

## **Acute Anterolateral Knee Instability: combined ACL reconstruction and ALL repair is not inferior to ACL reconstruction + LET. A Prospective Randomized Study.**

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**INTRODUCTION:** lateral extraarticular tenodesis (LETs) have been proposed in association to anterior cruciate ligament reconstruction (ACLR) to better control rotation instability and to reduce rate of failure in the surgical treatment of Anterolateral Rotatory Instability (ALRI); in acute ligamentous tears of peripheral structures, repair was considered as a simpler, reliable and less invasive option. To date no previous study evaluated effectiveness of Anterolateral ligament (ALL) repair in acute ALRI.

**Purpose:** To evaluate effectiveness of repair of ALL as compared with LETs, performed along with ACL reconstruction, in acute ACL tears with moderate to severe ALRI.

**METHODS:**

**Methods:** Patients referring to our First Aid Unit with acute ACL rupture were provisionally selected to be included in this prospective study. Definitive inclusion criteria were: (1) grade 2 pivot shift or greater, (2) a desire to return to high-risk/pivoting sports, (3) MRI signs of ALL injury. Exclusion criteria included: refusal to participate in the study; previous injury or operation in the ipsilateral knee; multiligamentous injury, grade 3 or 4 Outerbridge chondral tears, degenerative osteoarthritis. Patients were randomly allocated to either ACLR+ALLRepair or to ACLR+LET (Arnold-Coker modified McIntosh procedure). All patients underwent the same ACLR with hamstrings and followed the same postoperative rehabilitation. Clinical outcomes included graft

rupture rates, patient reported outcome measures (PROMs: KOOS, Lysholm and subjective IKDC), re-operation rates and complications. Based on IKDC and KOOS scores, 138 patients were required to be 90% sure that the lower limit of a one-sided 95% confidence interval will be above the non-inferiority limit of -5.

**RESULTS:**

**Results:** Among the 162 patients definitively included in the study, operated between January 2015 and March 2020, 150 were reviewed (104) or contacted by telephone (46) at a mean follow-up of  $53.4 \pm 17.9$  (range, 24-67 months), 74 patients underwent ACLR+ALLRep and 76 underwent ACLR+LET. ALL Repair consisted in retensioning the stretched ligament in 40 cases (partial tears), suture of complete rupture in 29 cases and fixation of bony avulsion in 5 cases. The mean age in the ACLR+ALLRep group was 28.2 (range, 14-67) and 25.4 in the ACLR+LET group (range, 13-56). Mean injury to reconstruction time was 6.6 days (range, 1-14) in the ACLR+ALLRep group and 7.4 days (range, 2-13) in the ACLR+LET group.

Noninferiority criteria were met for both the IKDC Subjective Score (ACL+ALLRep,  $86.7 \pm 12.7$ ; ACLR+LET,  $89.7 \pm 14.5$ ) and the KOOS score (ACL+ALLRep,  $90.1 \pm 10.8$ ; ACLR+LET,  $93.1 \pm 10.9$ ).

The graft rupture rate in the overall population was 2% (3/150). In the ACLR+ALLR group the graft rupture was 2.7% (2/74) and in the ACLR+LET group it was 1.3% (1/76,  $P=686$ ). Possible risk factors for rupture were analyzed in a multivariate statistical analysis, and the only significant risk factor was patient age 20 years or younger (O.R. = 6.02; C.I., 1.47-322.9;  $P=.013$ ). No significant differences were found between the groups concerning the mean postoperative KOOS (ACLR+ALLRep, 90.1; ACLR+LET, 93.1;  $P=.2$ ), Lysholm (ACLR+ALLRep, 93.2; ACLR+LET 93.3;  $P=.9$ ) and subjective IKDC scores (ACLR+ALLRep, 86.7; ACLR+LET, 80.7;  $P=.4$ ). No patients complained for loss of range of motion at final follow-up. Two patients required a manipulation under anaesthesia to regain full range of motion. Return to sport at preinjury level was observed in 57/74 in the ACLR+ALLRep group and in 58/76 in the ACLR+LET group at a mean of 6 months post-operatively (range 4 to 10) with no differences between groups ( $P=.9$ ). No differences were found in the non-graft rupture related complications rate ( $P=.2$ ).

**DISCUSSION AND CONCLUSION:**

**Conclusions:** a comprehensive early surgical treatment of acute ALRI, including ACLR and a lateral procedure is a safe and effective procedure in terms of clinical results, knee stability and return to sport, with a very low rate of failure and post op complications. Direct repair of acute tears of ALL is as effective as LET and can be reasonably associated to a standard ACLR.