

A Call for More Studies Evaluating Posttraumatic Knee Osteoarthritis in Patients Undergoing Combined Anterior Cruciate Ligament Reconstruction and Lateral Extra-Articular Stabilization



Ever since the “re-discovery” of the anterolateral ligament (ALL) by Vincent et al.¹ in 2012, a tremendous amount of research has been devoted to determining the anatomy and biomechanics of the ALL as well as its role in rotational stability of the knee joint following an injury to the anterior cruciate ligament (ACL).^{2,3} Biomechanical studies have demonstrated that the ALL plays an important role in resisting internal tibial rotation and preventing the pivot-shift phenomenon.⁴⁻⁶ Restoration of the function of the ALL in patients undergoing anterior cruciate ligament reconstruction (ACLR) may come in the form of ALL reconstruction or lateral extra-articular tenodesis (LET). Although either of these lateral extra-articular stabilization (LEAS) procedures may reduce residual rotatory instability following ACLR, biomechanical studies also have shown that these procedures may overconstrain the knee joint and increase lateral compartment pressures compared with the native state.⁷⁻¹¹

Clinically, indications for adding LEAS to patients undergoing ACLR vary by study but may include high-grade pivot shift, chronic ACL tear, revision ACLR, generalized ligamentous laxity, young patients involved in pivoting sports, and elite/professional athletes.^{2,12,13} In randomized controlled trials (RCTs) comparing the results of isolated ACLR versus ACLR with LEAS, the evidence is clear: LEAS procedures significantly reduce the risk of ACL graft rupture/clinical failure in “at-risk” patients.¹⁴⁻¹⁷ Several retrospective comparative studies have also found lower failure rates with combined ACLR and LEAS versus isolated ACLR.¹⁸⁻²¹ In some retrospective studies, addition of LEAS also has been shown to reduce the risk of other reoperations, such as subsequent meniscectomy following ACLR.^{22,23}

But what about the biomechanical studies showing increased lateral compartment pressures with LEAS? Might this increase the risk for posttraumatic osteoarthritis (PTOA) in the future? PTOA after ACL injury is high, with reported rates of knee osteoarthritis in approximately 50% of patients who undergo ACLR at 10 to 20 years’ postoperatively.^{24,25} As far as we can find, there is only 1 RCT with long-term (>10 years)

follow-up comparing rates of PTOA in patients undergoing isolated ACLR versus ACLR with LEAS. At a minimum 19-year follow-up, Castoldi et al.²⁶ found that patients who underwent ACLR with LET demonstrated a significantly greater rate of lateral-compartment osteoarthritis compared with patients who underwent isolated ACLR (59% vs 22%, $P = .02$). This is a dramatic difference and certainly should be evaluated in other RCTs as long-term follow-up becomes available.

LET is nothing new. In fact, in the 1970s and 1980s, extra-articular reconstructions were the procedure of choice for treating the resultant rotatory instability that occurred with injury to the ACL, without addressing the ACL itself.²⁷ ACL reconstruction with an “over-the-top” approach combined with LET was widely used in the 1980s but often resulted in arthrofibrosis.^{27,28} It is unclear whether stiffness was caused by joint overconstraint and/or significant dissection resulting in scar tissue formation. As indications for LEAS continue to expand, we fear that history may be repeating itself.

If it is revealed that LEAS procedures significantly increase the risk for PTOA, it does not necessarily mean that these procedures should be abandoned. They certainly hold advantages in terms of reduced risk of graft rupture, and so refinement of the indications for LEAS and a discussion with each patient would be justified to explain the risks and benefits and come to a decision on an individual basis. The benefits of LEAS are clear, but we think it is necessary to learn more about the possible detriments of the procedure before LEAS can be adopted as standard practice in “at-risk” patients undergoing ACL reconstruction.

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