Key Anatomy and Diagnosis of Collateral Injuries

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Anatomy is the key to treatment
- Correlate physical exam to injured structures
- Anatomic restoration key to early ROM
- Comprehensive knowledge of the anatomy key to being good and fast

Lateral Sided Injuries

I. Lateral Side Bony Anatomy
   a. Convex lateral femoral condyle articulates with convex lateral tibial plateau
      i. inherently unstable
      ii. Leads to poor healing of PLC injuries

II. Anatomy – Main Static Stabilizers of Posterolateral Corner (LaPrade 2003)
   a. Fibular collateral ligament (FCL) – 18.5mm proximal and posterior to popliteus
   b. Popliteus tendon
   c. Popliteofibular ligament (PFL)

III. Posterolateral Corner Knee Injuries
   a. Majority are combined ligament injuries
      i. 72% (LaPrade 1997; Geeslin and LaPrade AJSM 2010)
   b. Assess every ACL/PCL for concurrent PLC
   c. Use stress x-rays/MRI (stress x-rays = more objective)
   d. Remember to test for peroneal nerve function
e. Physical Examination
   i. External rotation recurvatum
   ii. Varus stress test at 30° flexion
   iii. Posterolateral drawer test
   iv. Vraust thrust gait

IV. Radiographic workup
   a. A. MRI Scans
      i. Assess injury patterns and graft needs
      ii. Determine if biceps femoris avulsed (affects surgical approach)
   b. Varus Stress X-rays in all Cases (objective assessment) (LaPrade, JBJS, 2008)
   c. Side – to – side difference
      i. > 2.7 mm – FCL tear
      ii. > 4 mm – complete posterolateral tear
   d. Kneeling PCL Stress X-rays (Jackman and LaPrade, AJSM 2008)
      i. 0-7 mm partial PCL tear
      ii. 8-11 mm isolated PCL tear
      iii. ≥ 12 mm combined PCL and PLC tear

V. Chronic Grade III PLC Injuries
   a. Assess varus alignment first
   b. Correct varus alignment before second stage soft tissue reconstructions
   c. Posterior tilt in PCLD knee
   d. Anterior tilt in ACLD knee

Medial Sided Injuries

VI. Anatomy – Medial Collateral Ligament (LaPrade 2007)
   a. 3 bony attachment sites (2 tibial, 1 femoral)
   b. Distal tibial sMCL attachment approximately 6 cm distal to joint line
   c. Femoral attachment 3.2 mm proximal, 4.8 mm distal to medial epicondyle
   d. Deep MCL- meniscofemoral and meniscotibial divisions
   e. POL- thickening of posteromedial capsule, central arm = main component

VII. Medial Collateral Ligament Knee Injuries
   a. Most common of all knee injuries
   b. Most combined ACL + MCL injuries occur in grade III MCL injuries
   c. Isolated MCL tears tend to heal non-operatively
   d. Valgus stress test, anteromedial drawer test, and dial test on physical exam
e. Use valgus stress x-rays/MRI for objective diagnosis (stress x-rays = more objective) (LaPrade 2010)
   i. Complete sMCL tear- 3.2 mm side-to-side difference
   ii. Complete medial knee injury (MCL +POL) – 9.8 mm side-to-side difference

VIII. Summary
   a. Lateral sided Injuries
      i. FCL, PLT, & PFL main static stabilizers
      ii. Often associated with ACL/PCL tears; confirm Dx with stress x-rays
      iii. Reconstruct main static stabilizers (PLT, FCL, PFL)
      iv. Repair biceps, lateral capsule, ITB
      v. Initiate early passive ROM 0-90º: validated that do not stretch out and low risk of arthrofibrosis (Geeslin JBJS 2011)

   b. Medial sided Injuries
      i. sMCL, dMCL, & POL main static stabilizers
      ii. Grade III MCL tears often associated with ACL tears
      iii. Repair or reconstruct sMCL, dMCL, POL depending on tissue quality

References


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