

**John J. Joyce Award Second Place Winner**

**The Lateral Tibial Tunnel in Revision Anterior Cruciate Ligament Surgery:  
A Biomechanical Study of a New Technique**

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**Summary:**

The use of a lateral tibial tunnel is a new technique to address tibial bone stock deficiencies in revision anterior cruciate ligament surgery.

**Abstract:**

**Introduction:**

Anterior cruciate ligament (ACL) replacement is now the standard treatment for the ACL deficient unstable knee.

Although primary and revision ACL surgery are performed routinely, deficient tibial or femoral bone stock frequently causes technical problems.

To address these challenges, we hypothesized that a convergent tibial tunnel, drilled from the lateral side of the tibia is a reliable and easy technique to obtain a well positioned tunnel allowing appropriate graft fixation without the necessity to address bone stock issues related to the primary medial tibial tunnel (MTT). We performed a biomechanical, paired, human cadaver study to investigate anatomic considerations and knee stability of this new technique.

**Material and Methods:**

A primary ACL reconstruction with a MTT was performed in 5 human cadaver knees. Secondly a revision ACL reconstruction with a convergent LTT towards the same aperture at the ACL footprint was performed on the same knee. Translational and rotatory stability were tested with the Praxim ACL navigation tool in the intact knee, after section of the ACL, after the primary ACL reconstruction with a standard MTT and after the revision ACL reconstruction with the convergent LTT.

**Results:**

No anatomical problems were encountered and an appropriate LTT placement was obtained in all specimens. No inferiority of the rotatory and translational stability could be detected between the revised knees with a LTT compared to the primary ACL reconstructed knees.

**Conclusion:**

A convergent tibial tunnel, drilled from the lateral side of the tibia is a new technique for ACL revision surgery. This new technique allows appropriate graft fixation without the necessity to address bone stock issues related to the primary medial tibial tunnel. This biomechanical study showed no inferiority concerning stability of the knee with the LTT, compared to the standard technique. Although further research concerning fixation strength, durability and in vivo testing is necessary, the results of this study are promising.