My Kneecap Popped Out!
Patella Instability

Jason L. Koh, M.D.

Board of Directors Endowed Chairman
North Shore University Health System
Clinical Professor
University of Chicago
Disclosures

• Consultant for Arthrex, Aesculap, Aperion
• Research funding from Arthrex, Aesculap, NIH
• Secretary and Board member, Patellofemoral Foundation
• Treasurer, International Patellofemoral Study Group
Goals of this talk

- Key elements of anatomy and physiology
- Natural history
- Non-operative Treatment
- Surgical management
Patella motion

- Trochlea “captures” patella by $\sim 20^\circ$ - $30^\circ$
- Instability usually occurs before capture
Knee Stability

- **Bony anatomy**
  - Trochlea groove
  - Alignment (trochlea-tubercle, valgus)

- **Soft tissues**
  - MPFL (50-60%)
  - Lateral retinaculum (22%)

- **Dynamic stability**
  - Quad strength
  - Alignment - dynamic
Classification

- **Acute traumatic**
  - occurs equally by gender
  - may occur from a direct blow
- **Chronic patholaxity**
  - recurrent subluxation episodes
  - occurs more in women
  - associated with malalignment
- **habitual**
  - usually painless
  - occurs during each flexion movement
  - pathology is usually proximal
Epidemiology

- Anatomic Factors
- General Factors
D.H.

- 13 yr boy, soccer
- Plant to change directions, felt a pop
- Swelling and pain to medial knee
- In ED:
  - “mild effusion, tenderness over the medial joint line, positive anterior drawer, no varus virus (!) instability”
  - “likely a complete ACL tear”
Initial eval (primary care sports)

- Recalls kneecap “maybe a little bit to the side”
- Unable to bear weight
- Large effusion
- 0-100° ROM
- Medial tenderness,
- + apprehension,
- MRI ordered
Torn Medial patellofemoral ligament
Natural history

• High rate of recurrence (23-50+%)
• Risk factors
• Youth (skeletally immature)
• Patella alta (high patella = longer to get in groove)
• Trochlear dysplasia (shallow or no groove)
• Other knee
• 4 factors – 88%; 3 – 75%; 2 -55% (Parikh 2015)
Focused history and examination

- Patient age / gender / approx. skeletal maturity
- # of dislocation/subluxation events
- Circumstances of events (traumatic/energy/activity)
- Known ligamentous laxity/dislocation
- Family history
- Functional activity – types of activity, esp cutting and pivoting
Physical examination

- Lateral patella apprehension
- J sign
- Generalized laxity
- Quad atrophy
- Patella mobility
Who DOESN’T need surgery?

- Most first time dislocators
- Patients without apprehension, pain, or limitations of activity
Nonoperative management

- Physical therapy
- Strengthen quads
- Dynamic movement (avoid functional valgus)
- So...strengthen glutes, watch knee motion
- Lateral buttress bracing (but can’t really hold)
Which ones need surgery???

- Patients with a loose body
- Patients with pain and disability
- Patients with a high risk of recurrence?
What surgery?

- Fix what’s wrong: mostly address medial patellofemoral ligament
Tubercle realignment: TTTG >20 mm or patella alta ratio >1.4

- Avoid over medialization
- Goal distalize 1.2; medialize to TTTG 10-15 mm

DON’T TRY THIS IN KIDS!
Rarely, reshape trochlea so there is a groove
3D print Trochlear dysplasia
Trochlea exposure and osteotomy
Postop Xray
My algorithm

- Non operative for most 1st time dislocators
- Physical therapy, bracing
  - Loose body = possible reconstruction
- repeat dislocator + normal bony alignment = MPFL reconstruction

- If TT-TG elevated/significant alta = tubercle osteotomy+MPFL plication

- Consider trochleoplasty for salvage cases with severe dysplasia
JUPITER

- Justifying Patellar Instability Treatment by Early Results
- Prospective Cohort Study
- Multicenter study with 12 center
- (HSS, CCHMC, NorthShore, Boston Children’s)
- Compares non-op treatment, isolated MPFL reconstruction, a la carte approach
Thank you!