Surgical Management and Treatment of the Anterior Cruciate Ligament/Posterolateral Corner Injured Knee

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KEYWORDS

• Posterolateral corner (PLC) • Anterior cruciate ligament (ACL) • Multistaged • Single stage • Peroneal nerve

KEY POINTS

- Early and accurate diagnosis is of the upmost importance, and an established and verified method for coming to said diagnosis has been adequately described.
- Reconstruction of the posterolateral corner (PLC) is integral to overall function and stability of the tibiofemoral joint and is of particular importance in the native and reconstructed anterior cruciate ligament (ACL).
- Anatomic single-staged reconstruction aimed at most completely replicating the native location and function of the PLC through utilization of definable anatomic landmarks is crucial to postoperative stability.
- With proper surgical technique and appropriate postoperative care, patients with combined PLC/ACL injuries can achieve significantly improved subjective and objective assessment scores.

INTRODUCTION

Assessing overall stability of the anterior cruciate ligament (ACL) deficient knee can often be difficult because of overall instability and tenderness. However, as the understanding of the biomechanics and interdependence of individual stabilizers of the knee evolves, it has become apparent how integral this stability assessment is. Each year, the diagnosis of multiligamentous knee injuries increases because of increased awareness more so than because of increased prevalence. Of those multiligamentous injuries, most involve the ACL and posterolateral corner (PLC).[1]

Disclosure Statement: Dr R.F. LaPrade is a consultant for and receives royalties from Arthrex, Ossur, and Smith & Nephew.

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Clin Sports Med ■ (2016) ■–■
http://dx.doi.org/10.1016/j.csm.2016.08.011 sportsmed.theclinics.com

The PLC of the knee has gained more attention in recent years because of increased understanding regarding its anatomy and biomechanical function. The stability of the PLC is of particular importance in regards to ACL reconstruction because it has been shown to be a leading cause of ACL graft failure. LaPrade and colleagues[2] showed the difference in ACL graft forces between deficient and intact PLC structures and found PLC-deficient knees to confer significantly increased forces in comparison to the reconstructed ACL graft. With this in mind, it is important not only to be aware of possible combined ACL and PLC injuries but also to have a standardized approach to the diagnosis and surgical management of said injury.

Standardized Diagnostic Approach

A standardized diagnostic approach to ACL and PLC injured knees is essential. The physical examination is always important and should include the Lachman, pivot shift, dial test at 30° and 90°, posterolateral drawer test with knee at 90° of flexion and 15° of external rotation, and varus stress examination[3] at 0° and 30°. Two additional important examinations, especially in the setting of a multiligamentous knee injury, are the external recurvatum test[4] and the reverse pivot shift. Studies have shown that increased recurvatum in a PLC injured knee suggests a combined ACL injury. The reverse pivot shift is essentially opposite to the pivot shift test and is performed with knee flexed and the foot in external rotation. As the knee is extended, the iliotibial band will reduce the posteriorly subluxed tibia.[3]

However, as previously stated, inflammation, pain, and overall instability make a definitive diagnosis difficult to obtain from physical examination alone. MRI is also helpful and has been shown to be effective in the diagnosis of multiligament injuries.[3,5] However, the gold standard for PLC injuries remains varus stress radiographs. Varus stress radiographs have been validated as a reliable and repeatable objective examination for both isolated fibular collateral ligament (FCL) injuries and combined PLC injuries. LaPrade and colleagues[6] reported that isolated FCL injuries increased varus opening by approximately 2.7 mm; a complete PLC injury led to 4.0 mm of increased gapping, and a combined ACL injury resulted in 5.3 mm of gapping compared with the intact state (**Fig. 1**).

Indications and Contraindications

Once a definitive diagnosis has been made, focus can be turned to surgical reconstruction of the injured structures. Historically, controversy existed on whether to

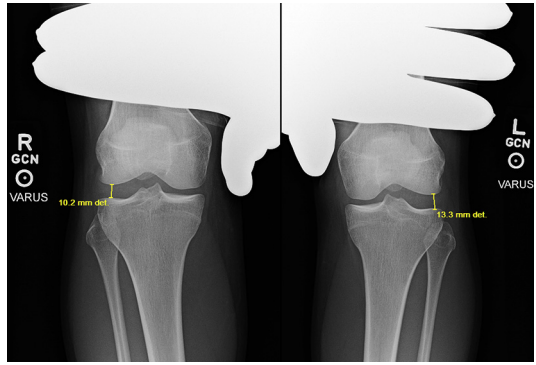

Fig. 1. Varus stress examinations are proven diagnostic techniques for providing quantitative data for PLC injuries.