Arthroscopic ACL reconstruction

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Abstract

Anterior cruciate ligament (ACL) injury is one of the most frequent injuries in sportsmen with a reported prevalence of around 68.6/100,000 per year. ACL reconstruction (ACLR) is one of the most commonly performedorthopaedic procedures. An ACL-deficient knee shows an anterior laxity and a variable degree of associated rotational instability.

KeyWords:ACL injury, ACLR, Rotational instability.

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Introduction:

Anterior cruciate ligament (ACL) injury is one of the most frequent injuries in sportsmen with a reported prevalence of around 68.6/100,000 per year (1). ACL reconstruction (ACLR) is one of the most commonly performedorthopaedic procedures. An ACL-deficient knee shows an anterior laxity and a variable degree of associated rotational instability (2).

A variable injury to the lateral capsule-ligamentous structures has been hypothesized in the onset of rotational laxity. Historically, anterior laxity in ACL-deficient knees was surgically treated with isolated extra-articular tenodesis, as described by Lemaire or MacIntosh. This procedure was effective in reducing the rotation of the tibial plateau relative to the femur; however, isolated extra-articular reconstructions provided only moderate control of anterior laxity. In addition, the overall long-term results of these procedures were poor and only few patients reported good to excellent results. The main drawback of these techniques is that they are non-anatomic and do not restore the function of the ACL in preventing anterior tibial translation (3).

These procedures were largely abandoned when single-bundle intra-articular ACL reconstruction emerged as the gold standard surgical treatment of ACL tear. However, traditional trans-tibial ACLR had the disadvantage of inter-related tunnels preparation. This may lead to a vertical femoral tunnel, with insufficient pivoting control. In fact, the most common problem after ACLR is the residual rotational instability, which has been described in 11% to 30% (2,3,4).

More anatomic single bundle procedures (for example antero-medially performed femoral tunnel) have the advantage of more horizontal graft with better rotational stability. More recently double-bundle technique has been proposed to achieve the anatomic and biomechanics of the native knee (5,6,7).

Unfortunately, up to date there is no clear evidence of better control of rotational laxity (8,9,10). Rotational instability has been related to the injury and loss of function of the antero-lateral structures with the anterolateral ligament receiving increasing interest in recent years (11,12).

The antero-lateral capsular injury is frequently associated with ACL tears, the capsular avulsion is termed a Segond fracture when associated with bony avulsion of the lateral tibial plateau but does not always include an osseous fragment. Persistent anterolateral rotary instability of the knee as measured by pivot-shift testing is associated with worse functional outcomes in patients who have undergone ACL reconstruction surgery.

Persistent anterolateral rotary instability after ACL reconstruction can occur for a variety of reasons; Meniscal root tears and total/subtotal meniscectomies, sectioning of the ALL and distal Kaplan's fibres (anterolateral soft tissue structures), and injury to collateral ligaments or posterolateral or posteromedial corner structures have all been shown to increase rotational instability. Additionally, increased posterior slope >12_ has been associated with increased graft failure and can result in insufficiency of the ACL graft over time in cases where overt failure does not occur. In certain cases, these contributors to rotational instability can be addressed, but in other cases, either a discrete additional cause of instability may not be able to be identified or rotational instability may still be present despite treatment. In such cases, augmentation of an ACL reconstruction with a lateral extra articular tenodesis (LET) procedure can be a good option. This article details our technique for performing a modified Lemaire LET using iliotibial band (ITB) auto graft versus ALL reconstruction as an adjunct to ACL reconstruction (11,12).

This lesion has been shown to be present in the vast majority of acute ACL injuries and its presence is associated with significantly increased rotational knee laxity (13).

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