

# **Lateral Extra-Articular Tenodesis Staple Risks Penetration of ACL Reconstruction Tunnel**

## **Abstract**

**Introduction:** The modified Lemaire lateral extra-articular tenodesis (LET) has recently been advocated as an adjunct to anterior cruciate ligament reconstruction (ACL-R) in certain patients at high risk of graft failure. Cited indications for its use as an adjunct to ACL-R include the presence of a high-grade pivot shift, generalized ligamentous laxity, or in a young patient returning to pivoting sports. Biomechanical and clinical studies have shown this technique decreases anterolateral rotational instability and may reduce graft failure rates. However, one recognized limitation when performing an LET concomitantly with ACL-R is the risk of convergence between the modality of LET graft fixation and femoral tunnel used for ACL-R. Therefore, the purpose of this study was to identify the risk of ACL femoral tunnel penetration by a small Richards staple used for lateral extra-articular tenodesis (LET) fixation and to determine whether or not the risk varies between two techniques for ACL femoral tunnel creation.

**Methods:** 20 paired, fresh-frozen, cadaver knees underwent ACL reconstruction with a LET. Left and right knees were randomized to ACL reconstruction with femoral tunnel creation by use of either a rigid guide pin and reamer through the accessory anteromedial (AAM) portal or by the use of a flexible guide pin and reamer through the anteromedial (AM) portal. Immediately after tunnel creation, the LET was performed and fixated with a small Richard's staple. Fluoroscopy was used to obtain a lateral view of the knee to determine staple position, and visualization of the ACL femoral tunnel was performed with the arthroscope to investigate penetration of the staple

into the femoral tunnel. A Fisher's exact test was conducted to determine if there was any difference in tunnel penetration between tunnel creation techniques.

**Results:** The staple was noted to penetrate the ACL femoral tunnel in 8/20 (40%) extremities. When stratified by tunnel creation technique, the Richards staple violated 5/10 (50%) of the tunnels made via the rigid reaming technique compared to 3/10 (30%) of those created with a flexible guide pin and reamer ( $p = 0.65$ ).

**Conclusion:** LET staple fixation combined with modern ACL femoral tunnel drilling techniques risks a high incidence of femoral tunnel violation. Surgeons may consider adjustments to operative technique, sequence, or fixation devices used when performing ACL-R with concomitant LET to avoid the potential for disruption of ACL graft fixation.

**Level of Evidence:** Level 2

**Keywords:** Lateral Extra-Articular Tenodesis, Tunnel Convergence, ACL Failure, ACL Graft Re-rupture