The Patellofemoral Joint

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Patellar Tracking Controlled by the Quadriceps
- Quadriceps inhibition
- Pain
- Inflammation
- Joint effusion

Quadriceps Balance Lateral Patella Force
- Dynamic Q-angle
- Proximal
  - Femoral adduction
  - Hip internal rotation
- Distal
  - Pronation
  - Tibial internal rotation

Merchant Classification

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**Initial Treatment:**

Anatomic Disruption Precluding Quadriceps Balance?

- Yes = Surgery
  - Fracture
  - Quadriceps rupture
  - Patellar tendon rupture
  - Patella dislocation*
  - Loose body
- No = Rehabilitation
  - Everything else

**Patella Stabilization**

- From Above
  - Hip
    - Abduction, extension, and external rotation
  - Core
  - Quadriceps
  - VMO
- From below
  - Foot and ankle control
  - Over the counter orthotic for pes planus

**Eliminate Quadriceps Inhibition**

- Ice
- NSAIDs
- Taping
- Bracing
- Aspirate/inject effusion

**Rehabilitation Goals**

- Reduce inflammation
- Restore motion
- Regain strength
- Recover proprioception
- Resume functional activities
- Return to sports

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Rehabilitation Goals

**Acute Phase**
- Reduce inflammation
- Rest
- Ice
- Compression
- Elevation
- Re-establish quadriceps control

**Early**
- Continue reduction of pain and swelling
- Restore motion
- Resume normal gait

**Intermediate**
- Regain strength
- Recover proprioception

**Advanced**
- Resume functional activities
- Return to sports

Images courtesy of Dr. Green's personal files
First Time Traumatic Patellar Dislocation

- What's the pathology?
- Associated problems
- Early surgery
- Non-operative management
- Technical pearls

Patella Dislocation

- Valgus rotation mechanism
  - MPFL
  - Patella, mid-substance, femoral
  - Medial patella
  - Contusion, chondral, osteochondral
  - Lateral trochlea
  - Contusion, chondral, osteochondral

Decision Making

- History
  - Previous subluxation
- Physical exam
  - MCL, ACL
  - Alignment, Q-angle
  - Straight leg raise
- X-rays
  - Osteochondral fracture*
  - Alpha, tilt, subluxation, trochlea hypoplasia
- MRI
  - Loose body*, MPFL@patella*, VMO tear*

Non-operative Management

- RICE
- Brace in extension
  - Quadriceps control
- NSAIDs
- Straight leg raises (VMO)

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Rehabilitation

- Brace
- Physical therapy (2/3 success)
  - VMO
  - Taping, eddm, biofeedback
  - Hip abductor and core
  - Foot

Early Surgery

- Osteochondral fractures
- Loose bodies
- MPFL @ patella
  - VMO attachment

Lateral Release

- The only operation that the literature does not support for patella instability

Recurrence Instability

- MPFL reconstruction
- Tibial tubercle transfer
MPFL Reconstruction Keys

- Schottle’s point
- Repair tension
- Avoid large patella tunnels
- Early ROM


Tibial Tubercle Transfer Tips

- Horizontal or anterior
- Enkel - Trillat vs Fulkerson (can unload distal lateral patellar cartilage)

Tibial Tubercle Transfer Tips

- Size matters
- Keep medial soft tissue intact
- Osteotome
- Fixation

Chronic Tendinopathy

- Jumper's Knee
- Exercise program (stretch/strengthen)
- Transverse friction massage
- Augmented soft tissue mobilization (ASIM)
- Iontophoresis
- Extracorporeal shock wave
- PRP
- Percutaneous ultrasound tenotomy (Tenex)
- Surgical debridement

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What's New?

- The infrapatellar plica: A major cause of chronic adolescent anterior knee pain, relieved by arthroscopic resection. Tom Smallman accepted by Arthroscopy.

Infrapatellar Plica (IPP)

- Infrapatellar plica tethers fat pad tight in full extension and full flexion.
- Arthroscopic view: Longitudinal fissure in distal trochlea.
Results

- 49 knees
- 64 month follow-up
- Lysholm Score improved 39 to 83
  - 41/49 Good/excellent
  - 3/49 Fair
  - 5/49 Poor
  - No one got worse with the surgery

Summary

- VMO balances lateral patella force
- Surgery for anatomic disruptions precluding balance
- Rehabilitation for all the rest
  - VMO, hip, core, foot stabilization
- First time patella dislocation
- Rehabilitation
  - Early surgery for fractures, loose bodies, MPFL off patella (VMO)
- Infrapatellar plica maybe cause of adolescent anterior knee pain that does not get better with rehabilitation

Thank You
Lateral Patellofemoral Angle

- Normally opens laterally
- Measure of tilt

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Congruence Angle D
Sulcus Angle C-A-B

- Congruence angle (subluxation)
- Sulcus angle (trochlea hypoplasia)

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Patella Alta Measurements

Trochlea hypoplasia clues on lateral x-ray

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CT overlay of tibial tubercle and trochlea