ISAKOS

International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine

9th Biennial ISAKOS Congress • May 12-16, 2013 • Toronto, Canada

Paper #10

Biomechanical Evaluation Of Knee Kinematics After ACL Reconstruction In Anatomic SB- And DB – Technique With Additional Medial Meniscus Suture

Olaf Lorbach, MD, GERMANY
Martin Engelhardt, MD, GERMANY
Mirco Herbort, MD, GERMANY
Michael Johannes Raschke, Prof, GERMANY
Matthias Kieb, MD, GERMANY

Münster University
Münster, Deutschland, GERMANY

Summary:
Anterior tibial translation (aTT) as well as aTT in response to a combined rotatory load significantly increased with ACL deficiency compared to the intact knee, additional medial meniscal injury further increased aTT. Anatomic ACL reconstruction with medial meniscal repair restored knee kinematics compared to the intact knee.

Abstract:
Purpose: Evaluation of knee laxity after ACL reconstruction and additional suture of a medial meniscus tear Methods: Kinematics of the intact knee were determined in 12 human cadaver specimens in response to a 134-N anterior tibial load (aTT) and a combined rotatory load of 10 Nm valgus and 4 Nm internal tibial rotation using a robotic/universal force moment sensor testing system. Subsequently, the ACL was resected following the creation of a bucket-handle tear of the medial meniscus. A standard repair of the medial meniscus was performed using 3 inside-out horizontal sutures. Finally, The ACL was reconstructed using an anatomic single-bundle (6) or an anatomic double-bundle technique (6). Knee kinematics were determined following every sub-step. Results: Significant increase of aTT in the ACL- deficient knee was found with significant increase in the ACL-deficient knee with additional medial meniscal injury (p=.003; p=.009). ACL reconstructions significantly decreased aTT compared to the ACL-deficient knee. No significant differences between the intact knee and the ACL-reconstructed knee with additional meniscal repair. In response to a simulated pivot shift, aTT in the intact knee significantly increased in the ACL-deficient knee as well as in the meniscus injured/meniscus-sutured knee (p=.003;p=.007). No significant differences were found between the ACL-deficient and ACL-reconstructed knee with additional meniscal repair were seen. SB- as well as DB-ACL reconstruction with additional medial meniscal repair restored knee kinematics compared to the intact knee. Comparison of SB- versus DB- ACL reconstruction did not reveal any significant differences neither in a simulated Lachman test nor in tibial translation in response to a combined rotatory load (p=.05). Conclusions: ATT as well as aTT in response to a combined rotatory load significantly increased with ACL deficiency compared to the intact knee, additional medial meniscal injury further increased aTT. Anatomic ACL reconstruction with medial meniscal repair restored knee kinematics compared to the intact knee. Comparison of anatomic SB- vs. DB-ACL reconstruction with additional repair of the medial meniscus did not reveal significant differences in aTT as well as aTT under a combined rotatory load.