Arthroscopic Patella Realignment: Indications & Technique

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Patella Instability:

- Proximal?
- Distal?
- Open?
- Arthroscopic?
- Reconstruction w graft?
How to Decide?

- **Simple instability**: Vast majority of cases
  - (no arthrosis, TT-TG < 20mm, and preserved native tissue)
  - Recommend soft tissue realignment – ANATOMIC REPAIR
    - arthroscopic (or open)

- **Poor native tissue or failed reefing**
  - Consider MPFL rec

- **High TT-TG distance, arthrosis**: 
  - Osteotomy (+/- reefing)
Why Anatomic Repair?
The Medial Patellofemoral Ligament (MPFL) is the Primary Stabilizer

**Laboratory Studies**

- Hautamaa/Fithian: 
  - cadaver serial sectioning
  - MPFL 50%  
  
  Orthop 1998

- Desio:
  - MPFL 60%, MPML 13%
(MPFL) is the Primary Stabilizer
Clinical Studies

Patella Dislocation and MPFL Tear

- **Nomura:** 27 pts
  - Knee. 2002 May;9(2):139-43
  - Surgery: 96%
  - MRI: 81%

- **Sanders:** 14 pts
  - J Comput Assist Tomogr 2001
  - Surgery: 100% (7 ptls)
  - MRI: 85%

- **Sallay:** 23 pts
  - Surgery: 94%
  - MRI: 87%
How Does Arthroscopic Patella Realignment Work?

- Arthroscopic plication of redundant tissue..... (similar to capsulloraphy of shoulder)
  - Regardless of where it appears torn on the MRI !!!

- MPFL heals, but elongated (similar to MCL, MGHL)

- Tightening of MPFL
MPFL Heals .. But Elongated

- Medial Repair or Reefing Works because MPFL Heals
  - Even w “avulsion” on MRI


- 13 consecutive cases – open exploration of MPFL….all healed !!
Results of Open Realignment

- Harilainen: 56 pts - AJKS 1988
  - Exc” results/ Lysolhm 92/ 1 redisl

- Vainionpaa: 55 pts JBJS 1990
  - 80% G/E

- Sallay/Speer: 23 pts/repair MPFL AJSM 1996
  - no recur

- Ahmad: 8 pts/acute repair AJSM 2000
  - 96% satisf

- Nam: 23 pts mini reefing AJSM 2005
  - 8% recur
  - (13% MUA)

But: potential for LOM, scar tissue, prolonged rehab and overcorrection….
Arthroscopically Assisted Realignment ("mini open")

- **Yammamoto**: (Arthroscopy 1986)
  - 29/30 Exc. 1/30 redislocated.

- **Small**: (Arthroscopy 1993)
  - 92.5% G/E

- **Henry**: (Arthroscopy 1995)
  - technique only

Minimal complications..!
The Next Logical Step: “All” Arthroscopic Realignment

Advantages
- Avoid incision
- Protect VMO
- Less post op pain
- Visualize realignment (fine tune)
- Avoid over-tightening
- Lower risk of complications
- Lower risk of p-op stiffness, scar tissue
- Easier rehabilitation
- More cosmetic
“ALL” Arthroscopic Patella Realignment:

- Ahmad CS, Lee FY: technique only
  Arthroscopy. 2001 May;17(5)

- Halbrecht: 29 pts- no recurrences
  2001 Nov-Dec;17(9)

- Haspl: 17 pts. no recurrences
  2002 Jan;18(1) E2

- Fukushima: technique (suture anchors)
  Arthroscopy. 2004 Sept;20(7)

- Schottle: 26 pts – no recur in pts w/o troch dysplasia
  Arthroscopy: 2006 Nov 22(11)

NO RECURRENCES- NO COMPLICATIONS !!!
INDICATIONS:

Patella Instability where a soft tissue realignment is indicated

- Dislocation
  - recurrent
  - primary (with residual radiographic subluxation)

- Subluxation
  - with failure of conservative treatment
Arthroscopic Realignment: Options

- **Suture hooks** (Ahmad)
  - difficult angle
  - Limited amount of tissue

- **Suture anchors into patella** (Fukushima)
  - Unnecessary (hardware)

- **Thermal shrinkage** (Coons, Barber)
  - Stretch out?
  - Amount of correction?

- **Arthroscopically assisted** (Small, Glogeau)
  - Still requires medial incision

- **Touhey needle technique** (Halbrecht)
Identifying the Appropriate Candidate:

Patient Evaluation

- **History**
  - Documented lateral dislocation
  - Recurring subluxation
  - Failed conservative Rx
Patient Evaluation

- **Physical Examination**
  - Q angle < 17
  - Lateral translation > 50%
  - Patella tilt +
  - J sign +/-

*Thanks to Tony Schepsis for the videos!
Patient Evaluation

- **Diagnostic Imaging**
  - **X-ray**
    - Merchant view
      - (congruence angle, translation, tilt)
    - Lateral
      - no (or slight) patella alta,
      - trochlea depth normal or shallow
  - **MRI**
    - MPFL injury
    - No deg OA
  - **CT**
    - ATT-TG distance < 20mm
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Halbrecht: Arthroscopic All Inside Technique

Percutaneous insertion using Touhy needle

Partial Withdrawal and reinsertion of Touhy needle

Arthroscopic knot tying for All Inside Technique
Example: Arthroscopic Proximal Realignment

Pre-op

Post-op
Arthroscopic Patella Realignment: Technique
Technical Pearls:

- Tuohy needle (Rusch, Duluth, GA)
  *ruschinc.com*
- Take big bites!
- Average # sutures: 4 (3-6)
- Practice arthroscopic knot tying
- Stimulate healing response along retinaculum
- Insert sutures prior to lateral release
- Lateral release prior to tying knots
- Tie from superolateral portal
- Avoid extravasation (speed!)
- Puckering (PDS, Med portal release)
- Careful post operative rehab
Post Op Rehab:

- **Immediate:**
  - WBAT with brace locked 0 degrees
  - Quad sets, SLR
- **Week 1**
  - ROM 0-30 degrees
  - Begin PT, e-stim, patella mob’s to prevent scarring lat ret.
- **Week 3**
  - increase ROM to 90
  - D/C brace
- **Week 6**
  - increase ROM to full
  - progress strengthening
Arthroscopic Patella Realignment

Clinical Results
Define Study

- 45 knees (41 patients)
- 29 available for study
- 23 dislocators/6 subluxators
- Avg. f/u: 20 months
- Avg. age: 30

Halbrecht J: Arthroscopy 2001
Subjective Rating: Overall

- significantly improved  27  (93%)*
- unchanged           1   (3%)
- worse               1   (3%)

* (p < 0.05)
Lysholm Score:

- Pre-op 49.5
- Post op 71.3* (p < 0.05)
Subjective Rating:

10 (severe symptoms) - 0 (no symptoms)

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<tr>
<th></th>
<th>Pre op</th>
<th>Post op</th>
<th>p value</th>
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<tbody>
<tr>
<td>Pain</td>
<td>7.1</td>
<td>2.4*</td>
<td>(p &lt; 0.05)</td>
</tr>
<tr>
<td>Swelling</td>
<td>6.0</td>
<td>0.8*</td>
<td>(p &lt; 0.05)</td>
</tr>
<tr>
<td>Instability</td>
<td>8.2</td>
<td>0.8*</td>
<td>(p &lt; 0.05)</td>
</tr>
<tr>
<td>Crepitus</td>
<td>6.6</td>
<td>2.5*</td>
<td>(p &lt; 0.05)</td>
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Average Congruence Angle: (degrees)

Pre op
+30.7

Post op
+8.2* (p < 0.05)
Average Lateral Patellofemoral Angle: (degrees)

Pre op: -3

Post op: +9.4* (p< 0.05)
Average Lateral Translation: (mm’s)

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<tr>
<td>+8.0</td>
<td>+1.2*</td>
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*p < 0.05*
Summary:
Arthroscopic Patella Realignment

- Excellent clinical and radiographic stability
- No complications
- Excellent relief of pain and crepitus
Conclusion

Arthroscopic patella realignment is a safe and effective procedure for correction of patella instability when a proximal realignment is indicated.
Thank You