Posterior Cruciate & Posterolateral Corner Instability

1) Epidemiology
   a) Mechanisms
      i) High energy injuries from tackling, skiing, motor vehicle injuries (pedestrian strike)
      ii) Rotational plant and pivot injuries
      iii) Varus blow to the knee
   b) Common with knee dislocations
   c) These play critical roles in knee rotational and coronal stability.

2) Imaging
   a) Varus Radiographs
      i) FCL 2.7 mm difference
      ii) PLC 4.0 mm difference
   b) Posterior Radiographs
      i) Kneeling Lateral Radiograph - 10 mm difference
   c) MRI is sensitive in acute injuries, less sensitive in chronic.

3) Anatomy
   a) FCL
      i) Femoral FCL is a small depression adjacent to the epicondyle 1.4 mm proximal and 3.1 mm posterior
      ii) Fibular FCL is 2.8 mm distal to the fibular styloid anterolateral deep to the biceps tendon and bursa
   b) Popliteus inserts 18.5 mm Anterior and distal in the anterior 20% of the popliteal sulcus of the femur
   c) PCL
      i) Trochlear Point
      ii) Medial Arch Point
      iii) Champagne Glass Dropoff

4) Treatment Options:
   a) PLC Repair has high failure rate (40% versus 6% for reconstruction)
   b) Non-anatomic Reconstruction
      i) Can correct coronal stability
      ii) Does poorly with rotation stability

5) Anatomic Posterolateral Reconstruction
   a) Reconstruct FCL, Popliteus Tendon, Popliteofibular ligament
   b) Anatomic basis and restores Varus and axial rotational stability at all flexion angles.

6) Technique
   a) Lateral incision based of the upper third or IT band
   b) Identify biceps tendon and subsequent peroneal nerve
i) Perform a complete peroneal nerve release from biceps to dividing the peroneus longus fascia.

c) Divide the biceps bursa and identify the FCL remnant.

d) From the remnant identify the anatomic point on the femur and divide the IT band. Find the anatomic footprint just posterior and proximal to the lateral epicondyle.

e) Make a small arthrotomy and identify the popliteal tendon 18.5 mm from the FCL. Place another socket here.

f) Using blunt dissection identify the interval anterior to the lateral head of the gastrocnemius, proximal to the biceps tendon and posterior to the lateral joint capsule. Elevate any soleus attachment using a Cobb and palpate the PFL origin on the back of the tibia approximately 1 cm distal to the joint line and 15 mm medial from the fibula.

g) Elevate the inferior half of the biceps off the fibula and identify the FCL insertion. Using a guide ensure that this tunnel is >25mm to avoid breakout. This should be medial and proximally oriented.

h) Drill a full 9mm tibial tunnel over a guide pin starting at the flat spot between Gerdy’s tubercle and the tibial tuberosity, and ending at the origin of the PFL posteriorly.

i) Using a LONG (>22cm) Achilles graft with bone block, make 2, 9mm grafts and whipstitch the ends with pulling sutures in the bone block.

j) Secure the bone blocks in the femoral tunnel.

   i) Pass the FCL graft deep to the IT band and anterior to posterior in the fibular head.

       1) Secure the graft at 30 degrees of flexion at neutral rotation and valgus.

       ii) Pass the popliteus tendon posteriorly out the posterolateral capsule and retrieve it.

       iii) Pass the Popliteus tendon and the remnant FCL (now the PFL) from posterior to anterior and secure with the knee at 70 degrees of flexion and neutral rotation.

7) PCL Reconstruction:

   a) Double Bundle PCL reconstruction

      i) Achilles 10mm bone block - ALB

      ii) Semi-tendinosis 7mm – PMB

      iii) Fixed at 90 degrees for the ALB, 0 degrees for the PMB.

8) Rehabilitation:

   a) NWB for 6 weeks

   b) ROM 0-90 for 2 weeks then increase as tolerated.

9) Outcomes

   a) Full Range of motion, stable knee (normal stress radiographs)

   b) Full return to sport.

10) Complications:

    a) Continued instability

    b) Neurovascular injury

    c) Fibula fracture

    d) Peroneal neuropathy (From injury or failure to release)

11) Bibliography


