Patella Dislocation and Osgood-Schlatter

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CHOA Sports Medicine Seminar
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Disclosures

• none

Etiology

– Genu valgum
– Femoral anteversion
– Tibial torsion
– Miserable malalignment
– Patella alta
– Trochlear dysplasia
– Ligamentous laxity
– Congenital anomalies
  • Ehlers-Danlos
  • Downs syndrome
– Trauma
Demographics

- Peak age 10-19
- Girls more common than boys
- 11/100,000 in age group 15-19
- Large range of recurrent patella dislocation 17-71%
- Recurrence rate depends on risk factors for dislocation
- 25% with a family history

Waterman et al. J Knee surg 2012, Filhian et al. AJSM 2004

History

- Mechanism of Injury: sports participation/trauma or just minimal activities
- Family history: patella dislocation, ligamentous laxity
- Rapid large tense effusion or no effusion at all
- Often patients know their knee cap dislocated, though sometime unsure
- Often reduces on its own, though sometimes requires reduction by HCP or in the ER
- May have prodromal subluxation events

Exam

- Effusion: Variable effusion size (depending on trauma incurred on the knee)
  - Large and tense if osteochondral fracture
  - No effusion if pops out easily and ligamentously lax
- Apprehension on lateral translation of the patella
- Prone rotational profile (femoral anteversion, external tibial torsion)
- Gait Examination (if possible)
- Standing alignment (genu valgum)
- Ligamentous laxity (Beighton Score)
- Scars from previous surgery
### Exam

- Moving patella apprehension test
  1. take knee from full extension to full flexion with lateral force on patella
  2. Flex knee to 90 and bring the knee into extension while applying a medial force.
- Positive Test: apprehension or quad activation during the first part and absence of symptoms during the second

### Imaging

- X-rays: AP, lateral, tunnel, sunrise
  - Look for avulsion off medial side of the patella
  - Large loose piece in anterior aspect of knee
- MRI Indications:
  - large effusion
  - contemplating surgical management
  - Suspect loose body

### MRI Findings

- Bone bruise of far lateral femoral condyle
- Bone bruise medial patella facet
- Osteochondral loose body (patella > femur)
- Donor site
- Increased TT-TG
- MCL injury
- Patella alta
**Natural History**

- Natural History
  - 1 of 6 will recur
  - 2 of 6 will have minor symptoms
  - 3 of 6 will remain asymptomatic
- Redislocation
  - Age 11-14 – 60%
  - Age 19-28 – 30%
  - Age 28+ – 10%
  - 1st time dislocator – 17%
  - Recurrent – 50%

**Decision making**

- Risk Factor Assessment
- Number of dislocations
- Mechanism of injury causing dislocation
- Age
- Chondral injury at the time of dislocation
- Patient/Family expectations

**Patella dislocation 1st time**

- Large Effusion
  - MRI
  - Further risk assessment
  - Counseling regarding risk of recurrent dislocation
  - Consider fixation if large bony fragment or removal if small/fragmented
  - Concomitant Patella stabilization if >2 risk factors
Children's Healthcare of Atlanta

Patella Dislocation: Recurrent

- Large Effusion
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**Treatment: Operative**

- Skeletally Immature with Genu Valgum:
  - Distal medial femoral hemi-epiphysiodesis
  - Some doing DMF-HE along with MPFL

- Skeletally Immature without Genu Valgum, TT-TG<20:
  - Physeal sparing MPFL reconstruction
  - May use autograft or allograft gracilis
  - My preference is anchors in patella and femur and also reconstruct MQTFL (1 limb in femur, 2 limbs patella.)
  - Many techniques
  - Femoral attachment distal to physis

- Skeletally Immature no Genu valgum and increased TT-TG
  - Patellar tendon medialization with MPFL reconstruction
  - Lateral release/lengthening dependent on arthroscopic exam
Treatment: Operative

- Skeletally mature, TT-TG <20: Standard MPFL reconstruction
- Gracilis allograft or autograft
- Careful of large graft if drilling into patella
- 2 limb reconstruction
- Do not over-tighten!

Treatment: Operative

- Skeletally mature recurrent patella dislocation with TT-TG > 20.
- Tibial tubercle osteotomy
- Elevate and 15 degrees with patella pointed forward.
- 1.5 cm fragment
- Usually translate 1cm
Treatment: Operative

- Miserable malalignment


Osgood-Schlatter
**Etiology**

- Traction apophysitis of the tibial tubercle
- Repetitive micro-trauma to the apophysis from repeated contraction of the quadriceps complex
- Rapid growth on the distal femur and proximal tibia places quadriceps complex on stretch

**History**

- Adolescents age 12-14
- Boys more common than girls
- Participation in sports requiring repetitive quad contraction
- Pain over the tibial tubercle
- Recent increase in sports participation (hrs/wk)

**Physical Exam**

- Point tenderness and swelling over the tibial tubercle
- Pain at the tibial tubercle on short arc extension
- Pain with Ely testing (bring foot to buttock while prone)
- Often bilateral
- Prominence of tubercle
Radiographs

- AP/Lat knee: 15 degree internal rotation view will get the tubercle in an unobstructed view
- Often normal
- May show physeal elevation, fragmentation or ossicle formation

Treatment

- Rest
- Activity Modification
- Cryotherapy
- Stretching of the quadriceps mechanism (must include hip extension as well, rectus)
- Hamstrings stretching

Treatment

- Cho-pat brace (not my preference)
- Surgical ossicle excision is option if painful after the apophysis closes (approx age 15), though not in my treatment algorithm
Comment

- There is a continuum between OS and non-displaced fractures, fractures with slight elevation of the apophysis and displaced tibial tubercle fractures.

Question

- Factors that increase the risk of patellofemoral instability include all of the below except:
  - 1) Femoral Anteversion
  - 2) Genu Varum
  - 3) Increased trochlear groove to tibial tubercle distance
  - 4) External tibial Torsion
  - 5) Increased ligamentous laxity