Management of First-Time Patellar Dislocation

Donald C. Fithian, M.D.*
San Diego, California

*I have no financial relationship with any commercial entity related to this lecture
Objectives of Lecture:
At the conclusion of this lecture you should be able to...

1. Describe the patient at risk and natural history of PPD
2. Describe evaluation and what to look for
3. Discuss key controversies in treatment
4. Use an algorithm for patient management
Epidemiology and Natural History

- Annual incidence of PPD 5.8 per 100K among general population in US
- 29 per 100,000 among 10-17 yr-olds
- 17% rate of recurrent dislocation among 126 first-time dislocators at 2-6 years follow up
- Reported recurrence rates range from 15% to 80% in literature

Many patients continue to be symptomatic 6 months after PPD

• 58% of patients reported limitations with strenuous activity
• 55% had not returned to sports

Initial Evaluation

• Young, athletic patient
  – Sports (61%)
  – Dance (9%)

• **N.B.** Injury mechanism is often similar to that of other ligamentous injuries in the knee

• History of problems in either knee raise risk of recurrence 3- to 6-fold
Findings on Examination

- Large effusion
- Tenderness in the medial retinaculum
- Test ACL, PCL and collaterals
- Gentle exam for endpoints should be effective
Tense Effusion ⇒ Hemarthrosis

- Aspirate to relieve pain and guarding (to facilitate exam)
- Look for fracture (MR superior to xray)
Endpoint, or checkrein sign depends on knee flexion angle...
... And so does displacement

<table>
<thead>
<tr>
<th>Test</th>
<th>Normal Subjects† N=94</th>
<th>Cadavers ‡ N=17</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 lb Medial</td>
<td>9 ± 3</td>
<td>10.7 ± 3</td>
</tr>
<tr>
<td>5 lb Lateral</td>
<td>7.5 ± 3</td>
<td>8.9 ± 2.5</td>
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†Fithian et al, 1995 ‡Hautamaa et al, 1998
Identifying Trochlear Dysplasia
Evaluation of Patellar Height (Alta)

Caton & Deschamps Index
Critical Questions in Acute Primary Patellar Dislocation

- Joint surface injury
- Retinacular (ligamentous) injury
- Risk of recurrence
- Long term impairment of knee function
Retinacular Injury in Acute Dislocation

Elias, et al. 2002
MPFL Tear

Adductor Tubercle

MPFL

Hemorrhage

Avulsion

Avulsed site

* Courtesy: E. Nomura, M.D.
Avulsion Fragment
San Diego KP Experience

- Prospective cohort of 189 patients (125 first-time, 64 with prior history of patellar instability)
- 2 to 5 year FU
- 17% instability after first-time dislocation
- 49% instability in patients with prior history
- Among first-time dislocators:
  - Recurrence rates not related to measured laxity or MRI finding of MPFL injury
Level 1 and 2 Studies Show Questionable Benefit of Early Operation

  - Retrospective case control, 120 patients, 8.1 year FU
  - 37 reconstructed acutely, 83 treated non-operatively
  - No differences in recurrence, activity, function or subjective outcomes

  - Cohort study, 61 Finnish military recruits, 7 year median FU
  - 23% redislocations after nonop, 19% after repair
  - 23% subluxation after nonop, 12% after repair
  - 56% of patients regained preinjury activity level after nonop, 81% after repair
  - Kujala scores 90 after nonop and 87 after repair

  - RCT 33 pts (16 Group C, 17 Group R), 2 year FU
  - 50% redislocation after nonop, 0% after repair (12% at later follow up)
  - Kujala score 69 after nonop, 92 after repair
Palmu, et al JBJS 2008
RCTs on Value of Early Operation

  - RCT with 2 and 7 year FU
  - No differences in instability or subjective outcomes at either time point
  - RCT 80 patients, 2 year FU
  - 20% redislocation rate after nonop, 17% after repair
  - Kujala score 78 after nonop, 85 after repair
- Bitar, Camanho et al (Arthroscopy 2012)
  - RCT with 39 patients (41 knees), min 2 year FU
  - 35% instability after nonop (immob and PT), 0% after MPFL reconstruction
  - Kujala score 71 after nonop, 89 after reconstruction
Non-Operative Management

• Maenpaa and Lehto, Am J Sp Med 97
  – 3 groups: bandage/brace, splint, cast 6 weeks
  – 3-fold higher recurrence rates in patients who were not immobilized
  – More motion loss in the casted group

• No studies on effect of rehab in reducing recurrence rates (!)
Osteochondral Injury

  - Prospective study of 126 first-time dislocators
  - 2-6 year F/U
  - Only 4% of first-time dislocators had loose OC fragment that needed repair

- Nomura et al *JARS* 2003
  - 37/39 (95%) articular injury, but few fixable fragments

- Stefancin and Parker *CORR* 2007
  - Systematic review
  - 1765 first-time traumatic dislocations
  - 24.3% risk of osteochondral fracture
An Algorithm for Acute Primary Dislocation

Initial Patellar Dislocation

AP, axial 30°, strict lat x-ray

X-rays (-) for OC Fx

Tense knee effusion or gross hemarthrosis

MR Imaging for OC Fx, MPFL

No loose body, or isolated cartilage injury

Consider conservative treatment

X-rays (+) for OC Fx

OC Fx with loose body

Exploration, ORIF, MPFL repair vs. recon
Summary

- In acute primary patellar dislocation, look for hemarthrosis
  - Aspiration (+) ⇒ MRI
  - Fixable fragments are rare (4%)
- Reduce and fix osteochondral fractures if possible (bony fragment ≥1cm diameter)
- Explore MPFL, repair or reconstruct as needed
- In the absence of a fixable fragment, early operative intervention remains controversial
- Studies are needed on non-operative treatment
Thank You!