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Paper #9

Biomechanical Comparison Of Double Bundle Versus Single Bundle Anterior Cruciate Ligament Reconstruction Using Three Dimensional Gait Analysis.

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Summary:
No differences were detected between anatomic SB and DB ACL reconstructed patients with regard overall tibio-femoral rotation and adduction moments.

Abstract:
Introduction. There has been a recent focus on surgical techniques that more closely approximate the anatomy of the anterior cruciate ligament (ACL). Double bundle techniques have gained popularity but are more surgically demanding, costly and may lead to more complex revision procedures. Outcome measures used in clinical studies may not be sensitive enough to detect a difference between the techniques, therefore more accurate in vivo studies are required.

Purpose. This study utilizes three dimensional gait analysis to compare two groups of patients having undergone either an anatomical single or double bundle ACL reconstruction. It is hypothesised that there will be no significant difference between the two groups with regard tibio-femoral rotation and knee adduction moments.

Methods. Twenty-eight patients (14 SBACLR, 14 DBACLR) were assessed using a ten-camera Vicon system allowing three dimensional gait analysis. They were each required to perform four tasks: level walking, step descent and immediate pivot, jog and cut and hop and dodge The overall range of tibial rotation and knee adduction moments were recorded for the reconstructed and normal contralateral knee. Other outcome measures including KT-1000, IKDC score and functional hop tests were recorded and clinical tests such as a Lachman and pivot shift were performed.

Results. Patient demographics were similar for both groups and all patients were clinically stable and satisfied with their reconstructed knee (IKDC A or B). There were no significant differences for range of tibial rotation between the reconstructed and ACL intact limbs for either the DB or SB groups. Similarly there were no differences between DB and SB groups regarding adduction moments.

Discussion. This paper demonstrates that an anatomical single bundle ACL reconstruction, when compared to the normal contralateral knee, is able to control tibio-femoral rotation and adduction moments as well as a double bundle procedure. The key may be anatomical graft position, not the number of bundles.