Soft Tissue Patella Stabilization: When is MPFL Reconstruction enough?

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I have no conflicts to declare.

Patella Dislocation and Dysplastic Anatomy
Patella dislocation often occurs in knees w/ an identifiable anatomic predisposition

- When is it necessary to correct / alter bony anatomy?
- When is an MPFL “enough”?
- When should we address the lateral side?

MPFL
the Queen of the PF joint
The essential stabilizer against Lateral Patella Dislocations

Surgical Management of Recurrent Lateral Patella Dislocation

Goal
Restore patella stability.
Restore / improve function.

Patella Dislocation and Dysplastic Anatomy
- Patella dislocation often occurs in knees w/ an identifiable anatomic predisposition
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4 Principal PF Instability Factors
1987 H. Dejour, G. Walch
Control (n=190) / Dislocation (n=147)

Without an MPFL Reconstruction

1 % Recurrence
14 % Residual Pain
Serie de 216 Patients
Service H. DEJOUR 1990 - 1993

Without an MPFL
Reconstruction

Alignment
Constraint

Surgical Management of Recurrent Lateral Patella Dislocation
Who is Ideal Candidate for MPFL Reconstruction?

History:
• Recurrent LPD with little or no pain between episodes of patella dislocation
• May report functional impairment when asked but…

MPFL Reconstruction: Surgical Indications
what about other factors??

• Trochlear dysplasia
• Increased Q-angle
• Increased TT-TG
• Patella Alta
• Increased lateral patella tilt

When should we add a bony procedure?

MPFL Reconstruction: Surgical Indications
Increased Q Angle:
Excluded if TT-TG >
• Wang et al. 2012 > 15mm
• Howell et al. 2012 > 18mm
• Kang et al. 2013 > 20mm

Increased Q Angle:
Excluded if TT-TG >
• Ellera Gomes (1992) – Q angle < 20° – TF Valgus < 10°
• Christiansen et al. (2008) – if Q angle ↑ : med. TTT
• Wang et al. 2012 > 15mm
• Howell et al. 2012 > 18mm
• Kang et al. 2013 > 20mm

Patella alta:
Distal tibial tubercle transfer
• Steiner et al. (2006) – “significant alta” excluded
  – M I/S 1.16
• Nomura et al. (2006)
  – I/S : M 1.08
  Range (0.98 - 1.23)
**MPFL Reconstruction: Surgical Indications**

what about other factors??

Patella alta:
- excluded if >1.2 (I/S)

- Ronga *et al.* 2009
- Kang *et al.* 2013
- Goyal 2013
- Wang *et al.* 2013

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**Systematic Review:**

Clinical Studies of “Isolated” MPFL Recon.

- 24 studies
  - 850 knees from 819 patients
  - $\bar{m}$ age 24.67 (range 10-60 yrs)
  - F/U 3 mo. to 17.2 yr.
  - 17 of 24 w/ min. 2 yr. F/U

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**Systematic Review:**

Clinical Studies of “Isolated” MPFL Recon.

- MRI available 44% (11 / 24) MPFL abnormalities 36% (4 / 11)
- Patellar height 76% (19 / 24) Insall-Salvati 53% of studies
- Trochlear dysplasia 88% (21 / 24) Sulcus angle 52% (11 / 21)
- Extensor mechanism alignment 88% (21 / 24) TT-TG 52% (11 / 21)
- Valgus 38% (8 / 21)

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**Systematic Review:**

Clinical Studies of “Isolated” MPFL Recon.

- In 8 studies, a *heterogenous* population was reported. (ie) patients with excessive anatomic imaging factors were included, (e.g.) patella alta, TT-TG, and TD.

- Only 2 studies related any outcome metric to pre-operative variables, in particular, anatomic imaging risk factors.

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**Systematic Review:**

Clinical Studies of “Isolated” MPFL Recon.

Anatomic Reconstruction of the MPFL in Children & Adolescents With Open Growth Plates

N= 21 $\bar{m}$ age 12.2 yrs.
F/U 2+ yrs. Kujala / Tegner outcome

High grade dysplasia ~ (+) apprehension sign

High-grade trochlear dysplasia possible risk factor for *inferior results* of MPFL reconstruction in skeletally immature children & adolescents.

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**Systematic Review:**

Clinical Studies of “Isolated” MPFL Recon.

Outcomes Reporting n=24

- Rate of re-dislocation – 88% commented
- Kujala score (pain scale) – 75% pre / 96% post
- VAS (pain) – 4%
- Return to sport – 67% commented
  - Tegner – 33% pre / 54% post
- QOL scale – 21% (KOS, IKDC, Cincinnati)
- Instability scale – none

_Nelitz *et al.*, AJSM 2012_

*Wagner et al.*, KSST 2013
Systematic Review:
Clinical Studies of “Isolated” MPFL Recon.

Increased Lateral Tilt
Lateral retinacular release / lengthening

- Lateral tilt measured: 42%
- LRL / LRR: “all” or “none” in most reported series

Distal Tibial Tubercle Transfer when is it necessary?

- Patella height: “excessive” > 1.4 on one or both ratios (I/S & C/D)
- “Functional Engagement”: My rule of thumb: 20% overlap

Empty Sulcus Sign

Recommendation

- Measure & Document
PF Anatomic Instability Factors

- Analyze Post-Operative Outcomes to the pre-operative factors
  Redislocation? Quality of life? Activity level?
- Help us create a better clinical algorithm for surgical PF indications

Patella Position
Sagittal plane – Femoral Based

Patella Trochlear Index
- 0.45 +/- .05 *
  (controls, n=81)
- 0.37 +/- .3 *
  (LPD, n=40)
- Alta: < 0.125 **

* Charles et al., AJSM 2012
** Biedert, Albrecht. KSST 2006
Conclusion

• “Isolated” MPFL is has sufficient literature based evidence that this is a satisfactory operation for Patella stabilization

• We do not have enough published information to know the “threshold” of when to add a bony procedure

Thank You