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The cruciate ligaments of the knee joint form as derivatives of the articular interzone and come to lie outside the joint secondarily, possibly as a result of the invagination of the posterior margin of the joint capsule. The condensation that eventually gives rise to the PCL first appears in 28-mm human embryos, whereas the first sign of its anterior counterpart became visible at the start of the fetal period .

In O'Rahilly stage 21, the cruciate ligaments began to develop. The PCL was distinguishable before its anterior counterpart. This ligament continued dorsoventrally to the inner aspect of the medial condyle of the femur in O'Rahilly stage 21. At this stage, the ligament is immersed in loosely organized mesenchyme. It is clearly visible in the intercondylar notch, in O'Rahilly stage 23 where it is surrounded by loosely organized mesenchyme that contained many vascular elements, among which the branches of the medial genus artery were most prominent .

Development of the cruciate ligaments was well advanced at week 9. A tract of fibers extended from the posterior horn of the lateral meniscus to the external and anterior margin of the PCL, giving rise to Wrisberg's menisofemoral ligament at week 10.

The posterior cruciate ligament (PCL) , named for its insertion on the tibia, originates from the lateral surface of the medial femoral condyle and passes posteriorly and laterally behind the ACL to the depression behind the interarticular upper surface of the tibia and extends for 3mm on to the adjoining superior surface of the tibial. PCL is narrowest at midportion and fans out superiorly.

It is completely surrounded by a synovial sleeve reflected from the posterior capsule. It is therefore entirely extraarticular in an anatomic sensey And is situated near the longitudinal axis of rotation of the knee.

The average length of the PCL in 38 mm and the average width is 13mm compared to 11 mm for the ACL.

The major control on knee stability has been ascribed to the PCL, This strong ligament, which according to tensile testing is approximately two times stronger than any other ligament around the knee .The middle genicular artery, a branch of the popliteal artery, provides its major blood supply, and it is supplied by nerve fibers from the popliteal plexus which receives contributions from the posterior articular nerve "a prominent branch of the posterior tibial nerve" and from the terminal portions of the obturator nerve .

Several mechanisms have been implicated in PCL injury, including the following :

1-Posterior translation of the proximal tibia,

2- dashboard injuries in motor vehicle accident (most common mechanism),

3-falling on a flexed knee (most common injury in sports),

4-forced hyperflexion of the knee joint, and

5-a posterior force applied against a hyperextended knee with the foot fixed, and forced hyperextension of the knee.

PCL injuries may be ;

(1) Complete tears - Approximately 40%

(2) Partial tears - Approximately 55%

(3) Avulsion tears - 7%

PCL injuries are thought to account for 3% to 37% of all knee ligament injuries. Information from a patient's medical history can rule out episodes of functional instability. Diagnostic tools rely mainly on detecting an increase in posterior laxity using either qualitative or quantitative clinical measures, such as

the manual drawer examination, arthrometric evaluation, or stress radiography. Several tests aid in the diagnosis of PCL injuries. The most commonly performed tests include the posterior drawer, posterior sag, Lachman's, quadriceps active, and the reverse pivot shift. It is important to perform a complete knee examination, given the frequency of associated injuries.

MRI is the preferred examination for evaluating PCL injuries. MRI is the most sensitive and widely used modality for evaluating the PCL and the other cartilaginous and ligamentous structures of the knee.

It is superior to physical examination and has replaced CT and arthrography because it offers superior soft tissue resolution and is noninvasive. The sensitivity of MRI has obviated the use of arthroscopy as a diagnostic tool for evaluating PCL injuries in almost all patients. Routine radiographs can reveal avulsion of the PCL insertion from the tibia on the latera radiograph . Ultrasonography is recently reported to reveal acute and chronic PCL tears.

Treatment of a PCL injury is perhaps the most controversial current topic in knee surgery, most authors have recommended nonoperative treatment for isolated posterior cruciate ligament tears .

The commonly quoted criteria for nonoperative treatment include ;

(1) a posterior drawer of less than 10 mm (grade II) with the tibia in neutral rotation (posterior drawer excursion decreases with internal rotation of the tibia on the femur),

(2) less than 5 degrees of abnormal rotary laxity (specifically, abnormal external rotation of the tibia with the knee flexed 30 degrees, indicating posterolateral instability) and

(3) no significant valgus-varus abnormal laxity (no associated significant ligamentous injury) .

It is preferred to delay reconstruction 1 to 2 weeks after injury to allow painful intraarticular reaction to subside and to allow the patient to regain full motion and some strength.

Clinically isolated acute PCL disruptions are repaired if the ligament is avulsed with a fragment of bone .

Allografts, either bone-patellar tendon-bone or tendo calcaneus-bone,are popular graft sources for reconstruction of the posterior cruciate ligament because of their large size. In addition, the tendo calcaneus allograft has the advantages of extra length and only soft tissue at one end , which makes graft passage easier.

Inlay technique is also used as described by Burks and Schaffer for the posterior cruciate ligament.

The two-tunnel technique has been shown in clinical studies to have increased stability and physiometric placement of a posterior cruciate ligament graft.

The single-tunnel technique, used mostly for reconstruction of multiple knee ligaments in knee dislocations.

The most common problems associated with PCL reconstruction are;

(1) loss of motion
(2) Failure to obtain objective stability
(3) Failure of the reconstruction
(4) Neurological injuries
(5) Vascular complications include laceration, thrombosis, and intimal injury to the popliteal artery
(6) Osteonecrosis of the medial femoral condyle has been reported.