

The Anterolateral Ligament has a Significant Role On Rotatory Stability of the Knee

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Summary:

The stabilizing effect of the ALL in ACL insufficient and reconstructed knees and the effect of ALL reconstruction

Abstract:

Recent studies have described the anatomy of an anterolateral ligament (ALL) of the knee. This ligament has been linked to the Segond fracture that is pathognomonic for tear of the anterior cruciate ligament (ACL). ALL is hypothesised to be important for the internal rotatory stability of the knee, but its mechanical role in ACL insufficient knees has yet to be clarified.

Our aim was to test the function of the ALL in relation to rotatory and anterior-posterior (AP) stability in ACL insufficient and reconstructed knees and the effect of anatomical ALL reconstruction with a tendon. In 18 cadaver legs ALL was dissected. Function of ALL (+/- ALL) and of ALL reconstruction (reALL) was tested with the ACL removed (-ACL) and reconstructed (+ACL) with following combinations: +ACL-ALL, +ACL+ALL, -ACL+ALL, -ACL-ALL, -ACL+reALL and +ACL+re-ALL. All combinations were tested with the knees in 0, 30, 60 and 90 degrees of flexion. AP stability was tested with a Rolimeter. Rotation of tibia was applied with a force of 8,85 Nm internal and external and measured photographically from K-wires inserted in tibia and femur. The appearance of ALL was not uniform, but it was well defined in 78 %. ACL (+/-) had a significant effect on the AP stability but not on rotation. ALL (+/-) had significant effect on the rotatory stability ($p = 0.0006$), regardless of the condition of ACL, and on the AP stability in ACL insufficient knees ($p = 0.023$). The lost stability from cutting ALL was regained when ALL was reconstructed.

ALL is a major rotational stabilizer. If ALL is torn in connection with ACL rupture, reconstruction of ACL alone is not re-establishing rotatory stability but rotatory instability is re-established if ALL is reconstructed. ALL reconstruction as supplement to ACL reconstruction might be considered in patients with a Segond fracture.