Knee Lateral Extra-Articular Tenodesis Decreases In-Situ Force In The Anterior Cruciate Ligament

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I have no financial conflicts to disclose.
INTRODUCTION

- Rotatory knee instability may persist after ACLR
  - Injury to anterolateral knee structures?
  - Recent increase in LET procedures combined with ACLR

- Concerns about overconstraint after LET procedures
  - Effects on in-situ force in the ACL, anterolateral capsule (ALC) and LET graft?
Knee LET Decreases In-Situ Force in the ACL

OBJECTIVE

To quantify the effects of LET on in-situ forces in the ACL, ALC and LET graft
METHODS

- Nine fresh-frozen cadaveric knees
- Mean age: 66.4 years
- Robotic Testing System (MJT Model FRS2010)
- Two loading conditions:
  - 200 N compression with 134 N anterior load
  - 200 N compression with 7 Nm internal tibial rotation
Knee LET Decreases In-Situ Force in the ACL

METHODS

Anterolateral capsule (ALC) separated from surrounding tissue with three incisions.

2-cm-wide strip of ALC removed to simulate ALC deficiency.

LET performed utilizing a 6-mm semitendinosus graft.
METHODS

Knee States
- Intact
- ALC Separation
- ALC Deficient
- LET Procedure
- ALC Deficient
- ACL Deficient

Statistical Analysis
- ANOVA with post-hoc Bonferroni
- At 0°, 30°, 60° and 90° of knee flexion
- Wilcoxon signed rank test for non-normally distributed data
In-situ force in the ACL significantly decreased after LET compared to ALC deficiency by 43.4% at 60° and by 50.0% at 90°

No difference between intact and LET states ($P > .05$)
In-situ force in the LET graft was significantly higher than in the native ALC by 43.0% at 30º, by 122.0% at 60º and by 170.8% at 90º.
MAIN FINDINGS

- In-situ force in the ACL was significantly lower after LET when compared to ALC deficient state
  - In agreement with previous studies that observed reduction up to 43% of in-situ force in the ACL after modified Andrews LET
  - LET may proved protective effect to the ACL when the ALC is damaged
  - In-situ force in the ACL was not lower than intact knee – LET does not seem to add protection to the ACL when no damage to the ALC is present
MAIN FINDINGS

✓ In-situ force in the LET graft was significantly higher than in the native ALC

- May offload stresses on other structures, such as the ACL
- May overconstraint the knee after LET and increase pressure in the lateral compartment
CONCLUSION

LET reduces in-situ forces in the ACL in the setting of ALC injury possibly providing a protective effect to the ACL. In-situ force in the LET graft was significantly higher than in the native ALC, possibly offloading the ACL. Further clinical studies are needed to evaluate the mid- and long-term outcomes of LET for rotatory knee instability, specifically its effect on ACL graft rupture and other knee structures.
REFERENCES


