-articular tenodesis (LET) has shown promising results during preclinical biomechanical and clinical testing at reducing anterolateral rotatory laxity; however, no studies have examined its effectiveness during a dynamic functional task. Therefore, we used the drop vertical jump (DVJ) to compare in vivo biomechanics of ACL reconstructed patients with and without LET from a subset of patients within the Stability randomized clinical study. We hypothesized that there would be a difference in peak knee abduction moment (KAM) between the two treatment groups at six months following surgery.

#### Methods

This is a subset of patients taken from one center, within a pragmatic, multicenter prospective randomized clinical trial. Thirty patients were randomized to receive ACL reconstruction alone (n=16) or ACL reconstruction plus LET (n=14). At six months postoperative, all patients performed a drop vertical jump test and knee kinetics and kinematics were measured using three-dimensional motion analysis. Biomechanical variables of interest included peak initial contact and stance values for knee abduction moment and angle, knee flexion moment and angle and knee internal rotation moment and angle. Independent groups t-tests were used to assess kinetic and kinematic differences between the injured limbs of both treatment groups.

#### Results

There was no significant difference in peak KAM between those who received ACL reconstruction alone (1.31 % BW×ht) and those who received an ACL reconstruction plus LET (1.14 %BW×ht) (Mean Difference, 0.17; 95% CI, -0.50 to 0.84, p = 0.60). Similarly, there were no differences in peak knee flexion moment or peak knee internal rotation moment between treatment groups (p=0.59 and p=0.37 respectively). There were also no significant differences in knee abduction angle, knee flexion angle or knee internal rotation angle at initial contact (p=0.40, p=0.08, p=0.23 respectively) or peak stance phase (p=0.10, p=0.44, p=0.19 respectively).

#### Conclusions

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We found no significant biomechanical differences between treatment groups at six months postoperative. However, these are the preliminary results of a larger continuing study and, at this time, no definitive conclusions can be made.