Dynamic Chiropractic

Isolated Posterior Cruciate Injury

Given that the anterior cruciate ligament (ACL) is damaged far more often than the posterior cruciate ligament (PCL), it is easy to overlook the PCL when evaluating athletes with knee pain. Additionally, when the PCL is torn, often there is far less swelling and pain, and the mechanism and severity of injury may be less dramatic. The incidence of PCL injury is between 1-44% of acute knee injuries.[1] This large variation in reported incidence is due to the setting (e.g., motor vehicle versus sports or other injury). It is likely that PCL injury occurs more commonly in contact sports.

Isolated PCL injury usually is the result of hyperflexion. Direct blows to the tibia at 90 degrees flexion may also be a reported mechanism. This latter mechanism and hyperextension will usually result in multiple tissue damage that may include the posterolateral corner (popliteus complex) of the knee, meniscus or ACL. Isolated PCL tears will usually leave the posteromedial component of the ligament intact while tearing the larger anterolateral component. Because the anterolateral component plays a more significant stability role (two times the cross-sectional area of the posteromedial component), testing with the posterior drawer test may reveal significant laxity; however, it will usually be less than 3+(1 cm). The anterolateral component comes under more tension with flexion, while the posteromedial component comes under tension toward extension. The PCL is also supported by the popliteus tendon/muscle and attached ligaments. The meniscofemoral ligaments may also provide secondary support. The PCL is the primary restraint to posterior translation of the tibia and is a secondary restraint to external rotation.

Historical clues to isolated PCL injury are few. Often the athlete may not even remember the mechanism because at the time of the injury, there is often no initial awareness of anything being damaged. During the acute phase, the patient may report pain at the back of the knee or pain with kneeling. Two to three weeks later, the report may be of anterior knee pain, or pain felt with deceleration, or when approaching full stride while running.

A recent prospective study followed 133 patients from the time of injury to an average of 5.4 years followup.[2] The intention was to determine the natural history of acute isolated PCL tears over time. Sixty-eight patients returned for long-term followup. Evaluation included stability testing and several functional questionnaires, including the Noyes knee score, Lysholm score and Tegner activity score. Following is a summary of their findings:

• Patients with greater laxity did not have worse subjective scores.

• Half of all patients returned to the same sport at the same or higher level (regardless of the severity of laxity).

• One third returned to the same sport at a lower level.

• One sixth did not return to the same sport.

• There was no change in laxity from time of injury to followup.

• There was no relationship between the amount of pain and the degree of laxity.

• There was no indication radiographically of an increase in osteoarthritis.

• There were few associated meniscal tears with isolated PCL tears (probably due to the fact that the injury occurs on an unloaded knee).

• Although there were differences in the athlete's ability to perform tests of quad-riceps strength, it was not felt that there was an obvious deficiency in quadriceps strength in patients with PCL injury. Patients with low subjective scores on knee questionnaires may need more focus on quadriceps training.

My own personal experience with patients with PCL injury is that a remarkable number of them are able to participate in sports despite gross instability on examination. Many of them do not even use brace support.

It is important to remember that more significant injury of the PCL including other structures (in particular, the ACL) may indicate a dislocation that spontaneously relocated. In this event, there may have been vascular damage. In acute settings, always check distal pulses. When multiple tissue damage has occurred, or in patients with gross instability or pain with chronic PCL injury, surgery may be the only option.

References

1. Harner CD, Hoher J. Evaluation and treatment of posterior cruciate ligament injuries. *Am J Sports Med* 1998;26(3):471-482.

2. Shelbourne KD, Davis TJ, Patel DV. The natural history of acute, isolated, nonoperatively treated posterior cruciate ligament injuries: a prospective study. *Am J Sports Med* 1999;27(3):276-283.

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